

ARMY.

MEMORANDUM

ON

NAVAL AND MILITARY AVIATION.

Presented to both Houses of Parliament by Command of His Majesty.



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MEMORANDUM ON NAVAL AND MILITARY AVIATION.

The following memorandum shows further details of the scheme of naval and military aviation which, in the debate on Army Estimates, on the 4th instant, Colonel Seely informed the House of Commons had been adopted by the Government, on the recommendation of the Committee which, under his chairmanship, had been commissioned to consider and report on the whole subject.

This memorandum omits all reference to the important subjects of emoluments and similar financial considerations, in regard to which the details have not been finally decided.

WAR OFFICE,

11th April, 1912.

CONSIDERATIONS OF GENERAL POLICY.

The Government have been impressed by the evidence which has been placed before them regarding the state of Aerial Navigation in this country, compared with the progress made by other great naval and military Powers.

The necessity for an efficient aeronautical service in this country is not less urgent than in the case of the other Powers. The efficiency of the aeroplane for purposes of military reconnaissance has been proved both in foreign manœuvres and in actual warfare in Tripoli, and without doubt aeroplanes have now become an important adjunct to the equipment of an army in the field.

The strategical and tactical uses of the aeroplane as an adjunct to the operations of a fleet cannot yet be forecasted with equal certainty, but it is clear that this country cannot afford to incur the risk of dropping behind other nations in this matter, and that every facility must be given for experiment and progress.

There are admittedly advantages in a policy of postponing the development of aeroplanes for naval and military purposes, and of leaving the pioneer work to private enterprise and to foreign nations, but it is clear that aeroplanes have now to a great extent passed out of the experimental stage as regards their employment in warfare, and an active and progressive policy has therefore become imperatively urgent.

GENERAL PRINCIPLES.

In formulating the policy to be adopted the Government have been guided by the following principles:—

- (a.) The organization adopted should provide establishments adequate for our present requirements, but must be sufficiently elastic to permit of considerable expansion in the future.
- (b.) The organization should be capable of absorbing and utilizing the whole of the aeronautical resources of the country.
- (c.) While it is admitted that the needs of the Navy and Army differ, and that each requires technical development peculiar to sea and land warfare respectively, the foundation of the requirements of each service is identical, viz., an adequate number of efficient flying men. Hence, though each service requires an establishment suitable to its own special needs, the aerial branch of one service should be regarded as a reserve to the aerial branch of the other. Thus in a purely naval war the whole of the Royal Flying Corps should be available for the Navy, and in a purely land war the whole corps should be available for the Army.

- (d.) It is important to give every possible encouragement to the development of private enterprise in aviation, and every inducement should be offered to flying men who do not belong to the Navy and Army to join the Royal Flying Corps. Proposals in this respect, and with regard to encouragement for existing aerodromes, will be found in this paper.
- (e.) It is essential that all combatant officers in the Royal Flying Corps should be practical flying men.
- (f.) Experimental work in all branches of the Royal Flying Corps should be co-ordinated.

OUTLINES OF THE SCHEME.

The general outlines of the scheme proposed by the Government are as follows:—

The British aeronautical service is to be regarded as one, and by special permission of His Majesty the King is to be designated "The Royal Flying Corps."

The Royal Flying Corps will supply the necessary personnel for a Naval and a Military Wing, to be maintained at the expense of, and to be administered by, the Admiralty and the War Office respectively. The corps will also provide the necessary personnel for a Central Flying School, and for a reserve on as large a scale as may be found possible.

This school is to be established for the training of flying men on Salisbury Plain, being maintained at the joint expense of the Admiralty and War Office, and being administered by the War Office. After graduating at the Flying School, flying men will become members of the Royal Flying Corps, and will then be detailed to join either the Naval Flying School at Eastchurch for a special course of naval aviation or one of the Military Aeroplane Squadrons for a special course of military aviation, or to pass into the Reserve of the Royal Flying Corps.

The Naval Wing of the Royal Flying Corps, entry to which should ultimately only be obtainable by qualifying at the Central Flying School, will for the present have its headquarters at the Naval Flying School at Eastchurch. It is impossible to forecast what its ultimate organization and development will be, as this depends to a great extent upon the result of experiments, which are about to be commenced, with hydro-aeroplanes.

