

MEMOIRS
OF THE
CALEDONIAN
HORTICULTURAL SOCIETY.

VOLUME FIRST.

— Deus nobis hæc otia fecit.

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Inserere nunc, Melibæe, Pyros; pone ordine Vites.

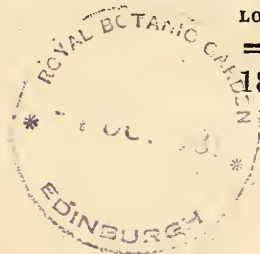
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1814.



THE
CALEDONIAN HORTICULTURAL SOCIETY,
ANIMATED BY THE GRATITUDE OF FAITHFUL SUBJECTS,
PRESUME TO OFFER
THE FIRST FRUITS OF THEIR LITERARY LABOURS,
TO HIS
ROYAL HIGHNESS
GEORGE, PRINCE OF WALES,
REGENT OF THE BRITISH EMPIRE,
THE ADMIRER SON
OF THE BEST OF FATHERS,
WHO, FOR MORE THAN HALF A CENTURY,
HAS ENJOYED THE UNPARALLELED SATISFACTION
OF HAVING BEEN
THE
FATHER OF HIS PEOPLE.

EDINBURGH, 22d August 1814.

Signed by appointment of the Society;

BUCCLEUCH, PRESIDENT.

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AN accurate alphabetical Index of the most important matters contained in the First Volume of the MEMOIRS of the SOCIETY, will be delivered to Subscribers, along with the First Number of the Second Volume.

New Editions of Nos. 1 and 2 of Vol. I., are in the Press, and will soon be ready for delivery; so that Gentlemen may have their copies completed.

Sept. 1814.

REGULATIONS,

*Sanctioned by the General Meeting, December 3.
1811, and to continue in force till regularly al-
tered or amended.*

1. **T**HE Society shall be denominated **THE CALEDONIAN HORTICULTURAL SOCIETY**, and shall consist of three classes of Members,—Ordinary, Honorary, and Corresponding; the number of which shall be unlimited.

2. The Ordinary Members shall consist of intelligent practical gardeners, and of amateurs of gardening, residing in any part of the British Empire.

3. Each Ordinary Member shall pay to the Treasurer, towards the funds of the institution, One Guinea, within one month after his election; and One Guinea annually afterwards, or, in his option, the sum of Ten Guineas, as a composition for annual payments for life.

4. The Honorary Members shall consist of Noblemen and Gentlemen who do not usually reside in Edinburgh, and who are distinguished amateurs in gardening. These members shall not be called upon to pay any annual contribution. They shall be entitled to attend the meetings of the Society, but shall have no vote in the management or appropriation of the funds, (excepting when any of them happen to fill offices in the Society.) But such of them as either give a donation of Ten Guineas, or subject themselves to the payment of the annual contribution, shall be entitled to every privilege of an Ordinary Member.

5. The corresponding Members shall consist of amateurs who reside at a distance from Edinburgh, and of intelligent practical gardeners who, there is reason to hope, may occasionally favour the Society with useful communications. They shall not be called upon to pay any annual contribution or admission money. They shall have no voice in elections or respecting prizes. But they shall be entitled to attend the meetings of the Society. And they shall also be entitled to all the privileges of Ordinary Members, if they choose to subject themselves to the payment of the annual contribution, or composition money.

6. The Ordinary Members, and those paying the annual contribution, shall possess the sole power of admission into the Society. All admissions

shall be by ballot, and the votes of two-thirds of the Members balloting shall be required for the admission of any new Members.

7. Candidates, whether for the rank of Ordinary, Honorary, or Corresponding Members, must be recommended by Two Members. They must be proposed at a regular quarterly meeting, and the fate of the proposal shall be determined at the quarterly meeting succeeding that at which it is made.

8. A meeting of the Society shall be held Quarterly, on the second Tuesday of March, June, September, and December, to transact all the ordinary business of the Society, and to hear such papers read as may be transmitted to the Secretaries during the course of the preceding quarter.

9. The objects of the institution are the promoting and improving the cultivation of the best kinds of Fruits, of the most choice sorts of Flowers, and of those vegetables which are most useful in the Kitchen. For this purpose, a certain number of prize-medals or premiums shall be awarded, annually, to such persons as shall be declared by proper judges to be entitled to the preference, in the investigation, by experiment, of subjects proposed by the Society. Communications shall also be received, on any subject connected with Horticulture, though not directly suggested by the So-

ciety. Such communications shall be read at the quarterly meetings: and it being in contemplation to publish Memoirs or Transactions, those papers which may be deemed of sufficient importance, shall (with consent of the author) be laid before the public.

10. The Society will not consider itself responsible for the statements contained in essays which may be published in their Memoirs: But when new methods are suggested, or new doctrines taught, it shall be a general rule to appoint a committee to superintend the repetition of the experiments on which such methods or doctrines may be founded, and to examine into the validity of such improvements as may be proposed. The results of these investigations shall be published, when deemed of sufficient importance.

11. On the second Tuesday of December annually, the Members of the Society present at the meeting who subject themselves to the payment of annual contribution, or who have paid the composition of Ten Guineas, shall elect a President, four Vice-Presidents, two Secretaries, a Treasurer, and Twelve Counsellors, for the ensuing year, all of whom, excepting the President, shall be Ordinary Members; but the President may be chosen either from the list of Ordinary or Honorary Members. At the meeting in December also, the

Members present shall elect an Experimenter, and a Painter of Fruits and Flowers. One Vice-President, and two Counsellors (one of the Professional, and one of the Amateur class,) shall be changed every year; and the President every second year.

12. These Office-bearers and Counsellors shall make all the arrangements respecting prizes, papers, publications, and other business of the Society. But the proposals made by them shall be submitted to the consideration of the Quarterly Meetings.

13. Twelve Members shall form a Quorum of the Society. Three shall be a Quorum in the Council.

14. The Secretaries shall have the custody of all papers belonging to the Society; and shall draw up and publish in some of the most widely circulated periodical papers, an account of the Society's proceedings, when they think it advisable. Previous to each quarterly meeting, schedules or letters shall be issued by post, announcing the place and hour of meeting, and the principal articles of business to come before the Society.

15. Every Member shall be bound to purchase a copy of the Society's Transactions; and a copy shall therefore be transmitted to each, and placed to his debit, by the Society's bookseller.

16. All future regulations to be enacted by the Society, for promoting the objects of the institution, shall be proposed at one ordinary quarterly meeting, and discussed at that immediately succeeding; to be then adopted, rejected, or altered, as a majority of the members present shall decide. But every proposed alteration must be submitted to the Council in writing, at least one month before it be presented to the Society.

PRIZES

PROPOSED

FOR THE YEAR 1812.

- I. The production of Fruits, Culinary Vegetables, and Flowers. (The prize the Society's SILVER MEDAL, or a Guinea and a Half, in the option of the Gainer.)

To be shewn at the Quarterly Meeting on the second Tuesday of March, or to the Committee at the Physicians Hall, on the second Tuesday of May.

1. The best brace of Early Cucumbers; seeds to be sown in January.
2. The best cluster of Early Grapes, of any kind.
3. The best six heads of Spring Broccoli.
4. The best six stems of Brussels Sprouts.
5. The best six heads of Winter Lettuce.
6. The best six seedling Polyanthus; from seeds sown last year.—2d Tuesday of May.
7. The best early Melon.—2d Tuesday of May.

To be shewn at the Quarterly Meeting on the second Tuesday of June, or to the Committee at the Physicians Hall, of the dates after mentioned.

1. The best Melon.
2. The best six forced Peaches, with names.
3. The best six heads of Cauliflower.
4. The best three seedling Pinks, from seeds sown summer 1811.—2d Tuesday of July.
5. The best twelve sorts of Gooseberries, twelve berries of each sort, with their names.—1st Tuesday of August.

To be produced at the Quarterly Meeting on the second Tuesday of September.

1. The best six Peaches, from the open air, with their names.
2. The best six Nectarines, from the open air.
3. The best six Apricots, with names.
4. The best dozen of Green-Gage Plums.
5. The best six Jargonelle Pears.
6. The largest cluster, and best swelled berries, any kind of Grape.
7. The best six seedling Carnations.

8. The best Home-made Wine, without the use of any imported material excepting sugar; two bottles to be produced, together with an account of the method of preparing it.

To be produced at the Quarterly Meeting on the second Tuesday of December.

1. The best six kinds of Apples, three of each sort, with their various local names, particularly kinds not generally known, with their peculiarities and history.

2. The best six kinds of Pears, three of each sort, also with names, &c.

3. The best six heads of Late Broccoli.

4. The best six heads of forced Sea-Cale.

5. The best twenty-five heads forced Asparagus.

II. The production of *new* or *improved* varieties of Fruits, Culinary Vegetables, or Flowers.

1. For the best new Apple, adapted to the climate of Scotland, raised from seed. Ten years to be allowed. Gold Medal and Twenty Guineas.

2. For the best new Pear, raised as above. Ten years to be allowed. Gold Medal and Twenty Guineas.

3. For the best new Peach or Nectarine, raised as above. Six years to be allowed. Gold Medal and Ten Guineas.

4. For an improved variety of the Dutch Currant, raised from seed. Five years to be allowed. Gold Medal, or, in the option of the gainer, Five Guineas.—And the same commutation will be allowed in other cases.

5. For the best new and productive Early Melon. Gold Medal.

6. For the best new Early Cucumber. Gold Medal.

7. For the best new Strawberry, raised from seed. Four years to be allowed. Gold Medal.

8. For the best new sort of Early Potato, *without blossoms*, raised from seed. Five years to be allowed. Gold Medal.

III. Communications, &c. (The Gold or the Silver Medal to be awarded by the Committee, according to the value and importance of the Communication.)

[It is expected that all communications will be founded on actual experiments.]

1. On the best method of improving the sorts of Broccoli already cultivated, and of saving their Seeds genuine in this climate.

2. The best method of cultivating and of forcing Sea-Cale.

3. The best treatise on Orchard Fruits adapted to the climate of Scotland, with lists and descriptions of the different kinds,—their habits of growth, &c.—their synonyms or local names; those for the table, and those for kitchen use.

4. The best treatise on the culture of the Dutch Currant for wine.

5. The best mode of preventing or curing the Mildew upon different Fruit-trees and other Vegetables.

6. The best mode of preventing or curing the Canker in Fruit-trees, &c.

7. The cheapest and most effectual mode of preserving Fruit-trees on walls from the effects of late spring frosts.

8. The best mode of destroying the blue insect, breeding in the crevices of the bark of Apple-trees, and causing them to canker and die, chiefly on those trees imported from the London nurseries.

9. The best method of destroying Wasps, Woodlice, Earwigs, &c. infesting wall-fruits.

10. The best mode of preventing the depredations of the Turnip-fly.

11. The best method of preventing Worms in Carrot, in Cauliflower, and Broccoli roots.

12. The best mode of destroying the Wire-Worm.

13. The best mode of destroying the Pine-bug,—the Brown Scale,—the White-bug,—the Aphis or Green fly,—the Chermes,—the Red Spider,—the Thrips; or any other insect infesting Hot-houses, Pits, Melon and Cucumber frames, &c.

14. The best means of increasing the quantity of Manure, and the best mode of applying it to different crops.

15. The best means of bringing into a bearing state, full grown Fruit-trees (especially some of the finest sorts of French Pears), which, though apparently in a very healthy and luxuriant condition, are yet in a state of almost total barrenness.

16. The best account of a Scotch Kitchen Garden, or of a Scotch Orchard.

17. The best method of preparing Opium in this country; and the most advantageous manner of cultivating the White Poppy for that purpose.

18. The best means of preventing the Curl in Potato.

19. The best mode of destroying or preventing Caterpillars on Gooseberry-bushes, and Fruit-trees.

20. For the greatest quantity of Asparagus, planted upon sandy land near the sea, and manured with sea-weed only ; not less than a quarter of an English acre.

21. For the greatest quantity of Sea-Cale, planted on the same kind of land, and manured with sea-weed ; not less than ten falls English measure.

22. For the greatest number of pints of Strawberries produced from the smallest extent of ground, not less than a quarter of an acre.

It is required that each article brought in competition have attached to it a particular motto, and be accompanied with a sealed letter referring to such motto, and mentioning the competitor's address.

Communications, either on the above subjects, or on any other topic connected with horticulture, may be addressed to Mr T. Dickson, 12. Broughton Street, or to Mr P. Neill, Edinburgh, the Secretaries.

LIST OF MEMBERS,

January 1812.

*HONORARY.**Elected December 5. 1809.*

- His Grace the Duke of Buccleuch.
 The Right Hon. the Earl of Dalkeith.
 The Right Hon. the Earl of Wemyss.
 The Right Hon. Lord Torphichen.
 The Right Hon. Lord Gray. 5
 The Hon. Henry Erskine.
 The Right Hon. Sir John Sinclair, Bart.
 Sir John Hope, Bart. of Pinkie.
 Sir William Forbes, Bart. Fintray House, Aberdeen.
 Francis Garden Campbell, Esq; of Troup. 10
 George Skene, Esq; of Skene and Carriston.
 The Right Hon. Sir Joseph Banks, Bart. P. R. S. Lond.
 Richard Anthony Salisbury, Esq; London.
 Thomas Andrew Knight, Esq;

March 6. 1810.

- The Right Hon. the Earl of Leven and Melville. 15
 The Right Hon. the Earl of Kintore.

- The Right Hon. James, Lord Ruthven.
 The Hon. William Maule of Panmure, M. P.
 Sir James Gordon, Bart. Letterfourie.
 Dr Alexander Monro, *senior*. 20
 Alexander Monro, Esq; of Livingston.
 David Black, Esq; of Bandrum.
 William Wemyss, Esq; of Wemyss-Castle, M. P.
 Adam Rolland, Esq;
 Charles Christie, Esq; of Durie. 25

December 4. 1810.

- The Hon. Douglas Gordon Halyburton, of Pitcur.
 Robert Spears, Esq; of Duninald.
 Dr Andrew Graham, Dalkeith.
 Dr Walter Graham, Dalkeith.

March 5. 1811.

- The Right Hon. Lord Viscount Duncan. 30

June 5. 1811.

- Lieutenant-Colonel Wemyss, of Wemyss-Hall.
 General Durham of Largo.
 Sir Simon Clark of Oakhill, Bart.
 The Hon. Baron Hepburn of Smeaton.

September 3. 1811.

- George Dempster of Dunichen, Esq; 35
 John Deas Thomson, Esq; London.

ORDINARY.

Elected December 5: 1809.

Sir James Hall, Bart. of Dunglass, M. P.	
Sir George Stuart Mackenzie, Bart. of Coul.	
James Hare, Esq; of Calderhall.	
Dr Andrew Duncan <i>senior</i> .	
Dr James Home.	5
Dr Daniel Rutherford.	
John Wauchope, Esq; of Edmonstone.	
Dr Andrew Coventry.	
Alexander Gibson Hunter, Esq; of Blackness.	
Robert Liston, Esq; of Milburn-Tower.	10
Thomas Hutchison, Esq.	
John Dundas, Esq; W. S.	
George Bruce, Esq; of Langlee.	
James Smith, Esq; Leith.	
Mr Walter Dickson, Edinburgh.	
— Thomas Dickson, Edinburgh.	15
— Andrew Dickson, Edinburgh.	
— Alexander Henderson, Edinburgh.	
— Thomas Shade, Edinburgh.	
— Patrick Lyon, Edinburgh.	
— James Macdonald, Dalkeith Park.	20
— John Hay, Edinburgh.	
— John Fletcher, Edinburgh.	
— Edward Sang, Kirkcaldy.	
— Patrick Neill, Canonmills.	
— Charles Norval, Abbot's-Hall.	25

March 6. 1810.

James Gibson, Esq; of Ingliston, W. S.	
William Pagan, Esq; of Spittleton.	
David Falconer, Esq; of Carlourie.	

Alexander Keith, Esq; of Ravelston.	
James Heriot, Esq; of Ramornie, W. S.	35
Henry Jardine, Esq; W. S.	
Henry Johnston, Esq; Edinburgh.	
James Weddel <i>junior</i> , Esq; of Pittendreich.	
James Kyd, Esq; Cupar, Fife.	
John Ferguson, Esq; of Stronvar.	40
David Mylne, Esq; R. N. Inveresk:	
William Murray, Esq; Laswade.	
Robert Little Gilmour, Esq; W. S.	
Robert Wilson, Esq; Edinburgh.	
Walter Berry, Esq; Edinburgh.	45
Mr James Dickson, Edinburgh.	
— George Dickson, Edinburgh.	
— John Bruce, Bridge-end, Liberton.	
— George Fulton, Edinburgh.	
— David Weighton, Melville House.	50
— James Smith, Ormiston-Hall.	
— Thomas Handyside, Fisherrow.	
— Alexander Walker, Monkton, Musselburgh.	
<i>December 4. 1810.</i>	
Archibald Mackinlay, Esq; Edinburgh.	
Mr George Watson, Edinburgh.	55
Mr William Sheills, Dalkeith.	
<i>March 5. 1811.</i>	
Hugh Watson, Esq; W. S.	
Charles More, Esq; Edinburgh.	
Mr Thomas Calder at Balmacom, Fife.	
<i>June 5. 1811.</i>	
Duncan Cowan; Esq; Edinburgh.	60
J. A. Higgins of Newk, Esq; W. S.	

John Macfarlane, Esq; of Kirkton.
Dr John Yule.

September 3. 1811.

Robert Fergusson of Raith, Esq;	
Gilbert Meason of Lindertis, Esq;	65
Robert Bruce Dundas of Blair, Esq;	
George Bell, Esq; Edinburgh.	
John Thomson, Esq. Edinburgh.	
James Stuart, Esq; younger of Dunearn.	
William Inglis, Esq; W. S.	70
J. W. Brougham, Esq; Edinburgh.	
David Bridges <i>jun.</i> Esq; Edinburgh.	
William Cadell <i>jun.</i> Esq; Banton.	
David Balfour, Esq; Arbroath.	
Robert Stewart Cumming, Esq. Dalkeith.	75
Col. Thomas Calderwood, of Polton.	
Mr James Lawrie at Spittalton.	

December 3. 1811.

John Maitland of Eccles, Esq;	
Alexander Young of Harburn, Esq;	
George Douglas of Cavers, Esq;	75
Ninian Hill, Esq; W. S.	
William Braidwood <i>jun.</i> Esq; Edinburgh.	
James Carfrae, Esq; Edinburgh.	
Mr Alexander Hay at Edmonstone.	79

*CORRESPONDING.**December 5. 1809.*

Mr Robert Anderson, Hamilton Palace.	
— James Smith, Keith Hall, Kintore.	
— Robert Hosie, Lynedock.	
— John Mitchell, Moncrieff House.	
— Alexander Muirhead, Invermay.	5
— Thomas Bishop, Methven.	
— John Macmurray, Stranraer.	
— Alexander Dods, Clerkington.	
— Alexander Macdonald, Durie.	
— James Nisbet, St Mary's Isle.	10
— Thomas Henderson, Blair-Adam.	
— William Harper, Dunibristle.	
— James Austin, Glasgow.	
— George Rutherford, Haddington.	
— James Bain, Dysart.	15
— James Kirk, Smeaton.	
— William Beatie, Scone.	
— Robert Miller, Dupplin.	
— John Henderson, Brechin Castle.	
— William Bannatyne, Dalkeith.	20
— Thomas Thomson, Wemyss Castle.	
— Joseph Archibald, Dalhousie Castle.	
— Thomas Thomson, Erskine House.	
— James Dods, Bargeny.	
— John Mackintosh, Abercairney.	25
— George Lamb, Dunkeld.	
John Shirreff, Esq;	

March 6. 1810.

- Rev. Dr John Stuart, Luss.
 Rev. John Fleming, Flisk. 30
 James Hoy, Esq; Gordon Castle.
 Mr James Townsend Mackay, Botanic Garden, Dublin.
 — James Laing, Wales.
 — James Rintoul, Coilsfield.
 — George Whittit, Barnton. 35
 — William Dickson, Arniston.
 — James Stewart, Pinkie.
 — Alexander Stewart, Valleyfield.
 — Peter Barnet, Amisfield.
 — Daniel Crichton, Minto House. 40
 — John Naismyth, Culloden.

December 4. 1810.

- David Ford, Tynningham.
 — Thomas Torrance, Shambally, Clogbeen, Ireland.
 — John Gibb, Linton, East Lothian.

March 5. 1811.

- Robert Ingram, Torry. 45
 — Walter Underwood, Eglinton Castle.
 — George Steel, Lundie.
 — James Buchanan, nurseryman, Camberwell, London.
 — William Nash, seedsman, London.
 — William Affleck, Hirsell. 50

June 5. 1811.

- William Gibbs, Castle Brahan.

September 3. 1811.

- William Forsyth, Stobo.
 — William Emslie, Goshan, Drummore.
 — William Urquhart, nurseryman, Dundee.
 — John Simpson, Prestonpans. 55
 — James Fell, Loretto.

Mr Picken, Kirkhill, Laswade.

— William Brownlee, Dalkeith.

December 3. 1811.

— James Brown, nurseries, Perth.

— Robert Brown, nurseries, Perth. 60

— William Macnab, Botanic Garden, Edinburgh.

— George Sinclair, Woburn Abbey.

— Robert Blair, Stevenson, East Lothian.

— George Ogilvie, Prestonhall.

— John Macdougall, Castle Huntly.

— Robert Fairbairn, Vogrie. 65

OFFICE-BEARERS

Elected 3d December 1811.

Sir JAMES HALL, Bart. M. P.—*President.*

Dr D. RUTHERFORD,
 ALEX. G. HUNTER, Esq;
 Dr DUNCAN *senior*,
 Sir GEORGE MACKENZIE, Bart. } *Vice-Presidents.*

Mr THOMAS DICKSON, }
 Mr PATRICK NEILL, } *Secretaries.*

Mr ANDREW DICKSON,—*Treasurer.*

COUNSELLORS.

<i>Professional.</i>	<i>Amateur.</i>
Mr James Macdonald.	George Bruce, Esq;
Mr Edward Sang.	Thomas Hutchison, Esq;
Mr John Fletcher.	James Smith, Esq;
Mr John Hay.	Alexander Keith, Esq;
Mr Alexander Henderson.	Henry Jardine, Esq;
Mr George Whittit.	James Herriot, Esq;

GENERAL COMMITTEE FOR PRIZES.

Professional.

Mr James Macdonald.

Mr Thomas Shade.

Amateur.

George Bruce, Esq;

Dr James Home.

Superintendent of Experiments.

MR JOHN FLETCHER.

Painter of Fruits and Flowers.

MR PATRICK SYME.

The Vice-President for the day, is *ex officio* a Member of the Committee for Prizes. For judging of the merit of Essays on particular subjects, occasional Committees are appointed by the President or Vice-President of the Meeting at which these Essays are read. The Secretaries are *ex officio* Members of all Committees.

PRIZES

Awarded since the institution of the Society.

 SILVER MEDAL.

1810.

- Mar. 6. *Early Broccoli*, The best six heads.—To A. G. Hunter, Esq; Loretto.
- April 12. *Radishes*, The first early, sold in Edinburgh market.—To Mr James Thomson, gardener, Duddingston.
- May 1. *Cucumbers*, For the best brace.—To Mr James Macdonald, gardener to his Grace the Duke of Buccleuch and Queensberry, at Dalkeith House.
- June 5. *Early Dutch Turnips*, For the first, (produced to the Committee).—To Mr John Heriot, gardener to Mr Mitchell of Parson's Green, near Edinburgh.
- Carnations*, For the six best.—To Mr Archibald Reid, gardener to Mr Munro of Livingston.
- July 3. *Cauliflower*, For the best.—To Mr James Stewart, gardener to Sir John Hope, Bart. Pinkie.
- Peaches*, For the best twelve —To Mr Robert Ingram, gardener to Sir William Erskine, Baronet, Torry House.
- Melon*, For the best.—To Mr Stewart, Pinkie.

1810.

Sept. 4. *Currant-Wine*, For the best.—To Mrs Dr Duncan *sen.* Adam's Square.

For excellent ditto ;

1. To Mrs Walker, Drumsheugh, (red).
2. To Mrs Keith, North Charlotte Street.
3. To Mrs Walker, Drumsheugh, (white).
4. To Mrs Bryce, St Andrew's Square.

For *Gooseberry* ditto :

5. To Mrs Fletcher, Restalrig.

Apricots, For the best twelve.—To Mr James Macdonald, Dalkeith.

Gooseberries, For the best.—To Mr Macdonald, Dalkeith.

Jargonelle Pears, For the best.—To Mr James Stewart, Pinkie.

Peaches, For the best.—To Mr James Macdonald, Dalkeith.

Plums, Green-Gage, For the best.—To Mr Thomas Henderson, gardener to William Adam, Esq; Blair-Adam.

Dec. 4. *Apples*, For the best.—(Two Medals awarded).

1. To Mr James Macdonald, Dalkeith.
2. To Mr William Ballantyne, gardener to the Right Honourable Lord Melville, Melville Castle.

Pears,—(Two Medals also awarded).

1. To Mr James Smith, gardener to the Right Honourable the Earl of Hopetoun, at Ormiston-Hall.
2. To Mr Robert Ingram, gardener, Torry.

1810.

- Dec. 4. *Early Broccoli*, For the best.—To Mr James Macdonald, Dalkeith.
Sea-Cale, For the best forced.—To Mr William Affleck, gardener to the Right Honourable the Earl of Home, Hirsel.
Asparagus, For the best forced.—To Mr James Smith, Ormiston-Hall.

1811.

- Mar. 5. *Broccoli*, For the best early.—To Mr James Macdonald, Dalkeith.
Lettuce, For the best winter.—To Mr William Affleck, Hirsel.
23. *Cucumbers*, For the best brace of, (seeds sown in January).—To Mr James Stewart, Pinkie.
- June 5. *Radishes*, For the earliest, sold in Edinburgh market.—To Mr John Macallum, gardener, Restalrig.
Turnip, Early, For the first 100, sold in Edinburgh market.—To Mr Thomas Davidson, gardener, Summerfield.
Polyanthuses, For the six best seedling.—To Mr William Affleck, Hirsel.
Melon, For the best.—To Mr James Stewart, Pinkie.
Apples.—To Mr Stewart for a communication on the method of keeping apples throughout the year.
Cauliflower, For the best six heads.—To Mr James Fell, gardener to A. G. Hunter, Esq; Loretto.

1811.

July 16. *Carnations*, For the best six seedling.—To Mr Henderson, gardener to Sir Alexander Mackenzie, Bart. of Delvin.

30. *Strawberries*, For the first Scotch pint of, sold in Edinburgh market, (10th June).—To Mr John Charles, gardener, Laswade.

Peaches, For the best twelve, forced.—To Mr Robert Ingram, Torry.

Sept. 3. *Currant-Wine*, For the best specimen of.—To Miss Edmonstone, 3. George Street, Edinburgh.

For excellent ditto :

1. Mrs Anderson, Stoneyhill, Musselburgh.

2. Mrs Simpson, Viewfield.

3. Mrs Mitchell, Parson's Green.

4. Mr Sang, Loanwells, Kirkaldy.

5. Mrs Wright, 11. Argyle Square.

For *Gooseberry* ditto :

6. Mr Sang, Loanwells, Kirkaldy.

Peaches, For the best six, from the open wall.—To Mr George Whittit, at Barnton.

Nectarines, For the best six, from the open wall.—To Mr David Trotter, gardener to J. Johnston, Esq; Alva.

Apricots, For the best six.—To Mr William Affleck, Hirsell.

Plums, Green-Gage, For the best twelve.—To Mr Henry Turnbull, gardener to Dr Monro at Craiglockhart.

Jargonelle Pears, For the best twelve.—To Mr Robert Ingram, Torry.

1811.

- Sept. 3. *Gooseberries*, For the best specimen of, with names.—To Mr James Allan, gardener to Sir William Forbes, Bart Collington.
- Hamburgh Grapes*, For a fine cluster of.—To Mr Robert Ingram, Torry, (extra medal).
- Original, or Burrknott Apple*.—To Dr Duncan senior, for his communication on the mode of propagating it, &c. (extra medal).
- Dec. 3. *Pears*, For the best six sorts of French pears, with their names, &c.—To Mr Robert Ingram, Torry.
- Sea-Cale*, For the best forced.—To Mr James Smith, Ormiston-Hall.
- Broccoli*, For the best six heads of.—To Mr James Stewart, Pinkie.
- Asparagus*, For the best bunch of forced.—To Mr Robert Ingram, Torry.
- Dec. 20. *Onions, transplanted*, For an excellent specimen of, and an account of his method of culture.—To Mr Macdonald, Dalkeith, (extra medal).

GOLD MEDAL.

- Dec. 3. *Curl in the Potato*, For the best account of, and method of preventing.—To Mr Thomas Dickson, nurseryman, Edinburgh.

A
DISCOURSE

READ AT THE
QUARTERLY MEETING

OF THE
CALEDONIAN HORTICULTURAL SOCIETY,
IN THE HALL OF THE ROYAL COLLEGE OF PHYSICIANS,
EDINBURGH,

December 3. 1811.

BY
ANDREW DUNCAN *sen. M. D. & P.*

ONE OF THE VICE-PRESIDENTS.

THE UNIVERSITY OF CHICAGO
LIBRARY

THE UNIVERSITY OF CHICAGO

LIBRARY

THE UNIVERSITY OF CHICAGO

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LIBRARY

A

DISCOURSE, &c.

GENTLEMEN,

AT the end of the second year, from the first establishment of this Society, we are now assembled for the annual election of our Office-Bearers. It is my duty to officiate as your Vice-President: And it has been recommended to me, to give a short account of what has already been done by the Society, and also to state some future objects which your Council have in contemplation. I trust, therefore, I shall be favoured with your indulgence, while I submit to your consideration, a few remarks on these subjects.

I need not detain you with any account of the views of those who first suggested this institution. It is sufficient to observe, that the kingdom of Scotland has been long and justly celebrated, for supplying useful practical Gardeners to every part of the British Empire. This, perhaps, has in some degree been the effect of our climate. We are not blessed with the same genial heat, particularly during the spring, as our brethren in the South. To produce, therefore, the same delicious fruit, greater attention and greater skill are required. By these, however, the experience of ages has now demonstrated that many difficulties may be overcome; that, by the aid of artificial heat, and the protection of glass, the fruits of our gardens may vie with those of any part of the habitable world; that, by proper management, almost every vegetable useful in the diet of the human species, may be reared in the greatest perfection, and in the greatest plenty.

But whether our skill in gardening, is to be ascribed to our unfavourable climate or not, certain it is that Scotland has long been famous, both for intelligent professional Gardeners, and

zealous amateurs. That men of rank and fortune should have dedicated some portion of their time and their wealth, to the improvement of gardens, is not surprising: For, without the hazard of contradiction, I may venture to assert, that, among all the rural amusements, gardening is one of the most innocent, the most rational, and the most healthful. Hence, to have obtained pre-eminence in this art, is creditable and honourable to the country.

It is therefore a duty incumbent upon the present age, to maintain that reputation which our ancestors have acquired for us. But it is often a more difficult matter to support, than to gain an eminent character. Expectation raised to a high pitch is difficultly satisfied. This can only be effected by continued, by increased exertions. When, therefore, Sir Joseph Banks, the truly respectable President of the Royal Society of London, and some other enthusiastic Horticulturists in England, formed a Society for the improvement of Gardening, by the combined efforts of art and science, it became the duty of patriot Scotsmen to follow so laudable an example.

Such considerations gave a beginning to this institution: And on the 25th of November 1809, a few gentlemen met at Mr Thomas Dickson's house, in the neighbourhood of Edinburgh, where it was agreed, that a letter should be sent to different skilful professional gardeners, and zealous amateurs, inclosing a sketch of an intended plan, and intimating, that a more general meeting was to be held on Tuesday the 5th of December 1809, to take that plan under consideration. The noblemen and gentlemen to whom that intimation was sent, were requested, either to attend the meeting in person, or to send intimation of their sentiments respecting the plan.

In consequence of this invitation, a very respectable meeting took place in this room*, on the 5th of December 1809; and notice was received from some of the first characters of the kingdom, approving of the plan, and intimating their readiness to become members of the institution. Among these, the DUKE OF BUCCLEUCH, who has long been distinguished in the country as a real patriot, and his eldest son, the EARL OF DALKEITH, sent notice of their approbation,

* The Hall of the Royal College of Physicians.

and of their readiness to accept of the rank of Honorary Members, to which they had been invited. Thus encouraged by men of rank, of worth, and of discernment, the first meeting proceeded to nominate Office-bearers for the ensuing year. The EARL OF DALKEITH was appointed your first President; and Sir JAMES HALL, who has long been distinguished for his patronage of the arts and sciences,—together with Dr RUTHERFORD, Professor of Botany,—Dr COVENTRY, Professor of Agriculture,—and Mr HUNTER of Blackness, a gentleman, whose enthusiasm in gardening has seldom been equalled,—were chosen the first Vice-Presidents. Such names gave the prospect of no inconsiderable support to this infant institution. But in no particular was the Society, in my opinion, more fortunate than in the nomination of their Secretaries. Two gentlemen, whose characters are well known to most of you, the late Mr WALTER NICOL, and Mr PATRICK NEILL, agreed to undertake the duties of that office. Mr Nicol's character, by his valuable publications, was already favourably known to every intelligent horticulturist in Britain. But, alas! it was the

will of Heaven that we should be favoured a short time only with his assistance. By his much lamented death, at an early period of life, our Society, in its infant state, sustained a very great, but I would fain hope, not an irreparable loss. Among other business of this day, the vacant office of a Secretary is to be filled up. Your choice will, I trust, fall upon some one of our number, who although he may not be able to equal, will yet be desirous to imitate the example set by our deceased friend. Our other Secretary, Mr Neill, will, I hope, be long both able and willing to lend his aid to this institution. He is not only a zealous amateur in gardening, but his superior knowledge in every branch of natural history, is universally admitted by all who have science enough duly to appreciate that knowledge: And I say no more than the truth, when I assert, that from his industry, and from his abilities, this Society has already derived many important advantages.

Having, at the meeting in December 1809, by the election of respectable and intelligent office-bearers, given to our Society a "body and a name," we proceeded to consider the proper Re-

gulations for such an institution. After considerable discussion on the printed sketch which had been circulated, it was agreed, that any decision on the subject, should be delayed till the next quarterly meeting; and a Committee was appointed to present to that meeting, a new draught of it, improved by the suggestions which had been thrown out.

A committee was also appointed to prepare a list of Prize-Questions, which, by holding out honorary and pecuniary rewards to men of spirit and genius, might call forth their exertions, for the improvement of horticulture in all its branches.

A List of Prize-Questions prepared by them, was accordingly sanctioned, by the General Quarterly Meeting held on the 6th of March 1810; and at the same meeting, the Laws and Regulations, as revised by the committee, met with unanimous approbation. Of these regulations, as being already in the possession of every member, I need say nothing: I shall only observe, that one great object of the Caledonian Horticultural Society, is to unite the exertions of intelligent professional gardeners, and of zealous

lous amateurs in every part of the kingdom, for the improvement of the art. With this view, it was agreed that the Society should consist of three classes of members: *1st*, Of *Honorary* Members, who, though from situation and other circumstances, they could not often be present at our deliberations, would yet, from their rank in life, and respectability of character, give celebrity and do honour to our institution, and, at the same time, induce the professional gardeners employed by them, to favour us with useful communications: *2dly*, Of *Ordinary* Members, who, from their residence being principally in Edinburgh, would not only regularly attend our meetings, and assist at our deliberations, but would agree to contribute a small sum annually, for calling forth and rewarding the exertions of genius and of industry: And, *3dly*, Of *Corresponding* Members, consisting chiefly of professional gardeners, residing at a distance from Edinburgh, who, by transmitting communications to this Society, might thus have an easy mode of imparting to the public, interesting improvements, which experience has enabled them to discover.

At the meeting in March 1810, the Society had the satisfaction of entering on the proper objects of their pursuit. Six different communications were then read; some of them on subjects of great national importance, such, for example, as on the means of preventing the *Curl* in the Potato. Of this vegetable, as a nourishing and salubrious aliment, both for the human species, and for many of our most useful domestic animals, it would be altogether superfluous in me to say any thing; nor need I insist upon the advantage of removing every impediment to its successful culture. A due sense of the importance of this subject, led the Society to propose the most effectual means of removing that disease in potatoes known by the name of *curl*, as the subject of a prize. In consequence of that proposal, several interesting dissertations were transmitted to your Secretary. These dissertations were subjected to the examination of a committee, and in consequence of the award of that committee, I now deliver to Mr THOMAS DICKSON your Gold Medal, as an honorary and public mark of approbation for his successful

exertions in the way of experiment. Of the value of Mr Dickson's experiments to the community at large, if the conclusions which he has drawn from them be just, it would be unnecessary for me to say any thing; I shall only observe, that we have reason to hope, that a full account of them, will in no long time be communicated to the public, through the medium of our *Memoirs*. After Mr Dickson's experiments are published, every cultivator of potatoes will have himself an opportunity of determining their value, by the test of future experience. But at whatever rate their value may finally be estimated, it is the unanimous opinion of the committee of judges, that Mr Dickson is entitled to a public mark of the Society's approbation, for the expence, the labour, the attention he has bestowed, and for the exertions of his genius on this interesting subject. It is the wish of your council, not only to publish his opinions to the world, but also to give a fair trial to his proposal, by a series of experiments conducted under their own direction.

Of all the memoirs that have been communicated, it would not be consistent with the busi-

ness of the present meeting to speak. To read even a list of their titles, would take up too great a portion of your time. I shall only observe, that twenty-six different communications, on subjects of no inconsiderable importance, have been read at our meetings; and that no fewer than fifty-two medals, or premiums in place of medals, have been awarded to different individuals. Of the medals, several have been awarded to Ladies for their excellence in the preparation of Currant Wine; and this I will venture to say, is, in the present state of the nation, an object of very great importance. That the wines of foreign countries, afford indeed to the inhabitants of the British Empire, some of their greatest luxuries, and most useful cordials, will not be denied; and it is the glory of civilized Society, that by the intervention of commerce, every nation on the face of the habitable globe, may be freely supplied with the produce of every other. Till the reign of terror in France, the genius and industry of our mechanics,—of a BOLTON, an ARKWRIGHT, a WEDGWOOD, and others, was repaid to themselves, and to the nation, by the best wines which France could afford. But

amidst tyranny and war, we are necessarily deprived of many of the blessings of peace; and it is the duty of the patriotic citizen, either to submit to these privations, or to supply them by the produce of our own islands, and of our own colonies. It has long been known, that from the fruit of the currant-bush, growing luxuriantly, and affording abundant crops in every part of the British isles, aided by the sugar furnished from our plantations in the West Indies; if the fermentation which takes place be properly conducted, a generous wine may be produced, well calculated either for cheering the hearts of those in a state of health, or for alleviating the distress of many when subjected to disease. Of this, incontestible proof has been afforded, by the many excellent specimens of currant-wine which have been sent to the Society, by competitors for our honorary premium. Some of these specimens, after the wine, previously retained for a proper time in the cask, had been kept in bottles for more than twenty years, afforded evident proof, that the art is neither new, nor the liquor, when properly prepared, a very perishable one. But in the preparation

of currant-wine, as in other arts, very great improvements have of late been made, particularly by the means of regulating the fermentation; and there is reason to hope, that by the aid of the *saccharometer*, and other contrivances, this most important part of the process, although it can never perhaps be reduced to certain rules, may be regulated with much greater accuracy than is commonly the case.

All the Ladies, to whose wines premiums have been awarded, have communicated to the Society a particular account of their method of proceeding. Of these, however, I shall at present say nothing. But permit me to observe, that by a judicious abstract from the specifications in the hands of our Secretary, there is reason to hope, that much useful information may be communicated to the public, respecting the preparation of good wine, at a moderate expence, from currants growing in our own gardens: For, from the specimens presented to this Society, it appears that the best currant-wines are not prepared according to the most expensive receipts.

I have thus pointed out two subjects, the

Prevention of the Curl in Potato, and the Manufacture of Currant Wine, with regard to which, I flatter myself, that the communications made to this Society, will be productive of no inconsiderable national advantage. Of many other useful suggestions, I might say much, particularly with regard to the best methods of destroying different insects that infest fruit-trees; the best means for bringing fruit-trees, particularly the finer sorts of French pears, into full bearing; and the best means of increasing the effects of manure. But for a particular account of these, I must refer you to our Memoirs, when presented to the public.

AFTER these cursory remarks on what has already been done, I shall next briefly mention some important objects which your Council have hereafter in view. On this subject, I must candidly acknowledge, that my expectations are in all probability, much more sanguine than they ought to be. But I well know, that, in the improvement of horticulture, by the exertions of industry and genius, much may be done; and I confidently hope, that not a little will be done.

Discoveries are chiefly to be made by judicious experiment. And it is by the test of experience alone, that the suggestions of genius can be duly appretiated, can be confirmed, or refuted. It is therefore an object of great importance, not only to encourage a zeal for experiment by proper rewards, but to recommend it by example, and to put the alleged results of the experiments of others, to future trials under our own inspection.

It is indeed true, as was long since observed, by an ancient writer of the first eminence, that "life is short, art long, opportunity fleeting, experiment precarious, and judgment difficult." It must also be admitted, that those horticultural experiments, which your Council have in view, cannot be executed without very considerable expence, as well as much labour and attention. But we have reason to believe, that to the fund arising from the annual contributions of Ordinary Members, a considerable addition may be made by the donations of those who have patronised the Society, by accepting of the rank of Honorary Members. And

some of our number are not without hopes, that our exertions may be forwarded even by Royal Patronage and Royal aid. They imagine, that for the purpose of our experiments, a grant of a small portion of that ground in the vicinity of Edinburgh which is the property of the Crown, and which is at present in an almost uncultivated state, may be obtained from our Most Gracious SOVEREIGN, or his Representative, our Most Excellent REGENT.

The best chance we have of obtaining Royal Patronage, is, by demonstrating that we deserve it: And we ought, without delay, to begin experiments, although upon a small scale. With this view, your Council take the liberty of recommending to you, to appoint two new officers to the Society; an *experimenter* for conducting such trials as the Society may judge proper; and a *painter of fruits, flowers, roots,* and such other vegetable productions as may serve to illustrate and to demonstrate the result of experiments.

It is indeed true, that the present state of our funds will not enable us to give an adequate remuneration to men, qualified for discharging

the duties of these offices. But your Council have good reason to believe, that there are men in our Society, who, from an ardent zeal for horticultural pursuits, will (like our Secretaries and Treasurer) cheerfully dedicate some portion of their time and talents to your service, without any pecuniary reward.

By these means, and by such aid, I would fain hope, that the useful exertions of this Society, may not only be continued, but increased; and that it will thus afford rational amusement, and interesting information to all who have already joined and patronised it, or who may hereafter be ranked among the number of its members.

THE Society, after hearing the preceding discourse, entered on the consideration of the proposal from the Council respecting the appointment of an Experimenter, and a Painter. That proposal met with unanimous and cordial approbation.

On the recommendation of the Council, Mr

JOHN FLETCHER was immediately appointed Experimenter, and Mr PATRICK SYME was appointed Painter.

After these appointments, Mr THOMAS DICKSON, whose paper on the Curl in Potatoes had been honoured with the first Gold Medal given by the Society, was unanimously elected Secretary, for supplying the vacancy occasioned by the death of the late Mr Walter Nicol.

MEMOIRS, &c.

I.

Observations on the Disease in the Potato, generally called the Curl; pointing out the most probable method of preventing it; with an account of the results of a few experiments made on the subject.

By MR THOMAS DICKSON, Leith Walk, Edinburgh.

(Read 6th March 1810.)

THIS disease, so far as I can learn, first began to be alarming to the growers of the potato, about thirty-five or forty years ago. Since that time, it has continued to engage the attention of many eminent agriculturists and gardeners.

Various opinions have at different times been advanced as to its cause. Some were of opinion, that the disease was caused by the tubers used for seed-stock, not having been sufficiently ripened;—others thought that they had been frost-bitten, in the course of the preceding win-

ter:—some ascribed the evil to the effects of blights attacking the plants in coming through the ground;—others to the attacks of certain minute insects:—lastly, the exhausted state of the soil was blamed for the disease. But no one seems to have hit upon the real cause, until the Honourable Baron HEPBURN of Smeaton, in East Lothian, one of the most successful and intelligent agriculturists of this country, started a new theory on the subject; which, from its singularity, and *seeming* inconsistency with our experience in matters of a similar nature, did not at the time meet with that attention to which it undoubtedly was entitled. The Baron thought that the curl was probably caused by the tubers used for seed-stock, having been allowed to become too ripe the preceding year, and that this practice of over-ripening, being repeated year after year, was the real cause of the disease, the vegetative power in the tubers being thus exhausted.

I candidly confess myself to have been rather at first a sceptic on the subject; but after considering the thing a little, my doubts began to clear away. In order to satisfy myself thoroughly, I resolved upon making a suite of experiments. I accordingly did so; and as they were conducted entirely by myself, or under my own immediate superintendance, I can pledge myself for their accuracy. I now beg leave to lay them before the Caledonian Horticultural So-

ciety, in hopes that they may, by means of the Society, be made known to the public ; and as the experiments are easily repeated, that they may induce others to turn their attention to the subject.

I think it right to observe, that the experiments now to be detailed, were not made with any view of their ever appearing before the public ; nor would they have been brought forward at this time, but from a wish to promote the views of this Society.

It is well known to all cultivators of the potato, that the usual mode of reproducing any particular variety of that valuable root, is by cuts or sets of the tubers ; and that this mode of propagation is repeated every year, so long as that particular sort is wished for, without our ever thinking of re-invigorating the *seed-stock* *, by raising new plants from the real seeds. In this way it happens, that merely the individual *variety* is propagated ; the *species* being reproduced only by sowing the true seeds of the plant. It is only by sowing the seeds that we obtain *new* varieties. But if the seeds be taken from any particular variety that is wished to be preserved,

* By this expression is always to be understood the stock of *tubers* for planting, in contradistinction to the real seed of the plant.

and if care be exercised, that the plants shall have no communication with the farina of any other plants of the same species in flower, then the produce of these seeds will probably be the same, or nearly the same, with that variety from which the seeds were saved; and from the seed-stock being renewed, and re-invigorated in this way, it seems likely, that the variety so obtained, may, by observing a proper management, be preserved from the curl or any other kind of degeneracy, for any length of time.

I shall presume, that the principal cause of the curl in the potato, is the over-ripening of the seed-stock for the supply of the ensuing year, by allowing it to remain too long in the ground, and especially if it be also planted early; this practice being repeated for several years successively, causes an exhaustion of the vegetative principle, in the tubers, which renders them totally unfit to produce vigorous healthy plants; and is the principal cause of the disease. This doctrine has almost uniformly been objected to by many very intelligent agriculturists and gardeners, as being quite contrary to our experience in regard to seeds in general; full ripeness being considered the best recommendation. But this objection, I apprehend, arises from the taking an improper view of the subject. It is true, that all of what are properly called *seeds*, are improved, by being thorough-

ly ripened ; but *cuts* or *sets*, taken from the tubers of a potato, cannot, strictly speaking, come under the description of seeds. Planting cuts of the potato, is analogous to budding or grafting of trees, being only a secondary mode of propagation ; and consequently, the above-mentioned objection does not hold good. This doctrine may be further illustrated, by observing the strong tendency which potatoes raised from seeds, have to run to flower and seed, unless prevented, by destroying these as they appear, and by earthing up the roots of the plant, so as to induce them to throw out tubers. This natural disposition of plants raised from seeds, will remain for several generations of the plant, gradually yielding to the artificial means used, until they at last become what we wish. And what may be deemed still a farther proof is, that those who cultivate potatoes most successfully, in the low and early parts of this country, where the disease chiefly exists, bring a supply of seed-stock, from the higher and later parts of the country, for a change, every second year at farthest. In such high places, from the lateness and wetness of the climate, the farmers are prevented from planting their potatoes so early as in the low country, and are also, from the fear of early frosts, obliged to take up their crop sooner ; consequently the tubers are never so highly ripened as to weaken the vegetative principle in them. Here,

then, we have a strong practical testimony to the truth of the doctrine which has been advanced.

On the other hand, in the early districts of the low country, where, as has already been remarked, the disease is principally known, particular kinds of potatoes are planted year after year successively, from the same seed-stock, and most of the early kinds are planted soon in the season, with a view to procure an early crop for the market : a part of these is generally allowed to remain in the ground till the usual time of taking up, to supply seed-stock for the ensuing year : by this time, however, the plants have become so ripe as to weaken very much the vegetative power of the tubers. This practice being repeated for several years, at last so impairs the vegetative power in the tubers, as to produce the curl ; and there is no doubt that if this practice were persevered in, it would ultimately destroy the power of vegetation altogether, as I have proved by experiments.

There is yet another powerful cause which weakens the vegetative power in the tubers ; and that is, the allowing such plants as are intended to supply seed-stock for the ensuing year, to run to flower, and produce seed *. This should in all cases be prevented, by cutting off the

* It is generally the late sorts of potatoes that produce seeds, very few of the early kinds doing so.

flowers as they appear, even in embryo. Thus, by turning nature from her ordinary course, we force her to exert herself in another channel, and to throw back into the tubers, that portion of the vital principle of the plant, which would have been exhausted in the formation of flowers and seeds. Nothing will more contribute to prevent degeneracy in the potato, and especially to prevent curl, than this treatment.

In proof of what I have already advanced on this subject, I shall now state a few experiments made by myself in the years 1801,-2,-3. They appear to me to be quite conclusive, and will go farther to convince, than a volume written without experiments.

In the autumn of 1800, when in Fife, at a friend's house, I met with a potato of the long flat kind*, which I thought very excellent, and obtained a few to cultivate for my own use: he however informed me, that they had been so infested with the curl for some years, that he had resolved to abandon the culture of them altogether. This led me to conclude, that, from their shape, &c. they were well adapted for being made the subject of some experiments I had previously resolved to make, with a view to ascertain the truth of the new idea, upon the cause of the

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* A sketch of a tuber of that kind, of the natural size, accompanies this, shewing the different cuts or sets, &c.

curl, which had been some time before mentioned to me. Accordingly, I selected about half a peck (14lb.) of these, as near the size and shape of the annexed sketch as possible. I took one or two sets from each end of each potato, that is, from the extreme, or wet end, and from the umbilical, or dry end, next the connecting radicle: each sort was planted upon the same ground, but in different rows, with the same kind and quantity of manure to each, and in every respect in exactly the same circumstances, on the 27th April 1801.

The season was very favourable. Upon examining the plants about the end of June, I found, that all those that were taken from the wet, or least ripened end of the potato, had come up, and were looking well and healthy, except three plants, which were a little affected with the disease: these I threw out, preserving only such as were quite free from it. Upon examining those plants which were produced from the dry or ripest end of the potato, I found that but few of them had appeared above ground, and such as had, were all diseased, more or less; but in many instances, the sets had not vegetated at all, nor did they, upon taking them up to examine them, show any signs of vegetation; although quite sound and fresh, they were quite inert; nor did these change their appearance throughout

the season, being nearly as fresh when the rest of the crop was lifted, as when they were put in the ground.

