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German War Maps and Survey: Discussion

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*At the Afternoon Meeting of the Society on 18 November 1918 the above maps were exhibited and discussed.*

Dr. AUBRAY STRAHAN (Chairman): We have no set paper this afternoon, but an extremely interesting collection of German military maps brought back from France by Mr. Hinks, who has undertaken to describe and explain them.

*Mr. Hinks gave a summary of the account printed above, and a discussion followed.*

Lieut.-Colonel H. S. L. WINTERBOTHAM, C.M.G., D.S.O.: I am afraid I cannot add very much to what Mr. Hinks has told us, at any rate, on the subject of topographical maps. But, first of all, to answer a question as to whether the best German mapping was not done by Bavarian and Saxon units: the answer is yes. The Bavarian Vermessungsabteilung, the equivalent of our Field Survey Battalion, was, undoubtedly, the best unit of that sort they had on the front. We captured a good deal of its material, and its maps were the best; and, what is equally important, its propaganda was the best. Mapping for Army purposes—for the artillery, for sound-ranging, and for flash-spotting—is more or less a new development, which has been brought about mostly by map-makers themselves, and those units which were best able to point to the advantages of their wares and get other people interested in them did the best work. The Bavarian Vermessungsabteilung wrote in 1916 two very interesting advertisements which we were fortunate enough to capture, and which gave us considerable insight into their methods. This Bavarian unit is the only one I know of that made very much use of the stereo-plotter: it appears, in fact, to have made use of everything possible.

Before this war no European nation thought of the necessity of a large-scale map. All were content to think of topographical maps as fulfilling tactical requirements; and we were just as bad as any of the rest of them in that respect. The organization, therefore, of all European armies catered for a section on the Staff whose duty it was to collect and to issue to the troops the established national topographical surveys. The Germans had an organization which they called the Kartographische Abteilung, or the Cartographical Section. All through the war this section had the responsibility of seeing that all German units were supplied with the small-scale maps, on 1/100,000 or smaller scales. These topographical maps were printed in Germany, with the exception of the supply for the northernmost army which was printed in Brussels. No doubt for the first three or four months of the war the Germans had no new surveys and depended upon the small-scale maps available before the war started. After about three months they began to find, just as the rest of us did, that they must have something much larger in scale, and much more accurate, to meet the needs of modern warfare. They then formed these Vermessungsabteilungen, who were the units which produced the large-scale maps (the 1/50,000, the 1/25,000, the 1/10,000, and the 1/5000).

Their Survey organization is based on warfare in more or less uncivilized countries. They do not seem to have made any special provision for fighting in France or Belgium. Their mapping ideas were founded on the assumption that they would have to start *ab initio* and survey on the ground before they could produce a map at all. Each army is considered a unit for survey purposes, and has its own grid (the system of reference to which Mr. Hinks has referred). The Vermessungsabteilung, starting with a certain trigonometrically fixed point as origin, sent out its observers and plane-tables, and, without letting them complete a thorough survey, made them responsible for

the compilation of a skeleton on which the final map was built up by plotting from air-photographs. The remarkable thing is that in France they seem to have carried these regulations through without modifying them to the smallest extent, in a country where good map material already existed. Take, for example, the Cadastral Survey of France, which was completed about 1840, and of which every commune had a copy. Moreover, in Lille, they captured all the cadastral plans of the Département du Nord. But it was not until 1918 that we captured maps which showed that the cadastral plans had been used. More remarkable still is the failure to make use of the French Fortress Plans-directeurs (a French topographical map on the scale of 1/20,000). The Fortress Plans-directeurs were good survey, and were available for all, or nearly all, of the eastern borderlands of France. On none of the captured German maps have we any signs that this material has been used, and for those same areas we have any number of captured German maps which are mere enlargements from the 1/80,000. To complete the skeleton of their large-scale maps, they talk a great deal about the use of the stereo-plotter. We have no evidence, however, that this method has been used, except by the Bavarian unit of which I spoke.

To complete the skeleton of fixed points on which the air-photographs are subsequently plotted three different units were employed. There is a topographical section with each corps which has on its strength a certain proportion of trigonometrical observers and of plane-tables. They have a little mapping unit which works in the trenches and which is attached to their Trench Mortar Battalions, and they have the more purely artillery-survey units which are mostly engaged on sound-ranging and flash-spotting, but are also responsible for a certain amount of mapping.

I am afraid all this is very uninteresting; but what is interesting is that the result of it all when put together would be no compliment to the officer commanding a British Field Survey Battalion. We have captured good German maps only on the Hindenburg Line. It is obvious that there the surveyors worked in peace and quiet; it was a long way from our lines, and they did make quite a reasonably good map of that area; but it was a very narrow strip of mapping, and in front of it and behind it they did nothing of value. I remember in 1915, not very far from Albert, we saw the first of our opposite numbers in the guise of three German officers who appeared near a small wood carrying a theodolite. We had at that time just begun the Observation Section which fixes the position of guns from their muzzle flashes, and with the aid of this unit we were able to range a battery upon these enterprising gentlemen and see them rapidly disappear. Mr. Hinks has mentioned the German flash-spotter and sound-ranger, and the fact that the former have so far failed to discover really good self-recording apparatus. We are not quite certain of that now, for we recently captured an order which said that a new system had come into force and all artillery officers were requested to come and see it. However, we have not captured a sample of it. Their methods were, perhaps, further behind our own in sound-ranging than in mapping. In flash-spotting, which is another geographical development, they have done very well. Their sections are good and well thought out, and have, undoubtedly, been the main source of their counter-battery information. The point under discussion to-day is however mapping, and I am sure that much more will be gained by looking at the specimens displayed on the walls than by any further remarks that I could make.

