

SURVEY IN EGYPT AND PALESTINE IN WORLD WAR ONE

7 FIELD SURVEY COMPANY R.E.

The following account is taken from "A Brief Record of the Advance of the Egyptian Expeditionary Force under the command of General Sir Edmund H.H. Allenby GCB, GCMG, July 1917 - Oct 1918", H.M.S.O. 1919.

Survey Order of Battle.

G.H.Q. Troops

No. 7 Field Survey Company R.E.
Topographical Section
Lithographic and Letterpress Section
Meteorological Section (Stations at G.H.Q. and Jerusalem)

XX Corps

"V" Section (Sound Ranging) 7th Field Survey Company R.E.

XXI Corps

"N" and "NN" Sections (Sound Ranging) 7th Field Survey Company R.E.

The 7th Field Survey Company R.E.

The work of the 7th Field Survey Company R.E. may be summarised under the headings of Field Survey; Compilation and Reproduction of maps and photographs and letterpress printing; Sound Ranging Sections and Observation Group; Meteorological Section.

A series of contoured maps on the scale of 1:40,000 of the coastal belt of Northern Sinai up to Rafa had been issued before July, 1917. Work on this scale was continued up to the Gaza-Beersheba line, and a series on the scale of 1:10,000 was started, showing the enemy trenches, barbed wire, and gun positions in greater detail. The work of the field parties consisted chiefly of triangulation, detailed survey with plane tables showing contours, intersecting points in and beyond the enemy's lines, and fixing battery positions and datum points for the artillery. Survey parties also accompanied all reconnaissances in force towards the more easterly trench systems and Beersheba, and did such survey work as time permitted on these occasions, fixing points ahead which were of great use to the artillery and in the compilation of the maps from aeroplane photographs. Officers in charge of sections in the field also kept in close touch with divisions and brigades and supplied them with advanced tracings of new or special areas surveyed.

The Royal Air Force and Australian Flying Corps took aeroplane photographs regularly over the enemy trench lines and country beyond. Copies were supplied to the Field Survey Company, and from these many maps were compiled wholly; intersected points or good detail on the existing maps forming the basis. An officer was appointed under G.S.I. to study all photographs and indicate all enemy defence works and details of military importance which were then plotted by the Survey Company on the maps. Enemy battery positions and other important targets were plotted at once, and co-ordinates supplied to this officer for communication to the artillery.

The compilation of maps from survey and photographs, and fair-drawing ready for reproduction were done at headquarters, and in June, 1917, a power-driven lithographic printing machine was installed at Rafa for printing maps with a minimum loss of time. In this way up to about the middle of August, 1917, all the country from the sea near Gaza to south of Beersheba was mapped in more or less detail, including all enemy trenches, and published in nine sheets on the 1:40,000 scale, and seventeen sheets on the 1:10,000 scale, in all thirty-seven editions.

Owing to the large number of 1:10,000 scale sheets required to cover the whole line of trench systems the scale of 1:20,000 was adopted and eighteen sheets were prepared, and twenty-eight editions printed, nineteen of them by the Survey Company, Printing Section, and nine by the Survey of Egypt, Cairo. Of the area covered by these sheets, 282 square miles were surveyed, and 403 square miles were compiled from aeroplane photographs. Over 3,000 photographs of the Gaza area and its communications were dealt with.

When the Turks evacuated their Gaza-Beersheba positions and retreated to the Jaffa-Jerusalem line, the survey parties continued the triangulation through the intervening country in two belts, one through the coastal plain and

thence to Jerusalem, the other along the Beersheba-Hebron-Jerusalem road in the hills. Points were thus established for the continuation of detailed ground survey along the new lines of defence, and for laying out new bases for sound-ranging sections without delay. At the same time a limited amount of contoured detail survey of immediate importance was done.

The rate of advance of our troops during periods of open warfare was too great to allow detailed survey of all country traversed at the time, but as soon as the enemy held a defensive line again, detailed survey was resumed by the field sections and continued with the gradual British advances, comprising a belt across the front from the sea to the River Jordan averaging fifteen miles in depth. This survey was carried practically up to the enemy's lines and a large number of points such as prominent hills, trees, and buildings in and beyond the enemy line were fixed by intersection. A check base line measured near Jaffa, and connected with the triangulation, showed that a satisfactory standard of accuracy was being maintained.

The scale of 1:20,000 was continued for a time, but in consideration of the extent of the country to be mapped and the steep mountainous character of the greater part of it, the scale of 1:40,000 was adopted again for the general map, while shortly before the British attack in September, five sheets were printed on the more open scale of 1:20,000, covering those areas where the enemy trench and communications systems were most complicated and extensive - that is, upon the coastal plain and the foothills. The operations maps of the 1:40,000 scale series were printed in four colours; the wadis, roads, railways, villages, wells, and such topographical features, the lettering and also the numbered reference grid, were in black, contours in brown, trees in green, and enemy trenches, gun emplacements, barbed wire, and such works in red over black. Different classes of roads were also indicated in red. Contours were surveyed at 20 metres (about sixty-six feet) vertical interval in the hilly country and at ten metres on the plain, with spot heights on the hills. A small number of sheets was also overprinted with a special grid sub-division and enemy battery numbers in blue, for the use of the artillery in counter bombardment work.

