

**“EARLY AERONAUTICAL CHARTS  
&  
THE GEOGRAPHICAL DEPARTMENT THAT NEVER WAS.”**

This note highlights an episode in the fairly recent history of military mapping and charting for which the post First World War requirement for civil aeronautical charting was the catalyst. It is believed this episode may not have been brought to light before. There is a deplorable paucity of reference material relating to the work of the Geographical Section of the General Staff (GSGS) in the early years of the twentieth century, perhaps one of the reasons why research in this field is so tantalising, and it is for that reason that it has been thought worth quoting in full some of the documents that have been found.

The tremendous growth of military aviation in the First World War and the need for Aeronautical Charts in the post-war period had resulted in the subject being addressed at the Peace Conference. In an Annex dated 10 April 1919, (1) entitled “International Aeronautical Maps and Ground Markings”, and referring to Clause 2 to Article 13, it was stated that international maps should be made and aeronautical ground marks established in accordance with certain principles. Two types of aeronautical charts were to be used. The index scheme was to be based on that of the International 1:1,000,000 scale Map of the World adopted by the Congress of London 1909 and the Congress of Paris 1913. The metre was to be the standard adopted for lengths, distances, heights and depths. The colours, symbols, and arrangements for production of the 1:1,000,000 International Map were to be used as far as practicable for the Aeronautical maps.

**The General Maps or Carte Generale Aeronautique Internationale** were to be drawn on Mercator’s projection on scale of 1 degree of longitude = 3 centimetres with a one degree graticule and values and were to show, at least, wireless stations, international frontiers, isogonals, a legend of symbols, publisher’s name and date of production.

**Local Maps** were to be on a scale of 1:200,000, except for sparsely inhabited areas where 1:500,000 or 1:1,000,000 might be used, and were to cover one degree of longitude and latitude. Sheet numbering was to be based on the anti-meridian of Greenwich and the south pole. Thus a sheet whose south-west corner was 49 degrees north and 2 degrees east would be numbered 139-182. A sheet whose south-west corner was 36 degrees south and 7 degrees west would be numbered 54-173. Sheets were to cover 1 degree of latitude by 1 degree of longitude with a 20 minute graticule. They were to show roads of two classes, all railways, cities and towns in outline, principal drainage, woods and other areas unsuitable for landings, aerodromes, airship hangars, permanent landing places on ground and water, aeronautical ground marks, fixed navigation lights, wireless stations, meteorological stations, power lines, remarkable objects, national frontiers, names of important settlements and bodies of water. Relief was to be shown by shading and figures indicating heights, the most important enclosed in an oval ring.

Marginalia were to include the locality/sheet name, scales of minutes and kilometres, adjacent sheet names, a bilingual Legend in English or French and the producer-nation language, magnetic declination diagram, adjacent sheets diagram, boundaries diagram and publishers name and date of production.

The impact of this new requirement and how it should be met evidently exercised the GSGS on whose behalf the War Office initiated a committee to discuss the way forward.

In a letter, dated 29 April 1919, (2) the War Office raise the question of the strong probability of overlap of the work in the preparation and production of maps needed by Government Departments, pointing out the long-standing role and expertise of the GSGS in preparing the maps needed for war. It noted that the Naval Intelligence Department (NID) had set up a special department in the war to produce reports on most parts of the world and had also compiled and published some maps. It announced the recent decision by an International Committee in Paris that two types of special map were needed for flying : -

Mercator’s Projection	3 cm to 1 degree of longitude, about 1:400,000.
Mercator’s again ?	1/200,000 of land areas.

The question of who was to produce these had arisen. The possibility that the Air Ministry might set up a special department would result, effectively, in a duplication of the GSGS and it was therefore for consideration whether the GSGS, enlarged if necessary, could do all the geographical work required by the R.A.F. as well as that required by the War Office.

The appointment of a committee was suggested comprising one member each to be appointed by the Admiralty, the Air Ministry, the War Office and also the D.G.O.S., since the O.S. reproduced much of the War Office's work and all the maps required by the Admiralty and the Air Ministry.

The committee was to be asked to consider the best means of co-ordinating the provision of maps required by the three Departments, and the desirability of forming one Geographical Department to serve the needs of all Government Departments as regards maps and geographical information outside the UK; it being understood that the Admiralty was solely responsible for charts, and the Ordnance Survey for maps of the United Kingdom.

In a letter dated 13 May 1919, (3), the Board of Agriculture and Fisheries concurred in the suggested committee, excluding from consideration and discussion Admiralty charts, maps of the United Kingdom and the normal functions of the O.S., and that the committee should be concerned only with the provision of maps and geographical information outside the U.K. The Board approved the proposal that the D.G.O.S., or his representative, should be a member of the Committee.

In a letter dated 24 May 1919, (4), the Air Ministry concurred in the suggested committee.

