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Imre Josef Demhardt
Soetkin Vervust *Editors*

History of Military Cartography

5th International Symposium of the ICA Commission on the History of Cartography, 2014

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Editors

History of Military Cartography

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Preface

This volume comprises most of the research papers presented at the 5th International Symposium of the ICA Commission on the History of Cartography which took place at Ghent University in Ghent, Belgium, on 2–5 December, 2014. As such it is the third volume in a series which has been made possible through the partnership between the International Cartographic Association (ICA) and the international publishing house of Springer-Verlag.

The history of cartography covers a vast field of knowledge and includes all maps and map-like graphics made by humankind since prehistoric times. Map compilation and map-use today are, however, seldom dependent on maps which were produced before early modern times. With this in mind, the ICA Commission decided to concentrate on the history of cartography since the Enlightenment and, more specifically, on cartographic developments during the nineteenth and twentieth centuries.

The 5th International Symposium of the ICA Commission on the History of Cartography had as its general theme "Cartography in Times of War and Peace". The Symposium was jointly organised by the ICA Commission on the History of Cartography, the ICA Commission on Map Production and Geo-Business, and the Brussels Map Circle (BMC) in collaboration with the Department of Geography of Ghent University, and the Research Foundation Flanders (FWO). The various paper sessions were held at Ghent University's conference centre "Het Pand".

The main focus of the Symposium was on Military Cartography in commemoration of the First World War (1914–1918), also known as the 'Great War'. The ICA Commission acknowledged the fact that the First World War was the world's first truly global conflict as the battle raged not just in the trenches of the Western Front, but also in Africa, in the Middle East, and in Asia, and that military maps and mapping played a decisive role in all these areas. With 2014 being the centenary of the outbreak of the War, and the conference venue in Ghent situated so close to the actual war zone of 1914–1918, contributions on military cartography during World War I were encouraged. The Symposium was, however, also open to contributions on military mapping executed in various parts of the world before and after World War I.

To foster cooperation and also broaden the discussion, the ICA Commission on Map Production and Geo-Business joined the Symposium in Ghent. This Commission made a contribution from a map production perspective by organising the Second EuroSDR Workshop on the "Preservation of the Geographical Production Process" immediately prior to the Symposium. The initiative was supported by EuroSDR (EuroSpatial Data Research), EuroGeographics (the Association of European National Mapping and Cadastral Agencies), the ICA and the National Geographic Institute Belgium. The aim of the Workshop was to bring the dwindling knowledge on cartographic production methods of the pre-digital era to the attention of European National Mapping Agencies, academic institutions, museums, private companies, ICA members, and other interested parties and to ask for their cooperation in addressing this situation. The ICA Commission on the History of Cartography pledged its support for this venture and undertook to investigate to what extent pre-digital map production processes and procedures have been archived and documented by National Mapping Agencies.

To complement the Symposium, the former Map Librarian of the Royal Geographical Society in London, Francis Herbert, kindly exhibited 130 military maps and postcards from his private collections. The maps and postcards, of which a comprehensive bibliography appears in this volume, covered various military events such as the Crimean War, the Boer War, the First World War, and the Second World War.

We would like to acknowledge out gratitude to Ghent University, and especially to the Head of the Department of Geography and Chair of the ICA Commission on Map Production and Geo-Business, Prof Philippe De Maeyer, for the logistic support he rendered during the Symposium. We are also indebted to Ms Helga Vermeulen for her continued administrative support before, during and after the Symposium, and to Michiel Van den Berghe for putting his technical knowledge re digital matters to our disposal. Finally, we gratefully acknowledge the kind assistance of Ms Agata Oelschlaeger and Ms Ragavia Ramakrishnan of Springer-Verlag towards the production of this book.

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Elri Liebenberg was Professor and Head of the Department of Geography of the University of South Africa. From 1999 to 2003 she was a Vice-President of the ICA, and from 2007 until 2015 she served as Chairperson of the ICA Commission on the History of Cartography. She acts as Regional Editor of the *British Cartographic Journal* for Africa, is a co-editor of the *ICA International Journal of Cartography* and a contributor to Volumes 5 and 6 of the joint History of Cartography Project of the University of Wisconsin and the Chicago University Press.

Imre Josef Demhardt is interested in post-enlightenment cartography, colonialism and regional studies with focus on Central Europe, Sub-Saharan Africa and North America. Besides numerous articles and several books on these subjects he is involved as co-editor of Vol. 5 (Nineteenth Century) in the encyclopedia project on the *History of Cartography*. He holds the Garrett Chair in the History of Cartography at the University of Texas at Arlington and since 2015 serves as Chair of the ICA Commission on the History of Cartography.

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Part I
Military Cartography during World War I

Image of Belgium in WWI Through Maps

Wouter Bracke

Abstract This contribution focuses on maps of Belgium produced in and outside the country during WWI and intended for the larger public. They have recently been digitized by the Royal library of Belgium and are readily accessible through the Europeana website.

During WWI, the press was very much censored by the occupying forces. Maps are mentioned nowhere in official publications related to censorship, and consequently little or nothing has been written on their production or diffusion in Belgium at the time. Nonetheless, they constituted important sources of information, together with newspapers and magazines. This contribution discusses some examples of these maps against the background of what is known about the Germans' censorship policy in occupied Belgium.

1 "Europeana Collections 1914–1918"

From 2011 to 2014 the Royal Library of Belgium participated in a European project, called Europeana Collections 1914–1918 (http://www.europeana1914-1918.eu/en). Directed by the State Library of Berlin, the project aimed at digitizing about 400,000 documents related to WWI present in national and university libraries as well as private collections in Austria, Belgium, Denmark, France, Germany, Italy, Serbia and the United Kingdom, thus making them available to a large public through the Europeana website. The project has created an impressive virtual cross boundary collection of WWI realia, including books, newspapers, trench journals, music sheets, children's literature, photographs, posters, pamphlets, propaganda leaflets, original art, religious works, medals, coins, and maps. It permits new interpretations of history that go beyond traditional military history. In this paper we will illustrate the effect of censorship, established from the first months of the occupation of Belgium onwards, on the production and distribution of war related maps in the country. Although we will take the main episodes of the war in Belgium

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as a thread, our interest goes not so much towards the maps' representation of the different stages of the war, but to the maps as a whole as a historical document. The maps we will discuss here are not the ones used by the officers in charge of the war, but those which were actually made for or sold to the larger public.

In the framework of the Europeana project, the Royal Library of Belgium digitized more than 15,000 items, amongst which about 600 map items, from various origins and with different topics: English, German, French and Belgian maps; military maps, news maps, censored maps and propaganda maps. They represent more than 20% of the total amount of the about 2000 cartographic items integrated in the project, of which a little more than 400 concern the western front. It is obvious from these figures that a selection has been made by the partners: for instance, the Imperial War Museum in London alone has approximately 1750 maps related to the Western front, out of a total of 34,000 maps in its possession. The selection was based on the following criteria: uniqueness of the documents, fragile state, historical and cultural relevance, chronology (they had to be made during the war) and provenance (they had to be made in the provider's historic territory). Sometimes though, exceptions to these rules were allowed.

2 The First Years of the War

At the outbreak of the war, the German Army in the West consisted of seven field armies, comprising over 80% of the German armed forces. On the 4th of August 1914, the German army under the command of generals Alexander von Kluck and Karl von Bülow invaded Belgium. Luxemburg had rendered 2 days before. There was some unexpected resistance around Liège, but the city quickly fell to the Germans under the direction of Erich Ludendorff on the 7th of August. Its 12 forts would hold from the 12th till the 16th of the same month. Two days later, the Belgian army left for Antwerp, after waiting in vain for the French and the British behind the Gete river, on the border between the provinces of Brabant and Liège. Brussels fell on August 20th, Namur on August 24th. Speed was important for the Germans who wanted to arrive in Paris as soon as possible. Not so much Liège, as popular tradition has it, but Antwerp impeded the Germans to quickly move southwards. Although the German army bypassed Antwerp, the city remained a threat to their rear flank, so five or six divisions under the command of General Van Beseler had to be sent north to attack the city. Antwerp eventually fell on October 10th (De Schaepdrijver 2005, pp. 69–97)

At the time of the invasion, the *Institut cartographique militaire* had followed the army to Antwerp, abandoning the printing presses in the Abbaye de la Cambre in Brussels (Seligmann 1921, p. 3). They would be used by the occupying forces for their cartographic production of the country. After the withdrawal of the Belgian government, the Institute moved from Antwerp to England where it was hosted at the War Office and would supply the Belgian and Allied forces (Southampton and Calais) with the necessary maps. Therefore, no official war maps were produced in

Belgium during the war, except for those produced by the occupying forces. Besides the official production by the Germans, maps were made and sold by private editors or companies.

After the fall of Antwerp, the Belgian army withdrew behind the line Nieuwpoort-Diksmuide, where the German forces made their final breakthrough attempt during the First Battle of Ypres (October 19th—November 22nd). By the end of November the front line was as it would remain for the next 3 years thanks to the flooding of the Yser plain. The entire territory east of the dike of the rail way was inundated, a brilliant idea, not so much stemming from the army officials but thought up by local citizens.

On the map by von Paasche and Luz of Stuttgart from 1917 (see Fig. 1), the flooded area is clearly indicated (*überschwemmungsgebiet* in German). The map is a later print of the one published in 1916. The text box in the upper right corner states that, following the decree on the press issued by the commander in charge of the Eastern front, the map could be diffused in the area under his command. This refers to the decree signed by von Hindenburg of 5 December 1915/28 February 1916, which permitted the diffusion in Ober-Ost of maps published in Germany. The censorship clearly has nothing to do with Belgium as the map was destined for the Eastern rather than the Western front. How, then, did the map arrive in Belgium, and in the Royal library? Was it distributed in Belgium during WWI and, if so, to whom? The copy of the Royal library was registered only in 1922, but it must have entered the library years before, as the inventory states that it came from the provisional inventory made during the war. Other maps we will discuss came from this same provisional source. So, if the map entered the library during the war, this means it must have been distributed in Belgium at the time. However, we found no indication of the map having passed the Belgian censorship.

The case of the map printed in Belgium shown in Fig. 2, is quite different with respect to censorship. The map covers more or less the same area between Nieuwpoort and Ypres, but on a larger scale. It clearly shows the flat open country of the Yser, with its fragile hydraulic equilibrium, which was maintained thanks to an ingenious system of canals, waterworks, reservoirs and thousands of small branches and ditches. No area was easier to flood than this one. In 1600 its inundation had impeded Maurits of Nassau from continuing his siege of the city of Nieuwpoort. In 1914 Emeric Feys, a lawyer from Furnes, who was also a historian and local folklore specialist, informed the military headquarters of this possibility. On October 28 the locks at Furnes were opened with the assistance of lockkeeper Karel Cogge and the day after, Hendrik Geeraert opened those of the Canal du Nord. For three nights in a row, the same ritual would be repeated (de Schaepdrijver 2005, p. 100). Despite its detail, the map does not show anything of the flooding, nor does it give any other information on the war. This is quite strange as the title of the map states it is a war map, describing the entire western front in 8 maps (of which this sheet is the first). In the map's lower right corner, following the map's generic title, a mark of censorship was added. Censorship is probably the reason for the absence of any war related information on the map. The map was registered in the library's inventory on 5 February 1917, but once again, it must have entered the institute long before, as the

Fig. 1 Map of Ypres and surroundings, 1917. (IV 5.588, Courtesy of the Royal Library of Belgium)

Fig. 1 (continued)

Fig. 2 *Le conflit mondial: le front occidental, l'Yser et la Bassée*, 1915. (IV 2.918, Courtesy of the Royal Library of Belgium)

inventory tells us it comes from the provisional inventory. In its description, a 1915 date has been added. We do not find the map in the *Bibliographie de Belgique* of that year, the national bibliography of publications on Belgium that had entered the library, probably because it was still provisionally inventoried. However, even if the map did not give any information on the ongoing war at the time, it does give us now, post factum, interesting details on map production in Belgium during WWI. The map was published in Brussels and Ghent, by Albert Sugg and Theo de Graeve respectively. Albert Sugg and Theo de Graeve are chiefly known as publishers and sellers of postcards. Postcards appeared at the end of the nineteenth century. As the *Histoire anecdotique de la guerre de 1914–1915* tells us, in the early twentieth century, they were sold in the streets, often together with maps (Nohain and Delay 1915, p. 68). Albert Sugg was of German origin. He moved from Ghent to Brussels, where he is listed as living in Schaarbeek (Rubensstraat, 23) on 4 June 1915. He would stay there until 1917 (Van Caeneghem-Schoone 2015a: *s.v.* A. Sugg). Theo De Graeve, from Ghent, had his print shop in the Burgstraat, 41, the address mentioned on the map. The place is said to have been occupied by the Germans, who would demolish the machinery at the end of the war. During the war the print shop also published cards of and for German soldiers (Van Caeneghem-Schoone 2015b: *s.v.* T. De Graeve). The map is thus a German controlled product as is confirmed by the mark of censorship.

Although in the first months of the war, during which the frontline at the Yser was stabilized, censorship was not yet generally established, in the autumn of 1914 most publishers of existing newspapers decided to stop their activities. An important number of new journals quickly arose, but only a few survived till the end of the year. With the decree of 13 October (regarding all kinds of prints, theatre and film), censorship was taken over from the military government by the civil administration. The work of this administration was however far from efficient and not guided by a uniform, centralized policy. All kinds of books, leaflets and maps could thus be published and distributed. The *Theâtre des opérations occidentales* by Henri Kumps-Robyn (see Fig. 3) bears no date, but in the Belgian bibliography of 1915 it is registered as a publication of 1914 (Bibliographie de Belgique 1915, p. 39). The map by Kumps is said to have been financed by the *Cercle philanthropique Les Sans-Souci* and sold for the benefit of the war victims. The map is an example of the various solidarity actions that spontaneously arose during these first months, amidst the general confusion that reigned in the country. The most important initiatives were without doubt, in Belgium, the creation by Emile Francqui of the *Société Général* of what was to become the *Comité national de Secours et d'Alimentation* (the major problem being that of the resupplying), and on an international level, the installation of a Commission for Relief in Belgium under the direction of Herbert Hoover in London. These initiatives would be followed on a local level all over the world to collect money for Little Belgium.

The Belgian bibliography of 1915, the first edition with maps since the war, publishes two lists of maps, both containing 33 items. The first mainly contains maps of 1914 (29) of which 26 were published by Belgian editors; the second mainly contains maps of 1915 (29) of which only 10 were Belgian, the others being of German origin. Although the lists cannot be considered as being complete—we

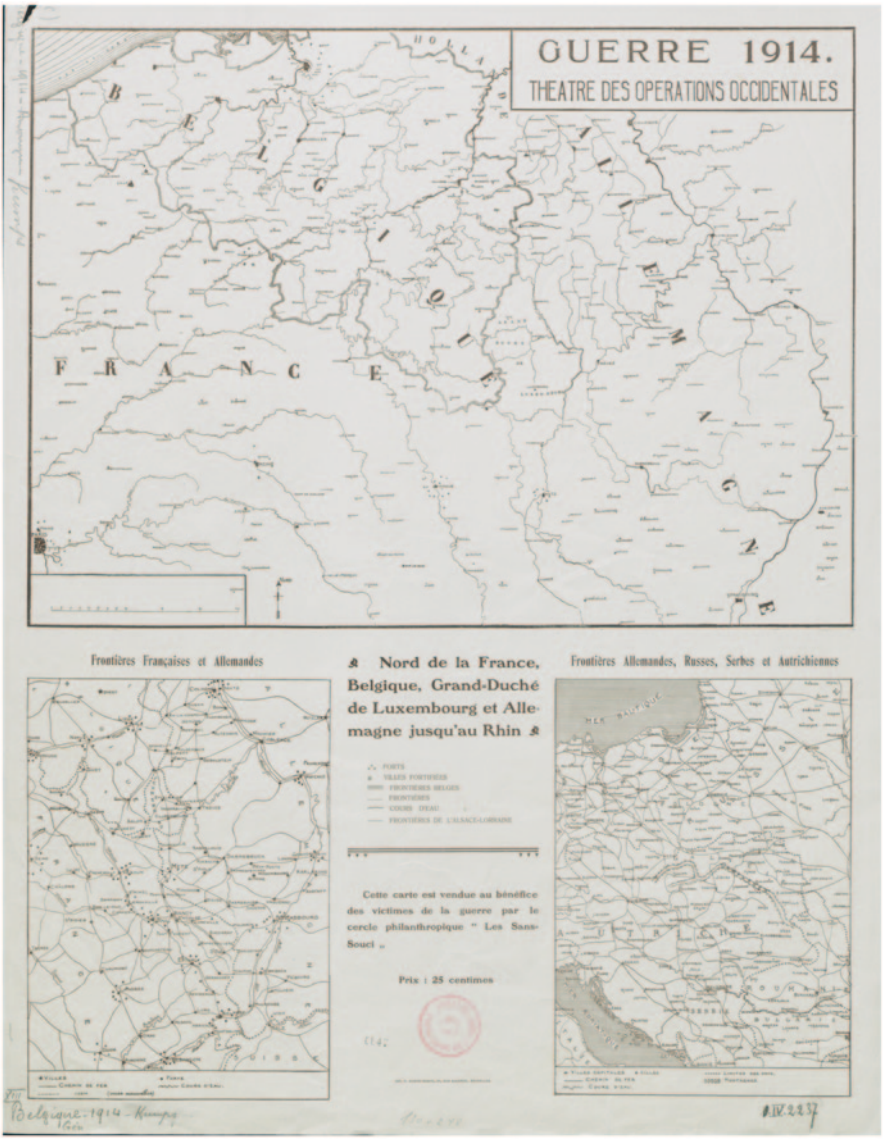

Fig. 3 *Guerre 1914. Théâtre des opérations occidentales*, 1914. (IV 2.237, Courtesy of the Royal Library of Belgium)

have seen that maps were entered in provisional inventories before being officially registered—they clearly indicate a shift from national to German publications. Censorship certainly constitutes one of the explanations for this evolution. If we then compare the books on the war which were published in the bibliographies of 1915 and 1917 (the latter lists no maps), we see an enormous decline in the number

of book publications: from 174 on a total of 808 items in 1915 to only 40 on a total of 920 items in 1917, most of which in German and clearly of propagandistic character. Again, censorship must have played a role in this evolution. In fact, during the first months of the war, numerous leaflets or booklets regarding the war were published, but their number diminished with the rise of circulation figures of the Belgian newspapers, as was already observed by the German administration in Belgium at the time (Amara and Roland 2004, p. 73).

In January 1915 a central control organ of the press (*Pressezentrale*) had been created and subsequently integrated in the political department of the General-Gouvernement in Belgien. The department was led by Oscar von der Lancken-Wakenitz and was responsible for more delicate political questions such as propaganda, censorship and religious and linguistic policies. The central control organ being divided in 5 sections, maps were treated by the last one, together with other images, postcards and illustrated magazines (Amara and Roland 2004, p. 72). The principles of censorship were simple: information published in occupied Belgium could not contain military information to the disadvantage of Germany and its allies, could not give information concerning the actions of the Belgian government in exile and absolutely had to avoid publishing articles that would "maintain or strengthen the hatred of the population against Germany". Finally, the Belgian population had to be convinced of the imminence of the German victory and had to be prepared for the solutions envisaged by the Germans for the future of Belgium (Amara and Roland 2004, p. 49; Boghaert-Vaché 1919, pp. 18–23). The application of these rules was entrusted to offices of censorship within the different editorial offices.

From 1915 onwards, maps for the Belgian market seem to suffer from censorship. A comparison between a newspaper map, a map published by a private company in Belgium and a foreign map can be illuminating in this respect. All three show the area around Gheluvelt, south east of Ypres, where in the First Battle of Ypres, the Germans had come closer than they ever would afterwards to breaking through Allied lines. The map published by *l'Echo de la presse international* in 1915 (see Fig. 4), a censored Belgian war paper (published in Brussels, rue du Canal) is said to have been explicitly made to offer its readers the possibility to follow the official news distributed by the occupying powers day by day, but it actually gives little detailed information. The same can be said of the map by René Dosseray, censored by the occupying forces in April 1916 as indicated on the lower left (see Fig. 5). The case of Nonnebossche near Gheluvelt can serve as an example. On 11 November 1914, the Allies (basically consisting of the British Expeditionary Forces) chased the Germans out of the woods here in a counter attack, thereby definitively repelling the German push. Notwithstanding its importance, Nonnebossche is missing on both maps. Dosseray's map even offers an almost idyllic picture of the frontline.

The absence of Nonnebossche can be a mere accident, but the locality does appear on this Daily News map of 1915 (see Fig. 6, east of Ypres), a fairly idyllic picture as well (perhaps in order not to frighten people at home too much). It looks as if the name has been added, as are other names in the area about which there was so much to do

Fig. 4 *l'Echo de la presse internationale*, 1915. (IV 2.500, Courtesy of the Royal Library of Belgium)

at the time: Westhoek, Polygon Wood which played an important role in the Third Battle of Ypres (1917), Verlorenhoek, etc. For the English, Nonnebossche of course was an important event as they had won that battle. The map entered the Royal library only after the war. The inventory indicates it came from the war archives in London. It clearly was not on the Belgian market during WWI.

3 From 1916 Onwards

The second part of the war, from the end of 1916 onwards, was even more difficult for the Belgian people than the first part (de Schaepdrijver 2005, p. 213 ff.). Two different views on how Belgium should be governed divided the general government in Belgium under the direction of von Bissing (and after his death in April 1917 of von Falkenhausen) and the military party, i.e. Ludendorff and von Hindenburg. The first aimed at a long term strategy, using the *Flamenpolitik*, the special—preferential—treatment of the Flemish population in Belgium, to convince or rather to mentally prepare or condition the country to become part of Germany. The second group

Fig. 5 *Panorama de l'Yser à Arras*, 1916. (IV 2.499, Courtesy of the Royal Library of Belgium)

Fig. 6 *The Daily Mail Bird's Eye View of the British Front—Sect. 1*, 1915. (IV 3.531, Courtesy of the Royal Library of Belgium)

Fig. 7 The frontiers of the General government in time. (IV 5.577, Courtesy of the Royal Library of Belgium)

on the contrary was in favour of a very short term strategy, and, supported in their plea by the big industries in Germany, asked for a severe repression of the Belgian people. When the ongoing war in 1916 asked for more labour than Germany could offer, the military lobby in Berlin asked and obtained that Belgium would be forced to deliver man power to work in the German war industry. Even if these deportations stopped rather quickly under national and international pressure, they only did in that part of Belgium that was governed by the General government (Fig. 7). In the *Etappengebiet*, roughly the western part of the country, where the military party held to its prerogatives, deportations went on until the very end of the war. Even if Belgian workers came back from Germany, they were often immediately sent to the Belgian front in the south, amongst other things to build the new Hindenburg line or the *Siegfried Stellung*, the new frontline 40 km behind the existing one.

The map (see Fig. 8) accompanying *Unser Belgisches Kriegsziel* by the medieval and Renaissance scholar and academic Aloys Meister illustrates the annexationist interests of the military staff in Berlin at the time as well as of Germany's industry magnates (Meister 1917). It shows Belgium divided in three parts: I is the

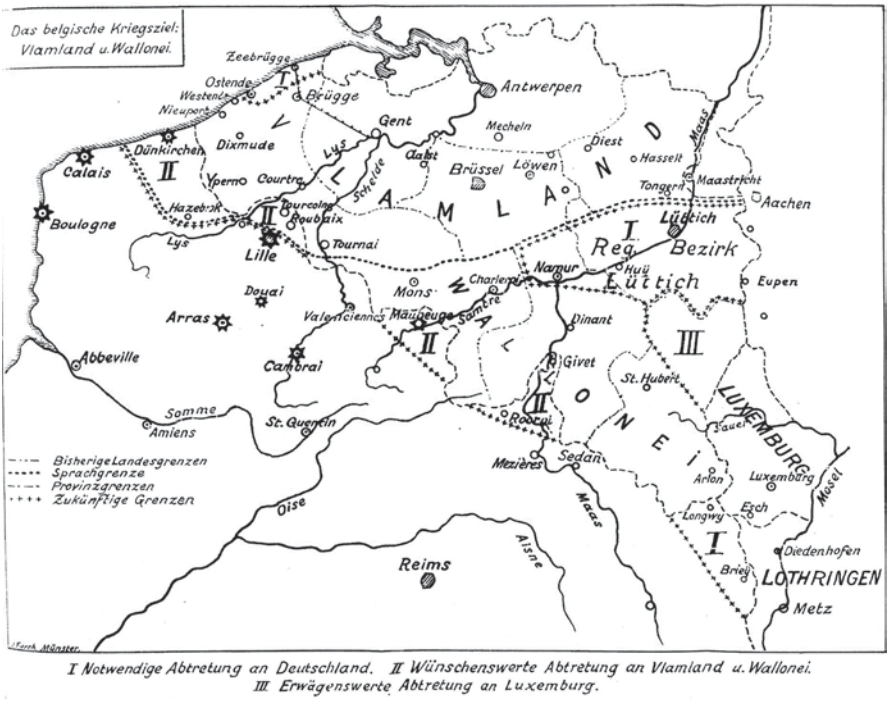

Fig. 8 *Vlamland* and *Wallonie*, 1917. (MIC IMP 539, Courtesy of the Royal Library of Belgium)

territory that necessarily has to go to Germany, II the territory that would best go to the Flemish and the Walloons respectively, III the territory that perhaps should go to Luxemburg. The Liège basin with its metal industry logically had to be incorporated in the German empire (de Schaepdrijver 2005, p. 221). Interestingly the booklet is mentioned in the Belgian bibliography of 1917 under the heading history and geography (Bibliographie de Belgique 1917, p. 102). Its presence in Belgium clearly served propagandistic purposes. As a German product it also shows how intimately publications of certain professional historians and university professors mingled with politics. That this attitude was not always as obvious as in Meister's case is exemplified by the following map by Fischer and Schönebaum (see Fig. 9), where a similar, if less explicit, attitude towards Belgium can be detected. It has the looks of a school map and is indeed present in different German reviews on higher education. The *Monatschrift für Höhere Schulen* of 1916 (p. 381) comments on the map by saying that the history of the expansion of the different European states and their power since the Renaissance gives a nice insight into the evolution of contemporary Europe. The overview starts in 1556 and ends in 1916.

Dr. Hans Fischer probably is the geographer Fischer (1860–1941), pupil of the geo-politician Friedrich Ratzel, who worked as a cartographer for the important Leipzig map publisher Wagner & Debes. Herbert (Felix) Schönebaum

Fig. 9 Europe from 1556 to 1916. (IV 2.596–2.604, Courtesy of the Royal Library of Belgium)

on the contrary is much better known. He was born in 1888 and died in 1967. He lived in Dresden and Leipzig, was a pedagogue and a historian. Interestingly, he was the last pupil of Karl Lamprecht, whose biography he wrote (Chickering 1993, p. xiv). More than a biography, the book was a kind of tribute to his former master. Karl Lamprecht is the key to understand this map. He was a well known historian in Germany, at the time often criticized by his fellow professors for his modernist, socio-economic approach to the subject. Being a friend of Henri Pirenne, he published his History of Belgium in Germany. The patriot university professor Lamprecht was firmly convinced of Germany's mission to

recover Belgium, and esp. its Flemish part. The Belgian identity was a vague idea to him, which could not be politically defended (Chickering 1993, p. 439). He visited the Belgian front in 1914 and the establishment of the political government under the direction of von der Lancken-Wakenitz actually goes back to his idea of a foreign policy of culture, whose ambassador he would have loved to become. He died on the 10th of May 1915. When comparing the Flemish and the Walloons during a conference in Dresden a couple of months before his death, he concluded that the first were in fact German and he tried to demonstrate that everything that had happened in the country's history (i.e. the history of the Netherlands) was in fact German (de Schaepdrijver 2005, pp. 142–143). This is more or less what this map tells us. In fact, it takes us back to the period of Charles V, when the German emperor governed the Netherlands and most parts of Europe. In a personal conversation with the German emperor, Lamprecht had deplored the fact that the German empire had abandoned the Netherlands in the sixteenth century. In the legend to the last map, the map of 1916, Schönebaum explicitly follows the official thesis of the German government as if the war was started by the Germans in self-defence: the aggression (by the English together with the French and the Russians), he writes, was countered thanks to the occupation of Belgium and Northern France.

The former maps are all clearly destined for propaganda policy only. They express ideas and do not care for geographic detail. For purchasing this latter kind of maps, one clearly had to buy or try to get hold of German products, although they were censored too before being put on the market and served propaganda policies. Figure 10 shows a map of July 1916, illustrating the war fronts in the East and in Italy at that time, but the map starts with showing the front line of Belgium.

At first sight, the curved lines seem to indicate a progressive movement of the German forces, but a closer look and reading of the information on the map makes us understand that it reflects the positions during the first months of the war in 1914. The full line (which would usually indicate the most recent front line) near Paris is the front line of the German army in September 1914. Two years had passed since the German army had come within 70 km (43 miles) of Paris, but was forced to retreat by the French and British troops at the First Battle of the Marne (6–12 September), north of the Aisne River. The map was exclusively distributed in Belgium and France by the Georg Stilke company. At the time, it was the founder's son who had taken over the business. His father had established the first railway station bookshop in Berlin in 1882, whereas Hermann (1870–1928) established bookshops on ships and in hotels, but above all created no less than 263 military bookshops during WWI. He had learned the tricks of the trade in America, England and France before entering his father's company (Haug 2007, p. 157 ff.). He was thus a good ally to the German government in developing its propaganda policy. The map was most probably intended for German soldiers, not so much for the Belgian population. The inventory of the Royal Library states it was found among the documents left by the enemy.

Fig. 10 The Belgian front, 1916. (IV 3.369, Courtesy of the Royal Library of Belgium)

In march 1917, when Hindenburg could be convinced to stop the massive deportations from Belgium to Germany, the General government decided as part of its *Flamenpolitik* (by then taken out of the political department, as was censorship) to split the Belgian administration into two parts, a Flemish and a Walloon one, in order to eliminate every possible influence of the French speaking part of the country

Fig. 11 *Flemming's Kriegskarte*, 1915. (IV 2.449, Courtesy of the Royal Library of Belgium)

(de Schaepdrijver 2005, p. 254 ff.). Germany understood by then it could not win the war anymore and that even peace would not be negotiated on its own terms but rather on those of the Allies. In doing so, it therefore hoped that it would keep some political influence after the war or perhaps even get military guarantees in a politically divided Belgium. With the *Flamenpolitik* getting a more official character, it also had its impact on maps, or rather maps seem to have played a role in this policy too. If we compare two editions of the same map (nr. 23) of Flemming's *Kriegskarte* (see Figs. 11 and 12), the first dating from 1915 and the second from 1917, one major difference striking the eye are the changes of the front line in France between December 1916 (dotted red line) and June 1917 (full red line). Less obvious, but perhaps more significant, are the clearly evidenced borders of the areas where, as the map's legend reads, *Niederdeutsch* was spoken at that time (full yellow line) or where it had been spoken but was now *verwelscht* (dotted yellow line).

Fig. 12 *Flemming's Kriegskarte*, 1917. (IV 14.337, Courtesy of the Royal Library of Belgium)

Of the several major offensives which took place from 1917 to 1918 on the Western front, those which concerned the Belgian territory were mostly concentrated in the Yser region. Best known is without doubt the Battle of Passchendaele (roughly 600,000 casualties) which started on 6 November 1917 and ended the Third Battle of Ypres. But there were two more major offensives to come. On 25 April 1918 the Kemmelberg was lost by the French to the Germans in what was called operation Georgette (which had started April 9), part of the final offensive of the German army directed to Hazebroek, an important railway junction. However, no maps of these offensives intended for the larger public, nor of the final campagnes by the Allies following them, are to be found in the digitized collection of the Royal Library. Because from August 1917 onwards all kinds of metal were confiscated for the war, most printing offices had to stop their activities. There was also a paper shortage which resulted in the remaining newspapers being limited to two pages. Even propaganda policy seems to have suffered from this lack of means.

After the war, little was left of the image of Brave Little Belgium and when Belgium asked for the expansion of its frontiers as compensation for the 4 years

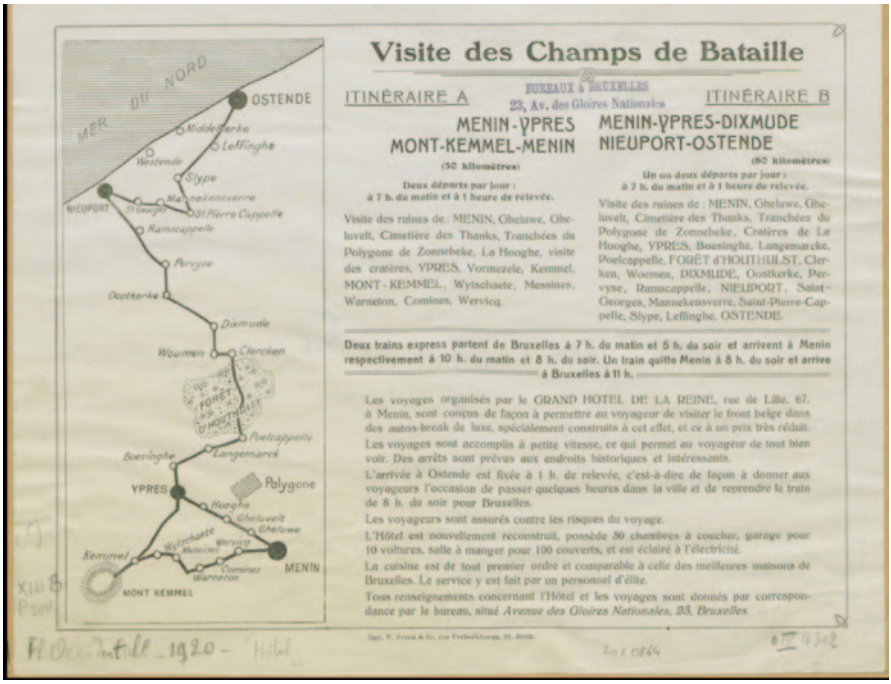

Fig. 13 Visiting the Yser front, 1920. (IV 4.312, Courtesy of the Royal Library of Belgium)

of suffering, the Allies could not appreciate what they considered as a very presumptuous request (de Schaepdrijver 2005, pp. 294–295). In the end, Belgium only received the region of Eupen-Malmédy. And the Yser front? It very quickly became a tourist attraction (see Fig. 13).

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The Postal Service of the Portuguese Expeditionary Corps (1917–1919): A Time-Step Analysis Using Historical Data Integration in a GIS Environment

Patrícia Franco Frazão, Sandra Domingues, Jorge Rocha and José Paulo Berger

Abstract This paper aims to discuss the Campaign Postal Service (*Serviço Postal de Campanha*—SPC) of the Portuguese Expeditionary Corps (*Corpo Expedicionário Português*—CEP) which served in Flanders during World War I. The Mission of the SPC was to ensure the exchange of correspondence between Portugal and the Portuguese Expeditionary Corps in France, as well as to regulate internal postal communications between the various units and formations. Much has been written about the participation of the Portuguese Army in this conflict, but the vast majority of studies either omit or refer only very briefly to the SPC. Our objective is to describe the implementation by force of circumstances of a civil structure such as the SPC in a military organization, the contribution of which is considered invaluable in the history of the participation of Portugal in the Great War.

The SPC left for France in 1917 under the guidance of Humberto da Cunha Serrão, an officer in the General Administration of Posts and Telegraphs who had been appointed to command and organize this service. Our aim is to describe the organization of the postal communication network in Flanders using cartographic and textual sources as well as a geographic information system (GIS) to compile new maps which can show not only the organization and operation of the service, but also the adversities it had to overcome in order to carry out its function. We also intend to emphasise the importance of establishing institutional cooperation relations for the study and dissemination of historical cartographic sources.

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1 Historical Context and the Need to Appoint a Civilian Team to Organize a Military Service

Portugal joined the Great War alongside the Allies. Although officially acknowledging its role as combatant in 1916, the Portuguese troops had left for Africa (where they fought against the Germans) well before they left for Flanders. On 23 February 1916, Britain invited Portugal to take an active part in all Allied military operations, and in August 1916 the Congress decided to send the Portuguese Expeditionary Corps (CEP) to Flanders (Afonso and Gomes, 2010).

An Auxiliary Division was formed with the responsibility of organizing the troops to cope with any emergency in the country's national territory. This division, based in the Tancos Manoeuvres Camp, was the foundation of the preparatory school for future members of the Portuguese Expeditionary Corps (CEP), later called the Training Division. The combat training exercises would only terminate on 10 August 1916 (Themudo and Severiano, 2004).

As the British Government had invited Portugal to participate in its military activities in Europe, political activities went hand-to-hand with the military preparation. A joint military mission of the English and French came to Portugal to discuss the assignment of Portuguese troops to the European theatre of operations with the Portuguese Government and the Joint Chief of Staff. The meetings resulted in the signing of two conventions: the Anglo-Portuguese Military Convention of Cooperation according to which the Portuguese Expeditionary Corps should cooperate with the British army in France where it would receive its final military instructions; and the Franco-Portuguese Convention which would be instrumental in the shipment of the necessary staff to supply heavy artillery batteries to France.

The headquarters of the Portuguese Expeditionary Corps was composed by 17 departments amongst which were the Postal Service Campaign. In 1917, the first troops of the Portuguese Expeditionary Corps embarked for Brest and from there continued to Aire which was the agreed meeting point.

The Portuguese sector, known as the Portuguese Sector of Flanders in the Middle Lys, was part of the British First Army which had a battlefront of 50 km with the Second Army operating to the North, and the Fifth to the South. The Portuguese front which ranged from Scheteland Road, West of La Bassée, to New Bond Street, East of Lavantie, never exceeded 18 km. The rear limit on the northern flank was the Lys canal, and on the southern flank was the La Bassée and Aire canals as far as the railroad bridge in Merville–Berguette.

The contact with the enemy was *via* a *no man's land*, a continuously guarded strip of land 100–400 m wide which separated the two combatant forces. Apart from being covered with shell holes and craters of all sizes and completely turned over by artillery fire, this was also an area subjected to long winters with frequent fog, rain and snow which kept the soil soggy and the temperature much lower than what the ordinary Portuguese soldier was used to (Marques, 2014).

The realization that military operations leading to victories or defeats could no longer be built solely on the battlefield, but required the effort of the whole Portuguese Society, was one of the most important realities of the Great War. The

importance of receiving news from loved ones regardless of postal censorship was a key factor in sustaining the morale of the troops and reassuring those back home of their well-being.

This need, among many others, was to be provided by the Postal Service Campaign (SPC) which had been created on 14 December 1912, but was not effectively implemented. Despite being a peaceful service, its mission was to support the Army when it was operating within national territory and in the colonies. Given the state of war in 1916, the Military Postal Service had to be reorganized so that it was able to connect Portugal to the Portuguese Expeditionary Corps in Flanders.

To render the SPC more effective, the General Administration of Posts and Telegraphs was asked to provide a technical team to organise and run the service: 48 men were recruited, all volunteers, with the exception of Humberto Serrão who was an officer working in the General Administration of Posts and Telegraphs. All 48 men assumed a Lieutenant or Second Lieutenant ('Alferes') ranking according to their professional category in the General Administration of Posts and Telegraphs (Serrão, 1958). An additional auxiliary team of about 100 men about whom very little is known, was recruited from sergeant and soldiers who were unable to serve on the front.

The procedures the SPC was to follow were in 1916 reviewed at the Tancos Manoeuvres Camp where the team was training. During their military training the team concluded that it was necessary to restructure and adapt the existing 1912 instructions for the Campaign Postal Services as these were outdated and not suited for the specific circumstances of the theatre of operations in Flanders. To effect this, a team was sent to Flanders on 6 January 1917 to inspect the operational area of the Portuguese Army and prepare for the Postal Service.

This mission confirmed that the Postal Service should be organized in a completely different way from what was stipulated in the 1912 instructions and rather defined in line with British Army instructions. The new instructions published at the beginning of 1917 had unfortunately no application in the field due to the constant changes in CEP organization which the Postal Service had to adapt to. The principle reason for this change was a new tactical mode of employing Portuguese frontline forces, according to the British Expeditionary Force (BEF): one Army Corps with two divisions instead of a reinforced one.

The departure of the SPC team to Flanders happened gradually. Under the Convention of January 1917, Britain had lent seven ships to Portugal for the transportation of the expeditionary troops which were joined by two Portuguese ships—the Gil Eanes and the Pedro Nunes. As Spain remained a neutral country, some of the members of the SPC travelled by train wearing civilian clothing.