On the 30th July, the whole were again examined ; the plants from the unripe sets were almost covering the ground, though planted at two feet between the rows, and were looking well, remarkably free from curl, and promising an abundant crop ; while those from the ripened sets, which had vegetated and grown, had made very little progress indeed, and were universally curled ; several of the plants died after coming a certain length, seemingly from mere weakness ; and such as grew stronger, had very few tubers at their roots, and those very small and puny.

On the 3d October, I took up the produce of both sorts, and pitted them, for renewing the experiment the ensuing year.

The same course of experiment was accordingly repeated, not only next year (1802), but also the following year (1803) ; and the results were exactly similar ; the plants produced from the wet, or unripened ends, continuing healthy, and producing abundant crops, while those produced from the dry ends, continued to degenerate.

I thus satisfied myself, that the disease originated entirely in the over-ripening of the seed-stock ; and indeed all my experience since these trials were made, has tended only to

strengthen that opinion. I might follow out this to a much greater length, and supply many more facts, all calculated to prove the truth of what has already been advanced ; but by doing so, I should only multiply the detail of similar trials and facts, which, instead of inducing individuals, might rather deter them from satisfying themselves by making experiments. This I should wish them to do.

It may be proper to observe, that the produce of the curled potatoes was taken up before being too ripe, and replanted with the others : I cannot say that the disease was removed, but they did not get worse. Perhaps replanting them in very highly manured land, for several years, might have a good effect : but unless it were for the sake of reclaiming a favourite variety, the experiment is hardly worth making.

Having trespassed so long on the attention of the Society, I shall only beg leave to suggest a few simple rules, which, if attended to, will, I am humbly confident, soon entirely banish the disease of curl from the country. These are,

1. To procure a sound healthy seed-stock, which cannot be relied on, unless obtained from a part of the high country, where, from the climate and other circumstances, the tubers are never over-ripened.

[Faint, illegible handwritten text at the top of the page, possibly a title or description.]



2. To plant such potatoes as are intended to supply seed-stock for the ensuing season, at least a fortnight later than those planted for crop, and to take them up whenever the *haulm* or stems become of a yellow-green colour: at this period, the cuticle or outer skin of the tubers, may be easily rubbed off between the finger and thumb.

3. To prevent those plants that are intended to produce seed-stock for the ensuing year, from producing flowers or seeds, by cutting them off in embryo, taking care, however, to take no more off, than the extreme tops, as, by taking more, the crop may be injured. The best mode of doing this, is with a common reaping-hook, or light switching bill. Two boys or girls may do an English acre in two or three days.

Nurseries, Leith Walk, }
6th March 1810. }

REFERENCES TO PLATE I.

- A The wet end.
- B The dry end.
- a a The cuts or sets from the wet end.
- b b The cuts or sets from the dry end.
- c c The umbilical cord or connecting radicle.
- d d The real roots of the plant.

II.*On the Curled Disorder in Potatoes.*

BY JOHN SHIRREFF, Esq.

(Read 6th March 1810.)

THOUGH many attempts have been made to assign causes for the curled disorder in potatoes, nothing satisfactory on the subject has yet perhaps been submitted to the public. Frost, vermin, both in the bulb and stem, stiff soils, &c. have each in their turn been considered as the cause.

The ingenious Mr Knight, in his Treatise on Fruit-trees, has shewn how futile it is to expect, that, by grafting or budding on seedling-stocks, by planting cuts in the soil, or by any other known process, the health, or even the life of any particular tree, or the wood of that tree, can be preserved to an indefinite length of time.

While, then, the firm texture of the various fruit and forest trees yields to time, is it to be

expected that immortality should be enjoyed by the spongy bulb of the humble potato? The various crops of this plant, annually raised from cuts, are merely successive productions of stems, leaves, fruit and bulbs from original seedling-bulbs, and the plants of each sort are, in fact, as much continuations of those original bulbs, as the branches, leaves, and flowers of fruit-trees that spring from grafts, are continuations, and form a part of the original seedling-trees, from which these grafts were either mediately, or immediately taken.

It may perhaps be alleged, that potatoes, in particular situations, never become diseased or curled. To this it may be replied, that the contrary fact has been ascertained by experience: for it is apprehended, that not a single healthy plant of any sort of potato, that bears apples or berries, and that was in culture twenty years ago, can now be shewn. It may also be said, that potatoes, which have become diseased or curled, have been restored to health for several seasons. To this, it may be answered, that vegetables, as well as animals, may be sick and recover, and that from unknown, as well as known causes. Mr Knight restored the wood of the languishing Golden Pippin, and enabled it to produce fair flowers, and fine fruit, by protection, and a favourable soil; but this was on-

ly a temporary renovation, as the health of the aged valetudinarian is preserved for a few years, by the aid of cordials, and the genial influence of a milder climate. It is well known, that potatoes cultivated in situations where the plants annually ripen their berries, soon become diseased or curled; while plants, from the same individual seedling, in upland situations, where there is not sufficient warmth every season to mature their fruit, continue for a longer time comparatively healthy. In the first case, premature old age seems to be brought on by excessive annual seed-bearing. In the last case, the plants, or rather bulbs, as they make less exertions, continue longer vigorous.

The maximum of duration of the life of every individual vegetable, as well as animal, is predetermined by nature, under whatever circumstances the individual may be placed. The minimum, on the contrary, is entirely determined by these very circumstances. Admitting, then, that a potato might reproduce itself from bulbs, for a considerable number of years, in the shady woods of South America, or the mountainous regions of Europe; we find it soon become abortive in the cultivated champaign of Britain. That some particular sorts of potatoes, are longer-lived than others, cannot be doubted; but surely, it is not much more philosophical to expect, that the

horticulturist should be able to give everlasting vigour to individuals of the vegetable, than that the physician should be able to do so to those of the human race.

Reasoning from what we know, there appears little doubt of the potato, in a cultivated state, being a *short-lived plant*; and therefore, though it may be preserved longer healthy, by growing it in elevated or shady situations, and, perhaps, by cropping the flowers, and thereby preventing the plants from exhausting themselves, by annually maturing their seeds; yet we have every reason to expect, that disease will, sooner or later, according to circumstances, make its attack. The obvious inference is, that *to obtain vigorous plants, and secure productive crops, recourse must frequently be had to varieties newly raised from seed.*

With all due respect to Mr Knight's claims to original discovery, it is not very improbable that the famous Italian surgeon Taliacotius, not only originally conceived the idea of his supplemental noses, from observing the wood of one tree grafted, and growing on that of another; but he also, from noticing that these grafts never long survived their parent trees, seems most philosophically to have anticipated the decay of his noses, when the persons died from whose

bodies the materials were taken, of which these sympathetic organs were constructed :

“ So learned Taliacotius, from
 “ The brawny part of porter’s bum,
 “ Cut supplemental noses, which
 “ Would last as long as parent breech ;
 “ And, when the date of knock was out,
 “ Off dropt the sympathetic snout.

“ HUDIBRAS, Canto I.”

Columella, at a much earlier period still, *seems* to have been aware that *young plants* could not be formed from *cuttings*, which he calls (*semina*), *De Arboribus, cap. 3.* Treating of the vine, his words are, “ Optima habentur a lumbis, secunda ab humeris ; tertia summa in vite lecta, quæ celerrime comprehendunt, et sunt feraciora, sed et *quàm* celerrimè *senescunt*,”

Craigside, near Edinburgh, }
 5th December 1810.

III.

A Letter from CHARLES LORIMER, Esq. Collector of the Customs at Dunbar, to Dr Duncan sen., giving an Account of an Improvement in the construction of the Flues of Hot-Houses, by employing Earthen-Ware Tubes, in place of Bricks or Tiles.

(Communicated by Dr DUNCAN senior.)

Dunbar, 30th August 1810.

MY DEAR SIR,

I RECEIVED your much esteemed letter of the 28th current, desiring an account of the can-flues for hot-houses.

Mr BURNET of Viewfield, (a particular friend of mine), was the inventor of these flues. He built a hot-house for vines about four years ago, thirty-five feet long, by thirteen feet wide, (inside measure), with one furnace, which he finds fully sufficient to keep up a proper temperature in the coldest weather. He then con-

sulted me respecting his plan for the flues, and the only credit I can take in the business, was my giving him my decided opinion, that it would completely answer his most sanguine expectations. He followed my advice at the time, and he has since had the largest crops of grapes I ever saw upon vines of the same age; and for the two last years, every part of his house, from the bottom to the top, has been loaded with a profusion of fine clusters, so thick, that they appeared everywhere almost touching one another. From the observations he has made, he informs me, that after the eyes of his vines are all fairly broke in the spring, and he was at liberty to increase the heat in the hot-house, he commonly found the thermometer, at eight or nine o'clock in the evening, to stand from 72° to 75° . The fire was then mended for the night; and the succeeding morning, (about six o'clock), the thermometer kept up within two, or at most three degrees of what it was the night before. His furnace is built after Mr Nicol's plan, with Rumford doors; and when the fire is mended for the night, he shuts his ash-pit door quite close, which prevents the heat being too much increased, and occasions a very small consumption of fuel; yet, from the cans being so thin, a proper degree of heat is transmitted, to

forward the growth of the vines amazingly fast.

I have two small hot-houses for vines, with one of Mr Nicol or Mr Loudon's furnaces to each. One of these houses has a flue built with bricks, and tile covers, in the old construction. The flue of the other was taken down about three years since, and a can-flue put in its place, which I consider a real improvement. In 1809, I put fire to the first mentioned house, the 14th February, and the other had no fire till the 30th March following; yet the house with the can-flue, ripened the grapes sooner than the other, which was fired six weeks earlier, and with a considerable saving of fuel.

This year, 1810, I repeated the experiment, and the result was the same. The house with the can-flue has ripened the grapes in six weeks less time than the one with the flue of the old construction.

In case you shall consider the particulars above mentioned of sufficient importance to be communicated to the Caledonian Horticultural Society, I shall take the liberty of mentioning the size of the cans used in Mr Burnet's hot-house and mine. They are from twenty-five to twenty-six inches long, of a conical or taper shape, from thirteen to thirteen

and one-half inches in diameter at the large end, and from eleven to eleven and one-half inches at the small end, (inside measure). When they are laid for a flue, the small end is inserted into the large one, an inch or an inch and a half, and the joinings closed with lime-plaster. I at first used fire-clay, but it cracked and fell off, and the smoke got into the house; but since I used the lime-plaster, the flue has been perfectly tight, and the house free from smoke.

Perhaps it might be an improvement if the cans were made of a cylindrical or drum shape, all of the same diameter, so that the ends would exactly fit one another, with about the half of the thickness of the cans taken off the outside for three-fourths of an inch from each end to hold the plaster. This would make the flue look much better on the outside, the swelling at the joinings from the plaster being thereby greatly reduced, and when the flue is cleaned, the soot would be more easily got out, as it would be quite smooth in the inside from end to end.

It may be objected, that the hot-house will not have so much steam from the can-flues as from the flues of the old construction; but this will be found not to be the case. I have raised full as much steam, by sprinkling the cans with a watering-pan, (after they are suf-

ficiently heated,) as ever I could do with flues of the old construction.

Mr Burnet's cans are made of common clay, yet they have stood the heat very well; and though his flue one night had taken fire, only the can next the furnace was cracked. Mine are made of fire-clay, which I think safer; the strongest fire I have applied not having in the least injured them.

Mr Carnegie at East Linton, built a vinery in 1808, and adopted the can-flue, with which he is highly satisfied; and this season he has a large crop of grapes.

From the cans not being half an inch thick, it is evident they must transmit the heat sooner, and in much greater proportion, than flues of the old construction, which are commonly three inches thick in the sides, and one inch in the tile-cover at the top.

When the can-flues are laid, the ends of the cans should rest upon a brick set on edge, which keeps the under part of the flue five inches from the ground, and thereby none of the heat is lost.

It may be also objected to the can-flues, that they will cool sooner than the brick and tile ones; but so long as any fire remains in the furnace, the can-flues will transmit the heat, which is not the case with the old flues, when the fire becomes weak.

I have mentioned every circumstance that occurs to me; but if you wish for further explanations, be so good as let me know, and I shall with pleasure, give you every information in my power. I am, &c.

CHARLES LORIMER.

 IV.
On a new method of planting Asparagus.

By MR JAMES SMITH, Gardener to the Earl of Kintore,
at Keith-Hall, Aberdeenshire.

In a Letter to the late Mr NICOL, Secretary.

(Read 6th March 1810.)

IN April 1807, I sowed some drills of asparagus seeds, which succeeded very well. I had intended to let the plants stand two years in the seed-rows; but in the third week in June 1808, in preparing a piece of ground for a late crop of peas, it occurred, (owing to my having been often unsuccessful in the planting of asparagus in spring, to try a drill of it at this uncommon season: At one side of this piece of ground, therefore, I prepared a small stripe, with plenty of rotten dung, which was dug in to the depth of eighteen inches, and carefully mixed to the surface. In a drill four or five inches deep, I planted my asparagus, at that time twelve or fifteen inches high, at three inches apart; keep-

ing the tops perfectly upright, and breaking or hurting the roots as little as possible. They were covered in with the spade, gently trod with the foot, and a good watering finished the operation.

Although no particular care was taken to keep the earth about the roots of the plants at the time of taking them up, I hardly perceived them to flag, or sit up in their growth a single day. I am certain that none of them died; and they surpassed, in the course of the summer, the plants that were left in the seed-rows.

The following winter, I put the whole piece of ground in preparation for the remainder of the seedlings, and about the end of March, I planted them in drills, four feet asunder, and three inches in the drill; but although due attention was paid to them in every respect, not one-half of them came forward; while those that were planted the preceding June, were making such progress that I could have cut some of them for use.

The piece of ground consists of a thin gravelly soil, with a large proportion of peat-moss in it, (perhaps two-thirds,) having been the foundation of an old peat-stack. I am, &c.

NOTE BY MR NICOL.

I can vouch for the correctness of this communication, having been at Keith-Hall in October last, and having seen the asparagus in question. I wrote Mr Smith in December last, requesting a statement of the matter, in the shape of a communication to the Society.

W. N.

Leith Walk, }
2d March 1810. }

An Essay on the Cultivation of French Pears in Scotland, and on the best means of bringing in- to a bearing state full grown Fruit-Trees; especially some of the finer sorts of French Pears.

By Mr JAMES SMITH, Gardener to the Earl of Hope-
toun, Ormiston Hall.

(Read 4th September 1810.)

THAT the finer sorts of French pears cultivated in Scotland, in general yield but a very precarious crop, is well known to every experienced gardener. Many elegant gardens have been made, and expensive walls built, with very little satisfaction, either to the proprietor or person that superintended them, especially in cultivating the finer sorts of French pears. How often is the table loaded with a profusion of fruit in the latter part of summer and the autumn months, but left with a very scanty supply in winter and spring, and frequently destitute of any. That there are a few places in this country, that have

a tolerable supply, is an undeniable fact ; but it is evident, that a wide field is left open for the more effectual cultivation and improvement of the finer sorts of French pears. To attain these important ends, and in some measure to afford the information required by the Caledonian Horticultural Society, is the object of the following remarks “ on the best means of bringing into a bearing state full grown fruit-trees, especially some of the finer sorts of French pears, which though apparently in a very healthy and luxuriant condition, are yet in a state of almost total barrenness.”

Keeping these ends in view, it will be necessary, in the *first* place, To point out the cause of failure in cultivating the finer sorts of French pears: *Secondly*, The remedies to prevent the failure so generally complained of: and, *Thirdly*, The means for bringing full grown pear-trees into a bearing state.

Before proceeding farther, it may be necessary to observe, that the cultivation of French pears in this northern climate, should not be attempted without walls ; especially the finer sorts, which require the utmost care and attention to bring them to perfection. The following remarks will therefore be entirely confined to the cultivation of that so much esteemed fruit on walls.

Cause of failure of the finer sorts of French Pears.

THE cause of failure in the cultivation of the finer sorts of French pears, may either proceed from want of climate, improper soil, or injudicious pruning and training.

From want of climate, gardens placed in high, cold, and late situations, are very improper for the finer sorts of French pears. If the soil be moderately good, the trees may grow with apparent luxuriancy, but in these bleak and elevated places, the spring is late ; the summer in general cold, and of short duration : there is a want of mild weather in the autumn, so requisite for ripening the fruit-buds for the succeeding season : the wood indeed may be so far ripened as to stand the severity of the winter, and in the spring shew a few weak blossoms ; but these never set kindly, and frequently end in total barrenness. The want of climate is often increased by placing trees on improper aspects, where sometimes the scanty crops may swell to a tolerable size ; but after keeping the fruit some time, it gets shrivelled and hard, little superior in taste to the wood of the tree it grew upon. For many seasons, the crop will entirely fail, and still the trees may apparently be in a very healthy and luxuriant condition, although in a state of almost total barrenness.

But the cause of failure may proceed from improper soil. Thin gravel, steril sand or stiff clay, are equally pernicious to the finer sorts of French pears. On thin gravel, the trees may grow pretty freely; but the fruit will be small, hard, cracked, and of little or no value. On poor sandy soil, the fruit is little better, because it does not receive proper nourishment. On stiff clay, the trees may make tolerable progress, and shew a considerable quantity of blossom; but the fruit is generally kernelly, and ill shaped, and very inferior in quality. When the sub-soil is of any bad quality, as cankering iron gravel, corrosive sand, or wet spongy clay, means must be used to make a bottom to the fruit-tree borders, more congenial to the finer sorts of French pears. Such soils, or sub-soils, naturally point out the evil, with the necessity of applying a proper remedy. The soil that requires more particular attention, is that which may be termed tolerably good: such a one I have had occasion to be concerned with; it was moderately good, almost three feet deep, over a bottom of dry clay. In ordinary seasons, the trees bore pretty fair crops of good quality; but in wet seasons, the fruit did not ripen, and the following spring, the scanty blossom seldom set into fruit, owing to a superabundance of moisture in the border, occasioned by the neighbouring ground having an almost imperceptible declivity that way; and the foun-

dation of the wall being sunk a few inches into the clay, increased the retention. Even on rich black loamy soils, in low situations, with a retentive bottom, the trees are very liable to barrenness, although apparently in a healthy condition.

Again, the cause of failure may proceed from improper pruning and training. Severe injudicious pruning in any of the kinds of fruit-trees, is very prejudicial to their bearing, and to none more so, than the finer sorts of French pears, which, in good soil, are naturally inclined to grow luxuriantly. When trees are not planted at a proper distance, the branches soon come in contact with other trees; their extremities are rendered weak, and their vigour is exhausted by producing luxuriant breast-wood. Many trees are neglected for the most part of the summer season, without taking off the breast-wood, or nailing in the young shoots; and some of them, neglected from one winter dressing until another, are often treated with contempt, and considered as hard, useless, and insignificant fruit, and obliged to give way to fruit of an inferior kind; while the very evil complained of, is augmented by that indifference with which they are treated. If they undergo a dressing in the autumn months, stumps are frequently left from half an inch to two inches long, which next season, produce two shoots for one: hence their luxuriance is increased, their breast-wood

becomes a mere thicket, intercepting the influence of the sun, air, and refreshing showers, robbing the fruit-spurs of their proper nourishment, drawing them out in a weakly state, which renders them almost useless, and the trees become a receptacle to insects and other vermin. It may as well be expected that a hedge which annually undergoes the operation of the shears, or pruning-hook, will bear a crop of seed, as that trees under such management will bear a crop of good fruit ; yet such trees will be in a very luxuriant condition, though in a state of almost total barrenness:

Remedies to prevent the failure so generally complained of in cultivating the finer sorts of French pears.

WHEN the cause of failure proceeds from want of climate, as will frequently happen in high, cold and late places, in such situations it would be highly improper to plant the Colmar, Virgouleuse, Chaumontelle, Winter Bonchretien, or other fine late pears : to supply their place, some of the best autumn pears should be planted on the best aspects, such as the Autumn Bergamot, Muirfowl Egg, Swan Egg, &c. They will be longer in ripening, than in warmer situations, and of course, keep longer for a supply to the table. Where the climate is less bleak, the Chatalonne Bergamotte, Green Sugar, and Brown

Beurré may be planted. In moderate situations the Crasanne and St Germain will succeed well. Where the situation is good, the other fine late pears should be planted, allowing them the best aspects, otherwise little good can be expected from them, even in the most favourable situations in this country.

If the cause of failure proceeds from improper soil, it will be necessary to remove it at least three feet deep, the whole breadth of the border; when the sub-soil should be carefully examined, and if it is of any bad quality, an impenetrable bottom must be made with a considerable declivity towards the walk in front of the border. Another consideration of importance, which requires particular attention, is, that a border, situated on a plain with a retentive subsoil, requires a different treatment from that placed on a declivity where the soil is permeable. In the former case, a good drain must be made in front next the walk, deeper than the bottom of the border, to receive the superabundant moisture. It may be necessary, when the adjacent ground has a declivity towards the border, to make another drain on the outside of the walk, to receive the water before it approaches the border. In the latter case, where the soil is permeable on a declivity, draining will be unnecessary; but as it is of such utility in cultivating French-

pears to have a dry bottom, draining should never be dispensed with, when there is the least risk of injuring the trees or the fruit, by neglecting it.

Having removed the inconveniences of a pernicious subsoil, and secured a dry bottom, the border should be made up with soil prepared for that purpose. When the situation is low and naturally retentive; I would prefer a hazely coloured loam, taken from banks or the borders of fields which remain unbroken by the plough. When the situation is on a declivity with a permeable bottom, strong loam is to be preferred: the most desirable is that taken from old pasture on the top of a clay soil. In either case, the more turf that can be got, so much the better; but it will be of considerable advantage to lay the soil up for some months before it be used, to be meliorated by the sun and air, and to rot the turf, turning it over at times, adding a quantity of good rotten dung, (preferring old hot-bed dung, as more latitude can be used with it, owing to its exhausted state); breaking the turf, and blending the soil and dung well together, in the operation of turning. When the soil is light loam, and not of any bad quality; it may only be necessary to remove a portion; and replace it with strong loam. In very stiff soil, light loam will be of considerable advantage. In all cases, where wall-trees are to be re-

newed, the borders should always be trenched over, adding what new soil and manure may be necessary, which should be regulated according to the nature of the soil, or other local circumstances.

Some years ago, having occasion to renew a considerable extent of wall with young trees, I was under the necessity of deviating from the above method, owing to the means being put out of my power, and the work requiring to be done without loss of time. The method I took, was this : after removing the old soil three feet deep, a quantity of strong loam well mixed with dung, was put where each tree was to be planted, (about a yard in diameter.) The intervals between the trees, and for a considerable extent in front of the wall, were filled up with fresh turfs, packed one above another, to the ordinary level of the ground, and laid over with a few inches of soil, to make the surface level, and prevent the grass from rising. The border was trenched over the succeeding season, and a quantity of manure broke in amongst the turf; care was taken not to injure the roots of the young trees. The effect has been truly astonishing; the trees are in the most thriving condition, and bear crops of excellent fruit.—Although the above method has fully answered every expectation, and the trees are at present standing as an ocular demonstration, I would by no means

recommend it in preference to the other, where a choice is left.

Regular pruning and training is likewise of great importance in the cultivation of the finer sorts of French pears. When planted, they should always be allowed proper room for extending their branches, to exhaust their luxuriance. The trees should be particularly attended to in the summer months, frequently looking them over, displacing all foreright and superfluous shoots, pinching them off with the finger and thumb, leaving the spurs about two inches long on the last year's wood; yet it may be necessary in some cases, to rub them off close, when care should be taken to injure the bark as little as possible. By these means, the trees will be kept in a regular state, and enjoy the benefit of the sun and air; the leading branches will receive more nourishment, the young wood, and fruit-spurs, will be more properly ripened for insuring a crop of fruit the succeeding season, and a great deal of that severe pruning will be avoided, which is practised on neglected trees in the autumn and winter dressing. The knife should be used as little as possible, and only where it cannot be avoided, for shortening the branches, for a supply of young wood, where it is necessary, and thinning out any useless and worn out spurs; or fully retrenching any of the shoots that

were shortened in summer, which are not likely to set into fruit-spurs, with any damaged or worn out branches. The trees should be regularly trained to the walls in the summer months, as they advance in growth, and undergo a proper regulation annually in the winter or spring, whether they are trained horizontally, fan, half-fan, upright, or pendulous.

Much has been said, both in favour of horizontal and fan training; but the method I generally practise, is different from both, or rather a medium betwixt the two; and from experience, I have always found it attended with good success. In the spring after the young trees are planted, and at the time the buds begin to burst, the branches are headed down to four or five eyes; and in summer, two or three shoots are trained from each branch in a regular manner, laying the first on each side horizontally at the bottom of the wall, and filling up the middle in form of a fan. The following winter, the young branches are cut back about one-half, less or more, according to the strength of the tree, training two or three shoots from each the succeeding summer. By the third season, if all has gone on well, the trees will have made considerable progress. In the winter training, the trees should be carefully examined: beginning at the bottom of

the wall, lay the first branch on each side horizontally, at full length, proceeding upwards at the distance of from eight to twelve inches, according to the size of the wood, foliage and fruit. Train the remaining branches likewise at full length, making them rise in a circular direction from the centre of the tree, until they are at the distance above specified; and then train them horizontally. When the branches are too much crowded, retrench the weakest, reserving four or five in the centre, which are to be cut back and trained in the fan form; and from these, two or three shoots may be allowed to rise. By this means, four or five pair of branches will be added to the height of the tree, which are to be trained in the same circular manner as before, until they arrive at width enough for taking the horizontal direction. The centre branches are to be shortened, as in the preceding winter, and so on, until the tree approaches the top, and you leave remaining only what shoots may be necessary to fill the wall. The upper branches take only a gentle curve before they are laid horizontal, to prevent the wall from having a naked appearance at the centre towards the top of the tree; allowing the next pair of branches below, to have a longer curve, but not so much as to make it disagreeable to the eye. Trees trained in this manner, seem less subject to luxuriance, than those trained in most other

methods; the strength being more equally divided amongst the branches, the wall is generally filled in a very few years, and the trees are sooner brought to a state of bearing.

The means for bringing full grown pear-trees into a bearing state.

As the barrenness of full grown pear-trees proceeds from different causes, owing either to their local situation, or former manner of treatment, it will be of great importance, before the application of any remedy, to ascertain the cause from whence the unfruitfulness proceeds, which may be from one or more of the circumstances already mentioned, under the head of the cause of failure of the finer sorts of French pears.

When the barrenness of full grown pear-trees proceeds from want of climate, they must either be cut back and grafted with some other sorts that will ripen properly, or be entirely removed, to give place to others more suitable to the situation. But as grafting is of such importance, and the only means to bring full grown trees into a state of bearing in such a situation, it should never be omitted, as by putting grafts on the branches, the wall will be covered, and the trees brought to a bearing state in one-third of the time required to rear young plants. I have

frequently found the flavour of fruit much improved, by grafting on old trees ; and they seldom fail of producing a good crop.

With respect to luxuriant trees placed on improper aspects, I have ever found, that the best remedy applicable in such cases, where the sorts were to be preserved, (even on trees of considerable magnitude,) is to have them carefully taken up and removed to more proper situations. The effect of such treatment is of considerable advantage, as it checks the luxuriancy, and brings the trees into a full bearing state in a short time. Where such trees are not wanted, they should be cut back and grafted, as in the case of want of climate.

When the climate and aspect are good, the barrenness must either proceed from the soil, or manner of pruning and training.

When the soil is of a stiff quality, with a retentive bottom, proper draining will be essentially necessary, to carry off the superabundant moisture; the border should be trenched, removing any pernicious soil, adding a proportion of good loam and manure, which should be stronger or lighter, according as the nature of the original soil or the situation requires ; at the same time, the roots of the trees should be considerably shortened, and this should be done in a neat manner, with a gentle slope from the under side, to prevent any wetness from lodging on the wound.

If any of the principal roots run right downward, every method ought to be adopted that can be used with propriety, to get them removed. By these means, the luxuriant shoots will be checked, and turned into fruit-spurs; the roots will put forth anew into the kindly soil, and the benefit will soon appear evident, by the fruitfulness of the trees. When the soil is inclined to gravel or sand, a considerable quantity of strong loam and manure should be added, the want of which is easily perceptible, in the fruit being small and hard; although when, on such soils, I have found very luxuriant trees in a state of almost total barrenness, it was more to be ascribed to improper pruning, than to the nature of the soil.

When the barrenness proceeds from improper training, or pruning, different remedies will be necessary, according as the various cases require. In some cases, where the trees are too much crowded, the inferior ones must be cleared away, to give place to the principals, to extend their branches, and exhaust their luxuriancy. But frequently when the trees are allowed to remain crowded for any length of time, the extremities of the branches become weak, and seldom grow freely; it will therefore be necessary, to shorten back the branches to the first well placed shoots, which should be trained to the wall as leaders; or where such shoots cannot be found, cut back the branches to some bud or joint, that has

the appearance of putting forth good shoots, to be trained for leaders to the branches, and in summer, the breast-wood should be carefully removed from time to time, that the trees may reap the benefit of the sun, air, and refreshing showers.

When any trees are wanted, if the situation is good, and the sort suitable, some of these crowded trees may be replanted with safety, if not too old. I have frequently removed trees that were extended twenty-four feet, by eighteen high; some of them were carried several miles, and are now doing well, and in a full bearing state, although they were formerly in a very luxuriant condition and in a state of almost total barrenness.

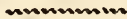
When full grown pear-trees are allowed to exhaust themselves in luxuriant breast-wood, the case is very bad indeed, and requires a severe operation to remedy the evil, which must generally be applied to both branches and roots. Some that are not too far gone, may be remedied by shortening the roots properly, and pruning off the stubs from whence the luxuriant breast-wood proceeds, retaining every part that has the appearance of setting into fruit-spurs; and by attending to the removal of the breast-wood in the summer months, the trees will be brought to a bearing state.

When trees are so far gone that they cannot be treated in the above manner, with any prospect of success, the next remedy is to cut the trees down, and train them anew. The cutting should be regulated according to circumstances, as in some it may be convenient to cut them, during the latter part of winter, or in the spring months, to within a little of where they were originally grafted. Others may be left to a greater length ; but in all cases it will be necessary to apply some soft paste, that will adhere to the wounds, to exclude the external air, and prevent any water from lodging and rotting the tree. The following summer, the trees should be carefully attended to, displacing all superfluous shoots, training a sufficient quantity to the wall, and nailing them in from time to time, as they advance in growth. Trees renewed in this manner, fill the walls in a very short time ; and, when judiciously managed, seldom fail of producing good crops of excellent fruit. I cut a Cresan pear-tree down in the above manner, on the 5th of May 1804 ; it now covers a wall sixteen feet high, and is at present (August 1810), twenty-eight feet betwixt the extremities of the branches, and in a full bearing state.

When trees undergo any of the above operations, it will be necessary to pay attention to the borders, adding what new soil or manure may be necessary, examining the roots of the trees,

and shortening them as the nature of the case may require.

Thus may full grown pear-trees be brought to a bearing state in a short time, although barren in the utmost state of luxuriance. When the trees are free of canker, they should not be grubbed up unless in the very last extremity, as by proper attention to climate and situation, there are few cases that may not be remedied if treated in a judicious manner.



LIST of some of the principal French Pears.

1. Poire Hativeau, or Hasting pear, or Green Chisel.
2. Citron des Carmes.
3. Gros Blanquet, Great Blanket.
4. Musk Blanquet, Little Blanket.
5. Fleur de Guigne, Flower of Guigne, Early Russelet, or Skinless.
6. Cassolette, Friolet, or Green Muscat.
7. Muscat d'Aoust, August Muscat, or Averat.
8. Boncrétien d'Eté, Summer Boncretien.
9. Longueville, Varieties Green and Grey; supposed French, being found about Old Abbeys in Scotland.
10. Poire de Prince, Prince's pear.

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|-------|---------------------------|------------------------------|
| * 11. | Le Doyenné, | or The Dean's pear. |
| 12. | Bergamotte d'Été, | Summer or Hamden's Bergamot. |
| 13. | Bergamotte d'Autonne, | Autumn Bergamot. |
| † 14. | Jargonelle, | English Cuisse Madame. |
| 15. | Cuisse Madame, | Common English Jargonelle. |
| <hr/> | | |
| ‡ | 16. Mouille-bouche, | Mouth-water pear. |
| | 17. Bergamotte de Suisse, | Swiss Bergamot. |

* This pear is particularly described by Richard Anthony Salisbury, Esq. F. R. S. in a paper presented to the London Horticultural Society; and he recommends it as proper for high situations, particularly for the higher parts of Yorkshire. The horticulturists in Scotland are also under an obligation to that gentleman, for bringing it under their notice. He says, "I have no hesitation in recommending it to our fellow-labourers in Edinburgh." This pear is not unknown in Scotland, having been cultivated in some gardens for a considerable length of time: its being now recommended by so eminent a horticulturist, may probably, however, be the means of making it be more generally attended to.

† It is somewhat curious, that the pear which in Britain is called the Cuisse Madame, is the French Jargonelle; and that the British Jargonelle, is the French Cuisse Madame.

‡ All the above kinds may occasionally be planted as standards in very good situations, and will yield crops in favourable seasons; but a proportion of Jargonelle pears should always be planted on walls, even in the best situations, for coming early, and thus prolonging the season of that excellent pear. The Autumn Bergamot, may likewise be planted on an east or west aspect, in case of the failure of those on standards.

18. Bergamotte de Hol-
lande, OR The Holland Bergamot.
19. Bergamotte de Cha-
tallonne, Gansel's Bergamot.
20. Bergamotte de Bugi, Easter Bergamot.
21. Bergamotte Cra-
sante, Cresan.
22. Messire Jean, Monsieur John.
23. Beurré rouge, Red Butter Pear ; varieties
Green, Grey, and Golden.
24. Sucré vert, Green Sugar.
25. Louisebonne, Good Louisa pear.
26. Saint Germain, The St Germain.
27. Poire de Colmar, The Colmar pear.
28. Poire de Livre, The Pound pear.
29. L'Eschasserie, The Long Green.
30. La Virgouleuse, Chambrette or Ice pear.
31. Epine d'Hiver, Winter Thorn.
32. Besi de Cassoy, The wilding of Cassoy.
33. La Pastorelle.
34. Boncrétien d'Hiver, Winter Boncretien.
35. Catillac, Cadillac.
36. Uvedale's St Ger-
main, Union pear.
37. Besi de Chaumon-
telle, The wilding of Chaumon-
telle.
38. Poire d'Auch Brought from France by
the late Duke of North-
umberland ; a fine pear.
39. Poire du Rousselet, Great Russelet, or King of
Summer.
40. Rousselet d'Hiver, Winter Russelet.
41. Fin or d'Hiver, Golden End of Winter.



The four following pears, although not ranked among French pears, are found particularly useful on walls, especially in high situations in Scotland, where the other finer sorts do not ripen properly.

1. Green Yair.
2. Muirfowl Egg.
3. Swan's Egg.
4. Winter Auchan.

It may, however, be remarked of the Muirfowl Egg, and Winter Auchan, that when planted as standards, they produce not only better crops, but fruit of a higher flavour.

VI.

*On Gooseberry Caterpillars, and on the Maggots
that infest Onions.*

By MR JOHN MACMURRAY, Nurseryman.

(Read 6th March 1810.)

OBSERVING that the Caledonian Horticultural Society has requested information respecting “the best method of preventing or destroying the caterpillar on gooseberries,” I beg leave to submit some observations on the former of these subjects; for prevention is certainly better than cure. I may premise, that my observations are founded on actual experience.

I shall first mention a preventive of a very simple kind, but which I have found efficacious.

In autumn, let a quantity of *cow-urine* be provided; and let a little be poured around the stem of each bush, as much as suffices merely to moisten the ground. This simple expedient has succeeded to admiration; and its prophylactic vir-

tues have seemed to extend to two successive years. The bushes which were treated in this manner, remained free of caterpillars; while those that were neglected, or intentionally passed over, in the same compartment, were totally destroyed by the depredations of the insects.

I have next to state another mode of prevention, equally simple, and equally efficacious; but the salutary effects of which extend only to the season immediately following the application.

Collect as much drift *sea-weed* from the beach, when opportunity occurs, as will cover the gooseberry compartment to the depth of four or five inches. Lay it on in autumn. Let this covering remain untouched during the winter and early spring months. As the season advances, dig it in. This plan has answered my most sanguine expectations; no caterpillars ever infesting the compartment treated with sea-weed.

The *rationale* of the operation of these substances, when applied to the soil around the roots of gooseberry-bushes, I leave to speculative inquirers.

I am rather uncertain as to the particular species of caterpillar which commits the greatest ravages on the gooseberry-bush. Two species very generally occur; the Linnean names of the moths produced from which, are, *Phalæna Wavaria*, and *Ph. grossulariata*. My own experience would lead me to conclude, that the first

of these species is the most common and the most destructive.

Though it would appear, from the observations of naturalists, that not a few lepidopterous insects pass the chilly months of winter in the pupa state; yet an equal number lie concealed in the egg, which has been carefully deposited by the parent insect, where the genial influence of the sun will early call the caterpillar into action. A number of caterpillars, however, also retire into the earth, and remain there in the pupa state, until the return of spring excites to new changes and exertions.

What has now been stated seems to render it probable, that the beneficial effects derived from covering the gooseberry compartment with seaweed, may depend on the strong effluvia arising from the putrefactive fermentation of the seaweed, proving destructive to the ova of the moth which may remain imbedded in any of the crevices of the bark near the root; or on the saline properties of that substance sinking into the earth, and hindering the fertility of the ova deposited there.

I observe, that information is also wanted concerning the *Maggot in Onions*.—This animal may, in my opinion, be considered as a non-descript, and peculiar to the onion and shallot. The *Allium Cæpa*, or onion, is a native of Spain.

It is natural to expect, that the soil and climate of this country, should not be very congenial to this plant; and it follows, that the value and quality of our crops of onions, must always, in a great measure, depend on favourable seasons, and the selection of a suitable soil.

If the season be dry and parching, and the soil of itself incapable of supplying the fibres with a proper and equable degree of nourishment, the plant becomes languid, assumes a sickly hue, and generally dies.

When, on the other hand, the season is very rainy, I am inclined to believe, that the fibres get clogged with moisture, and the vegetable not being able to absorb it, it centres about the bulb; mouldiness succeeds to damp, and produces an ulceration which works its way to the inner core. This, of course, effectually destroys the onion.

I have always remarked, that whenever the onion becomes diseased, it is liable to the attack of the maggot.

I could never detect this maggot in the soil: it is therefore highly probable, that the eggs are deposited in the root, and may be hatched in greatest numbers when the plant is in a sickly state. I do not think that the maggot ever passes from one onion to another. And any remedy sufficiently powerful to destroy the insect, must inevitably destroy the onion itself.

In these circumstances, the horticulturist perhaps does all that is in his power, if he be duly careful, to select for his crop of onions, those soils and situations that are most likely to resist the various common incidents of season, peculiar to this very variable climate, and containing such eligible food, and in such proportions, as this bulbous esculent requires.

The maggot which attacks the Carrot, I may remark, is certainly to be found in the soil, and visibly enters from without.

I conclude, for the present, with observing, that worms and insects in general are driven from their retreats under ground, by pouring bitter or acrid water upon it; such as water in which green walnuts have been steeped, or a lye made from potashes.

Stranraer, }
13th February 1810. }

VII.

Account of the Caterpillars that infest Gooseberry-Bushes, and the best Method of Destroying them.

By Mr JOHN GIBB, Linton.

(In a Letter to Mr NEILL, Secretary.)

(Read 4th September 1810.)

SIR,

IN compliance with your desire, I now give you a short account of the methods I have found most effectual, for the destruction of the several kinds of gooseberry-caterpillars.

These caterpillars are of three kinds, viz. the large Black, the Green, and the White, which last, are comparatively of a small size.

During the winter months, the *large* or *black* kind, may be observed lying in clusters on the under parts, and in the crevices of the bushes; and even at this season, (Feb.) I find them in that state.

In the course of eight or ten days, however, if the weather be favourable, they will creep up in the day-time, feed on the buds, and return to their nest during the night. Whenever leaves appear upon the bushes, they feed upon them till they arrive at maturity, which is generally in the month of June; after which, they creep down upon the under sides of the branches, where they lodge till the crust or shell is formed over them. In July they become moths, and lay their eggs on the under sides of the leaves, and of the bark. The produce of these eggs, coming into life during the month of September, feed on the leaves so long as they are green, and afterwards gather together in clusters on the under side of the branches, and in crevices of the bark, where they remain all the winter, as already said.—Winter is the most proper time for attacking this sort with success, as their destruction is most effectually accomplished by the simple operation of pouring a quantity of boiling hot water upon them, from a watering-pan, while no injury is thereby done to the bushes.

The second, or *green* sort, are at present (February) in the shelly state, lying about an inch under ground. In April they come out small flies, and immediately lay their eggs on the veins and under sides of the leaves. These eggs produce young caterpillars in May, which feed on

the leaves till June or July, when they cast a blackish kind of skin, and afterwards crawl down from the bushes into the earth, where a crust or shell grows over them, and in that state, they continue till the following April. The only method which I have hitherto found effectual for destroying these, is, *1st*, To dig the ground around the bushes *very deep* during the winter season, by which means, the greater part of them are destroyed, or buried too deep ever to penetrate to the surface: *2dly*, In April, when the flies make their appearance, to pick off all the leaves on which any eggs are observable; this is a tedious operation, but may be done by children. If any of the enemy should escape both these operations, they will be discernible as soon as they come to life, by their eating holes through the leaves, and may then easily be destroyed, without the least injury to the bushes or fruit.

The *white* kind, otherwise called *Borers*, are not so numerous as the other kinds, though very destructive. They bore the berry, and cause it to drop off. They preserve themselves during the winter season, in the chrysalis state, about an inch under ground, and become flies nearly at the same time with the last mentioned kind. They lay their eggs on the blossoms, and these eggs produce young caterpillars in May, which feed on the berries till they are full grown, and

then creep down into the earth, where they remain for the winter in the shelly state.

Thus have I given you a concise account of the best methods I have yet discovered for destroying these destructive vermin, to be communicated to the Horticultural Society. I have tried many other methods, but found none so effectual as those above mentioned, which are recommended by this advantage, that they injure neither the bush nor the fruit. The same thing cannot be said of tobacco-liquor, snuff, and soap-suds, which always render the fruit bitter and ill-tasted; and which, whatever affect they may have upon the smaller kind of caterpillars, I am certain have none upon the larger kinds. Soot, lime, and lime-water, do not affect any species of caterpillar whatever, as I have proved by repeated experiments. I am, &c.

Linton,
27th February 1810. }

VIII.

A short Account of the state of the Fruit-Trees on the Garden-Walls at Loanwells near Kirkcaldy, from the time of their being planted in 1792, to the 1st June 1810; intended to illustrate a method of destroying the Caterpillars infesting Fruit-Trees.

By Mr EDWARD SANG, Nurseryman.

(Read 5th June 1810.)

FOR the first seven years after the planting of my fruit-trees on Loanwells garden-walls, they made a most promising progress. But after this period, they became by degrees overrun with caterpillars, chiefly, I believe, of *Phalæna asperana*, which regularly made their appearance at the time of leafing.

The leaves were rolled up, and cemented with a glutinous substance; the caterpillar was lodged in the heart of the leaf, rolled up in a kind of imperfect cobweb, something like spiders

work; and in this manner committed wonderful depredations.

Many of the buds never expanded, especially the fruit-buds, which having produced the foot-stalk of the young apple, the corolla never opened: it held the larva within it, which generally ate a hole down through the heart of the expected fruit, and so completed its destruction.

Year after year, even so late as the first or second week of June, many of my wall-trees exhibited an appearance more like January than midsummer. After the depredations of the caterpillars were over, and when these had entered the chrysalis state, the trees made vigorous efforts to supply what had been destroyed, and generally produced a great profusion of breast-wood. This circumstance arose in some measure, from the moths, as they came out, chusing in preference to deposit their eggs in the flower-buds.

In spring 1805, I had recourse to fresh-water, which I threw upon the trees, with as much violence as a hand force-pump was capable of; but from the worm being rolled up in the blossom, it was defended from moisture, which otherwise seems destructive to it, and I did little or no good by this application.

In spring 1806, I attempted their destruction by soot. After having wetted the trees by

means of a force-pump, I applied the soot with a bellows, containing it in a hooper attached to the pipe, with proper holes in the upper part. By this instrument, I had the soot properly applied, and I flattered myself that I now had hit upon the means of destroying the caterpillar completely: but I found myself again disappointed.

After a great deal of trouble, and much expence, my trees still wore a sickly appearance, excepting that the breast-wood was always abundant. I now found my difficulties increased, my trees rendered unfruitful, and yet producing a profusion of fore-right shoots.

I had formerly experienced the good effects of cutting the roots of fruit-trees which were too luxuriant in their growth, and had one of the trees laid open for this operation, in the season 1807—8. The roots were large, but with few fibres; I found it necessary to shorten them, not only to stop the rambling growth complained of above, but to furnish the tree with proper feeders, in order to render it fruitful, in case of getting the better of the caterpillar. In this operation, I observed, upon examination, that the soil was deficient of a proper quantity of animal substance. I consequently set about making up this deficiency.

In 1807 and 1808, fodder was very scarce, and many old horses killed. I availed myself

of this circumstance, and collected all the dead horses I could procure in the neighbourhood, and I soon found myself master of above twenty carcasses. I had the trees on my east and south aspects treated as follows: A circular trench was made about three feet distant from the trunk, and so deep as to cut every root through: into this trench was put half a horse at least, divided into proper pieces, and covered up. The following spring, however, the caterpillars were not in the least diminished.

In spring 1809, I resorted to tobacco-liquor, and I found every worm which it could get at with the force-pump destroyed; but they are so well protected from any liquid, that but little was done in this way towards their destruction*.

Owing to the severe treatment above described, and the depredations of the caterpillars, no fruit was produced: my trees, however, looked quite green and healthy.

In August and September, I found the moths very numerous, flying about my trees; I was certain, that they must deposite their eggs at this

* The result of the experiments with the tobacco-liquor, was communicated to Mr Walter Nicol, in a letter dated the 29th November 1809, which has been since published by him in his Villa Garden Directory, and Gardener's Calendar.

season, because at no other do they exist. Certain also of their being deposited, upon or in the fruit and wood buds, I thought, if a proper liquor could be procured, sufficiently pungent and deleterious, to kill them, and not to injure the trees, I might yet have a crop of fruit. Cheered with the hope of having a reward for seventeen years application, I set about this last operation with alacrity.

In the beginning of January last, 1810, I took five lbs. of flowers of sulphur, three lbs. soft soap, one lb. potash, four pints very strong tobacco-liquor, (the expence of all which is but trifling), and made up the mixture to ten pints, with fresh-water; I put the mixture on the fire in a pot, and, when as intimately mixed as possible, I applied it in a lukewarm state, with a painter's small brush so as not to miss a single bud; and potful after potful was mixed up, till I had washed thirty-four full grown wall-trees, apple, pear, and cherry. Several trees which had been dressed with horse-flesh as above, were left unbrushed, that they might be compared with those which had been washed,

This application has at last proved successful: and now, on the 1st of June, I must say that no money that I ever laid out, yielded me so much pleasure, nor gave me such a prospect of profit. My trees, which had for many years exhibited an appearance of barrenness, are now full of most

healthy well-spread flowers, the stamina with fine antheræ upon them, quite bold ; not a single apple-tree on the whole wall so washed, being barren, and the cherries and pears set quite thick.

I have had visits from a number of professional men this spring, who have expressed their admiration of the trees so treated. It is proper to add, that those which were left unwashed, are nearly as usual, full of caterpillars, which I fear will resist my utmost efforts to reduce them at this season. I have applied tobacco-liquor in its strongest state : it has had a good effect, but still the power that they have to resist every liquid, remains as an insuperable bar to their entire destruction, unless it be applied with a brush.

I used twenty-five lbs. sulphur, and a corresponding quantity of the other ingredients for thirty-four trees. The soap and tobacco-liquor, gave a tenacity to the mixture, so as to hold the particles of the liquor apart, while the potash penetrates deep into the buds and bark, and destroys the eggs which produce the worm, and consequently destroys the glutinous matter which prevents the leaves and flowers from expanding.

I attribute the present healthy appearance of my trees, entirely to the above application. The cutting of the roots has thrown them into a profusion of flowers, while the wash has destroyed the destroyers of my fruit and trees. I am

therefore fully satisfied of the excellence of this wash; and must say, that I never saw any thing applied to fruit-trees, nearly so effectual for destroying this kind of caterpillars.

Another good effect of the wash may be stated. Six of the apple trees mentioned, have been for the last eleven years, much injured by mildew; but at this time there is hardly an infected leaf to be seen.

Kirkcaldy, }
1st June 1810. }

IX.

Observations on the culture of Onions, and particularly on the advantages to be derived by transplanting them from a seed-bed into regular rows at a proper distance from each other.

By Mr JAMES MACDONALD, Gardener to His Grace the Duke of Buccleuch and Queensberry, Dalkeith.

(Communicated 3d December 1811.)

THE Onion, a well known root, is in this country in common use among persons of almost every description; and on that account, every improvement upon the culture of it may be considered as a matter of some consequence. From this consideration, I think it may not be improper to communicate to the Horticultural Society some observations on this subject. The method which I am to recommend, is not merely speculative; for I have employed it with manifest advantage during four successive years; and have found from experience, that it not only produces excellent onions, but effectually prevents any de-

struction of the root, either by worms or by rot.

As the ground which I cultivate in the way of garden, is a light thin soil, it is not so favourable for the production of onions as many other soils. This led me to make many different experiments, and I am happy to say, that I found the following method far exceed my most sanguine expectations.

In the end of February 1808, I sowed my general crops of onions; and in each *break* I left one bed unsown. I pointed over the empty beds, and then drew, in each bed, which was four feet and a half in breadth, six small drills. I then thinned out my young onion plants, and having prepared puddle, consisting of one part of soot, and three parts of earth, mixed with a sufficient quantity of water, I took the young plants and dipt the whole of the roots in this puddle. I then transplanted them into the drills, at the distance of four or five inches from each other. A moist day is preferable for this work; and when that is the case, the vegetation seems to be in no degree retarded by their being moved. Nothing farther is afterwards wanted, but to keep the beds free from weeds, by hoeing with a small hoe between the rows as soon as weeds appear.

Proper hoeing seems to promote the growth of the onions; and by the end of August or

September, those treated in this manner, will far exceed those which are not transplanted, both in quality and in size. I also found them entirely free both from worm and from rot, while those which were left in the seed-bed, were a good deal infested in both these ways.

In the end of January 1809, I again sowed my onion crops, making a still greater reserve of ground, by interlining the beds, sowing one, and leaving another unsown.

In April I pointed over the empty beds, and transplanted the onions in the same manner as formerly mentioned. This trial was attended with equal success. The crops of transplanted onions, far exceeded the others, both in quality and size.