In a letter dated 4 June 1919, (5), the Admiralty concurred in the suggested committee but stated it must reserve the right to produce all charts and maps required for naval purposes and that its responsibility was for charts world wide, the compilation of which must be undertaken by the Admiralty which had the expertise both in the Hydrographic Department and the NID, by no means behind the GSGS in that respect. The question of the GSGS being responsible for the printing of maps was perhaps a matter of discussion. Air maps were produced for the Air Ministry from the commencement of the war at the request of that Ministry and the War Office statement that the O.S. reproduced all maps compiled by the Admiralty and Air Ministry was in error. It suggested that while Dr. H. N. Dickson, who had been engaged in the compilation of maps for the NID, could hardly be considered a representative of the Admiralty, he could furnish information on probable requirements of the NID.

At the first meeting of the Committee, (6), held in the Hydrographer's Room in the Admiralty on 15 July 1919, the participants were :-

GSGS.	Col. W.C. Hedley, C.B., C.M.G.
Admiralty.	Capt. H.P. Douglas, C.M.G., R.N.
Air Ministry.	Col. L.F. Blandy, D.S.O.
O.S.	Maj. A.G. Robinson, O.B.E., R.E.
Secretary.	Capt. G.T. McCaw

Initially, Colonel Hedley explained the background to the Committee and its role :-

*"I will start by explaining what made me suggest this Committee. I have been nearly eight years in the Geographical Section at the War Office and I have always felt that much of the work we did or were capable of doing was more or less lost. We meet the needs of the War Office, assisted in the work of reproduction by the Ordnance Survey, and we advise the Foreign Office and Colonial Office in questions of Boundary Commissions and matters affecting Colonial Surveys. It is, moreover, certain that our very existence is unknown to many sections of the Foreign Office and probably of the Colonial Office with the result that the Foreign Office officials are constantly working on maps which are far from the best which exist, and we receive no guidance from either the Foreign Office or Colonial Office as to what maps would best serve their purposes. A glaring instance of using the wrong map occurred recently at the Peace Conference when a Committee of the Foreign Office settled the new Danish Boundary on a bromide copy of a map dated 1864, when first class modern maps were available.*

*Such a thing would have been impossible in the War Office where officers are trained to come to us for the most suitable maps for studying any problem. I have long been of opinion that a Geographical Establishment to which any Government department could apply for maps and advice and assistance on geographical matters would be a great advantage.*

*On the outbreak of war the requirements of all departments for maps became at once apparent. Officers from the Admiralty were constantly, almost daily, coming to us for maps of all kinds. As a rule I think we met their requirements but the question of what maps would be required by the Admiralty in war had never been brought to our notice. We also have frequently to go to the Admiralty for information as to coast*

*lines, and other things such as positions fixed by His Majesty's Ships. The question of flying maps was dealt with in water-tight compartments. The Admiralty got the Ordnance Survey to prepare what are called "Packet Maps" for their flying people. These were simply War Office maps prepared in special sections, the sections being grouped together in suitable packets. It was some time before I even heard of these maps, although they were our maps, and I believe that I was instrumental in bringing these maps to the notice of the Army, Flying Corps. All this represented a sad lack of co-ordination.*

*The Peace Conference has a special Geographical Section at Paris which has done invaluable work. Early in the war, however, Treaties affecting Italy and Asia Minor were made using small scale obsolete maps as the basis. This is clearly quite wrong. If the Foreign Office requires a Geographical Section for a Peace Conference it requires one also for any Treaty in which boundaries or the decision of large areas is under consideration.*

*Shortly after the war broke out a new department was started by the Admiralty primarily with the object of writing handbooks and manuals. Very large numbers of these books were prepared and the new department also undertook the compilation of maps, amongst others one of part of the Balkans on the 1/400,000 scale and of Mesopotamia and Asia Minor on the 1/500,000 scale. These maps may or may not have been needed. They were certainly not required by the War Office for the prosecution of the war. The point is that there was already in existence a Government department whose duty it was to compile all necessary maps and it can hardly be right for a second Government department to compile new maps without even consulting the existing department. In saying this I am not referring to sketch maps to illustrate the handbooks. I should add that on June 28<sup>th</sup> this department ceased to exist, all maps being handed over to the War Office.*

*In addition to the maps produced by Dr. Dickson, the Admiralty occasionally prepares maps on its own account. I have here a few specimens. It is a comparatively small matter but the same argument applies. The real reason, however, which impelled me to take action was the advent of flying and the need for special flying maps and charts. I have already alluded to the lack of co-ordination in preparing flying maps in the early part of the war. Such a thing can hardly occur again as the Air Ministry is now entirely responsible for all flying maps. It is, however, obvious that for many years to come it will be necessary to use existing maps, i.e., the maps prepared by the G.S.G.S. or by the Survey departments such as the Ordnance Survey, Survey of Egypt or Survey of India.*