The Military Wing of the Royal Flying Corps should consist of a number of squadrons, entry to which should ultimately be confined to those who have qualified at the Central Flying School. Eight of these squadrons are required for use in connection with the Expeditionary Force.*

It is desirable that at present no establishment should be fixed for the Royal Flying Corps as a whole, but only for the Naval and Military Wings, and these provisionally with a view to future expansion. The Royal Flying Corps will be largely composed of officers and men who are not performing continuous service, and who are merely incurring an obligation and being retained on condition that they keep themselves proficient. Many of them will probably be naval and military officers performing duty with their ships or regiments, and many others will have joined on conditions of service resembling those of the Special Reserve of the Army.

The mechanical requirements of the Royal Flying Corps will be provided by the existing Army Aircraft Factory, which, with His Majesty's permission, is being renamed the "Royal Aircraft Factory." This establishment should undertake the following important duties:—The higher training of mechanics for the Royal Flying Corps and for the Central Flying School; the reconstruction of aeroplanes; repair work for the Royal Flying Corps; tests with British and foreign engines and aeroplanes of the latest design, and experimental work.

The Aeronautical Advisory Committee will continue its experimental and research work on the present lines, and it is of great importance that there should be the closest possible collaboration between the Naval and Military Wings, the Central Flying School, the Royal Aircraft Factory and the Advisory Committee. An officer from the Central Flying School and an officer from the Naval and Military Wings respectively should be added to the Advisory Committee.

The Government attach importance to the maintenance of private enterprise in the field of aeronautics in this country. The objects of this are not only to provide a reserve of flying men which may be drawn on in emergency, to stimulate invention and to keep

* Seven of these will be aeroplane squadrons, the eighth consisting of airships and kites.

alive public interest, but also to provide aerodromes, landing places and sheds at convenient intervals throughout the country, without which cross-country flights are almost impossible. Accordingly it is proposed that (a) for the present military officers and civilians who are candidates for commissions in the Royal Flying Corps should first have to obtain their Royal Aero Club certificate and on being accepted as members of the Royal Flying Corps should receive the sum of 75*l.*, and (b) a small rent should be paid to the principal aerodromes for landing rights and for the use of sheds by members of the Royal Flying Corps engaged in cross-country flights. The French Government rightly attach importance to cross-country flights, and offer every encouragement to those engaged in military aviation to undertake such flights.

The Government propose that a permanent consultative Committee should be appointed, to which questions in connection with flying affecting both departments should be referred by the Admiralty and War Office. This Committee should be designated the "Air Committee," and should be a permanent Sub-Committee of the Committee of Imperial Defence, and should be composed of representatives of the various departments concerned.

THE ROYAL FLYING CORPS.

In dealing with the formation of the Royal Flying Corps and its reserve, some difficulty arises from the consideration that the requirements of wastage in war in this new arm are unknown quantities. No estimates can be made of first-line requirements which are not to some extent guess work. Hence it follows that the Reserve of the Royal Flying Corps should be as large as financial considerations will permit, and should be capable of expansion in case of emergency—capable, indeed, of absorbing the whole of the resources of the country in this branch of science.

CONDITIONS OF SERVICE.

Entry to the Royal Flying Corps as officers will ultimately be confined to those who have graduated at the Central Flying School. Those officers will be drawn from (a) officers of all branches of the naval and military services, and (b) civilians. The rank and file will consist of warrant officers, petty officers, non-commissioned officers and men transferred from the Royal Navy or the Army, and also of men enlisted directly into the Royal Flying Corps, either on a regular or a special reserve basis.

Officers of the Navy who are selected for service with the Royal Flying Corps will, as a rule, undergo their elementary training at the Central Flying School. Officers of the Army may when selected, be required to obtain the Royal Aero Club certificate, by private arrangement, before joining the Central Flying School. After graduating at the Central Flying School, officers will be attached, as may be necessary, to the Naval or Military Wing for further training. At the conclusion of their training they should be eligible to be appointed either (a) for continuous service in the Naval or Military Wing of the Royal Flying Corps, or (b) to the permanent staff of the Flying School, or (c) to the Royal Flying Corps Reserve.