In 10 February 1917 the postal service at the E.C.B.P [*Estação Central da Base Postal*/Central Postal Base Station] was formed in a very rudimentary fashion in a shed next to the British postal station of Boulogne-Sur-Mér, using the material brought from Portugal and with the tools provided by the British Postal Service (Serrão and Feijão 1920, p. 11).

Due to the number of soldiers who were arriving from Portugal, the Portuguese postal stations always remained close to the cantonments of CEP units which im-

plied heavy postal traffic. Based on the network sketches designed by the technical team of the SPC, some stations changed their location dozens of times in an area ranging from 11 to 18 km. Most postal stations were located around the Aire region, and relocated as the battle moved between Armentières and Lens and between Merville and Bethune.

Due to the intense movement of CEP military units and the movement of officers and men between the units, there was daily correspondence between post offices. The mailbags were opened in all the SPC units where correspondence and parcels were handled, and then delivered to the postal ordinances of the different units who waited daily at the postal station to which they were designated to transport the mail to their units.

Each unit had one person in charge of the postal service with the responsibility to deliver all correspondence to the addresses indicated, and to redirect correspondence and orders after these had been submitted to local censorship. All CEP correspondence was censored in the sender unit (or formation) by the unit commander or his equivalent. If a letter contained objectionable matter, it was marked 'CENSORED' and, after being opened and receiving a number that identified the unit, delivered to the officer responsible for the unit who closed and stamped the envelope, preferably on the upper left corner. Upon its arrival at the Operating Base, the letter could, if requested by the Committee of Censorship, be reopened and examined by official censors who then returned it, labeled "OPENED FOR CENSORSHIP".

The team's arrival in Flanders was the starting point for our investigation, the methodology of which we will describe in the following sections. Our aim is to understand how a hastily trained civilian service was able to organize and implement a mail distribution system in articulation with the military organization in an adverse geographical space.

Despite all these challenges and the fact that they operated more than 2000 km away from Portugal, the SPC was able to ensure that recipients normally received post within 5 days. They also established a dynamic workflow which, between 1917 and 1919, involved the daily circulation of approximately 113 postal bags resulting in the distribution of a total of 32,862,989 postal items which included ordinary and registered letters and parcels (Serrão, 1942).

2 Disclosing the Activities of the SPC Through the Collection of Humberto da Cunha Serrão

The project discussed here is based on the private collection of documents that were donated to the Portuguese Communications Foundation in 1999 by the family of the engineer Humberto da Cunha Serrão (1885–1959). Humberto da Cunha Serrão joined the General Administration of Posts and Telegraphs in 1902 and reached the position of Services Director in 1932. His entire career is documented in his collection, which includes evidence of his participation in World War I. In December 1916, with only 8 days to prepare, he had to join the Portuguese Postal Service

Campaign of the Portuguese Expeditionary Corps. As 1st officer he was given the post of Captain and, being the most senior officer, he assumed the command of the service.

Humberto da Cunha Serrão's collection is the primary source of information that allows us to reconstruct Postal Service activity during World War I. However, as we shall see in more detail, the time and circumstances in which a large part of this documentation was drafted, introduced a significant number of inaccuracies and inconsistencies that made us look for alternative information sources. We need to consider the loss of documentation that occurred through the exchange of correspondence after the return of the SPC team to Portugal, which includes the disappearance of a report prepared by Humberto da Cunha Serrão whilst still in Flanders.

It is important to stress that the project implied a geographical analysis matrix of the organization and functioning of the Postal Service Campaign. This required an interaction between textual and cartographic sources, which is not always easy to implement as we shall demonstrate below.

2.1 The Collection of the Head of the Postal Service and Other Documents of the Portuguese Communications Foundation

Processing the information contained in the previously described collection implied dealing with different types of documents, such as maps, postal network schemes, letters, reports, and some manuscripts, printed and dated between 1917 and 1942 (Serrão, 1948). This led to a stage of transcription and information mapping which we hoped would help us to fully understand the way the SPC functioned.

Throughout this process, the team was confronted with many obstacles, mainly related with deciphering abbreviations, unclear handwriting, lack of uniformity in the terminology applied, and inconsistencies in the opening and closing dates, location and relocation of the postal stations. The data we worked with were interwoven data collected from Humberto Serrão's diary and data collected from other documents in his collection with data collected from the Military Historical Archive and other references. In completing this phase, we raised a number of questions and problems which we tried to solve accessing other existing collections from the Fundação Portuguesa das Comunicações (FPC), particularly their collection of newspapers and the *Official Bulletin of the General Administration of Posts* in which the orders and instructions given to the SPC were published.

2.2 Searching Other Archives: Completing, Complementing and Clarifying the Collected Information

The starting point for this new stage was not only to obtain sources that would complement what we already had and clarify the data obtained from the analysis of the collection of Humberto Serrão, but also to find information on the military

organization into which the SPC was integrated. It was crucial that we should understand how the Portuguese Army was organised and how it operated.

Due to the nature of the subject under study our research focused on the archives of military or related institutions—the Military Historical Archive (AHM), Directorate of Army Infrastructure (DIE), League of Combatants (LC), Portuguese Commission of Military History (CPHM), and the Portuguese Navy Hydrographical Institute (IH). However, we did not forget other libraries and archives for issues related with the Portuguese participation in World War I. All these institutions promptly agreed to collaborate with us and graciously offered us all the relevant information we could find in their collections.

The information collected from the AHM could be divided into two groups: textual documentation, which completed, supplemented or clarified the information collected from the collection of Humberto da Cunha Serrão, and cartographic information which assisted us, using GIS capabilities, to compile the maps we required to understand the functioning of the postal service which was so important to the morale of the troops.

As we completed the review of our sources, we moved on to the analysis and comparison of the data collected from the AHM with the data extracted and processed from the collection of Humberto Serrão. This intersection of data was performed at two levels: between textual sources, and between textual and cartographic sources. This phase solved some contradictions and filled in some information gaps, but also indicated that not everything was clear, a conclusion not uncommon when one is working with information from different sources and origins which were produced at different times or in the context of a war. Realizing that the few maps we had found could not cover the entire postal network or even reflect the several changes in the locations of the stations due to the constant movement of the military unit they served, we decided to create new maps using GIS capabilities.

3 GIS Analysis of Historical Cartography

GIS applications in the field of the history of cartography are very valuable, for instance to assess the accuracy of early maps, establish a database of places and historical administrative units, and integrate early maps into GIS or digital images. This phase of our work was divided into three distinct parts. The two first ones were associated with two different concepts sometimes regarded as synonymous, i.e. geocoding and georeferencing. The latter part consisted in the geographic analysis itself.

The first part is the process of associating an address or a place name with geographical coordinates on the map. In a spatial database this is done as a point layer with the name of the place as an attribute to the point location (thus the confusion with the term ‘georeferencing’). This is one way of geocoding. The second is the process of associating images, e.g. rasterized maps, with map coordinates. Once the image is associated with the map coordinates, it can be overlaid with other informa-

tion. Geocoding is therefore the process of taking coded location information (such as addresses or grids) and turning them into explicit location information (X and Y coordinates, usually). Georeferencing, on the other hand, is the process of taking a raster image or vector coverage, assigning it a coordinate system and coordinates, and translating, transforming, and warping/rubbersheeting it into a position in relation with some other spatial data, such as survey locations, street intersections, etc. For both processes one could use GIS software such as ArcGIS or QGIS (open source).

3.1 Geocoding

Our goal here was to identify the locations of the points and features of an early map on a modern base map, i.e., to find strictly comparable points and features between the early map and the modern base map. This modern base map with the identified points and features was used as the reference map to evaluate the accuracy of the early map.

Identifying the locations of the points and features of an early map on a modern base map can be very difficult for several reasons. First, some of the points or features of an early map may have disappeared over time. On the other hand, even though some of them might still exist today, their names may be different from those indicated on the early map. Further difficulties are caused by place names that are the same as the old ones but currently represent different features. Therefore, one must be very careful when conducting studies using this procedure.

Our geocoding procedure relied on quantum GIS software which uses Google maps interfaces to search for locations. With this approach we managed to geolocate 96% of the places where the SPC was stationed during the Portuguese campaign. The remaining 4% were located using bibliographic research and inspecting the records available online. All the data were projected onto a WGS84 datum in order to be compatible with Google Earth and to guarantee a wider dissemination (see Fig. 1).

Subsequently, we applied the same procedure to the localities related to the battlefront (see Fig. 2).

3.2 Georeferencing

Because features on the scanned original early maps are just images, these features need to be digitized as points, lines, or polygons to create vector GIS layers in order to perform spatial analysis. Once vector layers are created from the original early maps, the attribute data, such as the population of the administrative divisions, can be added and linked with these spatial features.

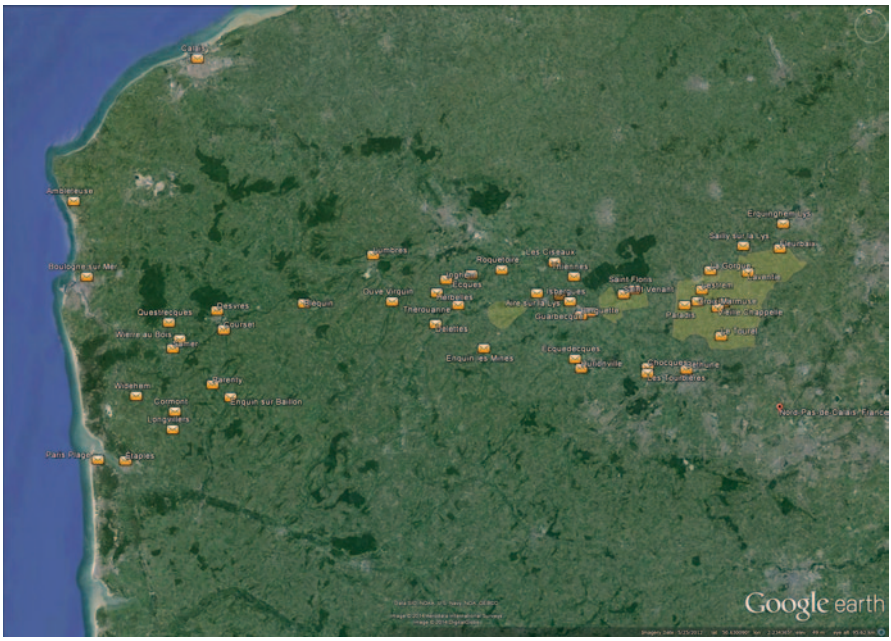

Fig. 1 SPC locations during the Portuguese campaign

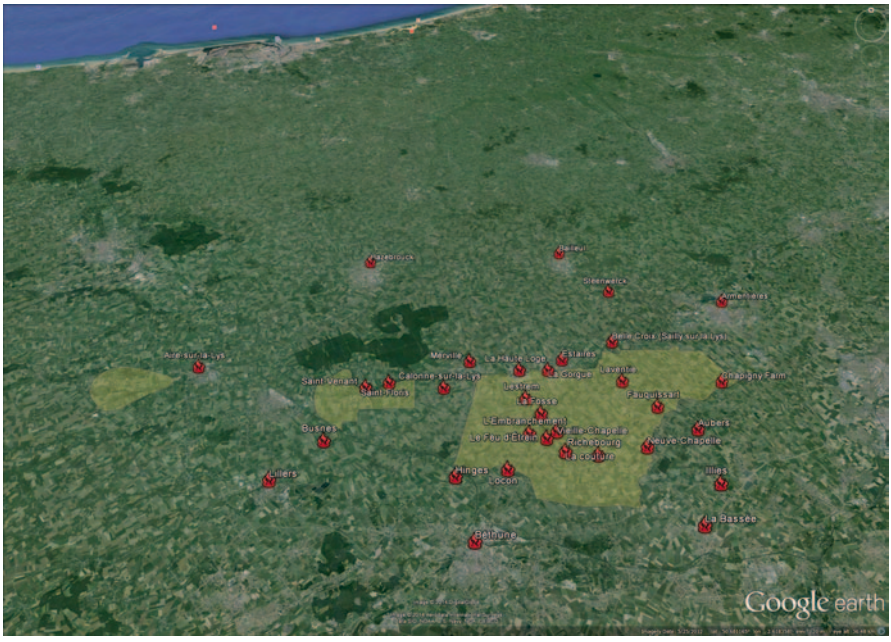

Fig. 2 Battlefront localities

Integrating early maps into GIS or digital images creates valuable resources and techniques to study historical spatial information, as well as information relative to the early maps themselves. Nevertheless, this is a time-consuming, labour intensive and expensive procedure.

The maps produced by the British Expeditionary Force to support operations along the Western Front were of three scales: 1:10,000, 1:20,000, and 1:40,000. For the most part, the three series were identical as the maps which had been first drafted on a scale of 1:20,000 were later either enlarged or reduced.

The three different scales also used the same grid system. The 1:20,000 series was the most popular topographic map used by British and Canadian forces. Due to the particularity of its mission, Portuguese data were also almost exclusively overprinted on the British 1: 20,000 map series. Since the British maps used in northern France at that time were produced using Belgium data and were discontinued right after the end of the War—which resulted in further loss of information on their precise location—the only possible solution was to georeference the data. The first step was to digitize the original early paper map using GIS. When we managed to get a 1:40,000 map of France which showed all the locations of the Portuguese troops, we used that as our reference map and matched the other maps of equal or greater scales to it grid.

In order to georeference the 1:40,000 map, the identical points on the two maps had to be selected as common control points for an overlay. Because the scale of an early map might vary in different places and its orientation might also be different from the modern base map, it is critical to carefully choose the common control points that can most accurately be overlaid to produce the maximum attainable degree of coincidence between the two maps. The principle of selecting the first common control point should be based on which point will provide the best possible overall average fit of the two maps.

Geometrically the point in the centre of a map is deemed the best for this purpose. The principle of choosing the second common control point is determined by which point will most accurately show the scale and orientation of the maps when it is connected to the first common control point. The most distant point from the centre is the best for this purpose as it has the smallest percentage of error in the overlay process when connected to the first control point.

Control points must be carefully selected around the edge of a map so that they are distant from each other and have a smaller percentage of error in the data conversion process. In addition to the distance from the centre, a point in an area of denser features and identified points should carry more weight than those in areas of fewer features and identified points. We eventually managed to find and mark 116 control points, almost all of them referring to buildings and crossroads, and widely dispersed over the map.

The last step was to examine the degree of distortion of the early map based on the overlay of the early map onto the modern base map. The absolute distortion can be analysed by the linear distance between the point on the early map and the identical point on the modern base map. The relative distortion of the early map can be examined by measuring the ground distances and angles between two points on

Fig. 3 The location of the Portuguese corps between 11 and 20 of December 1917

the early map and comparing these with the identical distances and angles on the modern base map. Using a second order polynomial transformation, this process resulted in an overall error of 6 m, with a minimum of 3 m and a maximum of 8 m. As a result, we had a map showing the location of the Portuguese Expeditionary Corps which we first transferred to vector format and then transformed to Google Earth (see Fig. 3).

3.3 GIS Spatial Analysis

Having the geographical location of both the SPC stations and the Portuguese Corps, we could overlay this information with other GIS related data, such as Digital Terrain Models (DTM). In Fig. 4 we can see that all the battles took place in lowlands which, coupled with the extremely severe weather conditions of that time, helps to explain the difficulty encountered by the opposing parties to gain just a few 100 m.

Despite being a very interesting method of analysis, data overlay can also be reductive as the GIS allowed us to progress even further in our analysis. Hence we moved to a space-time analysis of the Portuguese presence, taking into account not only the places where the troops were stationed, but also the time they spent there (in days). For this we applied a Kernel density estimator.

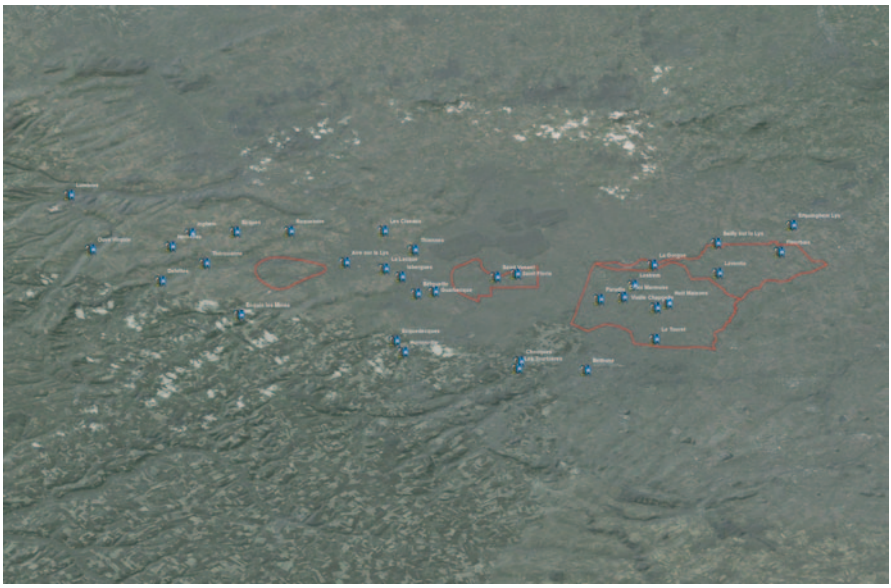

Fig. 4 GIS data overlay

Kernel density estimators belong to a class of estimators called non-parametric density estimators. In comparison with parametric estimators, where the estimator has a fixed functional form (structure) and the parameters of this function are the only information we need, non-parametric estimators have no fixed structure and depend on all the data points to reach an estimate.

To understand kernel estimators we first need to understand histograms, the disadvantages of which provide the motivation for kernel estimators. When we construct a histogram, we need to consider the width of the bins (equal sub-intervals into which the whole data interval is divided) and the end points of the bins (where each of the bins start). As a result, the drawback of histograms is that they are not smooth and depend on both the width of the bins and their end points. We can alleviate these problems by using kernel density estimators.

To remove the dependence on the end points of the bins, kernel estimators centre a kernel function at each data point. And if we use a smooth kernel function for our building block, then we will have a smooth density estimate. Thus, we eliminate two of the problems associated with histograms.

Conceptually, a smoothly curved surface is fitted over each point. The surface value is highest at the location of the point and diminishes with increasing distance from the point, reaching zero at the search radius distance from the point. This means it follows Tobler's first law of geography, i.e. all things are related but the nearest ones are more related. The kernel function used, is based on the quadratic kernel function described in Silverman (1986) and in our case resulted in the map below (see Fig. 5).

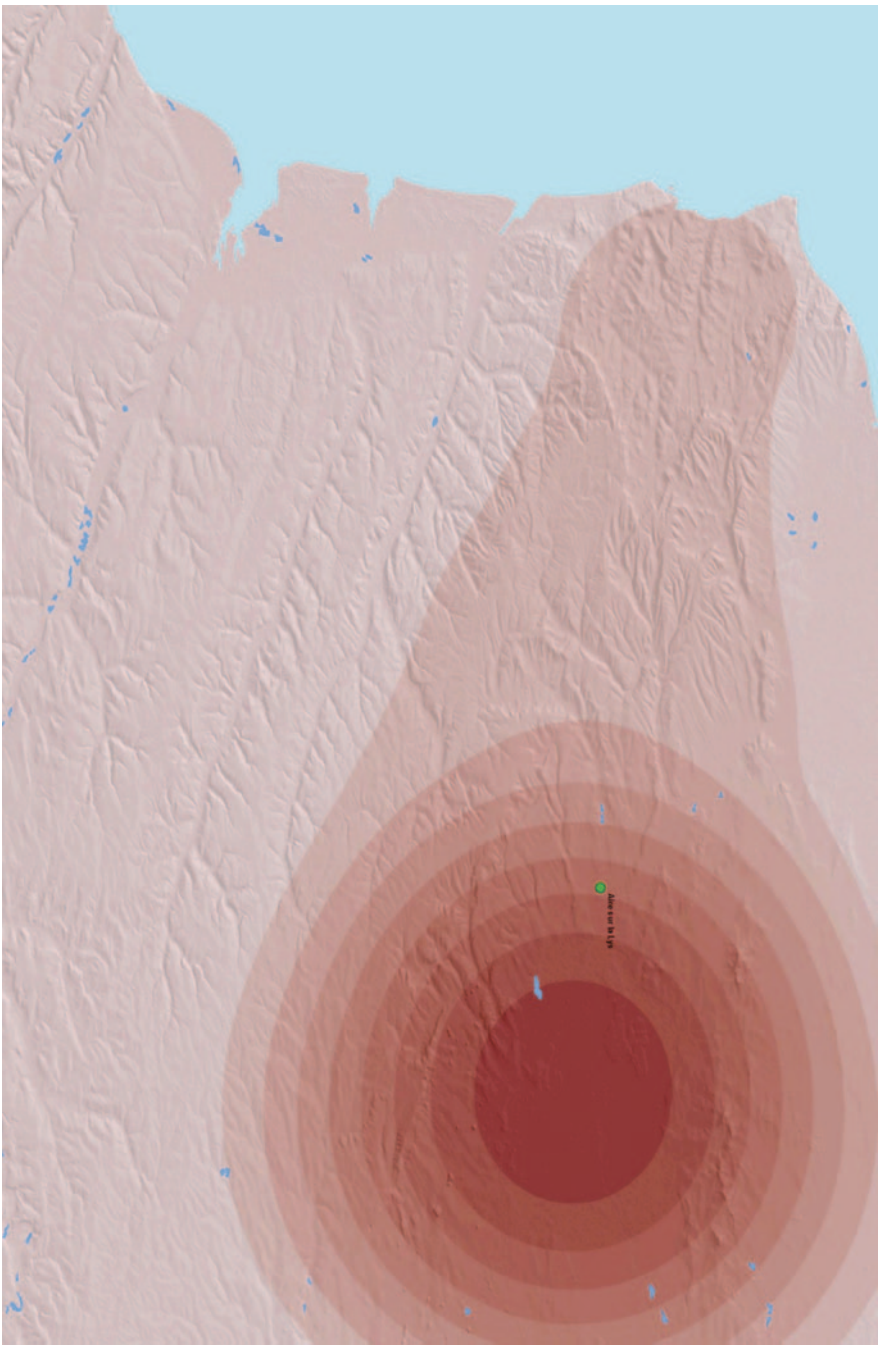

Fig. 5 Density map of Portuguese permanence in Flanders

This density map allows us to understand where the SPC spent most of its time in a space-time perspective. This data can further be correlated with other data, e.g. climatic, English and German troops movements in battlefront, and so on. Additional work can involve graph analysis of Portuguese settings and their connections, getting measures of accessibility and connectivity.

4 Conclusion

The research for this paper was carried out by the Centre for Geographical Studies (CEG), the Portuguese Communications Foundation (FPC) and the Portuguese Army, through the Office of Archaeological Studies of Military Engineering of its Directorate of Infrastructure (GEA-DIE). As such it was a multidisciplinary project based on the mutually agreed principle that even if the missions of organizations differ, it is still possible to establish partnerships which will allow for the achievement of mutual goals, especially when these goals relate to scientific activities and educational and cultural materials. By combining our resources, skills and knowledge, work can be more efficiently and effectively done.

One of the aims of this paper was to demonstrate the role that Geographic Information Systems (GIS) can play in the study and analysis of historical cartography. Historical maps should not only be seen as works of art, but should also be considered valuable sources of information to be used in reconstructing history and supporting future decisions. We also wanted to demonstrate the importance of interweaving different information sources in terms of their nature and origin, and to show that institutional cooperation is possible in spite of the varied nature of the documentation.

This project intends to function as a laboratory for the application of Geographic Information Systems in the processing, analysis and especially in the dissemination of historical information sources. At a time when the ‘new’ technologies are no longer an innovation, information itself should be the focus of our attention. The users of the information are no longer the same and have become increasingly demanding. Therefore library databases, archives and especially specialized documentation centres can no longer simply be shelves of information but should strive to extend their potential to other processing systems and above all should disseminate information, such as Geographic Information Systems when it comes to geographical documentation.

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Position Mapping: Cartography, Intelligence, and the Third Battle of Gaza, 1917

Joel Radunzel

Abstract World War I saw numerous innovations in military cartography. In the Palestine theater as elsewhere, the British and Dominion forces leveraged new technologies, including aerial photography and wireless intercepts, to supplement their use of intelligence to map enemy troop positions. The creation and distribution of these position maps by the 7th Field Survey Company for the Third Battle of Gaza in late 1917 represented an innovative process of intelligence-gathering, map production, and knowledge distribution. This paper not only examines the Egyptian Expeditionary Force (EEF) along with its subordinate intelligence assets and cartographic organizations as a comprehensive mapping system, but also elaborates upon David Woodward's cartographic framework to study the creation of the 7th Field Survey Company's position maps as well as their utility, accuracy, and effectiveness. Woodward's framework divides the map production process into four phases: information gathering, information processing, document distribution, and document use. Elements of the EEF were involved in each of these phases during the Third Battle of Gaza. This mapping system was cyclical insofar as the operations that these maps helped to facilitate also gathered further information that fed into the next cycle's product. As the condition of the battlefield and the nature of the operations changed, so too did the value of various modes of intelligence gathering, with varying effects on the accuracy and utility of the position maps. The utility of the position map technique is apparent in its reintroduction prior to the EEF's final offensive in 1918.

1 Introduction and Context

1.1 Historical Context

The Palestine campaign and the Third Battle of Gaza in particular stand out from the usual narrative of World War I operations in that the Palestine theater and the

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forces involved in the campaign allowed greater mobility and decisiveness than other fronts on which British forces fought. This difference seems to have facilitated a certain degree of creativity by the people and organizations who conducted this campaign on subjects ranging from the strategic military art to the best way to quickly unreel telegraph cable in the desert. One area in which members of the Egyptian Expeditionary Force (EEF) showed particular innovation and creativity was in the arena of operational position mapping. During the campaign initiated by the Third Battle of Gaza the EEF intelligence staff along with the 7th Field Survey Company (FSC) produced a series of 'position' or 'operation' maps that appear to have been both unique in the realm of World War I military cartography and innovative in how their authors manipulated relatively simple symbols to rapidly communicate complex information.

The offensive launched by the EEF under the command of General Edmund Allenby on the Turkish defensive lines between Gaza and Beersheba on 31 October 1917 was the result of an evolving campaign that today would be called an example of "mission creep." Essentially, an initial British desire to passively protect the Suez Canal—and with it the Empire's lines of communication to India—from a possible Turkish attack in 1914 had expanded to a need to occupy the entire Sinai Peninsula to ensure this goal by 1916. However, the resources and logistics required for the British to occupy Sinai were also too large to justify simply establishing a defensive line at the frontier of Palestine, and so the British government made the decision to pursue the campaign into the regions of modern-day Israel, Lebanon, and Syria in an effort to knock the Ottoman Empire out of the war.

To this end the British forces advancing out of Sinai attempted twice to crack the Turkish defenses at the Palestine frontier in what became known as the First and Second Battles of Gaza in March and April 1917. These were inconclusive affairs that attempted to breach by frontal assault the elaborate fortifications that were being dug by the Turkish army around Gaza. The failure of the second attack led to the replacement of the British commander, General Archibald Murray, by General Edmund Allenby, the officer who would eventually lead the EEF to decisive victory on this front. Allenby would command the EEF in the Third Battle of Gaza, which destroyed the Turkish defenses at the Palestine frontier, and through the pursuit northwards into Judea, which eventually resulted in the capture of Jerusalem and established a new front line north of Jaffa.

Allenby's commission from the British government to breach the Turkish defenses and seize Jerusalem by Christmas 1917 benefitted from advantages that were logistical, organisational, and geographical. The British army in 1917 was becoming increasingly sophisticated in both its staff functions and tactics to deal effectively with the problems of large-scale siege warfare that characterized World War I combat, meaning that Allenby's force benefitted from battle-tracking and cartographic processes that were thoroughly modern though not completely developed. To ensure Allenby's success, the British Imperial General staff would accede to his calls for more troops and equipment, and the British could more easily reinforce this front with secrecy using their command of the sea, than could the Ottomans who could only reinforce Palestine via a single railroad line that was observed both

by agents reporting to the British and through wireless intelligence. Finally—and most importantly for this paper—the Turkish line differed from many of the tactical problems that British forces faced during this war in that it possessed an assailable flank at Beersheba on the southeast end of the line and thus provided the prospect of the kind of maneuver warfare that could bring decision rather than incremental stalemate.

1.2 Scholarly Context

The potential for meaningful maneuver on this front gave rise to an innovative form of order-of-battle tracking cartography that proved to be both innovative and flexible, though not without limitations and faults. These 'position maps'—also contemporarily called 'situation' or 'operation' maps by various sources—were distinct in many ways from other tactical and operational scale battle maps produced during World War I, including the trench maps studied by Chasseaud 2013 and the more closely related 'order of battle' maps produced by the British Expeditionary Force (BEF) in France. They differed first in that they attempted to represent the positions of discrete units on the battlefield rather than the static cultural terrain portrayed by the trench maps or the continuous sectors of front lines portrayed by the more traditional order-of-battle maps. Second, these maps were notable in that the EEF intelligence staff along with the 7th FSC updated, printed, and distributed these maps on a daily basis starting on 28 October—several days before the commencement of the Gaza-Beersheba offensive—with production running at least through the fall of Jerusalem on 9 December.

Within this series of operational position maps the EEF intelligence officers, who populated each edition with symbols denoting friendly and enemy unit positions, experimented with numerous innovative methods for communicating not just what they knew about the conditions on the battlefield, but also what they did not know and their own analysis, along with ways to graphically differentiate between these types of information. Peter Collier has commented on these maps previously, noting that they were both novel and innovative, and calling for further research into the intelligence that informed them (Collier 2008, p. 13). Yigal Sheffy also relies on these maps in his book, *British Military Intelligence in the Palestine Campaign, 1914–1918*, and comments on the value and accuracy of the information they present (Sheffy 2004, pp. 240–243). In fact, these maps were stored or reproduced in a surprisingly large number of sources and locations in the aftermath of World War I, both published and otherwise, and this fact alone merits their further study.

The original purpose of these maps was as an operational decision-making aid for Allenby and his corps commanders during the Gaza-Beersheba offensive, but both the purpose and use of these documents evolved as the conditions on the battlefield changed with the flow of the campaign. In producing these maps the EEF was able to leverage numerous sources of tactical, operational, and strategic intelligence that provided both locational and qualitative data about Turkish units on the Pales-

tine front to create a relatively complete and accurate picture of the Turkish deployments when the front was stable. However, these processes broke down during the more mobile phase of the campaign, forcing the position mapmakers to rely on fragmentary pieces of intelligence pulled together by their own analysis. The importance to the position mapping effort of the different forms of intelligence-gathering available to the EEF also changed during the course of the campaign depending on the operational conditions.

2 The Woodward Framework and the EEF Cartographic System

In this essay I examine these position maps—including how they were produced, distributed, and used—by treating the entire EEF as a cartographic system along the lines of David Woodward's suggested framework (Woodward 1974). Woodward's framework divides the cartographic process into four phases: information-gathering, information-processing, document-distribution, and document-use. In creating the position maps, elements of the EEF engaged in each of these phases during the course of the campaign initiated by the Third Battle of Gaza. Furthermore, this process, like Woodward's model, was cyclical in that the use of the position maps—to formulate operational orders and initiate troop movement—also generated more information that fed into a new information-gathering phase of a subsequent cartographic cycle. Woodward's table, however, is necessarily generic. To make it useful for my own purposes as they relate to studying the 7th FSC's position maps, I modified its contents—though not its structure—to reflect the specific analogues for the actors, processes, and products within the EEF system (see Table 1). To do this, I examined documents at the British National Archives, the Imperial War Museum, and elsewhere to determine what entities in the EEF engaged in information-gathering in particular, but also in information processing, and how the operation maps were printed, distributed, and used. What I found was far more valuable than a simple correlation between the Woodward framework and the EEF cartographic system

2.1 Information-Gathering

The intelligence-gathering entities of the EEF fell into five general categories: (1) ground reconnaissance and contact, (2) aerial reconnaissance, (3) signal intercepts, (4) statements taken from enemy prisoners and deserters, and (5) reports from agents behind the lines. Each of these five intelligence gathering methods fulfilled an important role in a system that—at its best—tracked Turkish units from the time they arrived in the Palestine theater until they entered the front lines opposing the British forces. The form of the position maps required the EEF to collect both location data

Tab. 1 David Woodward's suggested cartographic framework modified to reflect the corresponding elements of the EEF on the Palestine Front

	Production			Product
	Personnel	Techniques	Tools	
Information-gathering	Intelligence officers	Signal intercepts	Wireless sets	Intercepted messages
	Aerial and ground patrols	Ground and aerial reconnaissance	Aircraft, cameras, optics	Aerial photographs, patrol reports
	Interrogators	Prisoner/deserter interrogations	Mental faculties	Prisoner/deserter statements
	Agent networks	Train watching	Communication networks	Agent reports
Information-processing	Communication specialists	Situation and intelligence reports	Report formats and communication networks	Situation reports
	Intelligence officers	Multi- and single-source analysis methods	Mental faculties, standardized forms	Intelligence summaries
		Compilation, drafting, engraving, printing tools	Pre-printed base maps, colored engraving plates	Draft operation maps
Document distribution	Staff officers	Daily intelligence dissemination	Chain of command, subordinate staffs	Operation orders
	7th FSC	Compilation, drafting, engraving, printing	Pre-printed base maps, compilation, drafting, engraving, printing tools	Operation maps
Document use	EEF commander, subordinate commanders	Military decision-making process	Tactical doctrine and training	Operation decisions, unit orders and movements
	GHQ and Corps staffs	Enemy capabilities and intentions analysis	Physical and mental faculties	More intelligence

(where groups of enemy troops were positioned on the battlefield) and identity data (the enemy unit's place in the order of battle). Different sources excelled at providing different types of data. For example, aerial reconnaissance was adept at locating large bodies of moving troops, though this method could not identify them, while signal intercepts could identify enemy units in the line, though it could not demarcate their boundaries. Ground reconnaissance, though often somewhat messy and gathered at a cost in blood, was many times the primary source of data about Turkish positions during the more mobile periods of operations, while deserter statements appear to have been the richest source of both location and identification data when the EEF had the time to process and plot them.

2.2 Information-Processing

The information-processing phase encompassed both the transmission of the raw data from the information-gatherers back to the EEF GHQ and the analysis of these data by the EEF intelligence staff, primarily led in this activity by the capable and creative British intelligence officer, Major Richard Meinertzhagen, who headed the EEF's Palestine Intelligence section during the Gaza campaign and was primarily responsible for the production of the position maps. Because the communication methods available to the EEF needed to manage a trade-off between the amount of information transmitted and the speed at which it could be received, much processing of these data actually occurred at a low level of the EEF as commanders and signal officers decided what information to send. In general, the EEF communication systems was constricted once mobile operations began the use of dot/dash systems of data transmission such as wireless telegraph, heliograph, and signal lanterns, for the purpose of passing information quickly. The laying of cable for telegraph and telephone lines or sending messages by courier—though able to transmit far greater amounts of data—often occurred too slowly for the information to be relevant on a rapidly changing battlefield.

To help them process the incoming information, Meinertzhagen and his fellow staff officers often utilized a "working copy" map technique in which they roughly plotted the positions of friendly units on the base line maps at different times during particularly active days of operations (see Fig. 1). These working copies—included in the archival collections with the more polished final daily editions of the position maps—are both visually and technically distinct from the published position maps. They are obviously hand-drawn in contrast to the printed symbols of the polished maps, and they only show British unit positions, ignoring the Turkish. The EEF staff likely employed these maps in a sort of "battle tracking" role to maintain awareness of the progress of operations, but also to make sense of the data about Turkish forces that was flowing back from the British units that were in contact with the enemy. These working copies of the positions maps were generally produced on days when large troop movements were occurring (31 October, 1–2 November, 6–7 November) and they provide some insight into the intelligence staff's analysis process.

Another information-processing tool that the EEF intelligence officers employed to organize the data that they presented on the position maps were the daily intelligence summaries issued at EEF General Headquarters (GHQ). These attempted to decant the raw data arriving at the headquarters into useful analysis that could aid the command's decision-making and planning. Within these documents, the intelligence staff regularly created "identification tables" that listed the location of Turkish units along with the source of the intelligence that identified and located the particular formation, as well as any qualitative information provided by the source. These tables often correlated very closely with the information presented on the position maps of the same day. Further narrative write-ups in the daily intelligence summaries often provided other details for the position of units represented on the maps that had been located—usually by aerial reconnaissance—but not iden-

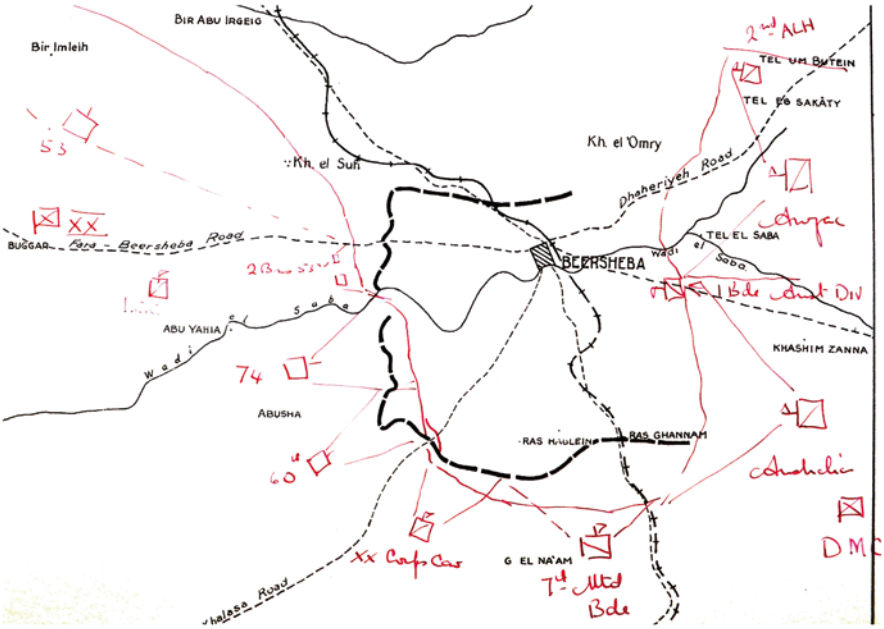

Fig. 1 An example of a working copy of the 31 October edition of the position maps illustrating the rough, hand-drawn technique and the lack of Turkish units (7th Field Survey Company RE 1917)

tified. Overall, these summaries appear to have been the primary tool used by the intelligence staff to organize their picture of the battlefield before committing it to paper in the form of the position maps.

2.3 Document Distribution

The printing of the final polished editions of the positions maps each day and their distribution to the EEF's corps and division commanders were functions of the document distribution phase of the EEF cartographic system. As Collier (2008) noted, the printing process—summarized by Meinertzhagen in his diary—followed a pattern of battle-tracking lasting until 4 pm each day, at which point the intelligence staff delivered to the 7th Field Survey Company draftsmen a map with both British and Turkish positions annotated. These draftsmen then created the necessary plates and printed the required number of copies onto pre-printed base maps, with the final product being available at 6 pm (Collier 2008 , p. 11; Meinertzhagen 1960 , p. 225). The 7th Field Survey Company recorded in their war diary the number of position maps—called "operation maps" in this source—that they printed each day. The number of copies supports Meinertzhagen's assertions that the maps were

meant to be distributed down to the division level, though larger numbers of prints on some days indicate a possible desire to give them to brigade level commanders as well (7th Field Survey Company RE 1917–1919). This pattern of distribution to relatively high-level commanders gives indications about how the maps were used: to help make relatively large-scale operational decisions about the deployment of friendly forces to counter enemy movements.

One qualification is necessary, however. The position maps—at least those editions printed prior to 15 November—were rather large, perhaps the size of a tabletop. These early editions were printed at a scale of 1:100,000, 1:250,000, or 1:168,960, depending on the day, and would have been difficult to transport in the austere circumstances initiated by mobile operations. Many division and even some corps commanders likely did not receive their copies of the maps on days when their units were engaged in offensive operations or located particularly far from GHQ. This was perhaps one reason why the 7th Field Survey Company began printing their 1:500,000 scale editions of the position maps on letter sized sheets after 14 November. However, even if the maps did not reach some of their intended recipients each day, they could still have been influential at GHQ itself where many of the EEF's operational decisions were made.