*The only existing topographical maps of the British Possessions in Africa are done by this section. The 1/M maps covering Europe, Russia and large parts of Africa are done by this Section, as are also the only British maps of Syria and Turkey in Asia. For many years to come therefore the maps to be used for flying must be those of this Section; all the material for new maps must also come from this Section. It was decided at the Peace Conference that two series of maps or charts should be prepared for flying : -*

- (a) A map on the 1/200,000 scale.*
- (b) A chart on Mercator's Projection on the scale of 3 cms to one degree of longitude or about 1/400,000.*

*Presumably each country will prepare its own maps and the question is who shall do it for the British Empire. It is a big question and I will not discuss the pros and cons now, beyond saying that I think the ideal solution is a Geographical Department to provide for the needs of all Sections of the Government. If we recommend such a department we ought to consider whether it should not be a Geographical Department in the full sense of the word. Our Section is chiefly concerned with survey and maps.*

*Dr. Dickson's department on the other hand wrote amongst many other things, geographical descriptions of the various countries dealt with. If these are necessary in war some organization ought to exist for their preparation in times of peace. The addition of a few geographers would enable this to be done.*

*I think we had better commence our proceedings by each department making a statement of the work to be done and of the means at their disposal for doing it."*

The business of the committee then got under way : -

"Colonel Hedley said : -

1. The G.S.G.S. is organised as follows : -

- (a) A Staff of 6 Officers (5 General Staff and 1 civilian) whose duty it is to make all preparation for the provision of the necessary maps for peace and war. This includes the compilation, drawing and reproduction of maps. Each Officer deals with a special area and it is his duty to have a complete knowledge of the maps and surveys (or lack of surveys) of his area and to keep in touch with all the Survey Departments in those areas. The G.S.G.S. is in constant communication with the Ordnance Survey and*

*with the Surveys of India and Egypt, and with the Surveys of all British Colonies and Protectorates, and with the surveys of Foreign Countries, especially France, Belgium and Italy.*

*(b) A Map Curator who has charge of a library of maps which include copies of all published topographical maps of the world and a vast mass of unpublished maps and map material. This is an essential part of any geographical establishment and is the material from which all new work is done.*

*(c) A staff of 22 geographical draughtsmen.*

*(d) A photographic establishment.*

*(e) A lithographic establishment including 3 printing machines.*

*(f) A map store where G.S.G.S. maps are stored and whence they are issued.*

*2. The requirements of an Air Geographical Section would be exactly the same as the above except that the officers, or some of them, would need to have a knowledge of the needs of the airmen. They would require the same knowledge of survey methods and of map compilation, the same library of maps, and a similar staff for drawing and reproducing maps.*

*3. The world may be sub-divided as follows : -*

*(a) Areas where perfect maps exist; e.g., England and most of Europe.*

*(b) Areas for which rough surveys or reconnaissances exist, e.g., the W.O. Cape Colony Series.*

*(c) Areas for which maps have been compiled from sketches, reconnaissances, travellers' routes, etc., e.g., W.O. Turkey-in-Asia, 1/250,000 map.*

*(d) Areas only roughly known or quite unexplored.*

*In cases (a) and (b) the greater part of the information for a perfect flying map already exists, though much remains to be added and the style in which the existing information should be represented to the best advantage of the aviator has to be settled. The present staff of the G.S.G.S. would be fully qualified to deal with the preparation of flying maps from the material if they had the assistance of officers fully acquainted with the Air point of view and in a position to supply either by air photos or by other means, the special information required by aviators. The work of compiling maps (c) and (d) is precisely the same whether the map is required for flying or for other purposes. It consists of collecting, co-ordinating and reconciling a mass of conflicting maps and reports. It would appear to be wrong to have two officers, one in the R.A.F. and one in the G.S.G.S. doing this at the same time for any one country. It would clearly be a duplication of work.*

*Similarly a special Air Geographical Section would require to be in touch with the Survey Departments of the World as the G.S.G.S. now is. It should be clearly understood that it is not possible to do anything like an accurate survey from Air Photos alone. Results from such efforts are better than nothing at all, but they are necessarily very inaccurate. All the Air Services can do is supply the particular survey concerned with all the photographs they ask for. This was recognised during the war in France, Egypt and Mesopotamia. It is recognised today in France, where the Service Geographique is utilising air photos for their maps, and in Egypt and India. Air photos are comparatively useless without a series of fixed points to which to tie them, and they only assist not replace the topographer. It would not therefore be wise to have two departments in London with which other Survey Departments should communicate on the subject of aerial maps and surveys.*