The period of appointment in the case of officers, who elect for continuous service with the Naval or Military Wings of the Royal Flying Corps or at the Central Flying School, will normally be 4 years.

Civilian candidates for appointment to the Royal Flying Corps as officers will apply in the first instance to the Commandant of the Central Flying School, quoting the number of their Royal Aero Club certificate.

Men transferred from the Navy and Army, or enlisted from civilian sources, for continuous service should be selected by the naval or military authorities respectively, and by the Commandant of the Central Flying School. The period of enlistment suggested is 4 years, with re-engagement from year to year, or opportunity to transfer to the Reserve.

Great importance is attached to the primary condition that every member of the Royal Flying Corps shall incur a definite obligation to serve in time of war either for naval or military purposes in any part of the world.

The Royal Flying Corps, with the exception of the Naval Wing and officers and men of the Royal Navy and Royal Marines who are members of the Reserve of the Royal Flying Corps, will be under the administration of the War Office.

CONDITIONS OF RESERVE SERVICE.

The officers of the Reserve of the Royal Flying Corps should be divided into two classes; the officers of the First Reserve should be required to produce on the first day

of each quarter satisfactory evidence that they have performed during the previous quarter flights amounting to an aggregate of nine hours in the air, and including one cross-country flight of not less than one hour's duration. These conditions should be subject to modification in particular cases. Flyers of the Second Reserve need not be required to carry out any flights, but should be available for service in the Royal Flying Corps in time of war.

Flyers of the First Reserve should be given facilities for their obligatory flights every quarter at one of the naval or military establishments, or if this is impossible, at a private aerodrome. An authorised rate of payment should be laid down for flights undertaken at private aerodromes.

No aeroplanes should be purchased for the Reserve of the Royal Flying Corps at the present stage, though this should not prejudice future policy on this question. For the present the Reserve should provide personnel rather than matériel.

A reserve, however, of matériel would be required in war, and for this purpose the Commandant of the Central Flying School should keep a register of privately owned aeroplanes, which might usefully be purchased for the use of the Royal Flying Corps in case of emergency.

Members of the Royal Flying Corps who own aeroplanes should be encouraged to bring these to the Central Flying School, when they undergo their training there, and to naval and military manœuvres.

The Government believe that a considerable proportion of the qualified flying men in this country can be attracted to this Reserve, which will then be of real value, being available in any part of the world and for either service.

It is not proposed at present to fix any limit to the numbers to be entered, as the number of qualified flying men in the country is comparatively small, and it is unlikely that as many as 100 applications will be received in the first year. Later on it will probably become necessary to fix a definite establishment of the Reserve of the Royal Flying Corps.

THE CENTRAL FLYING SCHOOL.

SITUATION.

The Central Flying School should be established on Salisbury Plain, on ground south-east of Upavon, the contract for the purchase of which has been signed. This ground must be regarded essentially as a flying ground. It should only be used for the training of troops in so far as that training interferes in no way with the work of the Central Flying School.

The site has been inspected twice by a committee of experts in order to view it under varying conditions. They reported as follows:—

“This area is in every way suitable for the proposed purpose. It is better than any British aviation ground with which the members of the Committee are acquainted.

“A certain amount of ground is at present under plough, but there is nothing to prevent the formation of an excellent surface for rolling over very large tracts.”

Apart from its excellence as a flying ground, however, the site selected presents the following advantages:—

It is situated in a lonely spot several miles from a railway station, and is therefore not liable to the inconvenience and danger of attracting large crowds of spectators,

The nature of the surrounding country is such that good landing places are available over a very wide area.

A good road runs through the centre of the aerodrome affording all necessary transport facilities.

The presence of large numbers of troops undergoing training on Salisbury Plain offers facilities for preliminary training in military reconnaissance.

It is conveniently situated with regard to the existing aerodromes at Aldershot, &c., for the commencement of cross-country flights, and is not too far distant from the sea at Portsmouth and Portland.

COURSES OF INSTRUCTION.

There should be three courses at the Central Flying School during the year, each course to last 4 months, which is considered to include a sufficient margin of time for leave of absence and spells of bad weather.