2.4 Document Use

One episode recorded by Meinertzhagen in his diary provides some insight into both the purpose of the position maps and how they factored into the GHQ decision-making structure. After the successful assault on Beersheba on 31 October, the focus of the EEF intelligence apparatus turned towards attempting to detect the movement of the Turkish reserve divisions, the 7th and the 19th, towards the eastern end of the battlefield. The 2 November position map showed a major shift of Turkish forces in this direction from both the reserve formations and from the central sector of the Turkish front lines and in particular depicted the 19th Division as a strong formation on the extreme right flank of the British line along with other units (see Fig. 2). The source of the information portrayed on this map had been a series of aerial reconnaissance reports and signal intercepts that indicated an eastward movement by large numbers of Turkish troops, but did not identify which formations had actually departed (GHQ Egyptian Expeditionary Force 1917). Meinertzhagen stated in his diary that his superior, Guy Dawnay—the EEF's Brigadier General of the General Staff, or BGGS—"refused to credit" the intelligence staff's portrayal of the data because it might frighten the British commanders on that end of the line into weakening their own offensive moves. Dawnay allegedly ordered Meinertzhagen to suppress this edition of the map, apparently with General Allenby's approval (Meinertzhagen 1917, p. 48). The following day's edition duly returned the Turkish unit symbols to their original locations on the map, though they were now represented by hollow—rather than solidly filled—box attenuation symbols to indicate the uncertainty of their true disposition (see Fig. 3). As the intelligence picture was

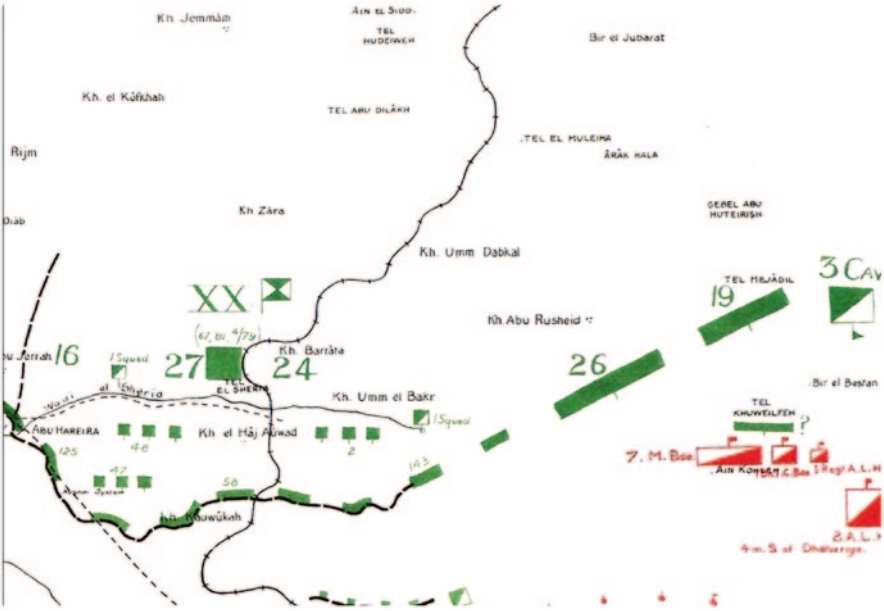

Fig. 2 (*Top*) showing an excerpt of the 2 November map that depicted a strong Turkish (*green* symbols) reinforcement of their eastern flank by numerous units including the 19th division

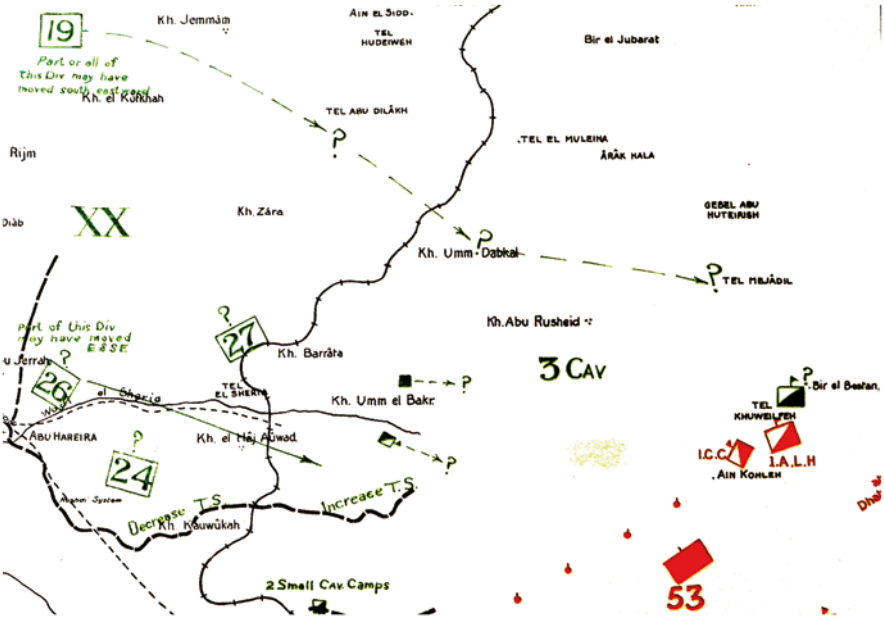

Fig. 3 (*Bottom*), an excerpt from the same area on 3 November depicting these units in their original positions but now represented by hollow box attenuation symbols (TNA WO 153 1035 2)

clarified on 4 November through information gleaned from Turkish prisoners, some of the Turkish units—including the 19th Division—were cartographically returned to the eastern flank of the battle front.

This dance of units across the maps from 2–4 November shows that, while the EEF command was no doubt concerned with the accuracy of the position maps, they were also concerned with the influence these maps would exert on the British commanders responsible for countering the Turkish moves. Doubts existed at GHQ about the judgment of both the XX and Desert Mounted Corps commanders—Generals Philip Chetwode and Harry Chauvel, respectively—and their anticipated responses to the bold movement of Turkish reserves portrayed by the 2 November position map (Meinertzhagen 1917, pp. 48–50; Lynden-Bell 1917). This indicates that these maps were at least somewhat influential in the operational decision-making apparatus of the EEF down to the corps level.

Important too are the products that the document-use phase of this cartographic framework generated. The operational orders and subsequent troop movements that the position maps influenced placed forces into contact with enemy formations (or not), thus generated further data about Turkish deployments that fed into a renewed information-gathering phase of the following day's cartographic cycle. Often these new operations would generate so much confused data that the intelligence staff was unable to adequately process it to portray a coherent picture of the day's operational situation.

3 The Position Maps

3.1 What, Where, When, and How: The Production of the Position Maps

The editions of the position maps can be divided into three chronological categories that correspond to the three operational phases that composed the British offensive. These included the initial phase where the EEF launched a thoroughly-planned set-piece assault on the Turkish defenses around Beersheba and Gaza, a second phase in which the British forces pursued the retreating Turkish army northwards in mobile operations across relatively open terrain, and a final phase in which the front lines again stabilized north of the town of Jaffa and the British conducted a slow and deliberate advance into the Judean hill country resulting ultimately in the capture of Jerusalem. The context created by each of these phases presented different challenges to the position mapmakers and influenced both the form and quality of the information they presented.

Phase 1: Set-Piece Assault, 28 October to 6 November

The first group of position maps recorded the EEF's assault on the Turkish Gaza-Beersheba defensive position from the start of the force's approach march to their jumping-off positions on 28 October until the Turkish evacuation of the line on the

night of 6–7 November. Of these maps, the three editions that were printed before the commencement of the offensive—those of 28–30 October—were the most complete, detailed, and accurate of any of the position maps because they represented the accumulated knowledge of months of information-gathering on a static front prior to the uncertainty and confusion that would shortly be introduced by combat and maneuver. Thereafter, the information presented on the maps became increasingly speculative, incomplete, and even inaccurate as the EEF intelligence staff struggled to remain abreast of the rapidly changing situation on the battlefield until—by 7 November—they were beginning to speculate as to the positions not only of the opposing forces but also of large portions of their own army.

The 28–30 October editions of the position maps showed the positions of both the British and Turkish forces with surprising precision, resolving the Turkish formations down to the regimental level across the entire front except for the Beersheba sector, where the opposing lines were most distant from each other. The maps also gave the location of the two Turkish divisions that were being held in reserve, the 7th and the 19th. Nearly all of the Turkish units in the line had been located by a multi-modal process in which new units arriving at the front were first identified by wireless intercepts and agent reports as they transited rail junctions on their southward journey before being located by numerous other sources as they neared the British positions. Upon their arrival in the front lines, these formations almost without exception began to hemorrhage deserters who pinpointed their unit's location in the trenches as well as that of other units. These deserter statements even allowed the British to monitor the routine rotation of battalions into and out of the trenches. This primary source of intelligence was supplemented by aerial reconnaissance missions that located enemy camps and fortifications and reported on moving bodies of troops, and by wireless intercepts that allowed the British information-gatherers to gauge the condition and intentions of their Turkish opponents. Such a triangulating approach to identifying and locating enemy units allowed the position mapmakers to create a remarkably complete picture of the Turkish deployments on the battlefield. However, the onset of offensive operations would rob the EEF intelligence staff of many of the sources of intelligence upon which they had been relying as well as the time necessary to analyze the data, resulting in progressively more incomplete maps as the battle progressed.

The opening attack on Beersheba on 31 October was recorded on that day's position map in a snapshot that highlights one of the structural restrictions of the mapping process. Because the rough drafts of the maps were completed and sent to the 7th Field Survey Company for plating and printing at 4 pm each day, events that occurred after this time did not appear on each day's map. In the case of 31 October, the map displayed the British forces having breached the Beersheba defenses but not yet in control of the town itself and its vital water wells, due to the fact that the town wasn't actually captured until about 6 pm (see Fig. 4). Additionally, there were several working editions of the 31 October map that showed an attempt by Meinertzhagen and his officers to use the maps as a battle tracking tool prior to submitting their final product for the day.

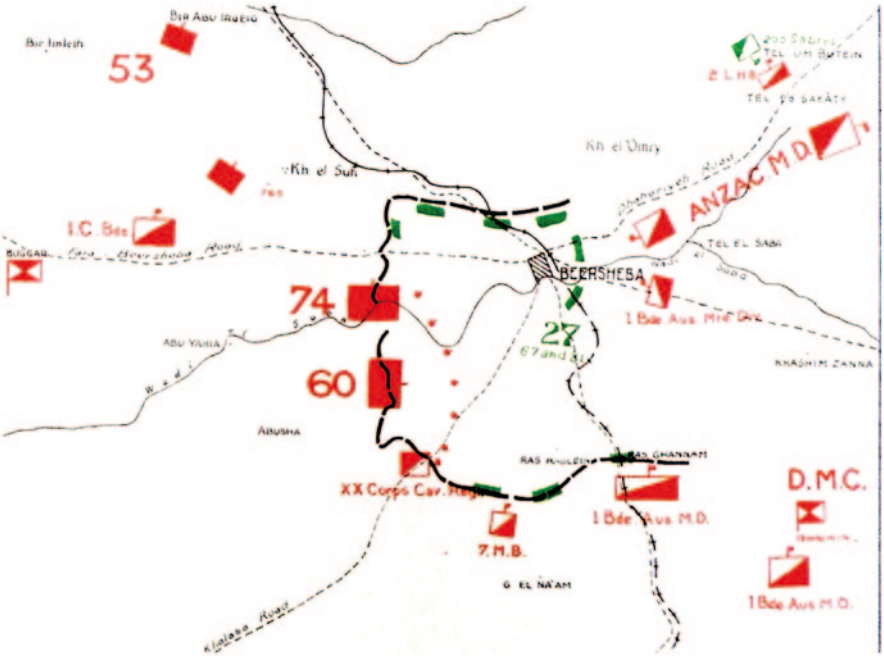

Fig. 4 Excerpt from the 31 October position map showing the situation around Beersheba at 4 pm. Note that the British forces (*red*) are depicted as having breached the town's defenses but not yet in possession of the town itself (TNA WO 153 1035 2)

The 2 through 4 November maps include the previously discussed dance of the Turkish reserve 19th Division across the map sheets for those dates, but they also record the British assault on the Gaza defenses and the unraveling of the Turkish position prior to the evacuation of the Gaza-Beersheba line on the night of 6–7 November. This fact indicates another use of the maps in that the frontal assault on Gaza had been predicated upon the Turkish reserves being busy elsewhere, and the confirmed movement of the 19th Division along with other formations away from Gaza to the eastern end of the line appears to have been one trigger to launch this attack. The British assault on Gaza did not have a pre-determined start date in the same way that the Beersheba attack did. Rather, the decision to launch the Gaza attack was dependent on the pace of developments on other parts of the front. Therefore, graphic aids such as the position maps would have been important components of the EEF GHQ's decision-making process.

Phase 2: Mobile Operations, 7–14 November

After 6 November, the position maps began to exhibit a drastic decrease in completeness and quality as the Gaza-Beersheba front that had been static for months disintegrated with the Turkish evacuation of their defenses and the northward pursuit of the British forces. This date also marked a point at which the position mapmakers began to display increasing creativity in how they manipulated the visual

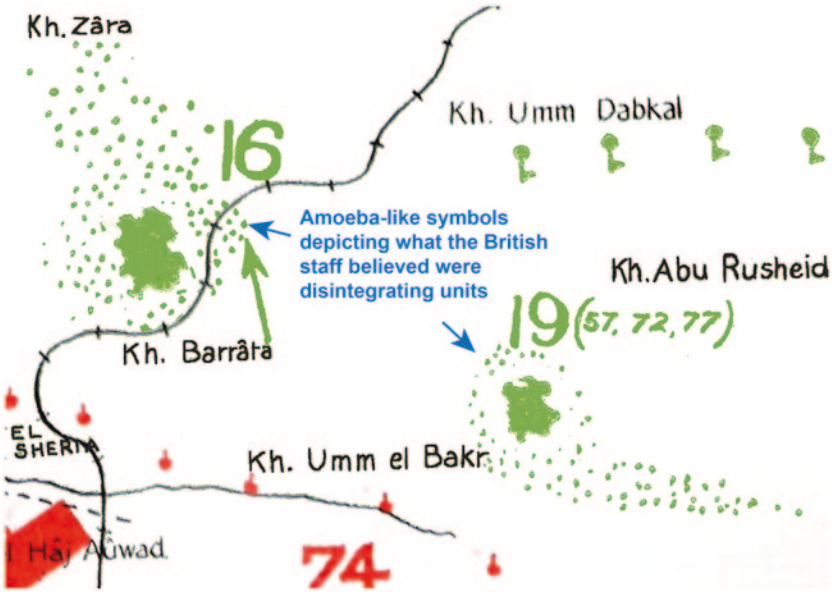

Fig. 5 **a** (*Top*) Excerpt from the 6 November position map showing the amoeba-like symbols that the EEF cartographers used to depict what they believed were disintegrating Turkish units. **b** (*Bottom*) shows the comet-like symbols used to depict fleeing Turkish units on 7 November (TNA WO 153 1035 2)

variables of the unit symbols representing the British and Turkish formations. The first examples of these creative manipulations occurred on the 6 November map in the form of two amoeba-like symbols representing two Turkish divisions that the British staff judged were in the process of disintegrating (see Fig. 5). The mapmakers took this technique a step further the next day, combining these decaying shapes with the more traditions rectangular markers to give the resulting symbol a sense of movement and direction, communicating that the staff believed the represented Turkish units were fleeing northward in confusion (see Fig. 5).

While these symbols were strikingly effective in communicating much information using relatively simple techniques, the analysis they represented was not entirely accurate, as the Turkish army was actually mounting effective rear-guard stands to hold off the British pursuers.

In the confusion of the pursuit, Meinertzhagen and his officers also employed creative techniques to represent uncertainty about their own forces. As the EEF moved into the pursuit of the fleeing Turks, the cavalry arm of the force—the Desert Mounted Corps (DMC)—lost contact with the rest of the British army as the horsemen attempted to advance into the Turkish rear areas. Meinertzhagen certainly had his own perhaps exaggerated ideas about what the cavalry could and should accomplish in this situation, and this optimism seems to have crept into how the intelligence staff chose to estimate and represent the probable location of the DMC on the 7 and 8 November position maps (Meinertzhagen 1917, p. 48). Rather than show

the position of the DMC with discrete symbols representing its subordinate commands, the mapmakers instead used a large dashed perimeter attenuation symbol to indicate the possible extent of the cavalry's advance on these days (see Fig. 6). These two editions of the map significantly exaggerated the extent of the cavalry's advance, a fact that may have contributed to the escape of the Turkish divisions holding the central portion of their line (Fig. 7).

The 9 November position map was the first of the series to be printed on a different base map from what the EEF cartographers had been employing to this point. The initial base map was a 1:100,000 line map of the area of southern Palestine encompassing the Gaza-Beersheba position (see Fig. 8). The scale and extent of this map was appropriate for the opening phase of the battle and also effective in allowing the British cartographers to mark unit positions without undue crowding or graphic interference. However, by 7 November, much of the important activity on the ground was beginning to occur beyond the northern and eastern edges of terrain represented by these maps. To compensate for this fact, the EEF intelligence staff substituted a 1:250,000 scale base map on 9 and 10 November that covered a far greater extent of the Palestine theater and showed somewhat more detail of the physical and cultural terrain. Given that the British could only locate a small number of Turkish units during this time and that the number of British units moving forward in pursuit was limited for logistical reasons, the smaller scale of the map did not seem to present any problems in terms of crowded unit symbols. However, these maps also provided coverage for large areas in the south and east that were irrelevant to the ongoing operations. Accordingly, on 11 November the EEF staff transitioned to a 1:168:960 scale base map that covered a more appropriate range of terrain and seems to have been a good compromise between scale and coverage. Even so, this base map would only be in service through 14 November, at which point both the form and function of the position maps changed with the introduction of a 1:500,000 scale map significantly smaller than each of the previous charts.

The 9–14 November editions of the position maps demonstrate both a breakdown in battlefield intelligence at EEF GHQ as well as numerous, varied, and creative attempts by the EEF intelligence officers to use their maps to communicate what information they did possess, what they did not, and what their analysis of the data was. Each day's edition produced a different cartographic technique, including wavy lines to represent an ill-defined Turkish front line beginning to form, text in the body of the map and at its margins to provide qualitative information about enemy units or to indicate uncertainty, and a brief adoption of the order of battle sector method to represent the front line that was employed by British units on the Western Front (see Fig. 7). Though creative, none of these methods appears to have been particularly successful due to the fact that the rigid 24 h cycle of the mapping process was too slow to compensate for the rapidly changing conditions of a fluid battlefield where the intelligence depicted on each day's map was more often than not out of date even before it was printed. Indeed, the maps from this phase are notable for how few of the active Turkish formations actually appeared on them due to the ambiguous—or complete absence of—intelligence as to their whereabouts.

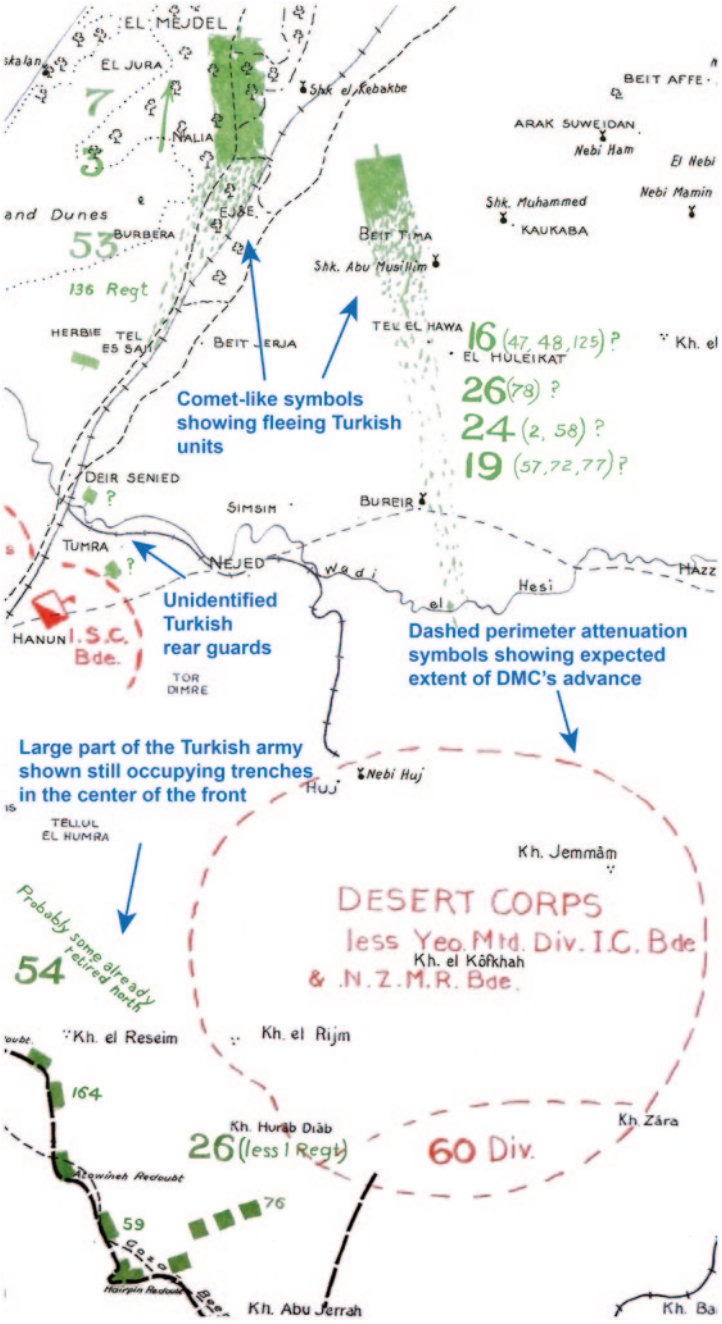

Fig. 6 Excerpt from the 9 November position map illustrating the *dashed line* perimeter attenuation symbol used to denote the uncertain extend of the Desert Mounted Corps advance (TNA WO 153 1035 2)

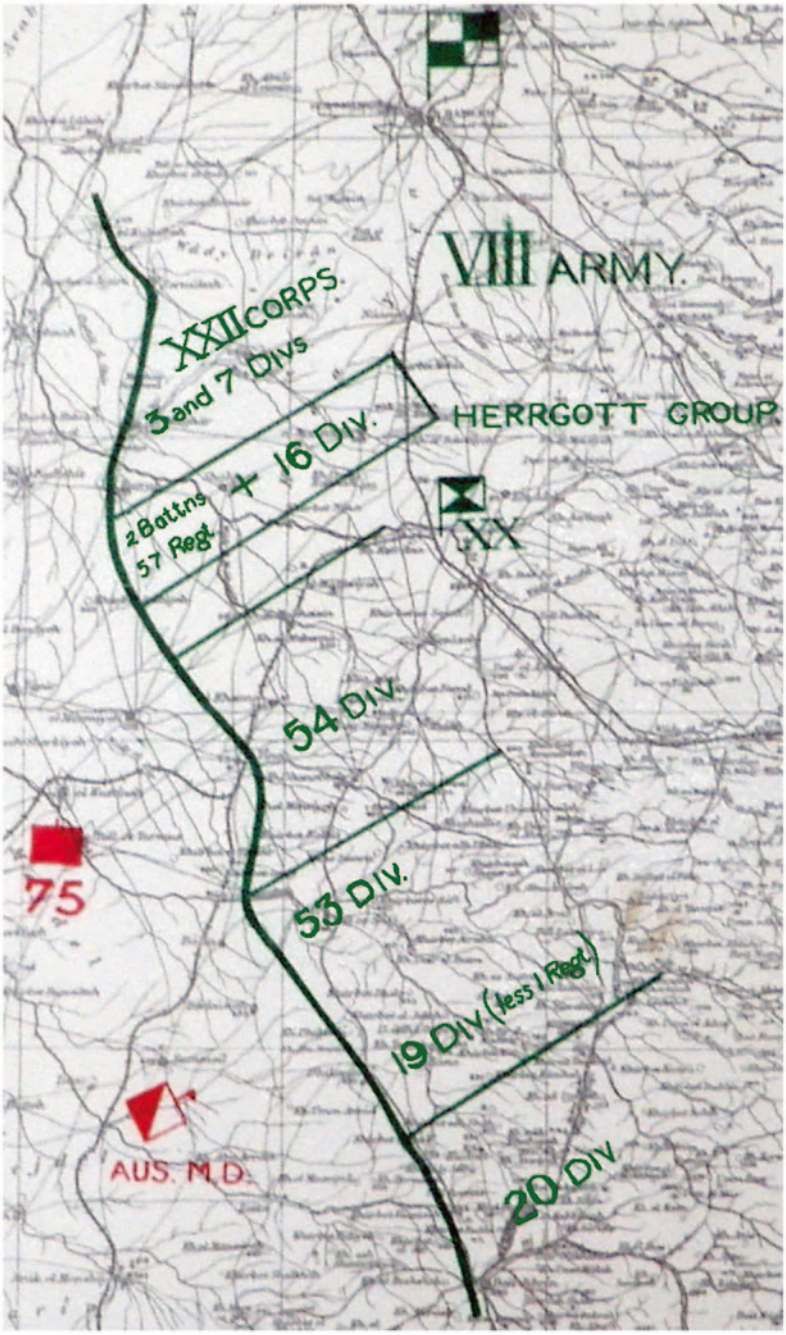

Fig. 7 An excerpt from the 13 November map highlighting the use of the sector method also employed on the Western Front (TNA WO 153 1035 2)

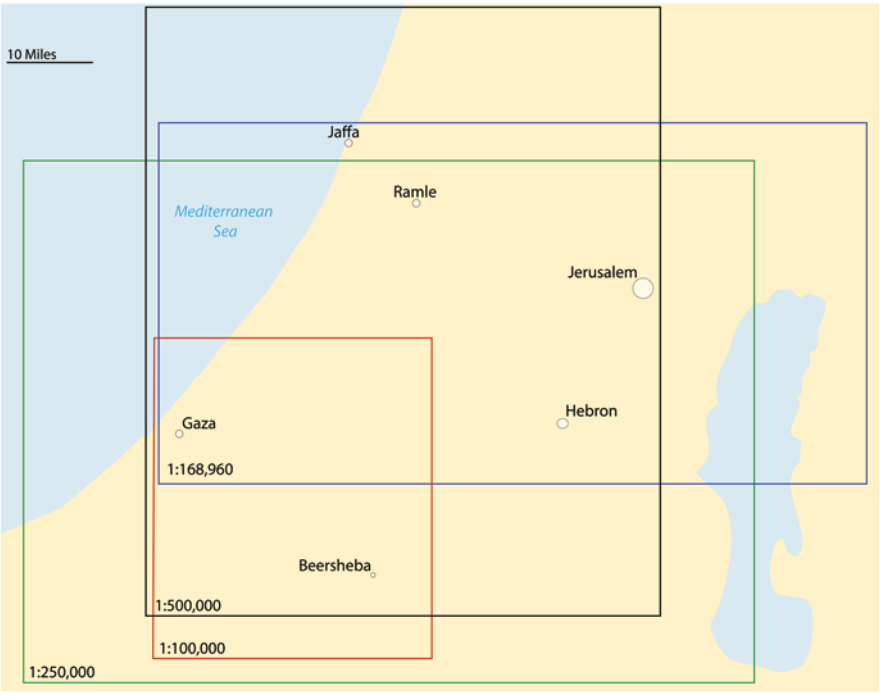

Fig. 8 The areas of the Palestine theater covered by the four versions of base line maps used by the EEF to print the position maps

Still, the position mapmakers' growing ability to graphically differentiate between data, uncertainty, and analysis was both impressive and useful.

Phase 3: Re-establishing the Front Physically and Cartographically, 15 November to 19 December

By 15 November the rapid northward movement of the British and Turkish forces had slowed to a point where the position mapping cycle began to once again catch up with events on the ground. From this date onwards the information presented on the maps would grow increasingly complete and accurate as the EEF was able to return to the multi-source intelligence-gathering methods employed during the initial phase of the offensive. The slower pace of operations meant that the gathered information was generally still current when it was presented on the position maps and often multiple days could be devoted to refining the identity and location of many units in the Turkish order of battle. The result was that by early December the detail and precision of the position maps began to resemble that of the earliest editions from October. By this point, however, the purpose of the maps seems to have changed from being a tactical and operational decision-making tool for use internally by the EEF to serving instead as a historical record of the campaign to be communicated to entities outside the EEF organization.

The most immediate and obvious change to the editions of the position maps starting on 15 November is the switch to the previously-mentioned 1:500,000 scale base map. Meinertzhagen and his cartographers would continue to use this format until they ceased the daily position mapping process. This format allowed for physically smaller maps—about the size of a letter sheet of paper as opposed to the size of a card table-top—that no doubt could be more easily transported and distributed than the earlier, larger versions, though the smaller size also made for some crowding and decreased legibility among the maps' unit symbols. This fact was not particularly evident in the first several days of this phase because as yet few units were being plotted, but the maps became increasingly crowded as the British intelligence picture began to allow accurate location of increasing numbers of Turkish formations.

Nor did the slower pace of operations ensure that the EEF staff's interpretation of the data became uniformly accurate. One clear example of misguided analysis occurred on 19 and 20 November when the mapmakers added text behind the Turkish unit symbols representing the front defending Jerusalem that identified this line as a "strong flank guard" screening a Turkish evacuation from the Holy City rather than what it actually was: a new front line (Fig. 9). In truth, the Turkish forces would not be forced to cede Jerusalem to the British until 3 weeks later and these maps provide a cartographic record of the tendency of Meinertzhagen and his subordinates to err on the side of optimism when evaluating the Turkish position and intentions.

In spite of these rather minor issues, by 28 November the EEF intelligence effort had managed to once again identify and locate all of the major Turkish formations on the Palestine front and plot them on the position maps, sometimes resolving the enemy positions down to the regimental level, a precision that had not been achieved since the start of mobile operations. This situational awareness seems to have enabled Allenby to weaken the central portion of his line for the purpose of reinforcing his army's eastward advance on Jerusalem, since he could be sure that the Turkish deployments did not allow them to threaten this sector (Bols 1917). This complete picture vanished again briefly when the Turks again retreated after the fall of Jerusalem on 9 December, though contact with the Turkish units was quickly reestablished during the stalemate that followed the conclusion of the campaign.

3.2 Who and Why: The Distribution, Purpose, and Use of the Position Maps

Meinertzhagen was clear in his diary about the process of printing and distribution for the position maps, and his statements are corroborated by records in the 7th FSC War Diary and by the locations where copies of the position maps have been found subsequently. What is more ambiguous is why the maps were created in the first place, and whether they were actually used for their intended purpose, particularly since the maps' purpose—or at least their use—changed during the course of the campaign. Meinertzhagen stated that his intelligence officers would submit a base

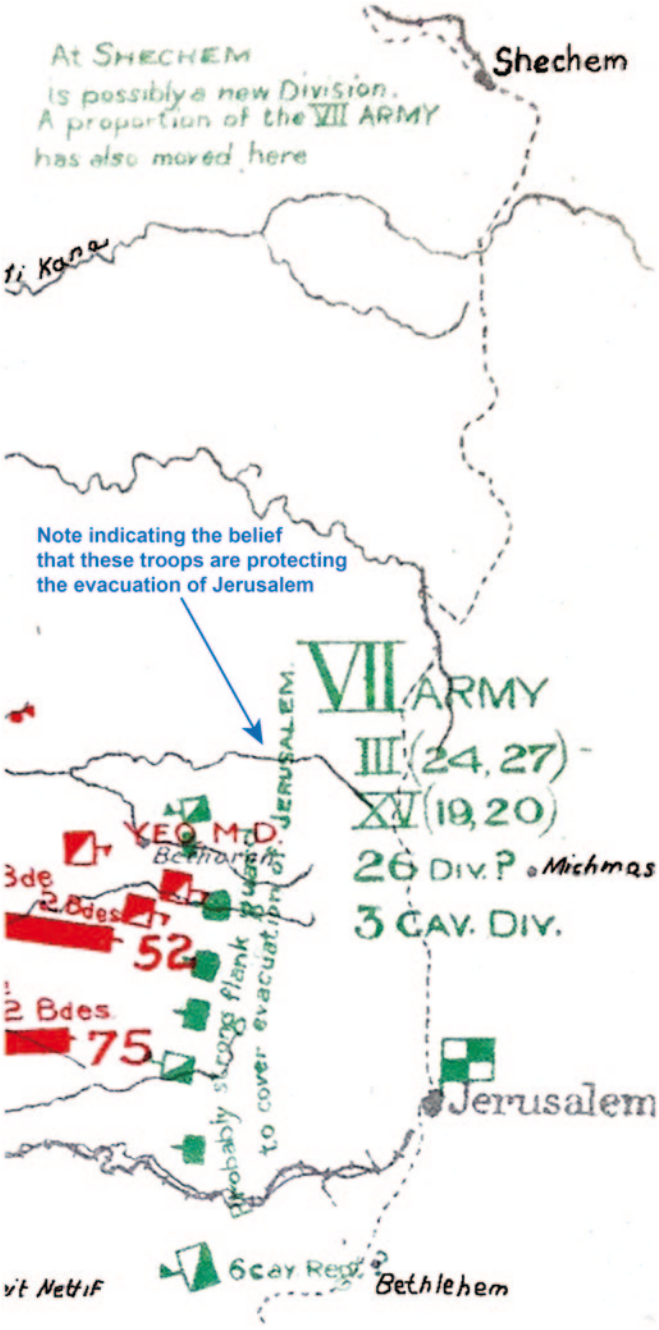

Fig. 9 Excerpt from the 19 November position map showing the misinterpretation of the new Turkish front line defending Jerusalem as a "strong flank guard" (TNA WO 153 1035 2)

map marked with friendly and enemy unit positions at 4 pm each day to the two draftsmen of the 7th FSC. These draftsmen then created the colored plates that produced the refined copies of each day's map. As Collier (2008) already noted, one of these draftsmen was a Mr. C. Malama, who subsequently delivered the 7th FSC's collection of the position maps to the British Army's historical section. According to Meinertzhagen, the maps were then distributed to EEF corps and division commanders, an assertion that is borne out both by the number of copies reported to have been printed by the 7th FSC, and by the fact that copies of the maps are now located in the archival collections of several of these EEF units.

This distribution pattern provides some indications as to the purpose of the maps, as does Meinertzhagen's diary. The seniority of the map recipients—division commanders and higher—indicates that the purpose of the position maps was to assist in relatively large-scale operational or even strategic decision-making, rather than for helping to solve small-scale tactical problems. This accords with the contents of the maps themselves in that the unit positions they portrayed were somewhat generalized and the maps' cartographic silences omitted such tactically important details as entrenchments and artillery positions. Furthermore, the disagreement that Meinertzhagen recorded in his diary between himself and Dawnay regarding the content of the 2 November edition of the maps reinforces the evidence that these were tools for deciding when and where the British would move division- and corps-sized formations. According to Meinertzhagen, Dawnay's concern about these editions was that they would unduly alarm the commanders on the Beersheba flank, leading them to commit more forces to counter the Turkish reserves moving to the eastern end of the line and thus denuding the decisive British attack in the center of vital forces (Meinertzhagen 1960 , p. 225). This episode in the very least indicates that the position maps were an influential factor in the decision-making processes of the involved British leaders, specifically Chetwode and Chauvel in this case.

But were the maps actually and consistently used for their intended purpose? The answer to this question seems to be "it depends." It depended on what operations the British were conducting, the conditions on the battlefield, and the capabilities of the opposing Turkish forces. The position maps appear to have been most useful in their intended role when the EEF was conducting set-piece operations, as they did in the opening days of the offensive and then once again in the advance on Jerusalem at the close of the campaign. Unsurprisingly, they appear to have been least useful in the intervening period of mobile operations when the information the maps presented was usually sparse, incomplete, and even inaccurate. Furthermore, in many cases the maps likely never even reached their intended recipients, as when the EEF GHQ lost communication with the Desert Mounted Corps for two days. Even during the final advance against Jerusalem—an opportunity for the maps to regain their relevance from the early days of the offensive—the need for them seems to have diminished because the defending Turkish forces no longer possessed the strength to mount counter-attacks or even effectively shift reserves to parry British moves, leaving the EEF command generally free to execute its plans without needing to minutely account for the Turkish order of battle. By this point in the campaign, however, both the purpose and use of the position maps appears to have changed.

With the switch to the 1:500,000 scale base maps, Meinertzhagen and his mapmakers shifted the audience for their charts away from recipients inside the EEF command structure and towards a broader range of people beyond the Palestine theater, with an eye towards recording for history and promoting the accomplishments of the EEF. Evidence for this includes correspondence between Dawnay and the Imperial General Staff in London in which Dawnay enclosed and referenced copies of the position maps as part of his report on the course of the campaign (Dawnay 1917). Additionally, when the position mapmakers adopted the final small-scale base maps they also reprinted all of the previous editions of the position maps in the new format. These maps were no longer operationally relevant to the EEF's commanders because the battle had moved far beyond the information they portrayed. Their purpose and audience, then, must have been different from what they were at the start of the campaign. The fact that complete copies of the position map series in this format were delivered as a set to the British Army's Historical Section, retained by Meinertzhagen in his diary, and in the 1919 history of the campaign edited by Harry Pirie-Gordon, reinforces the impression that the maps were being printed for historical rather than contemporary reasons by the end of the Gaza campaign.

4 Conclusions

Were the position maps effective tools in their intended role as an operational-level decision-making aid? Once again, the answer appears to hang on the context in which the maps were produced during the Gaza campaign. Clearly the maps were most effectively used when the information they presented was largely complete and passably accurate in the opening days of the offensive. Allenby's ability to track the Turkish movements, communicate his staff's analysis to his subordinates through a simple and effective medium, and launch his successive blows accordingly, are a strong argument in favor of the position mapping technique. However, during mobile operations the pace of events, quality of available battlefield intelligence, and rigid structure of the mapping process, all conspired to render the information communicated by the maps nearly useless. The accuracy of the enemy positions on the maps during this period suffered accordingly. Clearly, the position-mapping process required both abundant time and a relatively stable operational environment to flourish. Even so, the position maps must have been well-regarded and valued by Allenby and his staff, as they revived the technique prior to the EEF's final offensive in September 1918 (Bird 1918).

Historically, the position maps are a valuable resource, though one that must be understood for what they are. The maps themselves record that they represent the operational picture *as known at the British GHQ* each day, and not an exhaustive or historically objective record of the actual course of the battle. As such, they are a valuable window into the strategic and operational thinking and decision-making that occurred at EEF GHQ, but less useful in determining the actual unfolding of events on the ground. The reappearance of these maps in numerous historical pub-

lications and venues speaks clearly to their historical usefulness, so long as their limitations and biases are accounted for.

Finally, I found that the Woodward cartographic framework is a particularly useful and under-utilized tool for examining military cartography. Military organizations—often more so than civilian entities—are essentially self-contained systems that both produce and use their own maps at a prodigious rate. As such, they are uniquely appropriate subjects for the application of this framework in both historical and contemporary studies of military cartography. It is my hope that Woodward's framework becomes more commonly used for study in this area, particularly for examining subjects related to this campaign that merit further study, including the position maps that accompanied Allenby's final offensive in 1918 and the terrain models that aided the planning and training for this initial attacks on the Gaza-Beersheba line, among others

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The Eye of the Army: German Aircraft and Aero Cartography in World War I

Jürgen Espenhorst

Studying the map before the flight. **(***Illustrierte Geschichte des Weltkrieges***,** no. 151, p. 14)

Abstract Early military aviation relied first and foremost on maps for navigational purposes, but was also involved in the compilation, improvement and updating of the map sheets used. Although aeronautics and cartography were entwined, their overlap has remained largely understudied. The following notes are an attempt to close this informational gap with regard to Germany's participation in WWI with the focus on German military aviation (Luftstreitkräfte). For an additional discussion of the Central Power's general approach to military mapping in the Great War, please see chapter "A good map is half the battle" (vide pp. xx—xx).

1 Introduction

Military aviation already made remarkable progress during the first weeks of the Great War. It was deemed the "Eye of the Army", and two Allied references could be quoted to illustrate the usefullness of aerial reconnaissance:

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> August 22, 1914: "The British Expeditionary Forces (BEF) […] has been warned by air reconnaissance of a giant pincer movement by two German armies" at Mons, Belgium. This report saved the British troops from being encircled and annihilated.
> September 6, 1914: "This evening as French generals berated their fliers for failing to provide useful information, a French pilot arrived with a report, soon confirmed by British airmen, that the Germans had changed their plan to cut off Paris from the south. They were seen moving enigmatically from west to east on the river Marne, to the east of the city, exposing their flank. 'Gentlemen', General Joffre pronounced, 'we fight on the Marne'. Aerial reconnaissance has proved its worth. Already in the eventful first month of the war, air observation has prevented two Allied disasters." (Gunston 1992, p. 118)

On the German side, too, there was a similar decisive situation on the eastern front. In mid-August two Russian armies had broken into East Prussia and were on the verge of occupying the entire province. Under the command of Paul von Hindenburg, German forces were able to defeat one of the Russian armies at Tannenberg at the end of August, 1914, and later the second army as well.