*4. The material necessary for maps and charts has been collected through a long series of years by the War Office and Admiralty, not only from their own resources but by aid of the Foreign and Colonial Offices, by arrangements of a reciprocal nature with foreign governments, and by naval and military attachés abroad. This material comprises not only maps, but geographical and official publications and reports of all countries, special surveys and reports made either during peace or war, of which the War Office and the Admiralty are the sole possessors; numerous results of explorations made by private persons, forwarded to the War Office or the Admiralty, finally papers on special subjects of a varied nature. The purchase of even those comparatively few maps and publications which are now available would involve an outlay of probably £50,000; and even the floor space in London required for this housing would be considerable, as the present state of the corridors in the War Office testifies.*

*5. Before the war the staff of the G.S.G.S. was only sufficient to meet the needs of the War Office.*

*During the war so many maps have been prepared and so much ground covered that we ought shortly to be able to spare some draughtsmen for the work of flying maps. Some addition to the staff would however undoubtedly be required. The first necessity would be 2 Officers with a complete knowledge of air*

requirements. If no flying officers have the necessary survey qualifications I would recommend that some survey officers acquire the necessary flying knowledge.

Some more draughtsmen would also be necessary if much progress is to be made I would recommend 6 as a start. Our photographic establishment can I think compete with the work. It might be necessary to have another photographer. The lithographic establishment can render great assistance. It will be necessary to send more work to the Ordnance Survey.

6. I do not think it is necessary to decide now the question of whether the R.A.F. shall ultimately have a Geographical Section of its own, but I am convinced that the only practical thing to do for the moment is to slightly increase the G.S.G.S. by a staff which shall be devoted to air work.

7. the above additions are quite apart from the question of correcting air maps and charts and of issuing **Sailing Directions**. A special staff for this purpose will have to be organised by the Air Ministry who will then be able to decide whether it shall be placed under the direction of the Geographical Section or whether it shall be kept entirely in the Air Ministry. A small staff will be necessary for the reception and issue of maps.

Colonel Blandy asked as to the scope of the Committee. It was agreed that the function of the Committee, in the first instance at any rate, was to report the results of its conclusions.

He then placed before the Committee a statement of the present views of the Air Ministry on the subject of maps suitable for flying. The matter is fraught with considerable difficulty, the demand being so recent and the necessities of warfare preventing any general attempt to experiment with different types so as to ascertain the most suitable. The requirements of the aviator were certainly not quite the same as those of the ordinary map-user. These matters received attention at the recent Conference of representatives of the Allied Air Forces in Paris, where various proposals met with general assent and were embodied in the Report of the Conference.

But while it was decided to adopt certain scales and forms of projection, and, in particular, the special representation of certain ground features of particular value to aviators (overhead power lines for example), what we may describe as the general cartographic scheme was left more or less undefined, to be worked out according to the ideas of the country concerned. The conflict of national opinions on the subject will without doubt further the evolution of the best scheme and much may be hoped from an examination of the first French and American attempts.

Colonel Blandy mentioned that, in a report on a recent serious flying accident in Southern France, the officer concerned declared that the accident would most likely not have happened had the aviators been equipped with a proper flying map.

With regard to the production of maps for the Air Ministry, there was still a certain amount of conflicting opinion. The promotion of competition between private firms had been considered; but the necessity of being in a position to produce certain official or secret maps was recognised, so that the Air Ministry must be prepared to produce certain maps under their own direction; and accordingly a mapping section in immediate touch with the Ministry was essential.

Captain Douglas stated that the Admiralty have a special arrangement for the production of their charts by a private firm, whom they practically monopolise; nevertheless for the production of very special secret maps etc. for the war, they found it necessary to install two printing machines in their own buildings.

Regarding the work done during the war by Naval Intelligence, Section 32, it was agreed by the Committee that if such maps were required by the Admiralty for the purposes of warfare, it would be advisable to have in existence some machinery capable of compiling and producing them, so as to avoid expenditure of national effort in duplicating work. As the work referred to covered such areas as Mesopotamia, Abyssinia and Serbia, there was undoubtedly considerable overlapping of effort. This work has now been taken over by the War Office, which is completing Abyssinia.

Captain Douglas referred in particular to the coastal air charts which the Admiralty prepare for the Air Ministry. He stated that the Admiralty had produced a number of Air Charts and had a large staff engaged in making the necessary corrections. This was an arrangement for the war and he thought the time must soon come when this arrangement would probably be questioned. The Admiralty would have difficulty with the present staff in producing the 3 cm. charts for land areas, but could do them for the sea areas with the existing staff. He thought it would be easier for the War Office to do this work, getting the information from the Admiralty as to sea areas. If the G.S.G.S. undertook this work, he thought it would be probably necessary for a Naval officer to assist in the compilation.