In the beginning of March 1810, I again sowed my onion crops, leaving a still greater reserve of ground for transplanting, nearly a quarter of an acre. This trial was attended with equal success as the two former. In the transplanted onions, there was not the least appearance of worm or rot; and they swelled at least one-half larger than those which were not transplanted. Indeed they were equal in size to the best Spanish onions; heavier for their bulk, and firmer. They had also a more pungent taste than is in general observed in Spanish onions.

The seeds employed, were those most commonly used about Edinburgh; chiefly the Strasburg and Reading onion. All the kinds employed, succeeded equally well when transplanted.

After these repeated trials, I have no doubt, that the cultivation of onions, by transplanting, is an important improvement; and will be beneficial to the community. It will, I am convinced, be attended with less expence, and more profit than the ordinary mode of culture. The transplanting may be performed by boys or girls, who will do as much of this work as any man can do in the same time, and at much lower wages. This method has the advantage of permitting the clearing away of weeds, by hoeing in place of hand-weeding, which is in every respect much more beneficial to the growth of the plants. Besides this, a few beds of thick sown onions, may furnish plants for as many acres. The ground to be planted, may be under winter or spring crops, and it will be sufficient to clear it of these, by the end of April, or the beginning of May, when the transplanting is to take place. Those growing in the seed-beds, will, in the mean time, afford the necessary supply, either for the family or market.

The advantages of this mode of cultivating onions, like many other things in gardening, re-

quires only practice and perseverance to afford conviction to every one. And I am happy to say, that many practical and amateur gardeners, who have seen the crops in Dalkeith Park, are fully convinced of these advantages; and I take this opportunity of presenting to the Caledonian Horticultural Society, a few of my onions, as a sample of the general size.

NOTE.

THE onions alluded to in the preceding paper, sent by Mr Macdonald, were much admired by all the members who were present at the meeting.

The Committee for Prizes, unanimously voted to Mr Macdonald an extra medal for his communication; and it was thought advisable, that it should be printed in the first Number of the Memoirs, that every gardener may have it in his power, to try the mode of cultivation which he has recommended, during the ensuing season. It will give much satisfaction to the Society, if those who make trials, will communicate the results to Mr Neill, Secretary.

X.

COMMUNICATIONS

FROM MR HENDERSON, Brechin Castle.

(Read 4th September 1810.)

1. *Directions for covering the soil in Hot-beds, Pineries, &c.*

FOR this purpose, lay on the surface *fine drifted river or sea sand, three inches deep*. This covering possesses many advantages. It will extirpate the *slater* or wood-louse, as the nature of the sand prevents the insect from concealing itself from the rays of the sun. In dung hot-beds, it keeps down the steam. To fruit, it affords a bed as warm and as dry as tiles or slates. This covering also retains the moisture in the earth longer than any other, and is itself sooner dry. It gives the houses a clean neat appearance, and though it cannot be expected to remove the infection where already introduced, will be found a powerful preventive of that great evil mildew.

2. Observations on the sowing of early small seeds.

It appears to be a fact, that the produce of some small seeds, is connected with the time of sowing. Six years ago, I sowed on the flower border in front of our hot-houses, about 140 different kinds of annuals, allowing to each a patch of earth, and tallying them. In the other borders and shrubbery, I sowed the same kinds with equal care, and gave each patch about half a spadeful of compost dung. Of the first sowing, all the kinds grew except about five or six; of the second, not ten different kinds appeared in all our extensive borders. It happened, that, at the time of the first sowing, there was a field in the park laid down in grass, and at the time of the second, another was laid down with equal care. In the first, the clover was complained of as too abundant; in the second, there was no clover at all, except about the head ridges. Sixteen years ago, I observed the very same result in an early and a later sowing of lucern. The natural course in these instances, would be to lay the blame on the seeds, and complain of the merchant; but it turns out, that the seed in these cases were taken from the same bags. There must therefore be some other cause of the failure of the latest sowing, and it will be found in the relation of the time of sowing, to the production of those insects which de-

stroy the seed-leaf of the plant. Insects are not produced, as is vulgarly imagined, by the east wind, but proceed from eggs, chrysalides, &c. deposited the former year. At certain seasons, provided the weather is warm, these insects are produced in astonishing numbers.

It is worthy of observation, that plants suffer most severely, when frost succeeds a few days of warm weather. The warmth first hatches the insect; the cold checks vegetation, and retains the plant in the seed leaf; and by this, is the young brood supported. In weather of this sort, the annual weeds of the same age with these early plants, will be observed in the same manner perforated and cut down.

An angler must imitate the flies which are hatched at their respective seasons; and on his attention to this branch of his art, depends in a great measure his success. As different insects are hatched at different periods in the season, it will be of advantage to regulate the time of sowing in such a manner, that the vegetation of the seed, and the birth of its enemy, may not meet together.

In all the cases above mentioned, early sowing was advantageous. There are crops, however, which do not admit of this precaution, and for them proper antidotes are to be sought. In turnips which are so frequently lost in the seed-

leaf, I have found, that the expedient of dusting the ground with soot, deserves more attention than it receives. It should be employed in a damp morning; and when rain falls soon after the operation, it will be needful to go over the ground a second time. For field turnip, a box might be fixed on the roller to sow the soot with the seed, or a machine might be formed for dusting the plant when it is in the seed-leaf. For garden turnip, the best machine is the hand.

Brechin, }
23th August 1810. }

XI.

On the varieties of the Pinus silvestris, or Scots Fir.

By Mr GEORGE DON, Forfar.

Communicated in a Letter to Mr P. NEILL.

(*Read 5th March 1811.*)

I AM not acquainted with the latitude of subjects your Horticultural Society means to embrace ; but I trust the following observations on the *Pinus silvestris* of Linnæus, the well known Scots Fir, may not be unworthy of its notice.

One would be apt to think that little new were to be expected concerning the history or qualities of a tree that is not only indigenous to our country, but has been cultivated among us from time immemorial ; especially after an excellent monograph on the genus *Pinus*, by a first-rate botanist and observer, Aylmer Brook Lambert, Esq; F. R. S. and a Vice-President of the

Linnean Society, published not longer ago than the year 1803.

During the winter of 1810, when walking in some woods in the neighbourhood of Forfar, composed of Scotch Fir, for the purpose of collecting mosses and lichens, my attention was withdrawn from these humble tribes, by observing the very dissimilar appearances of different trees, of what botanists consider as one species of *Pinus*, the *Pinus silvestris*.

After examining a great number of trees, I became satisfied that it is possible to distinguish in our plantations, at least *four* varieties; and one of these indeed is of so fixed and marked a character, that it may probably be entitled to rank as a species.

It seems somewhat curious, that in Dr Smith's *Flora Britannica*, in Hull's *British Flora*, and in Withering's *Arrangement*,—while perhaps not fewer than six or seven varieties of some species of plants, not of the least known economical use or importance, are enumerated,—not one variety of the *Pinus silvestris* should be noticed.

It may here be proper to state, that lately, while observing the cutting down of a fir plantation, near Forfar, I was not a little surprised at the great difference in the size, and consequently the value, of some of the trees in comparison with others of the same species, the dif-

ference in value being not less than four times that of others, and in some individual trees exceeding six times. I was at a loss to account for this fact, as the trees were growing promiscuously in the same soil and situation, and had been equally thinned. On more minutely examining those trees that far exceeded the others in size, I perceived that they were all of that variety which I have suggested as probably entitled to rank as a species.

About a month ago, I re-examined the varieties of the *Pinus silvestris*, in order to collect some cones of each variety for seed; and I was then led to examine them with considerable care.

I think the following remarks may tend to distinguish and characterize the different varieties.

Var. 1.

THE Common Variety, which I shall rank as the first, is well known by its branches forming a pyramidal head; the leaves being marginated, of a dark or full green colour, and but little glaucous underneath; the cones being considerably elongated, and tapering to the point; and the bark of the trunk being very rugged. This variety seems to be but short-lived, becoming soon stunted in its appearance, and it is altogether a very inferior tree to either var. 2. or 3.

Var. 2.

THIS strongly marked and permanent variety, is distinguished from the former, by the disposition of its branches, which are remarkable for their horizontal direction, and for a tendency to bend downward close by the trunk. The leaves are broader than in var. 1., and serrulated, not margined as in var. 1. From that circumstance alone, I should at once pronounce them distinct. The leaves are distinguishable at a distance by their much lighter and beautiful glaucous colour. The bark of the trunk is not so rugged as in var. 1. Its cones are generally thicker, not so much pointed, and they are smoother than those of var. 1. The tree seems to be a more hardy plant, being easily reconciled to very various soils and situations. It grows very freely, and quickly arrives at a considerable size.

This is the sort which I conceive might constitute a distinct species; and from the disposition of its branches, I would be inclined to call it *Pinus horizontalis*.

May I here be allowed to conjecture, that the fir woods which formerly abounded in every part of Scotland, and the trees of which arrived at a large size, had been of this variety or species? I have certainly observed, that the greater part

of the fir woods of the present day, and which are so much complained of, are of the common variety, or var. 1. ; at least not more than one tree out of ten or twelve, is of var. 2., or the more desirable kind. I think this is the most natural way of accounting for the supposed decline of the Scots Fir in this country ; for two reasons ; 1. Because var. 2. still retains all the good qualities ever ascribed to the Scots Fir ; and, 2. Because, as var. 1. produces its cones much more freely than the other, the seed-gatherers, who were only to be paid by the quantity, and not by the quality, would seize upon the former, and neglect the latter.

The evident remedy for this defect in our plantations of Scots Fir, is therefore the cultivating exclusively this second and well marked variety.

Even granting it to be only a *variety*, it seems indisputable, that any fixed variety in a timber tree, rendering it more valuable, is as well worthy of being attended to, as are fixed varieties in cultivated grains, or culinary vegetables ; and the great improvements that have resulted to agriculture and horticulture from attending to such varieties, are too well known to need to be insisted on.

Var. 3.

THIS is likewise a remarkable variety, and seems quite distinct both from var. 1. and 2. Its leaves are of a still lighter colour than those of the last; insomuch, that they appear of a truly light glaucous hue, approaching to a silvery tint. Its branches form, like var. 1., a pyramidal head; but it differs remarkably in its cones, from both the former varieties; the cones in this variety having the appearance of being beset with blunt prickles, bent backward. The leaves are serrulated,—a character which at once distinguishes it from var. 1., with which the tree agrees in having a pyramidal head. This variety is more common than var. 2., and it is also a good tree.

Var. 4.

I have observed a fourth variety, the leaves of which are somewhat curled or rather twisted, and much shorter. This seems to be a scarce variety, as I have not hitherto seen more than three or four trees of it. It very nearly approaches *Pinus Banksiana* of Mr Lambert's Monograph.

BEFORE concluding, I may remark, that Mr Lambert, in his Monograph, mentions a variety found by Thunberg in Japan, having the branches horizontal. Can this be my var. 2.? Mr Lambert thinks it may be a distinct species. —And I beg leave to add, that as I have collected seeds of all the above varieties, and have sown them in my grounds at Forfar, I hope to be able, in the course of the autumn, to shew the young plants to any gentleman desirous of distinguishing the varieties in the seedling state. I have collected all the cones I could possibly find of vars. 2. and 3., being the most valuable, and mean to raise them extensively, as the most effectual means of promoting a reform in this department of the nursery business.

Forfar Garden, }
10th February 1811. }

XII.

COMMUNICATIONS

From Mr SMITH, Keith-Hall.

(Read 4th December 1810.)

1. *On preventing the Worms in Carrots.*

ABOUT five years ago, I had a heap of pigeon-dung, which lay through the winter months on a quarter of the garden. Having occasion to remove all this dung to other parts of the garden, I laid down the quarter with carrots, and was surprised to observe an extraordinary production of this vegetable on the spot where the dung had lain, both with respect to their size and cleanness. And although some worms might have been found in the other parts of the quarter, yet I could perceive none in the spot above alluded to.

From that time, this circumstance induced me to adopt the practice of sowing my carrots always in one particular spot of ground, which I have annually manured well with pigeon-dung,

laying on almost as much of it, though of a hot nature, as if it had been rotten horse-dung. And I have the satisfaction to observe, that I have never failed to have an extraordinary crop, and what is of more consequence, can venture to affirm, that a worm could not be found in my carrots during the four years that I have continued this practice.

Last year, in thinning my carrots, I transplanted a few of them into a piece of ground that had been well dunged with rotten horse-dung; and though they grew very well, yet they were so much cankered, that they were almost unfit for any use.

All this leads me to think, that pigeon-dung is a good preventive of the worm in carrots.

2. *On preserving Cauliflower through a great part of the Winter.*

As cauliflower is a most desirable vegetable, so it deserves to be kept as long for use as possible.

In 1808, I had a large quantity of this vegetable in full head in the beginning of November. Being at a loss for a shed or such place as is commonly used for hanging it up, in order to preserve it, I dug a pit along the bottom of a wall, about eighteen inches in depth, and much about the same breadth. On a dry day, I pulled up the stocks of cauliflower, keeping the leaves

as entire as possible, and lapping them round the flower. I began at one end of the above mentioned pit, laying in my cauliflower with the roots uppermost, and the tops inclining downwards, the roots of the one layer covering the tops of the other, and so on with the whole of my stock. The pits were then covered closely up with earth, and beaten smooth with the back of the spade, in order that the rain might run off.

It is to be observed, that the covering had a considerable slope from the wall. The experiment succeeded to my wish; and I was able, occasionally to give a dish of fine cauliflower till the middle of January 1809.

Keith-Hall, }
11th August 1810. }

XIII.

On destroying Insects, and removing Mildew, and Canker in Fruit-Trees.

By MR DAVID WEIGHTON, Gardener to the Earl of Leven and Melville, Fife.

(Read 6th March 1810.)

I SHALL state my own practice, which has been tolerably successful; and if it do not exhibit much of novelty, it may at least have the good effect of inducing others to communicate what they may consider as superior modes.

The *Thrips*.—There is no insect so fatal to grapes as the thrips. To prevent them, the vines should be well washed with the engine every evening. If washed in the heat of the sun, the vines are materially injured. Indeed all vines should be washed every evening, until the berries begin to colour, whether infested with insects or not; and after that, no water should be given, either to the borders or trees.

When the washing of the trees is neglected, the thrips generally make their appearance. They may readily, however, be destroyed by a fumigation of tobacco and damp hay. After such fumigation, the plants should be well washed with pure water.

The *White-bug* is very hurtful to many peach-houses and vineries. The cause of this insect making its appearance, is much owing to the trees not being properly washed every day with the engine. When a vinery is overrun with this insect, all the old bark must be stript off the vines, and all the shoots and trellis properly sponged over with black soap and warm water. I always make it a rule at the winter pruning, to take off the outer bark, whether infected or not, as the White-bugs lodge between the old and new bark. With regard to peach-trees that are infested with the White-bug; in the winter season they should be sponged all over in the same way, and if any appear in the spring, it is a good way to tie pieces of mat round the stem, and the large branches of the tree; about these, the insects take shelter from the heat of the sun. Once every day these mats must be taken off, and thrown out of the house. Soon after you begin forcing, you will observe the female much larger than the male, at which time she always goes into a hollow of the tree or bark, and lays some thousands of eggs. These

are easy to be observed, and may be picked out with a pin or small piece of stick. This is an effectual way of preventing the increase of them.

The *Brown-bug* sometimes make its appearance on peach-trees, particularly when the trees are shaded or near the flues. In the winter season, the trees should be washed with lime-water; and the trees should be syringed with it, after the leaves have fallen.

The *Green-fly* is very destructive to peach-trees, particularly when forced. They are most effectually destroyed by washing the trees regularly every day after beginning to force. Most people give over washing when the flowers make their appearance, but I always continue the washing; I never found it prevent the fruit from setting. And if any of the flies make their appearance, I keep them under by proper watering with the engine, and by picking off the first buds on which they appear. I find this prevents them from breeding, and I have never had occasion to use tobacco-smoke.

The *Red-spider* is a much more destructive insect than the former, both on peach-trees and vines, and its generation is promoted by the same cause, (a dry heat); but constant watering, in the same manner subdues it, always taking care that every part of the leaves be wetted, otherwise the

insects shelter themselves in the dry parts, and by that means escape the effects of the water.

The *Mildew* does much more injury to peach-trees, than any of the former. It is still uncertain whether it proceed from the soil, or from the air, or whether it be an insect or fungus. I have tried various experiments to ascertain its nature, but hitherto without success. It may be remarked, that trees or plants with rough spongy leaves, are more generally attacked by it, and those with firm and smooth leaves, are almost always clear of it. For instance, I have often had melons and cucumbers growing in the same frame; and the cucumbers, owing to their leaves being rough and spongy, were affected, while the melons remained clear. Further, nectarines growing in the same house along with peaches, being smoother in their leaves and fruit, are seldom hurt by it. The fruit of the Red Magdalane and Royal George peach, are seldom exempt from it, owing to the fruit being more rough and downy. I have budded the Red Magdalane peach upon the Newton and Noblesse peach, and found the graft of the Red Magdalane affected, and the fruit on the other branches not affected. I am of opinion, that mildew does not increase upon the trees from shoots being left in the tree that were affected last year; for I have left shoots covered with it, and found buds spring from the same shoots with none of it on

them ; and others that were clear, produced buds with mildew upon them. At Melville garden, where the ground is low and damp, there is no mildew upon the peach-trees : where the hot-houses stand, the subsoil is a dry open rock, forty or fifty feet above the level of the other ground : here the mildew makes its appearance.

The mildew may be kept under, (I cannot say be cured), by washing trees affected by it, with a mixture of sulphur and lime-water. My mode of application is, by the garden engine, with a little soap, or any other thing that will separate it from the trees ; this clears them at the time, but does not prevent the mildew from returning again*.

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* My friend Mr JOHN HAY of Edinburgh, having been very successful in *preventing* mildew, I shall here state his mode of management in his own words : “ Whenever mildew was observed to affect a leaf or the point of any shoot, the diseased leaf was picked off, the point of the shoot dipped in water in which black soap had been dissolved, and it was well *drudged* with a bellows-pluff, filled with sulphur, (sometimes mixed with Scots snuff.) This was generally done in the evening, and it was washed off with the engine or squirt, the following evening, if the state of the trees with respect to flowering or ripe fruit, did not forbid it. All the trees that were ever under my care, were thus prevented from being injured ; but strict attention was always paid to the checking of the mildew at its first appearance.”

The *Honeydew*, in some seasons, is very destructive to trees upon open walls : it is a glutinous substance, which seems to contract the minute vessels of the more tender parts, and prevents the proper circulation of the fluids, whereby the leaves and shoots are often destroyed. This matter may easily be perceived, either by its sweet taste, from whence it takes its name, or by its adhering to the fingers when touched. It makes its appearance on the young shoots and the young leaves : this is the reason why their under sides are most blemished by it ; for the side of the leaf first appearing, becomes the lowest when full grown. A few days after the honeydew comes on, the *green* and *blue fly* appear, especially upon plum-trees ; and if the weather be warm, two or three days will make them increase in great numbers : at first they have no appearance of wings, but if the weather continues dry and warm, they will soon be furnished with wings, and take their flight. There are many successions of them, and they greatly injure the leaves and young shoots of the trees. It is imagined by some, that this glutinous matter is perspired by the tree, and that the insects come to feed upon it ; and this is my own opinion. I have observed that the honeydew sticks closest to the weakest trees, and to the weakest shoots of any one tree. The method I

practise to get rid of the flies, is this : I water the trees two or three times a-week in a plentiful manner, if the weather be dry ; and while the honeydew continues upon the trees, I add a little common salt and a quantity of broom boiled, to the water. This mixture effectually kills the flies, and does not injure the trees, if too great a quantity of salt be not added. This management will make the trees shoot stronger ; the dews at the same time rising from the surface of the border, resting on the leaves, and tending to hinder the breeding of these insects.

The *Blight* in some seasons is very destructive to fruit-trees, both standards and on walls. The general opinion is at present, that it proceeds from cold dry winds ; but I am of opinion, that it proceeds from too much moisture, especially if the weather be cold at the time, hindering the perspiration of the moisture from the tree ; for it is well known, that all trees draw a large quantity of water from the ground, and evaporate it into the air. I think there is no effectual remedy for this : But draining the ground where too wet, may have some good effect.

The *Canker* in fruit-trees, may, in a great measure, be prevented by proper care. I always find that a cold wet soil or wet gravel, has been a principal cause of bringing on the canker

in many kinds of trees, particularly the tender sorts; and that a mossy bottom is the worst of any. A dry gravel is the best bottom for all fruit-trees. The wall-borders here, (Melville in Fife), are eighteen inches, of a light loam upon dry gravel; and we have peach-trees in a good bearing state, and free from canker, that are supposed to have been planted 90 or 100 years ago, and plums and cherries of the same age. I am of opinion, that trees when decayed in the top, if their roots be safe, may, by proper cutting, be renewed and brought to a bearing state, and continue for a long time. Two years ago, I cut down a large Brown Beurré pear upon the wall, that was decayed in the top, and had given over bearing; and I trenched the border around it. It has made fine strong healthy shoots, and is producing some flowers this season, which is the second year since it was cut down. I likewise cut down an old standard Swan Egg pear, that was so much decayed and overgrown with moss, that it appeared good for nothing; and a Muirfowl Egg, in the same state; and they have produced remarkably fine healthy shoots. There are some sorts of peaches, and particularly the Royal George, that grafted, where budded, upon all soils. I have lost three of them in houses under my management. I tried various methods to save them, by binding them tight

with linen-cloth and plaster of cow-dung, but they always continued in a sickly state for one or two years, and then died. I last year planted a Royal George here, which had been two years trained, and in the course of the summer it began to throw out large quantities of gum at the bud, and about a foot above it, and also in some of the largest branches: it appeared altogether in a very sickly state. I had recourse to a painter's brush and a little white paint, and covered all the places infected with gum; and in the large branches, I cut out all the infected wood, and gave the wounds two coats of white paint. This season, it is appearing as healthy as any of the other trees, and promising to have a good crop, and there is no appearance of gum breaking through the paint.

I find that the tender kinds of fruit-trees are most subject to canker. I have observed a standard-tree that was full of canker, to be cured by removing it to a south wall. I have found that a cold wet season, or a heavy load of fruit, will bring on canker. The hardy kinds are always free from the canker, while tender kinds in the same soil, are full of it; therefore, in planting fruit-trees, care should be taken to plant the hardy sorts in the most exposed situations, and the tender ones in the most sheltered.

I have had peach-trees upon open walls full of the canker; have put a glass-case over them, and have found, when the wood was well ripened, the trees free of it. I have grafted hardy kinds on trees that were almost useless with the canker, and have thereby obtained healthy trees, and great crops of fruit. There are some fine trees that have been treated in this manner at Craiglockhart, near Edinburgh, of my grafting.

Standard-trees are very often lost for want of pruning; and I think, that, in general, those that are pruned in the common way, are worse, instead of better for it. The common way is to get into the middle of the tree, and to cut all the branches from that place, leaving the top full and crowded.

Now, I think, that the pruning should be confined to the fruit-bearing branches of the extremities; thinning these out regularly, that the remainder may find a free passage through them; by which means, the wood will ripen better, and the tree will keep the freer of canker.

With regard to bringing a strong tree into a bearing state, I never was at any loss; for by taking the mould from the roots, and properly trimming them, cutting out the strongest, in proportion to the growth of the tree; it

will shew plenty of blossoms the second year following.

The best and cheapest method that I know for saving the blossoms of wall-trees, is, to take Norway spruce branches, from which the leaves have fallen, and stick them into the ground, with their tops against the trees; fastening others to the top of the wall, with their ends downwards, so as to meet the former; over which, put three plies of old nets. Fern leaves are better, where they can easily be had. The nets will keep the branches firm, and the branches will keep the nets from the trees. These should remain until the fruit be set, and have begun to swell.

There is another great cause of the failure of crops of peaches and nectarines in hot-houses, which never happens on the open wall, and that is by the buds being too much swelled by protection in the autumn, and the trees being then exposed to the frost, which makes the buds, when forcing commences, drop off, in place of turning out sound blossoms.

I have always found, that riders (*i. e. wall-standards*) of every kind, bear more fruit than dwarfs; the reason of which, I think, is, that the sap is more refined in passing through the long stem of the tree, and rendered more fit for entering the blossom. This led me to think, that only a small

quantity of water should be given at the time of the ascent of the sap ; and I always keep my trees very dry all winter ; and in the spring I give no more water than what is necessary to keep them in life before the fruit begins to swell. Thus managed, the stronger trees set their fruit in general more plentifully, and produce much better fruit than weak ones.

Melville Garden, }
Fifeshire, 1810. }

D. W.

XIV.*Remarks on the Construction of Hot-House Flues.*

By ROBERT STEVENSON, Esq; Civil Engineer.

(In a Letter to Mr P. NEILL, Secretary.)

I BEG to communicate to you for the information of the Horticultural Society, the particulars of an experiment made some years since, with a view to the heating of drying-houses, for the purposes of bleachers and manufacturers; being of opinion, that the same principle may be usefully employed in the heating of stoves, vineries, &c. in gardens.

The apartment in which the experiment was made, measured fifteen feet in length, and nine feet in breadth upon the floor. The fire-place was at one end, and the fuel was supplied on the outside of the walls. From the fire thus situated, a flue six inches by ten inches, was conducted under a floor of tile-brick; this flue was made to cross under the floor several times, be-

fore it reached the chimney, at the farther end of the room. By this means, the smoke and heat were longer detained in their passage to the chimney, and being made to traverse the whole of the floor, it was confidently expected, that the temperature of the apartment would be speedily raised to about 100 degrees of Fahrenheit. The result, however, proved otherwise, for it was with considerable difficulty that a temperature of from 60° to 70° could be maintained.

The flues were then removed, and cross walls erected in their places for supporting the floor. These cross walls were of open brick-work, so that the whole space under the floor, formed one large flue for the smoke and heated air. After making this alteration, the same quantity of fuel was put into the same fire-place, as before, and the temperature was speedily raised to 150°, at which it could be maintained for any length of time, with the ordinary expenditure of fuel.

I was some time since applied to by Messrs Rennie, Airth and Company of Arbroath, (who are extensively concerned in the bleaching of yarns), regarding the heating of a new drying-house, which they had just erected. It was stated that their former drying-house was much smaller than the new one, and that with two fires, and flues constructed in the ordinary way, so much difficulty was experienced in producing

a sufficient degree of heat, that they were afraid even a third fire, in very cold damp weather might be found necessary, on account of the larger dimensions of the new house.

Upon visiting the works, I found the walls of the house so far advanced as to be ready for the roof. It is situated at one end of a plot of grass land, unconnected with any other building, and therefore exposed on all sides to the weather. I recommended that the earth within the house, should be excavated to the depth of four feet, which was as low as the foundation of the walls had been carried. When this was done, a fire-place was opened at one end of the house, and a flue was carried to the other end, when it turned, and was brought down the middle of the floor, and after being conducted a second time to the end of the house, opposite the fire-place, it communicated with a chimney which carried off the smoke. This flue, measuring three feet in height, and two feet in breadth, makes its evolutions in a space equal to the area of the building, and four feet in depth under the sole of the door. The flues were therefore not only much larger than is common, but as the division walls for supporting a pavement floor over the flues, were all made of open brick work, the whole space above described, was thereby converted into one large flue, or chamber for heated air, which is made to issue from

the open joints left between the pavement stones of the floor, and circulates freely to every part of the interior of the building; so that with one common fire, the temperature of this drying-house, whose area measures thirty-five feet by eighteen feet, and fourteen feet in height, from the ground floor on which the flues rest, is speedily raised to, and easily maintained at, from 70° to 90° of Fahrenheit, while hung full of wet yarn, and while the shutters in the upper part of the walls are set open, to allow the steam arising from the process of drying the yarn to escape. This effect, which is much greater than could be produced in the old drying-house belonging to the same gentlemen, although of much smaller dimensions, and heated with two fires, is to be ascribed entirely to the larger flues of the new house.

It therefore appears, that the simple application of as large flues as the circumstances of hot-houses will admit, would not only be attended with much advantage in point of economy, as a very small fire would be sufficient to maintain the temperature usually required in hot-houses; but, what is perhaps of more consequence, flues properly constructed upon this principle can be easily regulated, and will induce a much more uniform degree of heat. It seems from this experiment, that the flues in general use, are of too small dimensions,—that there is not

capacity in them for allowing the heated particles of air to expand ; and that the heat passes through the narrow flues and makes its escape with the smoke in a latent state, without being allowed to act upon a surface large enough to rob it of its caloric.

Upon this principle, churches and large halls might be heated ; and one fire might be made to heat a much greater range of vineries than is in practice at present : it would also be a great improvement in the construction of hot-houses, and even of garden inclosures, to make the walls hollow *, as well on account of such a construction inclosing a space for air, which is an excellent non-conductor, as of the facility with which a fire may be applied, by converting the whole or greater part of the wall into a flue, or receptacle for heated air. When this is to be done, the fire-place should be kept as low as possible, and after answering its purpose in the hot-house, the flue might be made to communicate with the hollow garden-wall, and the smoke made to escape at a chimney situated, according to circumstances, at a greater or less distance from

* You will recollect to have seen in the town of Peterhead, in Aberdeenshire, a dwelling-house with hollow walls of brickwork, belonging to a Mr Leslie of that place, who I believe has some thoughts of taking a patent for his ingenious method of making bricks, and building houses with double or hollow walls.

the hot-house. An apartment heated with flues of a large construction, is less incident to sudden changes of temperature than where the flues are small. The heat in large flues can be regulated with much precision, and they are attended with the advantage of seldom or never requiring to be cleaned. In all chimneys of this kind, an aperture should be made in the wall with a close shutter, near the top of the chimney, where a lighted candle or lamp should be introduced, for an hour or two immediately after the fire is put on, in order to create a current, and thereby bring the smoke to issue at the chimney top. I am, &c.

Edinburgh, }
20th Nov. 1810. }

XV.

On the means of bringing Fruit-trees into a bearing state, and on preserving Fruit.

By MR ROBERT INGRAM, TORY.

(Read 3d December 1811.)

As the methods proposed for bringing pears into early bearing are various, I beg leave to offer for the consideration of the Society, some which I have adopted, and all of which I have found to be more or less effectual.

In the first place, pears that grow strong and luxuriant, and which may not bear from these circumstances, I have found to be rendered fruitful by cutting their roots in the spring, when they begin to push; but this must be done with care. They must be dug round, about two feet from the stem of the tree, and got fairly under, so as to cut the leading roots; if this is done, it will in most cases bring them into bearing.

In the second place, I have found pear-trees brought to bear, by transplanting; and when this is to be adopted, I would recommend, that the trees should be dug all round, and all the leading roots cut, one year before lifting, and care should be taken that the roots be cut clean and not split, for when split, they are long in healing over, and do not throw off fibres so freely. When trees are to remain one year after cutting their roots, I would recommend, that the space that is dug round each tree should be filled up with fine earth; when this is done, it will encourage the tree to make young roots, which will be found of great service to the tree when transplanted. The transplanting, I think, should take place about the end of November.

In the third place, I would recommend budding or grafting, if the trees stand in proper situations. French pears are in general the most shy to bear, and I have found, that budding has brought them into bearing, and has answered better than the two former plans. I have been able to bring the most of the kinds into bearing from three years budding, and have had from most of them a full crop, having from a dozen to a dozen and a half on each branch so budded, and the fruit much larger and finer than on those whose roots were cut, or those that were transplanted; because on trees that are

transplanted, when they begin to bear, the fruit is often for years quite small, and without the proper flavour. This will be found to be the case, particularly when trees are old before being transplanted. This naturally arises from the check the tree has got. The trees that I have budded over again, were from eighteen to twenty years old. They soon filled the wall, some of the buds making above four feet the first season. The kinds that were budded again, were the Crasanne, Beurrés, Bergamots, St Germain, Chaumontelle, and Swan Egg, all of which have borne well.

It may not be improper here to take notice of a fact that has occurred this season with regard to budding. I have a young tree of the Gansel Bergamot, about twelve years old; three years ago I put a few buds on a Swan Egg pear from this tree, and this season I had the pleasure of having five clusters of flower-buds, but they were all destroyed with the frost in the spring, except one pear, which came to be a handsome fruit. The mother tree has not shewn any flower-buds yet, which clearly proves, that budding will bring trees sooner into bearing; and I am convinced it not only does so, but that working over again much improves the quality of the fruit.

When trees are very old, though in good health, buds from such old trees are sometimes

very ill to take, or even to graft upon; these I would recommend to be cut in, and to bud or graft upon the young wood which the tree makes from being so treated. The budding or grafting may be done on the present year's growth; this I have found to answer very well, the trees pushing and making strong wood afterwards, and producing fine fruit.

It may be proper here to remark, that a number of trees, both pears, and apples, are much hurt in their bearing, from the mode of pruning. In the first place, it is a common practice to cut off all the young shoots of the present year's growth leaving two or three eyes; this I consider as an effectual way to encourage useless growth, and particularly at the stem of the tree, which often more resembles a *willow-stool* than any thing else. This is a strong reason why there is no fruit near the stem of the tree, for it is not from that wood that the flower-buds come. All this wood should be cut close off in the spring, (if it has not been so cut in the summer pruning,) and if so done, a great deal of useless growth will be prevented, and the strength of the tree saved for better purposes. In the first place, it will greatly enlarge the size of the fruit, and will also strengthen the fruit-buds for another year.

Some French pear-trees shew a great deal of flower-buds, and often produce little fruit, and

for this reason, that they are weakened from over-flowering. The Brown Beurré is one in particular that shews a great deal of flowers, and often produces little fruit. I had some trees of this kind that I got scarcely any fruit from, until I cut off almost the one-half of the buds, only leaving those that were strongest, and closest to the tree; from this management I have had good crops. Last year (1810,) I had upwards of twenty dozen from one tree, and this year there is a fair crop, as the season goes. This pear-tree is very liable to canker, particularly if allowed to have long spurs; and I would therefore recommend keeping the spurs very short. If this be done, it will greatly help to save the trees from canker.

I would also recommend keeping the spurs of all other pear-trees short, and only leaving those that are youngest; for when the spurs are allowed to grow strong, you seldom have any fruit from them. If the spurs are thus thinned out, it will greatly promote their bearing, and make the fruit much finer.

With regard to training on a wall, I would recommend the fan-way, in preference to the horizontal; for this reason, that pear-trees are much inclined to bear at the extremity of the branch, on the fine young wood; from training them fan-shaped, you have it in your power to

fill up the tree occasionally in the centre with young wood ; whereas, in the other case, you have it not in your power so readily to accomplish this.

Having thus made a few remarks upon bringing pear-trees into bearing, it may not be improper to say a few words on the gathering of pears and apples, and of promoting their ripening, as many of the kinds of pears in this climate scarcely ripen, and I am convinced they might be artificially brought to maturity. 1. There is a practice too common of making a general sweep at once of the fruit off the trees ; but this should not be done ; they should be gone over carefully, and those only taken off, that part from the tree freely. Those that are left will grow larger, and will ripen as well as the first gathered : the gathering of fruit, therefore, should be repeated as often as found necessary. 2. I consider that a great deal of the winter pears are too soon pulled, and the reason of it is : We have often some frost early in autumn, and when that happens, the fruit is gathered before it has got the full benefit which the tree can afford. But pears are not very soon hurt by frost ; for I have tried the experiment, and allowed them to remain, although there was a little frost in the night, and they have suffered no harm from that ; but, on the contrary, I found the fruit improved

a great deal from remaining on the trees, perhaps fourteen days longer than they would have done, had they been gathered when frost came on early. Every one who has got fruit to gather, must judge when the tree ceases to nourish it; for when this is the case, it will part from the tree by being gently lifted up. The pears or apples when pulled, should be carefully laid one by one into the baskets, so as not to bruise one another.

There seems to be an universal desire to have fine kinds of fruit; but I am sorry to observe, that there is so little taste in the country for having good *fruit-rooms*; the most of them being very cold and damp. When fruit is put into such places, instead of ripening, it will grow quite tough, and in most cases musty-tasted, and scarcely eatable. A fruit-room, should therefore be perfectly dry, and free of all dampness; and those pears and apples which this climate barely ripens, should be kept warm and dry, in a temperature corresponding to that heat which ripens them in their native climate. This plan I have found to answer very well: it was in this mode that the pears were kept which were sent from Sir William Erskine's garden, and shewn to the Society last December, (1810). The Chaumontelle pears were kept in from 60 to 70 degrees of heat, in close drawers, and some

of the others from 50 to 60 degrees. This I knew by always keeping a thermometer along with them. I would recommend, that a fruit-room should be fitted up with drawers, of about six inches depth, by three feet in length, and two in breadth. As to the number of drawers, or the size of the house, it must depend on what fruit the proprietor has to fill it with. The drawers should be made of hard-wood; for I have known fir spoil the flavour of the fruit. The house should be made to admit plenty of free air when required, for this will be necessary for keeping the fruit in good condition; and the drawers in which the fruit is kept, will require to be drawn out occasionally, to admit fresh air, which will prevent the fruit from getting musty-tasted. There should be a stove in the house, which should be used frequently, to keep up a proper temperature. It being of the greatest importance to have the table served as early with fruit, and also as late as possible; if the above plans be adopted, they will not only be the means of improving fruit, but will render it sooner fit for use. I have been able to bring Crasanne pears to the table about the middle of November, and have kept them until March; and Chaumontelle pears from the middle of December, until the end of April, (and the other kinds in proportion to their general keeping).

Care must also be taken that they be not kept too warm, for if this be the case, they will shrivel in the skin, and not have the due flavour. It must be observed, that no more should be brought to ripen, than will serve until those that are kept colder come in their turn; and the quantity will depend on the consumption by the family. All pears that ripen freely on the tree, if wanted to be preserved for the table longer than they commonly keep, should not be allowed to stand until they are dead ripe; but should be gathered sooner. You will thus be able to keep them some weeks longer than you could have done otherwise. I have been able to keep French Bergamot pears until Christmas, while others, gathered from the same tree, were fit for the table in the middle of October.

The soil in which the trees grow at Torry, is for the most part a strong black loam, with a bottom of sand and clay mixed. The soil is two feet deep, with flags under each tree, about a yard square. The manure given the borders is a compound of fine strong rich earth, from the cleaning of ponds or ditches, with dung and lime all mixed together, about two carts of dung to six carts of earth, and one cart of lime. This compound is turned over several times, and lies twelvemonths before it is used. Of this I have given the borders within these nine years,

two complete dressings, about six inches deep all over, trenching it into the borders; and I have occasionally given them common surface-dunging with the same. This sort of composition, I prefer to common dung. The trees have improved both in health and bearing, and produce much finer fruit. The wall is fourteen feet high, and the borders the same breadth. The common cropping of the borders is sallads, and a few bulbous roots. I consider heavy cropping with vegetables very hurtful for the trees, and it should be avoided if possible.

Should any of these remarks be of service, or found to add any thing to the general stock of knowledge of the Caledonian Horticultural Society, I shall feel myself gratified. I am at present engaged with some experiments, to ascertain what length of time pears and apples may be preserved in full perfection, &c.; and should any of them be found effectual, I shall take the earliest opportunity of communicating them to the Society.

Torry Garden, }
12th November 1811. }

NOTE.

MR INGRAM having, at different times, produced most satisfactory proofs of the efficacy of his method of keeping fruit, by exhibiting the finest pears ever seen by any member of the Society, at a period of the year, (7th February), when the same kinds of pears, preserved in the ordinary way, would have been completely destroyed ; the Society resolved to bestow upon him some mark of their approbation for his successful skill in this particular. They accordingly agreed, (10th March 1812), that a piece of plate, with a suitable inscription, should be presented to him. They at the same time directed the Secretary, to give him thanks in the name of the Society; for the offer which he has made of communicating to them the result of future experiments on this subject.

XVI.

Observations on the preparation of Soporific Medicines from common Garden Lettuce.

By ANDREW DUNCAN, *sen.* M. D. & P.

(Read 6th March 1810.)

OPIMUM, or the inspissated white juice which exudes from the capsule of the *Papaver somniferum*, when wounded, has long been allowed to be one of the most useful articles employed in the alleviation or cure of diseases. The high encomium bestowed upon it by the illustrious SYDENHAM*, has been fully confirmed by the testimony of many succeeding practitioners. It is, however, much to be regretted, that there are individuals of the human species, with whom, from peculiarity of habit, opium seldom fails to produce distressing consequences. There are also conditions of disease, in which it may be very necessary to induce sleep, or allay pain,

* “Ita necessarium est Opium, in hominis periti manu, ut sine illo, manca sit, ac claudicet medicina.”—*Sydenham, de Dysenteria anni 1670, &c.*

though circumstances occur by which the use of opium at that time is contraindicated. Hence, it has been long a desideratum in the healing art, to discover other powerful quieting medicines. For, although it is hardly to be expected, that an article will ever be discovered, so extensively useful as opium, yet, a good soporific may be found, which with some, will have less influence, either as exciting sickness at stomach, as occasioning confusion of head, or as inducing a state of constipation.

It has been the opinion of many, that all the milky juices spontaneously exuding from wounded vegetables, possess somewhat of the same sedative power, with the milky juice of the poppy. Few plants in Britain, afford such milky juice more copiously than the common garden Lettuce, the *Lactuca sativa* of Linnæus; and every one must have observed, that this juice, when spontaneously inspissated by the heat of the sun, on the wounded plant, soon assumes the dark colour of opium, while, at the same time, it possesses in a high degree the peculiar, and I may say, specific taste, which distinguishes that substance. And besides this, it is a well known fact, that lettuce was much used by the ancients as a soporific.

These circumstances led me to turn my thoughts on some method of collecting and preparing this substance, that I might try its ef-

fects in the practice of medicine. And, after several trials of different modes of preparation, what I shall now briefly describe is the best method I have yet been able to discover.

I dedicated to this experiment, in my garden at St Leonard's Hill, near Edinburgh, a small bed of that variety of lettuce, which is commonly known among gardeners by the name of *Ice Lettuce*. I allowed the plants, about a hundred in number, to shoot up, till the top of the stem was about a foot above the surface of the ground. I then cut off about an inch from the top of each. The milky juice immediately began to rise above the wounded surface. Though then of a white appearance, it had next day formed a black, or dark coloured incrustation, over the surface where the stem was cut off. I found it impossible to separate this by scraping, as is done with the milky juice exuding from the head of the poppy, when it has assumed the form of opium. I therefore cut off with a sharp knife a thin cross slice of the stem, to which the whole of the dark-coloured opium-like matter adhered. This was thrown into a wide-mouthed phial, about half filled with weak spirit of wine, the *alcohol dilutum* of the *Edinburgh Pharmacopœia*, formed of equal parts of rectified spirit and water. By this menstruum, the whole black incrustation on the thin slice of the stalk was dissolved, and the spirit, as may readily be concluded, obtained both the colour and taste of the black incrustation.

Each of my plants, in consequence of the fresh wound inflicted by the removal of the thin cross slice, afforded a fresh incrustation every day. And by throwing these into the phial, I soon obtained what I concluded to be a saturated solution of the exudation from the lettuce, or rather of the milky juice in its inspissated state. It was then strained off, to separate the pure solution completely from the thin slices of the stalk. To this strained spirit, which had nearly both the appearance and taste of the ordinary *laudanum* of the shops, I have given the name of *Solutio spirituosa succi spissati lactuæ*. From trials made with this solution, both on myself and others, I have no doubt that it is a powerful soporific. But to obtain a form in which it might be exhibited, with greater certainty as to the dose, I evaporated the spirit, and thus brought the residuum to a dry state. In this state, it has very much the appearance of the opium imported into Britain, particularly of that which is imported from Bengal, and which is a much softer substance than the Turkey opium. To this *opium-like* substance, I have given the name of *Lactucarium*. And from some trials which I have made with it, when exhibited under the form of pills, it appears to me to be little inferior in soporific power to the Opium which is brought from Bengal.

From the *lactucarium* thus obtained, I have formed a tincture, by dissolving it to the extent of one ounce, in twelve of weak spirit, which is the proportion of opium to spirit, in the *Liquid laudanum* of the Edinburgh College. To this formula, I have given the name of *Tinctura lactucarii*. I consider it as the best formula I have yet been able to contrive, for obtaining the soporific and sedative powers of the *Lactuca sativa*. And in different cases, I have, I think, seen manifest good effects from it, both as inducing sleep, allaying muscular action, and alleviating pain, the three great qualities of opium, which demonstrate it to be one of the most powerful sedatives. At present, however, I intend nothing more but to communicate to the Caledonian Horticultural Society a method of preparing a soporific medicine from common lettuce. For ascertaining more fully its medicinal effects, I am at present engaged in a series of trials, which may perhaps be likewise communicated to them.

Meanwhile, it will afford me great satisfaction, if the above short account shall draw the attention of others, particularly of professional gardeners, to the same subject, and shall lead to the discovery of a better method of obtaining an useful medicine, from a plant so easily cultivated in every garden. Perhaps this important object might be somewhat forwarded,

if the Caledonian Horticultural Society were to propose a prize, as a reward to the person who should be most successful in preparing a medicine from the milky juice of the *Lactuca*. But it should be an essential condition of that prize, that he should send them, not only a specimen of the substance prepared, but also an exact account of his method of preparing it.

In consequence of the above suggestion, the Caledonian Horticultural Society, at their quarterly meeting on the 6th of March 1810, agreed to propose a Prize Medal for each of the two following questions :

1. For the best method of preparing a soporific medicine from the inspissated white juice of the common Garden Lettuce. Specimens of the medicine to be produced.

2. For the best method of preparing opium in Britain, and the most advantageous manner of cultivating poppies for that purpose.

Further Observations on the preparation of a Soporific Medicine from common Garden Lettuce.

By Dr DUNCAN *sen.*

November 1811.

FROM the writings of the most eminent medical authors, it appears, that garden lettuce was employed many centuries ago, for the purpose of procuring sleep. Galen, who flourished about the commencement of the Christian era, mentions it frequently in his writings. And it is said, that in an advanced period of life, when distressed for want of sleep, he used it with success*.

Among the moderns, this article has not been altogether neglected. Some observations and experiments have been made respecting its medical powers, both in England and in America; particularly by Dr Cox of Philadelphia, and Dr George Pearson of London.

About two years ago, I read to the Caledonian

* “*Hypnoticam esse jam cognoverunt veteres: Celsus, qui papaveri ideo adjungit; Galenus, qui sibi ipsi senex in somnis vesperi lactuca comesa somnum conciliavit.*”—MURRAY, *Apparatus Medic.* vol. i. p. 109.

Horticultural Society, a short account of a method of preparing a soporific medicine from this plant. That account so far engaged the attention of the Society, that they proposed a Prize Medal as an honorary reward, *for the best method of preparing a soporific medicine from the inspissated white juice of the common garden lettuce.*

I am happy to learn that some ingenious men, have not been neglectful of this subject; and I would fain hope, that even our inconsiderable premium may lead to an honourable and useful competition. Among others, I have myself made farther trials with this vegetable, and I now present to the Society specimens of five different preparations of lettuce, all of which, may, I think, be usefully employed in the practice of medicine.

Of the method of preparing the first, second, and third of these, viz. 1. the Spirituous Solution, or tincture of the dried juice; 2. The Extract, which I formerly styled *Lactucarium*, and which is prepared by the evaporation of that solution or tincture; and, 3. The Tincture of the *Lactucarium*, which is prepared by dissolving that substance in diluted spirit of wine, I have nothing to add to what I formerly related to the Society. I may however observe, that, from repeated trials, I have found all of them to be useful soporifics. But the preparation of these requires much time,

and great attention ; and in preparing the lactucarium, it may be easily injured by the improper application of heat.

The two additional preparations, which I now present to the Society, the Inspissated Juice, and the Tincture of the leaves of Lettuce, may be made very easily, and at a very trifling expence. Although not so powerful as the solution or extract, prepared from the inspissated milky juice, yet they will, I am persuaded, be found upon trial, to be highly useful in the practice of medicine.

Method of preparing the Inspissated Juice of Lettuce, or the Succus Spissatus Lactucæ recentis.

TAKE any quantity of the leaves and stalks of the lettuce, when the plant is nearly ready to flower. Bruise them well, and including them in a hempen bag, compress them strongly till they yield their juice. Let this juice be evaporated in flat vessels, heated with boiling water. Let the evaporation be continued till the expressed juice be reduced to the consistence of thick honey.

According to the trials which I have made, twelve pounds of lettuce will yield about eight ounces of inspissated juice.

Method of preparing the Tincture of Lettuce-leaves; or the Tinctura foliorum siccatarum Lactucæ sativæ.

To one ounce of the dried leaves and stalks of the lettuce cut down, add eight ounces of the diluted Alcohol of the Edinburgh Pharmacopœia. Let the vessel containing this mixture, be kept for a week in a warm place, shaking it frequently. Let the liquor then be strained through paper, and kept for use. About fifty drops, may be taken for a dose.

Additional observations on the Lactuca, presented to the Caledonian Horticultural Society, by Dr Duncan sen, May 1. 1812.

IN two former short communications to the Society, I have given an account of a method of preparing from the common garden lettuce, different articles, which may, I am convinced, be employed with advantage in the practice of

medicine. To these I have given the following names :

1. *Solutio vel Tinctura succi spissati Lactucæ,*

Prepared from the inspissated juice spontaneously exuding from the plant when wounded.

2. *Lactucarium,*

An extract prepared by evaporating the above solution or tincture.

3. *Tinctura Lactucarii,*

Prepared by dissolving the lactucarium in proof-spirit of wine.

4. *Succus spissatus Lactucæ,*

Prepared by inspissating the expressed juice of the recent plant.

5. *Tinctura foliorum Lactucæ,*

Prepared by extracting the active powers of the lettuce, from the leaves of the dried plant, by warm infusion in proof-spirit.

To my former observations, I can now add, that during the course of last winter, I have made many trials of these articles, both in hospital and in private practice. I have particularly employed the first, and the fourth of these

preparations, in the clinical wards of the Royal Infirmary, where the effects were observed by many attentive and ingenious students. They have witnessed the benefit which may be derived from them in procuring sleep, in alleviating pain, and in allaying inordinate action, particularly troublesome cough. I am therefore not without hopes, that when the experiments I have made, are more generally known, they may have the effect of calling the attention of other medical practitioners, and of some intelligent gardeners, to a subject, which, in my opinion, is of considerable importance.

XVII.

Account of the state of certain Fruits found growing in some parts of the Highlands of Scotland.

By ALEXANDER GIBSON HUNTER, Esq. of Blackness.

(Read 3d December 1811.)

THAT “example is better than precept,” is an old and trite observation; and in nothing will it be found more true than in horticulture.—What we see our neighbour *do*, we naturally conclude, we may do ourselves; and in general we as naturally conclude, that nothing more can be done:—And hence improvements and discoveries are of so slow growth. We know that our northern climate of Scotland is capable of producing certain fruits, trees, and crops, with which we are well acquainted; and we are apt to take for granted, that it is capable of producing nothing better. Whereas, every person of observation, who travels over this country, and looks around him, must be satisfied, that we are

only beginning to learn what our country and climate are fit to produce ; more especially when aided by draining, planting, inclosing, and similar means of improvement.