The Royal Air Force photographed the whole of the enemy trench line, and country in the rear of it to a distance of roughly twenty-five miles, and in addition the main roads and railways leading into this area from the north. From 1 January 1918, to the cessation of hostilities, 15,690 photographs were dealt with, and the topographical information published in map form. The Photographic Section of the Royal Air Force has shown the greatest willingness to co-operate with, and meet the somewhat exacting requirements of, the Survey Company in the matter of aeroplane photographs, with the result that these photographs have been used in the compilation of topographical detail maps in this force to a relatively greater extent, perhaps, than on any other front.

After the surveying in the neighbourhood of the line had been completed, a number of topographers were available for surveying in the country passed over in the rapid advance from Gaza. The area between the sea and three miles east of the Jerusalem-Beersheba road, and back to the area surveyed before the Gaza-Beersheba line, has now been completed for the Occupied Enemy Territory Administration. This area covers 1,473 square miles. After the British advance in September field sections continued the triangulation northwards, one party along the Nablus road, another along the plain and foothills to near Mesudieh Station, thus connecting Damascus with the Survey in Egypt.

Astronomical observations have been made at Baalbek, Hama, and Aleppo, determining the latitudes and longitudes of these places. A small party proceeded to the Hedjaz and determined by star observations the geographical positions of several places, including Maan and Shahm on the railway. The wireless time signals of Paris and Berlin were received.

In addition to the regular sheets of the principal series of maps a considerable number of other miscellaneous maps were produced and new information from aeroplane photographs added to sheets of the one inch to one mile series. Maps showing the disposition of enemy forces to accompany "Intelligence Summaries" were printed periodically. During active operations these maps showing the situation up to 18-00 or 22-00 hrs were printed at night for despatch to units in the field before commencement of following day's operations. These maps were issued for some sixty days.

Sun printing and photography were also used for reproducing maps and plans when small numbers only were required.

Twenty-six telephoto panoramas were taken from a number of positions commanding good views over the enemy's ground, and enlarged copies supplied to the corps and divisions concerned.

Two Topographical Sections were formed in August, 1918, to work in closer touch with the headquarters of the XXth and XXIst Corps, and to compile and print small maps of the enemy's defence line as required, showing information from the latest air photographs and Intelligence reports more frequently than the regular full sheets of the Survey Company could be issued. The maps of the Survey Company were used as a basis, and new work was added or enlargements of limited areas were made to show smaller details. Maps measuring 14.5 x 9 inches were reproduced in five colours if necessary, on duplicators, and in this way several hundred copies could be produced within twenty-four hours of the taking of the photographs. The short time required to get out a map with a suitable amount of detail, made this a very useful supplementary method, especially in the case of raids. In the short period of seven weeks, during which the topographical sections were in action, thirty-two of these sketch maps in all were produced, and over 8,800 copies distributed.

The Letterpress Section of The Company.

Periodical "Intelligence Summaries", Topographical Handbooks, and other reports were printed at Ramleh.

Sound-Ranging Sections.

Two Sound Ranging Sections were added to the establishment of the Field Survey Company in August, 1917. Their work was to locate enemy guns and bursts of shells by sound, and also to conduct shoots on certain of the more active gun positions located. It should be noted that the sound ranging here spoken of is carried out by an application of advanced electrical science, and should not be confused with what are known as "sound bearings" - a rough and ready method, where direction is judged by hearing. On the Gaza-Beersheba line two bases were surveyed and occupied, one by each section, between the coast and Mendur. In this way the whole of the enemy's front line from the sea to Atinweh was covered - approximately ten miles. In this position 629 gun locations were made and twenty-four shoots were conducted.

With open warfare, these sections came out of action, but with the commencement of trench warfare bases were once more established and occupied. The sections moved with the advance of our line until the Arsuf-Sinjil line was reached, where three bases were occupied by one section on the hills and two bases by the other section on the plain. In August, 1918, a third sound ranging section was formed locally to occupy a sixth base on the foothills. In this way the whole of the enemy line, approximately 36.5 miles in length to a depth of five miles, was covered.

Sound ranging sections are able to locate guns by day or night with considerable accuracy, except in strong adverse winds, and at the same time to give the calibre of the guns located. In conjunction with aeroplane photographs sound ranging succeeded in locating practically all the enemy gun positions, and shoots on the majority of the locations were so effective that the enemy was forced to vacate occupied pits or their guns were silenced at will by our artillery.

From September, 1917 to September, 1918, over 3,000 gun locations were made, and over seventy shoots by our artillery were conducted.

Observation Group.

This group came into action in the foothill area in August, 1918. Its work consisted in locating enemy guns by flash spotting and reporting enemy activity behind the line, for example, concentration of troops, movements along roads, etc. The group required four accurately fixed observation posts, for which the necessary survey was done by the field sections of the Company. During the short time the group was in action, however, enemy artillery activity on its front was slight, and very little opportunity was given for locating guns in this way.

Meteorological Section.

Regular meteorological observations have been made by this section of the Company. Readings of maximum and minimum temperatures, humidity, barometric pressure, evaporation, wind, and rainfall were recorded four times a day. A daily weather report was issued comprising the observations at General Headquarters and at Jerusalem, and also a weekly summary of the observations at these two places. The necessary observations were telegraphed every morning to the Physical Service, Cairo, where they were combined with data from other places and used in making the forecast for the Palestine front. This forecast was issued daily except during the settled summer season. Recently a daily report has been issued giving weather and road conditions at a number of places throughout Syria.