*In regard to these charts the subsequent discussion revealed the absolute necessity for their revision at very short intervals, and it was clear that the labour of revision was greater than anyone not intimately acquainted with the nature of the subject would be likely to imagine.*

*Major Robinson said that the Ordnance Survey were equipped for the preparation of maps of every description, except maps with marginal pictorial sketches of features, such as required half-tone blocks for their preparation. During the war the Ordnance Survey had lent all its aid to the War Office, Admiralty, and other Departments; without its assistance the Naval Intelligence Section, for example, could not have produced its series of sheets. The result of this vast work has been that their peace-time programme has been set back for five years.*

*It was pointed out that for work outside the United Kingdom, the Ordnance Survey were in a position to undertake only the reproduction of maps already compiled, except perhaps sketch-maps, the material for which was commonly available.*

*He thought that a map with references to pictorial sketches printed independently in a reference book would be of much assistance to aviators and would enable the map as prepared for the ordinary user to be adapted without much alteration to the needs of flying.*

*He also referred to the difficulty of obtaining cartographic draughtsmen and mentioned that at the rates holding at present moment such men were being paid something like £300 a year. The Ordnance Survey, War Office, Admiralty and a few private firms have absorbed all the best draughtsmen.*

*The question of the copyright of the Ordnance Survey in maps of the United Kingdom must be considered. The experience of the Admiralty, however, appeared to show that it was difficult to maintain the copyright.*

*The following conclusions appeared to emerge from the subsequent discussion : -*

*The needs of the Air Ministry may be divided into two parts: -*

- (a) The ultimate ideal.*
- (b) The present possibilities.*

*The ultimate ideal may be taken to be represented by the Paris resolutions, which contemplated the preparation of two sets of Air maps or Charts : -*

- (a) A set of Air Charts covering land and sea on Mercator's projection on a scale of 3 cms. To one degree of longitude or about 1:400,000.*
- (b) A set of maps covering all land areas on a scale of 1/200,000.*

*It is evident that this programme will take many years to complete. In the opinion of the Air Ministry there was no urgency about the 1/200,000, except possibly for the United Kingdom but it was desirable to proceed with the smaller scale charts. In any case no appreciable results in this direction could be visible for some years and it was necessary to carry on in the meantime.*

*The present position was as follows : - The R.A.F. has a small section dealing with the question of maps, but has no organisations for the compilation of maps or charts.*

*A certain number of flying charts have been prepared by the Admiralty, who also have a considerable staff engaged in keeping them up to date.*

*For maps the Air Ministry is entirely dependent on existing maps, whether prepared by the G.S.G.S., the Ordnance Survey, the Surveys of India or Egypt or by Foreign Governments. During the war they obtained all their maps by application to the G.S.G.S., or in the East to the Surveys of India or Egypt.*

*It was undoubtedly necessary to do the following work : -*

- (1) Start the 3 cm. Air Charts.*
- (2) Provide for the supply and issue of the available charts and maps wherever obtained.*
- (3) Arrange for the printing of special air information on such maps and charts.*
- (4) Compiled new maps for flying.*
- (5) Carry out experiments with a view to arriving at the best form of flying map.*
- (6) Issue "sailing directions" and correct special air maps and charts.*
- (7) Consider and experiment on the best manner of taking air photos with a view to assist new surveys.*

*The Air Ministry feared that sufficient attention might not be given to such work unless they had a department of their own; but the provision of such a department was not an easy matter and they were ready to consider any alternative solution.*

*Colonel Blandy stated that the most urgent necessity was the production of maps for certain routes, ex. gr., England to Cairo, Cairo to Karachi, Cairo to the Cape, Karachi to Australia.*

*Colonel Blandy stated that, as at present informed, he was in favour of the work being done by G.S.G.S. suitably strengthened according to the needs and desires of the Air Ministry.*

*Colonel Hedley stated that the question of accommodation in the War Office for extra staff might be a difficulty, but it should not be insuperable. He was of opinion that a Geographical Department in a separate building would be the best solution but the discussion of this subject had better be deferred to a future meeting.*

*Captain Douglas and Major Robinson agreed that for the present the work should be done by the G.S.G.S.*

*The Committee provisionally determined on the following recommendations : -*

- 1. The needs of the Air Ministry would best be served by the addition of two Air officers and one Naval officer to the Geographical Section, General Staff.*
- 2. Maps should then be prepared by the Geographical Section on the Mercator projection as proposed by the Allied Air Conference.*
- 3. The Coastal Charts and Notices to Airmen should continue as at present until new arrangements were properly started and the charts should be replaced eventually by the 200,000 map.*
- 4. The maps of immediate urgency were those of the air routes (1) London to Cairo; (2) Cairo to Karachi; (3) Cairo to the Cape.*

*The next meeting of the Committee was fixed for Monday 21<sup>st</sup> July, at 3.p.m. in the Admiralty."*

As an action from the first meeting, on the 15 July 1919, Col. Hedley put questions to the Service Geographique de l'Armée (SGA) on the procedures followed in France.

It was found that the French Air Service did not have its own Geographical Branch, all needs being met by the SGA. The Survey work of French air service was limited to the supply of the photos required by the SGA.