It is a well known fact, that it is little more than sixty years since some larches were planted in pots in the Duke of Athole's green-house at Dunkeld, as being plants too delicate for our climate ; but that soon getting too large and luxuriant for the house, they were transferred to a warm and sheltered situation in front, where they at present remain, in the state of lofty trees. Till lately, it was generally believed, that the Scots pine was the only tree fit for planting in Scotland, at least in high, bleak and exposed situations, where other trees would not grow ; whereas it is now found, that the Scots pine, to be produced in any perfection, generally requires a better soil and situation, than most of our other trees ; and that the larch in particular, far from being the tender plant which was at first supposed, it will thrive at a height of 300 feet beyond the region of the Scots pine.

Wheat, we find we can grow with advantage, at an elevation where we formerly failed with barley.

Potatoes will thrive well in peat-moss, (provided it be dry), where we had not even common grass ;—and carrots, artichokes, and aspara-

gus, may be successfully cultivated in mere sand, which previously produced nothing.

But, without multiplying instances farther, and to come more directly to the object of this paper, the application of this doctrine to horticultural pursuits; it is known to many members of this Society, though not generally, that the excellent pears, the Swan's Egg and Muirfowl Egg, often produce more regular and abundant crops, and with superior flavour of fruit, when grown on standards, than when trained on the best walls; although the wall-fruit may be of larger size. The same I believe to be the case with the Grey or White Beurré,—the French and Autumn Bergamots,—with the Chaumontelle, strange as it may seem,—and, according to Mr Forsyth, with the Eschasserie, and even the St Germain's, and probably with many others with which I do not pretend to be acquainted.

It has been discovered too, that many of our plums, *e. g.* the Green Gage, the chief of its family, often produce better crops, and of more excellent quality, when growing on standards, than on the best exposed walls.

I shall state what I myself witnessed in this way, in the course of the present year (1811), unfavourable as the season has been; in a place too the least of all likely, or at any rate where I least expected to meet with any thing of the sort.

I had occasion, in September last, to make a rapid and short excursion to the Highlands,—to Fort William, Ben Nevis, and other places. I was not a little surprised at the quantities of apples and pears I noticed at different places, in remote Highland districts; such as Captain Stewart's at Ballyhulish, and Mr Cameron's of Glen Nevis; but these being in sheltered situations, and very little elevated above the sea, there was the less room for wonder, more especially when the instance I am about to mention, is considered.

In returning homewards, we struck off the great road, at High Bridge, and came up Glen Spean, and so onwards by way of Loch Laggan. After visiting the parallel roads of Glenroy, we stopped a night at Keppoch, the hospitable residence of Mr Macdonald of Glenco, to whom we were not known even by name; but, being benighted, he gave us quarters in the kindest manner.

Keppoch is situated in the parish of Kilmanivaig, about eleven or twelve miles south from the western extremity of Loch Lochy; and from the rapidity of the course of the river Spean, on which it is situated, its elevation above the level of the sea must be very considerable; and besides, calculating from the western sea, it is a long way inland. I could see few or no trees of

any consequence, in this part of the country ; but hearing by accident, that there was a sort of garden or orchard in the neighbourhood, with a considerable quantity of fruit-trees in it, I determined to examine it. From the impression I had formed of the country on the preceding day, I was completely at a loss to guess where this same garden could exist, or any thing of the sort ; for in fact the country looked extremely wet and wild, taken even as a Highland country. There was not a stack in the corn-yard, although the farm paid a rent of L. 600 a-year, (if I remember rightly), the whole corn being lodged in the *barns* ; necessarily implying a very scanty produce of corn. My time was limited ; but getting up early in the morning, I was conducted to the garden, which I found situated on a sort of bank, sloping towards the river, surrounded by an old thorn-hedge, and sheltered by a few spruce and larch firs of a good size, and in a very thriving condition, of the age of about thirty-five years, as I guessed. I particularly noticed, that this garden was not even their best soil ; there being a haugh of fine land beyond it, towards the river, in which were their drilled crops, turnips, potatoes, and some corn.

On entering this garden, (or rather orchard), the loads of apples and pears, and the vast size and healthy appearance of the fruit-trees, ab-

solutely astonished me ;— in fact, I think I can venture to assert, that I have no recollection of ever having seen a greater crop on the same number of trees, in any one place. As I have said, the trees were of very large size in general, and they were loaded with fruit, from the lowest to the top branches, which last were bent quite downwards in a pendulous state. Many of the younger and smaller trees were propped and supported by forked sticks ; and other branches were shewn to me, which had been broken down by the weight of the fruit.

It at once occurred to me, that this crop must have escaped the severe weather of spring, by blossoming later than ours in the Lothians. On examining the fruit, they proved, no doubt, to be chiefly of the ordinary kinds : some of these I was unacquainted with, and many of them I could not name ; as it is often more difficult to name the coarser sorts, than the finer and more valuable. I observed, however, of *apples*, the White Hawthornden, Strawberry, and Red-streak, and an apple generally called the Sugar and Water ; and of *pears*, the Early Carnock in great abundance, and of excellent colour and quality ; and the uncommon little excellent pear called John Monteith's ; the fruit of this last, very small and much *scabbed*, but of good flavour. I perceived they had the Crawford or Lammas, but its fruit was past. I looked in

vain for our excellent Scots pear, the Auchan ; it did not seem to exist in the garden.

Great as was my surprise with the apples and pears, it was nothing when compared with that excited by the *plums*. There were several trees loaded to excess with the true Damson, (if I be not very much mistaken, but which I am unwilling positively to assert it was ;) in fact the trees were clustered with them, and literally *black and blue*, as was the ground below them : For this fruit seemed to be utterly disregarded, not being a good eating plum. I recommended strongly to Mr M. to order a stock of sugar, and preserve them in pots ; when he could not fail to turn them to excellent account.

I next took particular notice of a good sized roundish pale-red plum, somewhat resembling the Imperial, though assuredly not it ; and even a better fruit, as I thought. With this plum I confess myself unacquainted ; the stone was free, in a large open cavity ; the flesh and flavour extremely good.

But I am well acquainted with the two next I have to mention, the *Yellow Magnum* and GREEN-GAGE, both thriving luxuriantly, and with excellent crops of fruit ; the Magnums large, well-shaped, free from gum, and of a rich yellow colour all over ; the Gages, of the true brownish and green colour, and completely ripened, though some of them were cracked by

the rains. These were growing on standards, in the heart of Lochaber, and where the snow on the tops of the hills was visible to us from the garden *on the 23d of September!* And so little were they thought of, that our conductor did not know their names, in English at least, and I did not inquire whether he did so in Gaelic. Indeed he took more delight in calling our attention to a stock of shot cauliflower, as being a much finer thing: more uncommon in that garden it undoubtedly was, being at the time quite unique.

I own I was much surprised by what I have thus attempted to describe, perhaps with some prolixity; but I conceive the notice of facts like these, to be of the utmost importance, both to this Society, and to the country in general. If some of the best and most esteemed fruits will thrive so luxuriantly, and produce fruit in such perfection, with so little aid, and with so few apparent local advantages, in the inland parts of Inverness-shire, surely the fact cannot be too generally known, nor the planting of these too generally recommended. Horticulture may thus become an object of serious attention in the Highlands; and where fruit-trees thrive so well, surely forest-trees of almost every sort, might be expected to do so.

Before leaving the garden of Keppoch, I regret I did not take more particular notice of the

soil. As far as my recollection serves, it was more of a clay than a loam ; little of it at all cultivated, only a patch or two dug occasionally for vegetables, and no appearance of drains, or any other work of art ; though the country is naturally one of the most wet and rainy in Scotland. In short, so far as I could observe, it did not appear to possess any particular local advantages, beyond most other considerable residences in the Highlands, and not so many as we very frequently meet with, in respect either to soil, shelter, exposure or climate.

To conclude, every day's experience seems to shew us that we are ignorant what our country and climate are capable of producing, more especially when aided by proper care, attention and skill ; and that we are only learners in the extensive field of horticulture ;—a doctrine which cannot be too much kept in view, and inculcated by our Society. And when it is further observed, that most part of the varieties of fruits we are at present acquainted with, have been discovered either by chance, or by random experiment ; that new sorts and improved varieties are coming to light daily, as well as new and improved modes of cultivating them ; and that, by well regulated experiments, we have every probability, not only of improving those we already possess, but of discovering sorts better adapted to our country and climate ; surely

these considerations must instigate us strongly to exertion and perseverance. It is but a few years since the first Ribston Pippin was discovered growing in a hedge at Ribston-Hall, the seat of Sir Henry Goodricke, in Yorkshire. Who can say but that a better summer pear than the Jargonelle may yet be found out? and better apples than the Golden Pippin or the Nonpareille? Let us then by every means in our power, endeavour to propagate and improve those fruits we are already possessed of, and if possible try to produce new sorts and varieties, of finer quality, better adapted to our climate, and (with God's blessing) we may indulge the hope of in due time 'reaping the fruits in abundance.'

*Loretto House, }
Nov. 1811. }*

XVIII.

An easy method of destroying the Blue Insect that breeds on the bark of wall-trees, and causes them to canker and die.

By Mr. PETER BARNET, Gardener to Lady Elcho, at Amisfield.

(Read 5th March 1811.)

In May 1807, when I entered as gardener at Alderstone, near Haddington, many of the wall-trees were infected with the blue insect. In particular, there were two golden pippin apples so overrun, that I was going to throw them out, or at least to cut them over, and re-engraft them in the following spring:

During the winter, however, I resolved to try an experiment for the destruction of the insects and their eggs. I collected a considerable quantity of chamber-ley; and when it had been kept for several weeks, I one afternoon unnailed the affected trees, and with the garden engine washed them with the stale ley. It was after sunset, and so hard a frost, that the liquid was soon con-

verted into ice upon the branches. I nailed the trees again to the wall, and at this time took no farther notice of them.

In the following summer, the trees made fine wood in every part; and the next year again, (1809), they bore the best crop that I ever saw; and they are now as healthy as any trees in the garden. A few of the vermin, indeed, still appeared, which had lain concealed about the spurs; but where the stems were clean, there were none to be seen.

I intended to have repeated the experiment on the same trees during the past winter, as the insects seemed again to be on the increase: but my removing to Amisfield in November last, has prevented it.

Here, however, I have ample room for the same sort of experiment; as nearly one-half of the trees in this garden, is affected, and severely injured by the same insect. I intend to have recourse to the above remedy; and shall communicate the result.

Meantime, as the experiment is very simple, and within the reach of every one, I thought it best to communicate it without delay to the Society.

Additional Remarks by Mr Barnet.

In the course of winter 1811, I repeated the experiment with chamber-ley on several fruit-trees here ; and have since had the satisfaction to find that they are entirely freed of the blue insect. It does not appear, however, that the applying of the liquor in the time of frost, is necessary to its success ; trees washed in fresh weather, being equally cleaned by the application.

*Amisfield, }
May 1812. }*

XIX.

Observations on the Transplanting of Fruit-Trees at an advanced age, especially Pear-Trees : On the cause of Barrenness in Pear-Trees ; and on the best method of rendering them productive.

By Mr THOMAS THOMSON, Wemyss Castle, Fife.

(Read 5th June 1811.)

I BEG the indulgence of the Society, while I relate the circumstances that first induced me to make the experiments on fruit-trees, which are to form the subject of the present communication.

In the year 1785, I was engaged to take charge of the Garden of Tynningham, in East Lothian, belonging to the Right Honourable the Earl of Hadinton, where there was a choice collection of the best kinds of fruit-trees cultivated in this country. These in general had given satisfaction, excepting upon one wall of French pears, which his Lordship said had very

much disappointed him, as at a former period they had borne fine crops, but had latterly almost ceased bearing; and the very few fruit they now produced, were of an exceedingly inferior quality: These evils, he imputed to the roots having got down into a bad soil. To me it appeared obvious, from the strong growth of the trees, that it was not to any defect in the soil or the roots, that the mischief was to be ascribed; but to a belt of planting, that had been placed too near the wall, so as almost to exclude the sun and air.

I was persuaded that the pear-trees would do no good unless the belt were reduced. As the proprietor would not consent to remove this ornamental belt of planting, I then proposed to remove a few of the best kinds of the pears, to a more favourable situation. With this plan he was highly pleased; but he said he was afraid it would not be practicable to do so with safety, as the trees had stood twenty-five years, and many of them covered 500 square feet of wall. I resolved, however, to make the trial.

In the month of November, I opened a trench four feet from the stem of the trees, in a circular form, and sufficiently wide to enable me to get to all the strong roots, which I cut off smoothly, with a sharp knife; I then filled up the trench again with fine rich earth. Though the *spurs* of the trees had got rather far from the wall, yet I

did not judge it prudent to cut them at the same time with the roots, as I thought they would, if left, cause the roots to push out a greater quantity of young fibres in the summer ; and that it would be against the tree to have both the wounds of the roots and top to heal at the same time.

The November following, I cut-in the spurs as close to the wall as possible ; and where this could not be accomplished to my liking, I took them off altogether. To those who are prejudiced in favour of old practices, it may appear strange to deprive a pear-tree of its spurs, as they might doubt of its being likely to get a fresh supply. I had, however, a different opinion ; for having observed, that generally where a large branch was cut off, a number of young shoots made their appearance, I therefore concluded, that a tree deprived of a large portion of its roots, instead of forming wood-buds, would form only flower-buds. This I found to be the case ; for all along the branches, where the spurs had been taken off, a number of strong buds were formed, which in many cases became fruit-buds the second year.

I do not know any circumstance in the training and managing of pear-trees, especially of the more delicate kinds, of greater importance, than that of keeping their spurs close to the wall, with the knife ; for when they have been neglected for a few years in this respect, they

become little better than standards, the fruit small and *gritty*, and of very inferior flavour, so as hardly to be known. Two years after cutting the roots, I removed the trees to the situations intended for them, having previously made pits of sufficient width and depth, and having at hand a quantity of rich fresh mould for filling them up. Considerable care must be observed in this part of the operation, as upon its being well performed, depends much of the success. I generally proceed in the following manner: The tree being *unnailed* from the wall, the branches are bound together, so as to prevent their breaking; a trench is then opened on the outside of that which was made for the purpose of cutting the roots; the whole ball containing the roots is then undermined, and as much of the loose earth is removed as can be done without injuring the young fibres on the outside, they being what the tree must depend upon for its immediate support: the tree must then be carefully moved to its new situation, placing it a little deeper in the pit than it had formerly stood, and raising it gently, as the mould is filled in, and at the same time distributing the fibres as regularly as possible, with the hand, and not allowing them to remain in tufts. If this is not attended to, they will be apt to become mouldy and rot, which would be a great loss to the tree. A bason of a few inches deep, should be formed

all round the stem of the tree, extending as far as its roots, for the purpose of watering, which should be done frequently if the soil is dry. Nail the branches slightly to the wall, allowing sufficient room for the tree to subside; and in the following March they may be nailed in for good. In the course of the summer, they may be watered twice or three times a week with the garden engine, over all their branches; but this should be done only when the evenings are fine and free from frost. Of all the trees treated in the above manner, not one failed; most of them had fruit the second year after moving, and the third they had a fine crop of large and well flavoured fruit, and were besides in as great vigour as if they had never been removed.

Barrenness in the pear-tree may arise from various causes, but most generally from improper situation, or a too copious supply of the vegetable sap; for example, planting the Colmar, Cressane, Beurré, &c. on a north-east or north-west aspect; when it is certain, that these not only require the best aspect, but also a very good season to bring them even to tolerable perfection in our climate. When barrenness happens from the above cause, I know of no remedy so likely to effect a cure, as that which I have before recommended, and which I have practised with so much success.

Barrenness in the pear also happens from the improper selection of stocks or scions, or sometimes from both. Pear-stocks are generally raised from seeds; and seedlings, though produced from the same tree, are very different in their nature, some growing very strong and luxuriant, while others are dwarf and crabby. If a luxuriant stock be grafted with a scion taken from a strong shoot near the stem of the tree, and the young tree be planted in a deep rich soil, it may become a fine looking tree, but very unfruitful, making wood only, without forming flower-buds. I have tried various methods to render such trees fruitful, but have found none to equal that of root pruning. This however must be done with much caution; the strength and vigour of the tree should be well considered, and also the nature of the soil. In no case should the roots be cut nearer to the stem than about four feet, and only such as are strong, and especially those that have a tendency directly downwards. The cut should be made with a sharp instrument, and very clean so as to heal easily. When root pruning has once been performed judiciously, it seldom needs to be repeated; at least if it has had the effect of throwing the tree into a fruit-bearing state, as then a desiccation takes place in the whole plant, which will prevent it again becoming so luxuriant.

Experiment made on a Cressane Pear-Tree.

THIS tree was planted against a south wall, and trained with an upright stem, and its branches horizontally trained, covering a space of wall sixty-five feet in length, and twelve feet high. It had borne fine crops for many years; for two or three years it had not borne such good crops as formerly, and had got into a very luxuriant state, for a tree of its size and age; this I attributed to its roots having reached a richer stratum of soil, as the border in which it was planted had been raised above six feet, to bring it to a level with the rest of the garden. I therefore thought it might be difficult to get at its roots, to cut them so effectually, as to produce a sufficient change in its constitution, and resolved on trying the following experiment. The earth was removed from the lower part of the stem for a few inches below the surface, and with a hand-saw the stem was cut two thirds through, and the earth filled in again. The effect produced was astonishing; instead of throwing out such a quantity of shoots as it had done for the last two or three years, it produced only flower-buds, and the next season I had the satisfaction of seeing it produce a fine crop of fruit: at one gathering, I took from it forty-seven dozen of fine handsome fruit.

Wemyss Castle Garden, }
April 1811. }

XX.

On destroying Caterpillars, removing Mildew, &c.

By Mr JOHN KYLE, Blair Drummond.

(In a Letter to the Secretary.)

I SEE by the Weekly Journal that you are to have a meeting of gardeners soon. As I am at too great a distance to attend, I here offer you a few remarks. If you think it worth while, you may let them be known to my horticultural brethren.

As to the *Caterpillars* on gooseberries, I have tried many ways. The only way that I got the better of them, was to take them at the first appearance, which is seen by small holes in the undermost leaves; pick off these leaves, which is soon done. I have commonly had to go over them a second time; but by so doing, I always preserve the fruit and the bushes from being hurt.

But now I have fallen upon a better way. When the leaves are fully out, go to the cow-dung-hill, and take the cow-urine; water round

below the bush, on the surface of the ground, but not on the bush ; it will improve your crop, and free you of caterpillar.

The *Mildew* on peach-trees, is occasioned by a very destructive insect. I was very much hurt with it here, and tried several ways, but could not get clear of it, till I watered the borders with cow urine ; and for nine or ten years I have not had the least appearance of it. I give them a watering at the winter dressing, end of November, or in December, and then another after they set a-growing. I likewise do the same to the vines, and I never miss a good crop.

As to *Hot-beds*, I make the beds with moss and dung ; I take the dung new from the stables ; lay first about a foot and half of dung, then a stratum of peat-moss about four inches, and then dung about six inches, moss four inches, and dung, and so on till I make the bed a proper height, giving allowance for sinking ; and in less than three weeks it is ready for the seed or plants. I have used this method for several years with great success, and it makes fine manure. The moss must be broke small, but it is not to be expected that every gardener has it in his power to get proper moss.

Blair Drummond, }
Feb. 26. 1811. }

XXI.*On destroying Wasps.*

By Mr JOHN MITCHELL, Moncrieff-House.

(Read 5th March 1811.)

HAVING been much troubled with wasps at this place, I have made trial of several methods to keep them under. Destroying their nests is most efficaceous ; and the following simple way of doing so, I have practised for several years past, and find it most beneficial.

The method I take to find out their nests, is by observing, in a quiet sunny day, the course of the flight of the wasps from the garden, following them as far as I can observe them flying ; then waiting till others pass the same way, following them likewise ; and so on until I reach their habitations. Having marked the place ; in the evening, when I think they are all in, I come provided with a lantern and candle, and a match of damped gun-powder, made in a roll on the end of a small piece of wood ; I light it, and it

burns like a squib ; and introducing it into the hole, I put my foot on it for a few minutes. I then dig until I see the works, and having a panful of water ready, I throw it upon them, and work it all together like mortar. When the nest happens to be on a bush or tree, I hold the match below it, when the wasps soon fall stupified to the ground, and are destroyed in the same way as above.

When I began to destroy wasp-nests in this way, I have in one season, and within 300 yards of the garden, destroyed upwards of fifty nests, without getting a sting, or passing a single wasp. They are every season diminishing in number, and I have not the smallest doubt, if every gardener were to use the same method, a great many fine fruit would be preserved, as well as honey-bees, which are much destroyed by wasps.

In the common way of hanging up phials against trees, a great many wasps may be enticed into them ; but still the hive is breeding more. Large white glass phials, however, are useful for destroying the *large black flies*, which are likewise very destructive to peaches. I put a little jam or jelly into them ; I find it has a good effect to entice them into them ; and this is the only method I have found to keep them under.

Moncrieff-House, }
21st February 1811. }

XXII.

On destroying the Green-fly, &c. and on bringing Pear-Trees into a bearing state.

By Mr WILLIAM BEATTIE, Gardener to the Right Hon. the Earl of Mansfield, at Scone.

(Read 3d September 1811.)

I BEG leave to submit to the Society, a method which I have practised with success, for the destruction of the *green-fly*, as well as the black vermin that infest cherry-trees.

Take one peck of unslaked lime; put it into an hogshead; fill it up with water; having first bored a hole to draw it off by about a foot or nine inches from the bottom, so that the lime, when slaked, may lie under the hole: Let it stand twenty-four hours, then draw it off; and add half a pound of common soda, such as is used for washing, to the hogshead of lime-water. Twice or thrice watering with this liquor, by means of a garden-engine, will destroy the vermin. Care must be taken not to exceed in the specified quantity of soda, otherwise it will destroy the

foliage being very acrid. The tub containing the lime, may be filled up a second time with water, stirring it well up, and may be used as before, adding the soda. New burnt lime is best ; for I found that lime that had lain some time, did not act so speedily, though by repeated application, it answered the purpose.

Bringing Pear-trees into a bearing state.

It may be proper for me first to state to the Society, the nature and state of the trees on which my experiments were tried.

The garden at Scone, is only five years old, the soil very strong in general, and the trees very luxuriant ; in particular peaches ; and pears so much so, that although they were nearly covering the walls, I never had any blossom for fruit. Last year, in June, when nailing in the young shoots, the trees still appearing luxuriant, I began to think of some method to check their rapid growth. Cutting the roots of trees *in winter* has been often represented by writers as sure to throw them into a bearing state ; but it had not the desired effect with me, although I had adopted that plan two winters before. I now therefore began to think of cutting the roots at this period of the year, (*June*,) but was somewhat afraid of killing the trees. I

however made the experiment on two peaches ; and after a week, I saw no alteration in the foliage. I then proceeded to cut the roots of the rest of my peaches, and also of two pears, an Autumn Bergamot and Golden Beurré ; and this spring, I had the satisfaction of seeing a very fine show of blossom, fruit being out of question this season (1811.) The pears were both uncommonly full, the Golden Beurré in particular. I believe indeed, that tree in general bears early. From the success (as I thought) that attended this experiment, I have this year cut the roots of the whole of my pears on a south aspect, consisting of Colmars, Cressanes, Poir d'Auch, &c. The result shall be communicated to the Society.

As some pears bear principally at the extremities of the branches, perhaps, by training them in the fan manner, and laying in some young shoots yearly, they would probably bear the second year, or more properly speaking, the third, when the shoots are two years old all over the tree.

Scone Gardens, }
July 15. 1811. }

XXIII.

On preventing the Maggot infesting the roots of Shallots, &c.

By Mr WILLIAM HENDERSON, Gardener to Sir Alexander Muir Mackenzie, of Delvine, Bart.

(In a Letter to the Secretary.)

Read 3d September 1811.

THE following very simple mode of preventing the *maggot* from infesting the roots of shallots, and of preventing worms from attacking carrots, you will please to lay before the Caledonian Horticultural Society, at their next Quarterly Meeting.

In all sorts of soils and aspects, shallots are in general destroyed or much hurt by the maggot ; but if my mode of culture be adopted, it will, I trust, be found completely to prevent the depredations of the insect.

I pick out the very smallest of my shallot-roots for planting. I plant about the middle of October, the ground being previously manured with old well rotten dung, or house-ashes. The

autumn-planting is the whole secret. By this management, I never have seen the shallots hurt by the maggot in the smallest degree.

When trying this experiment, I had a parcel of spring-planted shallots, only seven feet distance from those planted in the autumn. The spring planted parcel was totally destroyed by the maggot, while those planted in the autumn, were very productive and good.

The smallness of the roots planted, prevents them from growing mouldy.

The most intense frosts, I never have found to hurt the roots in the winter.

I planted last October, in one small bed, 204 shallot-roots, and lifted this August out of the same, above 5000 good clean roots, measuring in general about $3\frac{1}{2}$ inches in circumference.

A preventive against the Worms infesting the Roots of Carrots in light early soils.

THIS garden is of a light early soil, and seldom produced a clean crop of carrots, until I adopted the following mode of sowing, which occurred to me in the year 1807, having then got bad carrot-seed, a general complaint at that time.

I sowed the seed about the middle of March ; but finding by the 1st of May, that I had a very thin crop, I prepared the other half of the

same brake, which was all under celery the year before, and I sowed four times the usual quantity of seed, knowing it to be bad: from this quantity, I obtained a good crop. The early sown, I allowed to stand, although very thin; they were all destroyed by the worms, while those sown on the 1st of May were clean, good, and early enough for a general crop.

Ever since that time, I have sown my principal crop as late as the 1st of May, except in the year 1809, when I made the same experiment again, with the same result as in 1807.

I am now therefore induced to believe, that it is owing to early sowing, that carrots are destroyed by the worm in light early soils.

Delvine, }
16th August 1811. }

XXIV.*On transplanting large Fruit-Trees, whether Wall-Trees, Espaliers, or Standards.*

By Mr JAMES STEWART, Gardener to Sir John Hope, Bart. Pinkie.

(Read 3d September 1811.)

THE first thing claiming attention, is to prepare proper pits for the reception of the trees. They ought to be of a size sufficient to admit of the roots being spread out at full length, with two feet additional for encouraging the growth of new roots. If the trees are to be planted in borders which have been previously occupied by other trees, the soil should if possible be renewed, but if that cannot be accomplished, as was the case at Pinkie, a cart-load at least of fresh good soil from some old pasture or ground that has not been in cultivation, (loam, if good, is to be preferred,) with a quantity of well rotted dung, should be allowed to each tree, mixing the whole well with the old soil.

In transplanting large wall-trees, begin with

drawing a semicircle, of extent according to the size of the tree : should the branches cover from 150 to 250 square feet of a wall, it may be eight feet in circumference, measuring from the trunk of the tree each way. Dig a trench round the semicircle three feet wide, and six inches below the roots ; be careful in preserving the whole, and work out the earth from amongst them with a blunt three-pronged fork, throwing out the loose mould with the spade. Proceed thus till you have got fully under the tree. The roots should be tied together loosely ; the branches carefully loosened from the wall, and tied up in parcels to prevent their being injured. The tree must then be conveyed to the place where it is to be planted. Place it upright in the pit, so as the surface-roots may be level with the top of the border. Well broken earth is then to be packed in underneath and for about a foot round the bottom of the trunk, to fill up all vacuities where roots originate. All the roots are then to be carefully spread out at full length, cutting off those that are dead, bruised or knotty ; the remainder to be cut smooth at the ends, and at different lengths, keeping some at full length, others at five, four and three feet, and some even at one foot long ; taking care to preserve as many of the small fibres attached to the leading roots as possible. Begin first at one side of the semicircle next to the wall, and lay out a set of the bottom

roots in a level and fan direction, taking care to spread out the small fibres in regular order ; cover this first layer with from two to three inches of mould, packing it well with the hand, then spread another layer above the former, packing and covering as before, and so on till you finish at the top, never attempting to lay more at one time than can be readily reached with the hand ; never setting a foot upon the roots that have been covered. In this way proceed with layer after layer until you reach the centre of the semicircle ; then begin at the other side, and proceed as before, cover the whole with earth to the height of two inches above the level of the border ; and after this, lay rotten dung three inches thick above all. A good watering should then be given, to settle the earth about the roots. A few boards may be laid at the bottom of the wall to prevent the roots being trodden upon, while nailing up the trees. The principal branches only should be fixed at first, nailing up the whole five or six weeks afterwards, when the border has had time to settle properly.

The only difference in moving espalier and standard trees is, that a full circle is to be dug round them.

The best season for transplanting large trees, is from the middle of November to the middle of March. Dry mild weather should be chosen,

frost and wet being both very unfavourable to this operation.

Above one hundred and sixty large trees have been transplanted at Pinkie within the last four years. Only three of these have failed; and some omissions took place in the management of these, otherwise they might also have succeeded.

Several of the transplanted trees bore half a crop the first year; and one standard apple, above a bushel the second year.

Watering and sprinkling water over the branches of newly transplanted trees in dry weather is of great benefit.

Pruning is to be attended to when the trees begin to shoot. It must be regulated by the strength of the tree: if the tree be vigorous, little pruning is requisite; if otherwise, the knife may be more freely used.

*Pinkie House, }
August 1811. }*

A Committee of the Society having been appointed to examine the state of the transplanted trees at Pinkie, the following report was received, and an extra Silver Medal was awarded to Mr STEWART for this communication.

“ *September 1812.*

“ WE were agreeably surprised to see very plentiful crops of fine fruit, on the trees in Pinkie garden, which were transplanted when full grown, between four and five years ago, when the site of the fruit-garden was changed. On the wall-trees espaliers and standards, the crops were equally good. Many of the branches of the standards were quite pendulous with the load of fruit. Numbers of the wall and espalier trees measure from twenty to forty feet between the extremities of the branches, and are quite healthy. The principal kinds of trees transplanted, are Jargonelle, Winter Achan, Green Yair, and Carnock pears; and Hawthorndean, Non-pareil, Codling, Ribston Pippin and Gogar Pippin apples. Mr Stewart's undertaking was perhaps the greatest of the kind ever attempted in this country: it has been most successful; and it is to be hoped that horticulturists will know how to appreciate so excellent an example.

JAMES SMITH.

PAT. NEILL.”

XXV.

Method of preserving Apples and Pears.

By Mr JAMES STEWART, at Pinkie.

Mr STEWART, having at the quarterly meeting of the Society on 5th June 1810, produced specimens of various kinds of apples in the most perfect state of preservation, was requested to communicate his method of keeping fruit; and afterwards transmitted the following account.

THE best time for gathering fruit, is when it begins to drop off spontaneously. This is from the middle of September to the end of October. Ladders which will reach to the top of the trees must be provided; likewise baskets for the reception of the fruit. In plucking fruit, the best rule is to take what appears ripest in your hand, and raise it level with the foot-stalk; if it parts from the tree, lay it carefully into the basket; otherwise let it hang. The trees should therefore be examined every three or four days.

In the fruitery, the fruit is to be laid in heaps, and covered with clean cloths and mats above, or with good natural hay, in order to its sweating. This is generally effected in three or four

days; and the fruit may be allowed to lie in the sweat for three or four days more. They are then to be wiped, one by one, with clean cloths.

Some glazed earthen jars must then be provided, with tops or covers; and also a quantity of pure pit-sand, free of any mixture; this is to be thoroughly dried on a flue. Then put a layer of sand an inch thick on the bottom of the jar; above this a layer of fruit, a quarter of an inch free of each other. Cover the whole with sand to the depth of an inch; then lay a second stratum of fruit, covering again with an inch of sand, and proceed in this way till the whole be finished. An inch and a half of sand may be placed over the uppermost row of fruit. The jar is now to be closed and placed in a dry airy situation, as cool as possible, but entirely free from frost.

The usual time at which each kind of fruit ought to be fit for the table being known, the jars containing such fruit are to be examined, turning out the sand and fruit cautiously into a sieve. The ripe fruit may be laid in the shelves of the fruit-room for use, and the unripe is carefully to be replaced in the jars as before, but with fresh dried sand.

Some kinds of apples managed in this way, will keep till July. Pears will keep till April; the Terling till June.

XXVI.*On destroying and preventing the Pine-bug.*

By MR ALEXANDER MUIRHEAD, Gardener to Sir John Belsches of Invermay.

In a Letter to Mr NEILL, Secretary.

SIR,

SINCE I wrote you last, I have seen some pine plants very much infested with the bug, and have completely cured them. According to your request, and in order that the cure may come sooner to the public, I shall endeavour to give the necessary directions as distinctly as possible.

First, take a small brush made of bass-mat, tied on a small stick, flat on the other end, to go down to the under end of the leaves where the bugs harbour most. With the brush and water clean them as well as possible, then put one pound of flowers of sulphur to one common garden pailful of water, if a little more, there is no danger of hurting them;—the quantity according to the number you have to clean;—put the pine plants into this liquor, and let them remain for twen-

ty-four hours; be sure they are all covered, which may be done, by putting a board over them, and a small weight on it: when they have been immersed for twenty-four hours, take them out, set them on end with their tops down, let them stand till they be dry; then pot them, and treat them in the same manner as plants not infected.

Do not replace them among infected plants; if they are to be put into a pit where infected plants have been, remove the old tan or leaves and put in new.

There need not be so much sulphur-liquor made up at once as may be necessary to cure a whole stock; but as one quantity of plants comes out, you may put in another: I have not found it to lose the effect. I last winter made up some in a pot, and as the fruit was eat, I took the crown and suckers that were on the plant, and put them, time after time into the same liquor, and found no defect in the cure. If in winter, it will be advisable to take the chill off the water, and keep it in a stove; if convenient to be done in summer, the plants will take growth sooner.

Some presume to say, that healthy plants will not take the infection. I beg leave to differ from them. I got it by introducing plants, not knowing them to be infected. I have at present some plants which I cured two years ago; and there

is not the smallest vestige of the bug to be seen, which may be proved by inspection.

The way that I pursued to clean my stock was this, I took crowns and suckers year by year, (after performing the cure on them,) and put them in a pit by themselves, filled with fresh leaves, as I use leaves only.

I do not think it advisable to apply the cure to fruiting plants. By shaking the earth from their roots, and otherwise going through the cure, the fruiting would be injured.

I even did not trust my lads to clean my plants, but did it myself. I think I cleaned from twenty to thirty per hour. I am, &c.

Invermay, }
16th Aug. 1811. }

IT was agreed that the above communication should be referred to Mr BEATTIE at Scone, and Mr MITCHELL at Moncreiffe House, as a committee of the Society, to examine and report. The following report was accordingly received; and thereupon the Silver Medal was voted to Mr MUIRHEAD, and his communication ordered to be printed.

Mr THOMAS DICKSON, Secretary.

SIR,

WE were favoured with yours requesting us to inspect an operation by Mr Muirhead for killing the bug on pine plants. We had some difficulty to find any plants infected in this part of the country, but at last happened to fall in with some by accident; they were sent to Mr Muirhead's, and we attended and saw the operation performed on the 2d of April. On the 2d of May we inspected them again, and found the insects completely destroyed. No doubt remains in our minds, that in general it will prove an effectual remedy, and be of much use to those who may happen to have infected plants. We are, &c.

WM. BEATTIE.
JOHN MITCHELL.

Moncreiffe Garden, }
2d May 1812. }

XXVII.

Receipts for making Currant-Wine, which were presented to the Caledonian Horticultural Society, during the years 1810, 1811 and 1812.

AMONG other prizes announced by the Caledonian Horticultural Society, for the years 1810 and 1811, honorary premiums were proposed for the best currant-wines; and it was required, that each competitor should send an account of the method employed in preparing the wine. In consequence of this proposal, medals were awarded to several different Ladies, as will be seen from the list of prizes, published in the 1st Number of these Memoirs, p. 24; and the following are the receipts which were given in with the three wines which were adjudged to be the best in each of these two years.

September 1810.

No. 1.—“ To every English pint of the juice of fully ripe white currants, were added two English pints of cold water, and one pound of raw sugar.

“ The fermentation was promoted by gentle agitation every day for eight or ten days. But no article was added to promote fermentation.

“ When it appeared from the taste, that the liquor had obtained the pure vinous state, without either great sweetness on the one hand, or any obvious acidity on the other, which state was acquired in about the space of a month, the further progress of fermentation was checked by the addition of a small quantity of pure ardent spirit. One bottle of good whisky, free from any peculiar flavour, was added to twenty gallons of the wine.

“ After this, the cask was bunged up, and allowed to remain at rest for six months. The pure wine was then racked off from the sediment, into another cask, in which it was allowed to remain twelve months before it was bottled.

“ The wine now sent to the Caledonian Horticultural Society, marked *Vino pellite curas*, was prepared in autumn 1805 ; so that it is at present five years old.

No. 2.—The wine to which the second prize was awarded, was marked *On n'est jamais trop vieux pour apprendre*. The following was the receipt which accompanied it.

“ One Scotch pint of currant juice ;
One Scotch pint and a half of water ;
Three pounds of sugar ; half lump sugar,
and half soft sugar.

“Mix them together in a tub, then fill your barrel. What is over, keep for filling up, as it works over; but it is better not to fill up more than twice. When done working, add one Scotch pint of aquavitæ or brandy, to twenty pints of the fermented liquor.

“The wine sent, is flavoured with a small quantity of clary wine, the growth and manufacture of Drumsheugh.”

No. 3.—With the wine marked

Beatus ille qui procul negotiis,

.....

—*Horna dulci vino promens dolio,*

Dapes inemptas apparet,

the following receipt was sent :

“Squeeze the currants, when fully ripe, through a hair-searce. To every Scotch pint of juice, add two of cold water; and to every Scotch pint of liquid so mixed, a pound and a half of raw sugar. Dissolve the sugar thoroughly in some of the water before it be put into the barrel. It will begin to work in twenty-four hours. Fill it up every second day with sugar and water made very sweet, (about one pound of sugar to a Scotch chopin of water,) first taking off all the scum with a spoon.

“If the weather happen to be very hot, and if the fermentation go on very briskly, filling up every third day will do better than every second day. When the fermentation is over, bung it

up close, and paste brown paper over the bung. Put leather between the bung and the barrel, to keep it very close. Bottle it nine months afterwards."

September 1811.

No. 1.—The first prize was adjudged to wine marked *The true Falernian*, with which the following receipt was transmitted.

"This currant-wine was made in the year 1805, in the proportion of one English pint of currant-juice, to two of water, with one pound of sugar; but with the Dutch red currant, which the makers of it consider as a great improvement, from the effect which that kind of currant has, both on the colour and taste of the wine; and on that account, it ought certainly to be more cultivated.

"Wine made of the Dutch red currant does not require any spirits; and will keep as well as any foreign wine."

No. 2.—Was marked *Veritas*, and according to the sealed letter which accompanied it, the fruit, sugar and water, were as under:

"To every Scotch pint of juice, a pint and a half of water; and to every pint of the mixture, a pound and a half of sugar."

No. 3.—Was marked *Noble deeds are done by wine*. According to the receipt sent, it was prepared in the following proportions.

“ One English pint white-currant juice ;
 One English pint water ;
 And one pound of raw sugar.

“ At the end of ten days, the fermentation was moderated by the addition of a little malt spirit.”

September 1812.

For the year 1812, a prize-medal was offered for the best home-made wine without the use of any imported material excepting sugar.

Thirty-two different kinds were presented to the Society, many of which were excellent. But the judges gave the preference to a wine marked

Ce vin d'Ecosse

Merite quelque chose ;

which was found to have been prepared according to the following receipt :

“ For a twenty pint cask, five one-half pints of white-currant juice, eleven pints of water, and twenty-eight pounds of sugar are required. Mix all in a large tub ; skim the liquor well ; put it in a barrel, and fill up the barrel with water and sugar (one pound of sugar to a pint of water,) as long as the liquor ferments ; afterwards add half a bottle of whisky ; then bung up the barrel. The wine will be ready for bottling by April or May.”

XXVIII.

Some Observations on the treatment of the Currant-bush during the ripening of the Fruit.

By MR JAMES MACDONALD, at Dalkeith Park.

(Read 3d September 1811.)

THE many excellent specimens of British-made wines, from the fruit of the currant-bush growing in this country, which have already been presented to the Caledonian Horticultural Society, ought to encourage our exertions for the improvement of that fruit. I am therefore of opinion, that the following observations on the treatment of the currant-bush, may with propriety be laid before the Society.

The plan which I am now to recommend, has not, as far as I know, been employed by any other gardener; and with me it has for some years past, succeeded far beyond my expectation, both in procuring abundance of fruit, and in increasing their flavour and size.

I prune my bushes in December or January, shortening the last year's shoots from an inch to an inch and an half. I at that time also clean and dig the ground among the bushes. The following spring they make strong shoots, and shew fruit abundantly. But when the fruit arrive at the period of stoning, then is the time when they require every assistance that can be bestowed, to make them swell freely, and to a good size. When, therefore, the fruit begin to shew any colour, which is in general about five or six weeks before they be fit for being pulled ; I take the knife and shorten all the young summer shoots to five or six inches before the fruit. As I find that doing this by means of the knife is tedious, I have, for two years past, employed hedge-shears for clipping off these shoots. This answers equally well with the knife, and may be done at one third of the expence. A man may in this way go over half an acre of bushes in a day.

By this method of pruning, at the season when the fruit is ripening, I find that the berries swell to a size full one-half larger than they formerly did with me. But besides this, it has the farther advantage of giving both sun and air more free access to the fruit. By this means, *the damp*, as it is called, which is often very destructive to currants in wet seasons, is prevented ; the *damp* seeming to arise from the bush being

too much crowded with superfluous wood, and thus deprived of air.

This practice, therefore, it is my intention to continue; and I trust that it will be found equally advantageous by others who may adopt it. And I may conclude with observing, that several intelligent gardeners, who have seen the fruit produced under this method of treatment, have expressed great admiration, both of the general crop and of the size and flavour of the berries.

At the General Meeting in September 1812, Mr MACDONALD produced some branches of his currant-bushes with the berries upon them; and these samples met with universal approbation.

XXIX.*On Canker in Fruit-Trees.*

By Mr JAMES SMITH, Gardener to the Right Hon. the Earl of Hopetoun, Ormiston-Hall.

(Read 10th March 1812.)

THAT the canker, that most destructive distemper in fruit-trees, has made considerable havoc of late years, is evident from the mutilated state of several gardens and orchards in the country. Some of them, which, at a former period, produced fruit in great abundance, are, at present, in the last stage of existence; the old and young trees being equally infected with this desolating malady. There are but few places in which this baneful disease does not prevail in a greater or less degree; and it is certainly a very fortunate circumstance when an orchard or garden is entirely free from so obstinate a distemper, more especially, if it has been planted any length of time. For, although a new garden or orchard planted with young trees, may

appear very healthy for a few years, yet the disease may break out and render the most sanguine expectations abortive.

As fruit-trees, especially apples, in some particular places, and some delicate kinds in almost any place, are so liable to the canker, it must surely be of the utmost importance to have this distemper prevented, or to assist and relieve infected trees, when they are in a curable condition. The writer therefore proposes to lay before the Society, the result of his experience and observations on the treatment of trees so infected.

In order to treat this subject as distinctly as possible, it will be necessary to divide it into three separate heads.

1st, The pernicious effects of procuring scions for grafting, in a promiscuous manner.

2d, The effects of soils, subsoils and situations.

3d, The effects of injudicious pruning, accidental wounds, and other circumstances.

In discussing each of these heads; the causes of the canker will be pointed out; a few cases mentioned as they occurred in practice; and the means of preventing the canker, or of relieving the trees when in a curable condition, will be shown.

I. *Bad effects of procuring Scions in a promiscuous manner.*

It is a received opinion with many, that the canker and cause of failure in several of our best fruits, proceed from the same sorts being continued by grafting such a length of time ; and instances are given of the degenerate state of the Golden Pippin, the Grey Leadington, and several others of our best British apples. This in some respect may be true, and it is much to be wished that they could be produced from seed. But it is well known, that fruit-trees when raised in this manner, sport in endless variety. Allowing the above opinion in some degree its force, there is another cause of the degeneracy of fruit which has operated with a more powerful effect, that is, the promiscuous manner in which scions have been collected for raising plants, without considering the state of the trees from which they were taken. The procuring of scions from infected trees is an undoubted means of extending the canker, which thus frequently appears very unexpectedly, especially if the trees were not raised by the person who planted them, or who comes to superintend them afterwards. For, though the branches from which the scions are taken, may appear to be healthy, yet, if the other parts of the tree be

much affected with the canker, the juices of the scions will also be vitiated. When they are grafted on good stocks, they may indeed have a healthy appearance for a few years; but as the seeds of the disease are carried along with them, it sooner or later breaks out in the young trees, and renders them unfit for any thing, but to be grubbed up and cast into the fire. When this disease concurs with a bad soil, or indifferent climate, or is encouraged by injudicious or careless pruning, the malady increases with double rapidity, and soon ends in the total destruction of the trees.

Among the various cases in the writer's practice in raising young trees from those infected with the canker, the following instances are mentioned as being among the most conspicuous.

1. The large Dutch Codling apple trees being all nearly exhausted with the canker, and being anxious to preserve the sort, various attempts were tried to rear young plants, but all, sooner or later, proved abortive. The following was the most singular: a healthy stock was pitched on, and a vigorous scion grafted on it. The shoot produced the first year, was three and a half feet long; the second year it began to advance with equal vigour, but about midsummer, the canker broke out a foot above the graft; in three weeks time, it ran round the young stem, and the top of the tree died almost immediately.

2. In a Jargonelle pear. The scion was taken from an old tree which had been cut down and trained anew. As the young shoots were much infected with the canker, the most healthy one was chosen, and grafted on a stock in a south-west aspect. It continued to thrive for two or three years, when it was attacked by the canker, and the following season was almost overrun. On cutting away the diseased parts, it was found that the distemper had so completely infected the whole plant, that the pith or medullary part of the shoots had the appearance of a black thread, which continued downwards, and terminated where the tree was grafted. At the same time, the stock was found to be perfectly whole.

3. In 1804, a quantity of scions from apple trees were procured from different places, and grafted on good stocks. As they were new sorts in this situation, they were carefully numbered, and observations made on the state of the trees from which they were taken. In 1805, twenty of the above young trees were planted as half standards. This year (1811,) the destructive consequence of infected scions is clearly evinced in the state of these trees: two of them are entirely killed by the canker; four of them are in an infected and sickly state: however, the remainder are in a healthy and luxuriant condition, and bid fair for a crop next season. The

cause of the above canker cannot be ascribed to the soil, as it is all of an equal quality ; but solely to the infection having been carried along with the scions,—an opinion fully countenanced by the state of the trees from which they were taken.

Thus, it is evident, that grafting with scions taken from unhealthy trees, is attended with very bad consequences, and sooner or later ends in the total destruction of the plants. Therefore, such scions should always be rejected, when there is an opportunity of procuring others from healthy trees. In some particular sorts, it is not easy to attain scions for grafting, from trees which are entirely free of the canker ; therefore, the most healthy should be chosen, as there are still a few trees to be found even in the worst of cases, to which a decided preference ought to be given. Some particular kinds of fruit when raised from healthy plants, are of four times more value than the general run.

II. *Effects of Soils, Subsoils, Situations, &c.*

THE canker is sometimes brought on, or greatly encouraged, by pernicious soils. There are certain grounds which will corrode the roots in such a degree, that the trees in a short time will be all overrun with the canker ; stiff clayey grounds

in flat situations, likewise encourage the canker, more especially if they be high and late. In such situations, vegetation is commonly late, the trees are kept longer in a growing state in the autumn, especially in wet seasons, and the young shoots not ripening properly, are liable to be killed by early frosts. When these shoots are left on the trees, they encourage disease, and sometimes bring on an incurable canker.

Soils, may be tolerably good, and yet counteracted by *subsoils* of a corroding or very retentive nature. But as these in the worst degree are commonly rejected, or proper means used to render them otherwise, they may be passed over; yet there are several subsoils that will corrode the roots of trees in a slow and almost imperceptible manner and bring on the canker. These should also be avoided, for they are equally, if not more disadvantageous than the former, and it is a great mortification, at the end of fifteen or twenty years, to find expectations blasted, at a time when the trees ought to have made a full remuneration for the trouble and expence of rearing them.

In gardens or orchards which have been long occupied with fruit-trees, the soil is generally exhausted by the nourishment formerly afforded, and when young trees are planted, they make but little progress. In a few years they get into

a sickly and dwindling state, which frequently brings on the canker.

The canker is sometimes brought on by placing trees in improper aspects, or planting the finer sorts as standards in cold situations.

Examples might be given of the pernicious effects of soils on apple, pear, peach trees, &c. but as these evils are so conspicuous to those employed in the cultivation of fruit, it will be unnecessary to mention them.

On the effects of subsoils, the two following instances, from a number, may be mentioned, of their corroding nature, which was rather unforeseen, as the soil is what may be termed tolerably good.

1. In 1794, a Jargonelle pear-tree was planted in a south-west aspect. The tree advanced in a vigorous and healthy manner, bearing good crops for a few years. In 1806, it had extended thirty-five feet on a wall twelve feet high, and in that season it produced forty dozen of fine pears. Since that time, it has gradually become infected with the canker. For these two years past, the tree has not only been completely overrun, but the fruit has likewise been infected. On digging two and a half feet deep in the border, it was found that the roots had penetrated into a very indifferent subsoil, which, in all probability, had induced the disease.

2. In a south-east aspect adjacent to the above-mentioned wall, a peach-tree was planted, which continued to advance with equal rapidity for a few years, but on the roots coming into the sub-soil, the canker broke out in an obstinate manner, and rendered the tree useless in a short time.

Among the cases of exhausted soil, the following have been particularly observed by the writer.

1. A plot of ground consisting of about half an acre, which had been occupied with fruit-trees for seventy or eighty years, was almost cleared ; and in 1794, young ones were planted. Since that period, they have advanced in a very slow and sickly manner, and several of them have been infected with the canker, which terminated in their destruction. The remainder continue in a dwindling and sickly state. The soil is a black loam, and on being examined, it was found to be nearly four feet deep, moderately dry, and to every appearance was not made up of any pernicious substance.

2. On being desired to examine the state of a garden and orchard in the neighbourhood, which is situated on the sea-coast, in a favourable climate, the soil was found to be pretty good. The oldest trees seem to have been planted about the beginning of the last century ; but, from authentic accounts, the greatest number was planted in

1740, and the remainder within the last twenty years. This garden and orchard have produced abundance of fine fruit, but at present they are very much exhausted, the whole trees being less or more infected with the canker. The young trees are equally ill as the old ones, if not worse, which proceeds from the worn-out state of the soil, which has carried an exhausting crop of trees such a length of time.

Instances might be given of the pernicious effects of placing the finer fruit-trees in improper aspects, and of those which require walls, being planted as standards, for the canker is very frequently brought on by so doing. But, as these effects are so obvious to every one in the least acquainted with their cultivation, it seems unnecessary to notice them.

Thus, the canker may be brought on, and fostered by pernicious soils and subsoils; or greatly encouraged by exhausted soils, cold situations, and improper aspects.

Soils of a corroding nature, should be carefully avoided, else disappointment will be the inevitable consequence. But where it happens that no choice of situation is left, the bad soil, to a proper depth, should be removed; and to guard against the destructive consequences of the subsoil, the bottom should be paved, or covered over with a composition which the roots cannot penetrate. It should then be filled up with

fresh loam of the kind best adapted to the different sorts of trees intended to be planted.

