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## ABBREVIATIONS

A.A.I.	Allied Armies in Italy.
A.B.S.	Atlantic Base Section.
A.D.	Assistant Director.
A.D.G.B.	Air Defence of Great Britain.
A.E.A.F.	Allied Expeditionary Air Force.
A.F.H.Q.	Allied Forces Headquarters.
A.G.R.A.	Army Group, Royal Artillery.
A.L.F.S.E.A.	Allied Land Forces, South East Asia.
A.M.D.	Advanced Map Depot.
A.M.S.	Army Map Service (U.S.).
A.P. and S.S.	Army Printing and Stationery Service.
A.P.I.S.	Air Photographic Interpretation Section.
A.P.I.U.	Army Photographic Intelligence Unit.
A.T.S.	Auxiliary Territorial Service.
B.C.	Bureau de Cadastre.
B.E.F.	British Expeditionary Force.
B.T.	Bureau Topographique des Troupes du Levant.
B.T.E.	British Troops in Egypt.
C.B.O.	Counter Battery Organization.
Com. Z	Communications Zone.
C.O.S.S.A.C.	Chief of Staff to the Supreme Allied Commander.
C.R.A.	Commander, Royal Artillery.
D.G.O.S.	Director General, Ordnance Survey.
D.M.O. & I.	Division of Military Operations and Intelligence.
E.A.E.	East African Engineers.
E.T.O.U.S.A.	European Theatre of Operations, United States Army.
F.A.A.A.	First Allied Airborne Army.
F.M.S.	Federated Malay States.
F.U.S.A.	First United States Army.
G.S.G.S.	Geographical Section, General Staff.
I.A.S. & T.	Indian Air Survey and Transport Ltd.
I.G.N.	Institut Géographique Nationale.
I.H.B.	International Hydrographic Board.
I.P.C.	Iraq Petroleum Company.
I.S.T.D.	Inter-Service Topographical Department.
K.A.R.	King's African Rifles.
L. of C.	Line of Communications.
M.A.I.U.	Mediterranean Air Intelligence Unit.
M.A.P.R.W.	Mediterranean Allied Photographic Reconnaissance Wing.
M.E.I.U.	Middle East Interpretation Unit.
M.S.S.	Map Supply Section.
N.A.P.R.W.	North African Photographic Reconnaissance Wing.
N.C.A.C.	Northern Combat Area Command.
O.C.T.U.	Officer Cadet Training Unit.
O.P.	Observation Post.
O.S.	Ordnance Survey.
Paiforce	Persia and Iraq Force.
P.C.G.N.	Permanent Committee on Geographical Names.
P.R.	Photo Reconnaissance.
P.R.U.	Photo Reconnaissance Unit.

R.A.M.O.	Rear Airfield Maintenance Organization.
S.A.A.F.	South African Air Force.
S.A.C.S.E.A.	Supreme Allied Commander, South East Asia.
S.A.E.C.	South African Engineer Corps.
S.E.A.C.	South East Asia Command.
S.G.A.	Service Géographique de l'Armée Française.
S.H.A.E.F.	Supreme Headquarters Allied Expeditionary Force.
S.O.S.	Services of Supply (U.S.).
S.P.C.	Survey Production Centre.
S.R.	Southern Rhodesia.
S.T.C.	Survey Training Centre.
S.W.P.A.	South Western Pacific Area.
T.A.F.	Tactical Air Force.
U.S.A.A.F.	United States Army Air Force.
W.A.	West Africa.
W.A.A.F.	Women's Auxiliary Air Force.



## PREFACE

A few words of comment and explanation concerning this Survey History may assist the reader to appreciate its purpose, the sources from which the information was obtained, and the basis on which comments are offered.

The object of the book is to present in a convenient and accessible form the principal facts and features concerning Maps and Survey during the Second World War for the benefit of instructors and students at Military Educational Establishments, of staff officers, and of others who will be responsible for the organization, training and development of the Army for any future war which may arise.

The subject matter has been compiled from the following sources:—

The personal experience of officers who held appointment as Directors of Survey, Survey Staff Officers, or as officers serving with survey units.

A study of reports, diaries, correspondence, and other documents dealing with survey activities on the home front and in the various operational theatres.

This is not in any way a text-book. It does not lay down policy but purports to state only historical facts. Whatever comments and suggestions there may be are obviously matters of opinion, and are included primarily to form a basis for further thought and discussion, when those who will be responsible for future survey policy, or for the employment of survey personnel, will require to make their appropriate decisions.

The limiting size and scope of this book do not permit it to be a complete history of all the survey units concerned. Certain units are mentioned by name in connection with specific incidents and tasks; there are many units, however, to which no special reference is made, but whose achievements during the war, and whose contribution to final victory were of the highest order. With regard to individuals, named reference is made, generally speaking, only to those who held the higher survey appointments.

For certain phases of survey operations the writer had some difficulty in finding any written records or reports. In some cases this was owing to the overriding need for extreme security at the time, which reduced the information that could safely be recorded on paper to a minimum. In other cases the war diaries and other records were lost either by enemy action or by deliberate destruction to avoid risk of capture.

For each campaign an attempt has been made to provide an operational background against which the narrative of survey activities could be written. This is considered of importance, as survey officers must always make themselves fully conversant with the current operational picture and future plans if they are to provide efficient service. This fact should be realized by all staff officers.

A sketch map is included for each of the main operational theatres, on which the majority of place names mentioned in the text will be found.