It is believed that at some stage, Colonel Hedley called for a report on the proposal from Lt Col McLeod but that this report may have been received too late for the first meeting of the committee : -

***"Report by Lieutenant Colonel M. N. McLeod, D.S.O., R.E.***

*The question raised by the terms of reference of the Committee is one of principle as to whether a new service requiring special Geographical information requires its own department to supply its needs or whether these can be dealt with by existing agencies.*

*Already there are in existence three such services. The Army, the Navy and the Civil Government and each has now its own Geographical service : -*

*The G.S.G.S., the Hydrographical Department of the Admiralty and the Ordnance Survey. At first sight it would seem that on this analogy the Air Force would be justified in forming its own service also.*

*I think, however, that this is not the case.*

*Admitting, as is undoubtedly the case, that its requirements differ from those of any other service, it is nevertheless the case that the differences lie, rather in the form in which the information is presented, than in the special character of the information.*

*The ordinary topographical map shows all the features of the earth's surface. This also is what the airman requires; the only difference is that the features which are of most importance to the airman are not those which are most important to the man on the ground. It follows, therefore, that the types of map required in the air differ from ordinary maps only in the relative prominence given to particular features.*

*To decide which features should be thus emphasised it is unnecessary to know anything about the methods of surveying them. All that is required is that the office preparing the maps should have expert advice in the preparation of the maps.*

*It may be argued that since the air service already provides material for survey by means of air photographs that it would be economical to place the control of the entire survey in its hands. The air photograph, however, is only a small part of the process of survey. It is of no value for mapping purposes in the hands of one who is not fully conversant with all other aspects and processes of survey work.*

*Apart from this, however, it is clear that if a separate Geographical Section for the Air Force was established such a section would have to maintain a complete set of records and constant touch with all Foreign and Colonial Survey departments as is now done by the G.S.G.S. This is bound to lead to unnecessary overlapping and waste of effort.*

*I believe also that the practical difficulty of establishing such an office at the present time would be insuperable. Sufficient technical experts are not to hand.*

*That such overlapping has not yet taken place is due to the fact that the scope of existing agencies is limited by clearly defined lines of demarcation.*

*The Ordnance Survey deals with the British Isles. The Admiralty with the sea and the G.S.G.S. with everything else. The Air Service is, however, concerned with all three and there are in its case no such clearly defined lines of division.*

*In view of the above it should appear that what is now required is the formation of an Imperial Geographical Institute or Service whose functions would be to collect and record Geographical information from all over the world and prepare this information, or as much of it as is required, for each special service, in the way required by that service under the supervision and advice of its representatives. The latter would be responsible for saying what information should be shown on the map and be in a position to discuss with the technical mapping experts the best methods of showing it.*

*While actual surveys must I think still be carried out by the local Governments, such an Institute should have power to direct their activities towards any special requirements in the way of original work and should have the means of producing special maps for any service or Department.*

*It would also be very favourably situated for directing research work in new methods of survey such as aerial photography.*

*Such direction of geographical work is at present carried out unofficially to some extent by the Royal Geographical Society on a small scale. They also collect and record a great variety of geographical information.*

*The value and importance of their work is I think clear evidence of the value and opportunity for an official agency of a similar kind with wider powers and greater resources.*

*The need for something of the sort, is in my opinion, already pressing and will increase as time goes on.*

*If it be assumed that such a Geographical Institute is required it remains to consider how best to introduce it.*

*In view of the fact that the G.S.G.S. already maintain a complete set of records it would seem that the best means to forming it would be by expanding the G.S.G.S. and attaching to it representatives of all services which require special maps.*

*I am of opinion that such an expanded office should be detached altogether from the Army and work as an independent service recruited indifferently from the Army, Navy, Air Force or the Universities, wherever in fact the necessary survey and technical qualifications are to be found.*

*As long as it belongs to any one service, as at present, there will always be the danger that the requirements of other services may not receive their due share of consideration and there will be this desire on the part of each to form their own Geographical Sections.*

*It is essential I think that the Central Geographical Institute be independent of any one of them and that all should be represented on it.*

*It is perhaps premature to give any opinions as to the composition of the directorate or working staff of such an Institute but it may be said I think that while the head of it must be a fully qualified surveyor, its activities would be principally directed to the compiling of information supplied from outside and the drawing and printing of special maps.*

*It should not attempt to supplant or compete with local topographical surveys but to supplement them where necessary and to co-ordinate their work generally.*

*In view of the fact that the two most important services which it will serve will be the Army and the Air Force it is advisable that the organization should be of a semi-military character. In future campaigns there is no question but that every army must take the field with an elaborate topographical organization which must be supplied by and work under the direction of this General Institute which would take over the present functions of the G.S.G.S.*

(Sd.) M.N. MacLeod,  
Lieut.-Col. R.E.

19.7.19.