There appears to be no reason to suppose that one season of the year is less favourable than another for training in flying. It is possible that in summer there are more days during some part of which flying is possible. In winter, on the other hand, there are apt to be more days during the whole of which it is possible to fly.

The training to be carried out should include—

- (i.) Progressive instruction in the art of flying.
- (ii.) Instruction in the general principles of mechanics and the construction of engines and aeroplanes.
- (iii.) Instruction in meteorology.
- (iv.) Training in observation from the air.
- (v.) Instruction in navigation and flying by compass.
- (vi.) Training in cross-country flights.
- (vii.) Photography from aircraft.
- (viii.) Signalling by all methods.
- (ix.) Instruction in types of war-ships of all nations.

The naval and military flying establishments should undertake the more advanced training in observation and the transmission of intelligence.

The sooner the Staff for the Flying School is selected the better, for as soon as possible the members should be formed into a Committee to draw up the syllabus for the first course of instruction for submission to the War Office.

It is estimated that the number of flyers required for the Navy is forty a-year.

To provide the war establishment for the seven Aeroplane Squadrons that are considered necessary for our Expeditionary Force, 182 officer flyers and 182 non-commissioned officer flyers are required. This will entail passing through the Central Flying School one quarter of this total number annually, if it is assumed that under present conditions a flyer can hardly be expected to remain at active aeroplane work for more than 4 years.

If, in excess of actual Naval and Military requirements, a margin is allowed of, say, 25 per cent. for pupils undergoing instruction who fail to obtain certificates of proficiency either through sustaining injuries or through loss of nerve, the total service requirements as regards the annual intake of pupils at the school are as follows :—

One-quarter military war establishment of flyers	...	...	91
Royal Navy, say	...	...	40
			<hr/>
			131
Add 25 per cent.	...	...	33
			<hr/>
Total	...	...	164
			<hr/>

In addition it appears desirable to allow for the entry of (say) fifteen civilians during the course of the year, or five for each course of instruction.

Hence the total number to be passed through the Central Flying School in each year will be :—

To maintain the naval and military establishments	...	...	164
Civilians	...	...	15
			<hr/>
Total	...	...	179
			<hr/>

Thus, having regard to the foregoing considerations, it would appear necessary to estimate that for the immediate future, accommodation should be provided for sixty pupils at the Central Flying School in each term. As these numbers are liable to be increased, when the requirements of the Army other than those of the Expeditionary Force are decided, the school should be readily capable of expansion.

AEROPLANES.

Steps have already been taken for the purchase of twenty-five aeroplanes for the Central Flying School, and deliveries will commence as from the 30th April, 1912.

The makers have been called upon to meet all necessary requirements.

BUILDINGS.

Experience has shown that buildings of a permanent nature are very much more satisfactory, and ultimately more economical, than temporary buildings. Moreover, temporary huts are not well suited to the climatic conditions of Salisbury Plain.

Having regard, however, to the fact that the Central Flying School may require large expansion in the near future, and more especially that temporary buildings can be erected far more rapidly than permanent ones, all buildings, including sheds, should at first be of a temporary nature, without prejudice to the construction of more permanent buildings in the future.

All plans and specifications are now ready and tenders have been invited for the erection of temporary barracks, sheds, workshops, and a small hospital, at an estimated cost of approximately 25,000*l.*

TRANSPORT.

It will be necessary that complete war transport for two flights of aeroplanes should be provided at once for the Central Flying School.

GENERAL.

The Instructional Staff will require a few weeks in which to assemble, tune up, test and accustom themselves to the new aeroplanes, but it may confidently be expected that the first course will be completed before the close of 1912.

THE NAVAL WING OF THE ROYAL FLYING CORPS.

PROVISIONAL ORGANIZATION.

The Naval Wing of the Royal Flying Corps will be established for the present at the Naval Flying School at Eastchurch. For the immediate future its energies will be devoted mainly to elementary training in flying, so as to provide a nucleus of flyers for the first requirements of the Navy, pending the establishment of the Central Flying School, and to experimental work in the development of aeronautics for the Navy.