At the end of the book will be found a number of map specimens. It was, of course, impossible to include a specimen of each of the very large number

The effect of this reorganization on the R.E. Survey Service was unfortunate. After the war all the R.E. survey units disappeared altogether except for one small unit which was located near the Ordnance Survey Office at Southampton. This was, in effect, a training and depot unit only where training courses in military subjects and field survey were held for the military personnel serving with the Ordnance Survey. Occasionally during the few years before 1939, when important training exercises were held in one or other of the Home Commands, a small R.E. Survey party was scratched together on an *ad hoc* basis, partly from the Ordnance Survey and partly from the Depot Company, to represent the R.E. Survey organization and to provide the necessary triangulation control for the Artillery Survey Regiments. These exercises were spasmodic, and the R.E. personnel employed on them was almost always different on each occasion. Add to this the fact that, during pre-war years, Survey was not represented in any shape or form at the headquarters of any Home Command or formation, and that map supply and distribution to the troops under training was an almost automatic supply direct from the War Office to the Commands, and it will be realized that, during the critical years leading up to the Second World War, there was little if any opportunity for R.E. Survey personnel to learn and practise their war-time survey duties or to accustom themselves to army organization or procedure. Conversely, the rest of the Army, and especially the General Staff, were not able to gain any knowledge about the Survey Service, what it could do for them in the way of map production and supply and field surveys, or what facilities, in return, Survey would require from them.

It is a platitude to state that co-operative training during peace is essential for success in war. The lack of it, as concerning Survey, proved to be a considerable handicap during the early periods of operations in all theatres. The Survey Directorates and units which were mobilized in the late summer of 1939 to take their places with the British Expeditionary Force had no pre-war nucleus, the personnel, both officers and other ranks, having been drawn mainly from the Ordnance Survey. They had never worked together as a team before, many of them were not sufficiently conversant with the organization of a modern army, and their peace-time occupation, though technically valuable in many respects, was not adequate to fit them for their immediate duties under active service conditions.

of map series produced during the war, but those now shown provide a fair cross-section of the principal varieties of maps which were used operationally. The preparation of these specimens for printing and publication was undertaken by members of the staff of the Directorate of Military Survey and the Ordnance Survey. The author acknowledges the valuable assistance given by these officers, and by all those others, including survey officers of the Dominion and Colonial Forces and of the United States Army, who have assisted in the compilation of this history with their notes and criticisms.

The Titles of Survey units used in the text are those which were current during the war. Some have since been altered.

Whenever India is mentioned in the text it refers to the period before partition.

At the date of publication it is of interest to note that action has been taken concerning certain of the aspects of Survey policy discussed in this history. Amongst them may be mentioned the following:—

- (a) The execution of surveys in the Colonies is now organized and controlled by a Directorate of Colonial Surveys with headquarters in London, and the mapping of large areas in East Africa and elsewhere has already been completed by air survey methods. (See page 150.)
- (b) There is now a School of Military Survey, which is the direct successor to the Survey Training Centre R.E. (See page 12.)
- (c) The adjustment of the European national triangulations has been completed, and it has been decided to adopt a Universal Transverse Mercator Grid with 6 degree belts for the military maps of Europe. This will have the great advantage of reducing the number of grid junctions in a potential operational area. (See page 413.)

## HISTORICAL NOTE

By way of introduction to this volume it is of interest to refer to a document concerning Maps and Survey during the First World War entitled "Report on Survey on the Western Front 1914-1918." In the first paragraph it was stated that the organization for map provision with the original Expeditionary Force in 1914 was as follows:—

- “(a) The topographical sub-section of the General Staff at G.H.Q. consisting of one officer and one clerk.
- “(b) One officer and a clerk attached to H.Q. Lines of Communication to look after reserve map supplies.
- “(c) One Printing Company R.E. which had its H.Q. Section on the Line of Communication, and a small mobile section with each corps.”

This provision was based on the anticipated needs of a small force operating under favourable conditions, and on the supply of nothing but small scale maps produced in England. As events turned out, it showed a totally inadequate conception of the probable survey requirements of an expeditionary force embarking on a modern war.

The growth of the survey organization between 1914 and 1918 was extensive and rapid. The size of the British Force expanded to an extent quite undreamed of in August, 1914, and the technical development of survey activities in connection with mapping, map supply, artillery control, sound ranging and flash spotting was as remarkable as it was unforeseen. The evolution of static or trench warfare resulted in a demand for large scale maps, not only for use by the artillery, but also as tactical maps on which the trench systems could be overprinted. The development of aerial photography for intelligence and mapping purposes introduced a new factor in which the Survey Service was very vitally interested.

It should be noted that, in the First World War, there were no artillery survey regiments. The development and the execution of all work concerning artillery control surveys, sound ranging, and flash spotting was in the hands of Royal Engineer survey units. It will be seen, therefore, that between 1914 and 1918, R.E. Survey developed into a highly technical and quite indispensable organization of ample proportions.

With the scientific development of survey methods for artillery control, it was natural that, when the British Army was being reorganized for the post-war period, plans were laid for the Royal Artillery to take over the responsibility for those activities which were peculiarly required for their own domestic purposes. As a result, the sappers handed over to the gunners the responsibility for survey work connected with sound-ranging, flash-spotting, and the fixation of gun positions to the survey grid. Artillery Survey Regiments were formed and a Survey Wing was organized at the School of Artillery. It was agreed policy, however, that the Royal Engineers would continue to be responsible, on active service, for producing and maintaining the basic triangulation network, for all survey work other than that of a purely artillery nature, and for the production and supply of all maps which the ground and air forces would require.