The Committee issued a preliminary report on 9 Sep 1919 : -

***“Preliminary report of the committee assembled to report on the best means of coordinating the provision of the maps required by the Admiralty, War Office and Royal Air Force, and to consider the desirability of forming one Geographical Department to serve the needs of all Government Departments as regards maps and geographical information outside the United Kingdom***

1. *The present position as regards the preparation of maps and charts for the use of the Navy, the Army and the Royal Air Force is as follows : -*
  - a. *All maps for military purposes are prepared either by the Geographical Section of the General Staff or under instructions issued by them, except those of India and Mesopotamia which are prepared by the Government of India.*
  - b. *All sea charts are prepared by the Admiralty.*
  - c. *The R.A.F. has no organization for preparing special maps for its own use. The maps used for flying are those prepared by the G.S.G.S., Ordnance Survey, Survey of India or Survey of Egypt. At the request of the R.A.F. the Admiralty has also prepared a certain number of to a small scale of about 3 miles to one inch.*
  - d. *During the war a special department of the Admiralty compiled certain maps but this department has now ceased to exist, and the Admiralty does not contemplate the preparation of further maps except perhaps an occasional map for special purposes.*
2. *Until the advent of flying we are of the opinion that the organisation by which the G.S.G.S. prepared all maps and the Admiralty all charts was quite satisfactory. Special maps and charts are however now required for flying and no department exists for their preparation. Either the work must be allotted to the G.S.G.S. or to the Admiralty, or be divided between the two; or a new department must be formed whose duty it will be to deal with all maps and charts required by the R.A.F.*
3. *Before discussing these alternatives we will explain the work to be done. It was decided at the International Conference at Paris that the following maps or charts should be prepared, each country to do its own area :*
  - (a). *Maps on the 1/200,000 scale specially prepared to meet the airman's needs.*
  - (b). *Charts on Mercator's projection on a scale of 3 cms to 1 degree of longitude.*

*The work involved in (a). is immense. Some idea of the amount may be gathered from the fact that one sheet of the International 1/M series would include 25 sheets of the same size on the 1/200,000 scale. The Mercator map also means much work, but very much less than the other. The scale is about 1/370,000 on the Equator and one sheet of the same size would include nearly 4 sheets of the 1/M map. There are therefore nearly 100 times as many sheets in (a) as in (b). The completion of (a) must require many years. It cannot be begun until the style and conventional signs have been settled a thing which will require much consideration and experiment. (b) should be completed as soon as possible. When these maps are produced a considerable staff will be required for keeping them up to date and for issuing new editions at short intervals. It is clear however that these maps and charts will not be available for a very long time. The immediate work necessary for carrying on is as follows : -*

  - a. *The selection of existing maps of all countries for flying purposes.*
  - b. *The preparation of an extra plate for each map, giving such special information as is required for flying.*
  - c. *The keeping of this special , plate up to date and the issuing of new editions.*
  - d. *The conducting of experiments to decide : -*
    - (1) *The best style of flying map and chart.*
    - (2) *The best method of taking air photos for survey purposes.*
  - e. *The organisation of a section for issuing Flying Directions to correspond with the Admiralty Sailing Directions.*

4. To do the work indicated in the preceding paragraph a department is required as follows : -

- a. Officers with survey knowledge & with a background of the requirements of the R.A.F.
- b. A collection of maps of the world & of map material.
- c. Geographical draughtsmen.
- d. A reproduction department, including a photographic and lithographic section.

Now the G.S.G.S. is organised exactly on these lines, & the officers and men possess all the knowledge required except a knowledge of the special requirements of the airman. Moreover it has been explained in para 3 that the immediate needs of the future are the selection and adaptation of existing maps, most of which are prepared by the G.S.G.S. Further it would be exceedingly difficult if not impossible to find the necessary staff for a completely new section, and, if found their work would only be a duplication of the work now done by the G.S.G.S. For it must be remembered that the work of preparing a map for flying is essentially the same as that of preparing any other map. The construction of the map and the materials are the same. The only difference is that the special features to be emphasized on the map will be chosen differently if the map is to be used for flying.

We are therefore of the opinion that a separate Geographical Section for the R.A.F. should not be set up but that the G.S.G.S. should be so strengthened as to serve the needs both of the Army & the R.A.F.

4. The immediate additions recommended are as follows : -

1 G.S.O. 2 who should have a complete knowledge of survey methods and who should acquire, if he has not got it, a knowledge of the special air requirements. He would be responsible for all Air Force map requirements, including the issue of maps and probably Air Directions.

1 G.S.O. 3 whose special duty would be the design and reproduction of new air maps & charts and of special air overprints for existing maps.

1 G.S.O. 3 whose duty it would be to study the best methods of taking air photos for survey purposes & to arrange for the taking of such photos wherever required.

6 Geographical Draughtsmen.

We do not for a moment consider that these additions to the G.S.G.S. will be sufficient to meet the ultimate needs of the R.A.F., but we are of opinion that it will meet their immediate requirements and that it is useless to proceed further until the section now proposed has had time to consider the questions involved and to work out in detail the work to be done and the staff required to do it.