Soils which are retentive, should be drained in an effectual manner. When the situation is flat, although the soil may appear to be tolerably good, the fatal effects of latent water should be particularly guarded against. In such situations, the placing of flags under the trees, will be found to be of the utmost importance, as it makes the roots take a horizontal direction, and they are thus not so apt to penetrate into the subsoil; besides, if it should ever be found necessary to remove any of the trees at a future period, it could be done with more ease, and with more safety to the plants. Although this may appear but a trivial object, yet experience frequently shews, that it is of considerable utility in the cultivation of fruit.

Exhausted soils, such as are found in gardens and orchards which have been long occupied with fruit-trees, require considerable labour and expence, before they can be brought to a state fit to produce young plants in a healthy and vigorous manner. In some cases, it would be most advantageous to make new plantations of fruit-trees at once, if the situations will allow. But when old gardens or orchards are wished to be preserved, the most effectual manner of renewing the soil, so as to produce fruitful and vigorous trees, is to remove those which have

ceased to bear, and are in a sickly or cankered condition. Then the ground should be covered over to a considerable depth with new soil, well enriched with manure, which may be stronger or lighter as the old soil requires ; to which may be added, a proportion of lime, (or lime-rubbish from an old building passed through a screen,) to act as a stimulus, and to set the dormant particles of the old soil to work. After this, the ground should be trenched over to a proper depth, blending the old and new soils together in the operation of trenching. What young trees are wanted, should be planted at the proper season, adapting the sorts to the situation.

With respect to situations, or improper aspects, in the case of infected trees ; the best method of recovering them, is to remove them to situations more congenial to their nature. This should be done before the juices are completely vitiated, otherwise the best situations or aspects will not produce the desired effect. The canker may also be prevented by planting healthy sorts adapted to the situations or aspects.

III. *Effects of injudicious pruning, accidental wounds, &c.*

THE canker in fruit-trees, is sometimes brought on by pruning in a careless manner, leaving

stumps of improper lengths, or leaving the wounds ragged and exposed, so as to lodge and retain water, which by the operation of the external air, causes rottenness to take place. This gradually penetrates deeper and deeper, until the disease takes so firm a hold of the trees, that it is impossible to remove it, and it often terminates in an incurable canker.

Trees frequently suffer much from accidental wounds, such as limbs being torn off by high winds, the bark knocked off by ladders, hammers, &c. hurts by nails, or the branches cloth-bound; as also by allowing the branches on standard-trees, to cross each other, which, by their friction in high winds make large wounds; birds destroying the buds; insects and other vermin preying on the foliage and young shoots; all which are attended with very pernicious consequences to fruit-trees, and are frequently the means of bringing on the canker in an obstinate degree, if left entirely to the efforts of nature.

Several instances might be given of the effect of careless pruning, but the following may chiefly be noticed. Some years ago, several large limbs were cut off from an old apricot-tree with a hatchet in the time of autumn, and the wounds left in that manner until the following spring. On examining the wounds, some of them were found extending more than three inches below where the branches were cut, which must soon

have ended in the total destruction of the tree, had the wound not been dressed anew, and covered over with soft paste, to exclude water and external air.

Innumerable instances might be given of the injuries sustained by fruit-trees from high winds, wounds from ladders, &c. ; and the destruction of buds, foliage, and young shoots, by birds, insects and vermin ; but as these are so conspicuous in neglected orchards and gardens, it will be unnecessary to mention them.

From what has been said on improper pruning, accidental wounds, &c. it appears certain, that the canker may be brought on, or greatly encouraged by treating trees in a careless manner.

Therefore, all pruning should be performed in a careful and neat manner, never leaving unnecessary stumps or ragged and unsightly wounds. When branches of any considerable magnitude are amputated, the wounds should always be covered over with some soft substance that will adhere to the place.

When limbs of trees are torn off by high winds, or wounds made accidentally, they should be dressed with all convenient speed, to prevent any bad consequences. All the branches which cross others, should be pruned off, and measures taken to prevent the trees from being overrun with insects and vermin. By these means, the

trees will be kept in a healthy state, and not be so liable to be attacked by the canker. It is certainly much easier to prevent, than to cure that destructive distemper, if it has completely laid hold of the trees.

Thus, the canker may, in a great measure, be prevented or relieved, by avoiding the evils and using the precautions pointed out. And the writer has no hesitation in saying, that this powerful enemy to fruit-trees might be almost, if not wholly, banished from the country, were more attention to be paid to the procuring of healthy stocks and scions ; planting the trees in congenial soils ; adapting the sorts to the situations and aspects ; pruning the trees in a judicious manner ; paying proper attention to accidental wounds ; and keeping the trees free from insects.

Before concluding, the writer cannot in silence pass over a circumstance which is very closely connected with the cultivation of fruit, and is most unaccountable, nay, almost unpardonable, in this enlightened age of science ! the more especially, as horticulture is now brought to such perfection. It is the careless and indifferent manner in which the *situations* of gardens and orchards are fixed on at present, compared to the care exercised at a former period, and that especially when a choice is left. Prior to the Reformation, when the cultivation of fruit was almost entirely under the superintendance of the clergy,

proper situations for fruit frequently determined the sites of the abbeys and monasteries. Hence, the fruit-trees continued healthy, and reached to a great age. Some of them, or their immediate offspring, are at present standing as an ocular demonstration of the merit of the choice. But now, gardens and orchards are frequently laid out in some obscure corner, and little or no attention paid to the nature and quality of the soil or subsoil. Hence, fruit-trees become mutilated and diseased in a few years, and the expectation is often blasted, after considerable expence has been bestowed in rearing them. It is a certain fact, and cannot be too strongly enforced, that to indifferent soils, and above all, pernicious subsoils, the failure in the cultivation of fruit in this country is to be attributed, much more than to the want of climate.

Ormiston-Hall, }
29th Nov. 1811: }





H

H

Pl. vine ad antennam Pappi. Linn.

W. Arab. hab. d. Scop.

XXX.

Observations on the Propagation, by cuttings, of the Original, the Mother, the Oslin, or the Bur-knot Apple-tree.

By A. DUNCAN senior, M. D. & P.

(Read September 4. 1810.)

AMONG the various kinds of apples which are propagated in Britain, there is one to which, in my opinion, less attention has been paid than it deserves. The apple to which I allude, is, in different parts of the country, known under different names. At St Andrew's, once the metropolitan See of Scotland, and of course the residence of numerous ecclesiastics, to whom, as is well established, we are principally indebted for the introduction of the finest fruits into Scotland, it is generally known by the name of the *Original apple*. At Aberbrothock, a place still celebrated for the venerable ruins of a magnificent and picturesque abbey, it has the appellation of the *Oslin apple*. By several of the professional gardeners in the neighbourhood of Edinburgh,

it is stlyed the *Mother apple*, by others the *Golden apple*; and in different parts of England, as well as in the works of some eminent horticulturists, it is denominated the *Bur-knot apple*. The last of these names is evidently derived from the appearance of the tree: For it in general abounds with a particular sort of burs or knots. The appellation of *Oslin*, is supposed to be derived from its being first brought into Britain from a village of the name of *Oslin* in France. The denomination of the *Golden apple*, has, in all probability, been given it from its beautiful yellow colour. But of all the names by which it has been distinguished, that of the *Original*, appears to me to be the most characteristic: For, from the easy method in which it is propagated, it may justly, I think, be considered as a *Mother* or *Original apple*.

Every bur observable upon this tree, can, I think, be clearly demonstrated to be in reality, a root above ground; and this bur requires only to be planted in a proper soil for sending out numerous fibres, which will nourish and support even a large branch connected with it. This mode of propagation by slips, which among the apple tribe, is almost, though not altogether, peculiar to this species, has long been known, and is not without some remarkable advantages. For, by this means, a tree in full bearing, and of a considerable size, may be obtained almost imme-

diately. Of this a very strong proof is at present afforded in the garden of Mr Peacock, at Pilrig, in the neighbourhood of Edinburgh. In the month of February last, he cut off from an old Original tree, about fifty branches, each provided with a proper bur. These were immediately planted in a good soil, and almost all of them grew luxuriantly. More than one-half of these slips, though detached from the mother tree only in the spring, blossomed the same year, and produced ripe fruit in the autumn; and I think there can be little doubt that they will continue to be good bearing trees. Indeed, this is also demonstrated in Mr Peacock's garden. Three years ago he planted a pretty large branch furnished with a proper bur; and that autumn I counted above fifty fine apples upon it. Last year it produced upwards of twenty, and this year there are more than forty upon it. Hence, there can be no doubt, that a branch furnished with a bur, at once becomes a permanently bearing tree. The same fact has also been fully confirmed in other gardens in the neighbourhood of Edinburgh, especially in the garden of Mr Lyon at the Abbey of Holyroodhouse, and in my own garden at St Leonard's Hill. Indeed, this circumstance has been long and well known at St Andrew's, where this apple is more cultivated than at any other place with which I am acquainted. I have had an opportunity of witnessing it

from the earliest period of my life, especially in the garden of my grandfather, Mr William Violant, formerly Professor of Civil History in the University of St Andrew's, a zealous amateur in gardening, who was particularly partial to this apple. Nay, the probability is, that this mode of propagating it was known in Scotland, as early as the apple itself was introduced into the country. But this ready mode of multiplying the Original apple by slips, has, I think, been less attended to by professional gardeners, than, from its importance, it deserves.

The *Original apple* has not indeed the property of being a keeping apple. It is eaten with greatest advantage immediately when it falls from the tree, in consequence of a gentle shake, after it is fully ripe. When used at that time, very few apples are superior to it, either in appearance, in smell, or in taste. In point of taste, we have indeed no certain standard, each judging for himself. I shall only observe, that the *Original apple* has a considerable degree of sweetness, and a pleasant acidity, combined with a peculiar, and what I think a very delicate flavour; in point of smell, I know no apple superior to it; and its appearance when fully ripe, is that of a most beautiful yellow. It does not however retain these qualities for any length of time; but when taken immediately from the tree, I am acquainted with no apple which excels it, in any

of the three qualities mentioned, in taste, in smell, or in colour. From the colour, it is not improbable, that the *Original*, is the *Aurea mala*, much esteemed by the Romans in the days of Virgil *. Nay, a fertile imagination may carry it to much more ancient times, and suppose it to be the Golden Apple which grew in the Garden of Hesperides.

* *Quod potui, puero, sylvestri ex arbore lecta
Aurea mala decem misi.*

VIRG. *Ecl.* 3:

Additional Observations on the Original or Bur-knot Apple, by Dr DUNCAN senior.

(Read September 1. 1811.)

AT the Quarterly Meeting of our Society, held on the 4th of September 1810, I read some observations on the Original Golden apple, which is known in some parts of England by the name of the Bur-knot apple, from the numerous protuberances resembling burs, which appear on many of its branches. In that paper I asserted, that every bur, on whatever part of the tree it might be situated, was in reality a root above ground: And I then expressed a hope, that at some future meeting, I might be able to afford

ocular demonstration of this, to every member who might be present at that meeting. Such demonstration, I am now, I think, able to produce: For I have brought to the Society, several branches cut from a tree in my own garden, which have been planted some of them two years, others only about six months ago.

From even the slightest inspection, it must clearly appear to every one, that all the burs sunk in the ground, give out numerous fibres, affording nourishment to the branch, and thus producing both new wood and fruit. I would particularly call the attention of the Society to the branch NO. 1. This branch I cut from a tree in my own garden, on the morning of the 4th of September 1810, that I might then exhibit to the Society the appearance both of the fruit, the leaves, and the wood. That branch, after the removal of the apples, which were, I believe, eaten at our last anniversary dinner, was planted the next day. It was taken from the ground yesterday, and is again exhibited to the Society. Those members who examine it, will observe, that although it contains no fruit, and has not made much wood, yet that there is a considerable crop of healthy leaves. But I beg leave particularly to direct the attention of the members to the numerous fibres issuing from a large bur which was sunk under ground, affording, in my opinion, incontrovertible ocular de-

monstration, that every bur in this particuar species of apple, is in reality a root above ground, which wants only a nidus into which it may send forth its fibres.

With the branch now exhibited, whose roots have been produced from the burs, I also now present to the Society a branch containing both fruit, leaves and burs, which was cut from a tree this morning. It is not my intention to plant this branch with a view of repeating the experiment which I have related. If any member doubts the accuracy of it, he may easily repeat it for himself. But I wish to recommend it to the Society, to employ some ingenious artist to make an accurate drawing of it, with a view to a coloured engraving. By this means, the Original Golden apple, which is at present but little cultivated, although it perhaps may be the *Aurea mala* of Virgil, or the Golden apple of the Hesperides, will be accurately ascertained: And if the same plan of proper engravings made from drawings taken from nature, were followed with regard to several other of the best kinds of apples, a great deal of confusion which at present prevails with regard to the names of apples, both among professional gardeners and zealous amateurs, might be effectually remedied; and many mistakes which are committed by nursery-men, might be easily prevented.

At the request of the Society, an ingenious artist, Mr P. SYME, made a drawing from nature, exhibiting the flower, fruit and tree, of the Original apple. These have been copied in plate NO. 2. The figure at the bottom of the plate in contour lines, is the representation of a branch which was not planted erect, but laid in the ground.

Explanation of Plate 2. Vol. 1.

THIS plate is taken from a drawing made by Mr SYME, of a tree which grew in Dr DUNCAN's garden. It was about three feet in height, and was cut from a much larger tree growing in the same garden, early in the spring of 1811. It was taken up in autumn, that the drawing might be made.

A. The point at which this branch was cut off from the tree.

B. B. A large bur which was sunk under ground, sending out numerous fibres in all directions.

C. C. C. Burs on different parts of the tree.

H. H. A line marking the depth to which the branch, when cut off, was immersed in the earth.

The fruit and flower represented in the side figures, were drawn from portions taken from the mother tree.

The figure at the bottom of the plate drawn in contour lines, was taken from another branch cut from the same mother tree; but in place of being planted erect, it was laid horizontally in the earth, about the depth of three or four inches.

E. E. The two extremities of the branch.

F. F. F. Fibres coming from almost every bur.

G. G. A line marking the surface of the earth. The branches above it, were all shoots made during the course of six months.

XXXI.

*Extract of a Letter from the Right Hon. Sir
JOSEPH BANKS, Bart. to Mr T. Dickson, Secre-
tary, On the advantages of turning the Branches
of Fruit-trees over the walls against which they
are planted.*

(Read 10th March 1812.)

SIR,

..... In your 15th question, you require information concerning the best method of bringing full grown fruit-trees into bearing. On this subject, the Society may not be acquainted with a practice which I first learned of a market-gardener at Isleworth, when riding past his garden, That of turning fruit-trees, pears especially, over the wall against which they are planted, and nailing their branches in an inverted direction on the other side.

I have practised this method with the best success on the Gansel Bergamot pear, one not very free of bearing. It had stood against a north wall for several years, without once making a fruit bud. About three years ago, I turned it

over the wall, and had it nailed with the branches pointing downwards: the spring after, it bore about a dozen of very fine pears, and this autumn, the south-side wood, which has increased very much, produced at least ten dozen of the finest pears my garden afforded me.

This practice has now become not unfrequent. Mr Aiton, at the Royal Gardens, has turned some pear-trees on a west wall, over to the east-side, where is a paddock for young horses: he does not suffer the branches to reach so low as to be within the danger of being cropt by the horses, and he annually gets a considerable crop from these inverted branches.

I have also succeeded perfectly in bringing Duke Cherries over from the north wall, on which aspect, we, in this country, obtain a valuable crop of cherries for the months of July and August. The branches brought over to the south wall, produced this year the earliest fruit, and had the largest and fairest berries. This, in our climate, is a material improvement, as duke cherries seldom succeed on a south wall: the tree requires to have its root cool, and when it is exposed to the rays of a south sun, produces in general small and imperfect fruit.

I beg, Sir, only to add, that the information contained in this letter, is offered to your excellent institution, merely as a mark of attention from one who knows how to appreciate the value of their labours. I am, &c.

XXXII.

On the utility of Clay-Paint, in destroying various Insects on Fruit-trees, curing Mildew, &c.

In a letter from Mr JAMES SCOUGAL to Mr Neill, Secretary.

(Read 10th March 1812.)

SIR,

Broughton Place, 1st March 1812.

OBSERVING, that the Caledonian Horticultural Society is desirous of obtaining information on the best method of destroying the coccus, thrips and fly, infesting various kinds of fruit-trees, on walls and in hot-houses; I shall take the liberty of stating to you, for their information, what has been my practice for many years past, and which, though simple, I can assure you, has been attended with the greatest success.

Take a quantity of the most tenacious brown clay that can be obtained; diffuse it among as much soft water, as will bring it to the consistence of thick cream or paint; pass it through a fine sieve or hair-search, so that it may be made perfectly smooth and unctuous, and free from any gritty particles.

When the trees are pruned and nailed in, go over the whole carefully with a painter's brush dipped in the clay-paint, not even missing the young shoots, but more especially the stems and larger branches; this layer, when it becomes dry, forms a hard crust over the whole tree, which enveloping the insects closely, completely destroys them, without doing the smallest injury, either to the bark or buds. By covering the trees with matts or canvas in wet weather, it may be preserved upon the trees as long as is necessary. If one dressing has been found ineffectual, it may be repeated, and the second coating will in general answer the purpose.

It frequently happens, that peach and nectarine trees which have been hard forced, become, what gardeners term *hide-bound*; when that is the case, a good dressing with the clay-paint, whenever they are pruned and tied in, will be attended with admirable effects, especially, when the *dew-syringe* is freely used, after the fires are set a going, and the houses shut in: by retaining the dewy moisture upon the bark and buds, it nourishes both, makes the flowers much stronger, the fruit set much thicker, and keeps the trees free from insects, when they are in a state most liable to be injured by them. Indeed, I can confidently say, that peach or nectarine trees, managed in this way, will seldom be either *hide-bound*, or attacked by insects.

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Mildew is a disease to which peach and nectarine trees are very liable; but a seasonable application of the clay-paint, is the best cure that I have ever tried, and has the additional recommendation, of not injuring the trees in any stage of growth, which many other applications commonly used are apt to do.

When there are pine-stoves with vines on the rafters, a difficulty which most gardeners have felt, is to get the eyes of the vines to break equally; only two or three eyes at the extremity of the shoot generally breaking, where ten or twelve are wished for. I have for several years past, applied the clay-paint to these with the greatest success, and will venture to say, that every eye on a vine-shoot so situated, may be broke with as great certainty as in a vinery: the advantage to them, seems to arise from the clay retaining the moisture upon the shoots and buds for a greater length of time, when watered with the syringe, by which the buds are always kept in a kindly state of moisture.

From the simplicity of the above method, I doubt not there are many who may not think very highly of it; but all I request of these gentlemen, is, that they will give it a fair trial before they condemn it. When I went into Northumberland, where I resided for twelve years, many of my neighbour gardeners ridiculed my new practice in this way; but I had the pleasure of

seeing it very generally adopted, and most successfully, before I left the country.

The syringe I used, was one constructed by myself, with brass roses fitted to the end, of different degrees of fineness, so that water might be thrown against the trees in a strong body, or as finely divided as dew : they are to be seen in the different seed-shops in Edinburgh.

I shall feel happy, should the above hints be of use, and meet with the approbation of the Society. I am, &c.

XXXIII.

On Preventing the Depredations of the Turnip-Fly.

By MR ARCHIBALD GORRIE.

Rait Garden, 25th October 1811.

To the Secretary of the Caledonian Horticultural Society.

SIR,

Should the result of the following experiments, made to prevent the depredations of the turnip-fly, merit your attention; your communicating them to the Caledonian Horticultural Society, will much oblige, &c.

IN the month of March 1810, I had a sowing of early Dutch turnips above ground, on a south border, soil strong black loam. About the 20th, I observed some of the flies begin to attack them, and in a few days they all disappeared. To prevent this happening to the next

sowing, I steeped the seeds two days previous to sowing, in a strong ley mixed with sulphur. About the middle of April, this sowing began to rise, and the seminal leaves were fully expanded in two days, when they likewise began to disappear. The next sowing without sulphur, was above ground about the latter end of April; and this, I endeavoured to preserve, by sowing a little soot along the drills; at the same time, I dusted over some rows with coal-ashes, river sand, and road dust, two rows with each. I was surprised to see the fly devouring the turnips dusted with soot so voraciously, that few of them stood one day, and what remained, were totally dispatched next morning, although none were burnt by the soot, it being laid on quite thin. The next that gave way were those covered with ashes; and lastly, those covered with sand, became a prey to the destructive insects.

After a number of other unsuccessful experiments, I tried how quicklime might defend the young turnips from their merciless devourers. I dusted over a few rows with it; and it was washed off about a week after, when I found the turnips uncommonly fresh and green, although they had been almost devoured previous to my applying the lime-dust. I then went on with confidence, dusting all my young turnips the moment I perceived the fly begin to threaten them. Leaving a few rows undusted, to prove

the experiment, I found those I left undusted go off rapidly.

I was doubtful that my success was in some measure owing to the advanced state of the season, and the consequent rapid progress of vegetation, but from repeated trials made in the early part of this season with uniform success, I am confirmed in the opinion, that quicklime dusted over the seminal leaves of young turnips, is both an easy and effectual method for preventing the depredations of the turnip-fly. A bushel of quicklime is sufficient to dust over an acre of drilled turnips; and a boy may soon be taught to lay it on almost as fast as he could walk along the drills. If the seminal leaves are powdered in the slightest degree, it is sufficient, but should rain wash the lime off before the turnips are in the rough leaf, it may be necessary to repeat the operation, if the fly begin to make its appearance.

XXXIV.*On Pruning of Fruit-trees.*

By the HON. BARON HEPBURN.

(Read 9th June 1812.)

MR Baron Hepburn begs leave, with deference, to direct some part of the attention of the Caledonian Horticultural Society, to ascertain the best mode or system of pruning fruit-trees.

In tracing the first principles of such a system, it may be proper, in the *first* place, to ascertain what species of fruit-trees show their blossoms upon the wood or branches of the immediately preceding year, which seems to be the case with the apricot, the peach, and nectarine; and in the shortening of these branches by the knife, (and particularly of the peach and the nectarine, which seem most to require this operation,) to direct the attention of the practical gardener to leave a *wood-bud* immediately behind the knife, as the *blossom-buds* before a *wood-bud* never

swell off their fruit kindly, and rarely even mature it.

2dly, To ascertain what species of fruit-trees show their blossoms upon the wood or branches of the former year, which seems to be the case with some of the minor plums, such as the Drap d'Or, the Damson, the Cherry, &c. plums.

3dly, What species form their blossoms on *spurs*, which seems to be the case with the Magnum, the Imperial and Green-gage, &c. plums.

4thly, How long these *spurs* are in growing before they are matured to blossom, that is, whether these *spurs* require more than one year to mature them to blossom; and it merits attentive observation also, whether a dry and a bright autumn may or may not occasionally shorten the usual time of maturation.

Apple-trees seem generally to require two years to mature their fruit or blossom buds, although in a very favourable autumn, a blossom-bud matured on the wood of last year, has been observed occasionally, particularly at the extreme bud, when the branch has escaped the knife, which is not always the case.

Pear-trees, some French authors say, are always three years in maturing their blossom-buds, and probably this rule holds very generally; but in March 1811, some blossom-buds were observed upon a Muirfowl Egg pear,

which had been grafted only two years upon a Jargonelle stock of twenty years old, and it was changed to the Muirfowl Egg, because the Jargonelle, for three years before the change, seemed sickly, and many of its *spurs* had turned *carious* and died. Here the observations stop, for the devastating storm on the 7th, the 8th, and the 9th days of April of that year, destroyed these blossoms, and almost every blossom and fruit in the garden last year.

This isolated fact may perhaps lead to a conjecture or question, whether pear-trees, on bearing, may not have some roots peculiarly directed by nature, to search for the food to nourish *fruit* or *blossom* buds, and other roots, to collect food for *wood* shoots, and that the check given by the grafting, may not have left the *fruit* or *blossom* juices to collect in these roots for two years, and thereby to *force* or *mature* the formation of the *fruit* or *blossom* buds one year sooner than usual.

The *Crescent pear* generally shews its blossom only at the extremity of its branches, or very near it: query, If a particular mode of pruning could be discovered to invite this tree to give blossom nearer home? Long *spurs* have been left all over the tree with some, but only partial success, that is, a few and feeble blossom-buds are generally shown towards the stem. It may be tried, whether the *Crescent* should be trained in the *fan* way, like an apri-

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cot or peach, in place of one *stem*, and branches trained horizontally from it, as in the ordinary way, or whether the *right* hand branches might not be trained, after two or three years of growth, across the *stem* to the *left*; and the *left* hand branches trained in the same way to the *right*. **One** consequence, and perhaps only *one* would follow, that the branches of the same length, if thus trained, would cover less wall, before showing blossom.

XXXV.*Observations on a method of preparing a Soporific
Medicine from the common Garden Lettuce.*

By MR JOHN HENDERSON, Brechin.

(Read 8th December 1812.)

A HAZEL loam is the best soil for lettuce. It should be trenched the preceding year, and well manured. The coss kinds of lettuce are the best for opium. They should be sown on a warm border about the middle of March, and when two or three inches long, should be planted in rows in the prepared ground. The beds should be four feet eight inches in breadth, that is, bed and path. If the weather is dry, the plants must be watered till they have taken root, and great care must be used to keep them clear of weeds, by stirring the earth with small hoes.

When the plants have run up in a stem, and the flower on the top has attained the consistency of cauliflower fit for the table, the collecting of the opium is to commence. It ought not to be later, on account of the hardness of the stem; and it cannot be earlier, because the stem must

be sufficiently long to be separated from the leaves in cutting. The opium is found in the milky juice of the plant. The person who collects it, should have a knife with a sharp hook blade for cutting, and a straight lance-pointed blade for scraping off the gum or juice. He is to have also a small cup hung from the body by a belt, with a bit of lead fixed to the bottom of it, to make it hang perpendicular. Dry weather is an indispensable requisite to the operation, and even then it cannot be begun sooner than ten o'clock A. M. The first cuttings ought to be four or five inches in length, should be made very quickly, and in a horizontal direction, and to prevent the juice from dropping, are to be instantly turned upside down in the hand, which may hold in this manner from six to ten pieces before scraping. This operation is performed by the lance-pointed knife, which is to be drawn over each cutting with the point a little elevated. The juice will run along the blade, and the pieces being all cleaned, is to be taken off the knife into the glass. The cuttings after this may be dropped into a basket, and may be used for feeding swine. In this manner, two rows may be regularly gone over, standing in the path. The operation of cutting must be performed in the forenoon, to allow the juice on the tops of the plants to harden; and the hardened juice must be all collected before night. This

is to be done, by taking the glass in the hand, and with the lance-pointed knife, gathering into it all the hardened juice on the tops of the plants. Good plants may be cut ten times, each cutting after the first being about three inches, and it will be of use to make these with a slope, that the juice may be more easily collected. The quantity in the glass is now to be spread on stone plates, and dried in the sun, or before a fire, till it can be formed into a mass. To preserve the flavour, it must be kept dry, and free of moulding.

The advantage of raising opium in this manner, must depend on the judgment of medical gentlemen as to its relative value. An estimate of the expence may be formed from the following observations, which are the result of two years experiments.

No. 1. of the balls transmitted with this paper, was collected from plants of all ages, and by various methods. No. 2. was procured by the strict observation of the preceding rules, and may be considered a fair ground of estimate: 300 plants cut six times, making 1800 cuts, with twelve hours labour, two hours of each of six days, produced one ounce opium. Allow to an acre 60,000 plants, and make 360,000 cuts, and they will yield, at the above rate, 200 ounces or 12 lb. English. It took great exertion to produce one ounce by twelve hours labour

on different days; and employing women in the work, the expence of labour cannot be taken at less than two shillings per ounce, or L. 20 for the whole acre. Reckoning for rent of land, manure, labour and accidents, it does not appear, that the article can be brought to market at less than L. 5 Sterling per lb. It was stated, that the plants might be cut ten times; but it is to be taken into the account, that every successive cut is less productive than the former, and some of the latest will hardly yield enough to pay the cost of labour. Heavy rains, which dash the sand among the plants, in the time of collecting, are particularly hurtful, and in some seasons would destroy the crop entirely. It is thus evident, that the culture of the article is both very expensive and very precarious. If the Society should judge it proper to encourage it, the writer of this paper humbly suggests, that an eligible mode might be to ensure a certain price for a given quantity.

It might have been mentioned, that lettuce is very liable to the attacks of snails, wire-worms, &c.

Report of a Committee.

The Committee appointed by the Horticultural Society, for examining the Dissertations given

in for the Prize-medal to be awarded for a Dissertation, on "*the best method of preparing a Soporific Medicine, from the inspissated white juice of the Common Garden Lettuce,*" beg leave to report to the Society,

1. That two candidates only have appeared to compete for the medal, viz. Dr Duncan *senior*, who has given three papers to the Society on this subject; on March 6th 1810, November 1811, and May 12. 1812; and Mr John Henderson of Brechin, who has given a Dissertation on Lettuce Opium, which merits a place in the Transactions of the Society.

2. That they are of opinion that a medal should be given to Dr Duncan for his bringing this subject before the public; for his great zeal in prosecuting it, and for his excellent observations on this subject; and for his directions for preparing a Soporific Medicine from this plant.

3. That they are of opinion, that a medal should also be given to Mr John Henderson, for his very accurate account of the culture of the lettuce, and mode of preparing an opium from it; and for the specimens of opium which he sent to the Society along with his papers.

JAMES HOME, *Preses.*

EDINBURGH,

Dec. 3. 1812.

XXXVI.

A method of stowing Vegetables for Summer use.

In a letter from Mr JOHN HENDERSON, Brechin, to the Secretaries of the Horticultural Society.

(Read 9th June 1812.)

WITH all the directions for keeping vegetables, there is still, in late places of the country, a considerable interval between the end of the old crop and the beginning of the new. By great expence and trouble, a few articles may be forced ; but for general use, nothing can be procured in that manner. By the following method, I have preserved, in abundance, roots of all kinds till the return of the natural crop.

By the month of April, the ice in our ice-house is found to have subsided four or five feet ; and in this empty room I deposite the vegetables to be preserved. After stuffing the vacuities with straw, and covering the surface of the ice with the same material, I place on it case-boxes, dry ware casks, baskets, &c. ; and fill them with turnips, carrot, beet-roots, celery, and in particular potatoes. By the cold of the place, vegetation is

so much suspended, that all these articles may be thus kept fresh and uninjured, till they give place to another crop in its natural season.

I may mention also, that in this way I have procured my first early potatoes for the table. In an ice-house, vegetation is not entirely suspended, and if a portion of potatoes is left in the boxes in the month of August, they will put forth buds and roots, and in December or January, will yield a few dishes of new potatoes. This crop would be improved, by throwing a few spadefuls of earth into the boxes in August.

Where there is not access into an ice-house, vegetation may be considerably retarded, by placing the roots in vaulted cellars, caves, coal-pits, mines, or any place deep in the earth.

XXXVII.

Directions for destroying Caterpillars on Gooseberry-bushes and Fruit-trees.

By Mr ROBERT ELLIOT, Gardener to Sir Thomas Gibson Carmichael, Bart.

(Read 8th December 1812.)

IN the year 1806, I found my trees and bushes in general much infested with caterpillars. I tried many supposed remedies to no purpose. At last, remarking that the black currant bushes were not attacked, and that an elder bush, close by the side of my gooseberry flat, was also exempt from the attacks of the vermin, I resolved to try the effect of the juices of these plants in protecting the other kinds. I therefore prepared an infusion of them, and as quicklime is a very powerful and penetrating article, I added a proportion of it to the infusion. The following is the recipé for the mixture I adopted :

Take six pounds of black currant-leaves, and as many of elder-leaves, and boil them together

in twelve gallons of soft water ; then take fourteen pound of hot lime, and put it in twelve gallons of water ; mix them altogether ; then wash the infested bushes and trees with the hand engine ; after that is done, take a little hot lime and lay at the root of each bush or tree that has been washed ; which completes the operation.

By these means, you will completely destroy the caterpillars, without hurting the foliage of the bush or tree in the least. A dull day is to be preferred to any other for washing. When the foliage is all off the bushes and trees, wash them over with the hand-engine, to clean them of decayed leaves ; for this purpose, any sort of water will do. Then stir up the surface of the earth all round the roots of the bushes and trees, and lay a little hot lime about them, to destroy the eggs. This I have never found to fail of success, since my first trial, six years ago.

The above mentioned proportion of leaves, lime and water, will serve for two acres of ground or more, covered with trees and bushes in the ordinary manner, and will cost very little money indeed. The same proportion is to be observed in making a wash for the rest of the trees or bushes.

CASTLECRAIG, }
Aug. 5. 1812. }

XXXVIII.

On planting Peach-trees on a north border, and introducing their stems through the wall, to be trained on the south aspect.

In a letter to Mr NEILL, Secretary.

(Read 9th March 1813.)

SIR,

Errol House, 22d Feb. 1813.

IT would be unnecessary for me to take up the Society's time with any long detail of the reasons which induced me to adopt the plan of introducing the stems of peach-trees through a wall, and training them on an opposite aspect. Suffice it to say, that the soil in the south border here, where peach-trees had long stood, being much exhausted, of which the old peach-trees begin to shew evident symptoms, that circumstance rendered it advisable to adopt some plan, in order to fill the wall with young healthy plants, to be nourished with a fresh soil. To have planted young trees on the same border, without renewing the soil, would have been a useless waste of money; as it must have ended in disappointment. On the north side of this wall, there was

room for a border, and as it had never been occupied by fruit-trees, it occurred to me, that trees might prosper by being trained on the south side of the wall, although their roots were planted on the north side. Accordingly I set about trenching and preparing the north border for receiving peach-trees, which I have now planted. I prefer such plants as have stocks of sufficient length to reach through the wall to the south side; judging the stock to be more capable of resisting any external injury than the wrought part of the plant. The holes for admitting the plants from the north to the south side, are six inches in diameter, slanting upward, and about six inches from the south border; and I have also riders introduced, the same way, between the dwarfs, at four feet from the surface of the south border.

After what has been so ably written on the preparation of fruit-tree borders, by the late Mr Nicol, and others, it would be presumption in me to say any thing on that subject; but it would appear evident, I should think, to every horticulturist, that if a dry bottom be necessary for the welfare of fruit-trees in a south border, it will be still more essential to pay particular attention to that point, when trees are planted on a north border, where the same proportion of evaporation cannot be supposed to take place. It may

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be a matter of doubt, with some, whether the roots of tender trees planted on so unfavourable an aspect, may have the same chance of success as those planted on the same side where they are to be trained. But it is a circumstance well known to most gardeners, that the vine has yielded many good crops when the plants were planted outside of the hot-house, and the bearing part of the wood only introduced within the house. Certainly, then, the contrast between the temperature of a north and south border, in spring and summer, bears no proportion to that of the out and inside of a hot-house in winter, when vines are frequently forced. At the same time, this method, I know, has given way to modern practice, perhaps more from an idea of its being unnatural to have one part of the plant enjoying a warm, while the other is exposed to a cold temperature, than from any material advantage resulting from that circumstance, either to plants or fruit.

Although I have mentioned peaches, as the trees on which I am now making the experiment, I have no doubt but every other species of fruit-trees may be so managed with an equal chance of success; and in new gardens, where the walls are planted on both sides, by planting riders opposite to dwarfs, a shoot may be taken through the wall immediately above the dwarf; and likewise a shoot of the dwarf under the rider, or to fill any casual vacancy, as the judgment or

the fancy of the gardener may direct. And when the principal trees fill up the wall, these shoots, or part of them, may be easily removed, nor will their roots have exhausted any of the soil in the principal borders. By this means, the most favourable aspects will soon be filled, and the effects, if judiciously directed, will be at once pleasant and profitable.

Should this plan succeed, as I flatter myself it will, some of the old peach-trees may remain undisturbed for some time, and continue to afford a small supply of fruit until it be necessary to remove them, as the young trees come on to fill the wall; and when ultimately cleared away, the south border may be wrought and cropped freely, and may, before the north border be exhausted, be brought to afford nourishment to those plants which at present it seems incapable of supporting.

I do not delay sending this for your perusal, in case you should judge it worthy of communicating it to the Caledonian Horticultural Society, that others may be induced to make the experiment.

XXXIX.

*On the Gooseberry Caterpillar, and on the Worms
which infest Carrots and Onions.*

By MR JOHN MACKRAY, Gardener at Errol House.

(Read 10th March 1812.)

1. *Gooseberry Caterpillar*.—Much has been said respecting the destruction of the gooseberry caterpillar, and various devices which have proved more or less successful have been tried.

About nine years ago, when I came to Errol, I found these vermin very formidable, and making vast havock among the leaves of my gooseberry plants. I procured some tobacco and soft or black soap, and I boiled $\frac{1}{4}$ lb. of tobacco, with the 1 lb. of soft soap, in about 18 Scots pints of water, and kept stirring the liquid while boiling with a whisk, in order to dissolve the soap; this liquor, when milkwarm, or so cool as not to hurt the foliage, I applied to the bushes with a hand squirt in the evening, and in the morning I found all the ground under the bushes covered

ever with dead caterpillars. I partly attribute the success of this wash to the tenacious quality of the soap, which adheres to the leaves longer and closer than tobacco juice alone would do; this practice I continued for six years, always when I saw any symptoms of the approach of caterpillars. I found them to diminish considerably every season, and for the three last years, I have not seen any appearance of them in the garden. I judge from this, that the liquor must have either destroyed the eggs of the insect, or they must have been killed before having time to deposite their eggs. It may be right to remark, that the liquor has no bad effects on the foliage of the plants.

2. *Worm in Carrot and Onion.*—Garden-ground in general, being successively cropped with vegetables very near a-kin in nature to each other, and from the frequent application of manure, soon becomes a receptacle for worms, maggots, and other vermin, which prove destructive to the roots of carrots, onions, cauliflower and other tender vegetables, from which they are always free in new soils, or ground that has never been cropped before with such vegetables. The garden-ground at Errol, has been occupied as a garden for upwards of a century, and consequently is subject, in common with other old gardens, to the attacks of several species of vermin. This

first induced me to try to remove this evil by a *rotation of cropping*; and the most rational method that presented itself, was, to follow strawberries that had been four or five years planted, with onions, and artichokes that had stood the same time, with carrots; for the caterpillars do not choose to attack either the strawberry or artichoke. This plan I found to succeed, and I have now regularly practised it with uniform success for nine years.

In order to enable me to do this, I have planted a succession of strawberries, and artichokes annually; for which trouble I have found myself amply repaid, by larger and more regular crops of strawberries than could have been expected, had the same plants been allowed to remain for eight or ten years, as is sometimes practised; and I have always had a succession of artichokes from my young plants in November, after my old plants had done bearing. In some cases it may be safe to crop thrice with onions or carrot in the same spot, but not oftener, as some symptoms of the worm and maggot generally appear the second or third year; but from the ground being four or five years under strawberries or artichokes, plants on which those vermin cannot subsist, they soon perish, and the ground where the rows stood, has all the advantage of a new soil.

Soot applied as a manure is a good preventive of the maggot in onions, but it rarely happens that a

sufficient quantity can be procured for that purpose : shallots, however, from requiring only a small spot, may be much improved in growth, and entirely preserved from maggot, by applying old hot-bed dung as manure, in the bottom of the drills, well mixed with soot ; on this mixture, plant the shallots, and cover to a proper depth. The soot prevents the appearance of the maggot, and at the same time, greatly improves the strength of the shallots : I have never found this plan fail.

Cauliflower and broccoli roots may be preserved from the effects of worms, by watering the drills well with soap-suds before planting, and occasionally afterwards ; this not only prevents the worm, but encourages the growth of the plants, and in some measure prepares the ground for other vegetables subject to the same sort of attack.

ERROL HOUSE, }
27th Dec. 1811. }

XL

On preserving or retarding the blossoms of Fruit-trees.

In a letter from Mr ARCHIBALD GORRIE, to Mr DICKSON, Secretary.

(Read 8th December 1812.)

SIR, *Rait Garden, 26th October 1812.*

To preserve the blossom of tender fruit-trees from the effects of late spring frosts, has long occupied the attention of gardeners in this northern part of the island. Various methods have been resorted to, with various degrees of success. Common nets have been long employed as a screen, and of late woollen nets have been used by some, as a more effectual protection for tender wall-trees. Woollen nets indeed appear better calculated to resist the bad effects of hoar-frosts, than the common nets that have been long in use; but nets of any kind are found to be too open a screen for resisting the pernicious effects of dry frost winds, which not unfrequently happen about the end of March, and beginning of April. Although soft easy showers may be in

some measure conducive to the regular setting of the fruit, and the general health and cleanliness of the foliage ; yet I apprehend, that washing rains, if they happen to fall with any degree of force on the blossom of wall or other trees, when the fecundating farina is performing its office, the consequence is very fatal to the embryo fruit. To prevent this, as well as to protect the blossom of young fruit from the effects of frosts, screens of canvas rolled up in the day time, and let down at night, or in time of heavy rains while the trees are in flower, are used by many with tolerable success.

In a conversation I had with General Stuart on this subject, he recommended to me, to try to retard the progress of vegetation in the trees as much as possible, during the early part of the spring, so that before they came in flower, much of the severe frosts might be over. The idea appeared to me so well founded in reason, that, independent of my duty as a servant, I thought it merited a candid trial ; and to carry it into execution as far as possible, I thought of shading the wall-trees from the mid-day sun, as early as the 20th of February, when the blossom began to swell.

The branches of the silver-fir were the most convenient article wherewith I could form such a shade ; but to tie them close to the tree as is generally practised, I considered as very unfavourable both to the blossom and the wood-buds,

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as in that case they tend to weaken both, and render the young shoots an easy prey to the aphid or other insects. The labour attending the removing of the branches so often as I judge necessary for retarding the progress of vegetation in the early part of the season, and for promoting it after the trees were in full flower, also presented an insurmountable obstacle to my fixing them to the wall in the common method. I therefore had a frame made on a very simple construction, of which I herewith inclose a draught, and subjoin an explanation: the revolving parts of this frame I covered with the branches of the silver fir, and found every purpose I intended completely answered.

On the 20th February, I covered most part of the peach-trees with this frame, except a few that I left to be afterwards covered with woollen nets, that I might compare their success with those under the frame.

I shut up the frame close all day, and opened it every night, from the 20th February to the end of March, at which time the blossom had made little or no advance from the time the frames were put up; and the trees which I left uncovered, were beginning to expand their blossom, which I then screened with woollen nets.

About this time I did not open the frames, except a few hours in the afternoon, when the rays of the sun were oblique, for the first three weeks in April, but shut it close every night, in

case of frosts hurting the blossom, which, although not expanded, was now in such a state of forwardness, as to be liable to injury from chilling frosts.

About the fourth week in April, they began to blow, and by the first of May were in full flower, and those under the woollen nets had dropt their petals, and were beginning to set.

The difference in the appearance of the peach trees, under the different modes of treatment, was at this time strikingly visible: the flowers were off the trees under the nets, and their green foliage fully expanded, while those under the frame were in full flower, without the wood-buds having made much progress.

As soon as the trees under the frames were in blossom, I opened the frames every morning by six o'clock, and shut them at eight in the evening, admitting as much sun as I could, to forward the wood and setting of the fruit; the partial shade which even the open frames afforded, prevented the scorching rays of the sun from shrivelling the tender petals, a circumstance which I have frequently found injurious to peach and plum blossom. I always took care to shut the frames during a boisterous wind or a heavy fall of rain, while the trees were in blossom.

About the first of June, I removed the frames and nets, and gave the trees a washing with the

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engine. At this time, I could distinguish little difference between the progress the fruit had made under the nets, and that under the frames, but a visible difference was perceptible in the young wood ; the young shoots of the trees that were under the frames were fair and vigorous, while those under the woollen nets were sickly, and a great part of them curled,—a disease peculiar to peach-trees in exposed situations, occasioned I suppose by the action of the chilling blast on the sap vessels of the tender foliage ; the vegetative juices being diverted from their natural course, and flowing spontaneously toward the extremity of the shoot, form a mass of spongy wood and foliage. Although the trees which had been under the frames, had a fine healthy appearance, I was still apprehensive, that the check I had given them in the spring, would be felt at the time of ripening. I found, however, that those trees which had been under the frames, had their fruit ripened a week sooner than an early purple peach which was under a woollen net ; the fruit was more equal, and the wood still maintains a decided superiority.

I do not mean to say, that nets in all cases ought to be rejected. I know that many excellent crops of fruit have been obtained with no other screen, and in well sheltered gardens they are generally used ; but in exposed situations, such as the garden at Rait, where the situation

is an eminence, and the planting intended for shelter has not yet arrived at maturity, tender trees, such as apricots, peaches, &c. require more protection than nets can afford.

In point of expence, of which the making of the frame forms the greater part, although more wood is necessary for constructing it than is commonly used for other screens, this article will not materially add to the expence, where gentlemen may have plantations to thin in the neighbourhood of their gardens.

I hired a joiner by the day at 2 s. 6 d., and found that the expence of the frame for each running yard of the wall (which is fourteen feet high) amounted to one shilling, including the sawing of the fir timber; and as it can be laid up in little room when asunder, if kept dry, it may last for twenty year.

I by no means presume, that those who have canvas screens already, should lay them aside and adopt my method of shelter, although I have little apprehension, that those who may give it a fair trial will feel disposed to relinquish it for the more expensive mode of covering either with nets, gauze, canvas, or cotton wrapper.

The frame, if rightly constructed, will be opened and shut with the greatest ease and speed; the method of putting it up, opening, shutting, and taking it down, will be seen by the draught and subjoined explanation.

Explanation of Plate 3. Vol. 1.

a a a, The upright posts made of wood, two inches square, and fourteen feet six inches long, into which the cross bars *b b b*, &c. are mortised; the poles stand six feet asunder.

c c, The upper leaves of the frame, which open outward on their pivots *d d*, &c. The leaves are all made of inch deal, by inch and quarter broad.

e e, &c. Small pieces of wood nailed on the inside of the upper and middle bars, to prevent the leaves of the frame from falling inward on the wall.

f, The lower leaf of the frame, which opens out above, as represented in the transverse section, to admit the rays of the sun to the lower parts of the wall. This leaf revolves on its pivots *d d*.

g g, A transverse section of the wall and frame, as it stands when the leaves are open. The bottom or low end of the frame stands out two feet from the wall, and every other pole is fixed at the top, with an iron holdfast immediately under the cope. The leaves of the frame are to be covered with branches of the silver-fir so as to cover the vacant spaces at the end, middle and sides, marked *i i*, &c.

k, A horizontal view of one of the upper cross bars in which the upper leaves move round. The cross bars are made of inch and quarter wood, and of a breadth to correspond with the upright poles into which they are mortised.

l, &c. Small wooden pins in the ends of the cross bars, to hold the frame tight when it is up.

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Scale of Feet



It may be necessary to add, that the space between the wall and the frame marked *h* in the transverse section, should have a kind of partition at every twelve feet, formed of silver-fir branches, tied to the tree, and every second pole as at *m*. This will prevent a too free circulation of air along the wall, and preserve a degree of serenity very essential to the setting of the fruit.

XLI.

An account of some delicate Plants cultivated in the open air, in the Island of Guernsey; with Hints on the means of naturalizing tender Exotics.

By Dr MACCULLOCH of Woolwich.

In a letter to Mr NEILL, Secretary.

(Read 14th September 1813.)

SIR,

HAVING visited the Island of Guernsey some years ago, I was much struck with the peculiar luxuriance exhibited by many plants, which either grow with reluctance, or refuse to grow at all, even in the mildest counties of England. The variety and splendor of these productions, give a character to its horticulture, which is very impressive to an English visitor, and which excites surprise, when compared with the very slight advantages of climate this island appears, from its geographical difference of position, to possess. As some of these facts seem capable of leading to useful results in this valuable art, I

have turned to the notes I then made, with the hope that they might afford you a few minutes amusement. Among those productions, its *Amaryllis* * is almost too well known to be enumerated. It is said to have been brought from Japan, a country possessing such a variety of climate, that it might well afford plants suited to any latitude. I think, however, it is yet a point to be ascertained, whether there is any thing in the climate of Guernsey, peculiarly favourable to the growth and flowering of this plant. This is a fact which cannot be determined till the cultivation of it is carried on in England to the same extent in which it is practised in Guernsey. The gardeners of Britain are satisfied with returning to the earth the few roots they receive in flower, but are scarcely content to wait till the period of flowering of the exhausted individual shall again return. From such impatient and narrow trials, no conclusion can be drawn against its possibility. In Guernsey, every gardener, and almost every petty farmer who has a bit of garden-ground, appropriates a patch to this favoured root; and the few hundreds of flowers which are brought to England in their season, or which are kept for ornament on the island, are the produce of thousands of roots which are there planted. The average rate of flowering is not more than

* *Amaryllis Sarniensis*.

fifteen or eighteen in a hundred. The soil in which they are raised is light, and the beds are covered with sand; in other respects, there is no particular care taken of them, except keeping them very clean. What portion of this success depends on climate, cannot, as I have already said, be known, till experiments on a similar scale are tried in England. It is, however, true, that the bulbs are frequently injured in the winter, by a frost which has no effect on the hardy geraniums; so that it would be requisite in this country to guard against this danger, at least by matting or occasionally covering the beds. I may add, that some of its congeners, the *Amaryllis belladonna*, *vittata*, *undulata* and *formosissima*, also flower in Guernsey without care, and with great certainty and vigour.

A shrub of great beauty, the *Magnolia grandiflora*, is well known to be shy of flowering in England, if we except the mild climate of Cornwall, to which that of Guernsey bears a near resemblance. In this little island, however, its flowering is as certain as its growth is luxuriant. Among the more hardy of the tender plants which also grow freely in Guernsey, and which Cornwall but barely preserves through the rigour of winter, are the *Hydrangea hortensis*, *Fuchsia coccinea*, *Geranium zonale*, *inquinans*, *radula*, *glutinosum*, and some others, which pass the winter without difficulty, and emulate in

the summer the luxuriance they possess in their native climates. Many tender and transient varieties of flowers, and among those the varieties of the pink tribe, are remarkable for the facility and certainty with which they are propagated, and for the constancy of their characters. Every rustic cottage is covered with geraniums, and ornamented with numerous pinks, rarely seen in this country but among careful florists. Even the greenhouse is influenced by the climate. It is well known, that the *Heliotropium Peruvianum*, a plant otherwise of sufficiently easy cultivation, is in England much limited in its growth, becoming woody and feeble after it has attained a certain height. Here, on the contrary, if placed on the bed of earth in the house, although no artificial heat be applied, it soon fills the whole space, running over the bed, and striking fresh roots from its branches as it advances. But of all those shrubs which require the protection of the greenhouse in England, the *Verbena triphylla*, is that of which the luxuriance is here the most remarkable. Its miserable stature and bare woody stem are familiar to us. In Guernsey, it flourishes perfectly exposed, and attains the size of a tree of twenty feet and upwards, spreading in a circle of a diameter equal to its height, and its long branches reaching down to the ground on all sides. Its growth is indeed so luxuriant, that

it is necessary to keep it from becoming troublesome, by perpetually cutting it almost to the root; from which fresh shoots fourteen feet in length, resembling those of the osier willow, are annually produced. I may also enumerate a few other plants of tender constitution in Britain, which appear equally hardy in this more uniform climate. The *Celtis micrantha*, which ranks among our stove-plants, grows with very little care out of doors. So do both the double and single varieties of *Camellia Japonica*, the latter often attaining the height of twenty feet. Some species of *Olea* are also hardy, as well as many of the *Proteas*, the whole of which require in our own island the shelter of the greenhouse. Such is the case also with many species of the genus *Cistus*, and among them I may name *crispifolius* and *formosus*. I may add to this enumeration, *Yucca aloifolia*, *Dracocephalum Canariense*, *Jasminum Azoricum*, *Nerium oleander*, *Clethra arborea*, *Daphne odorata*, *Mimulus glutinosus*, *Correa alba*, *Melaleuca hypericifolia*, *Gorteria rigens*, together with a very large number of the genera *Ixia* and *Erica*, all equally requiring the protection of the greenhouse, during the severer winter of our island, and many of them subject to perish at that season, notwithstanding this care. I need scarcely add, that the Myrtle defies the utmost rigour of

a Guernsey winter, and flourishes in the greatest luxuriance.