The critical information that made these turnarounds possible was provided by reports from a German observation aircraft. Hindenburg later asserted that "without the aircraft and the pilots there would have been no Tannenberg." (Neumann 1920, p. 462).

2 Aircraft at War

With the advent of hostilities there were less than 900 aircraft available to all the combatants - and not all of them were fully operational (Johnson 2001, pp. 107–115; Niccoli 2002, p. 52; Potempa 2014, p. 91).

Germany	250	Great Britain	113
Austria	48	France	138
Italy	150	Russia	263

By the end of the war, 4 years and 3 months later, some 200,000 aircraft had been produced and deployed:

Germany	48,537	Great Britain	58,144
Austria-Hungary	5431	France	67,987
		Italy, USA, Russia	40,000

Compared to aircraft, no other category of weaponry experienced a similar rate of growth. The advent of the airplane significantly altered both the strategy and tactics of modern warfare. At the same time, the war promoted major improvements in the capabilities of the initially rather brittle wooden-framed and cloth-clad aircrafts.

At the beginning of the war the average power of aircraft engines ranged between 80 and 100 horsepower, which allowed no more speed than 70–80 km/h, and a maximum altitude of about 800 m. Four years later, aircraft engines were capable of up to 1500 horsepower, enabling the aeroplane to achieve speeds of as much as 200–220 km/h and altitudes of up to 7000 m. In addition, the reliability of the engines was significantly improved and the number of emergency landings due to engine failure considerably reduced. Out of unarmed flying machines, reliable and heavily armored weapons had emerged.

Flying was initially restricted to favourable weather conditions with good visibility, but by the end of the war only very thick ground fog posed an insurmountable problem to take-off. Even night flights had become possible, turning the airplane into an almost all-weather multi-purpose weapon. In the course of this development several distinctive types of aircraft emerged, each designed to meet the needs of a specific type of deployment. The German army introduced an official system of three groups with further subdivisions, each designated by a specific letter:

I Observation, Reconnaissance and Infantry Support Aircraft
A = Two seat, single wing, unarmed (August– end 1914) (see Fig. 3)
B = Two seat, double wing, unarmed (August 1914–1915)
C = Two seat, double wing, armed (introduced 1915)
J = Two seat, armoured, double wing, armed (introduced 1917) (see Fig. 2)
II Fighter Aircraft
E = Single seat, single wing, armed (1915–1916)
D = Single seat, double wing, armed (introduced 1916)
Dr = Single seat, triple wing, armed (introduced 1917)
III Bombers
G = Large aircraft (double wing) with two engines, armed (introduced 1915) (see Fig. 1)
R = Three to six engine very large aircraft (two wing) armed (introduced 1917)
N = Two seat, night flying aircraft, armed (introduced 1918)

The most important German type of plane used during the larger part of the war was the Type C which was deployed at the front lines as from spring 1915. Their missions were:

- close observation of terrestrial combat zones per direct viewing and documentation by using cameras;
- locating enemy artillery in order to provide targeting information for the own batteries;
- long-range reconnaissance; close air support for advancing infantry (Type J).

Close reconnaissance using both oblique and vertically aimed photographs made it possible to, for the first time, create maps of the enemy's front lines deep behind the immediate zone of contact. This was particularly useful in cases where geodetic or topographic data of the enemy areas was not available. Such plane-based maps

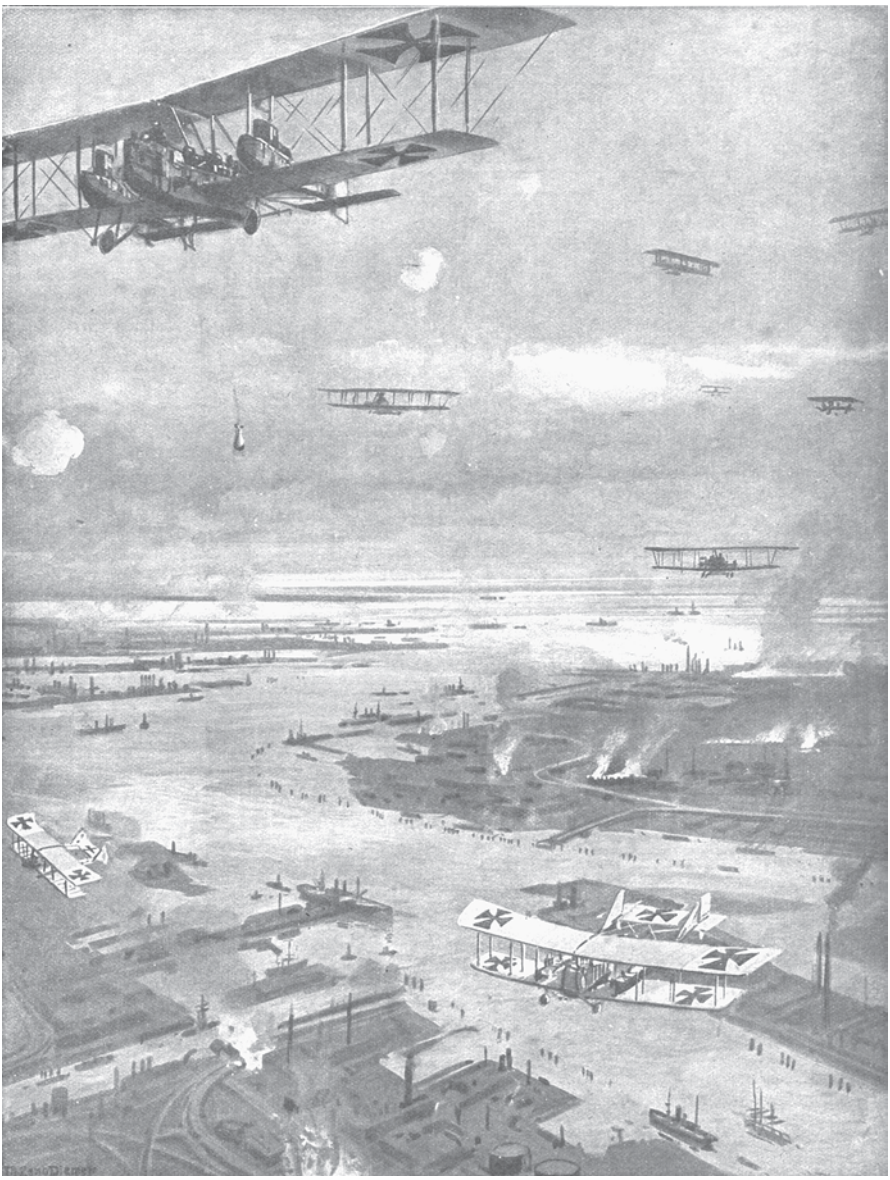

Fig. 1 A squadron of German Type G aircraft on a bombing mission over Harwich in 1917. (Illustrierte Geschichte des Weltkrieges, no 161, p. 169)

made it possible to develop campaign plans for the trench warfare which had become prevalent. As photographic technology developed, its automatisation made it possible to produce serial and stereo images which enabled data capture for map series showing elevations of areas which cartographically had previously been unknown.

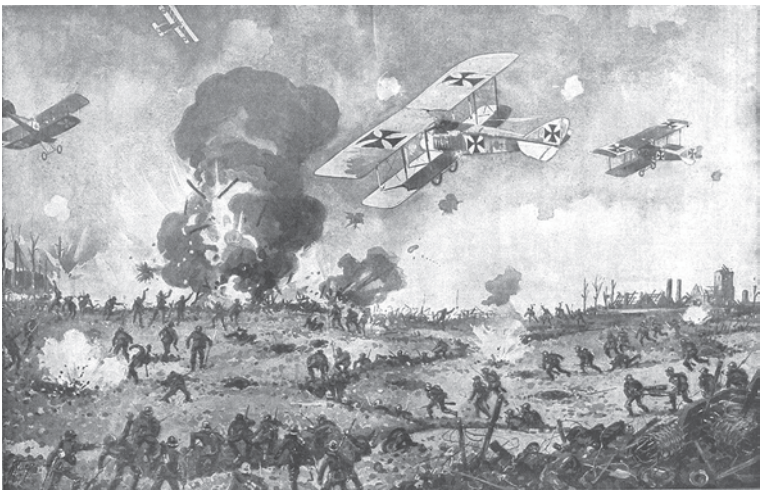

Fig. 2 A squadron of Type J aircraft providing infantry support in combat (1917). (Illustrierte Geschichte des Weltkrieges, no 171, p. 326)

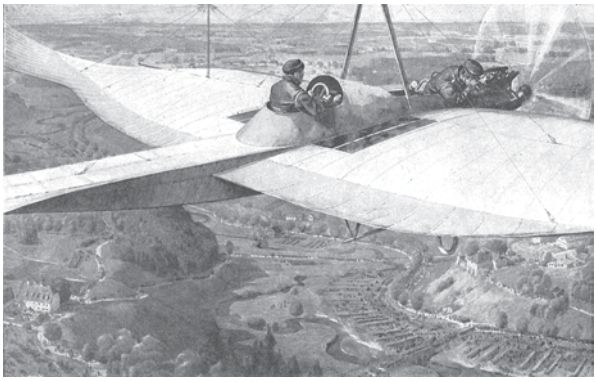

Fig. 3 A Type A plane on a reconnaissance flight in 1914. The pilot sits in the rear and the observer in front. The observer uses binoculars but has no camera. The map board can be seen on his *left*. (*Illustrierte Geschichte des Weltkrieges*, no 11, p. 218)

For long distance reconnaissance a special light-weight aircraft, called the Type CL, was developed. For long-range reconnaissance missions a light-weight version of the large two-engine aircraft emerged, designated as the Type GL. While the Type C planes could remain aloft for not more than 4 h, the Type R could fly for up to 8 h and therefore had a much greater range. These bombers could also carry a cargo load of up to 7000 kg.

In most aircraft used at the beginning of the war the pilot and the observer sat in open cockpits, unprotected against wind and weather. Only the Type R aircraft had closed cabins. Under normal circumstances in an open-cockpit plan, a map could only be used with the aid of a map board. The observer would fasten the sheet to the board and then enter notes on his observations on the map or on a memo pad.

Presumably the single seat fighter planes were equipped with a map board as well. However, Type D aircraft could only remain aloft for 1½ to 2 h, thus having a very restricted operational range. Planes could also be landed in an open field if necessary, without having precise information about the location or ground conditions. For these aircraft a map was not as essential as for the larger two-seat types, something considered a bonus as space in the cockpit was always a limited commodity.

3 Maps Used by German Aircraft

3.1 The Terms "Fliegerkarte" and "Aero Map"

The term "Fliegerkarte" primarily refers to maps which were used for aeronautical maneuvers. Since these maps were not an altogether new cartographical product but quite similar to existing maps, the term "map" has been used here rather than the more recent term "chart" which was only introduced in 1944 by the allied air forces. This change of name was due to a fundamental change in aeronautical mapping away from the more traditional topographical maps to almost exclusively navigational charts for long-distance flights. To ease reading, we will use the term "aero map" instead of "aeronautical map" in this chapter.

Of all the maps compiled, very few were intended for the sole use of pilots. Existing maps were often simply rebranded as "Fliegerkarten" (aero maps) without actually changing any of its contents. Something similar was true of the operational map series 1:800,000 which comprised 80 sheets and covered large areas beyond Germany's boundaries for which the military plane pilots did not have any up-to-date material. Thus these maps were used by ground troops as well as by pilots (dual use).

There were also aero maps which were not branded as "Fliegerkarte". To determine the true purpose of such maps, one has to study the reasons behind their making. A good example are the 44 maps of the UK in the *Übersichtskarte von Mitteleuropa 1:300.000* (General Map of Central Europe, 1:300,000), as these sheets, based on British surveys, were only used by German planes and air ships. During World War I there were no plans for an invasion of England and the German navy had its own nautical charts.

Trench maps at a scale of 1:25,000 or 1:20,000 were important, also for pilots who used these very detailed sheets for orientation and reconnaissance. Calling them aero maps may be debatable as they were used by both pilots and 'boots on the ground'-men. For the purposes of this discussion, we will label them dual-use maps. However, a case can be made for using this term for the special "Luftbildkarten" which were based on aerial photographs and which were mainly used by pilots in need for orientation because they displayed the features on the ground just as the pilots saw them (see below for an in- depth treatment of this map type). No consideration will be given here to maps which predominantly displayed the

logistic organisation on the ground. For example, there were maps which not only depicted landing strips but also whole airports equipped with a huge infrastructure such as workshops and railway connections. Such maps merit a separate article. In this article a brief orientation will be given on the aero maps of 1:300,000 and 1:800,000 scales respectively, whereas the main focus is on maps of 1:200,000. The latter had been discussed and subsequently being preferred at a conference in Germany in 1909 (Gasser 1909, p. 283), and were accepted as the international norm in May 1911 Peucker, p. 31. Although the Prussian general staff did not initially consider aerial maps to be necessary, they soon changed their minds. It is possible that the decisive stimulus for this altered approach came from France. In the spring of 1911 the French Service Géographie de l'Armée began to publish a six-colour *Carte aéronautique au 1:200,000* (Petermanns Mitteilungen 1911 II, p. 97), and it is possible that this French initiative had more of an impact than all the prior academic discussions. If Prussia did not want to be outdone by the French, its general staff had to act fast to adopt a pragmatic means to alter the existing maps for pilots, setting aside the special needs of balloonists, zeppelin and pilots of privately held planes (Albrecht 1974, p. 7–15).

When researching early aerial maps, one encounters a number of challenges. For example, the title given to a map does not always indicate whether the map was used as an aero map. For folded maps this information was frequently indicated only by a label affixed as title to the front of the map. But in case such a label is missing, could one then assume that the map is in fact an "aero map"? There are three categories of aero maps: Firstly, all cartographic series which contain sheets known to have the label "Fliegerkarte" (see Figs. 5 and 8). Secondly of course, all maps that use the word *Fliegerkarte* in their printed titles (see Figs. 11 and 12). As the third and final category, maps which were developed exclusively for the use of pilots (see Fig. 10). Proceeding in this fashion produces an orderly sequence: firstly, maps which were created on the basis of data developed prior to the war and not only exclusively used by pilots, but have a label with a title affixed to them which indicates this (see Table 1, nos. 1 and 4); then maps which were produced in the course of the war which were specifically designated for aerial use, or were used as such (see Table 1, nos. 2 and 3); and, finally, those maps which do not fall into any one of the prior categories (see Table 1, nos. 7 and 8). Aero maps nos. 1 and 4, here shown in bold, were already available at the beginning of the war.

The following diagram shows all maps belonging to these categories, together with short identifying titles, and numbers which correspond to the numbers mentioned in the previous paragraph.

3.2 The First Two Official aeronautical Map Series

In 1914 and immediately before the outbreak of the war the *Kartographische Abteilung der Königlich Preußischen Landesaufnahme* (Cartograpic Section of the

Table 1 Classification of German Aero Maps

Scale	Maps labeled as aero maps with an aeronautical signature	Maps labeled as aero maps without an aeronautical signature	Maps not labeled as aero maps but used as ones	Maps with dual use (aero and ground)
≥1:25,000				7. Luftbildkarten
				8. Stellungskarten
1:200,000	1. Topographische Übersichtskarte des Deutschen Reiches (35 western sheets)	2. Feldmäßig hergestellte Fliegerkarte West (31 sheets)		
		3. dito Ost (62 sheets)		
1:300,000		4. Topographische Übersichtskarte von Mitteleuropa (24 western sheets)	5. Topographische Übersichtskarte von Mitteleuropa (44 sheets of the UK)	
1:800,000				6. Operationskarte

Stellungskarten = trench map; Luftbildkarte = aerial photo map
Topographische Übersichtskarte = topographical general map
Feldmäßig hergestellte Fliegerkarte = aero map printed in the field

Royal Prussian Survey) produced two special map series for pilots. These series did not take into account any of the intensively discussed special signatures for aeronautical obstacles which had been suggested such as high voltage cables or tall buildings. They were content with simple modifications of colours used in existing maps because this was the least time-consuming option. The 1:200,000-series was based on the normal mono-colour *Topographische Übersichtskarte des Deutschen Reiches* (General Topographical Map of Germany) (Eckert 1925, p. 794). This newly created "Fliegerkarte" was printed in six colours (see Table 1, no. 1). The first series of 35 sheets had already been printed and was made available as a set in 1914. They were labeled *Fliegerkarte West* (see Fig. 4) and are only rarely, if at all, mentioned in the literature (Kleffner 1939, p. 58). On German territory, landing strips were marked in red and meadows for emergency landings were highlighted in yellow (see Fig. 5). On the four sheets covering parts of France, the red color indicated fortifications, not landing strips, thus it is fair to assume that this map was intended for defensive purposes.

The 35 sheets printed in 1914 formed the first officially published German map series for pilots (see Table 1, no. 1). It is unlikely that a *Fliegerkarte Ost* had been published at the same time because large areas of eastern Prussia were not covered by the *Topographische Übersichtskarte des Deutschen Reiches 1:200.000* which mean that other ways of mapping this region had to be explored (see Fig. 10).

Presumably sheets from the ordinary *Topographische Übersichtskarte des Deutschen Reiches 1:200.000* (see Table 1, no. 1) which covered areas with locations of aircraft factories and flying schools, were used as aero maps. The only means to identify these maps is that open fields are marked in green and landing places in red. One such sheet from the year 1915 was "Dessau" where the Junkers

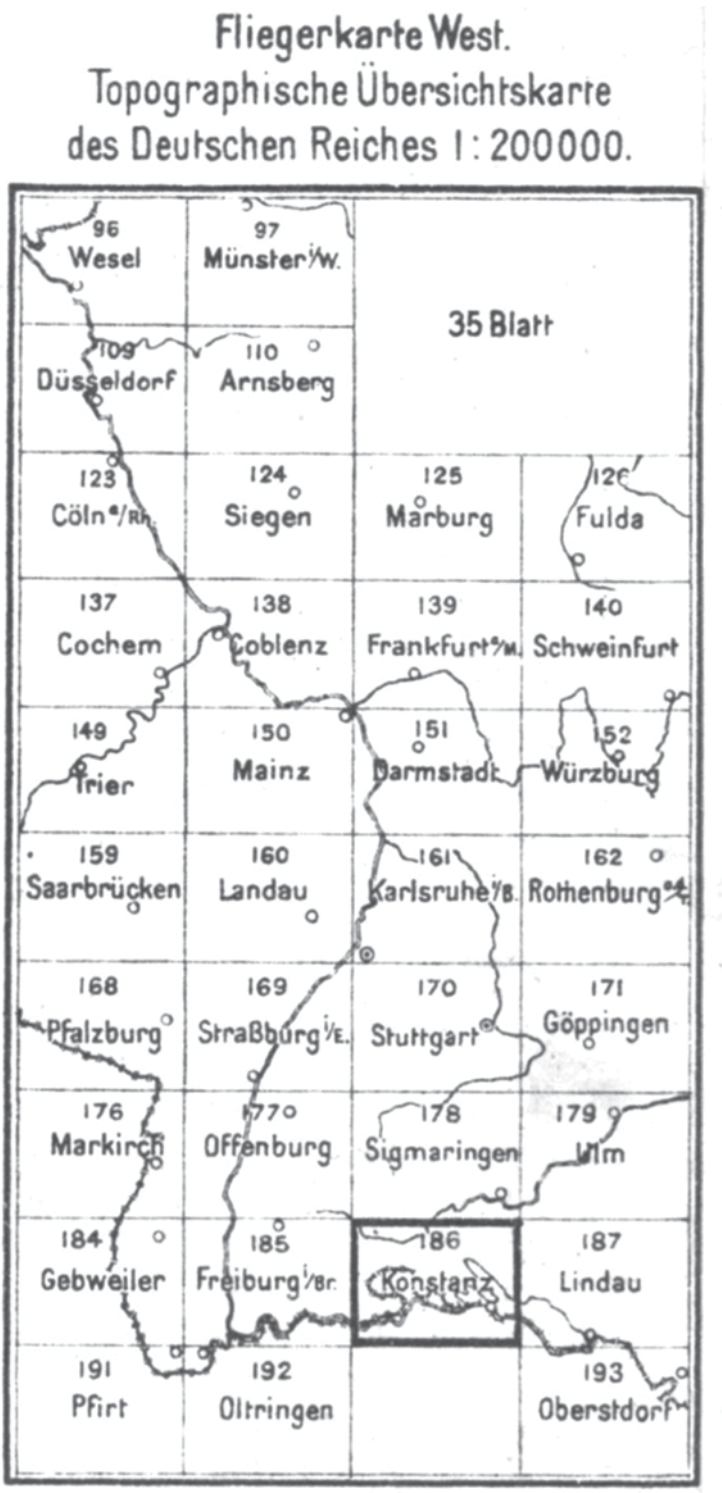

Fig. 4 Index sheet affixed to all aero maps (Fliegerkarten) produced in 1914. Later editions had no such indexes and could only be identified by their style. This is the index for the map of Konstanz

Fig. 5 Official landing strips were marked in *red* and open fields, which could be used for emergency landings, were outlined in *yellow-green*

aircraft factory was located. Because of the need to individually examine each sheet in question, it is difficult to determine how many of these domestic German maps were used as aero maps.

Because the 35 sheets of the Fliegerkarte 1:200.000 only covered the western part of Germany (see Fig. 7) and the border regions with France and Belgium, a different set of maps for pilots was needed when German troops invaded their western neighbours and marched towards Paris. Modern maps with this scale did not exist for these regions, so another set of maps on a scale of 1:300,000 was used (*Übersichtskarte von Mittel-Europa*).

4 Aero Maps Newly Developed During Wartime

This text has so far only dealt with multi-sheet map series based on earlier general maps or on their derivatives (as was the case for the UK sheets). To provide the full picture, the following paragraphs will focus on maps which have been created from scratch and exclusively for aeronautical purposes. As the *Übersichtskarte von Mittel-Europa* 1:300,000 did not cover the United Kingdom, a new set of 44 sheets had to be added to enable bombing raids across the Channel (see Table 1, no. 5).

Fig. 6 The sheet Köln (Cologne) with several landing fields. The title and description of this sheet does not indicate any aeronautical use; only the *red landing strips* and the *yellow-green meadows* indicate that it was intended for pilots

When opting for the scale of 1:200,000, up to 70 sheets would have been needed to display the entire area up to the Hebrides. To date such a series has not been identified in the literature, and no index sheet could be found either. As was previously mentioned, these added sheets were used solely as military aero maps although they were not marked as such and could therefore easily slipped positive identification (see Fig. 8).

It was established that at the beginning of the war France and Belgium were covered by a scale of 1:300,000 (see Fig. 7, 9), but as the position of the western front came to a standstill, it was of paramount importance to have cartographic material that offered a better overview. Reconnaissance flights were not limited to the area around or immediately behind the trenches. Information regarding troop movements and changes in infrastructure further behind the enemy's lines was important as it made it possible to detect preparations for major attacks. It was for this purpose that in 1916 a *Feldmäßig hergestellte Fliegerkarte*, a flight map printed in the immediate hinterland of the German front, was created covering northeastern France

Fig. 7 The 1914 series of 1:300.000 covered Belgium and Northern France and carried a label on the verso identifying it as "Fliegerkarte". Its 15 sheets contained little specific information relevant for aeronautical use. For example, there were no fixed landing sites behind the advancing front lines. The only special markings were coloured areas indicating the ranges covered by artillery in fortified areas, which obviously were to be avoided. These sheets were used primarily in reconnaissance flights to record the movements of enemy units. Other series of these kind of features were later added but not carry the label "Fliegerkarte"

at 1:200,000 (see Table 1, no. 2) (Eckert 1925, p. 759). This successful series was continuously copied until 1918 (see Fig. 11).

Great emphasis was put on the main rail routes and trunk routes for cars and trucks. In contrast to the *Fliegerkarte* West from 1914 (see Table 1, no. 1), possible emergency landing areas are not marked. Instead, forested areas, which were not suitable for use, were marked in green. No airfields are identified. Foreign airfields were to be avoided in any case, and German air fields were not marked because of the danger of these maps being captured by the enemy.

Fig. 8 This sheet is part of the series titled *Übersichtskarte von Mitteleuropa 1:300.000* (General Survey Map of Central Europe). It shows the range of artillery, here shown for the fortified area around Amsterdam in neutral Netherlands. The fortifications of neutral states were highlighted in *green*, enemy ones in *red*. The map contained no grid for reports and was not specially modified for use in aircraft. Nevertheless, such sheets were the only available modern material for pilots in 1914

Fig. 9 An extract from a 1914/15 map series in 1:300,000 which included the United Kingdom (Cruickshank 2006, p. 10). It provided orientation for aerial attacks both by airplanes and airships (Zeppelins). In the south of London the locations of a series of action-ready fixed installation batteries were accurately marked in *green*

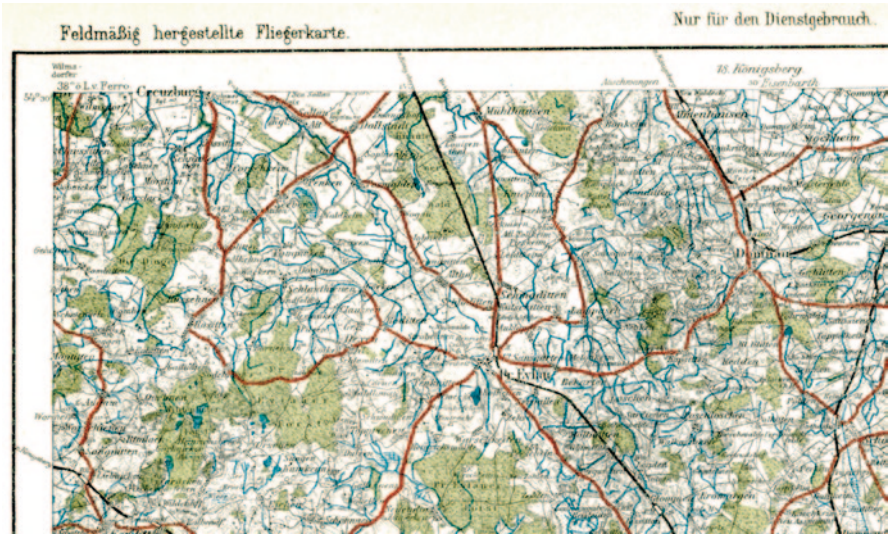

Fig. 10 Sheet Pr(eußisch) Eylau of the *Feldmäßig hergestellte Fliegerkarte* (in East Prussia) (see Table 1, no. 3). As could be expected, the 1:200,000 series was considered classified information

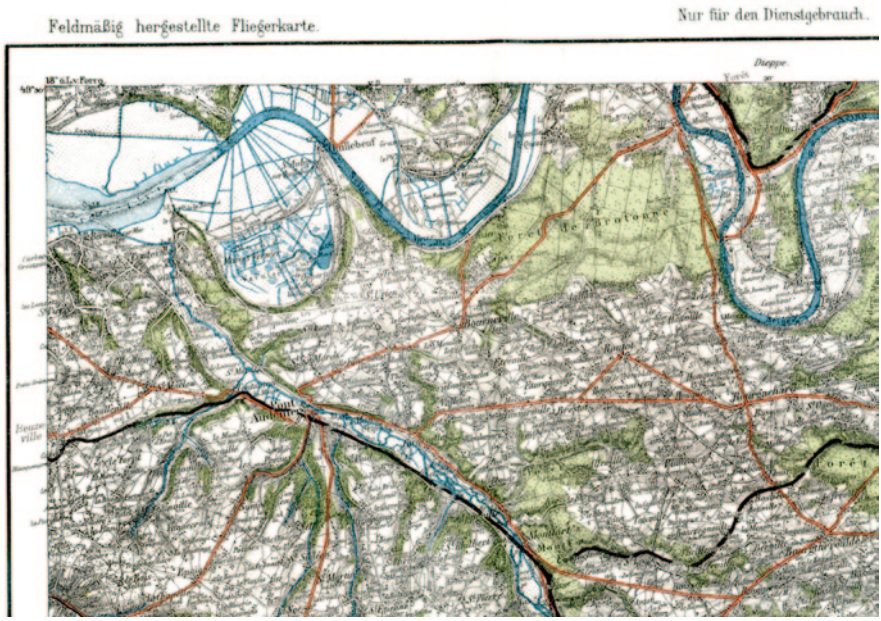

Fig. 11 A sheet of the western set of *Feldmäßig hergestellte Fliegerkarte,* 1916. (see Table 1, no. 2)

When this new map was created, great care was taken that it connected with the western areas of the *Topographische Übersichts-Karte von Deutschland*. This meant that the *Feldmäßig hergestellte Fliegerkarte* West (see Table 1, no. 2) interlocked with the 35 sheets of the *Fliegerkarte West 1:200.000* (see Table 1, no. 1).

The most important difference between these two map series is possibly the way in which they were produced: the *Fliegerkarte West* (see Table 1, no. 1) was a modified existing map and the *Feldmäßig hergestellte Fliegerkarte* (see Table 1, no. 2) was newly conceptualised and therefore drawn in a different style. To date the author has unfortunately not been able to locate any of the index map for the presumable 31sheets of this 1:200,000 series. Likewise, no sheets of the corresponding Austro-Hungarian map series have been found. The latter was presumably made using the German flight map as a model.

Large areas of the eastern front (Poland and the Baltic region) were covered by a German map at a scale of 1:100,000 (*Generalstabskarte,* General Staff Map). However, this scale was unsuitable for long distance flights as it did not provide pilots with an overview of a large area which made it difficult to undertake reconnaissance flights. To improve the situation a new map based on the topographic map series 1:200,000 was gradually developed. There was another already existing map with the same scale (*Specialkarte von Mitteleuropa, Reymann-Karte*), but it was outdated and based on a different projection which meant that it did not meet modern standards. In contrast, the newly created *Feldmäßig hergestellte Fliegerkarte*

Fig. 12 The operational map series 1:800,000 which reached eastwards as far as Persia, provided basic topographic information for aircraft deployments over the Balkans and the Near East. Only for Palestine and only towards the end of 1917 more detailed aero maps were made, based on aerial photography. This extract depicts the positions of known fortification-based artillery as well. (see Calais and Boulogne on the French as well as Dover and Chatham on the UK side)

(No. 3) could, in the east, easily be fitted to the already existing sheets of the new *Topographische Übersichtskarte von Deutschland*, and it even covered those parts of Eastern Prussia which were not included in the older map series.

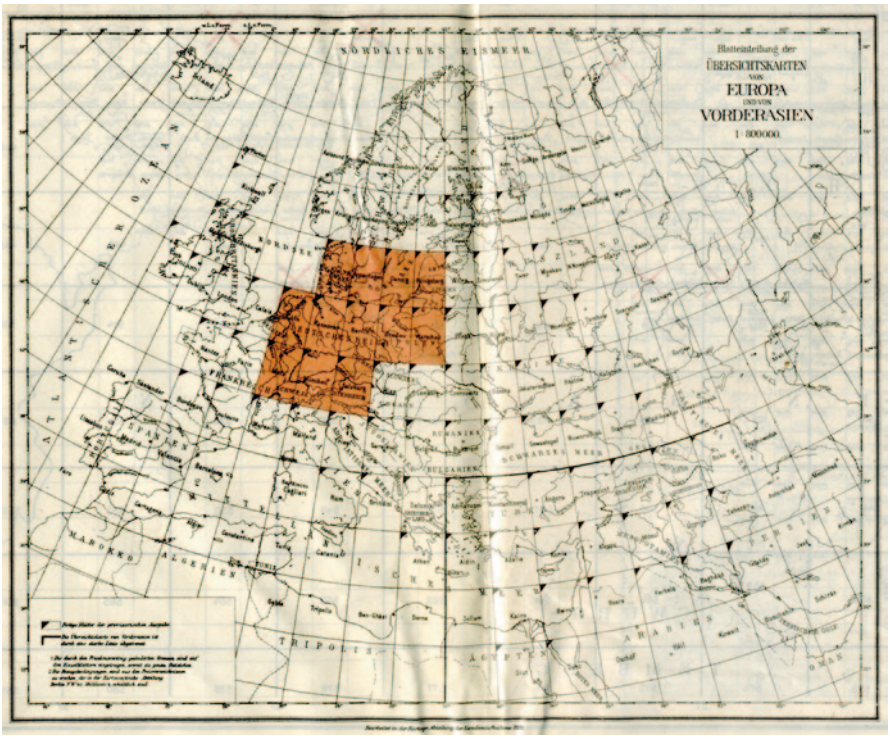

Fig. 13 The grid indicating the sheet system of the operational map. This index sheet was printed in 1919 when the title of the map had already been de-militarized and renamed as *Übersichtkarte von Europa und von Vorderasien* (General Map of Europe and the Near East). The highlighted parts were updated soon after the war

The 1:200,000 and 1:300,000 aero map series covered only small parts of Europe, but as the war progressed eastwards beyond the Balkan area and the enemy had to be faced in the Near East as well, the German air forces (Luftstreitkräfte) needed new maps especially made for longer flights. For this purpose the so-called *Operationskarte 1:800,000* (see Table 1, no. 6) was the perfect example of a "dual use" map (see Figs. 12 and 13).

5 New Methods of Aerial Mapping

When the western frontlines became stationary in the fall of 1914 and trench warfare prevailed, the need for both big scale and accurate cartographic material became apparent, especially for the artillery, which needed it to target hidden enemy gun emplacements. New maps of individual sectors of the front at scales of 1:20,000 to 1:25,000 were created, often based on aerial photography. As all existing maps needed constant reviewing and updating, it became a central mission of the military

pilots to assist with this task by taking photographs of the frontlines and beyond. These maps also provided useful information for the infantry and the close support aircraft.

It is estimated that German pilots took about 1 million aerial photographs of the fronts (see Fig. 14). The transformation of aerial photographs into maps was assigned to survey detachments (see Fig. 15). However, on the western front support units of the Luftstreitkräfte also put together maps which were based on aerial photographs taken of the hinterland of the frontline. These maps were initially called *Luftbildkarte* (Aerial Photograph Maps) (see Table 1, no. 7), but the chief of the *Kriegsvermessungswesens* (Wartime Survey Office), Siegfried Boelcke, apparently objected to this on the grounds that his office was designated to handle all map production. In spite of this the air forces of several German armies still created those maps. Some changed the labeling to read *Geländebild* (Terrain Image), thereby administratively solving the problem (see Fig. 16).

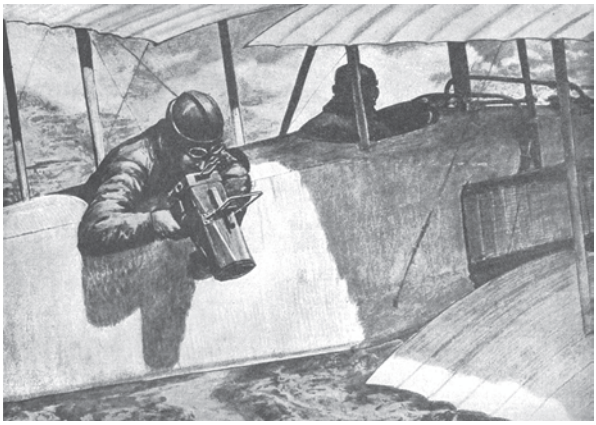

Fig. 14 In a type C plane the pilot sat in the front cockpit and was able to operate a machine gun. The observer sat behind him with a camera, here shown equipped with a viewfinder. (*Illustrierte Geschichte des Weltkrieges*, no. 118, p. 332)

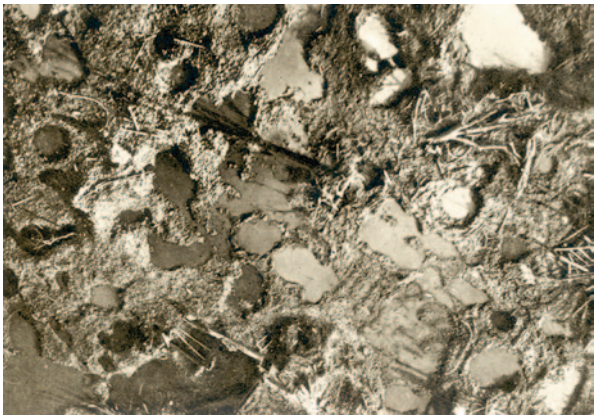

Fig. 15 Over wartorn frontline areas normal surveying was both impossible and also ill equipped to outline the battlefield destruction. Only aerial shots could provide the troops with an accurate and up-to-date view of the actual situation at the front. Because of this reason these photos were very important and sought after, especially by special forces

Fig. 16 Aerial maps (*Luftbildkarten*) (see Table 1, no. 7) were made with the help of a complex series of different photos, enhanced by toponyms and a map grid. Above, a sector of such a sheet. Such a map could give the troops a good impression of the actual situation, but they had to learn how to "read" an aerial map. These maps provided almost no information on the surface contours. Because everything seemed flat, the officers in command wanted both: The normal contour sheet as well as an aerial map. The British forces created similar maps. (Chasseaud 2013, p. 207)

Photogrammetry later made it possible to produce a three-dimensional view. If one colours one of the maps in red and the other in blue, and then use glasses with red and blue ophthalmic lenses, the reader's eye can see the relief in 3-D. This method of stereoscopic vision was widely used by the German armies, especially in mountainous regions.

6 Maps of the Front for Military Pilots

The Office of the Kriegsvermessungschef (Chief of Wartime Surveying), Siegfried Boelcke, was created in the spring of 1915. Prior to this date military aircraft units were obliged to rely on captured maps, augmented by aerial photographs and maps rather designed for use by ground-roaming troops. As described in the article *A Good Map is Half the Battle*, Boelcke took it upon himself to solve this problem. Nevertheless, various military plane units kept their local printing facilities, which enabled them to create their own maps locally at the front and as their own demand dictated. One such map which is shown here (see Fig. 17) was produced by the Feldfliegerabteilung 32 (Field Aircraft Sect. 32) in the fall of 1915. The unit was stationed on the western front between Amiens and Arras. The sheet is dated October 8, 1915 which leaves room for the assumption that this type of map was continuously developed and printed by that facility.

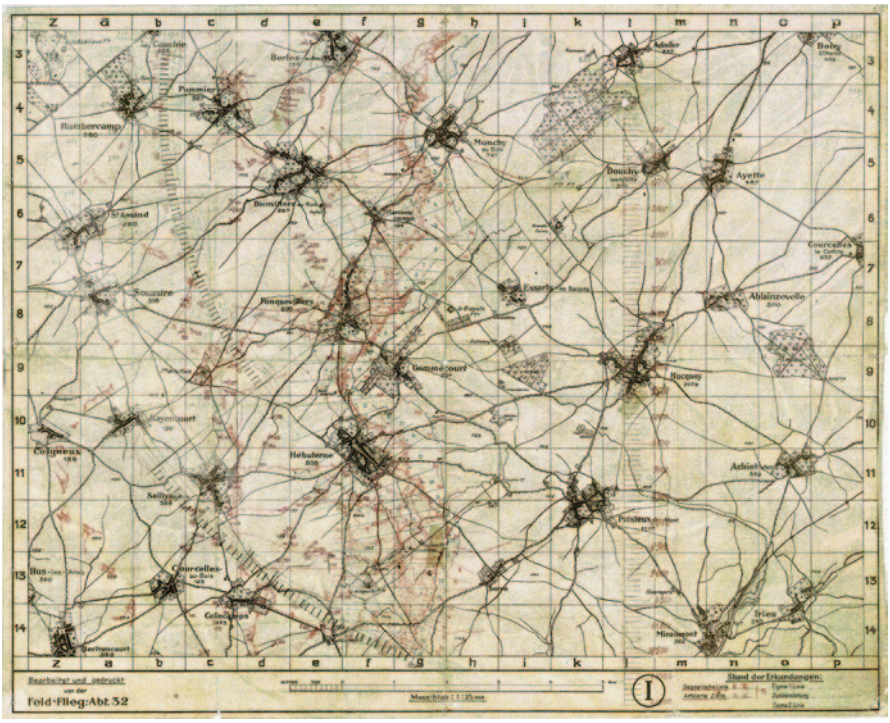

Fig. 17 Sheet of a map series on 1:25,000 produced by a military aircraft unit to serve as an orientation aid to the pilots stationed in the landing field located at square I-4 on the grid. Two "bearing circles" have been added to assist pilots in setting a correct course for an attack over the front lines to the west which were marked in *red*

The 1:25,000 map (see Fig. 17) encompasses the aircraft unit's landing field (south of Adinfer) and an area of the front lying to the west (see Table 1, no. 8). Two circled areas provide bearings for pilots leaving the airfield. They serve to demarcate lines from the field to the target area at the front to the west which the aircraft was to follow. The upper circle was to be used for the northern part of the front, the lower circle for the southern part. Enemy locations, including anti-aircraft guns behind the front, are marked in red. Positions of own facilities are only sketchily shown because of the ever-present danger that the maps might fall into the hands of the enemy. Research has not yet proven whether such maps were also regularly printed by other aircraft units or whether the Feldfliegerabteilung 32 was a unique facility (Welkoborsky 1939). In any case, it made sense for the pilots.