In a short time the preliminary training in flying will be undertaken entirely by the Central Flying School, and the Naval Flying School will then be utilized for experimental work, and for the specialized training of naval ranks and ratings and of selected civilians in naval air work.

It is impossible to over-estimate the importance of experiments for the development of hydro-aeroplanes, and in flying from and alighting on board ship, and in the water under varying weather conditions. Until such experiments have proved conclusively how far such operations are practicable it is impossible to forecast what the rôle of aeroplanes will be in naval warfare, or to elaborate any permanent organization. The present organization must therefore be regarded as provisional.

PERSONNEL.

The Naval Flying School at Eastchurch will, for administrative purposes only, be provisionally under the orders of the Captain of H.M. ship "Actæon," and all officers and men will be borne on the books of the "Actæon."

AEROPLANES.

Steps have been taken for the purchase of 12 aeroplanes, hydro-aeroplanes and floats for first requirements.

In selecting the types for purchase it has been deemed desirable to test a number of types with a view to arriving at the most suitable pattern for naval service. As soon as a satisfactory type of aeroplane for future use has been evolved, orders will be given so as to ensure that there are always not less than two machines of the same type available.

The prospects of the successful employment of the rigid type of airship are not sufficiently favourable to justify the great cost, and it is therefore recommended that the naval experiments should be confined to the development of aeroplanes and hydro-aeroplanes. The utmost vigilance will be taken, however, in watching foreign developments of the airship, and the present recommendation will not be taken to prejudice a reopening of the question, should important developments occur.

THE MILITARY WING OF THE ROYAL FLYING CORPS.

GENERAL PRINCIPLES OF ORGANIZATION.

At present no military requirements beyond those of the Expeditionary Force, which are of urgent importance, are being dealt with. It must be borne in mind, however, that considerable extension will be necessary in order to provide for the requirements of those military forces which are not included in the Expeditionary Force.

For the future the Military Wing of the Royal Flying Corps should comprise all branches of aeronautics, including aeroplanes, airships, and kites. All these are required for the same purpose and should work in close co-operation.

The present Air Battalion, R.E., ceases to exist under this scheme. Its personnel and matériel should be absorbed as far as required in the Royal Flying Corps.

The purposes for which aeroplanes will be required in land warfare are as follows :—

- (a.) Reconnaissance.
- (b.) Prevention of enemy's reconnaissance.
- (c.) Inter-communication.
- (d.) Observation of artillery fire.
- (e.) Infliction of damage on the enemy.

Having considered the organization of the aeronautical forces of other Powers, so far as information is available, the Establishments laid down below would appear to provide a suitable organization for the Expeditionary Force of 6 divisions and 1 cavalry division, viz. :—

- Headquarters.
- 7 Aeroplane Squadrons, each providing 12 aeroplanes.
- 1 Airship and Kite Squadron, providing 2 airships and 2 flights of kites.
- 1 Line of Communication Flying Corps Workshop.

ADMINISTRATION.

The Administration of the Military Wing will be carried out by the War Office.

FLYERS, &C., REQUIRED FOR SEVEN AEROPLANE SQUADRONS.

Up to the present time the authorities have only attempted to train officers as flyers. It is now proposed to train non-commissioned officers and men as well.

It is considered that the minimum number of trained flyers should be two per aeroplane. Of these one should be an officer, and, in the case of one-seated machines, both should be officers.

For purposes of calculation, however, one officer and one non-commissioned officer flyer are allowed.

The number of flyers required on this basis is shown in the table below :—

	7 Squadrons.	
	Officers.	Non-commissioned officers.
Commanders	7	..
Serjeants .. .. .	..	7
3 sections	84	84
Total	91	91

In addition, it is necessary to provide a reserve to meet casualties, and it is considered that this should be on a basis of 100 per cent. for 6 months' wastage.

The total number of flyers required will therefore be:—

	Officers.	Non-commissioned officers.
For war establishment and 7 squadrons ..	91	91
Reserve	91	91
Total	182	182

In addition to flyers the necessary mechanics should be provided for the maintenance of machines, &c.

PEACE ESTABLISHMENTS.

The first requisite is to provide the trained personnel for the formation of the *war* establishment of the flying service.