In the production of many fruits, the gardens of this island are no less remarkable. The superiority of its Chaumontelle pear is well known, a superiority which the grafts imported into England do not retain. Yet in this respect it yields to its neighbour, Jersey; and I may add, for the consolation of English gardeners, that this pear, even in these islands, is reared under the warmest walls, succeeding but indifferently in any other situation. The purple and green fig grow readily as standard trees, and produce perfect fruit every year. Many varieties of the melon ripen without glasses. The Romana is even raised in Jersey, without the assistance of the hand glass, and is cultivated there in large quantities. The usual method of proceeding with it, is to dig a hole in the earth, into which is thrown a small quantity of hot dung, and above that ten or twelve inches of earth. The seeds are then sown; and the young plants, although sometimes covered with hand glasses for a time, are often left entirely to nature.

The attempts to raise Oranges have not been numerous, but in different gardens there are trees of the Seville and sweet orange, both standing under the shelter of a wall, and producing fruit in abundance every year. They require, however, to be protected by mats in the

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winter. In a lower, but not less useful department of this art, the Parsnip, the favoured root of the island, is remarkable for its bulk and goodness.

But the circumstance to which I would chiefly call your attention, is the naturalization of a native of very warm climates, the *Canna Indica*; a circumstance which confirms and illustrates the remarks made by Sir Joseph Banks, on the naturalization of *Zizania aquatica*. This very tender plant has become thoroughly habituated to the climate, scattering its seeds every year, so as to prove a weed in the gardens which it has occupied. I attempted to introduce it here also, from seeds which I brought from Guernsey; but my experiment was interrupted by an accident, and I have never since attempted to repeat it. I think it is not only desirable that it should be repeated, but that similar attempts should be made to naturalize other ornamental or useful plants, which have as yet foiled us, chiefly perhaps because the trials have been ill conducted. Abundant experience has shown, that the propagation of a plant, by cuttings or offsets, has little or no effect in changing its constitution, and the instances above cited, equally show us, that the seed will produce a hardier progeny, a progeny which in time may possibly be habituated to bear all the range of temperature which the globe affords. To carry this

speculation into practice, it is evident, that in most cases the attempt will be unavailing, if the transition is violent; and that we should often fail in our endeavours to naturalize the inhabitants of Bengal or Jamaica, to the climate of England or that of Newfoundland. It is probable, however, that in the immense number of untried plants, many might be found, which, like the *Canna Indica*, would even bear a change as great as that now mentioned: but to pursue this system of naturalization with any great hopes of success, it would be necessary that the transition should be more gradual, and that the transplantation should be carried from a hot climate, through some intermediate one, to our own more ungenial shores. The very peculiarity of the climate of Guernsey, arising chiefly from the uniformity of its temperature, would afford us ground to hope, that it possesses many of the requisite properties, and that it would form the step required in this experiment. It is certain, that neither the thermometric state of a given country, nor any meteorological condition which we have yet been able to observe, are competent to explain the peculiar affection of plants for particular regions of the earth. The observations of Monsieur Ramond, in the "*Annales du Museum*," which have been translated by Mr Salisbury, show this in a striking point of view. From these we see the persever-

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ing regularity with which certain plants affect peculiar elevations, apparently unconnected with the nature of the soil, but bearing a relation alone to particular states of the atmosphere, which we have no means of appretiating. Similar facts are familiar to botanists in our own country, in the very limited zones of elevation, affected by our alpine plants. But perhaps of individual instances, the strongest and best known, is that of the Caper, *Capparis spinosa*, whose delicacy of sensation has, I believe, hitherto precluded its cultivation in any other climate than its native one. Whatever this obscure condition of a climate may be, it appears that the island of which I have been speaking, possesses requisites appertaining to it which are not common, and which, to us at least, in the present state of things, are elsewhere inaccessible. These considerations, therefore, should stimulate us to make trials, which, in their results, may possibly prove useful as well as ornamental. Many of the fruits which are now too tender to bear our climate, might be taught to produce seeds, which would give us products equal in goodness to the original, and of hardier character. It is not unlikely, for example, that a variety of the Melon, from seeds produced in Guernsey, might be made to grow without the aid of glass in England. Perhaps, even the Caper or the Orange might be naturalized through

the same medium. That process which has naturalized the *Canna Indica*, might go far to put us in possession of many other desirable objects, at least in cases where, like the melon, the generations can be rapidly repeated, and where the produce goes hand in hand with each successive generation. Thus, possibly, even the elegant Pine of Norfolk Island, might become a British tree, although the toil of many years would be requisite for effecting such a purpose.

An economical object which depends on this property of plants, remains yet to be noticed. This, which is still more in our power, is probably of more consequence than either of those above mentioned; I mean the perfect naturalization of the Vine. It is well known, that from many of the ordinary varieties cultivated in this country, we can always insure a crop of grapes, but not always a crop of ripe ones. From two or three of these, the chance of ripening out of doors is considerable; from many others it is hopeless. It is not improbable, that by successive sowing of seeds, other varieties might be produced, still more certain of ripening than those which succeed best with us, the Miller and Sweetwater. We should thus acquire possession of an article of cultivation of great importance, by which a useful addition would be made to the agricultural proceeds of land in particular situations, and by which we should

be enabled to fabricate wines of quality sufficiently good to compete with those of foreign growth.

A more important object is the perfect naturalization of the Potato, an effect as yet but very partially obtained, notwithstanding the length of time during which this valuable root has been a subject of cultivation. It is certain, that this imperfect naturalization has been the result of the common practice of propagating by the tubers, to the almost total neglect of the seeds. It is true, that seeds have been occasionally sown, and new varieties thus produced; but the experiment has stopped in the first stage, having been always undertaken for the mere purpose of producing these varieties, without any regard to that much more important object, the production of a plant sufficiently hardy to bear at least the first frosts of winter. In the southern parts of our island, it is not a desideratum of much importance, as the tubers are in general fully formed before the plant is killed by frost; but in the northern parts it is an object of great consequence, the plant being frequently killed long before the roots have attained maturity. In the Highlands of Scotland, in particular, where a frost will frequently occur early in September, the crop is often prematurely destroyed, and the uses of this vegetable are in consequence materially limited. It is plain, that it would be ne-

cessary to sow the seeds of successive generations many times, before the requisite degree of hardiness could be expected, and that the process would demand both patience and time. Yet, if it requires more of these than we can expect from the ordinary cultivator, it is an experiment which we may at least recommend to those public bodies, who so laudibly exert themselves in ameliorating the agriculture and horticulture of this country. The difficulty of procuring seeds from seedling plants, could doubtless be obviated in some measure, by depriving the young plant of its tubers, and thus compelling it to direct its energies to the other and more common mode of propagation, with which nature has provided all plants.

I cannot, however, conclude this speculation, without noticing a formidable objection which stands in the way of our attempts to naturalize particular plants. In every case where the useful varieties have been the result of cultivation in a warmer climate from a base and useless parent, it is to be feared that the process followed in naturalization, would again throw the plant back to its original state. This objection applies chiefly to those fruits, such as the peach, the apple, and grape, which, in their present cultivated state, are almost entirely the produce of art. For this reason, it is not improbable, that all attempts to naturalize the grape to a

cold climate may fail ; yet the trial deserves to be made. The case does not apply equally to the potato. The original plant appears to be valuable, independent of any artificial character, and would consequently admit of a change, tending even to some degree of deterioration, before it was materially injured in its properties.

XLII.

Account of a successful rotation of cropping, observed in the Garden at Airthrey Castle.

By MR THOMAS KELLY, Gardener.

In a letter to MR NEILL, Secretary.

(Read 8th December 1812.)

SIR, *Airthrey Castle, 16th Nov. 1812.*

WE have a rotation of cropping here, which, for a number of years, has never failed to give excellent crops. I beg leave to lay it before you, that you may, if you think proper, communicate it to the Horticultural Society.

The first of the rotation is *celery*.

For this crop we choose a piece of poor ground, generally what has been run out by German greens; about the first of July, we lay out two broad ridges seven feet broad, and five feet betwixt them, allowing three feet at each side; then we cast out the space of seven feet, a spading and shovelling deep, laying the earth

equally on each side, and filling the ridge a foot deep with dung. The dung we use is from the dunghil where winterings have been going. After smoothing and treading the dung, we cover the whole with about four inches of the earth thrown out, taking great pains in properly planting the celery across the ridge, about fourteen inches row from row. When it is fully earthed up, it will stand four or five feet from the top to the bottom of the ridge. These ridges have several advantages above single rows, or the mode commonly practised. By digging so deep, there is, in the course of blanching, a great quantity of new earth mixed with the old surface and dung; and further, the celery is thus kept dry through the winter, which prevents it from rotting. One of the ridges may be planted a fortnight later than the other, when the one will come in well for the winter, and the other for the spring; and if some be wanted early, a single row or two may be planted in a warm place in the common way.

The next season after the celery, we plant the ground with spring-raised *cauliflower* and *red beet*; the beet sown not sooner than the first of May, about eighteen inches row from row.

The third year we sow the ground with *onions*; these we sow in beds four feet wide, and with one foot of an alley; we think this way better than rows, as we can get them clean-

ed without treading the ground. The Portugal onion does well here.

The fourth year, we crop with *German greens* or *pease*. All these crops have been often raised here, without failing in any instance, and without any manure after the celery.

XLIII,

Account of a small economical Orchard near Tranent, in East Lothian.

By Mr JAMES SMITH, Ormiston Hall.

In a Letter to Mr NEILL, Secretary.

(Read 9th March 1813.)

SIR,

IF you consider the following communication of any value to horticulture, I beg you will have the goodness to lay it before the Society. It may be of some importance to those who have only a small piece of pasture-ground, to learn that they may convert it into an orchard without seriously diminishing its utility as pasture.

In the month of June last, I was asked by a friend, to call upon Mr Vallange in Tranent, to see a small orchard he had lately made. I found Mr Vallange a vigorous old man, who had retired from business, and amused himself in the cultivation of fruit-trees. The ground he at present occupies in that manner, is about two

Scotch acres, about three quarters of an acre of which are occupied with full grown trees, which carry very weighty crops of fruit: the remaining acre and a quarter, has been planted about two years, and is divided from the old orchard by a wall. Both the old and new orchards are in grass, except a small part allotted for kitchen vegetables.

As the new orchard particularly drew my attention, I shall give a description of it by Mr Vallange himself, and then mention some things omitted by him, adding a few remarks that occurred to myself when on the spot.

“ SIR, *Tranent, 3d July 1812.*

“ Although I was not taught horticulture, it was always a pleasant pastime to me to work amongst fruit-trees. As you have told me your method of planting, I think it my duty to give you a description of mine in my new orchard. I had pastured the ground for above twenty years with horses and cows, and mean to continue it for pasture; for which cause, my method of planting was as follows: I began by measuring off my distances, putting stakes in the places where the trees were to be planted, and drew a circle round each stake about four feet diameter. I then dug up the turf, and laid it aside: I took out some of the earth, and planted the trees in the centre, pressing down the plant to make the

roots spread, not to go too suddenly down, and thereby to escape the beneficial effects of the sun: I covered the roots two inches thick with earth, tramping it gently, covering the whole circle two inches thick with well rotted dung: I then threw in the rest of the earth; then put the turf, with the grass side downward, circular ways about the plant, about eight or nine inches from the root of the plant, widening it in the building: when that was done, I enlarged the circle the breadth of a spade round, and laid that turf on the outside and above the other, with the grass side upward: I then put in dung, which would be ready to receive the roots kindly when they approach it: the turf was well beat down with a spade, and the inside pared to the resemblance of a bason or punch-bowl, and I put the paring above the dung to prevent evaporation. Thus I finished my plan, and thus I still have as much pasture as before the trees were planted. I am, &c. WILL^M. VALLANGE."

This orchard, as formerly mentioned, is only about an acre and a quarter in extent. It is planted with 384 trees, to which Mr Vallange means to add a few more, to make out 400. The largest proportion are apple, the remainder pear trees. The trees are planted in rows about twenty feet distant, and ten feet between the plants in the rows. The soil is a deep rich

black loam, and having been occupied as pasture for a considerable length of time, is in good condition. As it was a great object with Mr Vallange, possessing only a small spot, to keep this ground in pasture for a cow, it was some time before he could settle on a plan to gain his favourite amusement of cultivating fruit, with safety to the trees, without destroying his pasture. At last, having planted the trees as described in his letter, and raised the turf about a foot high, each tree stands as in a bason of about eighteen inches diameter at the bottom, and three feet at the top; the bottom of the bason is at the same level with the ground. The turf being only of a moderate breadth and manured below, the roots of the fruit trees meet with no obstructions, and the plants are in a vigorous state, while the surface for pasture is not lessened.

The next object was to secure the cow from hurting the trees; for which end Mr Vallange put on her a collar, (such as is used in stables for horses,) with a ring, and round each fore-leg above the ancle, a leather belt with a buckle: the end of an iron chain is fixed to one of the belts; passes through the ring of the collar; and the other end of the chain is fixed to the other belt on the opposite leg; so that, as the animal advances forward, the chain becomes alternately longer and shorter on the opposite sides. By

these means the cow grazes amongst the young trees without hurting them, and her head being confined nearly to within a foot of the ground, she eats the grass on the outside of the circles of turf, without being able to touch the inside, or hurt the trunks of the trees. The cow can lie down and rise pretty freely; and does not seem to feel inconvenience from the restraint she is under. She is taken into the house to be milked and get water. Mr Vallange thinks she has produced more milk this season when thus restrained, than at any former period.

As if to add to this singularity of a cow grazing in a young orchard, Mr Vallange allows two pigs to range in it. They are of course furnished with *nose-rings*, to prevent them from turning up the turf. The dung from the animals enriches the soil; and according to all appearance, in a short time this little orchard will become of considerable value. The only thing against the orchard at present is, being somewhat exposed to the north and east winds: This Mr Vallange is trying to obviate, by placing some of the strongest growing pear-trees to protect against these points.

XLIV.

Observations on the superiority of Composts to simple Dungs.

By MR DAVID WEIGHTON, Gardener to the Earl of Leven and Melville, Melville House, Fife.

(Read 8th December 1812.)

THE first thing to be done in gardening, is to consider where to get materials for making compost ; and as this compost is to be adapted for the improvement of the soil which the gardener is to work upon, it ought to be mixed according as it is either for light sandy, or heavy soil. It is evident, that light land must require a compost of a heavy nature, such as the scourings of ditches or ponds, and clay ; and no less so, that the other kinds of land require a compost of a light or fiery nature, such as will divide its heavy and adhering particles.

The following forms a good compost for cold clayey land :

Three load of light mould ; one load of rotten dung ; one load of sharp sand ; one load of coal-

ashes ; half a load of lime, with a quantity of pigeon, sheep or other hot dungs.

And the following is a suitable compost for light sandy ground :

Two load of the natural soil ; three load of pond earth, or the scourings of ditches ; three load of strong loamy earth ; one load of clay ; two load of dung, and one load of marl, if to be found.

In both cases let them all be well mixed together, and thrown up in a large heap, and turned over once or twice before being used.

It is my opinion that all dung should be laid up in this manner. Indeed, the common way of spreading dung over land, be it either arable or pasture, can by no means answer the end ; for the fertilizing particles of dung being of a volatile nature, are readily exhausted by the action of the sun and air.

I have always observed, that there is no land so soon worn out as light sandy ground. Though clay land be much more intractable than this ; yet being of a heavier texture, the fertilizing particles seem to remain longer in action than in a more sandy ground. For this reason, clay-land is by some preferred, especially if dug or rather trenched every year, and laid up in ridges all winter to meliorate.

I shall now state the manner of using the compost so prepared. A trench being opened in the

borders or ground where it is to be used, and the compost lying at hand, fill the bottom of the trench eight inches deep with it; then take up the whole ground in the next trench ten inches deep, and spread it over the compost that is laid at the bottom of the trench. Which done, cover that bad or indifferent earth over again with the same thickness of compost; by which means, you have three strata, two of compost, with the indifferent earth in the middle. And this being done at the latter part of the year, let it remain till the spring; at which time, dig the ground over, mixing the compost and the old mould together; which, by the washing of the rains, and the action of the frosts in the winter, will greatly improve it.

It may perhaps be thought strange that I have not recommended more dung, that being generally esteemed the grand improvement for all lands, and indeed it is what most people are fond of. If they have dung enough all is well, and they think vegetation cannot fail of going on. This is especially the case in the repairing of worn-out grounds. But with this, I can by no means agree. I esteem dung no more than a good ingredient to mix with earth and other sorts of compost. It ought to be well mixed and incorporated with them, and they being all consumed together, make an excellent

compost fit for new planted trees, or for repairing worn out ground.

Whether the land worn out, be either heavy or light, the two different composts which I have recommended, will suit them; and for other lands, one of a middle quality may easily be formed.

I have avoided running into sub-divisions of the kinds of soils; since doing so, tends rather to mislead than to instruct gardeners in the execution of their business.

XLV.

A method of Destroying one sort of the Gooseberry Caterpillar.

By Mr JOHN TWEEDIE, Gardener to Mr Hamilton, Sundrum.

In a Letter to Mr ANDREW DICKSON, Treasurer.

(Read 9th March 1813.)

SIR,

In compliance with your request, I here send you my mite of information for destroying one of the kinds of gooseberry caterpillar. Upon a fair trial, it will be found sufficient as a radical cure. If it is thought to merit a place in the Memoirs of the Society, I have no objection to its being inserted. I am, &c.

AMONG the various necessary acquirements which a gardener ought to possess, that of subduing the devouring hordes of insects with which he is continually annoyed, is certainly an

important one. There is not a seed thrown from his hand, nor a plant which he puts into the ground, but is liable to be destroyed by insects, reptiles or vermin of one description or another. Many insects not only feed upon the plants, but constantly lodge about them, and thus produce a great many distempers and failures in the vegetable kingdom, often imputed to other causes. Among gardeners, gooseberry caterpillars have long been complained of: almost every year has produced a new receipt for their destruction: still we find a repetition of the complaint, and another method wanted. Had a complete knowledge of their modes of life, and the seasons of their transformation, been acquired, the destruction of some kinds could readily have been accomplished. There are two distinct kinds, of one of which only I am now to treat.

In the year 1803, I selected a few bushes very much overrun with caterpillars, on purpose to observe the progress of the caterpillars, as also to see what became of them at last; and after strict observation, I found that these caterpillars went into winter quarters precisely under the bushes whereon they were fed, and if any old dung or rotten leaves lay under the branches, or about the roots, they gathered to such in great numbers: these substances appear indeed, to be the chief material of which their chrysalids are formed.

In the spring following, I put some of these chrysalids into a hot-bed, and confined them, on purpose to obtain a knowledge of the parent fly; and though they had been exposed to the preceding winter frost by their own choice, being only covered at most two inches under the surface, they, with the exception of four out of fifty, produced each a full grown fly. It must of course be admitted, that the inclemency of the weather cannot destroy them in the chrysalis state, as was supposed by many would have been the case.

It may easily be understood, that gooseberry bushes ought not to be planted beside box-edgings, flower-borders, and beds or rows of strawberries, as is often done, all these affording suitable winter retreats to the caterpillars. I immediately removed all my bushes, both currants and gooseberries, into quarters by themselves, and placed them in rows, as the growth of the different sorts required.

I then adopted the following simple method of destruction: In the course of any of the winter months, I pare all the earth from under the bushes to the depth of about three inches, into a flat ridge betwixt the rows; and on the first dry day following, I either tread, beat or roll these ridges, and trench the whole down one and a half or two spade deep, ob-

erving to tread the foul earth into the bottom of the trench.

The natural season of this insect, is from the middle of April to the first of June; between which times, the cold easterly wind is most predominant, which causes the fly to take shelter under the young foliage; hence arises that ancient notion of such insects being brought by the east wind. On the foliage they lose no time in breeding and depositing their eggs. I have often seen those vermin so late as July, and even in August; this is probably owing to their having been buried from the sun's influence in the common process of digging, being then deprived of immediate warmth, and so remaining longer in their nymph state.

SUNDRUM, }
1st Jan. 1813. }

XLVI.

Observations on the cultivation of Sea-cale.

By SIR GEORGE STEUART MACKENZIE, Bart.

In a Letter to Mr NEILL, Secretary.

(Read 9th June 1812.)

SIR,

OBSERVING that the cultivation of Sea-cale is one of the subjects on which the Horticultural Society desires information, it may not perhaps be useless, that I should inform you of the method I directed my gardener to follow, several years ago, and which he has since pursued with complete success, producing that admirable vegetable in the greatest perfection. The method probably has nothing new in it ; but as Sea-cale is not yet very generally known, and as I do not observe any communication respecting it in the first number of our Memoirs, a short statement of my plan, may not be unacceptable.

Two long trenches were dug, and the greatest part of the soil removed from them. The depth was about eighteen inches, and about eight inches of soil were left. A quantity of river sand was then put into the trenches, and spread over the bottom to the thickness of six inches, and then well mixed with the soil below. The trench was now a foot deep, and it was filled six inches more with a very light sandy loam, and the whole dug over again and well mixed. The seed was now sown in a line along the middle of the trench and as the plants grew, they were earthed up, and at last the trenches were reduced to slight hollows. The plants began to show themselves so stout the second year, that I resolved to make use of some of them; and the method I took to blanch them, and which my gardener has practiced ever since, was to shake a quantity of dry clean straw loosely over the plants, taking care to remove it whenever it became wet and heavy. Through this light covering the plants shot freely, and remained perfectly white and clean. I have frequently heard gardeners, to whom I recommended this mode of blanching, assert, that straw breaks the plants; but my reply has always been, that they must have been very careless, if ever they had actually tried it. By using the rows alternately, the plants are kept strong; and by being left to

grow one season after being cut, they recover their vigour for a renewal of the operation.

It appears to me, better to raise Sea-cale from seed, than from offsets, on account of the plants from the former producing larger roots. As this vegetable is really worthy of ample space being allotted to it, over-cutting should be guarded against.

Such is the simple method by which I have been furnished with Sea-cale in the highest degree of perfection. But the labours of the gardener are often rendered fruitless by the carelessness of the cook. Sea-cale should be tied into small bundles before being boiled; and it cannot easily be overdone. When taken out of the water, which ought to be perfectly clean, it should be well drained, and allowed to stand a few minutes before the fire, that a considerable portion of the water may evaporate. Sauce, such as may suit the taste of those to whom it is to be served up, may then be poured over it.

I have never had occasion to have this vegetable forced; but though I have not practised it, I may mention to you what has occurred to me as a method, simple, and likely to be successful.

Let planks, bricks, or flags, eight or ten inches broad be placed on edge, on each side of the row to be forced, and covered with cross spars,

having a space of about an inch between them. Over this let a sufficient quantity of prepared dung be laid, leaving at every ten feet a small part open. The quantity of dung should be such, that the heat may be no more than just enough to *draw up* the plants, to use a gardener's phrase.

Should you consider this short communication of sufficient importance to be attended to by the Society, you may lay it before the next meeting. I am, &c.

EDINBURGH, }
6th April 1812. }

XLVII.*An Account of the Orchards in the Carse of
Gowrie.*

By MESSRS MACHRAY and GORRIE.

(Read 14th September 1813.)

THE Carse of Gowrie is situate on the north bank of the Tay, and lies between Perth and Dundee. It measures in length, from Kinfauns to Invergowrie, about sixteen miles, and is about four miles in breadth, from the Tay north to the sloping ground, or Braes of the Carse.

Nearly in the middle of the Carse, there is a rising ground which runs, in a parallel direction with the river, almost the whole length of the Carse, beginning west from Pitfour, and ending at Invergowrie. The summit of this gently sloping ground may be estimated to rise from 60 to 100 feet above the level of the sea; and on it are situate the different *inches* of Inchtire, Inchmartin, Inchmichael and Megginch, as also the villages of Leetown, Errol, Inchtire and

Longforgan, the demesnes of Pitfour, Murie, Errol and Dremmie, and the orchards of Argaith, Murie, Errol, Megginch, Horn, Inchmartin, Inchtire, Moncur and Overyards. Except the orchard at Murie, which is just laying out, and consists of about two acres, the other orchards are very old, and some of them a good deal decayed. The soil about Leetown to the east of Pitfour, is a brown-coloured sandy loam, on a cold clayey bottom; but to the eastward where the ground rises higher, at Argaith, Murie and Errol, the soil is a good black loam, on a gravelly or tilly* bottom. Megginch and Inchmichael are considerably lower than Errol, and partake of the clay soil of the Carse. From Inchtire eastwards, the soil is a reddish brick-coloured loam, or a mixture of sand and clay.

To the north of this rising ground, and between it and the Braes of the Carse, is a fine level, from one to two miles in breadth. This is supposed, and has every appearance of having been the bed of the Tay at some former period. Its present surface is about forty feet above the level of the sea, and is composed chiefly of a black mossy soil in the middle, and a sound black loam towards the sides. Many who are still alive, remember when this part

* *Till* is an expression used for a composition of gravel and clay: having the poverty of the one, and the retention of the other, it is reckoned a bad subsoil.

of the Carse was entirely a marsh, producing nothing but reeds, junci, carices, and other marsh and aquatic plants: it was held as a common, and afforded pasturage for cattle; but the common being divided, the whole of this long marsh was drained, and the Qua, the only remaining loch or pool, was drained five years ago; so that the whole tract from Glencarse to Invergowrie, along the bottom of the Braes of the Carse, is now in a high state of cultivation. No attempt to raise fruit-trees in this division has been made, so far as we know; nor would the mossy soil of which it is chiefly composed, either encourage or justify the attempt. It may be observed, however, that, about fifty or sixty years ago, the ground under fruit-trees in the Carse of Gowrie, was nearly equal to what it is at present, when the agricultural extent was not nearly one-third of its present dimensions.

Towards the river side, the soil is a strong clay, from fourteen to twenty feet deep, having different strata of river sand, at various depths from the surface. Under this is a bed of moss, which is to be met with along the bank of the river at many places between Inchyra and Invergowrie. In this moss are found the remains of old trees, and some are even found among the clay which covers it. In this division, is situate the orchard of Monorgan, by much the largest and best in this district, and perhaps one of the

oldest, as also Bogmill, Powgavie, Seaside, and the Pow of Errol. Where the strata of sand appear within three feet of the surface, as at the Pow of Errol, the trees arrive to a great magnitude, and seem to retain their vigour to a great age; pear trees in particular grow to a larger size here and at Bogmill, than at most other places of the Carse.

In many of the old orchards of the Carse, we noticed some large trees lying along the surface, with their branches bent upward, and producing as healthy wood and as fair crops of fruit as those that were still standing; indeed, the advantage seemed to be on the side of those trees which the storm or some accident had laid on their sides. In particular, we observed a pear tree at the Pow of Errol, which, to the best of our information, must have lain upwards of fifty years; its stem measures about twenty feet in length, and about twenty inches in diameter; when it fell, the trunk had split right above the root, and the wound has since increased, so that only about six inches of the bark on the under side of the trunk remains sound, to convey nourishment from the root to the branches, which have now formed tops as large as four ordinary trees of from twenty to thirty years standing. Although the trunk is split and shattered in many places, the branches, which look like so many thriving trees, exhibit more

of the appearance of health than many other trees in the orchard, notwithstanding the limited channel through which they receive their nourishment. We judge, that the health of these stems may be owing in some measure to the settled state of the roots, (which can suffer nothing from wind-waving,) or perhaps from the moisture which surrounds the bark of the trunk, where there may be still the remains of vegetable life; but we leave it to other horticulturists, to form what conclusions they may think proper on this subject. The instance we have given is by no means a solitary one, but may be met with in some degree in every old orchard.

We shall now give a description of the new orchards that are laying out in this quarter.

There is an orchard laid out this season at Glencarse, within the policies belonging to Thomas Hunter, Esq. of Glencarse. It measures about three acres, has a south aspect, and is well sheltered from the north, west, and east, by thriving plantations. The soil is a rich black loam, from two to five feet deep. The trees are from twelve to fifteen years old. The proprietor, who carries on these improvements with the spirit and judgment of a horticulturist, has withheld no necessary expence nor pains in having the ground drained, and the trees judiciously pruned and regularly watered, partly from the drainings of the cow dunghill. The trees have a

healthy appearance ; and from the situation, soil and management of this orchard, it promises to make a respectable figure among the Carse orchards.

Within the policies belonging to General Stuart of Rait, a new orchard is just now laying out on a rising ground, having a south aspect, and rising gradually from 40 to 120 feet above the level of the sea ; it contains from eight to nine acres, and the soil, like the most part of the Braes of the Carse, is a strong black loam, from one to four feet deep, partly on a rocky and partly on a gravelly bottom. It is naturally sheltered on the north by the rising ground, on the east and west by a strip of planting, and on the south by a stone wall. It has been completely drained, and as it forms a part of the lawn, it is laying out by a plan given by the proprietor, which differs from most other orchards, in the rows being all circular, expanding regularly from a centre ; the advantages presented by this mode of planting, are, the trees being planted with the same precision and regularity as if they were in straight lines, without the stiff formality of straight lined orchards, which can be no way ornamental in a lawn ; nor, from the detached manner in which the trees appear to stand, can they prevent the influences of the sun and air, to the same degree as if planted in straight lines. As to ploughing, it will be performed without

ever turning the horses, and the next ploughing it may be reversed to throw back the furrow; perhaps the space next the centre may have to be thrown up with the spade, but that being a small spot, will occasion but a trifling expence.

At Murie, there is a new orchard fenced in with a stone wall, consisting of nearly two acres. The ground is trenched and drained, and it is to be planted as soon as the season will permit. The soil is a clay loam, mixed with the black loam that was on the surface. It is the property of Miss Yeoman of Murie.

At Benvie, in the parish of Liff, the old orchard, from whence the Benvie pear takes its name, has been lately renewed. The original pear-tree of that name is still alive: it has been at some former period laid over by the wind; the original stem is about five feet in circumference, and fourteen feet in length; it is much shattered and decayed, but where the branches begin to bend upward, fourteen feet from the root, it has sent forth new roots, which supply a large thriving top with nourishment: its having struck root at such an age, we consider as very singular, and we conclude from it, that this variety of pear shews a disposition to grow by layers. The tree we mentioned at the Pow of Errol orchard, which must have lain upwards of fifty years, shews no disposition to root, except one

of the young branches that had been long covered with earth.

At Birithrie, an extensive orchard has been lately laid out, wherein is planted from 2000 to 3000 fruit-trees. It lies in the parish of Liff, and is the property of Mr Webster, who has laid it out; it measures about nine acres, and the young trees have a very promising appearance. The ground of this orchard is chiefly a steep den, and is one of the many situations of that kind in the Braes of the Carse, that might be cultivated in that manner with advantage.

At Abernyte, an orchard has been lately planted. It is situate in a steep den north from Ballanden, and is the property of Mr Miller. Like most other new orchards here, it was planted with standard apple and pear trees, two or three years grafted: the soil was trenched, and large pits were made and filled with a compost of prepared mould, mixed with lime and dung: the trees were planted with their roots spread in every direction, within eight inches of the surface; the mould was laid over them, and the top of the pit left level to receive the rains and surface water.

*List of the principal Apples, Pears, and Plums,
cultivated in the Carse of Gowrie Orchards.*

NO.	APPLES.		
1.	Tower of Glammiss, or Carse of Gowrie, -	Winter Apple.	
2.	Moncrieff Pippin, or Gogar,	Winter.	
3.	Lady's Finger, or Magnum- bonum, -	Winter.	Table.
4.	Cat's Head, -	Winter.	
5.	Norfolk Beaufin, -	Winter.	
6.	Naked Apple, -	Winter.	
7.	Ribston Pippin, -	Winter.	Table.
8.	Loman's Pearmain, -	Winter.	
9.	White Codlin, -	Autumn.	
10.	Dupplin Codlin, -	Autumn.	
11.	Kinnoul Codlin, a new ex- cellent apple, -	Autumn.	
12.	Glammiss Pippin, -	November.	
13.	Moncur Apple, -	Winter.	
14.	Royal Codlin, -	November.	
15.	Hawthorndean, -	Winter.	
16.	Stoup Leadington, -	Autumn.	
17.	Scarlet Leadington, -	Autumn.	
18.	Striped Leadington, -	Autumn.	
19.	Grey Leadington, -	Winter.	Table.
20.	Monstrous Rennet, -	November.	
21.	Lamont. -	Winter.	
22.	Black Stock, or Fox Whelps,	Winter.	
23.	Green Fulwood, -	Winter.	
24.	Bulastrae Hill, -	November.	
25.	White Captain, -	Autumn.	
26.	Summer Strawberry, or Bran- dy, -	Autumn.	

27. Winter Strawberry, or Winter Brandy,	-	Winter.	
28. Carlisle Codlin,	-	November.	
29. Royal Russet,	-	Winter.	
30. Lemon Pippin,	-	Winter.	
31. Summer Queening,	-	Autumn.	
32. Winter Queening,	-	Winter.	
33. Oslin, or Arbroath Pippin,		Autumn.	Table.
34. Red Wine, or Queen of England,	-	November.	
<i>N. B.</i> —The above are all great bearers.			
35. Yorkshire Green,	-	Winter.	
36. Margill,	-	Winter.	Table.
37. Chartreux Corpendu,	-	Autumn.	Table.
38. Margaret,	-	November.	Table.
39. Nonsuch,	-	November.	
40. Dutch Codlin,	-	Autumn.	Table.
41. Golden Rennet,	-	Winter.	Table.
42. Juneating,	-	Autumn.	Table.
43. Summer Pearmain,	-	Autumn.	Table.
44. French Corpendu,	-	November.	Table.
45. Summer Redstreak,	-	Autumn.	
46. Winter Redstreak,	-	Winter.	Table.
47. Orange Pippin,	-	Autumn.	
48. Golden Russet,	-	Winter.	Table.
49. Maggy Duncan, a large green apple,	-	November.	
50. Lady Johnston, a large beautiful apple,	-	November.	
51. Red Calville,	-	Autumn.	
52. White Leadington,	-	Autumn.	Table.
53. Balmano Pippin,	-	Autumn.	Table.
54. Sugar Loaf,	-	November.	
55. Lady Apple,	-	Winter.	

- 56. Maclean, - Winter.
- 57. Berry's Favourite, cultivated
about Dundee, - Winter.
- 58. Purse Mouth. -

Apples planted on walls, not mentioned in the foregoing list, (some of which, although standard apples, are sometimes planted on walls.)

- 59. Nonpareil, - Winter. Table.
- 60. Golden Pippin, - Winter. Table.
- 61. Loan's Pearmain, - Winter. Table.
- 62. Scarlet Nonpareil, - Winter. Table.
- 63. Kirton Pippin, - Autumn. Table.
- 64. Revelston Pippin, - August. Table.
- 65. Sykelhouse Apple, - Winter. Table.
- 66. Grey Rennet, - Winter. Table.
- 67. Pile's Russet, - Winter. Table.
- 68. American Early, - Autumn. Table.
- 69. Sack Apple, } Either Wall or
- 70. Fair maid of } Standard; ex-
Taunton. } cellent apples. Winter. Baking or
Table.

NO. STANDARD PEARS.

- 1. Green Yair, - Winter Pear.
- 2. Grey Achan, - Winter. Table.
- 3. Black Achan, - Winter. Table.
- 4. Crawford, - Autumn. Table.
- 5. Carnock, or Drummond, Autumn. Table.
- 6. Swan Egg, - November. Table.
- 7. Longueville, - Autumn.
- 8. Scots Bergamot, - Autumn.
- 9. Summer Bergamot, - Autumn.
- 10. Autumn Bergamot, - Autumn.
- 11. Muirfowl Egg, - Autumn.
- 12. Benvie, Summer and Autumn, Autumn.
- 13. Green Chisel, - August.

14. Pear James,	-	August.
15. Briar Bush,	-	November.
16. Pear Nut, a great bearer,		Autumn.
17. Gold Knap,	-	August.
18. Galston's Muirfowl Egg,		Autumn.
19. Pow Megg,	-	November.
20. Elshenhaft,	-	Autumn.
21. Christie. A large pear and good bearer,	-	Autumn.
22. Soutar's Thumb,	-	Autumn.
23. Green Honey,	-	August.
24. Cadillac,	-	Winter.
25. Jargonelle, (chiefly on walls.)		Autumn.

Pears cultivated on Walls.

26. Cressane,	-	Winter.
27. Chaumontelle,	-	Winter.
28. Colmar,	-	Winter.
29. Brown Beurré,	-	Winter.
30. French Bergamot, (wall or espalier,)	-	Winter.
31. White Beurré,	-	Autumn.
32. Cuisse Madam,		Autumn.
33. Gansell's Bergamot,	-	Autumn.
34. Swiss Bergamot,	-	Autumn.
35. St Germain,	-	Winter.
36. Orange Bergamot,	-	Winter.

N0. PLUMS *cultivated in the Orchards.*

1. White Magnum Bonum.
2. Common Orleans.
3. Precoce de Tours.
4. Red Magnum.
5. Blue Perdrigon.
6. Damson.
7. Fotheringham.
8. Green Julian, &c.

The above list contains the names of those fruit-trees that are most commonly to be met with in the Carse of Gowrie orchards, although there are many other kinds of inferior note. About twenty different kinds of apples have been sent to some of the new orchards in the Carse from England; but as they have not been here long enough to establish their character, a list of their names would be wholly uninteresting.

The article of pruning fruit-trees is perhaps too little attended to by some of the owners of Carse orchards; but where orchards are kept in a superior style, as at Monorgan, and all those within gentlemens policies, the trees are regularly divested of all superfluous or decaying wood. Young trees are generally made to form tops at the height of six feet, at which height they are for the most part allowed to divide into three, four or five branches; these shoots in general, are shortened according to their length and vigour, at the winter pruning, to make them push the more freely; all cross branches are taken off close by the stem; and when the trees have formed an ordinary sized top, they are allowed to push at random, observing to keep the branches clear of one another, and to remove those that may shew any symptoms of decay, either from having carried large crops or otherwise. Old fruit-trees that may have been neglected, and whose tops

form a kind of thicket, have the slender branches taken off, and every branch thinned in the same manner as each were a separate tree, taking care that no side-shoots may interfere with those of another branch ; but few large branches are to be cut off the main stem, if it can be avoided.

In the annexed Table illustrative of the Carse orchards, will be found, at one view, the name of the proprietors ; the name of the orchards ; the parishes in which they are situated ; their extent ; the general character of their soil ; the prices which the fruit brought annually, from 1809 to 1813, as far as these could be ascertained ; and the names of the tenants, where the orchards are under lease. In some cases, as at Castle Huntly, Seaside, Watry Butts, &c. the orchards or lawns are kept in the proprietors hands, except during the short period of the fruit season, when the purchasers of the fruit guard the orchard and gather the fruit.

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The orchards in general are cropped with a rotation of oats, or barley, grass, wheat with dung, &c.; where this is not the case, they are marked in the table as under grass or pasture. The orchards, are, for the most part, let by roup about the beginning of August. The purchaser finds a market in Dundee, where the fruit is sometimes bought by carriers and others, to supply the towns of Arbroath, Forfar, Montrose, and Aberdeen. The average profits derived from thriving orchards, may be reckoned at from L. 16 to L. 20 Sterling per acre; the under-crop is generally worth about L. 6 Sterling per acre, and is sometimes let along with the fruit; but many of the old neglected orchards will not bring L. 10 per acre, at an average.

The whole ground occupied by thirty-two orchards, may be from 125 to 130 acres, and to these may be added six orchards, laid out within these three years, (or laying out this season,) containing about twenty-nine acres more. Twenty-seven of these lie in the dens or on the Braes of the Carse, where there is still ample room and excellent situations for the cultivation of fruit-trees. Were the mode which Sir James Stuart of Coltness* has adopted, practised here, some

* The terms on which Sir James Stuart lets the banks on his estate for planting with fruit-trees are, The tenant pays one-

hundreds of acres in the dens which intersect the Braes of the Carse, might be planted with fruit-trees, with great advantage to the proprietors, and prove an ornament to the country.

half of the expence of planting; and one guinea per acre; the proprietor receives one-half of the annual produce in name of rent; the lease is for twenty-five years. See Mr Neill's chapter on Orchards, p. 134.

XLVIII.*On the causes of Canker in Fruit-Trees.*

By MR JAMES SMITH, Glasgow.

(Read 9th March 1813.)

It is generally allowed among gardeners, that the canker in fruit-trees, proceeds from the roots having got into a bad soil. However general this opinion may be, I would beg leave to differ from many of my brethren on that subject. For some years past I have had an opportunity of observing a good many trees in a cankered state, and, in my present situation, I have a good many trees infected. Having imbibed the above general opinion, I accordingly, in January 1810, uncovered the roots of several of my worst infected trees, in order to cut any of them that might have got down into the bad soil. The first I uncovered, I found, that about two feet and a half below the surface, previous to the trees being planted, there had been a bottom laid nine feet in diameter with brick

and lime. I followed each root out to the extremity, and found that none of them had ever touched the subsoil. I tried several more of them, and found they had all bottoms of the above description.

I have likewise a good many trees on the wall, all in a healthy state, none of them having the least appearance of canker. In February 1811, I trenched the border along the wall in which the trees are planted; I examined the roots of every one of them, (thirty-four in number,) and found that the roots of most of them had got down into the bad soil, as no bottom had been made for them when planted. The soil in many places was not above thirteen inches deep, and many of the roots had run down about thirty-five inches into the bad soil.

When I found that the trees on the wall were not cankered, although the roots were in such a bad condition, I began to think, that the canker must proceed from something else than bad soil. I examined my standard trees more minutely, and found, that all the early kinds were considerably worse cankered than the late ones. I then thought, and am now almost convinced, that the canker proceeds from the frost injuring the sap. In order to ascertain how far this might be true, I determined on trying an experiment. On the night of the 3d of May 1811, we had a pretty sharp frost; and several of my trees

had made good shoots by that time: I, next day, tied a piece of small thread round a good many of my young shoots, as a mark, in order to ascertain in the end of the season, whether the frost had done them any injury. I likewise marked a good many buds which had not yet begun to push, but which I thought were likely to do so. On examining my trees during the winter, I found, that none of the shoots made from the buds which had not begun to push, were in the least inclined to canker, whilst the greatest part, though not the whole, of the others are cankered. I intend this spring to try some more experiments, which I hope will be more satisfactory. The above is only intended as a few hints, in order that any member of the Society may make the like or other experiments, to ascertain how far the above is entitled to credit.

GLASGOW, }
February 1812. }

XLIX.

On the origin of Canker in Fruit-Trees.

By MR EDWARD SANG, Nurseryman, Kirkcaldy.

In a Letter to MR NEILL, Secretary.

(Read 8th Dec. 1812.)

SIR,

THE last number of your Memoirs, unites with many other instances in numerous parts of the country, to show the prevalence of canker in fruit trees. Most of the kinds in present cultivation, are subjected to its ravages.

But while all agree in the growing prevalence of the disorder, there are many various reasons assigned for the cause. Some think it may be produced by insects; some by the plants being placed in exposed situations; some by an unkindly soil; others by a wet subsoil; and others suppose that it is the consequence of carelessness in selecting the grafts; and hence the variety of methods of cure prescribed.

Mr Forsyth of London supposed that it proceeded from age and accidental bruises, or

wounds, and hence he recommended heading down the plants, and cutting out the disordered parts of the wood, and then applying to such parts a plaster prepared by himself.

Mr Knight, in some papers read to the Horticultural Society of London, and also in a pamphlet, since published, examines the alleged effects of Mr Forsyth's methods of curing old cankered or decayed fruit-trees, and comes to the conclusion, that topical applications will prove of no real or lasting advantage to fruit-trees. He suggests, that we must seek for the cause of the appearance of decay by canker, from other sources than accidental or external operations, and endeavours to demonstrate, that it is to be found in kinds debilitated by age, since they were produced from the seed. He seems to think, that no regrafting will at all renovate the kinds, or preserve them in health, and adduces experiments, which are supposed conclusive. The arguments and experiments offered by that able horticulturist, have made a multitude of proselytes to his opinion, so that now nothing is heard of, but new kinds to be obtained from seed, as the only means of procuring trees healthy and free from canker. The method which is recommended by Mr Knight to effect this, and which he used in procuring the *Downton pippin*, is as follows: He brought a branch of a Golden pippin, and a branch of a Siberian crab into contact, when

in full flower, and secured the impregnation of some of the blossom, and when the fruit of them was matured, he sowed the seeds, and the result was the kind above mentioned.

Nothing can be more plausible than Mr Knight's theory, and nothing demands more the attention of horticulturists. But while I would give every credit to the ingenuity of the proposition, I would guard against too implicit a dependance upon its excellence, to the neglect of old-fashioned precautions, until its good effects be fully established by longer experience; and, with this view, I shall subjoin the following remarks.

One of the trees concerned in the production of Mr Knight's Downton pippin, was the Golden pippin, which is acknowledged by him, to be the farthest advanced in debility, canker and decay, of any sort we have. Now, I take it, that canker is the effect of a vitiated habit, and that whenever it appears, the *whole* juices of the plant are vitiated. if I am right, a question thence arises, namely, Can a disordered and vitiated plant be depended upon as capable to produce a sound and healthy offspring? I think doubts must arise.

Another train of reflection was suggested to me upon this subject, by observing a bed of crab-stocks which had been sown on a piece of moist sandy soil, upheld by a bed of rotten rock,

the interstices of which were filled up by a red ochry looking earth: many of the plants, by the time they had stood two years in it, were so much cankered, as to be unfit for being preserved for grafting upon: these were consequently discarded, but the seemingly healthy plants were planted out in good ground, and afterwards used for grafting upon. Yet a great many of these soon became cankered, even though grafted with kinds that were naturally very healthy. From this circumstance, It ake it, that the canker in apple trees may be, and sometimes is, produced from want of due care to the health of the stocks. Indeed, in procuring healthy plants, the utmost attention ought to be paid to the providing clean and healthy stocks, as well as healthy grafts.

I beg to be understood, as suggesting the above, without any personal reference, but merely as an inquiry after truth. I am, &c,

KIRKCALDY, }
5th Dec. 1812. }

L.

*On the preserving of the blossom of Fruit-Trees,
by means of Straw or Hay Ropes.*

By MR JAMES LAIRD, Gardener, Portmore.

(Read 9th March 1813.)

HAVING for a number of years been in the practice of protecting the blossom of fruit-trees from frost, by means of straw or hay ropes, and as I know of no person who has practised that method except myself, that it may be more generally known, I send you an account of my method, and you may, if you think fit, lay it before the Horticultural Society.

As soon as the buds begin to get turgid, I place poles against the wall, from four to six feet distance, the one from the other; the lower end sunk a little in the ground, about a foot from the wall; the upper reaching just below the cope; fixing the top of the first and last one to the wall with a strong nail or hold-fast, to keep the ropes tight. Having the ropes prepa-

red, I begin, by fixing the rope near the top to one of the out-side poles, going on in a horizontal manner to the other end of the wall, taking a turn with the rope round each pole as I pass. Beginning again eighteen or twenty inches below the first, I go on in the same manner, and so on, until I reach within two or three feet from the ground.

The operation is then concluded. As this covering does not much intercept the rays of the sun, I let it remain, although the fruit be set, until the middle or end of May, as I see the weather settled. The first time I tried this method (1802), the fruit being all set, I uncovered all the wall on the 1st of May, except a peach then in blossom; on the 5th we had a great fall of snow. At five o'clock in the morning of the 6th, the thermometer was $2\frac{1}{2}^{\circ}$ below the freezing point; the consequence was, the whole uncovered fruit on the wall was destroyed, except a few that were protected by the foliage, while the peach tree that was covered had an excellent crop.

As I am of opinion, that the parts of fructification are often hurt before the flower is expanded, I recommend, that the ropes be put early on.

For want of poles, I have sometimes placed the ropes in a perpendicular manner, the upper end fixed with a nail to the wall, the lower end

by a peg driven into the ground. But in this way, in time of wind, the ropes are very apt to beat off the flower buds.

I have used the branches of evergreens, and also old fish nets, for the protection of fruit-tree blossom, but have found nothing to answer the end so well as the straw ropes. I am confident, whoever gives them a fair trial, will not only find them a cheap but a secure protection. It may be candid to state, that I never had an opportunity of trying woollen-nets, which are much recommended by some.

I may add, that I often use straw-ropes to protect pease, beans and potatoes, &c. from the effects of the cutting frosty winds which frequently prevail in the spring. I fix the ropes along the side of the rows, by means of pegs driven into the ground, and find them exceedingly useful.

PORTMORE GARDEN, }
8th Jan. 1813. }

LI.

Observations on a new kind of Ground Onion, introduced into Scotland by Mr JOHN BURN of the Royal Navy.

Communicated to the Society in a Letter from Dr ROBERT CUMMING, Dalkeith, to the Secretaries.

(*Read 10th March 1812.*)

I beg leave to lay before the Caledonian Horticultural Society, a specimen of a new kind of onion, brought into this country by Captain John Burn, of the Royal Navy, and for which reason, I call it the Burn Onion.

The plants herewith produced to the Society, were reared in a garden at Leith, during summer 1811.

Captain Burn planted twenty-three onions in April last, and notwithstanding the severity of the spring, which completely checked and blasted many other plants (that were early sown), the Burn onion flourished, and during the

month of August, produced upwards of 600 fine plants. The circumstance in which they differ principally from our common onion, (viz. that produced from the Strasburgh and Deptford seed,) is, that the Burn onion is larger. In taste, the quality is the same. But it has a material advantage over the seed onion, in this particular, that if planted about the middle of April, it will be fully ripe about the same time in September. It is a well known fact to gardeners and others, that the seed onion, after being put in the ground, is liable to sundry casualties, viz. that the seed itself may be bad in quality, as has been repeatedly experienced in this country; that a very dry season, or even a very wet season, produces very indifferent crops. But the great advantage the Burn or ground onion has over the seed onion, is, that no instance has yet occurred, where it has been injured by vermin or insects,—a very frequent occurrence with the seed onion.