7 Radio-Signal Navigational Charts

Already in the summer of 1914 a special German military authority, "Inspektion des Militär-Luftfahrt-Wesens und Militär-Kraftfahrt-Wesens der preussischen Armee" (Inspection of the Military Aviation and Military Vehicle Assets of the Prussian army), had tested the possibility of airborne navigation by radio signals ("Funkentelegraphie"). A radio navigational map for aircraft was already available in 1914 and during the war this technology developed into a well functioning system of radio direction (Neumann 1920, pp. 205–209) with accompanying flight charts created by Wedemeyer (1919, p. 103).

The Entente decoded this system on the western front very soon and tried to lead the fleet of zeppelins, which were raiding the United Kingdom, astray with false radio signals, which seemed to have worked on several occasions. As a result, the so-called passive system (the aircraft receiving radio signals) was exchanged for an active system (the aircraft sending signals) in 1918 (Neumann 1920, p. 208).

8 Conclusion

During World War I the definition of the term aero map remained blurry on the German side. Sometimes already existing maps were modified to accommodate the new aeronautical use. In other instances existing maps were simply called aero maps, but remained without the addition of any specific modifications and aeronautical signatures. Although dedicated aero maps were developed from 1914 onwards, they did not differ significantly from other customary maps. Whereas other countries had aero maps with a reduced display of features on the ground and very few toponymes, German cartographers found it difficult to do away with the traditional map features depicting surfaces. They were bound to the convention of displaying everything with as much detail as possible, even if that made navigation for the pilots rather difficult.

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Jürgen Espenhorst has been researching the cartographic history of Germany for more than 20 years with an emphasis on the period 1800–1955. Arguably his most significant contribution to the field is the survey of handatlases produced in the German-speaking areas of Europe (Andree, Stieler, Meyer & Co, 1994/1995 and Petermann's Planet, 2003/2008). In addition, in 2005 he initiated an annual international conference on atlases which aims to offer an exchange platform for connoisseurs of maps and atlases who reside beyond the realms of academia.

A Good Map Is Half The Battle! The Military Cartography of the Central Powers in World War I

Jürgen Espenhorst

Abstract During World War I the Central Powers (Germany, Austria-Hungary, Bulgaria and the Ottoman Empire) were burdened by the heterogeneous structure of their military mapping-facilities. Nevertheless, in the end they produced far more maps than the Allied Powers. The German cartographers, without any overstatement, created the lion's share because they were present on all the fronts from Flanders via the Balkans to the Near East. This article explores pre-war cartographic efforts, looks at the various types of maps that were produced during the war, and traces the dramatic development of cartographic technology that occurred as a result. The following discussion focuses on maps created for the army. Maps for use by aviation units are discussed in a separate chapter.

1 Some Background

1.1 Preliminary Cartographic Work Prior to World War I

One might fight but cannot win a war without maps. Recognition of this bitter truth came all too late to the German troops as they reached the Marne in September 1914. There they stood, only a few kilometers away from Paris, totally lost in the French countryside.

How did this happen?? When beginning the invasion of Belgium on August 4 the troops had been given a large packet of maps which only covered the area north of the Marne (Meyer 1937, p. 370). The maps which had been printed for the adjoining region were still in Berlin. Although every effort had been made to provide maps of enemy territory (Boelcke 1921b, p. 444), there was an ever increasing degree of disorientation. Entire divisions had to make do with simple sketches (Eckert-Greifendorff 1939, pp. 327–328; Albrecht 1969, p. 8). The troops were the victim of their own rapid advances and had to fall back to avoid being overrun. Figure 1 describes the situation: On the right the position of the 1st Army under Gen. Kluck

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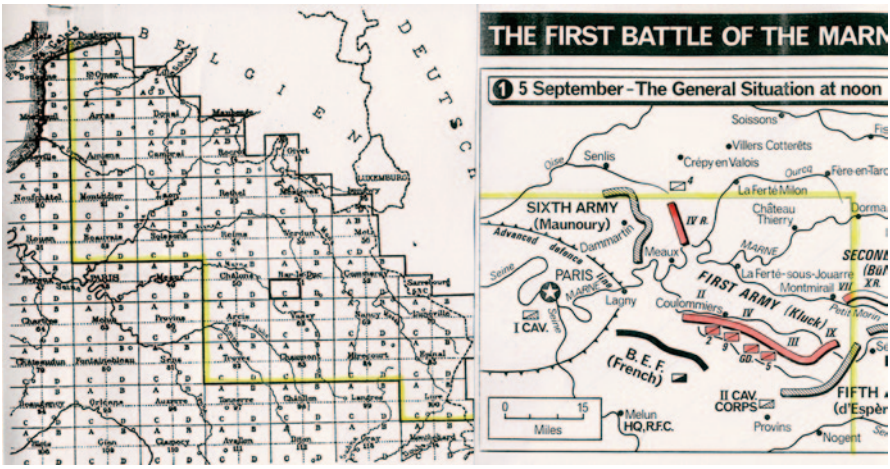


Fig. 1 On the *left* is the index map for the "Carte de France" 1:80,000 (Map of France 1:80,000). The German reprint divided the index into several different groups. Group 1 comprised 113 sheets (outlined in *yellow*). The maps in this group were given to troops as they deployed; the sheets belonging to Group 2, which included the area around Paris, were not

on 5 September 1914 is marked in red. They were situated in an area for which they had no maps. The same was true for the right flank of the 2nd Army under Gen. Bülow, directly behind them. Because the right flank of the 1st Army was being threatened by the counterattacks of the Entente forces, they had to withdraw, forcing the 2nd Army to do likewise.

One British author stated that the withdrawals only ended when the troops finally reached areas for which they had maps (Cruickshank 2006, p. 19). It is remarkable that, to the author's knowledge, in all the literature on the "Miracle on the Marne" this significant problem has never been discussed. In fact, the importance of maps in the conduct of war has frequently been overlooked. It is worth taking a look behind the scenes at this often neglected set of military tools.

The following remarks are intended to make the unfortunate situation of the German armies throughout the summer of 1914 more understandable. To achieve this it is necessary to explore the traditional structure and procedure of governmental map-making in Germany at that time, which was intimately linked with military planning. We will explain which changes this process underwent as a result of the outbreak of war.

Before considering wartime cartographic activity in detail, we need to take a look at the years preceding World War I. The critical question is whether the cartography of that period was based on planning for a "major war" and, if so, how this should be understood.

The January–February 1914 issue of the German geographical monthly *Petermanns Mitteilungen* contained a set of index sheets for the official maps which were publicly available. The collection comprised the following cartographic works:

1. "Messtischblätter 1:25.000" (Plane Table Maps 1:25,000)
   A complete set of plane table maps for Germany. However, topographic details were not uniformly portrayed.
2. "Deutsches Reich 1:100.000 (Generalstabskarte)" (Germany 1:100,000 (General Staff Map))
   Except for sheets of the border areas, this map covered only Germany. It was the map used for annual maneuvers.
3. "Topographische Specialkarte von Mittel-Europa 1:200.000 (Reymann-Karte)" (Special Topographical Map of Central Europe 1:200,000 (Reymann map))
   This structurally obsolete map covered a large part of Central Europe. To the south it extended to Lake Garda, to the west as far as Bayeux on the English Channel, to the north to Riga, and in the east to Minsk. Since the earliest parts of this map dated back to the first half of the 19th century and the cartographic styles used were not consistent, it was considered obsolete at the beginning of the 20th century. Nevertheless, it did cover a large operational area. In 1914 the *Planabteilung Metz* (map depot of Metz) assembled 49 of these sheets into 13 amalgamated sheets covering Belgium and eastern France. The sheets covering eastern Poland were also reprinted during in 1916.
4. "Topographische Übersichtskarte des Deutschen Reiches 1:200.000" (Topographical Survey Map of Germany 1:200,000)
   This map series was intended to succeed the Reymann map. Work on it had begun around 1900, and by 1913, with the exception of sheets covering East Prussia (which, in the fall of 1914, were urgently needed), 184 sheets had been produced. Thus ultimately the full set of 196 sheets was never completed. However, in contrast to the Reymann map, they covered only the peacetime territory of Germany.
5. "Übersichtskarte von Mitteleuropa in 1:300.000" (General Survey Map of Central Europe 1:300,000) (see Figs. 2 and 3).
   A rather modern map series which was begun in 1893 and which the first sheets were published in 1906. Nevertheless in 1913 the section to the West only covered the German borderlands. To the East, on the other hand, it reached as far as Southern Estonia, Minsk and Southern Poland. In the course of the war the series was extended to also cover the United Kingdom and was used as an air navigation chart.

The following maps were not listed in the index; they apparently served purely military purposes:

6. "Wegekarte des Deutsch-Französischen Grenzgebietes 1:300.000" (Road Map of the French-German border area 1:300,000) (Müller 1990, S. 63)
   This contained 24 sheets and covered the area from Amsterdam in the northwest to Bourges in the southwest. It even included a large part of Switzerland (Bern, Chur). Work on the map began in 1890 and was completed in 1904. It had a different index from the later General Survey Map of Central Europe 1:300,000 cited above.

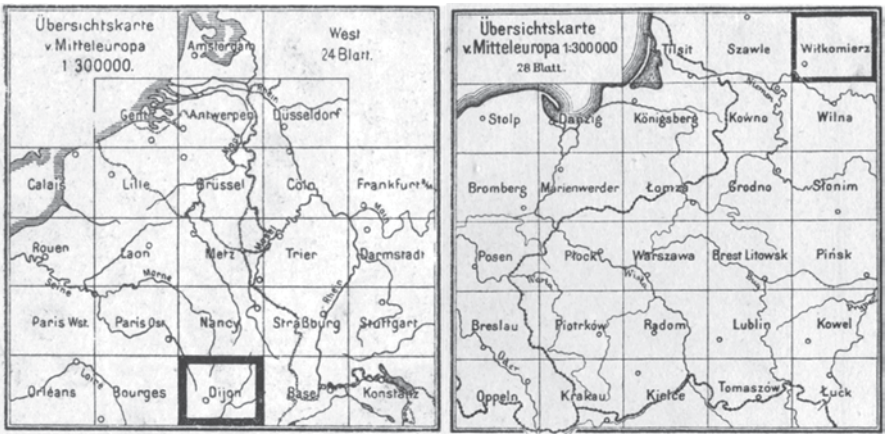


Fig. 2 At the beginning of the war two groups of map were assembled from the 1:300,000 map, one for the West and one for the East. The western group contained 24 sheets, while the eastern one had 28 sheets. Later these groups were augmented by larger sheets on which multiple sheets were combined (Zusammendrucke) to obtain a better view of the overall area (see *below*, No. 8)

Fig. 3 A segment of the sheet for Lille (1:300,000) printed in September 1913. View of Ypres and the fields where the battles in Flanders were fought

7. "Wegekarte des Deutsch-Russischen Grenzgebietes 1:500.000" (Road Map of the Russo-German border area 1:500,000) (Müller 1990, S. 63) (see Fig. 4).
   This comprised 17 sheets covering the area to the East as far as Wilna, Pinsk and Rowno (Galicia) and was printed in 1905 (or possibly 1904).
8. "Zusammendrucke 1:300.000" (Amalgamated Prints 1:300,000)
   While the General Survey Map of Central Europe 1:300,000 cited above highlighted roads in red and forest areas in green, there was an earlier version without these coloured imprints. This simplified map was used as the basis for general overview maps of "Belgien" (Belgium) (118 × 88 cm) and "Paris, östlicher Teil"

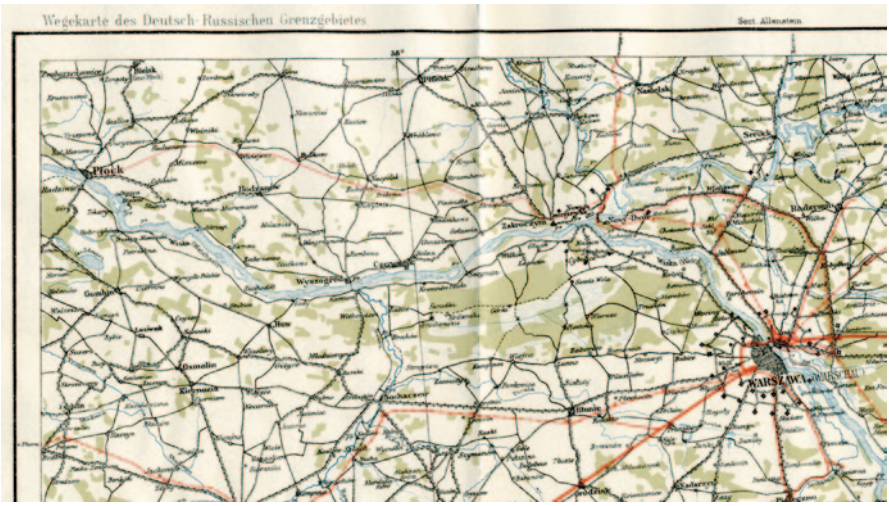


Fig. 4 "Wegekarte des Deutsch-Russischen Grenzgebietes" (Road Map of the German-Russian Border Area) was created in 1904/1905 in the rarely used scale of 1:500,000. It covered wide areas of what was later to become Poland. In contrast to the 1:300,000 map sheets, the areas covered by the fortified belt were not shown. One can, however, clearly see that Warsaw was surrounded by a series of fortified installations

(Paris, eastern section) (75 × 99 cm), and, possibly, a map of the southern section as well. These maps covered an area of four to six normal sheets (48 × 37 cm) and did not fully comply with the index map. It should be noted that the sheet entitled "Belgien", which covered wide areas of northeastern France as well as the Channel coast, appeared in 1912, whereas the other sheet, "Paris", did not appear until 1914 when the war had already broken out. In the East there were similar combined printings for Poland available as early as 1899 which continued to be produced during the war. They were well-liked because of the wide-ranging nature of the areas of operation. They encompassed an area that was more or less the equivalent of six "normal" map sheets. As the name indicates they served to provide more of a general overview of the area rather than being a basis for directing tactical operations of troops in battle.

With these maps being all that was available, it was difficult to wage war beyond the German borders. The road maps were crucial for artillery units which could not be deployed except over hard surface roads, but they were completely inadequate for the movement of entire armies. As a result, the cartographic section of the *Königlich Preußische Landesaufnahme* (Royal Prussian Survey) received a number of new orders post-1910:

9. Reprint of the map of Belgium 1:60,000.
10. Reprint of the French 1:80,000 map of Northeastern France, including Paris. In Berlin the individual map sheets were reprinted in two groups. The first group was distributed to the troops, as has been described above (Fig. 1), the

Fig. 5 All local printing facilities were involved in order to obtain a comprehensive supply of maps

second group (including the area around Paris) was held in reserve to be distributed later. It was these sheets which were lacking at the Marne. In addition, the *Planabteilung Straßburg* and *Planabteilung Metz* (map depot for Strasbourg and Metz respectively) (see Fig. 5) also distributed larger amalgamated prints.

11. Reprint of the "Topographische Specialkarte von Mittel-Europa 1:200,000 (Reymann-Karte)" (Special Topographical Map of Central Europe 1:200,000 (Reymann map)) for the West and the East. The map was issued as large sheets each combining four maps.
12. A "Karte des westlichen Russlands 1:100,000" (map of Western Russia 1:100,000), comprising 437 sheets, which had been produced since the end of the nineteenth century (Reichsamt für Landesaufnahme 1931, p. 279). This series was attached to the General Staff Map in the index and continued to be produced until 1919.
13. Reprint of the map of European Russia 1:126,000 (Three-Verst map).

In 1902, Admiral von Tirpitz had commissioned a comprehensive German chart series of the oceans for the use of the Navy. This work initially focused on maintaining connections with German colonies in Africa and the western Pacific. However, in the years 1906–1908, in response to a special order, the *Nautische Departement des Reichs-Marine-Amtes* (Nautical Department of the Imperial Navy Office) concentrated its efforts on the Dutch-Belgian coast of the North Sea. Altogether some 508 naval charts had been completed by the outbreak of World War I. This enabled the German High Seas Fleet to operate on a global scale while at the same time securing

the coasts of the North Sea down to the English Channel. The British coastline was also well documented (Schmidt and Zacharias 1921, pp. 77–82).

In addition, the Prussian Army General Staff apparently also had a fairly accurate and classified map of the French fortified lines in the Vosges on the scale of 1:25,000 that had been produced prior to the war (Boelcke 1921a, p. 122).

Within the first few weeks of the war it quickly became apparent that the available maps were neither quantitatively nor qualitatively adequate. Even worse was the disaster that resulted from the Belgians opening the canal sluices leaving large portions of the advancing German army literally standing in water. It turned out that the German operation organisers had misread the sea level contours on the Belgian maps (Meyer 1937, p. 371).

It is against this background that the scathing critique of A.R. Hinks is to be understood. In 1919, the British geographer gave a lecture at the Royal Geographical Society on German cartographic preparations, which he characterised as a disaster (Hinks 1919, p. 30–44; Bertrab 1919, p. 166–167; Winterbotham 1919, pp. 253–276). The implications of the preparations which had been made were not thoroughly considered and the quantitative requirements which were estimated were totally incorrect. The fact that detailed military-geographical studies had previously been undertaken for Belgium and Northeastern France in (N.a. 1908) and Russia in 1913 (Schmidt 1913), made no difference.

A certain amount of pre-war cartographic work on the part of countries that later became enemies of the German Empire is known. In 1903 the Belgian Military-Cartographic Institute began work on a new 26-sheet map at a scale of 1:100,000 which was published in 1909–1912 (Hammer 1909, p. 241 f.). In 1910 the Geographical Section of the British General Staff published a copy in eleven large sheets, which also covered wide stretches of Northeastern France (GSGS No. 2364). The fact that the British map was printed on reinforced linen paper proves that Britain was preparing for any eventuality. It follows that the British had more current maps of the later theatre of war than the Germans, and they also managed to correctly interpret the rather confusing Belgian water level indicators (Albrecht 1969, p. 30). The Russians adapted copies of German maps of East Prussia and Pomerania (Boelcke 1921b, p. 446). In 1913 the French General Herment authored a memorandum outlining the possible threat to France of a German attack on their northeastern flank through Belgium (Immanuel 1913). In 1912 the Military Geographical Institute in Vienna published a study on "Cartography of the Balkan Peninsula in the 20th century."

Despite all this activity one cannot conclude that plans for a war of aggression were being actively developed. Instead, the mapping efforts should be billed as the 'normal' war game under the military motto: "be prepared." It is therefore not surprising that the German reprint of Belgian and French maps already began in 1907, only 1 year after the German General Staff in 1906 adopted the Schlieffen Plan as the basis for their military strategy which, *inter alia*, conceptualised an attack on the French northeastern flank. It remains debatable, however, whether one should conclude that the British copies of the Belgian maps shortly thereafter should be seen as a targeted answer to the German plan.

It is hard to assess whether, cartographically speaking, Germany was by the summer of 1914 adequately prepared for a major military conflict. Maps were available, yes, but they had been compiled without any special care or attention to their quality. Even the annual maneuvers of the Prussian army were, from a cartographer's point of view, better organized and prepared. In contrast the situation at the beginning of World War II 25 years was entirely different as the strategists had by then learned their lessons from the shortcomings in the built-up to World War I and were well aware of the importance of thorough cartographic wartime preparation.

1.2 The Organisational Structure of Official Cartography in Germany

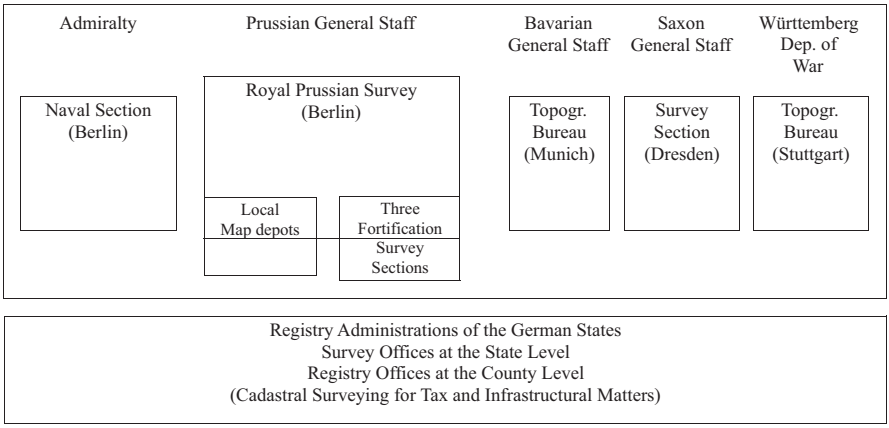
Before turning to the war-time mapping, a brief look into the federalised peacetime structures of official German mapmaking provides a better understanding of the situation in the field in 1914 and how Germany reacted to it. One needs to remember that the "German Empire" (Deutsches Reich), founded in January 1871 in Versailles while confederated German troops were besieging neighbouring Paris, was a "federation of princes" in which certain members had reserved special rights. Thus, in peacetime, the kings of Bavaria, Saxony and Württemberg retained supreme command over the troops of their respective kingdoms. Only in time of war did the German Emperor, in personal union also the King of Prussia, gain supreme command over all German forces. Mirroring this delicate and problem-prone setup, civil surveying remained the responsibility of the individual member states. It was not until 1919 that a *Reichsamt für Landesaufnahme* (National Survey Office) was created to coordinate and ultimately centralise cartographic activities. As a result, basic geodetic data on maps of the various German federal states were grossly inconsistent. This was especially true for plane table sheets (1:25,000) since there was no uniform system of coordinates.

Member states with peace-time military command authority also had extensive cartographic organisations. Except for Prussia, which made up more than half of the German Empire, they remained as follows throughout the First World War (see Table 1) (Hafeneder 2004):

- *Kartographische Abteilung der Königlich Preußischen Landesaufnahme* (Cartographic Section of the Royal Prussian Survey)
- *Topographisches Bureau des Königlich Bayrischen Generalstabes* (Topographical Bureau of the Royal Bavarian General Staff)
- *Abteilung für Landesaufnahme des Königlich Sächsischen Generalstabes* (Survey Section of the Royal Saxon General Staff) (Treitschke 1921, pp. 47–60)
- *Topographisches Bureau des Württembergischen Kriegsministeriums* (Topographical Bureau of the Wurttemberg Ministry of War)

By far the largest organization was the *Königlich Preußische Landesaufnahme* which, by 1914, comprised of four sections:

Table 1 OFFICIAL GERMAN MAP AND SURVEYING ORGANIZATION IN PEACETIME



1. Trigonometric section for the determination of trigonometric points.
2. Topographic section for the depiction of terrain characteristics and the recording of manuscript field maps striving to be as accurate as possible.
3. Cartographic section for getting the maps ready and for overseeing the actual printing.
4. Map Depot (*Plankammer)* for the storing and distribution of maps to military and civilian users alike.

In addition to the Berlin-based Map Depot there were decentralized depots associated with major fortifications because of the special need to provide support to the fortification's artillery. The map depots in the western fortifications at Metz and Strasbourg, both in Alsace-Lorrain close to the French border, also provided combined prints of large areas in their vicinity.

Since official mapmaking in Germany was embedded in military structures—as was the case in other European states—it is also necessary to examine the structural outline of the German army. For peacetime we can be brief since there was none except for the separated armies of Prussia, Bavaria, Saxony and Württemberg. Only the navy was a unified body in peacetime with its own department to provide nautical charts and surveys (Albrecht 1969, p. 12). The aviation units which were just emerging were almost entirely part of the various armies, except for a small number of naval aviation units.

Despite this polycratic organisational structure, most of the pre-war military maps do bear the following notation in the center of the lower edge of the map: *Kartogr[aphische] Abt[eilun]g d[er] K[öni]gl[ich] Preuß[ischen] Landesaufnahme*, portraying them as made by the Prussian Military Survey. Maps copied from foreign sources, however, do not carry this annotation, even when copied by the Prussian army, save a few exceptions from 1917 onwards.

For organisational purposes Germany was divided into 25 military districts. Each district had its army corps and each corps was made up of a number of divisions. The officer in charge of each corps was called *Generalkommando* (General Com-

mand). The paramount importance of Prussia is evidenced by the fact that it had 19 military districts while Bavaria had three, Saxony two and Württemberg only one.

Much of the peace-time fractioning was to disappear in the case of war, when troops were mobilized and sent out to the front lines, each army corps with its designated *Generalkommando* now under the single (and de-facto Prussian) high command of the *Generalstab des Feldheeres* (General Staff of the Field Army), to which the Prussian, Bavarian, Saxon, and Wurttemberg forces (and attached mapping units) reported. A *Stellvertretende Generalkommando* (Deputy General Command) was to oversee home operations including the recruitment of reserves.

To address the needs of the Schlieffen Plan which sought to strike decisively and fast in the west to win the war before any enemy could pose a threat in the east or south, the army corps were combined into eight armies. Seven of these were stationed in the west, and only one in the east. When the actual war of August 1914 did not evolve as planned by Schlieffen but was prolonged into a multi-year carnage, additional corps and armies were formed. This is not the place to elaborate on this constant addition of new units. We merely want to state the crucial fact that German military surveying and mapmaking throughout the Great War remained organised and thus fractionised at army level.

With the outbreak of hostilities in August 1914 the *Königlich Preußische Landes-auf-nahme* (Royal Prussian Survey) ceased to function as part of the General Staff. Only the groups involved in the printing of maps and their distribution remained operational. The Chief of Survey, General Hermann von Bertrab (1857–1940), took over the command of an army division (Albrecht 2004, p. 144) and many of his topographers likewise rushed to the flag. The General Staff left Berlin and moved to the *Große Hauptquartier* (Supreme Headquarters) together with the *Obersten Heeresleitung* (Army High Command) which soon took residence in Spa in eastern Belgium for most of the war.

The *Stellvertretende Generalstab* (Deputy General Staff) remained in Berlin but only in an administrative capacity. However, with the war not being over in weeks as assumed in all pre-war plans, this originally make-shift stand-in unit gradually resumed the discontinued mapmaking activities while the armies were out in the field. Thus, whenever a map reads *Stellvertretender Generalstab* (Deputy General Staff) it signifies that the map was produced during wartime in Berlin and not by an army map unit in the field (see Fig. 7). In addition, pre-war maps were reprinted but without updating the peacetime source notation. Due to the peacetime infrastructure and military organization, maps were also printed in Dresden, Munich and Stuttgart during the war and credited accordingly. The maps printed in these locations did not need continuous updating. These were primarily small-scale overview maps while large-scale maps were printed close to the front and marked “feldmäßig” (field suitable). Communication between the offices in Berlin and at the fronts was not well organised (Cruickshank 2006, p. 10). For example, German army units supporting the Ottoman troops in Palestine needed basic maps which were available in Berlin, but which were not forwarded to units in the Holy Land where the commanders mostly did not know about their existence and therefore did not ask for their delivery.

Fig. 6 Maps produced in various military regions differed from one another and each army had to find a way to familiarize newly arriving recruits with the geodetic principles used on their maps. This classified brochure (16.5 × 11.5 cm) was produced by the *Vermessungsabt. 3rd (preuß.)* der 5. Armee (Survey 3 (Prussia) of the 5th Army) and contained many sample maps

It was not until April 1917 that the *Landesaufnahme* was reactivated in Berlin under the direction of General von Bertrab who was ordered back from his field assignment (Albrecht 2004, p. 145). However, it still had no formal jurisdiction over frontline cartography units (Albrecht 1969, pp. 48–49). The only means to somehow organise the de-facto independent army cartographies was the custom to date maps. Indeed most army unit maps provide information as to the date of their original survey, the date of revisions, and the year (and often the month) of printing. While the first two dates are most of the time printed in easily legible fonts in the margin of the map, the printing date frequently appears in a very small font squeezed into or under the lower right corner of the map.

Apart from the centralized organization of the *Landesaufnahme,* each of the many armies had at least one, and sometimes even two, *Vermessungsabteilungen* (VA or Survey Sections) (see Fig. 6). It therefore should not come as a surprise that by the end of the war some 10,000 soldiers or the equivalent of a combat ready division were involved in the various cartographic units of the German armies (Albrecht 1969, p. 18).

Fig. 7 An example of the pragmatic cooperation between Deputy General Staff in Berlin and a front unit. At the request of AOK 6 (*Armeeoberkommando 6*) (Army High Command 6), printing plates for "Carte de France 1:80,000" (Map of France 1:80,000), which were available in Berlin, were sent to a map unit of a Bavarian army to be revised into new plates. These maps were printed immediately behind the frontline

Before the war the military had had little experience with such an organisational structure. The first three VAs were established in March 1914 at the principal fortifications in Cologne, Metz and Strasbourg. They were referred to as *Festungsvermessungsabteilungen* (Fortification Survey Sections). These VAs were created for the sole purpose of supporting the artillery based in these fortifications. As the front quickly moved forward, eight more VAs were added to smaller fortifications located closer to the frontlines.

Despite the fact that nobody in the pre-war period had thought about creating mobile versions of the VAs for deployment in seized enemy territory (Albrecht 1969, p. 7) the number of these units had, by the end of the war, risen to 29 (Eckert 1925, p. 806). The scope of their work had also completely changed. It took until the end of September 1915 before the change in their organizational structure from *Festungsvermessung* (Fortification Surveying) to *Feldvermessung* (Field Surveying) had been completed (Albrecht 1969, p. 11) and echoed the erstwhile mobile and later more trench-line-than-fortress-centered character of military mapping needs.

Each of these survey sections were part of the staff of the army to which they were attached. From September 1917 onwards they were directed by a *Stabsoffizier für Vermessung (Stoverm)* (Staff Officer for Surveying) (Albrecht 1969, p. 12). At about the same time special commanders were installed to co-ordinate the military surveyors, topographers and mapmakers in the three most important front regions: West, Southeast (Balkans) and East (Albrecht 1969, p. 65).

In the initial months of the war, when frontlines were pushing rapidly beyond Germany's borders and where fluid as never again until shortly before the end of the war in the fall of 1918, cartography units of the individual armies had absolute

freedom to organize, staff, and define their tasks as they and their army commanders deemed effective. It was not until the middle of 1915 that the lack of coordination was recognized, albeit still reluctantly. To address the problem, the office of *Kriegsvermessungschef* (Chief of Wartime Surveying) was assigned to an officer with the rather lowly rank of Major. The first person to be appointed to this position was the organisationally talented Siegfried Boelcke (1876–1930) (Hafeneder 2004, pp. 93–94). As in any strictly hierarchically organised military environment, a Major could hardly by expected to influence map-relevant decisions made by the Generals of the plethora of field armies.

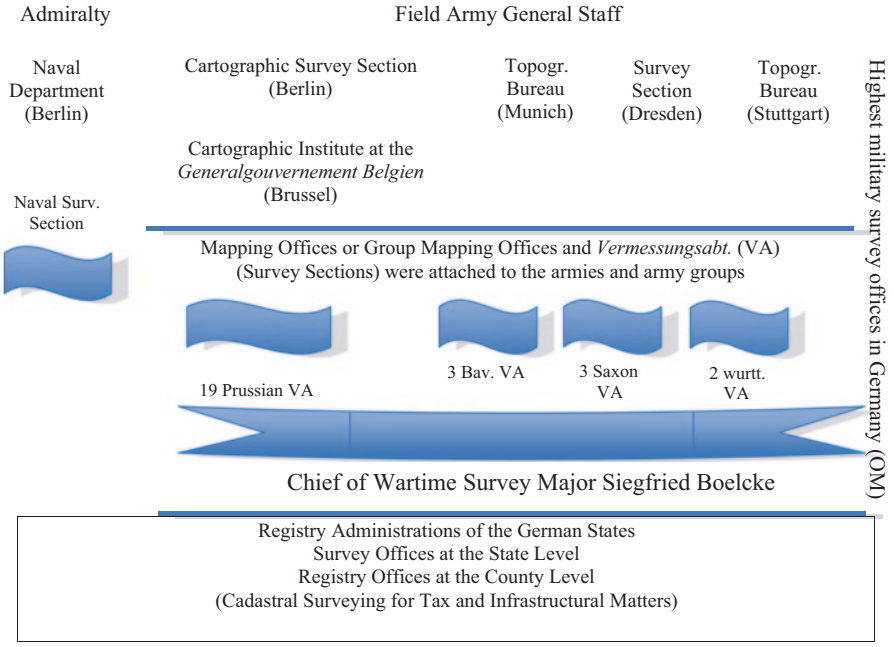
It was only in January 1918 that this organisational structure was adapted again. Whereas before a VA had only been responsible for the printing and distribution of maps, now an additional unit was created, responsible for updating existing maps using aerial photographs and other cartographic resources. These units were known as *Gruppenkartenstellen* (Group Mapping Offices) and were primarily attached to army groups (Albrecht 1969, p. 13). The regular VAs concentrated on improving trigonometric measurements and on making exact calibrations, particularly for the heavy artillery which was crucial in the trench warfare. Thus the notation *Gruppenkartenstelle* or *Divisionskartenstelle* on the margin of a map indicates that this map was published in 1918.

A fact not widely known is that the VA structure survived the Armistice in November 1918 and the subsequent disintegration of the German army units. The *Preußische Landesaufnahme* (Prussian Survey) (now no longer "Royal") had four *Grenzschutzvermessungsabteilungen* (Border Protection Survey Sections), emerging from the wartime VAs which continued to provide cartographic support to German militias in the guerilla war along the ethnically mixed eastern border regions until the end of 1919 (Albrecht 1969, p. 49).

When General von Bertrab was reappointed as chief of the *Landesaufnahme* in Berlin in April 1917, a dual system was created. The *Kriegsvermessungschef* (Chief of Wartime Survey) networked with the survey sections of the armies (which were still not placed under his command!), while the Berlin office took care of central affairs not directly related to the front. At the same time, Berlin also assumed responsibility for the coverage of the occupied territories behind the frontlines. Thus a map repository was established in the *Generalgouvernement Warschau* (German term for occupied Poland) and a *Kartographische Abteilung* (Cartographic Section) was created in the *Generalgouvernement Belgien*. As is easy to imagine, this dual structure created strains and tensions, a problematic situation that was not helped by the fact that the *Landesaufnahme* was a Prussian concept which was brought back to life (see Table 2).

General von Bertrab used his political connections to press for a parliamentary resolution, which called for the creation of an *Oberste militärische Vermessungsstelle im Deutschen Reich und in seinen Schutzgebieten (OM)* (Supreme Military Survey Office for Germany and its Protectorates). To that end he set up yet another office along with a set of operating procedures. Parliamentary hearings at the end of February and early March 1918 (N.a. 1918b) merely led to the acknowledgement of the already well-known fact that negotiations leading to a unification of geodetic

Table 2 Official German Map and Surveying Organization in Wartime



principles for Central European cartography were urgently needed (Albrecht 2004, pp. 144–145). If Germany had seriously intended to wage a preventive war on the basis of the Schlieffen Plan and had wanted to have a reliable cartographic base prepared, these Berlin hearings should have been held and according results been implemented at least a decade earlier. In 1914 however, military thinking was still entirely focused on a short and fast-moving campaign with the goal of "Christmas in Paris". No-one even considered the possibility that the front could come to a stalemate for years as ultimately happened on the Marne in September 1914.

In the course of the war the fragmented pre-war cartographic administration was replaced by an intentional short-term yet pragmatic war-time set-up of even greater complexity. This was due to the immense pressure to produce adequate maps for successful military operations at the widespread frontlines.

Even after 4 years of war, federalist structures superseded any practically demonstrated claim to reform. The *Kriegsvermessungschef* had little interest in setting aside the urgent needs of the front cartography in favor of long-range goals, regardless of how desirable they might have been. Nothing changed during the war—nor did much change after the war. A civilian authority, *Reichsamt für Landesaufnahme* (National Survey Office), was set up in Berlin, but the offices in Dresden, Munich and Stuttgart continued to operate not much differently than in the pre-war era (Penck 1920, pp. 169–179). Even in modern day Germany federalism is reflected in the fact that each of its states has an independently operating *Landesvermessungsamt* (State Survey Office).

Besides the (multiple) armies there was also the Navy, which operated under an independent *Reichs-Marine-Amt* (Imperial Marine Office or Admiralty) (see Table 2). One of its components was the *Nautische Abteilung* (Nautical Section) which was responsible for maps and handbooks for the navigation of the seas. Like its army cousin, the *Nautische Abteilung* was also shut down at the beginning of the war, even though map-printing activity intensified. New charts were needed especially for the deployment of the submarine fleet, for example in the Aegean to fight back against the Allied ANZAC landing on the Gallipoli peninsula. Altogether some 900,000 charts were printed by the Navy during the war (Schmidt and Zacharias 1921, pp. 82–83). The Navy also deployed separate survey groups which were particularly active along the Baltic Coast and in Finland (Schmidt and Zacharias 1921, p. 97).

2 War Maps by German Survey Offices

2.1 Overview

Looking back in 1920, Siegfried Boelcke, former *Kriegsvermessungschef* (Chief of Wartime Survey), observed: "Not only were German surveying sections located along all French and Russian fronts, they were also positioned in Galicia, the Carpathians, Romania, Italy, Macedonia and Palestine in support of German, as well as Austrian, Hungarian and Turkish troops,…" (see Fig. 8) (Boelcke 1920b, p. 7).

The total number of military maps produced during the war cannot be determined today with some certainty, but Boelcke estimates that the German forces alone printed more than 500 million map sheets in the field (Boelcke 1921b, p. 463). In addition, another 275 million map sheets were printed back at home (Chasseaud

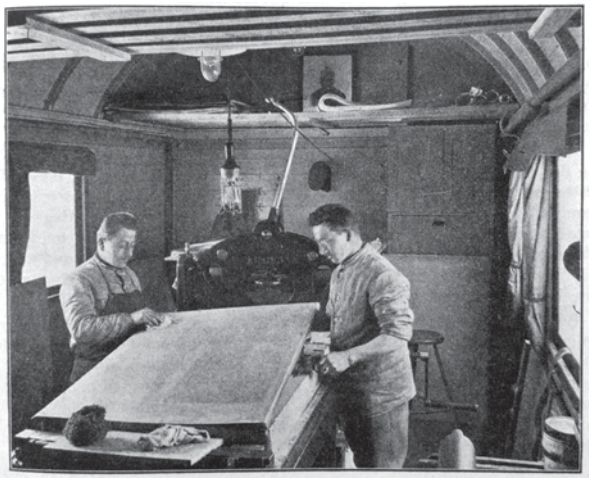


Fig. 8 Near-the-front printing was sometimes done in railway cars. Complete with their own locomotives such units were self-sufficient and mobile, allowing the facility to quickly relocate and rapidly resume service to their armies. (Albrecht 1969, p. 12)

2013, p. 19). However, despite these impressive numbers, the quantity of sheets actually surviving today are astonishingly small. By the end of the war in November 1918 the German cartographic records were either lost or had to be surrendered (Boelcke 1921b, p. 473), and only a small number were given to the *Reichsarchiv* (National Archive). The military portion of these records, which would have included cartographic material, was transferred to the *Heeresarchiv* (Army Archive) in Potsdam in 1936. There they were subsequently destroyed by allied air raids in World War II, and particularly during the disastrous archive fire at the Brauhausberg in Potsdam on April 14, 1945. It is therefore possible that today more German cartographic material is residing in foreign archives than in Germany itself.

This is even more regrettable when considering that the survey sections themselves were aware throughout the war of the historical significance of the events that were being recorded. Following the end of the war, battlefields were photographed. There was even a *Kriegs-Vermessungsmuseum* (Wartime Survey Museum) set up in Sedan (Albrecht 1969, p. 13). The only remaining records of this activity are two photo albums which are currently held at the *Deutsches Museum* (German Museum) in Munich.

The word "Kriegskarten" (Wartime maps) never appeared in any official documents or correspondence. In the initial decades of the twentieth century this term was only used in the sciences and by private map publishers. In official cartography—the focus of this chapter—this term was not used during the war. Thus the army had no *Kriegskarten- und Vermessungswesen* (War Maps and Survey Office), but instead a *Kriegsvermessungswesen* (War Survey Office). It was not until World War II that the terms *Kriegskarten- und Vermessungswesen* were used officially. Whenever coming across the term "Kriegskarte" in German cartographic publications up to 1930, it refers to the work of private publishers (Flemming, Velhagen & Klasing, Wagner & Debes, Ravenstein, i.a.). These works normally contain no military related information whatsoever. The concept "Kriegskarte" was used solely for sales promotion purposes. As an alternative term one could use "Militärkriegskarte" (Military war maps) for official maps.