We have said that it would rest with the G.S.O. 2 to issue "Air Directions" but we understand that a staff for this purpose already exists. In any case the preparation of such directions is entirely a matter for the Air Ministry and we are unable to say whether the staff dealing with Air Directions would be better as part of the geographical Section or as a separate department of the Air Ministry.

5. We have said in para 1c that the Admiralty already has a staff engaged in the preparation, printing, correction and issuing of certain Air Charts. This work should be continued by the Admiralty for the present but should ultimately be taken over by the G.S.G.S. when it is in a position to do so. It is possible that one of the new officers should be a naval officer.

6. The recommendations we have made are preliminary only. It is evident that very much greater increases will ultimately be necessary, especially in the reproduction department. We are however quite unable to state what these increases should be until the requirements of the R.A.F. have been worked out in detail by the staff we now propose. We wish also to defer till then our recommendations as to the establishment of a separate geographical Department to serve all Government needs.

We propose therefore to issue a further report at a later date. We will only say here that it is probable that a Geographical Section will be required which will far overflow the accommodation available at the War Office & that if such proves to be the case the best course would appear to be to form one Geographical department to do all the map work, including compilation, drawing and reproduction required by the Government and to establish it in a suitable building close to London. The Ordnance Survey is already very hard put to it to meet the requirement of the War Office & Admiralty and further expansion in their existing premises is difficult. It would moreover be much more convenient to have a Government lithographic establishment nearer to London than Southampton.

7. *If our recommendations are accepted we consider that the present rule by which the R.A.F. pays for maps supplied by the G.S.G.S. should cease. A simple plan would be that the cost of the G.S.G.S. be divided between the R.A.F. & War Office in whatever proportion is considered just.*

*The Committee summarised its conclusions as follows : -*

*I. That for the present the Geographical Section of the General Staff shall be reinforced by three officers or civilians with the necessary experience of whom one shall have had a hydrographical surveyor's training. These officers or civilians shall be selected by the Air Council in consultation with the Admiralty & the Army Council.*

*II. That six draughtsmen shall be added to the G.S.G.S.*

*III. That the G.S.G.S., thus increased, shall proceed to examine how the existing maps can be adapted to the needs of the Air Ministry & shall begin the preparation & printing of such special maps as the Air Ministry requires.*

*IV. That the Admiralty shall continue in the meantime the preparation, printing & correction of Coastal Air Charts in the areas already specified, but in future in new areas they shall be drawn on the scale and projection laid down by the International Aeronautical Convention (1919) of Paris.*

*V. That the Notices to Airmen shall be continued by the Admiralty for the present.*

*That, as it is essential that air maps should be kept fully up to date, so that the prospect appears to be that the geographical information required by the Air Ministry will be continuously increasing for a considerable period to come, the Committee should devote further study to the various aspects of the subject as they arise."*

The Treasury approved the recommendations of Preliminary Report (7).

On 2 June 1920, G.T. McCaw of the G.S.G.S. submitted to the Admiralty, and presumably the other Departments, a report proposed to be issued as closing the work of the Committee for the Coordination of Maps : -

*"On 9<sup>th</sup> September, 1919, we issued a preliminary report making certain recommendations for the preparation and supply of maps for the R.A.F. These recommendations have been approved by the Treasury (5004/20 of 26-2-1920) & are being put into force.*

*We had originally contemplated the issue of a further report examining the whole future programme of work in connection with the provision of maps for the R.A.F. & making suggestions for carrying out the work. We now feel, however, that these matters can be left to be arranged between the Geographical Section, General Staff, & the Air Ministry, & that we cannot usefully do any more.*

*In our terms of reference we are instructed to report on the desirability of forming a Central Geographical department to meet the needs of all Government Departments. We feel that there is much to be said in favour of such a department which would combine a geographical (in the full sense of the word) & a Topographical side. Such a Department would however necessarily involve a heavy initial expense. A separate building would have to be designed & built to hold the new Department.*

*We do not think that any such proposal could possibly be favourably considered at the present time & we do not therefore propose to investigate the question unless we are asked to do so.*

*June, 1920."*

Thus ended the "Geographical Department". The production of the Carte Generale Aeronautique Internationale or the International General Aeronautical Map was to continue until the 1940's.

#### **References : -**

- (1) Annex - "International Aeronautical Maps and Ground Markings", dated 10 Apr 1919.
- (2) War Office, Army Council, letter 81/1804 (C.3.) dated 29 Apr 1919.
- (3) Board of Agriculture and Fisheries letter E.7162/1919 dated 13 May 1919.
- (4) Air Ministry letter, B.11212 (D.D.C.) dated 24 May 1919.
- (5) Admiralty letter H.15596 dated 4 Jun 1919.
- (6) Proceedings of the Committee's first meeting.