Captain Burn was so kind as to give several gentlemen plants during last spring 1811, viz.

To Mr Ebenezer Bell, 2 plants, which produced 12.

Mr Douglas, 2 ditto, produced 15.

Mr Shiels, 1 ditto, produced 15.

Dr Cumming, 2 ditto, produced 15.

And Captain Burn himself planted 23, which produced 600.

These are believed to be the only plants of this ground onion in Scotland. I flatter myself, therefore, that by giving the specimens herewith sent, I have done what will be acceptable to the Society. And I request, that you will be pleased to give them to such members as the Society deems proper, in order to promote their growth, and to multiply them in Scotland.

Directions for planting the Ground Onion, from Egypt, or the Burn Onion, as some have named it.

Let it be planted in any ground thought suitable for the common onion, meliorated with well-prepared horse dung ; cover the plants with only one-half inch of earth. The best time for planting them is during the month of April. Let them be a foot or eighteen inches asunder. They will grow in clusters like currants or grapes. Some will grow round, others will grow conical ; those on the surface will be the largest ; those in the centre will be soonest ripe ; and they should be taken up as they ripen. If they be intended for keeping, they may be taken up before they are completely ripe.

Those who wish for farther information respecting this onion, may apply to Captain John Burn, Royal Navy, Tobago Street, Edinburgh.

*Some Additional Observations on Mr Burn's
Egyptian Ground Onion. By A. DUNCAN,
senior, M. D.*

Some time ago, a letter was read in the Society, respecting a ground onion introduced into Scotland by Mr Burn, of which Dr Cumming produced several specimens raised in his own garden.

Mr Burn informed me, that he obtained a few of these onions from a friend in Cornwall, to whom they were given by a gentleman who had brought them from Egypt. And he was kind enough to favour me with two of those which were the produce of his own garden. They were roots of a moderate size, and were each about an ounce in weight.

These two onions, I planted in my own garden about the beginning of May 1812. They produced during the course of the season, pretty large and apparently vigorous plants, but shewed no flower or seed. The plants began to decay about the beginning of August. But I did not raise the produce from the ground till the beginning of September. I then found, that one of the roots had produced nine onions, and the other twelve. These were of very different sizes; but the whole taken together, weighed more than a pound.

LII.

Observations respecting the Lactucarium.

By Mr ARCHIBALD GORRIE.

In a Letter to Dr DUNCAN *senior*.*(Read 14th September 1813.)*SIR, *Rait Garden, 29th July 1813.*

YOUR observations on the preparation of soporific medicines from garden lettuce, inserted in the 2d Number of the Memoirs of the Caledonian Horticultural Society, and the medical qualities which you have found the lactucarium to possess, induced me to try some experiments, to obtain that opium-like substance, without the aid of alcohol.

I need not trouble you with a detail of unsuccessful experiments. Suffice it to say, that the easiest way I have found of collecting it, unmixed with any other substance, is to scrape off the milky juice off the wound, within an hour after the wound is made ; by this time the milk

will be a good deal congealed, and comes off freely: it may then be laid on an earthen plate to dry in the sun. To allow the lacteal juice to remain on much longer than an hour, endangers its mixing with a watery juice, which issues from the interior part of the wound, and which is afterwards evaporated or reabsorbed into the lettuce stem, leaving an inseparable crust over the wound.

I take the liberty of inclosing a small specimen of the dried milky juice; and as the mode of collecting is both easy and simple, it would be highly gratifying for me, to hear from you, whether the specimen sent, has retained the virtues of your lactucarium, which, if it does, you are at liberty to communicate, or use as you please. My only ambition, is, in this instance, to meet the wishes of one who has deserved so well, not only of the medical world, but of every practical gardener. I am, &c.

LIII.*On the Allium Canadense, or Tree Onion.*

By Mr GEORGE NICOL, Overseer, Meadowbank Nurseries.

(Read 14th September 1813.)

THE time at which this valuable bulb was introduced into Britain appears to be uncertain; and as far as I can learn, it has never been cultivated to any extent: Next to the *Allium cepa* (common onion) and *porrum* (leek), it promises to be the most useful of all the genus. The numerous failures that have of late years occurred in the onion crop, chiefly from non-importation, and the bad seasons we have had for ripening home-growing seed, directed my attention to the *Allium Canadense*, as a substitute, in part, for keeping onions. Imagining, that a plant of this sort, coming from a country such as Canada, where, in many places, the winter is long and very severe, would have some other property than mere curiosity, which has hitherto been

the only cause of its propagation here ; I considered it in another point of view, namely, to make it useful.

Three years experiments have enabled me to give the following account of this species of onion.

The root-bulbs, when two years old, put up a stem from thirty inches to three feet high, on which good sized bulbs at top were formed : from these others pushed out of a second size ; sometimes a third set is produced still smaller ; but the first and second size are the only ones fit for planting. About the end of August the top-bulbs are fit for gathering, and should be carefully dried in a shady place, then laid in a dry airy place till the season for planting. At this time the old stool bulbs should be lifted ; they will most of them have one or two onions at them, of good quality, all of which will keep in perfect order till the first or middle of May.

About the last week of April is the most proper season to plant the young top bulbs for a crop, for if sooner planted, they are apt to push that season, and neither produce good root-bulbs nor top-bulbs. The old roots should be planted any time in February or March, as early planting makes them produce good bulbs at top : the young bulbs of the first size should be separated and planted in rows in any good garden ground, in an open situation, six inches by four : the se-

cond size in rows six inches by three, in shallow drills, not very deep, as it spoils the swelling and ripening of the roots.

All of them will produce onions of good size, that will keep till the middle of May, if taken care of. The old stool bulbs, if they are not all wanted for planting, will keep equally well, as in general they produce two or more bulbs each ; and after a sufficient stock of stool bulbs is got, they may be used with the other principal onions.

The old roots are the best to plant again for a crop of top bulbs, as they are the most sure to run to stems.

I have never known them to be infected with vermin in any stage of their growth : the reason I think is, they are of quick growth, and come to maturity before the season that vermin generally attack spring sown onions, as I have often observed, that onions sown in August and September, and allowed to stand for next year's crop, are seldom or never affected, even on light dry ground.

Besides their long keeping, they are a strong well flavoured onion, equal, if not superior, to many of the varieties of the common onion.

The cultivation of them, I think, cannot well be extended beyond private gardens ; as on account of the great quantity required by market gardeners, they could not pay attention to them with

profit ; but if Noblemens and Gentlemens gardens were provided with a certain quantity of stool bulbs, it would render them independent of the failure of their crops of common onions ; and I am convinced, if their cultivation was generally understood, they would be grown with both pleasure and profit.

Specimens sent.

- NO. 1. The old stool bulbs that have produced young bulbs this season.
2. The root-bulbs produced from the principal top bulbs after the first planting.
3. A clump of root-bulbs produced from the second sized young bulbs, without being separated when planted.
4. Young bulbs of this year's growth, that are to produce next year's principal crop.

LIV.

A Report respecting Can-flues in Hot-houses.

By Dr DUNCAN senior.

(Read 14th September 1813.)

IN the first number of the Memoirs of our Horticultural Society, Collector Lorimer of Dunbar, has given an accurate account of what he considers as an improvement in the construction of the flues of hot-houses, by employing earthenware tubes, in place of stones, bricks, or tiles. As I had lately occasion to pass a few days in East Lothian, I took that opportunity of visiting some hot-houses on this new construction. It gives me much pleasure to be able to inform the Society from ocular inspection, as well as from the report of men, on whose testimony the greatest confidence may be placed, that this new mode of construction has been attended with remarkable success.

My visit to East Lothian took place about the beginning of August, and on the 12th of the

month, I visited the grape-houses, both of Mr Lorimer at Dunbar, and of Mr Burnet of Viewfield. Although, prior to that time, they had cut many grapes, yet in the vineries of both, I found remaining a most abundant crop of grapes, and those of the best quality. I found a very great crop, not only on those vines which are esteemed the best bearers, but also on those, as the Frontiniac, which are in general less productive. And all of them, produced as fine grapes as I ever recollect to have tasted in the course of my life, either in Britain or in any other country, even at the village of Constantia at the Cape of Good Hope.

Two days after I had seen Mr Lorimer's grape-house I had an opportunity of visiting the hot-houses both of the Duchess of Roxburgh at Broxmouth, and of Sir James Hall at Dunglass. These also are constructed with the can-flues on the plan described by Mr Lorimer. And in both, this construction promises to be attended with very great success in the culture, not only of grapes, but also of peaches and nectarines.

From the information I received, I have no doubt, that, by means of the can-flues, two very great advantages will be obtained; first, an equal degree of heat may be had from much less fuel; and, secondly, the same degree of heat may be easily supported, with much greater uniform-

ity, both during the day and the night. To obtain any heat in the air of the hot-house, when the flues are built of brick or stone, a strong fire is required, which is very apt to give too much. But with the can-flues, a very little fire, burning very slowly, will give out a sufficient degree of heat. Upon the whole, from what I have now seen, and from what I have heard on good authority, I have no doubt in considering the introduction of can-flues into gardens, as being an important improvement in horticulture.

Can-flues may easily be made by any potter. Those employed by Mr Lorimer, were furnished to him by Messrs George and Robert Gordon, potters, at Morison's-haven, near Prestonpans, in East Lothian. They are made of fire clay, which seems to possess some advantages over common clay.

LV.*On excluding Wasps from Hot-houses.*

In a Letter from Mr JOHN DICK, Gardener at Bal-
lendeau, to Mr NEILL Secretary.

(Read 14th September 1813.)

SIR,

I NOW submit to the Caledonian Horticultural So-
ciety, a method, confirmed by actual experience,
of keeping wasps out of peach-houses and vine-
ries, where they often destroy both the grapes or
peaches. I send you a small model of a hot-
house, covered with a kind of cloth, called
scrim, which answers that purpose extremely
well. I thought a model, shewing the method
of putting it upon the hot-house, would give
a clearer idea of the plan than any description
would have done.

The cloth is made in the form of a sheet or
sail, to answer the dimensions of the house; and
is bound round the outsides with a kind of tape
like the pattern. Barking it like the fish nets,
would be of service. However, it will do, with

or without it, as convenience may answer. The cloth is about a yard in width; and is sold at about eightpence or ninepence per yard. There is another kind a little different, but higher priced.

When the grapes are beginning to ripen, or the wasps make their appearance, it is time to put on the cloth in the manner shown upon the model, with small tacks; and only in such a way as will let the sashes go up and down: the cloth will not need to come any farther down, than the bottom of the top sashes: that is the reason why I have covered the model with a little rough draught on paper, of two sashes half down and two up. The cloth is so very thin, that it will permit plenty of air to pass, and yet no wasp will attempt to go through. It does not exclude much of the sun, and will not hurt the grapes in the smallest degree.

If the hot-house stand by itself, or in the middle of a *range*, you will see by the cover upon the door of the model, how to prevent them from getting in, when any person is passing from house to house. The cover being fastened at the top of the door with small tacks, as upon the outside roof; and the sides of it, upon small hooked wires, can thus be taken off at one side, when passing out of or into the house: and if the door is wanted to stand open

for air at any time, it will answer for the same purpose.

When the house has sashes in front, the cloth may be nailed upon the outside or inside, according as the sashes shift with the hand, or are drawn up and down with a rope, still giving plenty of air when wanted. I have never seen a single wasp attempt to go in by the lops of the glass.

There is at Ballendean, one large vinery, about forty years old, with large panes of glass, and no wasps ever get into it; and there is a large new vinery with the lops of the glass all puttied, and the old vinery is as impenetrable as the new one.

I have seen various ways attempted of keeping the wasps from grapes. I have seen the grapes put in paper-bags; but the exclusion of air causes them to damp off. I have seen also gauze-bags put upon them, which is still more expensive, and gives a good deal of trouble. But the above method, shewn by the model, gives free air and free access at all times, and preserves the grapes in good order: besides, it is a pleasure for the proprietor to go into the vinery and pull the grapes without molestation from wasps, instead of going into a vinery resembling a hive of bees buzzing about one's ears.

When the fruit is all cut, the cloth should be taken off and well washed, and then kept in a

dry place until needed again. If any noblemen or gentlemen try the above recommended method, they will find themselves amply rewarded for their trouble.

If the Caledonian Horticultural Society wishes more information, they may, by desiring any of their members in this neighbourhood, to call at Ballendean, find the truth of the above statements and get any further information they may wish.

I have also sent a contrivance of a small instrument for pulling fruit, by which a lady or gentleman may pull fruit off standard trees and wall-trees with the greatest ease.

The instrument is all nicked out round the mouth: there are three small nicks for cherries, and the large ones are for large fruit; the inside of it is lined with velvet, to keep the fruit from being hurt; the velvet comes out at pleasure. When the fruit is to be taken down, the stalk of the apple, pear, peach, apricot, cherry, or nut, is put on one of the nicks, and by a gentle pressure to one side, the fruit comes off, and falls into the inside of the instrument quite safe. The instrument goes on a socket, put upon the end of a small rod, like a bayonet, and goes off and on at pleasure: the rod can be made of any length that is wanted. There is also a small hook, that may be used for taking

down fruit off standards, which will steady or pull down the branch, when taking down the fruit. It is very useful for taking down a few fruit for table, or any purpose; and almost any person may use it with facility.

Similar instruments, I understand, have been used in England; but I never had an opportunity of seeing any of them. I am, &c.

JOHN DICK.

BALLENDAN,
12th Sept. 1813. }

LVI.*On preventing Hares and Rabbits from attacking the Bark of Trees.*

In a Letter from Mr JOSEPH SMEALL, Gardener at Millburn-Tower, to Mr NEILL, Secretary.

(Read 14th September 1813.)

SIR,

WHEN I came to Mr Liston's service six years ago, I found that the young apple and pear trees which had been previously planted in the garden, were much injured by hares and rabbits eating the bark during the winter season. I endeavoured to find out a remedy, and am happy to think that I have completely succeeded. It is very simple, and attended with little expence, and I beg leave to communicate it to you, for the benefit of the members of the Society.

Take hog's-lard, and as much whale oil as will work it up to a thin paste or paint. With this, gently rub the stems of the trees upwards, at the

fall of the leaf. This may be done once in two years, and will be found effectually to prevent either hares or rabbits from touching them.

The innocent nature of the ingredients of which the composition is made, renders it unnecessary for me to say, that the trees are not injured by the application in the slightest degree. I am, &c.

JOSEPH SMEALL.

MILLBURN-TOWER,
24th August 1813.

 LVII.
On preventing the Mildew on Peach-trees.

In a Letter from Mr JAMES KIRK, Gardener at Smeaton, to Mr THOMAS DICKSON, Secretary.

(Read 14th September 1813.)

SIR,

I BEG leave to submit the following observations, to the Horticultural Society, on the mildew upon peach-trees.

For more than nine years I have not had a mildewed leaf on any of the numerous peach-trees that are in the garden of the Honourable Mr Baron Hepburn at Smeaton, either in the hot-houses, or upon the open wall.

I ascribe this exemption from mildew, to my mode of management; which is this: In the months of January and February, if I see any of the trees in a stunted or sickly state, I take away all the old mould from the roots, as carefully as possible, and put in its place, fresh

rotten turf from an old pasture, without any dung. This I have done in many instances; and all the times that I have practised it, the trees have never failed, not only completely to recover their health, but to produce a crop of fine swelled fruit.

This being the whole operation, I have only to subscribe myself, &c.

JAMES KIRK.

SMEATON, }
11th Sept. 1813. }

LVIII.

Essay on the preparation of Opium in Britain.

By JAMES HOWISON, Esq. Crossburn House, Lanarkshire.

(Read 14th December 1813.)

“ *It is better to walk than to run ; to stand than to walk ;
to sit than to stand ; to sleep than to sit ; and death
is best of all.*”

GENTOO CODE.

It is necessary to premise to the Society, that the accompanying specimen of opium, was made under circumstances, as to soil, situation, species of poppy, distance planted, instruments used for extracting and gathering the milk, and future preparation, which, after much experience, I consider as best suited to the climate of Britain.

I am therefore of opinion, that a short account of the steps followed by me, under each of these heads, will convey to the Society a more distinct idea of my method, than any other arrangement I could adopt.

1. *Soil.*

A rich light black soil of considerable depth, is most favourable for the growth of poppies. In Bengal where 200,000 lbs. of opium are

made annually, notwithstanding the soil is entirely formed from the deposite of the Ganges, the Hindoos constantly apply manure to their poppy crops, and to these only. This added to my own experience, leads me to think that there is little danger of poppy land being too rich.

2. *Situation.*

As poppies send down long tap roots, with few lateral fibres, and with their large heads rise to a very considerable height, they of all crops are the most liable to be hurt by winds. A sheltered situation where these prevail, is therefore indispensable, otherwise a very small proportion of the crop will be found standing when the season for gathering the opium arrives.

3. *Species of Poppy.*

After many trials with the large single white poppy, I have now entirely given up its cultivation, for the purpose of making opium. Independent of the objections stated under last head, to which, from its great size and height, it is peculiarly liable, it never in this climate arrives to that perfection as to yield milk of proper consistence for making good opium. I cannot say in the usual sense of the word, it does not ripen, for although upon wounding the capsule, not a drop of milk appears, or that of a very watery consistence, still the seed will grow well. The white poppy has another great de-

fect, viz. the few that arrive at a state to afford good milk, only continue so for a day, and any attempt to bleed them a little sooner, or later, would be without success. I therefore give the preference to the double red garden poppy, and its varieties, as being in a great measure free from all the above objections.

It is proper, however, to notice here, that the large single white poppy, is that universally cultivated for opium in Bengal, and that in some experiments I made with it about ten miles from London, I found its milk more in quantity, and better in quality, than in Scotland; still its period of giving it is very limited. Owing to the advantages it has from its great size; it is not improbable that, in warm climates, where high winds seldom prevail, it would be entitled to a preference over every other species.

4. *Distance.*

This is a circumstance of more importance than at first sight would appear, as the expedition in bleeding and gathering, depends greatly on the regular distance of one plant from another. Near London, the fields of poppies for the use of the druggists, are all sown broadcast, owing to which, I found more time necessary to bleed 100 poppies, than would have been sufficient for 1000 on the drill system; and what was worse, half of the crop broken down and trampled.

upon, before the opium from the remainder could be gathered.

I therefore divide my poppy grounds into four feet beds, with alleys sixteen inches wide. On those, about the end of March, I sow four drills, which admit of their being $9\frac{1}{2}$ inches from each other, and when the plants are of a proper size, I thin them out to the same distance in the rows. By this arrangement, the labourers can bleed and gather from two rows in going up, and the same number in coming down, without breaking or missing a single poppy. To prevent the crops being all ripe at the same time, it is necessary to divide them into different sowings, allowing a few days to intervene between each, and as the poppy stands the winter of this climate, the early crops might be sown during the August of the preceding year.

5. *Extracting the Opium.*

As the poppies sown about the end of March will begin to change from green to white about the middle of July, this crisis must be watched with some attention, as marking the period for commencing the bleeding, and which if neglected for but a few days, the opium of that crop would be completely lost.

It is to the alterations I have made in conducting this part of the process, that I consider my method as having a decided advantage over that

formerly in use, especially for manufacturing opium in Britain.

In Bengal the instrument used for wounding the poppy heads, is a small knife, fixed in a wooden handle, with which the labourers make three or four longitudinal incisions, according to the size of the head. From the peculiar structure of the vessels containing the milky fluid, they are so instantaneously emptied, that a second wound being given on the opposite side of the capsule, following the first as quickly as possible, will not yield a fourth part of the milk. This circumstance would have rendered one wound sufficient, had it not been necessary to spread the flowing milk on a large surface, and thereby endeavour to prevent its running upon the ground, by which, after all their care, one third of the crop is lost.

To obviate this inconvenience, the Society will observe, that the instrument employed by me for the same purpose, consists of a brass ring made to fit the middle finger of the operator, in which is fixed a wheel set with lancets, which, when put in motion, by drawing the hand along the poppy head, makes, with great expedition, whatever number of perforations are wanted, each giving out its distinct drop of milk, by which a great surface is afforded both for support and evaporation. By this instrument, the milk vessels are rather perforated than

cut, which produces more a slow exudation than a wasteful stream, the unavoidable consequence of the method formerly in use. In this wet climate, it is attended with another advantage, the saving the seed, which is in general lost when the incisions are made into the capsule with a knife; these naturally enlarging, admit of the rain, which instantly causes the seed to germinate.

6. *Gathering the Opium.*

The difficulty of accomplishing this, with any degree of success, has justly been considered the principal obstacle to the manufacture of opium in Britain.

In Bengal, where the rains are so periodical, that during the opium gathering season it may be predicted that none will fall, with nearly the same certainty as that the sun when set will again rise, the custom of allowing the milk to thicken, by remaining for a time on the capsule, is highly judicious. But in this climate, where the serenest day is often followed by a night of deluging rains, adopting that plan, would be worse than trusting our fortune to the chance of a lottery.

From my being convinced, that the juice of the poppy undergoes no change in its properties by exposure to the air, farther than acquiring a greater consistence from the evaporation of its

watery part, I divide my labourers into two parties, *bleeders* and *gatherers*, the former going before the latter more or less, according to the appearance of the weather; by which arrangement, the gathering *immediately* follows the bleeding, unless both are prevented by rain. Were I to follow the Bengal method, the produce of the day's labour, however extensive, would be completely lost by a single shower during the night.

For gathering, I use the tin flask, sent for the inspection of the Society, instead of the knife and cup of the Hindoos. By this change, it is evident, that much is gained in the saving of labour. The opium by them is first collected with the knife; and by a second operation deposited in the cup; whereas my gatherers scrape the opium off with the mouth of the flask, which is flattened about half an inch for that purpose, and which at the same time conveys it into the flask, which is calculated to hold a day's gathering. The small cord attached, is intended to hang the flask to a button, or button-hole, to save the trouble of placing it on the ground when the hand is wanted for any other purpose.

On finishing the labours of the day, the milk collected is put into a shallow vessel, and afterwards exposed to the rays of the sun, in a room

where there is a free circulation of air. As the black coats form on the surface of the milk, these are to be forced down, until the whole acquires a proper colour and consistence. Were the manufacture of opium attempted on a large scale, a drying house would be necessary, as in this climate the evaporation from the heat of the sun alone is too slow. If built upon the plan of a hot-house, it would answer completely, as by placing the vessels containing the milk upon the flues, the additional heat wanted would be obtained, while the rays of the sun would have free access to the milk, through the glass.

Conclusion.

Although, with all our improvements, there is but little probability of our ever making opium in Britain, in sufficient quantity to form an export, there can remain no doubt of the practicability of preparing it with advantage, to answer every domestic purpose.

To the amateur gardener, and the members of his family, the cultivation of the poppy, and preparation of the opium, to an extent sufficient for the supply of himself and neighbouring poor with that valuable medicine, might constitute a rational and delightful amusement.

The cake of opium from which the specimen sent was taken, weighed eight ounces and a-half, and was collected from a field of poppies, mea-

asuring about five falls, by a young lady, in the course of a fortnight, the bleeding and gathering being wholly done by her at her leisure hours, with the instruments now under the inspection of the Society.

It is proper to state, that our situation here is more distant from the sea, than almost any other in Scotland ; is subject to frequent rains, and in consequence has little sun, the presence of which I consider as essential to the production of good opium.

CROSSBURN HOUSE, }
30th Nov. 1813. }



The Prize Medal proposed by the Caledonian Horticultural Society, was awarded to the specimen of British Opium sent with the preceding paper. That specimen was afterwards put into the hands of Dr Duncan *senior*, that it might be tried in actual practice. During Dr Duncan's attendance on the Clinical Wards in the Royal Infirmary, from the beginning of February to the end of April 1814, he had many opportunities of exhibiting it ; and he repeatedly mentioned in his lectures, when speaking of particular cases in which it had been employed, that Dr Howison's British Opium, had proved, in its power of inducing sleep, of alleviating pain, and of restraining looseness, in no degree inferior to the best Turkey Opium.

Many Students attending the Clinical Wards, had also the same opportunity of witnessing its efficacy.

LIX.

*Information regarding the Carlisle and Keswick
Codlin Apples, extracted from various commu-
nications on that subject, addressed to the Right
Hon. Sir JOHN SINCLAIR, Bart.*

(Read 14th December 1813.)

THE Carlisle Codlin possesses the peculiar property of being fit for use at an earlier period of its growth than any other apple, making an excellent tart when no bigger than the smallest plum; at which time also it is even useful to thin the crop. If blanched in boiling water, when of that size, the outer rind slips off, and they may be baked whole; their colour is then a transparent green; and their flavour is exquisite, resembling that of a green apricot. When it is about the size of a large nutmeg, it may be made into apple marmalade, or a dried sweetmeat, which rivals the finest Portugal plum. When fully ripe, in the beginning of October,

it is not only much admired for baking, but is reckoned by some a good eating apple. It keeps well till February, when properly attended to.

The tree is hardy. It thrives without any particular attention, and may be planted nearer together than most sorts of apples. It does not seem to be subject to disease, and is supposed to be, on the whole, less liable to suffer in bad seasons than other apple trees. If propagated by slips, it generally bears soon, (in the course even of the first or second year); but when grafted, not earlier than other kinds, nor is the fruit reckoned so fine. The best, though not the usual mode of propagation, is, by slipping off small branches, which, near their junction with the stem of the tree, put out a sort of excrescence, with half-formed roots, similar to that of the apple called *Burknot*. The produce must of course depend upon the size of the tree, and other circumstances; but when properly treated, the trees are generally *loaded with fruit*, which ought to be removed *in succession*. Full grown trees will yield from ten to twelve Winchester bushels of fruit, worth from 8s. to 9s. per Winchester bushel. In England, they are frequently sold by the *hoop*, which contains in measure six quarts, and in weight is equal to one stone, fourteen pounds to the stone.

These trees are sometimes, but too seldom, planted in the gardens of the Cumberland cot-

tagers, comparatively few of whom are possessed of gardens. Horticulture, indeed, is only in its infancy there, and is hardly yet become an object among the peasantry, who cannot be persuaded to throw away their time, as they are too apt to consider it, on gardening.

The Carlisle Codlin requires some degree of shelter, a good loamy soil, which should be frequently manured; it is observed at least, that those trees which are thus managed, invariably produce most fruit.

The Keswick Codlin tree has never failed to bear a crop since it was planted in the Episcopal garden at Rose Castle, Carlisle, twenty years ago. It is an apple of fine tartness and flavour, and may be used early in autumn. The tree is a very copious bearer, and the fruit is of a good size, considerably larger than the Carlisle Codlin; but it begins to decay in the end of November or beginning of December, and consequently it is desirable to have some of both sorts. It flourishes best in a strong soil.

Both the Carlisle and Keswick Codlin produce fruit, which may be used *in succession* from June to January, and even February. Much herbage, and perhaps even potatoes, might be raised under them in the gardens of cottagers; but other roots so planted, would not pro-

bably acquire any size, as is usually the case in such situations.

They may be had from all the nurseries in the north of England and in Scotland: The price is from 9d. to 1s. each. They may be planted at any time from October to March inclusive. They have answered uncommonly well, planted singly, or against a wall, or as standards, at Jedburgh,—in Dumfries-shire,—in Galloway,—and in Fife,—and in some places even near the sea; and are likely to be a very important acquisition to Scotch gardens in general, more especially in the western counties, as Clydesdale, Dunbartonshire, Argyleshire, &c. *

The Hawthorndean Codlin might be tried at the same time, which some have recommended for hardiness and produce.

* In the more southern districts of Scotland, and still more of England, labourers might pay the rents of their cottages and small gardens, by cultivating the Carlisle Codlin, and other fruits.

LX.

On pruning Old-worn out Apple and Pear Trees upon walls, so as to bring them into a bearing state again.

By Mr JOHN YOUNG, Belmont-Castle, Perthshire.

(Read 8th March 1814.)

WE commonly see in old gardens, numbers of apple and pear-trees occupying a great extent of wall, and yet producing but very little fruit, and even what they do carry very inferior in quality to what the tree formerly produced. This may be ascribed, generally, to the great extent of wall that each tree is intended to cover, the consequence of which is, the tree when large, seldom produces fruit, but at the extremities of the branches and if there should chance be a few fruit scattered over the body of the tree, from their being produced from old cankered spurs, they are generally hard and kernelly, so as to be scarcely fit for eating.

Having once entered to a place where a great number of the trees were such as has been above described, being completely covered with long cankered spurs, considerably advanced from the wall, with scarce any blossom buds upon them, excepting a few upon the extremities, as the heading down might have been considered too great a sacrifice, and probably not been allowed, I bethought myself how they might be renewed, at the same time retaining the chance of what fruit they might produce. Therefore, in the winter pruning, I thinned out all the coarse and cankered spurs, particularly those that had no appearance of blossom, regularly over the whole surface of the tree, reserving all such as were best situated, and all that had blossom upon them, so as the tree might be regularly furnished, and not have a naked appearance. After this discipline, the trees made fine vigorous shoots the following summer, from the roots having less to support; and in the summer dressing, I selected a number of the best of the shoots in different parts of the tree, (particular near the stem where they could be laid in conveniently,) and trained them in at full length between the branches, taking off any long barren spur on either side, that shaded the new laid in shoot, so as to admit all the sun and air possible.

The second winter's pruning, consisted in thinning out any of the remaining cankered barren spurs, regularly over the tree, on each side of the young shoots. And in the following summer, a few more young shoots was laid in, always making as much room for them as possible, by displacing barren spurs as they advanced in length; and in autumn I had the satisfaction of finding all the shoots laid in the preceding summer, full of fine blossom-buds.

The third winter, the trees were gone over as before, and all the spurs that remained upon the old branches, on either side of the first laid in shoots, were entirely taken off, so as they might have all the influence of the sun and air; and in the succeeding spring, the first laid in shoots pushed fine healthy blossom, which set kindly, and continued through the summer to swell freely, so that at the time of gathering the crops of the respective kinds, they had by far exceeded my most sanguine expectation, they being large and clean-skinned fruit, whereas what was produced upon the old branches, were very inferior in quality, so much so, that, had the produce of the old branches and those of the new shoots been laid in separate parcels, no person could have supposed them to be the produce of the same tree.

In the end of autumn, the third season, the state of the trees was thus: A considerable

number of shoots that was trained-in the first summer, and which had produced a crop of fruit this, with the appearance of fine blossom-buds for next season upon their extremities: The shoots of the second summer full of fine bold blossom buds, and a few more shoots trained-in this summer in regular advance to continue the succession. The plan that I had formed for myself, for their future management, was this: In the following winter's pruning, to have cut out a number of the worst of the old branches, either back to the body of the tree, or to the part where any of the young branches might arise from them, continuing to lay in a few young shoots every summer, as a supply for what was removed, always continuing occasionally to take out some of the old branches till the whole tree was renovated, and a regular supply of young bearing branches produced over the whole tree.—But a change of situation at this time prevented me from following out the practice to the extent I now could have wished, as it would have enabled me to have placed the subject in a clearer point of view.

It seems unnecessary to mention the names either of the apples or pears thus treated, as all the different kinds succeeded equally well.

I have been led to think, from the above practice, that we generally give apples and pears too much space of wall, as by the time they

reach their utmost limits, they begin to turn barren in the middle ; whereas, by giving them less space, if the walls are of a sufficient height, we may have three trees for two, which, if under a proper system of training, would not only produce more, but also finer fruit, and likewise afford room for more trees, which would, if wanted, admit a greater variety for the dessert.

The Cressane is one of our finest pears, and the tree is a free grower ; yet the trees seldom produce fruit but upon the young wood : I therefore think they might be made to produce better crops and finer fruit, if they were trained in the way we train the peach ; making allowance for the difference of time the young wood of the one takes to produce fruit from the other. This, and the distance at which trees might be planted, I mention only as my own conjecture ; flattering myself the idea may be taken up (if not already done) by other horticulturists, and our doubts removed on the subject.

BELMONT CASTLE, }
16th February 1814. }

LXI.

*An Address to Mr Neill, by the Rubus Chamæ-
morus.*

In a Communication from MR GORRIE.

(*Read 8th March 1814.*)

Benmore, 8th Jan. 1814.

MR SECRETARY,

IT is now more than four thousand years, since I and my progenitors have lived on this mountain, nor has any of us ever before expressed a wish to alter our situation.

In the days of other years, when the lords of the creation, naked as the stem which supports my flower, pursued the deer over these mountains, my condition was not then pitiable, because I was not neglected. The blue-eyed maid pulled my berries ; and, with the other fruits of the hill, prepared a repast for the young heroes at their return from the chace.

In later times, science has led the way to refinement ; and though war still sounds her dire

alarms, the heroes of Caledonia fight her battles in other lands, while her peaceful sons have exchanged the bow and the spear, for the spade and the plough. Her valleys abound with corn, her orchards and gardens are loaded with fruit. The conservatory,—the green-house,—the stove,—the shrubbery,—and the pasture, can boast a more numerous variety of plants, than the mountains of the island.

These strangers are treated with that kind attention, which the charms of novelty never fail to inspire ; some of them may become naturalized, and repay with their beauty or utility, that care of which they are the present objects ; but a long time will elapse, before the native heath of the Cape shall produce a breed hardy enough to resist with me the rigour of the blast on the bleak brow of Larchchellegan.

While such laudable exertions are making in behalf of the produce of other climates, may not a native of the *Caledonian* hills, presume to solicit a small share of the attention of the *Caledonian Horticultural Society* ? I do not mean to ground my pretensions to your regard on the score of beauty, although my flower and general appearance, might even vie for elegant simplicity, with some of your far-fetched exotics ; it is my fruit, Sir, to which I mean to direct your attention. I shall not expatiate on the taste and flavour of my berries, as you might think me a

very incompetent judge of matters on which even human *connoisseurs* are not altogether agreed. I may be allowed to say, however, that crows and Highland shepherds, are so fond of my berries, that they often devour them before they come to maturity.

It may be objected, that I have only one berry on each stem ; but may not art supply that deficiency? Bring my flower in contact with the flower of an Antwerp raspberry ; sow my seeds, and ten to one, but you have some plants with many-flowered stems, and the fruit perhaps improved in flavour. Then would I have a corner in the fruit-garden allotted me, and might have the honour of being served up to the finest companies in the kingdom. I might also become a profitable acquisition to the cottager and market gardener ; for I would thrive in situations and soils, where strawberries could not shew a petal. You may think, Sir, all this is very fine ; but how is it to be accomplished ? We have tried, you will say, to encourage your growth in our gardens, without success. Very well, I believe you have ; but what rational hopes of success, let me ask, could you entertain from the mode in which these experiments were conducted ? A botanist has occasionally visited our mountains in the months of June or July, and fallen in with some plants of us, and, without so much as saying, By your leave, grubbed us up with a few mutilated roots, and

sent us off per carrier in a box to Perth, Edinburgh or London, where we were at length transplanted into a soil, in no one quality resembling our native earth, but that it was black, and part of it had been once in a moor;—in vain did our roots seek for that cooling and exhilarating moisture, to which they had been long accustomed, and which habit had rendered necessary for their existence. If we survived, stunted flowers, and a languishing existence were the natural effects of such sudden transitions.

If you would recommend it to some of your botanical correspondents, to gather some of our ripe berries in August, and sow them immediately in a situation nearer the level of the sea by 400 feet than where he found them, and to sow the seeds of these lower and lower every time he could obtain fruit,—in a short time, possibly, many varieties of our berries might be obtained, and plants that would thrive in any situation.

As some of your correspondents may be as fond of medals as I am anxious to send my breed in an improved state to the Low Country, perhaps it might be a wise measure to offer a medal to the first who shall produce a Scots chopin of our berries, from a situation within 500 feet of the level of the sea, to be produced at the September meeting, four or six years hence. Would not this tend to promote a spirit of in-

quiry into the nature and properties of mountain plants,—of which there is a beautiful and useful variety, particularly of the Grass tribe; and amongst other of its useful effects, you might calculate upon succeeding the Strawberry season with a regular supply of Cloudbberries, from,

Mr SECRETARY,

Your Highland Petitioner,

LUS NAN EIRAG,

LXII.*On the Forcing of Sea-cale.*

By MR WILLIAM GIBBS, Inverness.

In a Letter to MR NEILL, Secretary.

(Read 8th March 1814.)

SIR,

As I have not seen any thing in the Society's Memoirs on the Forcing of Sea-cale, I have sent you an account of the method I have tried. I doubt not but by further trials, considerable improvements may be made on this mode; but at present, I have it not in my power to pursue it further.

It occurred to me, that sea-cale might be forced in a manner similar to asparagus, and I resolved to try the experiment.

I prepared a hot-bed in the same manner as for asparagus; when the heat became moderate, I put a little light earth on the surface of the bed;

then took strong plants of sea-cale three or four years old, which were taken up with as good roots as possible, and placed them closely together on the bed, covering them in with such earth as is used for cucumbers. I then put on the glass, which I covered with double mats, in order to exclude light. In a few days, the plants began to grow, and in about a fortnight a good many of the stalks were fit for use ; and they continued to come in succession for two months.

The size of the stalks did not seem to be stunted or diminished by the removal of the plants ; they were well blanched, tender, and in every respect as good as those forced by any other method ; besides, a greater quantity was obtained in this way than could be had by the common method, and the expence of labour and dung was far less. Although I used glass and mats, (having no other covering at hand,) I suppose boards, or any other covering that will exclude a considerable portion of air and light, will be found to answer completely.

The plants that have been forced in this manner, would not be fit for forcing the succeeding season, unless they were to remain in the same place to acquire strength ; but from being close on the bed, they would not have sufficient space to get strong : therefore, the best way to keep up a succession is, to have at hand a considerable

store of seedling plants in successive beds, a small bed being sown every year. The seeds may be sown in rows about two feet apart, and the plants thinned out to a proper distance in the row. These, when three years old, may be taken up and forced in the manner above mentioned.

It appears to me, that sea-cale may be had in this way fit for use in any quantity, at any season, at less expence, and with greater certainty, than by any other method that I have seen or heard of.

If you think these remarks deserve attention, you may communicate them to the Society. It may induce others to give this method a fair trial, and thus a proper determination may be formed, how far it may be proper generally to adopt it. I am, &c.

INVERNESS, }
22d February 1814. }

LXIII.

On the Renovation of old Peach-Trees in Hot-houses ; and on destroying the Blue Insect on Apple-Trees.

By MR ALEXANDER HAY, Gardener, Newliston.

In a Letter to Mr DICKSON, Secretary.

(Read 26th March 1814.)

1. *Renovation of old Peach-trees.*

SIR,

WHEN I came here in the beginning of June 1812, I found the trees in two large houses, in the worst state possible; in particular, they were overrun with coccus and red spider; and, what was much worse, there was not a young shoot upon them, but what was mildewed its whole length; the few fruit on them, being entirely covered with it, so as to render them useless. I saw there was no good to be expected from such wood next year; and my master being anxious to save the old trees, and recover

them if possible, I resolved to make the attempt. I was satisfied that the ordinary mode of dusting the leaves in summer, with flowers of sulphur, was but a temporary remedy. I therefore resolved to apply this powerful substance in a liquid form, or in the state of a paint. I took two pounds flowers of sulphur, two pounds soft soap, and mixed them well together, with as much boiling water as brought the mixture to the consistency of a paint: I then untied the trees, and cut back every mildewed shoot, to two or three eyes; brushed the trees clean, and washed them with a sponge, dipt in soap-suds. I then anointed them with the above mixture, taking care not to miss a single bit of them, old wood and new. The mixture should be allowed to remain as long as possible on the trees, in order that it may act the more completely. I dressed them again to the trellis, forked over the surface of the borders, and gave them a hearty watering with dunghil drainings.

The above operation was performed in the beginning of June; but it is to be understood, the mixture may be applied at any season of the year. I gave the houses very little air through the day, and kept the thermometer about 74° in the night, till the young shoots that were cut back began to push; gradually letting it down to 55° , at which I kept it nearly for the season, giving plenty of air through the day. The

trees made much better wood than I expected, and which, with the help of the flues in autumn, was pretty well ripened.

The following winter I lifted the border-soil the whole depth and breadth, to within two feet of the trees, replacing the old earth with the following compost: One-half strong loam, one-fourth vegetable mould, and one-fourth well rotted stable dung. I then gave the trees their winter dressing, at same time anointing them with the mixture.

In 1813, I did not begin forcing till the buds were swelling, and then gave no more heat, than I thought would resist frost or damp. We had a middling abundant crop, and of fine fruit; the trees made excellent wood, which ripened well; and this year (1814,) they have as fine an appearance of a crop, as I have ever seen, and not the smallest vestige of mildew or vermin of any kind has been on them, since their first dressing with the mixture. The trees are upwards of twenty-four years old, and have been forced every year.

If the mildew has been brought on trees with age and bad treatment, which was the case here, the above mixture, and renewing the borders, will complete their cure; but it will be necessary to anoint every winter. If it is from a wet or bad bottom, nothing will do them any good, till a kindly bed is made for their roots.

Wounds in peach, or indeed in stone-fruit trees of any kind, are effectually prevented from cankering, by being laid over with the mixture, and then coated over with tar. I have repeatedly tried this plan, and never once found it fail.

2. *Blue Insect on Apple-Trees.*

When the new gardens at Edmonstone were made in 1809, my then worthy master, the late John Wauchope, Esq. wished to have the greater part of his trees from the London nurseries: accordingly, they were commissioned, and came safe, in good time for planting in the beginning of 1810. On unpacking the apple-trees, I observed a mouldiness all over the plants; but not being acquainted with the blue insect, never having seen it before, I thought it had been contracted in their passage. I planted them, without thinking any thing was wrong. As soon as the trees began to vegetate, I observed them getting worse every week, and in a short time they were quite overrun. I immediately had the trees taken from the wall, brushed and washed all over with a mixture of soft soap, sulphur, and tobacco juice. A pound of each, mixed in about a Scots quart of soft water, was what I used. I saw nothing more of the insects till August

following, when they again made their appearance. I again repeated the dose,—cleared them off a second time,—and thought all was well, as there was nothing of them seen the following winter. In spring 1811, as soon as the trees began growing, I looked frequently over them, and observed the insects some time in May, principally near the lower parts of the trees; but before the end of June, the trees were as bad as ever. I then saw it was an endless business to clean the external parts of the trees, as it was evident from their being first seen on their under parts, that the insects were lodged in the roots, and proceeded upwards with the juices of the tree.

In the beginning of July, I repeated the former operation, and at same time opened the earth about their roots, cleared them as well as I could, not to loosen them; and, having a large quantity of the following mixture ready, viz. about forty Scots pints of soap-suds collected from the washing-house; the juice of 4 lbs. roll tobacco; 4 lbs. flowers of sulphur; I gave each tree about one Scotch pint of it, gave it time to absorb, and closed the earth about it.

I happened to leave the place at Whitsunday 1812, and from the above date, viz. July 1811, there was not the slightest vestige of them seen.

I called at Edmonstone in October 1813, examined the trees, and found them quite clean; at the same time, the gardener who succeeded, told

me he had seen nothing of them since he came there.

I am inclined to believe, that summer is the most proper time for the above operation, as the juices are then in motion, and seem to be much more easily acted upon, than when they are in a dormant state.

I may add, that if any gentleman should chance to get trees that are suspicious, it would be worth while to wash them all over, and soak their roots a considerable time in the above mixture, before planting. I am, &c.

NEWLISTON, }
24th Feb. 1814. }

LXIV.

On the cultivation of the Carnation.

By Mr JOHN MITCHELL, Moncrieff House.

In a Letter to Mr DICKSON, Secretary.

(Read 26th March 1814.)

SIR,

As I have been pretty successful in raising some good varieties of carnations from seed of my own saving, if you think my method will be any way useful to the Society, you may lay it before them, as it may induce others to improve and increase the varieties of that much admired flower.

The carnation (*Dianthus Caryophyllus flore pleno*) consists of several varieties, which florists distinguish by the names of Flakes, Bizarres,

and Picotees. All of these will grow in any soil or situation, and are easily propagated by layers and cuttings; but it is observed when they are kept long on the same ground, they frequently run from a fine striped and variegated, to a self or red colour: therefore, to keep up a good stock of these flowers, recourse must be had to sowing seed; but as the carnation flowers late in the season, it is very seldom ripe seeds can be obtained in the open air in this country.

My practice, therefore, is, when the plants are in flower, to select what I consider the best, that is, such as have fine long regular pods, not inclining much to burst, with rose-leaved petals, and good colours, rather light than otherwise, or having more white than red. The layers of these I take off at the usual time, put in small pots, and shelter them in a hot-bed frame during the winter. In the month of March, I put them in pots about one foot in diameter; having previously prepared a compost, which consists of a pretty strong light-coloured loam, with a third vegetable mould of rotten tree leaves, and a small quantity of river sand. They are again placed in some sheltered situation, till the month of June, when they are placed on the stage in the green-house. As soon as the flowers expand, if they are much crowded with leaves, I pull out a few to give room to the seed-pod

to swell ; and whenever the flower begins to fade, I pull out the whole of the petals, without hurting the styles or horns that proceed from the point of the seed-pod. I often find it of great advantage, to slit down one side of the calyx, to drain out any moisture that may lodge in the bottom of the cup, which would soon damp and rot the pod : it is likewise very useful, to cut away about one third of the calyx, to encourage the swelling of the pods. The seed is known to be ripe when the pods become a little brown, and hard. They are then cut as they ripen, and hung up in a dry place till near the time of sowing, which is in May.

I sow the seeds in a frame, without any bottom heat ; and when the plants are sufficiently up, I take away the glass, and throw a net over them, to keep the birds from pulling them out. If they come up too thick, I transplant them into another bed, where they continue till they are planted out for good. I may observe, that some of them are longer in coming up than others, and are also very weak and small. These I nurse in pots, as I find them frequently turn out to be the very best sorts, although they sometimes do not flower till the third season.

I have only to add, that every one has not the conveniency of a good green-house ; but

there are very few places where there is not either a green-house, hot-house, or hot-bed frame, any of which will be found very useful to ripen carnation seed. I am, &c.

MONCRIEFF HOUSE, }
1st March 1814. }

LXV.

On the culture of the Carnation.

By MR WILLIAM CRAWFORD, Gardener at North-Park.

In a Letter to Mr NEILL, Secretary.

(Read 26th March 1814.)

SIR,

I SHALL at this time endeavour to give you a short statement of the method I have found most successful for blooming *carnations*.

In the month of November, I begin to collect my compost, which is as follows: one-half fresh sound loamy earth; one-fourth rotten cow-dung, one year old; one-fourth vegetable mould, two years old; one-sixth of the whole, coarse sea or river sand. These ingredients are to be well mixed together in an open exposure, and turned frequently during winter; but before I use the compost, I generally put it through a coarse riddle, such as is commonly used for lime, to reduce

its parts, and take out stones, or any extraneous substances it may contain.

In the end of March or first of April, as the season will permit, I begin to prepare my bed for planting. I make choice of an open situation, and, stripping off the original soil to the depth of one foot, I substitute the compost above prepared. I then plant at the distance of fifteen inches each way. At this period, I always conceived there is the greatest danger of having the plants destroyed by the *cut-worm*, *wire-worm*, or snails. The two former are often to be found near to the plants first attacked, not much above one inch under ground; they may be destroyed, and other plants completely saved; and the snails are kept down by picking them off morning and evening. I always found the dusting of hot lime rather hurtful.

When the flower-stems are grown to the height of eight or ten inches, they ought to be supported with sticks, and as the stems continue to advance in height, the tying up must be continued. The calyx of many sorts contains a great number of petals, which, as they increase in bulk, will burst, if not timely prevented by small slips of wet bass-mat tied round the middle of the pod where it is most swelled, and appears to have the greatest inclination to burst: on the opposite side of the pod, it must be gently opened with the point of a pin, that it may

burst freely from both sides ; if this be neglected, the flower will produce a loose irregular appearance, totally destroying that compact circular form which a perfect flower ought to possess. When any of the flowers begin to open and expand, such should be shaded both from sun and rain by temporary covers ; but when the major part are in bloom, a cloth awning should be placed over the whole. This must be thrown off, or rolled up at every favourable opportunity.

Those who are particularly curious in blowing their carnations strong, carefully extract the weaker pods : in general, three or four pods are as many as ought to be suffered to remain on one plant.

The best time, I think, of laying carnations is, as soon as the plants are in full bloom. The practical part of this operation is so well understood by almost every person who is acquainted with the flower, that I think it needless to say any thing on that point ; only to those who are cultivators of this elegant flower, I would recommend light sandy earth, not too rich, for the purpose of laying, and not to cover the layer above one-half inch deep, that it may have the advantage of the influence of the air. When the layers are properly rooted, which will be the case with most sorts in about three or four weeks after laying, provided due care be taken to keep them moist regularly in hot sultry weather, I

immediately cut them off, and plant them in pots or boxes made on purpose, six inches deep, filled with fine light rich earth, at the distance of three or four inches apart. They are seldom injured by moderate rains or frosts at this time ; but I always wish to have them under cover for the winter in the first of November in as dry a state as possible, to prevent mildew, which they are very liable to contract, if they have not the benefit of a free circulation of air. I am, &c.

NORTH-PARK, }
4th March 1814. }

LXVI.

On the cultivation of the Parsnip, as it is practised in Guernsey.

By Dr MACCULOCH, Woolwich.

(Read 13th September 1814.)

THE great superiority of this root, as cultivated in Guernsey and the neighbouring islands, to its produce in Britain,—the high reputation which it bears among the farmers in those islands, and the very little knowledge of it, which those of Britain seem to possess,—have induced me to lay before the Society, a short account of the methods practised in its culture in Guernsey.

I am inclined to think, that it will be found much more worthy the attention of agriculturists, than has been hitherto supposed, and that it will form a material and valuable addition to the system of green crops, when it shall become better known.

But it is chiefly on account of the power which it possesses of resisting the injuries of frost, that I have ventured to point it out as an object of attention to the Caledonian Horticultural Society. The injury which the green crops, commonly cultivated in the northern parts of our island, suffer from this enemy, is such as to render it highly desirable to find one which shall be exempt from the effects of winter.

It has been hitherto, but generally and carelessly said, and as if the fact was not well ascertained, that this root did not suffer from frost. The unusually severe winter of 1813—14, has enabled me to decide this question most positively; and to name the parsnip, as perhaps the only cultivated root which appears to defy all cold. In the garden of my friend Mr Mathews at Waltham Abbey, a crop of parsnips was suffered to continue in the ground throughout the winter. That land is well known to be wet meadow-land, and was frozen in a solid mass, to the depth of a foot or more. The roots remained unhurt; and while I write, in the beginning of April 1814, they are all putting out their new shoots. This hardiness, which would render the parsnip a desirable object of cultivation in the coldest parts of Scotland, would still more recommend its use to the unfortunate Greenlanders, among whom the esculent vegetables have hitherto been limited to two or three,

and where the parsnip has not as yet been introduced. If other circumstances (the method of culture, the deep ploughing required, and the nature of the soil necessary for this root) do not prevent its introduction into the Highlands, it may eventually be found a valuable substitute for the potato, in many situations where the early frosts often destroy that plant long before the tubers have arrived at maturity. It is no small additional merit, that it is nearly exempt from the attacks of insects; and from the diseases incident to all our esculent roots, as well as from the effects of cold. In wet springs only, it is remarked, that the plants in Guernsey are sometimes destroyed by slugs, and that extremes of dryness or moisture protracted through the season, are injurious to them.