2.2 Maps of the Western and Eastern Fronts

As late as 1906 Emperor Wilhelm II famously maintained that the horse would soon re-establish itself as a means of transportation and drive out the newly introduced automobile. This failure to foresee the direction of technological developments is unfortunately quite symptomatic of the relationship of the Prussian military to science and technology. Indeed, there were a few places where automobiles, airships, and even an occasional airplane were being used by the army, but by and large, the ideal profile was that of the dashing officer leading his men, preferably on horseback, into man-on-man combat as in previous centuries.

However, World War I rapidly developed into modern, technologically driven and increasingly industrialized warfare that demanded a high level of organization

and communication, not brave but outdated mounted Hussars. In short, the officer corps was mentally totally unprepared. The artillery, for example, was used only for firing at targets "in sight." But in the fall of 1914, as the moving fighting changed into trench lines, enemy artillery installations became hidden and firing had to be done based on data taken from large-scale maps (so-called "Planschießen"—map-based firing) rather than by direct sighting of the target. There had scarcely been any training for this type of engagement, and there were no usable maps for this type of deployment. This would become the main focus of improvised wartime map making.

It is not widely known that within only 6 h following the announcement of imminent hostilities (thus prior to actual mobilization), border patrol troops were ordered to assigned posts. For these early response units a set of classified maps of Germany at a scale of 1:100,000 marked "Grenzschutzzwecke" (Border Security Purpose) was available. The example shown in Fig. 9 of the East Prussian border area was created in 1913 and printed in 1914 (presumably in July of that year).

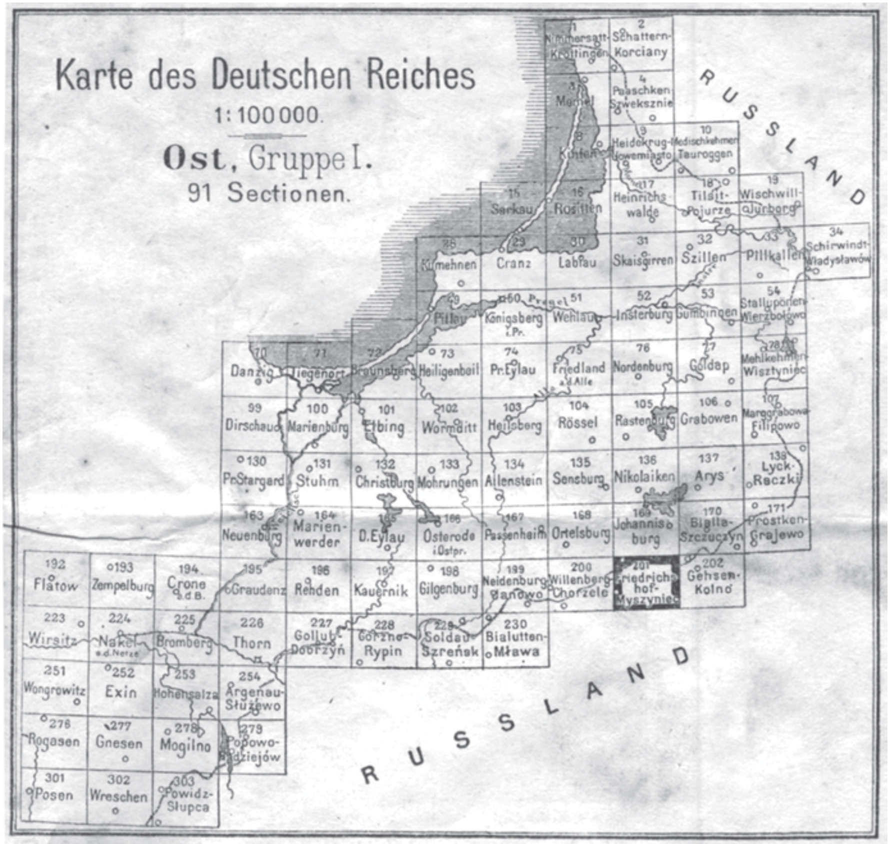


Fig. 9 Index of the northeastern sections of a classified map at a scale 1:100,000 created for border control troops that were activated as a result of the growing threat of war

Fig. 10 The 7th Army was able to take a monochrome French map and turn it into a tri-color print (1:100,000), which was much easier to read. Mountainous terrain was shaded in *brown*, although there were no elevation annotations. Grid lines, each 1 km apart, made it possible to identify specific areas for reporting purposes

In the summer of 1914 a map series covering the area west of Paris in 1:300,000 was successfully delivered. It consisted of 24 sheets and was frequently reprinted during the war. There were even special versions of this map for long-distance communication units and for aircraft pilots. However, the withdrawal from the Marne and the development of trench warfare presented an entirely different set of requirements. Now large-scale maps were needed, which would make it possible to identify the most favorable terrain for one's own defenses and for attacking the dug-in enemy.

For Belgium there was a map at 1:20,000 that could be used by the Germans, but for France there were only a few fortification plans ("plans directeurs") available at a scale of 1:20,000 and they were not drawn in any sort of consistent style.

Since no-one believed that this trench warfare situation was going to last long, each of the seven German western armies used whatever material became available to draw up their own sketches of the section of the front they occupied (see Figs. 10 and 11). Photographs taken by surveillance aircraft often formed the basis for these maps. There was no office which could have coordinated these efforts since the *Preußische Landesaufnahme* (Prussian Survey) had been dissolved for the period the war would last (as stated above). The inevitable result was a crude patchwork of maps of the front created by the troops themselves which greatly contributedto the very confused communications between the armies (Albrecht 1969, pp. 23–29).

The maps of the front and of the enemy territory beyond had to be continuously expanded and improved. As this became a defining role for the aviation units, the Hussars, or traditional reconnaissance units on horseback, were no longer being asked for reports. Numerous aircrafts were launched in the initial months of the war, many of them for surveillance purposes. It quickly became apparent that an aerial photograph contained more information than the best report from a trained observer

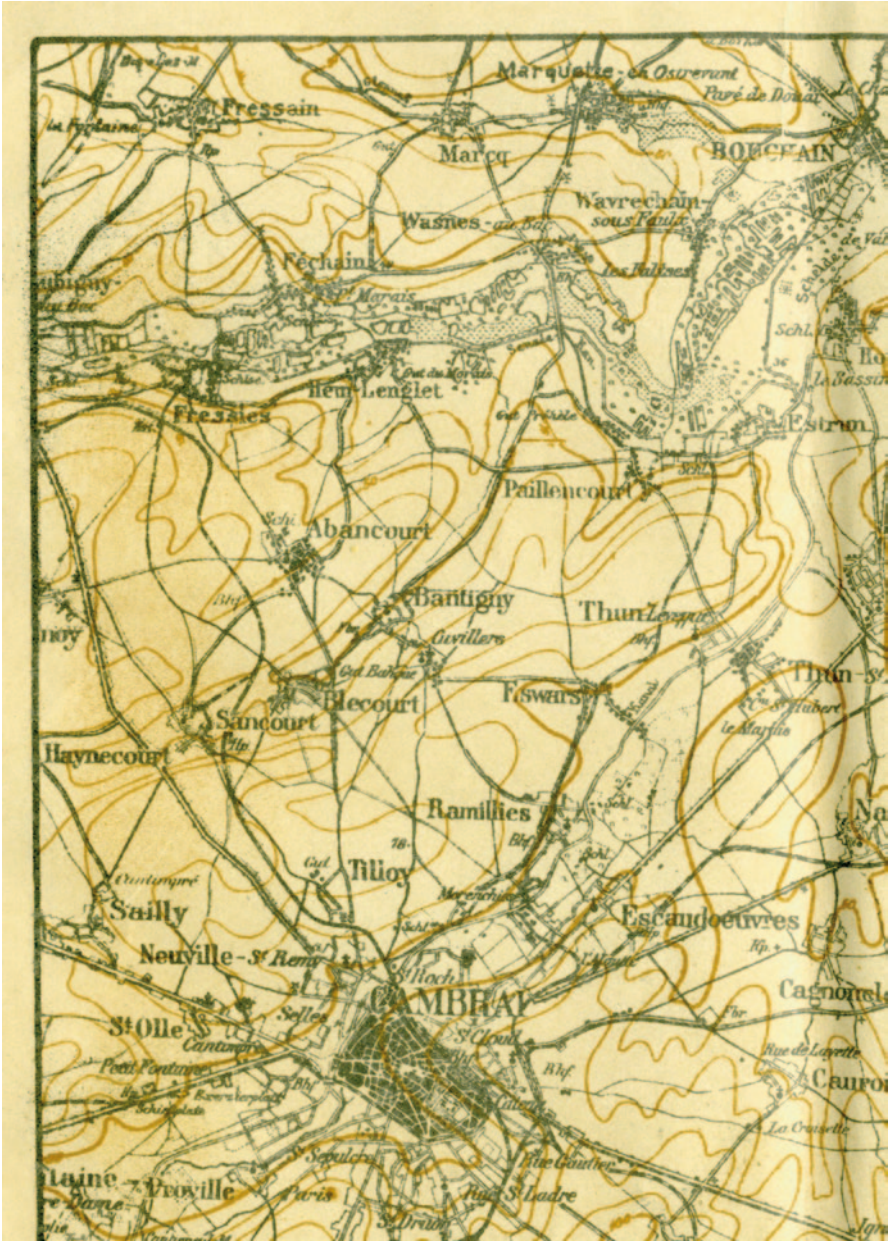


Fig. 11 By 1917/1918 it had finally been agreed that all general survey maps should have a single unified scale of 1:100,000, like this segment from a general survey map for the 18th Army, produced in December 1917. Note how elevations are no longer indicated by *shading*, but by *contour lines*. Although such lines were less visible, they were far more precise. There were also no more *grid lines*

on the ground. As a direct result, aircrafts were equipped with cameras, and these aerial photographs were then patched together in groups to form "Luftbildkarten" (aerial image maps). "These simple means provided at least some help with the situation. Etching all the unimportant material off the printing plate and leaving only the militarily valuable information, created maps of the trenches. […] Approximate dimensions could also be determined from these map-like images, since the altitude at which the picture was taken, and the focal length of the camera lens were known, and pictures taken at different altitudes could be either enlarged or reduced to create a uniform scale" (Neumann 1920, pp. 164–165). However, for a professional cartographer these make-shift procedures were considered to be nothing more than emergency assistance measures (Eckert 1925, p. 765).

By the spring of 1915 the *Oberste Heeresleitung* (Army High Command) had recognized that there was an urgent need for coordination and therefore the new position of *Kriegsvermessungschef* (Chief of Wartime Mapping) was created. Its first chief Boelcke soon had to recognize that there was no way that the chaotic mapping system which had evolved within the armies could be unified, simply because replacing the maps that were in daily use by new unified ones was not possible. Boelcke refused to use the newly developed "Luftbildkarten" (aerial image maps) of the aviation units. His argument was that they lacked exactitude to be used to guide artillery fire, and far more precise instruments were needed. Individual artillery batteries had to have plans to guide their firing in correspondence with their positions. It would have been possible to update them by means of aerial photographs, but then these had to be trigonometrically calibrated. The main question was how the aviation units would be able to achieve that.

It is interesting that these aviation units were later able to produce "Luftbildkarten" (aerial photograph maps) which were prepared for printing in their own facilities by using copper engraved plates. These maps were numbered to indicate the army to which they were given. In some instances these products were referred to as "Geländebildkarte" (Terrain Image Maps). The disadvantage of these maps was the fact that there were no contour lines, thus making it difficult to determine elevations. Their advantage, however, lay in their ability to portray rough terrain with a degree of detail no other map was able to achieve (see article "The Eye of the Army", Fig. 15, 16).

The trench warfare that developed in the fall of 1914 demanded maps of the largest possible scale. which could only be produced by using aerial photographs (Korzer 1939, pp. 202–207). Initially, the cameras could only take pictures at an angle, but the process of reconciling variations in camera angles was very difficult. To remedy this problem, the photographic process was converted as quickly as possible to take vertical photographs. By 1916 this allowed for the creation of continuous strip images as well as the development of three-dimensional stereo images (stereo-photogrammetry) (Steeb 1911, pp. 92–94). On the western front, maps which were good enough for use by the artillery were gradually developed out of rough photographic enlargements (Chasseaud 2001, pp. 119–134). With the help of this technology it finally became possible to create a sufficient number of accurate maps for areas where there was no basic pre-war map material as for example on the

Macedonian front (Boelcke 1921b, pp. 465–466). Altogether over a million aerial photographs were taken on the German side for various purposes during the war (Fels 1919, p. 89).

In many instances it was necessary to create an entirely new photographic image of the terrain. Addressing this problem, Boelcke wrote: "Above all it must be remembered that the normal photographic procedure fails in those battle zones where there is active firing. One can sometimes identify details using sound measuring equipment, but attempts to piece together adjoining images was an extremely time consuming and inaccurate process. Apart from the numerous special requests which the troops demanded be addressed, the deflections on the compass needles by the ever-present iron structures frequently led to unacceptable errors. The result was increased reliance on aerial photography to portray the trenches and barbed wire in the battle zones on both the enemy and allied sides" (Boelcke 1920b, pp. 7–8).

Looking back in 1921, Boelcke described the situation as follows: "Map making activities on the western front could be divided into three groups: Belgium, Lille to Verdun and Verdun to Mühlhausen. All of the printing plates for official maps of the Belgian surveying unit at La Cambre were seized. The 1:20,000 map […] had already been drawn with grid lines and could be used immediately without any further work" (Boelcke 1921a, pp. 121–122).

For the central part of the western front around Lille-Verdun there were a few small French fortification plans ("plans directeurs"), most of which had their own grid lines. Using whatever supplementary material which was available, maps were created at a scale of 1:25,000 by adding to these plans. Sometimes this was achieved by enlarging sections of the well-known "Carte de France 1:80,000." The resulting map was unfortunately so inaccurate that the artillery was not able to use it. Moreover, the French map sheets were often drawn in different, incompatible styles and, in most cases, without contour lines. As long as nothing better was available, these sheets were sent to the front as "Leerkarten" (basic monochrome maps without special military overprinting) in the hope that they could be updated in-situ (see Fig. 12).

Particularly challenging was the determination of elevations and their depiction on the maps. Such information was an essential precondition for accurate artillery firing. The ultimate goal was to create contour lines in 5-m increments throughout enemy territory. As the war progressed, the results of these efforts improved, and the maps became gradually better.

On the left flank of the western front, between Verdun and Mühlhausen, the military had the advantage of being able to rely upon map material that Germany had already prepared in secret before the war (see Fig. 13) (Boelcke 1921a, p. 122).

These "Stellungskarten" (trench maps) contained not only the usual topographical elements, but also depicted the system of protective trenches, both on German (in blue) and on enemy (in red) sides (see Figs. 12, 14 and 16). At the same time new German toponyms were created to designate locations. Where the situation was too complex, but was deemed important enough to warrant the effort, plans were drawn at a scale of 1:10,000, and even on occasion at 1:2000.

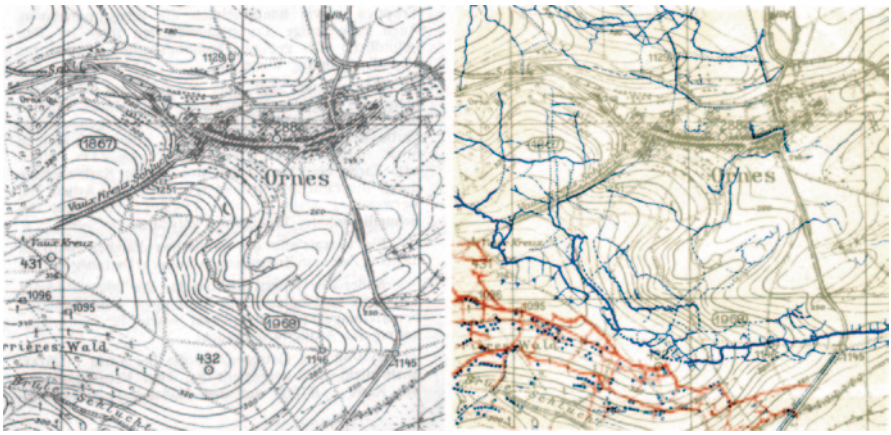


Fig. 12 These samples are taken from the map stock held by the 5th Army northwest of Verdun. The extract on the *left* is part of a basic monochrome map at 1:25,000. On the *right* is the same map showing military positions. German lines are shown in *blue*, enemy lines in *red*. The buildings of Ornes have been deleted because, apparently, the village had been destroyed. Even though the 1 km grid lines have been retained, the symbols have been changed to reflect a different system (N.a. 1916)

Against this backdrop it is understandable that in 1914/1915 each army in the west was forced to develop its own coordinate reference system. For this reason the creation of a comprehensive and integrated image of the front was not possible (Eckert 1925, pp. 775–782). Boelcke could do nothing to change this when he was appointed *Kriegsvermessungschef* in July 1915 as he was not in a position to force the high commanders of the various armies to agree on a uniform scheme of grid coordinates (Boelcke 1920b, p. 8). People were apparently still convinced that the war would not last long enough to warrant such an effort. The best that could be done, was to agree on some common ground in the imprinted grids: the grid lines were to be uniformly set 1 km apart, with alpha-numeric identifiers in the margins so that reports could be located with reasonable accuracy (see Fig. 13).

Then, in the 6th Army, under the direction of Max Eckert, brown overprinting for elevated areas was added to maps at a scale of 1:80,000. With valleys shown in green and elevated areas shown in brown, the maps were much easier to read for cartographically untrained soldiers (see Fig. 17; Eckert 1925, p. 789) (Fig. 15).

It was not until 1917/1918 that an attempt was made to create a coherent map of the entire western front at a scale of 1:100,000 (see Fig. 18). The basis for this effort was a reduction of the “Carte de France 1:80,000.” This task was taken over by the revived *Preußische Landesaufnahme* in Berlin which incorporated the French cartographic work into the system used for the German General Staff map series 1:100,000. Plans were also made for a map series of the front at a scale of 1:25,000, and it was created using Gauß-Krüger coordinates. This work was, however, never completed and it was not until World War II that a corresponding German army grid was developed.

Fig. 13 An extract from an artillery observation map of the region west of Verdun showing an unusual printing notation. The map was produced by the *Kart. Abt. der Landesaufnahme* in 1912. Of course, this notation only refers to the basic *black* and *white* map. The coloured imprint was added in 1917 by a Bavarian survey unit. It is an example of German spy activity, which concentrated on the fortification belt in eastern France, but did not extend its coverage into the northeastern area of the country

Fig. 14 The 4th Army at Ypres could draw upon existing Belgian maps. The extract shows a trench map on a scale of 1:20,000. The 1 km grid lines indicate the use of a coordinate system designed specifically for army use. Upon examination of the index map, however, it is evident that the scale of 1:20,000 was still much too small for accurate operation planning at the front

Fig. 15 During the early years of the war basic "Leerkarten" had no coloured areas. Later, valleys began to be overprinted in *green*. The extract shown is at a scale of 1:80,000

Even more significant was the achievement of introducing multi-coloured depictions of elevation on maps at a scale of 1:25,000. Green and brown were each divided into three levels, thereby creating a three-dimensional coloured (*farbenplastische*) map (see Fig. 17). In this case too, it proved difficult to achieve a uniform method of representation. As in other areas, decisions were made on a pragmatic basis, and almost every army had its own system for designating elevations (see Fig. 19 and 21; Eckert 1925, p. 789).

In March 1917, at the time of the withdrawal to the "Siegfried-Stellung" (referred to in the British literature as the "Hindenburg Line") a multi-coloured map of northeastern France at a scale of 1:50,000 was created which included the areas west of the front. Millions of copies were printed and used as a guide for the attempted break-through battles in the spring of 1918 (Boelcke 1920b, p. 9; Jochim 1930). No one wanted to relive the disaster of 1914 when, standing on the banks of the Marne, no adequate map material was available.

While the validity of the data of the reprinted maps of Western Europe was apparently trusted, the Russian map material of the eastern front was treated with more skepticism. Berlin had therefore already decided before the war to expand the German general staff map (1:100,000) eastwards to encompass what was then Russian

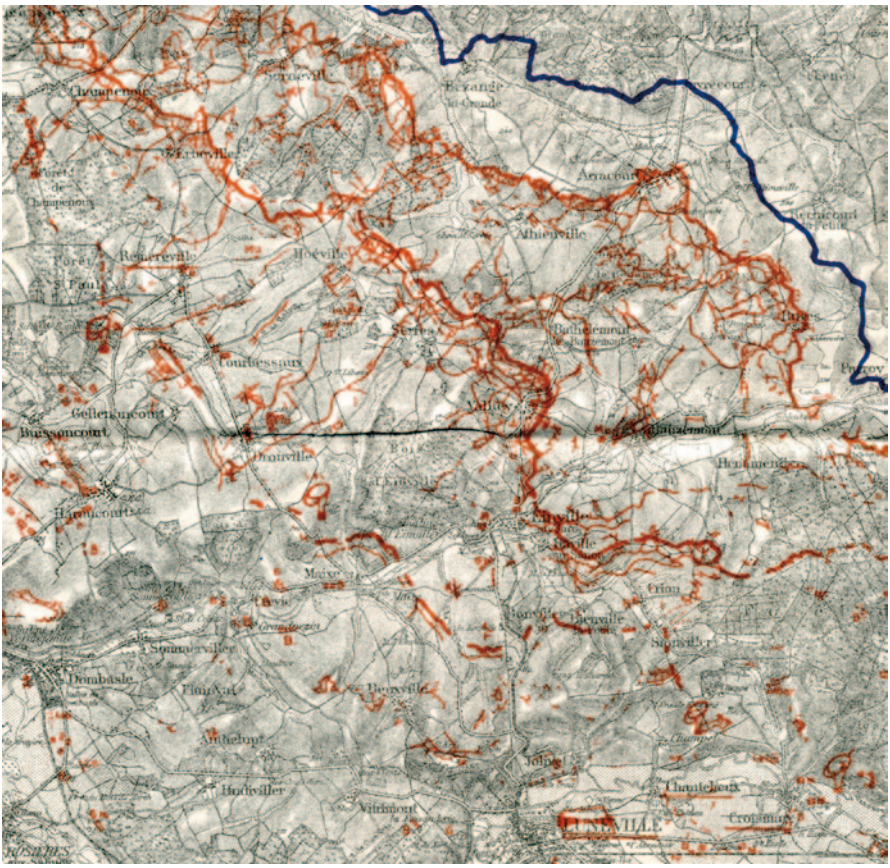


Fig. 16 Detailed depictions of Allied positions were printed in *red* on the map series of 1:100,000. Not only were the trenches indicated, also the infrastructure of the area behind the lines was shown, including the locations of airfields and observation balloons. In contrast, the German lines were only roughly indicated in *blue*

Poland and the Baltic area. This map, entitled "Karte des westlichen Russlands" (Map of Western Russia) included all regions up to the area just east of Minsk.

The *Kartographische Abt. der Preuß. Landesaufnahme* had produced the map series since 1897, relying on both Russian and Austrian maps. From August 1914 onwards, large map sheets were created by amalgamating nine individual sheets. From 1915 onwards, most of these large sheets were printed by the Deputy General Staff in Berlin. For the remainder of western Russian territory the "Drei-Werst-Blätter" (Three-Verst sheets) at a scale of 1:126,000 were reprinted.

Overall, the military campaigns on the eastern front moved in phases, especially in Poland and the Baltic. To support actions there the survey sections produced large area maps. Thus, for example, maps were created for Kurland (Courland) and Livland (Livonia) at a scale of 1:50,000. This illustrated the special strategic interest in

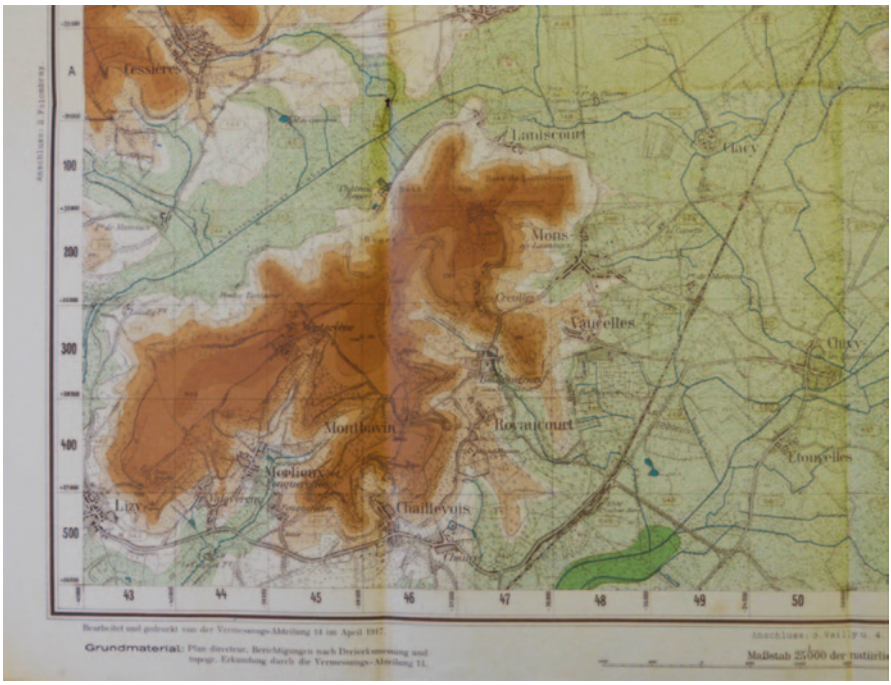


Fig. 17 With great energy and determination the surveying sections sought to make their maps more informative and easier to read. Sometimes they were able—as seen here—to use a basic monochrome French map (*plan directeur*) as a basis. This is an extract of a 1917 map by the 7th army of the Laon region. Although designed and printed in the field, behind the front, it shows the most advanced cartographic method of depicting contours using 14 colors to indicate elevations, at a scale of 1:25,000

the Baltic region where there was a significant German heritage and estate-owning elite. As in the West, where the fighting evolved into trench warfare (as for example on the Daugava front near Riga), situation maps were created at a scale of 1:25,000. In addition, a part of this area was covered by an "Übersichtskarte der 8. Armee" (General Survey Map, 8th Army). All of these maps were based on updated Russian map material.

While the maps of the Baltic were reworked to scales normally used for German maps, the same was not true for the reprinted Russian "3-Werst-Karte" (Three-Verst map), drawn at a scale of 1:126,000. In essence, the *Kartographische Abteilung des Stellvertretenden Generalstabes* did not do much more than transcribe place names.

At first there were no maps available to cover the Macedonian front in the Balkans. For this area a completely new map series at a scale of 1:25,000 was created under the guidance of Curt Treitschke, using state-of-the-art stereophotography. "Numerous photographic units using the very good portable "Kammern" (cameras) made by Zeiss continuously explored the desolate wastelands. The photographic plates were then shipped back to Germany via the Orient Express, where they were

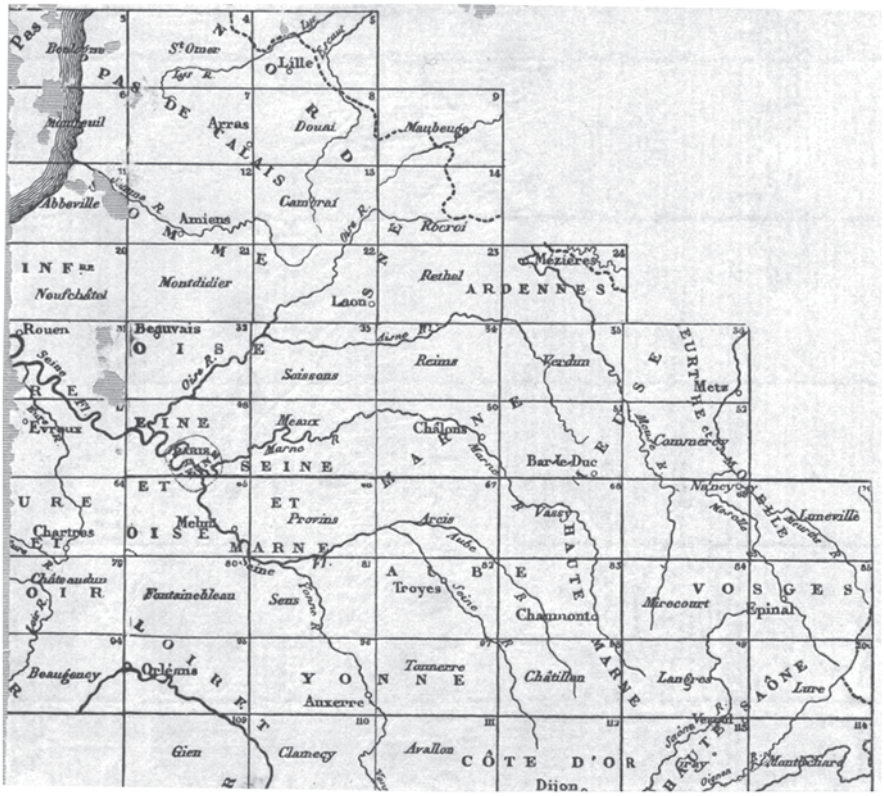


Fig. 18 The index map of the 100,000-series shows 55 sheets

overlaid with contour lines using professional cartographers who were familiar with the areas" (Boelcke 1921a, p. 123).

2.3 Specialty Maps

In addition to general topographic maps, a number of specialty maps were developed over the years. From the beginning there were maps at a scale of 1:300,000 which showed the telephone lines to be used in enemy territory. Later, in times of positional warfare, there was a demand for geological maps for deploying mines (N.a. 1918a). As a result departments of War Geology were set up within military survey units (Albrecht 1969, p. 10). Hydrology and geology maps were also important in supporting the efforts to supply the troops with potable water. In the end a multitude of specialty maps were developed. Albrecht (1969, p. 46) lists no fewer than 19. Some of the more significant ones were:

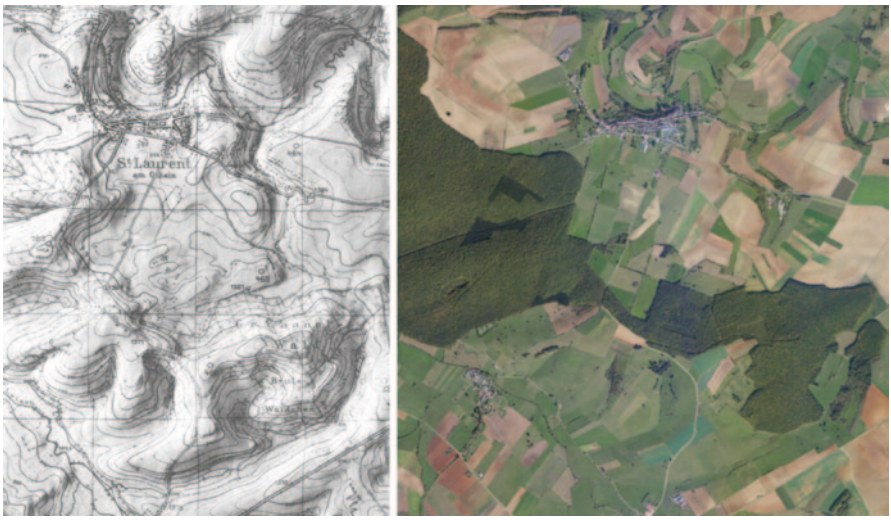


Fig. 19 In the course of the war the demands for tactical engagement maps steadily increased. It was therefore decided that for certain specific areas plaster relief maps of 1:25,000 would be created. These models were then illuminated at an angle and photographed, and topographic details such as streets and houses then added. Finally, contour lines were drawn, not only to achieve a three-dimensional-like representation, but also to add exact elevation data. How important that was, can be seen upon comparison with modern satellite images. The features of the area may be recognizable in the photograph, but the contour lines cannot be determined from it. In World War I this would remain a major problem of aerial maps until the advent of stereophotography

- Artillery observation maps (1:25,000), showing locations of enemy positions.
- General survey map (1:80,000) for German long-range artillery, showing locations of targets.
- Battery plans (1:25,000) with firing plans for each German artillery piece.
- Maps (1:25,000) showing trigonometric locations of specific objects.
- Infantry and artillery location maps (1:25,000) with pre-printed forms for messages.
- Sight-line maps showing areas of the terrain which could not be seen from enemy observation balloons.
- Maps of military storage sites showing storage capacities.
- Wartime logistics maps (1:80,000) showing locations of purposely built military logistics facilities (bakeries, vehicle parking areas, warehouses etc.).
- Transportation maps showing railway connections, landing fields for aircraft, and automobile road networks, etc.
- Charts for aircraft pilots also played a special role. Please refer to the other article “The eye of the army” of the author in this volume.

In addition, starting from 1917, there was a degree of co-operation between the *Stellvertretender Generalstab* and the reconstituted *Preußischer Landesaufnahme* in Berlin. The maps produced in Berlin were primarily of a small scale, usually

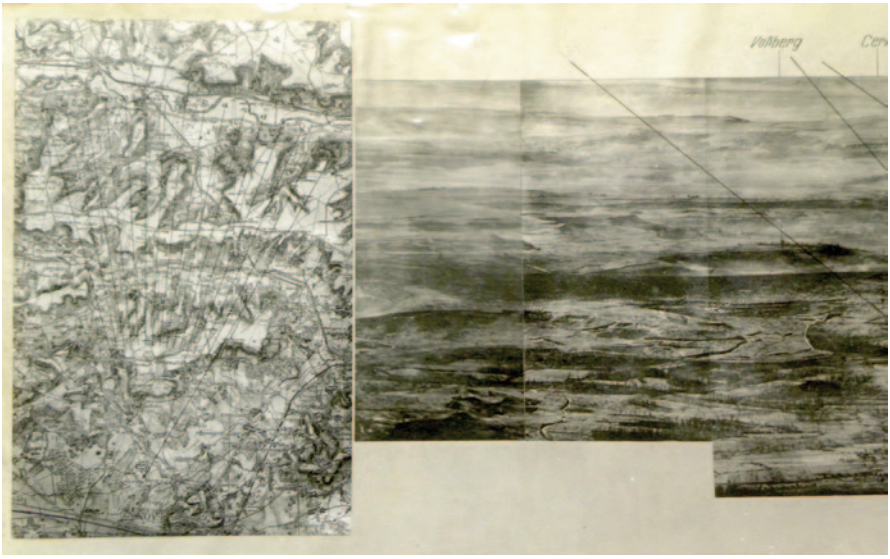


Fig. 20 Extract taken from a panoramic image. The picture extends a full 60 cm further to the *right*. The map, which has been affixed on the *left* (at a scale of 1:100,000), shows the location of the camera and the perspective lines corresponding to the image (Courtesy of the Staatsbibliothek zu Berlin, Map Collection)

1:300,000 or smaller. Berlin, as well as the larger stationary army printing units such as the *Planabteilung Metz* (Metz map depot) (see Fig. 5), also delivered the so-called "Leerblätter" to the field installations. These maps "contained simple, lightly printed, mostly monochrome grid lines and contour information (see Figs. 12 and 19). As a rule they were not fit to use until buildings, roads, geological features and other details had been added in color" (Boelcke 1920b, p. 9). These "Leerblätter" which are generally difficult to recognize mostly lack margins and labels.

Another unique instrument was the "Rundbild" (panoramic image) (see Fig. 20). They were taken from balloons and encompassed an entire horizon line (Neumann 1920, p. 166). A corresponding extract from a map of the area was affixed to the margin of the photograph so that the map and the image supplemented each other. These images demanded first class equipment of the highest precision and personnel who had been specially trained in heliography. They were initially only made, developed or printed only at a heliographic printing facility in Berlin (Boelcke 1920b, p. 9), but later a second such printing installation was established in the citadel at Mézières (Albrecht 1969, p. 34).

In addition, each army headquarters had large relief maps made of plaster for their section of the front (see Fig. 23). These models measured 4×2 m at a scale of 1:25,000 and were mounted vertically. It is almost certain that none of these 3-D models have survived. In special circumstances three-dimensional relief maps of particular sections of the front could be created which made it possible to take advantage of the protection offered by hilly terrain. The maps could be photographed

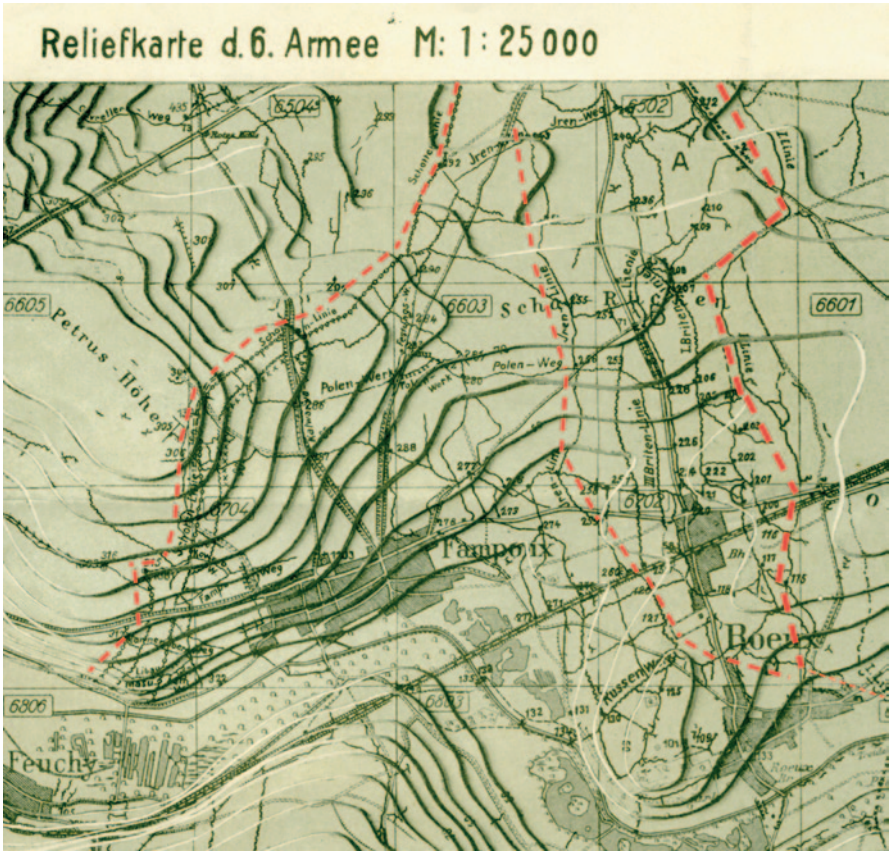


Fig. 21 The use of the relief technique varied and each army developed its own style. Within the 6th Army the terrain was reproduced by putting together thin sheets of wood whose thickness was determined by the contours of the terrain ("Stufenrelief"—step relief). The resulting model was then photographed using slanted illumination from the west. Next, topographic elements were imprinted on the image. Special attention was given to the location of the deployed lines. The British lines in this monochrome print are difficult to discern. For this reason they were highlighted by the author with *dashes* (1st British Position, Irish Line, and further to the *left* the Scottish Line). The German position was further to the east, outside the area depicted here. Note the numbered 1 km *grid lines*, which have been added. The Bavarian *Feldlichtdruckerei 4* (Field Printing Facility 4) did the printing in the hinterland of the front

using slanted lighting and the images were then copied and reproduced. The relief maps were welcomed with enthusiasm by the troops and following the war, Karl Wenschow (1884–1947), one of the professionals involved in making these maps, expanded the process for civilian use (Eckert 1925, pp. 797–798).

The German war effort was not limited to a two-front conflict in West and East. Over the years, new fronts developed in northern Italy, the Balkans and in the Middle East. To maintain a strategic overview of the situation the "*Kartographische Abteilung des Stellvertretenden Generalstabes der Armee*" in 1914 began working

on a general survey map series at a scale of 1:800,000. During the war this map was referred to simply as "Operationskarte" (operational map) and was classified as "Nur für den Dienstgebrauch" (For Official Use Only). By 1920 some 80 sheets had been produced covering the entire theatre of war from Ireland to western Iran.

In addition, in 1917 a special "Wegekarte von Westrussland" (road map of Western Russia) was created on the basis of this map. It not only indicated which roads were fortified, but also contained notations indicating the surface conditions of the land, which facilitated the mobility of troops across areas in which there were no roads.