Eventually it may be possible to draw up a more economical *peace* establishment, when the Reserve of the Royal Flying Corps has been developed sufficiently to enable the Military Wing to count on an effective organized reserve.

DISTRIBUTION OF THE AEROPLANE SQUADRONS.

N.C.O.'s and air mechanics* will be required as engine drivers, fitters, carpenters, smiths, sailmakers, riggers, &c. Selected N.C.O.'s and air mechanics should also be trained as flyers. To provide this personnel, it will probably be necessary to rely largely on direct enlistment, except, perhaps, as regards flyers.

The period recommended is 4 years. On completion of the period of continuous service re-engagement should be allowed from year to year, or transfer to the Reserve of the Royal Flying Corps on the recommendation of the Commanding Officer of the Military Wing, or of the Commandant of the Central Flying School.

Commissioned officers joining the Royal Flying Corps should be seconded and other ranks should be transferred.

AEROPLANES.

The total number of aeroplanes required for the seven squadrons of the military division will be eighty-four. The completion of these squadrons, however, and the training of flyers for them at the Central Flying School must occupy some considerable time.

SHEDS.

A shed of a portable type, suitable for service in the field, should be at once provided for each aeroplane as it is ordered. Permanent sheds should be provided at the headquarters of squadrons, when the locations have been fixed.

THE USE OF AIRSHIPS FOR MILITARY PURPOSES.

Careful consideration has been given to the question of whether airships should still be used for military purposes.

The airship possesses the great advantage over the aeroplane in military warfare of being able to receive messages by wireless telegraphy; it is also able to transmit to greater distances.

Other countries can establish permanent sheds or shelters at convenient intervals throughout the country, where their airships can seek refuge in bad weather, and they are therefore able to make better use of dirigibles than this country, whose

* The term "air mechanic" is applied to denote men of the Royal Flying Corps below the rank of petty officer or serjeant

Expeditionary Force is more likely to be employed oversea. It is hoped, however, that means will be found for overcoming difficulties in this respect, and experiments in this direction are now being conducted, which give prospects of success.

On a general review of the foregoing considerations it has been decided that any immediate extension of the existing equipment of airships is unnecessary so far as the requirements of the Expeditionary Force are concerned, and the military requirements other than those of the Expeditionary Force are not in question. Having regard, however, to the persistence of all the great continental nations in experiments with this type of aircraft, it would be undesirable for the Army to abandon entirely the use of airships.

Therefore, the present Airship Company, furnishing two airships, together with the kite equipment, should be retained, and should become an eighth squadron of the Royal Flying Corps.

Kites form at present the only means of aerial observation in really high winds. Two flights of kites should therefore be included in the Airship Squadron of the Royal Flying Corps.

TRANSPORT.

War transport will be required for each flight on its establishment.

THE ROYAL AIRCRAFT FACTORY.

FUNCTIONS.

The existing Army Aircraft Factory has been renamed the "Royal Aircraft Factory." It will be administered by the War Office. It should carry out the following functions:—

- (1.) The higher training of mechanics for the Royal Flying Corps.
- (2.) Repairs and reconstruction for the Royal Flying Corps.
- (3.) Tests with British and foreign engines and aeroplanes.
- (4.) Experimental work.
- (5.) The existing work in the manufacture of hydrogen, and generally meeting the requirements of the Airship and Kite Squadron.
- (6.) General maintenance of the factory as at present.

BRITISH AND FOREIGN ENGINES.

It is important that this country should keep abreast of all practical developments in the aeroplane industry in all parts of the world. At the present time the primary need of this industry is the perfection of an entirely satisfactory engine. There are at the present time a number of aeroplane engines in the market which are believed to have given satisfactory results. It is extremely difficult, however, especially in the case of foreign engines, to obtain reliable information regarding them without purchasing power. Experience has shown that the foreign engine manufacturer attaches but little importance to the prospect of business in this country, and when approached either personally or by letter is prone to be suspicious of a desire on our part to learn by his experience.

Fifteen makers of engines are being approached.

THE AERODROME, SOUTH FARNBOROUGH.

Certain improvements are required in the aerodrome, South Farnborough.