The superior quality and size of the root in Guernsey, appears to be the result of the long continued care and attention bestowed on it, since there is nothing in the soil of that island, to account for this difference; and since that soil itself is by no means of a very superior quality. The greater part of the island consists of a large foliated gneiss, impregnated with a considerable proportion of iron, and subject to decomposition in the mass, by a process of rotting or gangrene similar to that which occurs in many varieties of the trap family, and among other places very remarkably in Sky. The result is consequently a

gravelly loam. It is remarked by Mr Young, that the parsnip requires a rich putrid dry sandy loam; and he discourages its cultivation where the soil is not of this desirable quality. This is assuredly not the character of the soil of Guernsey, where the cultivation is successfully carried on, even in situations where the land is stiff, cold and wet. An open and loose soil is obviously necessary, to allow of the growth and descent of the long-rooted variety; but it will be observed by and bye, that two varieties are in use, of which the one is much shorter than the other; and consequently better adapted to soils of no great depth.

These two principal varieties cultivated in Guernsey, are known by the names of the *Coquaine* and the *Lisbonaise*.

The first of these roots is the finest, and sometimes runs four feet deep. It is rarely so small in circumference as six inches, and has been known to reach sixteen. The leaves of this variety grow to a considerable height, and proceed from the whole crown of the root.

The *Lisbonaise* does not extend to so great a depth as the *Coquaine*; but the root is as good, and is preferred by many farmers, since that which is lost in length is gained in thickness, and it does not require so deep a soil. Though the crown is equally large in this variety, the leaves are small and short, and only proceed from

its centre, in which there is a hollow or cup. The root terminates rather abruptly, in small fibrous radicles.

There is yet a third variety, known by the name of *Fourquée*, (forked,) which appears to be only a modification of the last, and which, although still cultivated, is less esteemed.

On comparing the dimensions of these roots with those of the variety cultivated in Britain, it will be seen, that the former are much superior; and it is supposed, that their qualities in Guernsey are also superior to those of our varieties. It will likewise be seen, that they can produce a heavier crop in that island on the same extent of ground.

From these considerations, it would be advisable to cultivate the Guernsey varieties in this country, by procuring the seeds from that place, and to abandon those whose produce seems in every respect inferior.

Although this root is cultivated in almost all the soils of that island, that is esteemed the best which consists of a good light loam, the deeper the better. If the loamy soil is not deep, the under soil at least should be open, to allow of the free penetration of the roots.

If the land is not perfectly clear from couch-grass and other weeds, it is pared with the paring-plough in October, and harrowed, to remove the weeds. About the middle of February, the

land is prepared for sowing by means of two ploughs. A small plough precedes, and opens the furrow to the depth of four inches, and is followed by a larger plough, drawn by four or six oxen and as many horses, which deepens the furrow to ten or fourteen inches. This plough is called the *Grande Charrue*, and as the small farms into which Guernsey is divided, do not admit of such an army of cattle in the possession of any one farmer, this work is performed by a contribution of the neighbours, who are repaid by the like joint-stock assistance, the whole being attended with a holiday-like bustle, that cannot fail to surprise a stranger. I need not remark, that a more accurate system of husbandry could accomplish the subsequent trenching and turning up of the first furrow with much less force. The spade is used for this purpose in some parts of France as well as in Jersey, but is less expeditious and economical than a judicious use of the trenching-plough. As soon as the clods are capable of being broken, the harrowing commences, and is repeated till the soil is pulverized, and reduced nearly to the state of garden mould. The whole of these processes are intended to loosen the soil to as great a depth as possible.

The seed should not be more than a year old, as it is uncertain when of a greater age. It is sown broadcast, and in a day just so windy as to

insure its regular spreading over the surface. The seed is then covered by the harrow. The quantity sown is from half a *denerel** to one *denerel* per *vergée*. The half *denerel* is judged sufficient, but many farmers sow the whole, to enable them to harrow the land before the first weeding, by which means, they destroy so many weeds as to save much of the after hand-weeding. As soon as the plants are sufficiently strong, they are hand-weeded and thinned; and this operation must be repeated at least three times during the summer. The distance between the plants is ultimately about nine inches; and, to save a portion of the labour, a harrowing is sometimes given between the first and second weedings. The expence of weeding a *vergée* three times, is 50s. I believe that the practice of drilling and horse-hoeing, by which much labour might probably be saved, has never been attempted in Guernsey, where agriculture has not arrived at that perfection which it has attained in this country, and where, from the infinitely small division of property, and consequent size of the farms, with the almost unavoidable attachment to antient practices which accompanies

* The *denerel* is four quarts; the *vergée* 17,640 square feet; 2.46 *vergées* are equal to an English acre, which consequently gives about ten quarts to the acre. The price of parsnip seed while I write, is 2s. 6d. the *denerel*, making the whole expence per acre nearly 7s. 6d.

these circumstances, its operations are in general antiquated. It is indeed said, that in other countries, where this method has been tried, it has not been found to answer so well as the system of broadcast culture.

The first weeding is performed about the middle of May, or it may be earlier or later according to the state of the plants; it is repeated when necessary, till the beginning of July. The distance at which the plants are allowed to remain, is greater in Guernsey than in England, where they are suffered to stand at six inches asunder.

Although the general practice is that which I have now described, the seed is sometimes sown at the latter end of September or beginning of October, and the plants are found to pass the winter well, and produce a good crop. It is supposed that they may thus become strong before they can be injured by weeds. There is also some variation in the time of the spring sowing. Where the soil is a rich sandy and dry loam, the seed is sown early in January; but the general period of sowing over the whole island, is from the middle of February to the beginning of March, except in stiff and wet lands, where it is deferred for a fortnight.

The produce per acre, is considerably greater than that of the carrot. A good crop in Guernsey is considered 17,600 lb. per *vergée*, or about

44,000 lb. per English acre. This is a less heavy crop than turnip, but it is much more considerable than that either of the carrot or potato. If we consider, at the same time, that the quantity of saccharine, mucilaginous, and, generally speaking, of nutritious matter in the parsnip, bears a far larger proportion to the water, than it does in the turnip, its superiority in point of produce, will appear in this case also to be greater.

The roots are dug up about the middle of August, when they are thought to be most nutritious, and to fatten animals better than after the leaves are decayed. I do not understand that the green tops are used in Guernsey, although in England they have been found as useful for live stock, as other green food, either consumed in the field, or cut off when the roots are taken up. The quantity dug up at this season, is not more than is required for two or three days consumption. It is only in October that the root is fully ripe, when it may be dug up with forks, and preserved dry in sheds during the winter, but it is usually left in the ground in Guernsey, where frost is rare, and taken up as it is wanted.

The parsnip is considered by the farmers of Guernsey, as the best fallow crop known, and as in the greatest degree influencing the subsequent crop of grain. In Jersey, it is the usual

practice to follow it by wheat. As it draws its nourishment from the deeper parts of the soil, it is evident, that it is particularly calculated to succeed the generality of fibrous-rooted vegetables. If sown, therefore, after a hay or barley crop, it seldom needs any manure, and yields a very good produce without it. In England, where manure is required, farm-yard dung is preferred, and it is turned into the soil by a light plough, immediately before sowing the seed. But in Guernsey, sea-weed is universally adopted when it can be obtained,—a species of manure, in which many districts of the Highlands abound, although its use is by no means so extensive as it deserves to be. The recent and apparently steady diminution in the price of kelp now going on, will doubtless introduce this valuable manure into much greater use in the Highlands, than has hitherto been the case.

The parsnip is considered by the Guernsey farmers, to be the most nutritious root known, superior even to the carrot and the potato. When small, it is given to the animals whole; but when large, it is sliced longitudinally. As no farmer in Guernsey feeds his horses or cattle on parsnips alone, it is not possible to determine its exact value from their practice, with the accuracy which the more scientific agriculturists of this country would desire. The art has not yet attained in that island the same precision,

nor been subjected to the same laws of rigid calculation, which it has undergone in Britain. But a tolerable conclusion may be drawn of the efficiency of this root, even from the examination of the testimony of Guernsey farmers.

Cows fed with parsnips, are said not to yield so great a quantity of milk, as when fed with turnips; but the milk is richer, and the butter is better, as well as in far greater proportion, and both are also free from the disagreeable flavour which they acquire from turnips;—a circumstance highly deserving the attention of those dairy farmers, who supply the population of great towns, with these indispensable articles of consumption. They are in fact equal to those which are produced by feeding in the best pastures. These animals, when intended for the butcher, are observed to fatten faster and better on parsnips, than on any other food. The only precaution used, is to interpose hay, to prevent them from being surfeited with the root. It is also found necessary to begin with a smaller proportion, as they are apt to be satiated with this food in the first week, if given to excess. After that period, it is remarked that it may be used in any quantity.

The farmers are of opinion, that cabbages are the best substance to interpose for this purpose, although turnips or hay may also be given with the parsnip. The allowance for fattening an

ox, who will weigh 1100 lb. is 120 lb. per day, exclusive of hay. As far as any experiments have been made in England, the results tally with those here reported. The cattle were found to fatten quicker and become more bulky, than when fed with any other root; and the meat has also turned out more sweet and delicate. In some experiments, recorded as having been made by an experienced farmer in Surrey, an ox was fattened from the plough on parsnips alone in thirteen weeks. I may add, that in many parts of France, and among the rest in Brittany, where this root is extensively cultivated, the same results have been obtained. Beef fattened with parsnips fetches a halfpenny per pound more in Jersey than under any other system of fattening.

Hogs prefer this root to all others, and make excellent pork, but it is fancied in Guernsey, that the boiling of the root renders the bacon flabby. It has, however, been found, in the trials of the Surrey farmer above mentioned, that the hogs became satiated with the raw parsnips before they were fattened, upon which he caused them to be boiled, with good effect. The animal can be fattened in six weeks by this food.

Horses are equally fond of the parsnip, although, from eating it with too much avidity, it is said sometimes to stick in the throat, and to choke them. But this may be easily prevent-

ed, by cutting the roots into pieces before they are given. The use of parsnips is said to affect the eyes of this animal, but we may safely consider this assertion as somewhat apocryphal. They are found to supersede the necessity of corn, except when the work is excessive; and in Brittany, they are even used for this purpose, to the exclusion of corn.

I may add, that it is a popular opinion among the Jersey farmers, that all animals intended for the butcher may be fattened on parsnips in nearly half the time, and with half the quantity, which is required in feeding them with potatoes. This must, however, be taken rather as a general opinion, with regard to the superiority of the one root over the other, than as the result of any accurate set of experiments, since the practices of agriculture in that island as well as in Guernsey, are by no means reduced to that nicety of calculation, which they have hitherto experienced in Britain.

In Brittany, they also form a principal article of the food of the people, and are still used largely, notwithstanding the introduction of the potato; but I need scarcely add, that, as in the case of most other roots, the potato has, to a great degree, also diminished the consumption of parsnips as an article of human food. The peculiarity of their flavour is such, as perhaps for ever to prevent them from entering into competition

with that most valuable plant; although, in situations similar to the highland districts to which I have above alluded, the cultivation of the parsnip, to a certain extent, might probably be found a useful resource, at least as an auxiliary article of food, in case of the failure of the potato.

Before terminating this paper, I may remark, that a species of wine has been often manufactured from the fermented juice of parsnips, and that report speaks in its favour. I have no experience of it, and, for obvious reasons, there has never been any temptation in Guernsey or its neighbour islands, to discover substitutes for the untaxed and superior produce of the vine. Nor do I know that the parsnip wash has been subjected to distillation. It would be worthy the attention of the Society to inquire, whether the spirit produced from it might not become a substitute for whisky, since the produce per acre would unquestionably be much greater.

I may also add, that parsnips are cultivated to great extent in Jersey, as well as in Guernsey, and with the same favourable results, though with some little variation in the process.

The preparation of the land there, and the other previous arrangements, are similar to those already described. After the harrow, the ground is dibbled with beans in rows at five feet distance. The parsnip seed is then sowed over the whole broadcast. In May, the handweeding

commences, and the parsnips are thinned to the requisite distance. The beans are pulled up by hand in September, and the parsnip crop is then disposed of as in Guernsey. I have not been able to procure any accurate estimate of the comparative value of the two processes, nor to learn how far the bulk of the parsnip crop is diminished by the additional incumbrance imposed on the land by the beans.

LXVII.

Extract of a Letter from Dr JOHN COAKLEY LETTSOM, Physician, London, to Dr DUNCAN senior, Edinburgh, respecting the Beta Cicla, Mangold-Wurzel, or Root of Scarcity, as it has been called.

(Read 14th December 1813.)

I HAVE directed to you a box, containing, among other trivial articles, a few pounds of Mangold-Wurzel seeds from different sources and correspondents.

When I introduced the knowledge and cultivation of this seed about forty years ago, I met with some approbation, and much ridicule. Even Peter Pindar was pleased to devote a few lines to me, as well as to Sir Joseph Banks, in his Emperor of Morocco. But time and experiment have now established it as the most productive vegetable in Europe. On my request to Sir Mordaunt Martin of Purnham, Norfolk, by whose steady perseverance this root was pre-

served as an article of cultivation in this country, he sent me the bag of seed which I now transmit to you. His letter to me accompanying the seed, contains the following paragraph :

“ I send you about half a peck of Mangold
“ Wurzel seed, and in the bag a small sample
“ of what I bought from Mr Newby of Cam-
“ bridge. I sold, this year, three hundred weight
“ of my own growth, to Messrs Mackeys, nur-
“ serymen at Norwich, at 2s. 6d. per pound,
“ part of more than four hundred pounds of the
“ produce of one rood of land. At Mr Newby’s
“ price, this would produce above L. 640 per
“ acre. But I am content with L. 200 per acre,
“ and what I value more, with the credit of ha-
“ ving, by my perseverance, contributed so much
“ to bring this article into such demand.

“ The leaves, which were eaten by my cows
“ in the summer 1812; the roots, which were
“ eaten by my bull and swine, after the seed
“ was reaped in 1813; and the stalks, which are
“ now in use for kindling the fires in my house,
“ I set against the expence of cultivation.”

I have inclosed in the box memoranda from different gentlemen on this vegetable. To these I refer you for farther information.

The seeds should be sown in rows, at such a distance, as to allow a horse to pass between the rows, with a view to destroy the weeds; and probably, the earth, by being occasionally turn-

ed up, conveys more nutriment to the plants. When properly cultivated in a suitable soil, the produce of roots, may be calculated at forty tons per acre, each root, upon an average, weighing about twenty-three pounds.

But all the accounts among us, are far inferior to the produce in St Helena, as communicated to Sir Hugh Inglis from Governor Beatson, which I should hardly have credited, had not Sir Hugh Inglis sent me two roots, each weighing fifty-six pounds.

The papers alluded to in Dr Lettsom's letter to Dr Duncan, were duly received, and have been presented to the Caledonian Horticultural Society. Some of them, particularly the very interesting communication from Governor Beatson of St Helena, to Sir Hugh Inglis, will probably be published in some future number of their Memoirs. The seed which was sent to Dr Duncan, has been distributed among different members of the Horticultural Society; and we hope, at a future period, to be able to communicate to the public, favourable accounts of the cultivation of this vegetable in Scotland.

LXVIII.

New method of preserving Potatoes.

By the Rev. ANTHONY DOW, D. D.

In a Letter to Mr DICKSON, Secretary.

(Read 8th March 1814.)

SIR,

FOR some years, I have bestowed considerable attention on the mode of preserving that most useful and valuable vegetable, the potato. I have tried many various ways of keeping it; but have found none so good as the following; which I have employed these two last years with the best success.

That part of my potatoes, which I mean to keep longest, that is, for spring and summer use, before the succeeding crop be ready, I put into small pits, holding about two bolls each, heaped up and covered in the usual mode, with straw

and earth. In April or May, according to the heat of the season, these potatoes are turned over into other pits; after carefully rubbing off, or picking out the shoots or buds, and laying aside every one that has any blemish or tendency to spoil. The evening before, a new pit is dug, or an old one cleaned out, in some dry spot; and, if possible, under the shade of some tree, wall or stack of hay, &c. This is filled nearly full of water; which by next morning is all drunk in, and the earth well cooled all round in the pit. The potatoes, carefully picked of all their shoots, are put into the pit thus prepared; and every quantity, of a firloot or half boll, is watered as it is put in, till the potatoes are level with the surface of the ground; they are then covered with live turf, the green side next the potatoes, and a hearty watering given; when the whole is covered to the depth of two feet, with earth, watered, and well beaten together with the spade. This process is repeated every time the potatoes are turned over, which is about once in three weeks, less or more, according to the weather. When it is very hot, and the pits or heaps not in the shade, it is proper sometimes to cover the pit or heap with a mat, supported on a few sticks, so as to allow a free current of air between the mat and the heap.

In this way, I have been enabled to preserve potatoes quite plump, and entire in taste, to the end of September, or till the succeeding crop be sufficiently ripe; to be used without loss; and loss must always be sustained in the quantity, when potatoes are largely used before they be nearly ripe. Nay, in this way, potatoes may be recovered in plumpness and taste, when they have suffered by injudicious exposure to air or heat, or by necessary carriage. In July last, I had occasion to send some potatoes, for the use of my family, at sea-bathing quarters, a distance of sixteen or seventeen miles. They were taken out of the pit, and put into a sack; but it was three or four days, before they were sent off; and, when they came to be used, they were found to have lost much of their fine taste, and somewhat of their mealiness. I immediately made a small pit in the back ground belonging to the house I possessed; into which, when well watered, the potatoes were put, watered and covered, as already described. In five days the pit was opened, and the potatoes had recovered both their dryness and taste.

As the Horticultural Society, I observe, most judiciously limit not their attention to the mere culture of plants; but extend it also to the pre-

ervation of their produce, perhaps the above may be thought by you not unworthy of their notice. If so, your taking the trouble to communicate it to them, will be obliging. I am, &c.

MANSE of KILSPINDIE, }
8th Nov. 1813. }

LXIX.*On the management of Cherry-Trees.*

By Mr WALTER UNDERWOOD, Gardener, Eglinton
Castle.

(Read 8th March 1814.)

I HAVE often observed, when the branches of cherry-trees are laid in too near to one another, or are crossed by branches of the same kind, or by plum-tree branches, as is sometimes the case, that although there be abundance of blossom, yet there is no crop, even in good seasons.

This led me to investigate the cause of the failure, and on examining the blossom, I found, that in fifty flowers, there were not above two styles, of course, no fruit could be expected.

It occurred to me, that it must be the want of light and air to ripen the flower-buds, which, if not thoroughly ripened in any kind of trees, it will be in vain to look for fruit.

I have, for several years past, as soon as the cherries were set, and the young fruit began to swell, gone regularly over every spur, and carefully picked off every remainder of decayed blossom, and also all weak fruit, which did not appear likely to stand. I give the trees a strong washing with the engine, throwing the water with considerable force, yet so as not to drive off the young fruit; and before I put on the nets to preserve the fruit, I clear off all superfluous shoots. As soon as the crop is gathered, I take off any late shoots that may be on the trees, and give them another complete washing with the engine. Where any of the spurs are much darkened by the leaves, I pick a few off to let in the light. Since I have practised these methods, I have never failed of having a plentiful crop of this most delicious fruit.

I have repeatedly proved the advantage of this mode of proceeding, with trees, whose branches are laid in too close, by leaving a tree untouched: wherever the tree was so left, I have invariably found very few fruit.

EGLINTON CASTLE,

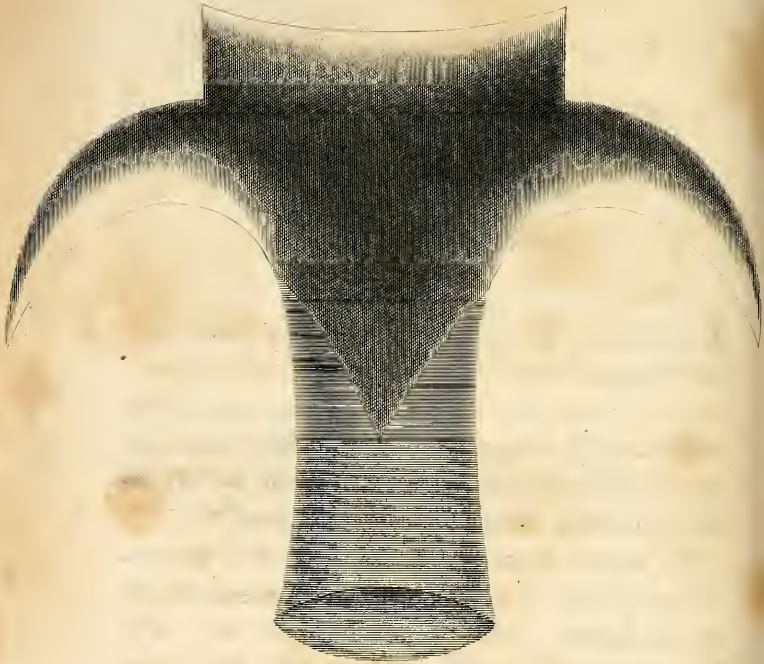
28th February 1814,



PLATE IV.

Cal. Hort. Soc. Mem.

Vol. I. p 429.



Scale of half Inches.



LXX:*Account of a new Pruning Instrument.*

By MR WILLIAM MENZIES, Gardener at Meikleour.

In a Letter to Mr DICKSON, Secretary.

(Read 26th March 1814.)

SIR,

I BEG leave to trouble you to lay before the Caledonian Horticultural Society, at the next meeting, the following account of an expeditious method of pruning larch, Scotch firs, and other pines. The sketch of an instrument by which that operation is performed, is annexed *.

To be the better understood, it will be necessary, first, to describe the instrument, which by the figure, (exactly half the real size,) will be seen to be simple, being merely two edged hooks, projecting from a socket-shank three inches in length, the breadth of which, where the hooks spring off, is two inches and two tenths of

VOL. I.

F f

* Plate IV.

an inch ; the hooks themselves project from the shank three inches ; between them, and on the top, is placed a strong chisel four inches broad, and one inch in depth. It is needless to say, that the length of the wooden handle, should be in proportion to the size of the trees to be pruned. Those used by us, are of different lengths, from six to eighteen feet, which last is as long as a man can properly manage. Where trees require pruning to a greater height, a ladder was made use of for that purpose, with one of the short-handled instruments.

The hook is what we principally make use of, which cuts the branch from the upper side : the chisel is only employed when snags are left, and where branches are too strong for the hooks ; in which case, the chisel is first made to strike the branch from below ; but a mallet is never used.

There is perhaps no instrument in use capable of pruning larch woods, so expeditiously as this, particularly where they have been allowed to grow up close, and neglected for years, or where they have not been pruned at all. The branches of trees growing very open or in hedge-rows, are generally beyond its power, at least those near the bottom. In a larch wood at Meikelour Place, which had hitherto been neglected, two men were able, in the course of the day, when they worked only seven hours, to prune, on an average, 300 trees, on each of which there were

from fifty to sixty branches cut off. Labourers wages here, is 1s. 6d. per day in winter: so the trees cost only 1s. per hundred pruning, and were pruned to the height of eighteen feet. That no time may be lost in shifting, there is a man to each instrument in use; the instruments being employed in rotation, according to the length of the handle, the shortest first, and so on.

Without a trial, some may suppose, that because the branch is cut from the upper side, it must necessarily tear off part of the bark from the trunk of the tree. This would certainly be the case with hard wood; were it to be pruned after this manner; but not so with firs, whose branches, from their brittle nature and horizontal direction, are easily removed; sometimes indeed they break, and snags are left, but these are cut off by the chisel.

I have also used this instrument with good effect and expedition, in removing unnatural branches from oak, and other hard-wooded trees. Fir-trees will certainly be much improved by pruning, both as to growth, and quality of their timber; but in my opinion, care should be had not to over-prune them. Larches will always shew when that is the case with them, by breaking out into numerous unnatural branches; but it may not be so soon observed in Scotch, spruce, or other firs, which, however, have generally a stunted appearance for some years afterwards,

and sometimes it occasions their death. Four or five tiers of branches should always be left, particularly on young trees; and on larches there should be still more.

Few, I imagine, have as yet thought the pruning of firs an object worthy their attention. Perhaps the expence may, with some, be the only objection: by this mode, it is certainly very considerably lessened; for it must be remembered, that the trees instanced as being pruned for 1s. per hundred, were of a very large size. It is true, that trees, in the course of their growth to perfection, will require a great many prunings; but the oftener they are pruned, the less they will need at one time, and their value will be always increasing. I remain, &c.

WILLIAM MENZIES.

MEIKLEOUR HOUSE, }
4th March 1814. }

LXXI.*On Cast-Iron Espalier Rails.*

By MR JOHN MIDDLETON, Gardener, Tillychewan.

(*Read 26th March 1814.*)

THE advantages attending espalier rails in gardens, both in respect of utility and ornament, are too much felt and acknowledged by every person of discernment and taste in such matters, to require any illustration. The greater chance of setting and ripening afforded to the fruit, by the branches being laid in, at regular and equal distances, the neatness of appearance which the trees exhibit, in a place where nature is entirely put under the superintendence of art, and the elegant vistas produced by the rail and trees, when bordering the sides of well kept walks, are all matters with which the lovers of gardening have long been acquainted. To whatever cause it may be owing, it does not appear, that this, by no means uninteresting branch of the

horticultural profession, has in any considerable degree engaged the attention of the improvers of the art.

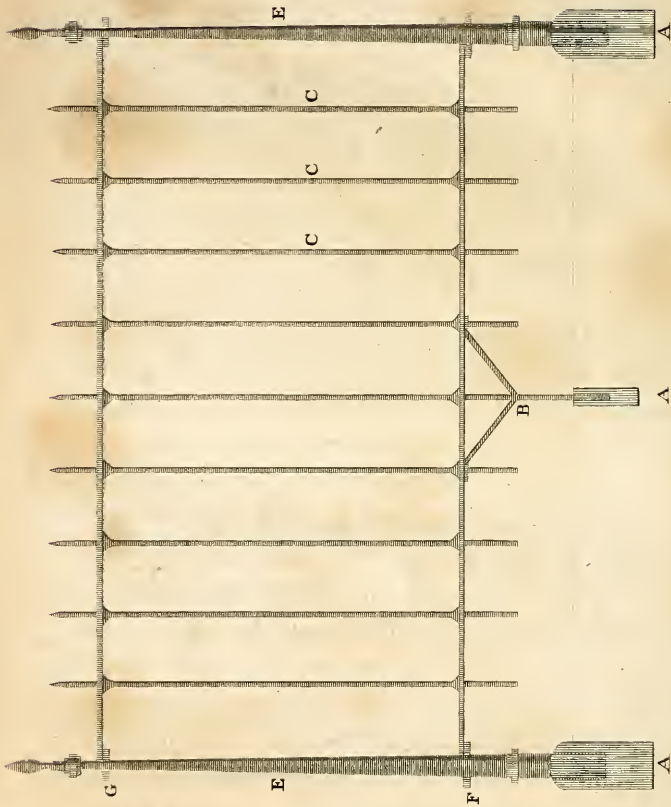
I have now by me a volume on gardening, written by George London and Henry Wise, gardeners to the Royal Family in the days of Addison and Steele, in which is given a plan of an espalier rail pretty much the same as that given by Mr Nicol, in his book entitled *Forcing Gardener*. Espalier rails have generally been made of wood; but not without objections.

The principal objections to which wooden rails are liable, are want of durability in the materials; the difficulty of keeping them in a position perfectly rectilinear, and the clumsiness of appearance which they always in some degree exhibit, when they are made of the dimensions necessary for the due extension of fruit trees.

The modes of constructing espalier rails, which I have seen, are the two following: 1st, To have upright splits of dressed timber, sunk into the ground, and mortised into a horizontal top rail. This method is abundantly objectionable in two of the points I formerly mentioned, viz., they want durability, the splits always soon giving way where they are sunk into the ground; and it is scarcely practicable to keep them straight. The second method, and that which is most generally practised, is to sink upright posts into stones, to



PLATE V.



Cal. Fort. Soc. Memoirs, Vol. I, p. 433.

Scale of $\frac{1}{2}$ Inch to the Foot.

E. Mitchell Sculp^t

mortise two cross bars into these posts, and to nail upright splits to the bars. The great defect of this method is, that, by the bulk of the posts, rails and splits, so great a strain is thrown upon the stones, during high winds, that they cannot long resist it; and the consequence is, that the rail soon begins to twist, whilst the part sunk into the stones, in spite of every precaution, will in no very long time decay, in consequence of moisture getting in between the wood and the stone.

The substitution of cast iron in place of wood, in many departments of mechanics, has induced a gentleman in Dunbartonshire to try an espalier rail of that metal, an elevation of which is given in the annexed figure *. A A A are the supports on which it stands; the centre one is a piece of seasoned oak, driven into the ground, and sunk a little below its surface. It receives the triangular piece marked B, which keeps up the centre of the bottom rail, and through which the upright arrow to the right and left of the middle one is put. Those at the sides of the figure, are stones of two feet in length, having their tops hewn into a hemispherical shape, and in the middle perforated by a hole of four inches in depth, which receives the column E E. The upright arrows marked C C C, are each furnish-

F f 4

* Plate V.

ed with a ruff at the place where they meet the top and bottom rail.

The columns are in length six feet, their bottoms are sunk four inches into the stone, as was said before: the diameter at the point marked F, is $1\frac{1}{2}$ inch; and that marked G, $1\frac{1}{8}$ inch: the arrows are in length five feet, their diameter one-half inch; the bottom rails are in thickness three-eighths of an inch, and in breadth one inch and five-eighths; the top ones $\frac{3}{4}$ ths by $1\frac{1}{4}$ th inch.

It is hoped, the above will convey a tolerably accurate idea of the thing. It may be necessary to add, that the columns at the points marked F and G, have a flank projecting at right angles to the column having a hole, through which, and through a hole in the end of the rail, the leaden rivet is put, for fastening the rail to the column.

It now only remains for me to give an account of the expence attending its erection. From the circumstances of a few of the rails being broken by accident, when bringing them from the foundry, and a few remaining more than were needed, I am not able to speak upon this with entire accuracy; but the statement I here make, may be regarded as very near the truth: 81 cwt., or 4 ton 1 cwt., at 17s. per cwt., gives L. 68, 17s. The length of the rail when put up, is exactly 300 yards; of course the expence of the metal at the foundry, will be about

4s. 7d. per yard. As to the expence of putting up and painting, it being all done by our own hands, with the occasional assistance of a blacksmith for the putting up, I am not prepared to speak correctly; but it did not cost less than L. 12.

The lowest estimate we had from a carpenter for a wooden rail, was L. 72, independent of putting up; so it appears that the iron one is cheaper at the first, and it may be expected, from its durability, to be infinitely cheaper in the end.

LXXII.*Experiments and Observations on the Potato.*

By MR DANIEL CRICHTON, Gardener, Minto.

In a Letter to Mr NEILL, Secretary.

(*Read 26th March 1814.*)

SIR,

IF you think the few following experiments and practical observations on the potato, are worth communicating to the Society, you may do so.

In 1803, I got a good kind of potato for seed-stock, from a friend of mine, who had planted the same kind for many years before that period. This sort I planted several years, with complete success, and without any appearance of curl. I make it a rule to pit those I intend for seed, immediately when dug out of the ground in autumn; and never expose them to the air, but during the time they are preparing for planting in the spring. In 1806, however, I observed a little curl among

them. In 1807, I happened to plant a quarter at two different periods: the first planted, turned out good as usual, and free of curl: the last planted had more than the half of them curled. The seed tubers were all cut at one time; but on account of the weather turning unfavourable for planting, the last half of the quarter was not planted until a month after the first. The seed was kept, during that month, in a hamper, covered up with straw, in a shed, but not excluded from the air, which, in my opinion, was the reason of them curling. The truth of this opinion, I think I ascertained in the following years.

In 1808, I planted for a general crop, part of the first planted of last year's, which turned out well, and had no curl amongst them. This year I exposed to the air, for four weeks, as much seed as planted a row; they turned out all curled, less or more.

In 1809, I planted the general crop as usual; they turned out with not one curl amongst them. This year, I exposed to the air for three weeks, as much seed as planted a row; this row had more than the half of them curled.

In 1810, I planted the general crop as usual, which turned out well, and no curl amongst them. This year, I exposed seed to the air, for one row, one week; for one row, two weeks; and for one row, three weeks. They turned

out as follows: the seed that was exposed for one week, had very few curled;—the seed that was exposed for two weeks, had about one-fourth of them curled;—and the seed that was exposed three weeks, had about the half of them curled.

In 1811, I planted the general crop, guarding as usual against exposure to air. It turned out well, and there was no curl amongst the plants. This year I planted several rows of those whose seed was exposed to the air last year, of which I picked those that had not the curl, that I could discern; but this year they turned out nearly all curled. I also planted a row exposed ten days to the air; half of them was curled.

In 1812, I planted the general crop as usual, which turned out well, and free from curl. This year I planted a row of those that had their seed exposed ten days last year, of which I took those that were not curled. This year they turned out more than the half with curl.

In 1813, I planted the general crop as usual; had a good crop, and no curl. I this year exposed a few for one and two weeks for two rows, as I had done three years before, and found them turn out curled, in proportion as they had been exposed to the air.

I am now satisfied in my own mind, that the curl in the potato, is occasioned by the way the potatoes are treated that are intended for seed. I have observed, all around this part of the coun-

try, that wherever the seed-stock is carefully pitted, and not exposed to the air in the spring, the crop has seldom had any curl; but where the seed-stock is put into barns and out-houses for months together, such crop seldom escapes turning out in a great measure curled; and if but few curl the first year, if they are planted again, it is more than probable the half of them will curl next season.

I have merely stated the facts which I observed, and willingly leave the discussion of the theory to other hands. I am, &c.

DANL. CRICHTON.

MINTO GARDEN, }
5th March 1814. }

LXXIII.*On increasing the Quantity of Manure.*

By Mr THOMAS BISHOP; Gardener, Methven Castle.

(Read 26th March 1814.)

IN compliance with the request of the Society's circular letter, of the 8th of December last, I beg leave to offer the following communication, as to the best means of increasing the quantity of manure, and applying the same for purposes in horticulture.

Experience hath taught us, that manures afford the most essential assistance to the improvement and fruitfulness of soils; and luxuriance of crops grown thereon. The fear that agriculturists may sometimes entertain, of having their ground in too high condition for particular crops, never creates the least alarm in the mind of the gardener, whose crops depend more on

the luxuriance of roots, stems and flowers, than in the maturation of seeds. That most vegetables, which are of quick growth, or such as arrive early to a state of maturity, require a greater proportion of manure to bring them to perfection, than those of the same genus, which are slower in growth, will be readily admitted by all who are conversant in their culture. For instance, a fair crop of late potatoes can be obtained from ground in an indifferent state, where some of the earlier sorts would not produce more than the seed planted. The same may be observed as to the later and earlier sorts of peas, beans, and sundry others. As the generality of garden crops, are therefore of that nature which requires ground in the highest order, to produce them good, and the means which a garden affords, of itself, for the increase of manure, is so very circumscribed, it is with the greatest propriety that the Society proposes, for the consideration of horticulturists, an article, the want of which is so frequently felt, although absolutely necessary to be obtained.

Without enumerating the various means that, with careful economy, may be used for its increase, such as collecting the urine of animals, chamber-lye, soap-suds, or mixing fresh soils of opposite qualities, I shall confine myself to a plain statement of a method I have practised for these several years

past, with much success, and shall offer a few observations connected therewith.

Situated the same as many others, to whom the produce of the stable-yard is the only allowance of dung that can conveniently be allotted for the garden, which, although every way advantageous for hot-beds, and other purposes of forcing, yet to use it as a manure for garden crops, without having its qualities altered by fermentation, or blended with substances of a heavier nature, would, in many cases, be more injurious than beneficial; I therefore, during the summer and autumn, have all the offals in the garden, such as weeds, leaves of strawberries and other vegetables, short grass, peas and asparagus haulm, with the foliage of trees and shrubs when newly shed, carefully collected into a heap. These are all turned over and mixed during the winter, that they may be sufficiently rotted to mix with the dung against the end of summer. I have also another heap formed with the prunings from gooseberry and currant bushes, fruit-trees, raspberry shoots, clippings of box-edgings, and loppings from shrubs; also the roots of greens and cabbages; which are generally burnt at two different periods in the year, viz. in spring and autumn; but previous to each burning, I endeavour to pare up all the coarse grasses around the garden, with a portion of the soil adhering thereto, and when-

ever these are sufficiently dried, have them collected to the heap intended to be burnt. The fire is kindled at a convenient distance from the heaps, and a portion of such as burn most easily is first applied, until the fire hath gained a considerable power. After this, the process of burning is continued, by applying lighter and heavier substances alternately, that the one may preserve the action of the fire, and the other prevent it from reducing them too much to ashes. When the whole are thus consumed, a quantity of mould is thrown over the heap to prevent the fire from breaking through; and whenever it can be broke into with safety, it is then mixed up into a dunghil with the rotted vegetables, moss-earth and stable-yard dung, in such proportions as is likely to insure a moderate fermentation, which is generally completed in three or four weeks; at which time, I think, it is most advantageously applied, in having it carried to the ground, and instantly dug in. Whenever it is practicable to get as much of it used this way early in autumn, when the ground is dry, I prefer it, rather than using it in winter, or early in spring; as this renders it necessary to dig the ground, so manured, a second time before cropping, which incorporates it with the soil, and thereby renders it a fit receptacle for seeds, especially those of the smaller sorts.

I have also practised Lord Meadowbank's method of fermenting peat-moss with dung *only*, and have found it to succeed as a garden manure very well, but not equal to the above compost, nor so well adapted as a manure for fruit-tree borders; and for vegetable crops, I have experienced greater benefit in using it, than from an equal quantity of street-dung, which cost 8s. per cart load.

The advantage with which every gardener may use this method, in converting the offals and rubbish of the garden into a source of fruitful manure, must be perfectly obvious, although he possesses not all the different articles above mentioned; for in whatever way the rubbish from the garden can be used, to ignite the greatest portion of soil, sward or vegetable substances, not easily rotted, a greater quantity of the most fertilizing manure will be obtained, and above all others, the most congenial to the growth of fruit-trees. The powerful effect which fire has upon every soil, (even clay,) in improving its fertility, will not easily be credited by those who have had no opportunity of ascertaining it; but certain it is, that burnt soil, applied in making fruit-tree borders, will be found more conducive to the health and fruitfulness of the trees than any application of dung, which, for a few years *only*, hath the injurious tendency to cause them produce spongy luxuriant shoots, subject to blights, and

several other diseases, that, with the greatest difficulty, can hardly, if ever, be brought back to that firmness of texture, roundness and shortness of bud, which is so very desirable in all fruit-bearing trees.

It is therefore of the greatest importance, wherever a garden or orchard is to be planted, if the ground be under grass, to have it pared, burnt and fallowed, previous to trenching, by which means, a fund of excellent manure is obtained and incorporated with the soil: Whereas, to trench down a sward with much grass beyond the action of the weather, will increase the damps arising from a wet bottom, by forming there a stratum similar to that of peat-moss. This I have had occasion to suspect, is very detrimental to the roots of trees.

Having attached such importance to soil and vegetable ashes, I trust I shall not be understood as applying the same to coal ashes, from which I have seen the most pernicious effects, when applied in quantities, to garden ground.

It frequently happens, when a garden hath been long and severely cropped, or through the application of unsuitable manure, that the soil becomes quite sterile and barren: Composts of fresh soils may be advantageously applied to recover its fertility; but where moss-earth, of a dry loamy nature, can be got, a less quantity of it will be equally serviceable: even peat-moss,

when exposed in a heap for five or six months, and well broke and turned over, will be found of great advantage. The good effects of both have been fully experienced by myself, as well as others, in this neighbourhood.

On the application of manure, so as to produce the greatest benefit, I would only observe, that it ought to be applied as much as possible when the ground is in a dry state ; and never when it is much wet or drenched with rain ; nor suffered to lie exposed to the air, after it is put on the ground : and also, that, by a proper preparation of the ground, at certain seasons, before using it, half the quantity will produce as abundant a crop, as the whole, when such preparation is neglected.

It has been a practice with gardeners, from time immemorial, to ridge up their vacant ground before winter, that the frost may act freely thereon, which is attended with advantages only on clay soils. But when the same method can be adopted, to expose soils to the more benign influence of the sun in the beginning of summer, it will be found in a greater degree conducive to its fertility, and a less proportion of manure applied, will operate more powerfully.

It is my constant practice, during the above season, to have every vacant piece of ground dug over to a good depth, and laid up as whole and as open as possible, that the sun's influ-

ence and drying winds may have the greater effect upon it, although it should only remain in that state a very few days, before it is manured, and again put under crop. That intended for late crops, such as broccoli, turnip, or winter spinage, frequently remains so for several weeks, whereby it receives the meliorating advantages arising from a summer fallow ; and when put under crop with a very small quantity of manure, never fails to insure a good return.

These observations must be known to many,—will be useful to some,—and may be the means to induce others to make further trials, for the increase and advantageous application of an article so essentially necessary in horticulture.

METHVEN CASTLE, }
24th February 1814. }

LXXIV.*On the Prevention of the Blight in Fruit-Trees.*

By Mr GEORGE SINCLAIR, Gardener, Woburn Abbey.

(Read 26th March 1814.)

AMONG the terms in use to denote the diseases of plants, that of *blight* seems to have the least precision in its application; for it is taken in general, to signify that affection of plants which appears in the preternatural colour, disfigured and sickly state of the leaves and flowers. From whatever cause the disease may arise, it is evident, that a variety of causes bring on this affection,—different species of insects, unfavourable weather, and the like. To prevent or palliate the injuries of these to plants, requires very different means. The species of *Araneæ* and the *Acarus telarius*, which spin their webs over the leaves of plants, cannot be destroyed by the same means, as that which is found effectual for the

different species of *Aphides*, which not only extract the juices, and give to plants a sickly appearance, but likewise are the well known cause of the *honeydew*. The larvæ of different *Phalænæ Tortrices*, or grubs, as they are commonly called, are singly often the cause of blight; the former by rolling and curling up the leaves, and the latter by eating the substance of the leaves and flowers.

Though it may be vain to attempt to arrange with accuracy, the various diseases of plants, while the knowledge of their internal structure and economy, is still so limited; nevertheless, some degree of precision should be adopted and followed in the application of terms. Physiologists have arranged the various diseases of plants under two chief classes; those that are brought on by external causes, as accidents, insects, parasitic plants, and the like; and those which arise from a corruption of the sap by improper soil or situation, insects at the roots, or most frequently the extreme age of the plant*. Under the first, among others, we find, wounds, fissures, defoliation, mildew, honeydew, leprosy, and galls. Under the second, are barrenness, canker, gan-

* Gangrene and canker, are common on young trees. They arise from a corruption of the sap; but it seems highly probable that the age of a plant can only be ascertained from the age of the parent tree, or that which afforded the *graft*, and not from the age of the stock on which it is grafted.

grene, dropsy, and consumption, which last seems rather to be the uncontrolled effects of two or more of the foregoing. Blight may be therefore with more propriety considered an order of diseases, rather than a single or specific disease.

That *species* of blight, which is caused by the larvæ of the Phalænæ Tortrices or grubs, is very common and destructive to the orchard trees in this part of the country. The following remedy, which I have used for these five years bypast, for the orchard trees of His Grace the Duke of Bedford, at Woburn, has been productive of the most beneficial effects. I have therefore much pleasure in submitting the process to the Caledonian Horticultural Society.

There are two orchards of about six acres in extent at Woburn-Abbey; one is furnished with apple-trees, and the other with cherry-trees. They are placed under circumstances unfavourable to the growth of these trees, in regard to exposure. Until the following remedy was tried, they were every year more or less subject to the ravages of the larvæ of these insects, particularly those of the *Tortrices*. His Grace the Duke of Bedford instructed me to submit the trees to the action of caustic lime. It was thus effected; A waggon load of lime was placed in the orchard, immediately after the fall of the leaves, and suffered to slake by the weather. Advantage was then taken of the morning dews, to

powder every part of the surface of the trees with the lime; while in its most caustic state. The trees then exhibit that appearance which they assume after a fall of snow, or an intense hoar frost. This has been repeated every year, and there has been but one feeble attack by the insects since, and this I attributed to the lime which was that season used, having lost much of its causticity before it was applied, and to a heavy fall of rain which immediately followed the process of liming.

Though the lime does not seem to have an immediate effect upon the different algæ and musci, which cover the stems and branches of the trees, yet when once these parasites are displaced, they never recover themselves, if the process of liming be annually repeated; at least that is the result of this practice in the present instance. The apple-trees were here the most affected with the different mosses and lichens; but since the process of liming has been yearly repeated upon the trees, they have not made their appearance,—a circumstance which I conceive will prove to be of much advantage to the occupiers of extensive orchards. The expense is but little, if the lime be not at too great a distance: seventy bushels, properly applied, will be sufficient for an orchard of five acres extent, completely furnished with full grown trees. It is most essential, that the algæ be re-

moved from the trees before the process of liming is adopted; because they not only injure the tree, as it is well known, by closing up the pores of the bark, but they also form the principal nests where the eggs of those insects are deposited during the winter season. The *Lichen farinaceus*, and *Lichen fastigiatus*, were by far the most common on the apple-trees here. These grew from two to three inches in length, forming dense tufts, which completely protected the eggs from the action of the lime, and defeated the purpose of its application. When the bark of the trees is rugged, with numerous fissures, the insects prefer these for nests to the lichens, being thereby better protected from the wet. Even in the scales of the buds at the end of autumn, I have found the eggs of the *Phalæna dispar*, and those of a species of *Aphis*. In a single specimen of the *Lichen fastigiatus* which is now before me, there are the nests of a species of *acarus*, with the parent, and a great number of eggs, and that of a species of *musca* or fly in the chrysalis state: they occupy different sides of the plant.

From the disappointments which I have experienced in trying remedies for diseased trees, my faith in palliative or even preventive means, is not very great, except such as have a powerful influence over the general health of the plant, as change of soil, exposure, &c.; the only exception that I know to the contrary, is

the liquor discovered by Mr Nicol, which, in my practice, I have never found to fail of success; only the process is two minute for orchard-trees, and it would in this case be too expensive.

The different algæ which were removed from the trees, previous to their undergoing the process of liming, were as follows:

1. *Lichen farinaceus*. Herb. Saucers mealy, on the edge of the foliage: Leaves grey glaucous green, upright, compressed, branched.

Grows from one to three inches high; warts on the edges of the branches mealy, as is the whole plant, flat, or rising, resembling saucers. Dillenius. Engl. Bot. 889.

2. *Lichen fastigiatus*. Herb. Saucers pale grey green, lateral and terminating; foliage pale grey green, upright strap shaped, branched, pitted, convex, ending in sharp points. E. Bot. 890. Withr. Arr. vol. 4. 50. *Lichen calicaris*.

3. *Lichen siliquosus*. Shrub. Saucers grey white, lateral; plant solid, compressed, branched. Dillenius. Withr. Arr. vol. 4. p. 39.

4. *Lichen parietinus*, Crusts leaflike, loose. Saucers tawny yellow, leaves full yellow, curled. E. Bot. 194. Withr. Arr. vol. 5. p. 33.

5. *Lichen physodes*. Saucers red brown, on pedicles; leaves whitish above, black underneath, hollow as if inflated; segments jagged, blunt. E. Bot. 126. Withr. Arr. v. 31.

6. *Lichen pallescens*, Crusts with saucers. Saucers pale brown, crust grey white. Jacquin, Coll. III. 5. fig 3. a. a. Withr. Arr. v. 20. Most frequent on the cherry-trees, forming large white patches.
7. *Lichen botryoides*. Crust with black lines; Green, powdery. Flora Danica, 899. 3. With. v. p. 3. This is not acted upon by the lime, nor is the following moss.
8. *Hypnum velutinum*. Shoot, creeping, branches crowded, upright; leaves awl-shaped, hairy at the end. E. Bot. Withr. Arr. vol. iii. 848.

LXXV.*Observations on Pruning and Training of Pear-Trees.*

By MR ALEX. STEWART, Gardener, Valleyfield.

(Read 14th June 1814.)

IT has often occurred to me in pruning and training of pear-trees against a wall, that it was necessary to adopt some other than the common mode of pruning, so as to obtain a succession of young bearing wood, in place of trusting to the spurs, which, in a short time, become hard and cankered, and seldom produce any fruit, but at the extremity of the branches.

Training pear-trees in the fan-shape, has often been recommended and adopted, with a view to obtain a succession of young bearing wood, but in general it has been found not to answer the purpose in many respects. When trained in this way, the upper part of the tree is apt to

get into too luxuriant a growth, thereby depriving the lower branches of their proper share of nourishment, which is so requisite in every part of the tree to render it fruitful.

Training in a horizontal direction, I conceive to be the most eligible plan, both for equalising the sap, and covering the wall in the neatest and most regular manner. Yet, from the general mode of pruning trees trained in this way, the branches soon become full of spurs and breastwood, which turns hard and cankerous in a few years, and seldom produces any fruit but at the extremity of the branches; consequently, the middle of the tree becomes barren more and more, as the branches extend on the wall. This deficiency is found to exist in most trees that have arrived at a bearing state, although every precaution has been taken in pruning and thinning the spurs to render them fruitful, which has in general proved ineffectual, and has led me to try the following mode of pruning :

The trees that I have under my management, had been planted about ten or eleven years ago, when I determined to alter the mode of pruning them. At this time, they were beginning to bear tolerably well, but it was only at the extremities of the branches; and the trees, nearly meeting each other on the wall, would soon have caused confusion. The trees are trained with

an upright stem, and the branches in a horizontal direction. I began at the bottom of the tree, and cut out every second branch within a few inches of the stem on both sides, taking three or four from each side of the tree; and upon other trees, I removed every second branch all the way up to the top. It is two years since I performed this operation, and the trees have made fine bearing wood, which I am in hopes will produce fruit this season. By taking out every second branch in this manner, I have been enabled to lay in a number of side-shoots from the branches that were left, which have formed fine fruit-spurs, equal to the young wood that is produced from the stem of the tree: The side-shoots, I intend to remove, as the others advance. In the mean time, I expect them to be of considerable consequence. Besides, the encouraging of these shoots prevents the tree from throwing out so much breast-wood, as it might otherwise do.

I intended to have taken out some more of the branches last year; but in consequence of a quantity of blossom-buds being on them, I deferred the operation until this season. After removing every other branch as I have before described, I then mean to begin with the other old branches that were left, but not until the young wood has arrived at a sufficient length, say four or five years; and after removing those

branches, I mean to lay in side-shoots from the young wood that was first obtained, in the same manner as I do now from the old wood that is left. I have great hopes, as far as I am at present able to judge, that, by proceeding upon this principle, I shall always be able to keep a regular supply of fine young bearing wood in every part of the tree, which is the object at which I aim.

Should the Society think the method that I have adopted, worthy of their notice, it will give me great pleasure to communicate what further may result upon the subject.

VALLEYFIELD, }
5th March 1814' }

END OF VOLUME FIRST.

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