Whenever troops were transferred from Germany to South(east)ern Europe and the Near East in order to stabilise the front lines of German allies, aviation units and survey units often accompanied them in order to support the effective use of artillery. This was an indication that the cartographic material needed for the creation of firing plans was often less adequate than on the western and eastern fronts.

3 The Balkans, Middle East and Africa

3.1 Military Map Making in the Austro-Hungarian Double Monarchy

In principle, Germany should have had limited its military activities to the western front and, on the eastern front, to Poland and the Baltic area. But when in 1914 the extensive yet weak Austria-Hungary failed to conquer small Serbia, and the Russians seized Galicia (or Halychyna, a region in modern-day Poland and Ukraine) and reached the Carpathian mountain passes, ready to invade the plains of Hungary, the German high command quickly came to the conclusion that their ally needed immediately help. In the years that followed, German troops again and again were called upon to provide "corset stays" to stabilise the fronts. As a result the "k.u.k. Monarchie" (Imperial and Royal Monarchy) was quickly reduced to the role of junior partner in the war as the Germans insisted on having the overall command. This situation was also reflected in the maps of this area. The Germans used Austrian map material, but improved and expanded it where necessary. This was true for the entire area of the Balkans, where local map resources were lacking as there were no reliable large scale maps of Bulgaria (another German ally) produced before the war.

The situation in Austria-Hungary differed from the one in Germany in that there had been a number of battles within Austro-Hungarian territory which made adequate map material available. The *Militärgeographisches Institut* (Military Geographical Institute) in Vienna had also estimated the Balkans to be a region into which the war could potentially expand, and had therefore made every effort to develop their map coverage of that area, using also Russian drawings. however, This material ultimately proved to be of little use as it was often imprecise and inaccurate for modern warfare.

Similar to what had happened in Germany, large parts of the Viennese *Militärgeographisches Institut* were dissolved at the outbreak of the war and its personnel reassigned to regular field units. The rump institute concentrated on the printing of maps that were already available and altogether some 65 million sheets were printed (Mühlberger 1929/1930, pp. 208–209). This comparatively small number of printed sheets was an indication that for the army of Austro-Hungary, map production played a much less important role than it did in Germany.

Following the outbreak of hostilities, it soon became clear that the Austro-Hungarian forces were not adequately prepared in terms of either their survey technology or their cartography. As a result, in early 1914 they created a *Kriegsphotogrammeterabteilung* (Wartime Photogrammetry Section) and, in the spring of 1915, three *Kriegsmappierungsabteilungen* (Wartime Survey Sections) and a *Photokartographenabteilung* (Photo Cartography Section). In September 1915 they introduced a comprehensive new organization of wartime mapping activities following the pattern used by the German army and renaming the result the *k.u.k. Kriegsvermessungswesen* (Imperial and Royal Wartime Survey). Hubert Ginzel (1874–1950), an officer of the General Staff Corps, was chosen as commandant of this new organization. He was later promoted to the rank of colonel and held this position until the end of the war. (Mokre 2013, p. 51)

During the war, the work of the Austro-Hungarian Survey concentrated on three priorities: the printing of maps needed at the front, continuous improvement of map material, and new topographic mapping of the occupied foreign territories in the Balkans which had not previously been possible (Ginzel 1921, pp. 130–131).

For Austria-Hungary itself maps were available at a scale of 1:25,000. However, in contrast to Germany these maps were only at hand as original drawings, not as prints. When the troops needed them at several front lines, the sheets first had to be prepared for printing and then repeatedly updated. In some cases even three-dimensional reliefs were added (see Fig. 23).

There was an "Operationskarte 1:400,000" (Operational Series 1:400,000) which was restricted to military use only. In addition a program was developed that included a variety of sheets, some of which were at scales of 1:10,000 and 1:5000 (Ginzel 1921, pp. 132–138).

In contrast to the western front, the warfare on the front lines with Russia and Romania was a war of movement, which went through several lengthy phases. Small-scale maps were available for use in those areas, including a "Spezialkarte 1:75,000" (Special Map 1:75,000). This military mapping effort had already created some 714 sheets by 1888 (Mühlberger 1929/1930, p. 203) and was expanded to 805 sheets following the occupation of Bosnia and Herzegovina. Since this set of maps also included all of Galicia, it offered a certain amount of support for the troops at the Russian front. However, it had a number of disadvantages as it was in many ways obsolete. It had no contours and was printed in black and white, which made it difficult to read in mountainous areas (Mühlberger 1929/1930, p. 205).

In 1916, following the occupation of Serbia, several *Kriegsmappierungsabteilungen* (Wartime Mapping Sections) were established in Vienna. "Within two years (1916/1918) some 63,000 km^2 of Serbia and Albania were geodetically and

Fig. 22 Extract from a sheet of the Austrian General Survey Map 1:200,000 showing a well-designed four-color image (junction of the San and Weichsel Rivers near the Russo-Polish border). A hand-drawn *yellow line* indicates the border itself. Although the overall appearance of the map is appealing, the cartographic quality of areas outside Austrian territory was definitely poor, a fact which led to many military difficulties, especially in the southern Balkans

topographically mapped with exemplary quality, in many cases with the use of stereophotogrammetry. These images formed the basis upon which wartime mappers produced the original drawings for a multi-colored special map at a scale of 1:75,000, which was then copied by the *Militärgeographisches Institut*…. Unfortunately part of the mappers' valuable work was lost with the collapse of the front (in 1918) and has not been seen again" (Mühlberger 1929/1930, p. 209).

A "Generalkarte von Mitteleuropa 1:200,000" (General Map of Central Europe 1:200,000) (see Fig. 22) was initially intended for use by higher staff levels to provide direction to the troops. Just as the German army had learned that aerial reconnaissance was essential, this one was also given a make-over as an aerial chart. "Later, in peacetime, as studies were undertaken concerning the development of flight charts, it became evident that as flying evolved, flight charts could be made simpler. This led to limiting the flight version of the general map to heavy emphasis

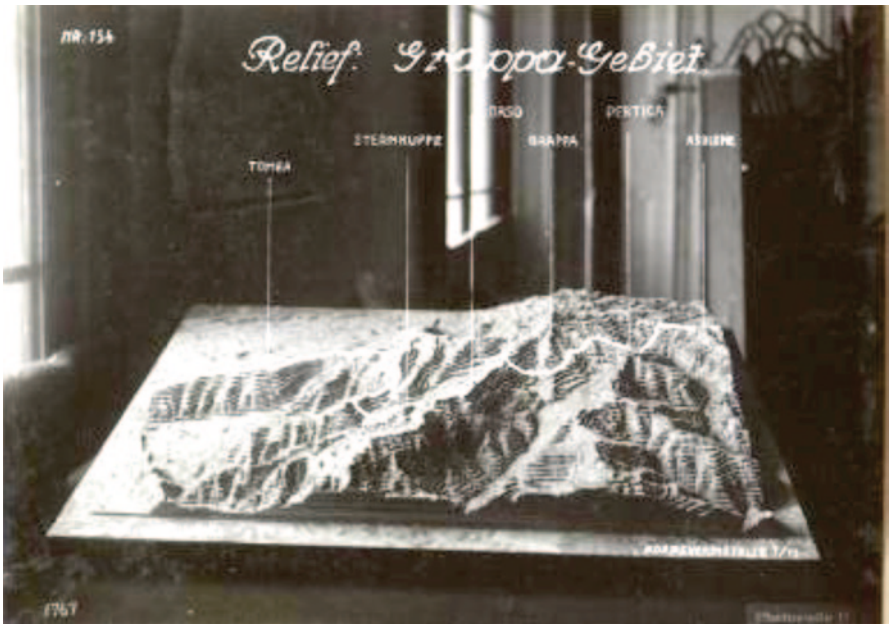


Fig. 23 The Austro-Hungarian surveying units too used terraced three-dimensional relief models for especially difficult mountainous terrain. Shown here is the Grappa-Massif, which the Italians made into a cornerstone of their defenses. It was here that the Austrians and the Germans tried to make a breakthrough in December 1917 during the first battle of Piave in a drive towards Venice. The line marking the extent of their advance is shown in *white*. Following the second battle of Piave in June 1918 the Grappa Massif continued to be in the center of major fighting that continued until the end of the war. (Courtesy of Europeana)

on wooded areas using a soft green color and areas of water using a dark blue, together with spot elevations in mountainous areas printed in red and, on some sheets, red lines to highlight the road network" (Ginzel 1921, p. 134).

It is interesting that in both Germany and Austro-Hungary flight charts were created using the same scale. As a comparison of these charts has not been possible thus far it is impossible to say whether this was due to a co-operative effort.

There are very few examples of joint cartographic ventures between the Germany and Austria. One such involved the Berlin cartographers sharing with the *Militärgeographische Institut* in Vienna sheets of the map "Westliches Russland 1:100,000" (Western Russia 1:100,000) from which Vienna could, through enlargement to 1:75,000, create their own maps of the eastern areas (Ginzel 1921, p. 133). Sheets from a German map in 1:400,000, which had been produced by the German survey sections, were also reprinted. In return, Vienna gave the German troops a stock of some 2 million Austrian maps of the Balkans which they had acquired following the conquest of Romania, and which they continued to augment (Ginzel 1921, p. 131). The Germans were, however, still not content. Writing in 1921, Boelcke maintained that these old Austro-Hungarian maps were not useful, especially in the Carpathian Mountains, and needed to be completely replaced

(Boelcke 1921a, p. 121). In his opinion: "German troops needed German maps. Indeed, they could read the Austrian works, but essential elements of German military maps were missing, in particular the grid lines which formed a network with a 1 km mesh. As a result, the work of the royal and imperial survey troops was scarcely good enough even for their own army" (Boelcke 1921a, p. 120).

An example from the Alpine front: "When at the end of September 1917 the 14th German army in the Save valley […] attempted to determine what was known about the terrain and the enemy positions for use in planning their offensive, it became apparent that the Austrian maps of the Julian Alps […] which they had were not adequate. All that was available was a map at a scale of 1:200,000, which, while barely adequate on the level of a flat plain, would hardly satisfy a tourist in the mountains. […] It fell to the leadership of the aviation units assigned to the German army to help out in this difficult situation. […] They were able to quickly photograph the areas on both sides of the front. […] On the basis of the improved maps that were then made, it was possible to make timely disposition of the forward artillery for the attack, as well as to assign targets to the individual batteries, guided by observation aircraft" (Neumann 1920, pp. 514–515).

Overall, it would appear that the relationship between the chiefs of the Austrian and German wartime survey units were not very co-operative. Each side was proud of its own achievements and thought little of the other's, and one misses words of thanks for whatever co-operation there was. Instead one can find notable examples of duplicative mapmaking efforts even as far away as the Middle East.

3.2 Military Map Making in the Middle East

At the end of October 1914 the Ottoman Empire entered the war on the side of the Central Powers. The Turks seek participation and support in various technological areas. These interests could be seen prior to the war in the planning and construction of the Berlin to Baghdad railway, but they also included military assistance (Mühlmann 1927, pp. 13–42).

Turkey fought on four fronts: against the western allies on the Dardanelles (Gallipolli), against the Russians in the Caucasus, against the British in Mesopotamia, and on the Suez Canal (see Fig. 24), and German troops and cartographers were often present on each of these fronts.

Along with the first German troops, survey technicians were also sent to Turkey. In Mesopotamia Prof. (Albert) Tafel (1877–1935) began the cartographic mapping of the course of the Euphrates River while in the Turkish-Egyptian border area. Capt. (Hans) von Ramsay (1862–1938) undertook the first preliminary work for cartographic imaging of the area. In Baghdad and Erzurum German mapping units were created. (Holzhausen 1937, p. 166)

The material created by these efforts was processed at the *Stellvertretende Gene-ral-stab* in Berlin. In 1915 a short "Kurze militärgeographische Beschreibung von Mesopotamien" (Brief Military Geographical Description of Mesopotamia) and

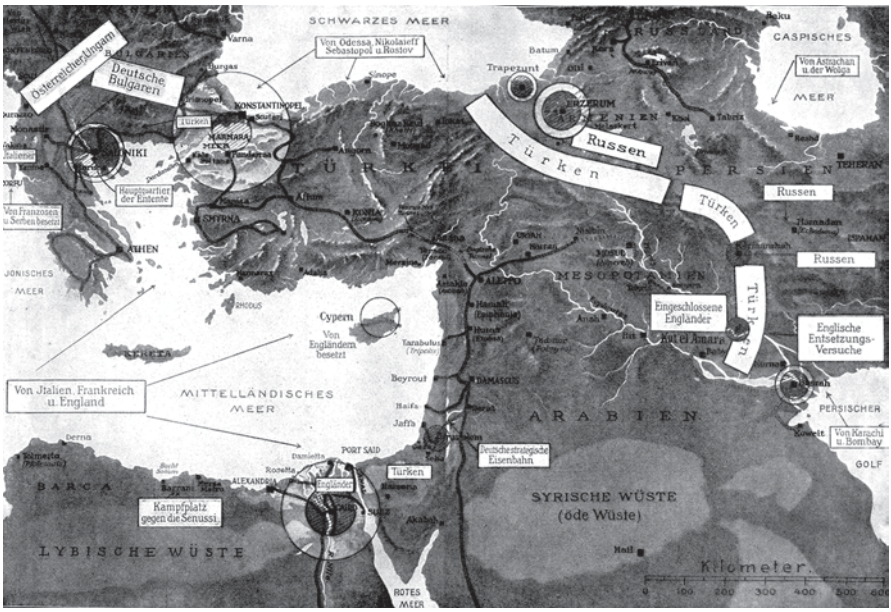


Fig. 24 This map dating from the first half of 1916 was based on British intelligence. It gives an overview of the strategic situation in the Middle East. The importance of the railway lines is clearly emphasized

a "Karte von Mesopotamien in 1:400,000" (Map of Mesopotamia on 1:400,000), which was intended to comprise 24 sheets, were put into production. By the fall of 1917, 11 of these sheets had been published (Uhlig 1917, p. 102). The work was continued until February 1918 when the plan was altered to produce a total of 29 sheets. How many of these sheets were actually completed has yet to be investigated (see Fig. 25).

Parallel to these developments the idea arose of a spectacular attack by German and Turkish troops on the Suez Canal (see Fig. 27) which was controlled by the British. In preparation for this offensive, Turkish and German personnel undertook a joint exploration of the Sinai with special emphasis on identifying sources of water which the troops would be able to use. Included in this effort were a number of water diviners. After several months marching through the desert this water divining expedition actually reached Ismailia on the Suez Canal on February the 6th, 1916 (N.a. 1989, p. 72). Cartographic support for this project was presumably the British map "Eastern Turkey in Asia, 1:250,000" which was published in 1901 by the *Intelligence Division, War Office* in London (GSGS 1522).

On the basis of the British map and the information provided by the exploratory expedition, the *Kartographische Abteilung des stellvertretenden Generalstabs der Armee* (Cartographic department of the deputy general staff of the army) in Berlin "at the request of the Turkish Ministry of War" produced a "Karte des Türkisch-Ägyptischen Grenzgebietes (Vorläufige Ausgabe)" (map of the Turkish-

Fig. 25 This index map from 1918 shows how eager Berlin was to continue their cartographic work in preparation for the conquest of the Middle East despite the realities on the front. One has to remember that in the summer of 1918 a German expedition was sent to Georgia

Egyptian border area (Preliminary Version)) in 1915/1916 at a scale of 1:250,000 (see Fig. 26). It was classified as "Nur für den Dienstgebrauch" (For Official Use Only) and contained notations in both German and Turkish (the latter in Arabic script). The map comprised four sheets. It covered the area from the mouth of the Jordan River at the Dead Sea in the north to the Gulf of Aqaba in the south. Parallel with this effort, a map of the Suez Canal at a scale of 1:200,000 was produced by the *Militärgeographische Institut* in Vienna (Ginzel 1921, p. 135) to aid a small contingent of troops with light howitzers which the Austro-Hungarians had provided (N.a. 1915, 1916). Why there was not more adequate consultation on cartographic matters between Berlin and Vienna with regard to this area remains a mystery.

The attempt to seize the Suez Canal failed, and by 1917 it proved impossible to keep control of Baghdad as well. The German forces sought to maintain at least the Palestinian front, and a joint German-Turkish army group called *Ildirim* ("lightning") was formed (Steuber 1924). It was accompanied by a modern support unit called *Vermessungsabteilung 27* (Surveying Sect. 27) which had been newly created by Berlin and which published a "Kurze Militärgeographische Beschreibung von Palästina" (Short Military Geographical Description of Palestine) (N.a. 1917).

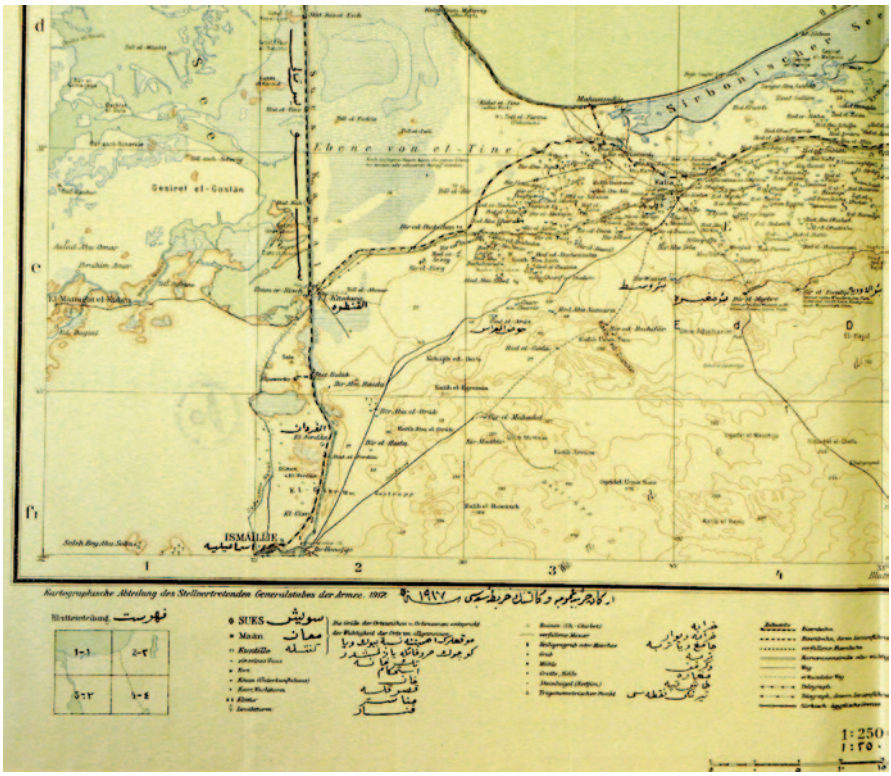


Fig. 26 An extract from the map of the Suez Canal with German and Turkish notations in Arabic characters. (Courtesy of the Staatsbibliothek zu Berlin, Map Collection)

The military was apparently not satisfied with this and also expected the *Vermessungsabteilung 27* to produce maps on a larger scale. In 1937 Holzhausen published a short report which indicated that work on this publication which was badly needed, had begun in September 1917 as there was no German or Turkish material available that could be used by the military. "It was characteristic of the situation that, when the *Ildirim*-Fliegerabteilungen (*Ildirim* pilot sections) stationed in Aleppo asked for maps of the Gaza front at the beginning of the operation, not a single map of Palestine was provided" (Holzhausen 1937, p. 167).

Although there was a map of the Ottoman-Egyptian border area, no useful cartographic documentation for Palestine itself was available and the German troops had to make do with copies of old British maps until finally more up-to-date information was obtained from captured sheets of the British General Staff Map at a scale of 1:250,000. From this material two sheets entitled "Palästina Südlicher Teil (Samaria)" and "Palästina Nördlicher Teil (Galiläa)" (Palestine Southern Part (Samaria) and Palestine Northern Part (Galilee)) were published in mid-December 1917 (Holzhausen 1937, p. 170).

The situation improved in 1916 with the discovery in Haifa of a copy of the British *Palestine Explorations Funds* map at a scale of 1:63,300 in 26 sheets (Chasseaud 2013, pp. 99–100). This map was enlarged to a scale of 1:50,000 and by

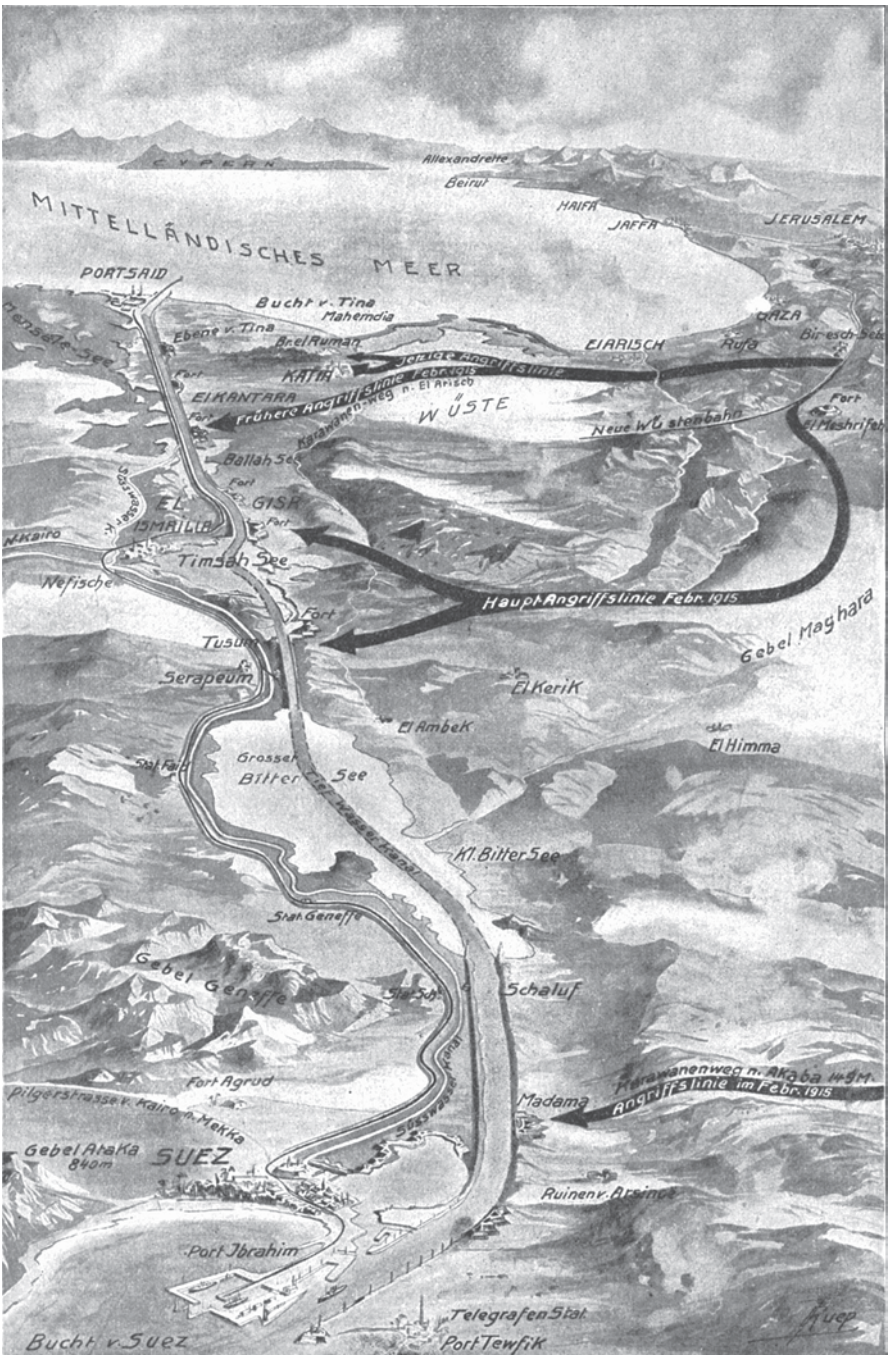


Fig. 27 At that time so-called "Vogelschaukarten" (bird's eye view maps) were a highly valued means of orientation. They were important, not so much for operational purposes as for the psychological element in the conduct of the war. This image shows the planned attack by Ottoman troops on the Suez Canal in February 1915. This example demonstrates how important maps were in areas other than direct military operations. The German High Command had long been aware that there was also a home front, which needed to be supported

the middle of February 1917, 39 sheets covering Palestine (including areas east of the Jordan) had been printed and distributed to the troops. Additional maps of Syria followed later (7 sheets on a scale of 1:25,000, and 1 map on a scale of 1:100,000) (Holzhausen 1937, p. 171).

Assistance towards this effort was provided by the Bavarian *Fliegerabteilung 304*, (Flying Sect. 304) which produced numerous aerial photographs. Today there are some 2872 glass plates of cities and rural areas in Palestine in the Bayerische Hauptstaatsarchiv*, Abt. IV* (Bavarian Main Archives, Sec. IV Bavarian War Archives) in Munich. The scientific examination of this war relict proves important today for the assessment of the status of early twentieth century aerial archaeology in a landscape that has since changed dramatically. The aerial reconnaissance troops created their own sketch images at a scale of 1:100,000 of the areas where they were flying. These sketches were then assembled during week-long sessions of detailed work (Neumann 1920, p. 527). Strictly speaking the *Vermessungsabteilung 27* (Surveying Sect. 27) should have been responsible for this work, but they were elsewhere employed.

In the spring of 1918 work had begun on the creation of "Stellungskarten 1:25.000" (tactical maps at a scale of 1:25,000) for the moving front. By the fall of 1918 seven of these sheets had been completed (Holzhausen 1937, p. 172). They are characteristic for the way in which the survey sections operated under wartime conditions: improvisation, use of captured maps and aerial photographs and the tendency to make maps in ever larger scales, were predominant. With the acceleration of the withdrawal at the end of September 1918 all the remaining map material was burned (Holzhausen 1937, p. 175).

On the Turkish side three further fronts were of special cartographic interest: the Dardanelles, the Caucasus, and Persia. On the Dardanelles front the Turkish forces used maps at a scale of 1:25,000 (see Fig. 28). Some of these fell into British hands who used them to make their own maps (Chasseaud 2013, pp. 76–77). Interestingly, the relationship was in some cases reciprocal as the Central Powers had maps which they had reprinted from British maps (see Fig. 29): "Beginning with the copying of English maps, excellent map material covering the Dardanelles theater was created with both Turkish and German notations. Because of the lack of accurate documentation for the rest of the Turkish areas, the domestic Turkish units had to make do with small-scale general survey maps. Between these maps, which had "Operationskarte des Orients 1:800,000" (Operational Map of the Middle East at a scale of 1:800,000) imprinted, and the large scale maps of local conflict areas, which were created at the front, there was a huge gap" (Holzhausen 1937, p. 167).

It remains to be investigated in what form the Turkish troops acted independently to fill this gap, especially in the Caucasus area. It is possible that they used Russian map material, similar to the way the Germans reproduced so many British maps.

Austrian activities in the Middle East should not go unmentioned, especially those that are related to Alois Musil (1868–1944). Just as Lawrence of Arabia did, Musil sought to win the confidence of the Arab tribes, an effort in which he was successful for a considerable time. Musil became a member of the official Austro-Hungarian mission to the Middle East and produced a number of maps of Arabia

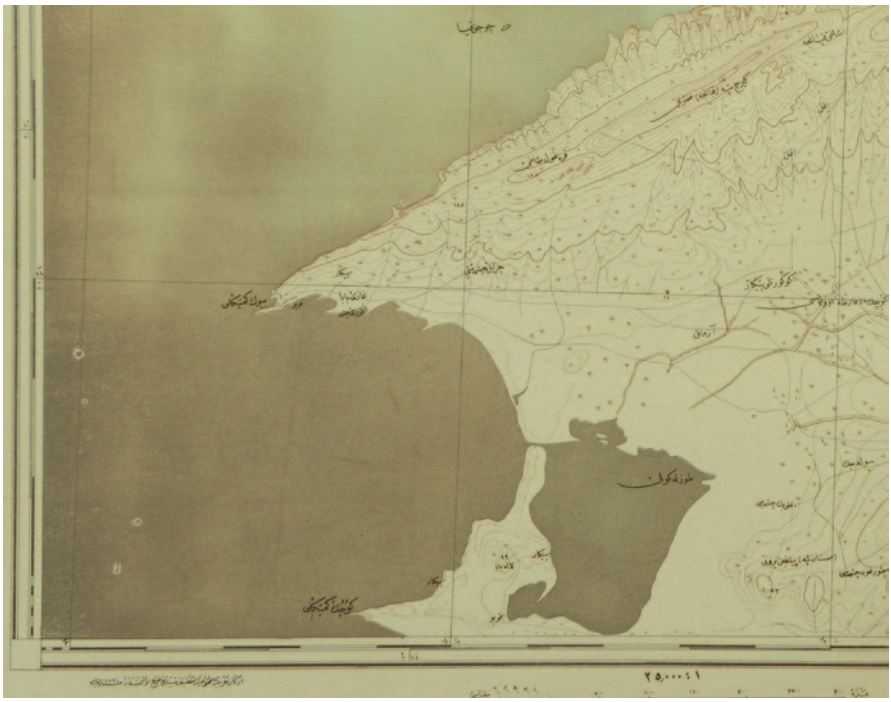


Fig. 28 The Ottoman map of the Dardanelles at a scale of 1:25,000 had a very detailed depiction of elevations. Unfortunately, they were only shown using contour lines. No attempt was made to improve the images through the use of hachures. Notations in Arabic were used to indicate water sources and to mark peaks and valleys. By the end of 1918 the map comprised of 46 sheets. The sheet labeled Anafarta shows the area of the Suvla Bay, where in August 1915 Entente troops, together with ANZAC forces, made a landing. Even though the Ottoman army only had 1500 troops on the Anafarta front, under the command of a Bavarian major, the landing attempt failed. (Courtesy of the Staatsbibliothek zu Berlin, Map Collection)

(Bernleithner 1978, pp. 1–2) Whether they were useful for military purposes remains unclear.

3.3 Military Mapping of Africa

When the war broke out in August 1914 Germany immediately lost contact with its colonial empire. The Pacific islands, Tsingtao in China and Togo were lost to Allied invasions within weeks, South-West Africa by 1915 and the Cameroons by 1916. This meant that the war in the colonies was primarily fought in the protectorate of German East Africa. Beginning in 1896 Richard Kiepert (1846–1915) and Max Moisel (1869–1920) worked on creating a map at a scale 1:300,000. This "Spezial-kar-te von Deutsch-Ostafrika" (Special Map of German East Africa) comprised

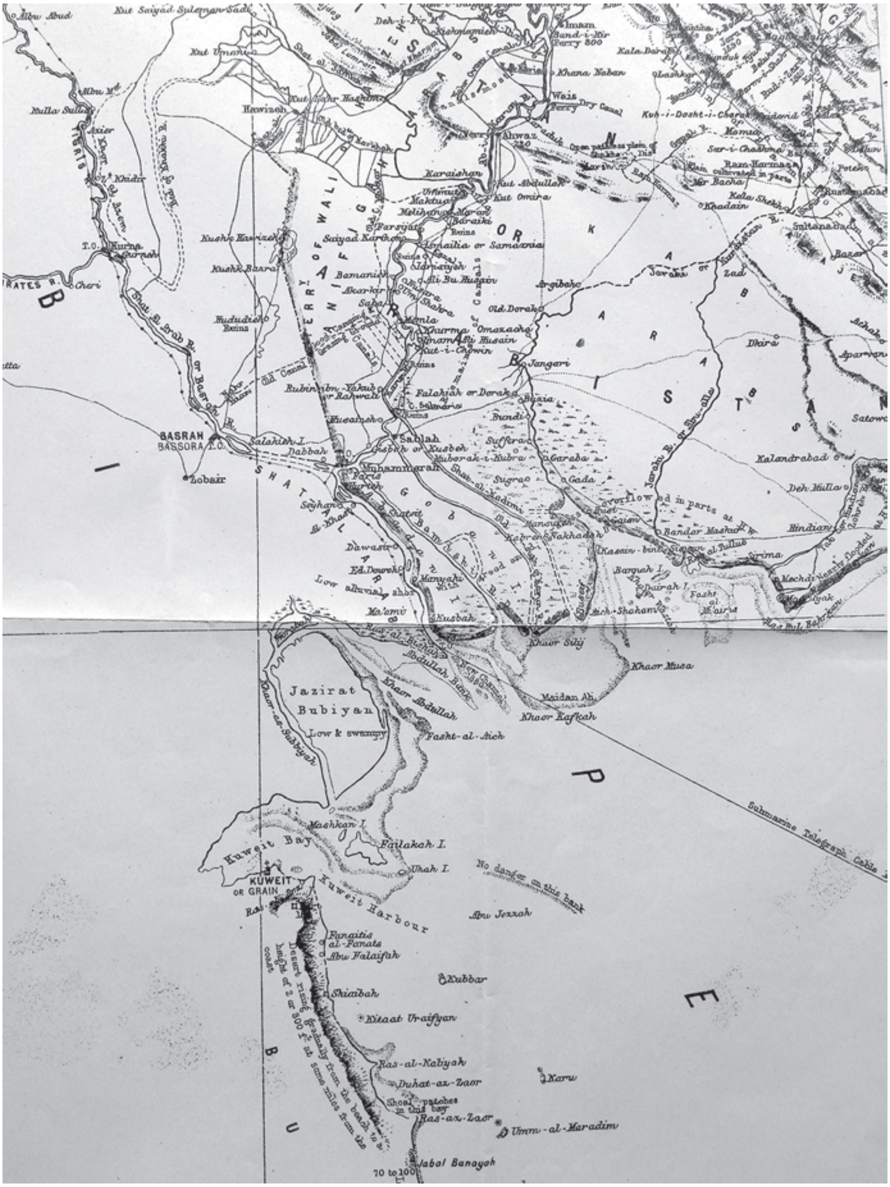


Fig. 29 The German General Staff had far-ranging plans to take the war to Persia, Afghanistan, and India, in order to challenge the British Empire and relieve the pressure on the European fronts. Because no German cartographic material existed for these distant areas, Berlin copied British maps. Shown here is an extract of the map of Persia covering the area from south of Kuwait City north to the Shatt-el-Arab and Basra

of 29 sheets and was completed in 1911. The British had a copy of this map at the scale 1:250,000 (Obst 1921, p. 109). A revised version covering the areas along the railway lines was ready for publication in Berlin when the war broke out (Sprigade and Moisel 1914, p. 541). Although the protectorates had their own survey offices (Sprigade and Moisel 1914, p. 542), it is highly unlikely that they produced any military maps during what was for most of them a rather brief course of the war. In any case the military had their own field survey units: "The defense forces in German East Africa had produced maps that served solely to provide information to the troops as to the locations of water and food supplies and road maps between military installations at a scale of 1:1 million that would serve to indicate the length of time needed to march from one to the other" (Sprigade and Moisel 1914, p. 542). These maps proved to be of unusual importance in the colonial war, and might explain in part why the German forces in East Africa were able to hold out against the British for so long.

3.4 Post-war Versions of Overseas and Western Front Maps

Smaller scale and special maps printed in Germany could still be obtained after the war. Such was the case, for example, with the "Operationskarte 1:800,000" (Operational Map 1:800,000) from which an "Übersichtskarte 1:800,000" (General Survey Map 1:800,000) was created. This 80-sheet survey was still available at the beginning of World War II. It should be noted, however, that updating this series terminated in 1928 (Reichsamt für Landesaufnahme 1931, pp. 277–278).

Until then the *Reichsamt für Landesaufnahme* also continued to offer the "Karte von Mesopotamien und Syrien (vorläufige Ausgabe) 1:400,000" (Map of Mesopotamia and Syria (preliminary version) 1:400,000) in 20 double and 9 half sheets. Three of the double sheets even had Turkish notations (N.a. 1928, p. 17).

Much more noteworthy is the fact that private map sellers continued selling surviving stocks of military maps on the open market. This was especially the case for map material of the western front. The firm *Carl Kuhn Verlag München* for instance offered a "Gelände-Karte von Frankreich (Generalstabskarte) 1:100,000" (Map of the Terrain of France (General Staff Map) 1:100,000). These sheets probably were derived from maps produced for the last German attack of 1918 and was a reduced copy of the "Carte de France 1:80,000." *Theodor Riedel's Buchhandlung and Domina-Verlag* in Munich also sold these maps. They are undated and carry no printing notations, which makes them difficult to identify. One clue to identify post-war prints is the fact that they do not carry a censor's notation on the title sheet. The requirement that such an imprint be included was strictly enforced for all printed materials from mid-1916 until the end of the war. The target audience for these offers were probably former military personnel who had fought in these regions.

4 Conclusion

Altogether, some 1,000,000,000 map sheets were created by all combatant nations involved in World War I. Boelcke estimates that Germany alone accounted for about 800 million (Boelcke 1921b, p. 463). Other estimates put the number at 775 million (Chasseaud 2013, p. 19) or 750 million (Eckert 1925, p. 806). Austria-Hungary produced about 65 million. No numbers are available for Bulgaria and the Ottoman Empire, but it is safe to say that altogether the Central Powers produced some 880 million map sheets.

Far fewer map sheets were created on the Allied side. Peter Chasseaud estimates 34 million for the United Kingdom, 30 million for France and 20 million for Italy. For Russia he sets the total at 320 million (Chasseaud 2013, p. 19). However, this number seems improbably high. It presumably refers to the number of print runs and not the number of map sheets. When we compare it with other data, we believe that 65 million map sheets is a figure consistent with the others, making a total for all the Allied nations of some 150 million.

The Central Powers thus produced almost six times as many maps as the Allies. Since the front lines were of equal length for all parties, and the British, for example, were involved in almost as many fronts as the Germans, there must be other reasons why the militaries of the Central Powers, and of Germany in particular, were so obsessed with maps. What could explain this difference? Four factors could be pointed to:

1. The use of maps is consistent with the desire for **order and regulation** inherent in the German national character. On a good map things are clear and concise. They form an indispensable foundation for planning and organization. Having good maps becomes a measure of a well-organized state and army. Cartography thus contains an element of national identity, something which the states which were brought together to create the German Empire in 1871 were reluctant to forgo.
2. From a military point of view a map is an important aid in the effective conquest, control and defense of territory. At one and the same time it documents a claim to the **achievement of power** and a **promise of its exercise**. In all the wars since 1864 Prussia had recognized the importance of maps in imposing order and enforcing its claims to power. A map was an essential instrument of Prussian, and later Imperial German war efforts: “A good map is half the battle” was a widely accepted slogan. This resulted in a huge demand for maps of all kinds. Without maps it was impossible to wage war in an organized and effective manner. The September 1914 disaster on the Marne was a consequence of an unusual absence of maps. Thereafter, every effort was made to prevent this from happening again. For the sake of security ever-larger numbers of maps were created.
3. The decentralized structure of the German Empire made it difficult to respond rapidly to unexpected developments on the far spread battlefields. Sufficient maps were made available to the troops for the initial phase of the attack in the West. But events moved far faster than had been anticipated, and logistic

arrangements for further map distribution could not be revised quickly enough. The further evolution of the conflict into trench warfare was equally not anticipated. The need for new maps to meet these new requirements was critical and every effort was made to produce them. The result were **numerous map production facilities** immediately behind the front, a development which produced many more maps than even a well-organized centralized production and distribution system could have made and distributed. France and England had centralized facilities from the beginning and hence required far fewer maps to meet their needs.

4. Both the trade blockade imposed by the western allies and the number of superior enemy forces faced by the Central Powers, meant the latter found themselves in a dangerous position. It was essential that they managed to achieve a more efficient use of their resources if they were to get out of this unsustainable situation. This necessity set free huge technical and organizational potential, especially in Germany. This is made evident by the **effectiveness of the German military deployments** in the Middle East and the eastern and southeastern areas of the Danube monarchy, which improved in a way that could not have been achieved merely by an increase in the number of troops. Maps were an essential part of this development. The greater the effort to achieve control, and the more difficult the situation, the more maps were created. The steadily increasing scope of the cartographic work towards the end of the war was more a sign of structural weakness in the organization of the military than it was of superior military leadership.

Because the authority of the administrations and the effectiveness of its wartime leadership were at stake, what began as a small administrative office, completely unprepared both organizationally and technologically to meet the challenges of a major war on foreign soil, gradually grew into a huge bureaucracy. In the course of the war the number of people working in the field of military cartography increased from just 911 to over 10,000. But still there was no unified leadership and central coordination seemed impossible. The short-term demands constantly put forward from the fronts made systematic growth of these facilities difficult. Cartographic resources, which in themselves would have been effective, could never be made available to the troops in an efficient manner and the insistence of the individual components of the structure on maintaining their independent control could never be overcome.