At present there is one good flying ground at Cove Common, where the Royal Aircraft Factory is situated, and another on Laffan's Plain, and to make it possible to alight anywhere between these areas a passage has been cleared. It is very desirable, however, that another passage should be cleared in order to bring the area at Ball Hill into communication with the other two and to allow of a circular flight over the combined areas.

A passage should therefore be cleared as soon as possible from Laffan's Plain to the Royal Aircraft Factory via Ball Hill. These alterations would greatly increase the value of this aerodrome.

Further improvements which could be effected here would be the clearing of a passage from Laffan's Plain to Fleet Pond.

MISCELLANEOUS.

THE USE OF PRIVATE AERODROMES FOR CROSS-COUNTRY FLYING.

Great importance is attached to cross-country flights as an essential part of the training of a naval or military airman. If such flights are to be accomplished, however, it is indispensable that landing rights should be obtained at convenient intervals throughout Great Britain, and that shelter should be available whenever practicable.

The aerodromes at present existing happen to be very well situated for cross-country flying, and, with a few intermediate points, it would be possible to fly regularly and with fair safety from London to Scotland.

Negotiations have been opened with the managers of these aerodromes, excepting Eastchurch where the Naval Flying School provides all necessary facilities, to ascertain whether they would be prepared to grant to His Majesty's Government the occasional use of one shed together with landing rights for Government aeroplanes the flyers of which might desire to make use of such facilities during practice flights, &c., and, if so, upon what terms; observing that the shed would only be required occasionally so that all that would be necessary would be the grant of lien upon it.

The negotiations will be continued by the War Office, one of the conditions which will be fulfilled being the maintenance of stocks of petrol and oil above a certain specified minimum.

In order further to facilitate cross-country flying further landing rights will be obtained by the War Office at certain selected points.

Most of these points would also be of considerable importance for naval or coast defence reconnaissance, and there can be little doubt that at many of them aerodromes must be established at some time for naval or military purposes.

It is hoped that in time further extensions of this system may be made, so that flying rights may be established over the whole country.

THE ENCOURAGEMENT OF PRIVATE ENTERPRISE.

Mention has already been made of the fact that importance is attached to the existence in this country of a flourishing private industry. This consideration has been given due weight to in the provisions regarding the purchase of aeroplanes, about half of which will be ordered from British firms. The arrangement under which officers and civilians desiring to enter the Royal Flying Corps as flyers will first have to obtain their Royal Aero Club certificate privately, and the rent to be paid for sheds and landing rights should render some assistance to the private aerodromes.

A stimulus will thus be provided to private enterprise, which may assist the aerial industry to tide over the difficult initial period.

METEOROLOGY.

Steps should be taken forthwith for the investigation of the atmosphere above this country. It is important, if the art of aviation is to progress and accidents are to be avoided, that the prevailing air currents and the meteorological conditions of the atmosphere should be studied. Such investigation must be based on the results of continuous observations from a number of stations, carefully co-ordinated, and extended over a long period.

Evidence of Dr. W. N. Shaw, Director of the Meteorological Office, has been taken on this question. Dr. Shaw laid stress on the importance of co-ordinating the theoretical and scientific experiments with the practical experience of flying men.

It is plain that little investigation has hitherto been undertaken in respect to those meteorological problems which more particularly concern flying men. Dr. Shaw indicated that he was prepared to conduct such experiments if the necessary funds were placed at his disposal.

A Meteorological Section should be established at the Central Flying School. Ultimately it may be found possible to include in this section officers who have been compelled to give up actual flying. For the immediate present, however, it will be sufficient to attach a meteorological expert to the Central Flying School for instructional purposes.

All officers at the Central Flying School should be instructed in meteorology.

All members of the Royal Flying Corps should be directed to report any unusual meteorological phenomena to the Meteorological Office.

Each Wing or Squadron of the Royal Flying Corps, as well as the Flying School, should keep a meteorological log, and forward a monthly report to the Meteorological Office.

Such investigation of the air currents near the ground and in the upper atmosphere as will be useful to flying men should be undertaken by the Meteorological Office, and the results of their investigations and any phenomena of special interest should be communicated without delay to all branches of the Royal Flying Corps.