Lieut.-Colonel SALMON, M.C.: I am afraid I have not very much to add,

because although I have worked to a certain extent with German maps, I have not made a particular study of them. The only remark I can make is that I have come across cases of absolute dishonesty. In the country behind the German lines we always had considerable difficulty with the contours. All we had to go on in most of this country were contours made from the old French 1/80,000, which were rather sketchy. Certain German maps which were taken of those areas showed contours which were different from our own, and those who had little experience of German mapping immediately came to the conclusion that they must have been surveyed, because they were different from the French, and there seemed to be no reason for changing them unless they had made some new surveys themselves. There was always considerable difficulty in stopping people from printing or sketching, on our maps, these contours obtained from German maps. Only quite recently in the country between Le Cateau and Le Quesnoy maps were captured showing contours which were different from the French; and when we shortly afterwards took that country I was able to send out my own topographers to find out which were better—the French or German. They found that the German contours were entirely wrong. It looks as if they had sent out a surveyor to see what the French contours were like, and he thought he would be unpopular if he said they were good, and so made different contours of his own which did not represent the country at all. There was one curious instance; a certain mill at a place called Ballieuilmont, that was a trigonometrical point in the French lists; I think that in practically every edition of the German maps of that area we captured it was shown some 1200 yards out of position. That mill was visible from the German lines, and you would have thought the German observers would have discovered their mistake. Moreover, it should have been visible on air-photographs; yet it was continually put 1200 yards out of position. Another example may be given to prove the point of Colonel Winterbotham and Mr. Hinks that they did not go in very much for detail survey. There was another portion of country round Courcelles le Comte, where the German maps showed a certain number of trigonometrical points which I imagine were put in by some special artillery unit for the use of its guns. Those trigonometrical points were very clear marks, such as chimneys and windmills, and yet in more than one place we find that the people who had actually drawn the maps somewhere behind the lines had placed the detail round these trigonometrical points in the wrong position; particularly, this was the case near Courcelles le Comte where artillery survey men had fixed the position of a certain chimney, and yet when the map was published there was some trouble in finding where the chimney was, for they showed this village with a chimney standing in a place which was really an open field; I think the whole village was shown some 300 or 400 yards out of position. That helps to show that there was considerable lack of co-ordination between trig. and detail work, just as there was in the grid systems of adjoining armies.

MR. BURGESS: I have no remarks to make on the German maps, but last time we met to discuss maps I made a suggestion, and since then I have carefully followed it up. I find there is no mechanical difficulty in the way of it, and now that peace is imminent I should like to see England take the forefront and produce a really good map. At the present time all maps are reduced to level and have a flat surface. That is very convenient for purpose of measurement and charting, and so on, but the maps are not accurate; they are reduced to that flat surface. There is, as I say, no mechanical reason with our modern scientific inventions why there should not be produced maps with

a curved surface, correct according to the curvature of the Earth. If that were done it would be a considerable advance on what has been done hitherto. If this could be done in future and if publishers could see their way to go to the immense expense involved, it would be a very great advance.

The CHAIRMAN: It remains for me to wind up the discussion. I do not know whether others share it, but I have a comfortable feeling that the German thoroughness has not been quite so thorough as we were led to suppose, and that although perhaps we talk less about our maps, they have proved to be incomparably superior to the German. For my own part, I have been more connected with geological maps than with maps of this description. We made a geological map for the scene of operations, which I think has proved of considerable use. Since the war began not much German literature has come into my hands; but one pamphlet, at any rate, interested me greatly, and caused me great amusement. I extracted parts of it in a lecture I gave some year or two ago, and I would like to read you one or two extracts. The author gives hints that much greater use has been made of geological maps for military purposes than can be made known now. In fact, I gather from the author, who is himself a Professor of Palæontology, that a sufficient and intelligent use of geologists would go far to win the war. He admits, however, that an individual geologist may not be infallible, and he acknowledges that in attack or retreat the first line cannot wait for the geologist's advice. This comes from a harmless necessary palæontologist. He proceeds to recommend that "full advantage should be taken now of examining the innumerable artificial openings which have been made and gaining such a knowledge of the ground of our neighbours as may be desirable for military purposes." "For the peace will not be an everlasting peace. Who can hope for it? We whose country has so often been invaded must, therefore, prepare to defend ourselves, and as the new battles may very likely be fought on the ground on which our armies are now fighting, our descendants would be justified in reproaching us if we were so shortsighted as not to avail ourselves of the present favourable opportunity of examining the geological character of the field of battle." I invite your attention to the fact that the preparation for another war is suggested while the present war was at its height. I do not know whether the inferior maps that have been shown to us to-day are part of the preparation for the next war; if so, we may look forward with considerable hope and confidence to a favourable result.

It is now my duty to thank cordially Colonel Hedley and Colonel Jack for allowing the maps to be brought over, and Mr. Hinks for bringing them; also Colonel Winterbotham and Colonel Salmon for the extremely interesting remarks they have made upon the maps.

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## EL WAD SŪF

W. J. Harding King

THE *Shotts*, or salt lakes, that lie near the northern fringe of the Western Sahara, on the frontier between Algeria and Tunis, in former times received the water brought down by a number of rivers. But, except in the case of the streams from the north, which rise in the mountains, and consequently sometimes after a heavy rain near their