Against this background the achievements that were made, while not decisive for the outcome of the war, were nevertheless astounding:

1. An immense number of maps were produced in the most difficult circumstances and in some cases even updated on a daily basis.
2. Numerous maps were produced for a plethora of special purposes, from large-scale plans to small-scale overview maps: railway maps, flight maps, geological maps, artillery firing plans, maps for long-distance communication troops, for construction units and for furnishing missions by special forces.

3. Huge quantities of quality maps and aerial photographs were printed both at home and at the fronts.
4. The focal point for this work was the territory outside Germany which meant that many foreign maps were not only copied, but also often improved.
5. A very large number of new techniques were developed in a very short time. This was particularly true for aerial reconnaissance, photogrammetry and firing plans for the artillery.

Central to all these efforts was undoubtedly the technological development which occurred in wartime cartography. The pinnacle of that achievement was the contribution of long-distance cartography (Eckert 1925, pp. 784–787) in guiding the German heavy artillery outside Paris in the spring of 1918. It enabled 796 shells to hit the city from a distance of 80 km. To accomplish this, a special firing plan had to be created which even took into account the rotation of the earth. A description of how this was done goes beyond the scope of this paper.

In retrospect one question stands out: how are we to judge technological and scientific achievements that were developed solely in order to wreak destruction and kill human beings, as was the case with the firing on Paris? The entire wartime mapping enterprise had only one goal, and that was to kill more effectively. Ethicists found a way out of this dilemma by declaring that war was legitimate and justified as long as civilians were not attacked. With air raids on cities—begun by the French in 1914 with an attack on Freiburg im Breisgau, a German town just beyond the French border—this boundary had already been breached. Today more than ever in most areas of armed combat it is no longer possible to maintain a distinction between organized uniformed combatants and the civilian population. It becomes apparent how artificial and unrealistic it is to attempt to maintain a separation between acceptable acts of war and unacceptable civilian acts of violence. As we look back on the atrocities of the two World Wars it becomes increasingly difficult to close our eyes to these realities and award the highest military honor, Pour-le-Mérite, the Imperial German equivalent of the Victoria Cross and the Legion d'Honneur, to the trigonometers, the topographers and the cartographers who did this work.

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Jürgen Espenhorst has been researching the cartographic history of Germany for more than 20 years with an emphasis on the time period of 1800–1955. Arguably his most significant contribution to the field is his survey of handatlases produced in the German-speaking areas of Europe (Andree, Stieler, Meyer & Co, 1994/1995 and Petermann's Planet, 2003/2008). In addition, in 2005 he initiated an annual international conference on atlases which aims to offer an exchange platform for connoisseurs of maps and atlases who reside beyond the realms of academia.

Military and Civilian Mapping (ca 1912–1930) of the Great War: A Selective Private Collection (Including Postcards)

Francis Herbert

Abstract Civilian projects or military conflicts will, alongside explanatory texts and statistical tables, initiate graphic sketches – maps/charts – to promote the objectives and to invite comments. The longer a project or conflict lasts the more likely are its source materials to result in a greater quantity and quality, and variety of media and format, adapted for differing 'audiences'. Information and publicity (propaganda included) on the Russo-Japanese War from February 1904, concluded by the Treaty of Portsmouth (Kittery, Maine, USA) on 5 September 1905, was comparatively limited. In contrast, the Great War (afterwards 'First World War'), triggered by the unstable undercurrents of the 1912–1913 Balkan Wars, extended over a period of four and one quarter years. Its post-conflict treaties of 28 June 1919 to 10 August 1920 caused reverberations for another dozen years, exemplified by the quadripartite occupation by Belgium, France, Great Britain and USA of the Rhineland and by plebiscites affecting Germany's peripheries. The period, media and format range in this (mainly British) selective carto-bibliography encompasses military map-reading manuals and training maps, a trench map, 'stand-alone' folding maps commissioned from leading map-makers by newspapers, bird's-eye-view and panorama maps for weekly 'popular' magazines, maps in insurance company year-books and in geographical journals, and ephemera – notably map postcards: *i.e.* items encompassing both civilian and military needs.

To complement the 5th International Symposium of the ICA Commission on the History of Cartography 130 map items, from a much larger private collection, were taken for display at Ghent University. They ranged from Bruckman and Harrewyn's folio sheet of the siege of Ghent in 1708 (Brussels: E.H. Fricx [,1712]) and W. & D. Lizars' folded frontispiece of the Battle of Waterloo for J. Simpson's 8vo *A visit to Flanders, in July, 1815* . . . 4th ed. (Edinburgh: Blackwood, 1816), to the postcard 'Kriget är slut!' (Stockholm, 7.v.1945). Only those relating to the Great War (see Fig. 1) are listed here; items acquired after the Ghent Symposium are omitted. Mini-

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Fig. 1 'Altering the map with his "SWAN" fountpen'. This map of western Europe (black on yellow paper) was published in the June 1915, vol. 36 no. 423, issue of *The Stationery Trades' Journal* (London), published by the well-known firm of J. Whitaker Sons Ltd., opposite p. [424]—the back cover's verso. The *British Empire paper stationery & printing trades' journal* (London), August 1905, vol. 25 no. 8, p. 444 includes, from its New York correspondent 'Uncle Sam' dated 31 July, this: '"For every pound of steel that goes into swords eleven pounds go into pens," said a statistician. "For every sword that is made 100,000 pens are made." He smiled. "Verily the pen is mightier than the sword," he said.' A more famous quotation springs to mind from Edward Bulwer-Lytton's

mum data, that sufficiently identifies similar items elsewhere, has occasional notes added to differentiate from those in other collections (variant printings, varying contents between editions of the same work, manuscript annotations, etc.). Products here originate from Austria-Hungary, Belgium, Britain, France, Germany, Hungary and Italy (Fig. 2).

Thirty-six map postcards are listed: two set the pre-War political scene and two reflect post-War effects. Beyond their social context, when personal messages – even if militarily censored – are present, they exhibit obvious political agendas, through satire or propaganda, by a range of pictorial techniques: simplistic commercial mapping; black-&-white topography lacking relief; sepia photographic sketch-maps poor in toponyms; sophisticated chromolithographic art-works and higher-quality cartography (i.e. with stated map scales and including a graticule).

Only around 10 British-produced map postcards shown related to the Great War, but precursor cards with maps exist. A heraldic design postcard containing a map of the British Isles and a quotation from Shakespeare's 'King John' was published as early as March 1900. A March 1901 magazine advertised a series of picture postcards of an impending Royal Visit to Australia, of which number 5 was to be 'A carefully drawn map showing the whole route from England to Australia; posted at Aden'; orders to *Review of Reviews* or to E[velyn]. Wrench 'Pictorial Postcard Publisher' – both of London. By July 1901 an Edinburgh stationer, George Stewart of 92 George Street, at the top of one his 'New Empire' series postcards included, in its 'Floreat Britannia!' design, a double-hemisphere map of Africa showing British possessions in 1837 compared to 1901 – the extent of Queen Victoria's reign. His series of 100 photographic views, 'A Tour through Scotland', included 'A sketch map [that] indicates the route covered by the pictures'.

From June 1902 'The British Empire (colored [!] red) showing the All-British Cable round the World' – the map now covering nearly all the card's non-address side – states this 'Geographical Postcard' is copyright of 'Stengel & Co., 39 Redcross Street London E.C.' The sole Great Britain agent for the Dresden and Berlin firm of Emil Stengel was Oscar Flammger (as 'An Enemy Subject' through the 'Trading with the Enemy Amendment Act, 1916', by an order dated 22 December, he was to have his business compulsorily wound up). The stationer William Lyon of

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play *Richelieu* (1839), II. ii—'Beneath the rule of men entirely great, |The pen is mightier than the sword'; and a second from the same source – 'Take away the sword: | States can be saved without it; bring the pen'. Contrast this point-of-view with post-Great War boundary changes resulting from, for example, the Versailles Treaty when other quotations might be more valid: 'Pens are most dangerous tools, more sharp by odds | Than swords, and cut more keen than whips or rods' from John Taylor (1578–1653) in his *Part of this Summer's Travels, Or News from Hell, Hull, and Halifax* . . . (London, 1639); or from his contemporary, Robert Burton (1577–1640), in his *The Anatomy of Melancholy* (1621): 'The pen worse than the sword' (I, 2, 4; 7). Indeed, regarding the eventual contentious nature of some re-drawn international boundaries, note this Figure's use of question (interrogation) marks, in lieu of continuous lines, between Austria and Serbia, Germany and France and Germany and Russia (Poland), and the omission of any boundary between Germany and Belgium. Mabie, Todd Ltd began in New York in the 1860s making pencil cases and pen holders. As 'Mabie, Todd and Bard' it produced the 'Swan' fountain pen in 1884, opening a showroom in London's Cheapside, then in High Holborn from 1905; Bard's name was omitted in 1906. As a British firm established in 1914, Mabie, Todd & Co. Ltd opened a pen factory in 1915, flourishing during the Great War. With kind permission of St Bride Library, London

Fig. 2 [entries 20a – 20c] ‘Franco-Belgian Zone’. This is arguably a good example of bad commercial cartography: too many toponyms, and confusion of sea routes. The depth of this map postcard’s colouring varies, too, and at least three variant impressions of the back exist: due to the publisher’s under-estimated print-run, or the card’s unexpected popularity? A fourth exemplar (posted 27.viii.1915), in the Author’s Collection, has a pen-&-ink message from a father to his son: “There are not many p[ost]. cards at B[urnham (Somerset)]. I thought a map would please you best”

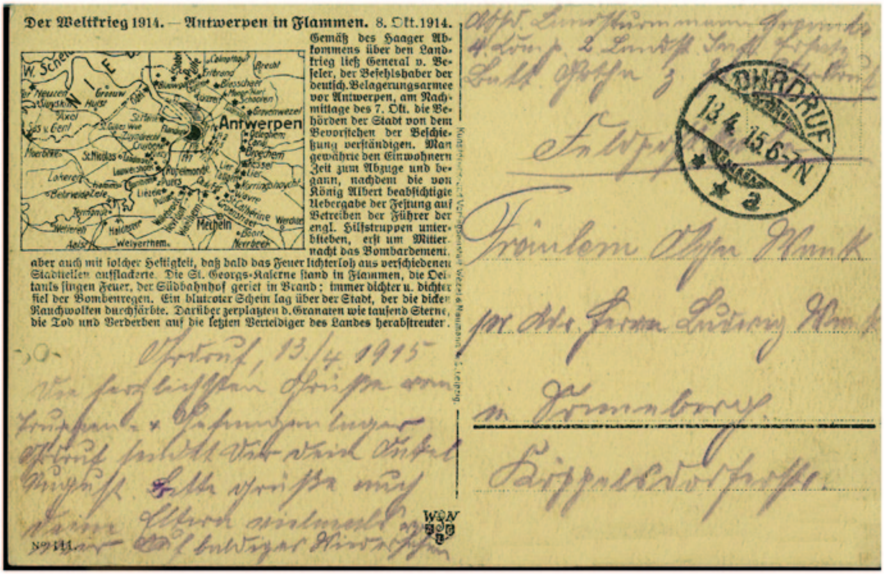

Fig. 3 **[entry 24]** 'Der Weltkrieg 1914. Antwerpen in Flammen'. Against Universal Postal Union rules, that stipulated one side only on a postcard may convey an illustration to leave the other free for address and (optional) message, this category of picture postcard carries a map on its address side. Perhaps the German firm, in 'war conditions', felt it could flout the rules?

Glasgow, amongst his 'Premier Series' picture postcards published by August 1902, depicted a colourful artistic map with an inset vignette – both unattributed – and a poetical quotation (e.g. from Milton). Contemporaneously, too, the Edinburgh firm of John Bartholomew, using its extant printed topographic base-maps, is credited for an Isle of Wight map postcard, with a vignette of Carisbrooke Castle and a 'puff' for the Island from *The Daily Telegraph*, for publication by the stationer A.J. Potts of Newport, IoW. As with 'St Helier', with its 'Corbière Lighthouse, Jersey' vignette, it was part of Potts' 'Garden Isle map picture post card' series.

In this 'incunabula' period of map postcards in Britain the leading printers were, as with 'regular' pictorial cards, those in Belgium, France and – especially – Germany, the latter because of its superior skills in chromolithography. Rare exceptions for fine quality British coloured map postcards appeared during 1904 to inform on the Russo-Japanese War: No. 873 in the 'Geographical Series' produced by Bartholomew for London publisher John Walker & Co.; 'Johnston's Russo-Japanese war map' by rival Edinburgh firm, W. & A.K. Johnston (also used as a basis for an advertisement of the 'Perfecta Resistance Apparatus' of Monte-Callow & Co. – 'The Controller Folk' – of London), both had graticules and scales; and 'Tuck's Russo-Japanese war map' (probably printed, like its Russian language version, in Leipzig by original producer, Wezel & Naumann A.-G., who were responsible for the 'Der Weltkrieg 1914. Antwerpen in Flammen' – see entry **[24]** and Fig. 3) (Figs. 4, 5, 6 and 7).

Until The Great War, however, several German firms (such as Stengel, noted above) or artisans (such as Emil Pinkau, through his London agent Oppenheimer

Fig. 4 [entry 11] 'Come, – if you dare'. This quotation may derive from a motto on one of the flags raised in 1775 at Bunker Hill (Boston MA) as an act of defiance by the American colonialists against the loyalist British besiegers. Two chief symbols representing Britishness – the lion and the bulldog – are frequently used in propaganda against perceived 'enemies of the State'; here the bulldog faces off threats from Germany. Examined closely, the crudely-produced map reveals conurbations which have their symbols only partially obscured whilst their toponyms remain. Unfortunately, Belfast had been erroneously shown and named in the position of Dublin!

of 13, Berners Street from around March 1902) worked, or were accepted, in London and Britain; or they supplied the goods to British publishers and distributors. Anti-German sentiments, notably after a U-Boat's torpedo sinking of the passenger ship 'Lusitania' on 7 May 1915 and Zeppelin bombing raids over London and eastern England, resulted in the boycotting of German (and 'Triple-Alliance' co-member Austro-Hungarian Empire) products. This particularly affected the stationery trades. Pinkau's name in Leipzig appears on two map postcards listed here of April and of August 1915 – see entries **[26]** and **[32]** and the accompanying Fig. 8. And, amongst many British newspapers and journals, *The Stationery Trades' Journal*, largely reflecting the production and publishing of, amongst things, postcards – recorded these incidents. In its vol. 38, issue no. 504 for May 16th, 1917 – during one of the most difficult times for printers and paper supply – a section 'War time printing from day to day' noted: "For what it is worth Fleet Street men are being cautioned to be ready with their maps of Macedonia. News is expected from that quarter".

The recording of items is based on the conventions of the *International Standard Bibliographic Description for Cartographic Materials* (1987); this stipulates form, sequence, content and punctuation of data. All items are arranged in approximate chronological order; many, such as postcards – which could be posted long after their original printing – are as yet undated due to research time constraints. Each

Fig. 5 [entry 13] 'Son ambition!' Propaganda, together with satire, is a 'weapons of war'. The tactic of this French-language product is two-fold: to warn, by the pun of 'VEMPIRE ALLEMAND' (= German Vampire [or: 'Empire']) on the skull-and-crossbones icon of the 'Pickelhaube', and the 'GERMANIA' of the would-be German Empire of the whole world; and to poke fun by depicting Kaiser Wilhelm's holes in the soles of his boots

Fig. 6 [entry 46] 'Dieser dreckige Stiebel . . .' An Austro-German alliance of October 1879, enlarged to a 'Triple Alliance' by the addition of Italy in 1882, was thereafter to be renewed every five years; in December 1912, during the First Balkan War, this alliance still held. On 23 May 1915, Italy withdrew and became the object of abuse by its former partners. 'Stiebel' – a variant

Fig. 7 [entry 36] 'Ecole Française en Alsace'. Propaganda, as support for France to regain Alsace and Lorraine that were lost to Germany during the Franco-Prussian War of 1870–1871, is to the fore here. Utilisation of the tricolour's constituents is evident: four flags, a rosette, the terrestrial globe and the clothing of the children, in addition to a deliberate *blue* and *red* centred on the schoolmaster. 'Nous aimons la France' encourages the children; even the alphabet reading test on the wall is promoting France's capital city

item's entry is allocated its unique number, placed at the end in square brackets (thus: '**[1]**').

of the more usual 'Stiefel' ('boot', or 'Wellington') – was an obvious, and characteristic, symbol with which to portray Italy. Thus, 'This dirty boot must be properly shined with Germano-Austrian 0.42 [metre diameter] book-blacking [polish]'; an alternative reading might be 'This worthless boot must be given a thrashing with a Germano-Austrian 0.42 [metre diameter]'.The '0.42' metre diameter punishment was, as is blatantly shown, an artillery shell (an example is in the In Flanders Fields Museum, Ypres). The designer, architect and operatic tenor Paul Kalisch (Berlin, 1855 – St Lorenz, Modensee, Austria, 1946) trained and made his début in Rome; thus he was temporarily connected with all three nations. *Kladderadatsch* was a satirical magazine founded in Berlin in 1848 by his father, David Kalisch (1820-1872)

Fig. 8 [entry 32] 'Das Kampfgebiet in Russisch-Polen'. A form of perspective or projection, known for some centuries, is used here to emphasise space and great distance (ca N 51º – 57º) within a small frame. Reduced from the original design by Emmersleben, it may be difficult, in this map postcard version, to discern the 'Deutsch – Russische Grenze' after it passes to the west of

Fig. 9 [entry 65] 'Tre Venezie'. Issued by the short-lived 'Istituto Italo-Britannico' in Milano, whose publications are known from 1916 to 1919 – that is, after Italy broke away from the 'Triple Alliance' in May 1915 – this is yet another propaganda map postcard. This example uses a high-quality cartographic firm: the map has a stated scale, longitude and latitude lines, relief depiction that does not obscure the toponyms, etc. Clearly defined is what Italy judged its borders to be at 24 May 1915 and what they were at the Austrian offensive of 15 June 1918; several such map postcards were issued to reclaim its three provinces 'stolen' in the previous century (see entries **[35]**, **[58]**, **[61]** & **[62]**)

1 Entries

Karte des Kriegsschauplatzes / [anon.]. – Scale not given. – [?Berlin:] H & S [, 1912 (?)]. – 1 map postcard: col.; 13 × 8, card 14 × 9 cm. – (No. 1796.). – No graticule. – Extent: 'Skager Rak' – Serbien – Sicilien – London. – Toponyms Breisach & 'Fried' [?] are printed in red; erroneous spelling of 'AMSTRDAM' & '[Le] Hávre' **[1]**

Österreichische Riviera / G. Freytag & Berndt, Wien. – Massstab [ca 1:1 520 000]. – Abbazia: Verlagsbuchhandlung 'Mandria' [, 1912 (?)]. – 1 map postcard: col.; 13 × 8.5, card 14 × 9 cm. – NW corner in orange, 'Gradisca' & 'Istrien' areas in pink, Laibach in green, Fiume in yellow, 'I[sola]. Pago' area (toponyms in Italian forms) in purple. – "Nachdruck verboten". – 'Magyar Kir. Posta' 10 filler (red & black) stamp, franked 'FIUME 1912 + JAN.14 -N4'. – Pen & ink message from 'W.H.S.' **[2]**

'SUWALKI' (Suwałki) and then north and northwest to 'MEMEL' (Klaipėda). The writer/soldier's marking of his route seems to show a return journey between 'Kowel' (Kovel') and 'BREST-LITOWSK' (Brest)

Manual of map reading and field sketching 1912 / General Staff, War Office. – London: His Majesty's Stationery Office; Wyman and Sons; Edinburgh: HMSO Scottish Branch; Dublin: E. Ponsonby; London: T. Fisher Unwin; printed by Eyre and Spottiswoode, 1912, reprinted with additions 1914. – 104 p., 21 leaves (some fold., some col.) of plates: figs, maps, photogr.; 18.5 cm. – Print code: (B 11031) Wt. 26060–235 75M 11/14 H[arrison] & S[ons]. – On p. [104]: "NOTE. *Plates* 5, 6, 7, 8, *and* 12, *of the* 1912 *Edition have not been included in this issue. Plates* 22, 23, 24, *and* 25 *have been added*": –

22: Training map / Ordnance Survey Office, Southampton. – Scale of Two Miles to One Inch; 1/126 720. – 1 map: col.; 14 × 10.5 cm. – "Note. – This map is printed from the Outline, Water, and Contour plates only of the Normal Edition". – Extract centred on Bury St. Edmunds from sheet 25 of the '½ inch England Training Map'

23: North West Europe 1:250, 000/ War Office, 1914. – Scale 1/250 000. – 1 map: col.; 14 × 10.5 cm. – Extract showing Brussels, Hal & Brain-le-Comte from sheet 1 of GSGS No. 2733

24: Belgium 1:100, 000 / War Office, 1914. – Scale 1:100 000. – 1 map: col.; 14.5 × 10.5 cm. – Extract showing Liege to Dolembreux from sheet 7

25 Index to maps of Belgium & North-east France / War Office, Oct. 1914. – Distinguishes between 'Strategical 1/380,160', 'France 1/80,000', & 'Belgium 1/100,000'

Inserted (loose) between pp. [2]-3 of adverts: Figs 1– 4, printed in black & red, of the magnetic and service prismatic compasses; printed area 32.5 × 49, folded to 17.5 × 11 cm (removed from uncited publication). – Price One Shilling [£05p.] **[3]**

Ordnance Survey of England and Wales, sheet 30: Colchester / Ordnance Survey Office. – Scale of ½ inch to one mile; 1:126 720. – Southampton: Ordnance Survey Office, 1914. – 1 map: col.; 47 × 69.5, folded to 18 × 10 cm. – Cover title: ½" England. Sheet 30. Training map [with ind. of adjoining sheets 18–19, 24–25, 29–30, 34 & 39–40]. – "Reduced from the One Inch Map of 1902–4"; magnetic variation for 1911. – Printed in black, blue (hydrography), & sepia (relief contours) only. – Pen & ink inscription on cover: C. L Elliott Lt. – Price 6d [£02.5p.] **[4]**

Ordnance Survey of England and Wales, sheet 33: Salisbury, Winchester and Reading / Ordnance Survey Office. – Scale of ½ inch to one mile; 1:126 720. – Southampton: Ordnance Survey Office, 1914. – 1 map: col.; 47.5 × 70, folded to 18 × 10 cm. – Cover title: ½" England. Sheet 33. Training map [with ind. of adjoining sheets 27–29, 32–34 & 37–39]. – "Reduced from the One Inch Map of 1901–03"; magnetic variation for 1912. – Printed in black, blue (hydrography), & sepia (relief contours) only. – Price 6d [£02.5p.] **[5]**

Ordnance Survey of England and Wales, sheet 33: Salisbury, Winchester and Reading / Ordnance Survey Office. – Scale of ½ inch to one mile; 1:126 720. – Southampton: Ordnance Survey Office, 1914. – 1 map: col.; 47.5 × 70, folded to 18 × 9.5 cm. – Cover title: ½" England. Sheet 33. Training map. Printed for the Ordnance Survey by Messrs. MOODY BRO[THER]S., Birmingham [with ind. of

adjoining sheets 27–29, 32–34 & 37–39]. – "Reduced from the One Inch Map of 1901–03"; magnetic variation for 1912. – Printed in black, blue (hydrography), & sepia (relief contours) only. – Price 6d [£02.5p.] **[6]**

Map of the area of the European War. – Scale of miles 300 = 90 mm; [ca 1:5 400 000]. – [London:] *The Times* [newspaper] [, 1914]. – 1 map; 56 × 82.5 cm. – Extent: Aland Islands – Rostov – Malta – Lisbon **[7]**

Western War area / George Philip & Son Ltd. – Scale Miles 60 = 29 mm; [ca 1:3 300 000]. – [London: George Philip & Son Ltd; Liverpool: Philip, Son & Nephew Ltd [, September (?) 1914]]. – 1 map; 14 × 17.5 cm. – Extent: Tilburg –Kaiserslautern – Montbéliard – Le Havre. – On front lining papers of: *Philips' pictorial pocket atlas and gazetteer [:] 148 pages of maps, pictures and statistical diagrams, with gazetteer-index of 18,000 names [:] With War supplement*. – Un-numbered 3 pages between verso of t.p. & p. iii includes 'The events that led up to the Great European War' (29.vi – 23.viii.1914) **[8]**

Eastern War area / George Philip & Son, Ltd. – Scale Miles 60 = 26 mm; [ca 1:3 700 000]. – [London: George Philip & Son Ltd; Liverpool: Philip, Son & Nephew Ltd [, September (?) 1914]]. – 1 map; 17.5 × 14 cm. – Extent: Tilsit – Brest Litowsk – Przemysl – Posen. – On rear lining papers of: *Philips' pictorial pocket atlas and gazetteer [:] 148 pages of maps, pictures and statistical diagrams, with gazetteer-index of 18,000 names [:] With War supplement*. – Un-numbered 3 pages between verso of t.p. & p. iii includes 'The events that led up to the Great European War' (29.vi – 23.viii.1914) **[9]**

This is only my head – wait till my body comes / [anon.]. – Scale not given. – [S.l.: s.n., ca Sept. 1914 (?)]. – 1 map postcard (sepia photogr.); 12.5 × 8, card 14 × 8.5 cm. – No graticule. – Bulldog's head bursting through simplified map of southern Holland, Belgium, & northern France. – Quotation at br: "We strove with all our might to prevent its outbreak – we do not regret our decision" credited to 'THE PREMIER IN THE HOUSE AUG 27TH' (i.e. Mr Asquith); misquoted from *Hansard, HC Debate*, **66**, cc 191-4 'Address to His Majesty', 192, where correctly: "We strove with all our might, as everyone now knows, to prevent its outbreak, and when that was no longer possible, to limit its area [. . .] We do not repent our decision." **[10]**

'Come, – if you dare!' / E&A. – Scale not given. – [London:] E&A [, 1914 (?)]. – 1 map postcard (sepia photogr.); 8.5 × 13.5, card 9 × 14 cm. – (P 131). – No relief or graticule. – Extent: [Orkney Islands] – Antwerp – [Land's End] – Ireland]. – On map of British Isles a bulldog faces, from southern Britain, Western Front region. – 11 toponyms present; attempted erasure of 'BELFAST' originally placed in position of Dublin! (Fig. 4) **[11]**

The silent watcher. The North Sea battleships as seen by the Man in the Moon / John Clennell. – Scale not given. – London: F.C. Hodges & Co. [, ca 1914?]. – 1 map postcard: col.; 11 × 8.5, card 13.5 × 9 cm. – (No. 781). – Author's name, at lower left corner in black on red-coloured England, appears faintly, too, at lower

right corner on green-coloured continent (France). – Outline of bulldog formed by black silhouettes of ships & submarines. – Geogr. names present: England, Scotland, Belgium, France, Germany and Kiel (only); no borders, relief, communications, etc. **[12]**

Son ambition! / HC [or: CH] (monogram)]. – [S.l.: s.n., ca 1914 (?)].– 1 map postcard: col.; 12 × 7.5, card 14 × 9.5 cm. – Inflatable terrestrial globe with 'GERMANIA' across all continents save Americas, surmounted by 'Pickelhaube' with 'skull & crossbones' inscribed 'VEMPIRE [*sic*] ALLEMAND'; a Pickelhaube-wearing Kaiser [?], sleeves rolled up and with holes in the soles of his boots, inflates globe's size with air pump (Fig. 5) **[13]**

[Western Front area] / [anon.]. – Scale [ca 1:4 000 000]. – [S.l.: s.n., 1914 (?)]. – 1 map postcard; 14 × 9 cm (map & card). – (EM. 51). – Extent: Alkmaar – Cologne – Besançon – Paris. – No relief or graticule. – Many place and river names in French forms; 'Venlo' (NL) & 'Wiltz' (L) erroneously as 'Vento' & 'Witz' **[14]**

[Western Front area] / [anon.]. – Scale [ca 1:3 300 000]. – London: Radermacher, Aldous & Co.[, 1914 (?)]. – 1 map postcard: col.; 13.5 × 18.5, card 14 × 9 cm. – Extent: Antwerp/Dusseldorf [!] – Colmar – Belfort – Epernay. – No graticule. – Belgium (red), France (green), Germany (yellow). – Verso has usual printed matter in green; "Designed & Printed in London" in black; centre is overprinted obliquely in black: Published by | Radermacher, Aldous & Co., Ltd | 56, Ludgate Hill, | London, E.C. [. . .]. – Erroneous spellings of 'Euskarchen' & 'Altkircht' etc. **[15]**

[Western Front area] / [anon.]. – Scale [ca 1:3 300 000]. – London: Radermacher, Aldous & Co. Ltd [, 1914 (?)]. – 1 map postcard: col.; 13.5 × 18.5, card 14 × 9 cm. – (RA Series). – Extent: Antwerp/Dusseldorf [!] – Colmar – Belfort – Epernay. – No graticule. – Belgium (orange), France (green), Germany (yellow). – Verso has usual printed matter in black, with "Designed & Printed in London" and "Published by **Radermacher, Aldous & Co**., Ltd. | 56, Ludgate Hill, London, E.C. **British Co**." **[16]**

[Western Front area] / [anon.]. – Massstab 50 km = 18 mm; [ca 1:2 900 000]. – Berlin: *Berliner Zeitung am Mittag* [newspaper] [, 1914 (?)]. – 1 map postcard: col.; 10.5 × 8.5, card 14.5 × 9.5 cm. – A 'B.Z. – Kriegskarte'. – No graticule. – Also shows NE France, Luxemburg, German border and southern 'Niederlande'. – Text printed below map: "Kennen Sie schon 'Die grosse Zeit' die neue, vom Verlage Ullstein & Co herausgegeben illustrirte Kriegsgeschichte? [. . .] Das Werk gibt in zeitlicher Reihenfolge eine [. . .] illustrierte Darstellung der Kriegsereignisse. Jedes Heft ist einzeln erhältlich und kostet 30 Pfennig" **[17]**

Belgien / [anon.]. – Scale not given. – Berlin: Verlags-Anstalt 'Adler' [, 1914 (?)]. – 1 map postcard: col.; 9.5 × 14 cm (map & card). – Title from verso. – Gridded in squares. – Also shows NE France, Luxemburg, western Germany [Dortmund, Coblenz to Pirmasen] and southern 'Niederlande'. – A 'Feld-Postkarte'. – Thick blue pencil route from Neuss/Düsseldorf *via* Lüttich, Brüssel, Maubeuge, Cambrai & Amiens to Meaux and thinner line from Metz to south of Esch; blue pencil crosses at/near Arras, Noyon, Laon, St Menehould, Verdun & Gondrecourt **[18]**

Der Völkerkrieg: westlicher Kriegsschauplatz / Ottmar Zieher. – Scale not given. – München: Ottmar Zieher [, 1914 (?)]. – 1 map postcard: col.; 13 × 9, card 14.5 × 9.5 cm. – (Nr. 11). – No graticule. – Extent: [Orkney Islands] – Hamb'g [!] – Zaragoza – Cork. – Erroneous spelling of 'I. Wigth' **[19]**

Franco-Belgian war zone / H.G. R[owe]. & Co. – Scale [ca 1:4 500 000]. – [London:] H.G. R[owe] & Co. [, 1914 (?)]. – 1 map postcard: col.; 13.5 × 8.5, card 14 × 9 cm. – ('War' Ser.; No. 1). – Shows meridian of E [5°] and parallel of N [50°]. – Sea routes shown. – Except for 'THE NETHERLAND[S]' & 'LUXEM- | BURG' the topography is cross-hatched in blue (diagonally for 'BELGIUM' & France; squared for Germany). – Extent: Helder – Andernach – Montbard/Belfort – Amiens. – NB: 3 variant printings of the verso (postage rates etc.) (Fig. 2) **[20a -20c]**

Galician-Silesian zone / H.G. R[owe]. & Co. – [Issue 1 (?)]. – Scale [ca 1: 4 500 000]. – [London:] H.G. R[owe] & Co. [, 1914 (?)]. – 1 map postcard: col.; 8.5 × 13.5, card 9 × 14 cm. – ('War' Ser.; No. 3). – Shows meridian of E [20°] and parallel of N [50°]. – Topography is cross-hatched in blue (squared for Germany/ Prussia & Austro-Hungary; diagonally for Poland). – Extent: Tomaszow/Iwangorod – Sokal – Losonez – Pardubitz **[21]**

Galician-Silesian zone / H.G. R[owe]. & Co. – [Issue 2 (?)]. – Scale [ca 1: 4 500 000]. – London (16/17, Devonshire Square, E.C.): H.G. Rowe & Co. [, 1914 (?)].– 1 map postcard: col.; 8.5 × 13.5, card 9 × 14 cm. – ('War' Ser.; No. 3). – Shows meridian of E [20°] and parallel of N [50°]. – "Printed at our fine art works, London." in postage stamp space. – Topography is cross-hatched in blue (squared for Germany/ Prussia & Austro-Hungary; diagonally for Poland). – Extent: Tomaszow/Iwangorod – Sokal – Losonez – Pardubitz **[22]**

East Prussian-Poland zone / H.G. R[owe]. & Co. – Scale [ca 1:4 500 000]. – [London:] H.G. R[owe] & Co. [, 1914 (?)].– 1 map postcard: col.; 8.5 × 13.5, card 9 × 14 cm. – ('War' Ser.; No. 4). – Shows meridian of E [20°]. – Topography is cross-hatched in blue (squared for Germany/Prussia; diagonally in lighter blue for 'POLAND'). – Extent: Brusterort/Kovno – Now. Dwor – Lodz – [T]reptow/Glogau **[23]**

Der Weltkrieg 1914. Antwerpen in Flammen, 8. Okt. 1914 [ill.] / K. Winter. – Leipzig: Kunstdruck- und Verlagsanstalt Wezel & Naumann A.G. [, 1914 (?)]. – 1 postcard; 9 × 14 cm. – (W&N AG L; No. 111). – Recto sepia artwork entitled 'Antwerpen in Flammen'; on verso's left half: text explanation of events to 8 October, with map of Antwerp area and its forts at scale [ca 1:1 875 000], 3.5 × 4.5 cm. – Erroneous spellings of 'Braesschaer', 'Korringshoycht', 'Odel', 'Schooren', & 'Zuyndrecht'. – A 'Feldpostkarte' with purple pencil message ('Ohrdruf, 13. 4. [19]15. 6-7N) (Fig. 3) **[24]**

North West Europe, GSGS 2733, sheet 1 & part of 4 / Geographical Section, General Staff. – Rev. ed. – Scale 1:250 000. – [London:] War Office, February 1915. – 1 map: col.; 60.5 × 72, sheet 72.5 × 86, mounted on cloth folded to 11 × 18.5 cm [or *vice versa*!]. – Extent: ca N 50° 20' – 51° 39'/ E 2° 23' – 4° 19' (Zierikzee – Louvain – Valenciennes – St. Pol/Dunkerque). – Ind. on verso to sheets 1, 1a, 2, 2a, 3, 3a, 4–6, 7, 7a, 8–12, 13, 13a & 14–23 **[25]**

Reliefkarte des Kampfgebietes zwischen Maas und Mosel / [M. Zeno Diemer]. – Scale not given. – L[eipzig].: E[mil]. P[inkau]. & Co. A.-G. [, ca April 1915]. – 1 bird's-eye-view/map postcard; 9 × 14 cm (map & card). – (A 260). – "Mit Genehmigung der Illustrirten Zeitung, Leipzig". – Reduced bromide photogr. copy of original version in *Illustrirte Zeitung* (Leipzig), 22 April 1915, **144**. Bd, Nr 3747 (Kriegsnummer 38), p. [475]. – Artist's name visible on original. – Re-issued in *Illustrierte [!] Weltkriegschronik der Leipziger Illustrirte Zeitung 1914* (Leipzig; Wien), p. 269. – Black pen & ink (over purple pencil) route from east of Pont-à-Mousson *via* Flirey, Ailly, St Mihiel, Fresnes, north of Verdun towards Argonnerwald; also underlined in pencil is Braquis (E of Verdun). – Verso's pencil message dated '12. Juni, [19]16.' **[26]**

[Bacon's new war map Paris to Berlin (with contour colouring) showing clearly rivers, roads, railways, ports, fortified towns, naval stations, etc. Scale 18 miles to one Inch] / Bacon's Geographical Establıshment [!]. – Scale 1:1 200 000. – London: G.W. Bacon & Co. Ltd [, 1915 (?)]. – 1 map: col.; 71.5 × 85.5, sheet 76.5 × 87, folded to 19 × 11 in covers 20 × 11.5 cm. – Title from front cover. – Relief by layer-col. – 'Reference' is conventional signs for 'Naval Stations', 'Fortified Towns', & 'Forts'. – Extent: ca N 47° 45' – 55°/ E 0° 30' – 13° 30' (Schleswig – Dresden – Besançon – Le Havre/Hull). – Back cover (verso) lists 5 'War maps. Bacon's are made by Englishmen [. . .]' – Price on paper 1/- net [£05p.] **[27]**

Kent: the doorway of England / designed & printed at Voile & Roberson's Library. – Not drawn to scale. – Faversham, Kent: Voile & Roberson's Library [, 1915 (?)]. – 1 map postcard; 9 × 14 cm (map & card). – Recto has logo of 'Invicta [Press]' (printers of Ashford, Kent). – Postage stamp (1/2 penny), franked Wrotham, Kent '1 FE 15'. – Pen & ink message with 'X' on map and, at bottom of card, 'X Wrotham.' **[28]**

[France] 1915 / [anon.]. – Scale not given. – Boulogne-sur-Seine: Tirage Bromure G. Piprot [, 1915]. – 1 map postcard: col.; 12.5 × 9 cm (map & card). – 'Visée PARIS Numéro au VERSO': [monogram:] CD [?] | 121/4. – Recto has distich: "Songeant, que les Français savent se souvenir, | O Belges, l'œil serein, contemplez l'avenir!" **[29]**

Östl[icher]. Kriegsschauplatz, 3: Galizien – Lublin – Warschau / Adolf Brandstätter Postkarten-Verlag. – Maßst[ab]. 1:4 500 000. – Bielitz (Oesterr. Schles.): Adolf Brandstätter, Postkarten-Verlag [, ca 1915 (?)]. – 1 map postcard: col.; 9 × 14, card 9.5 × 14.5 cm. – (Postkarten des östlichen Kriegsschauplatzes; Nr 3. Import.). – Verso has vignette scene in camp with a Pickelhaube-wearing German shaking the hand of an Austro-Hungarian [?] **[30]**

Westl[icher]. Kriegsschauplatz, 4: Straßburg – Nancy – Reims / Adolf Brandstätter Postkarten-Verlag. – Maßst[ab]. 1:2 000 000. – [?Bielitz (Oesterr. Schles.): Adolf Brandstätter, Postkarten-Verlag [, ca 1915 (?)]]. – 1 map postcard: col.; 9 × 14.5, card 9.5 × 14.5 cm. – (Postkarten des östlichen Kriegsschauplatzes; Nr 4. Import.). – Verso has vignette scene of sword-drawn Pickelhaube-wearing German officer turning to his men to advance towards an enflamed distant settlement **[31]**

Das Kampfgebiet in Russisch-Polen / [Walter Emmersleben]. – Scale not given. – L[eipzig].: E[mil]. P[inkau]. & Co. A.-G. [, ca August 1915]. – 1 bird's-eye-view/

map postcard; 12.5 × 9, card 14 × 9 cm. – (A 333). – "Mit Genehmigung der Illustrirten Zeitung, Leipzig". – Reduced bromide photogr. copy of original version in *Illustrirte Zeitung* (Leipzig), 19 August 1915, **145**. Bd, Nr 3764 (Kriegsnummer 55), p. [248], to accompany 'Vom östlichen Kriegsschauplatz' (pp. 246–54). – Artist's name visible on original captioned '[. . .] Reliefkarte des Gebietes zwischen Warschau und Brest-Litowsk Für die "Illustrirte Zeitung" gezeichnet von Walter Emmersleben'. – Re-issued in *Illustrierte [!] Weltkriegschronik der Leipziger Illustrirte Zeitung 1914* (Leipzig; Wien), Bd I, Lfg 18 [or 19?], p. 421, to accompany 'Die russischen Niederlagen im August 1915'. – Verso has purple-inked stamp 'Soldatenbriefstempel | III. Batl. L[andwehr]-R. 350. * 10. Komp. |* 88 Inf.[Divis]ion (von Menges) *'; postmark 'K.D. Feldpoststation |Nr 198 [?]|16. 9. [19]16.9-10 V' |; with pencilled 'Feldpostkarte' & message dated 'am 15/9.15.' (Fig. 8) **[32]**

The *Strand* coloured detail map of the Balkan States / designed by The Byron Studios. – Scale of miles 50 + 100 = 235 mm; [ca 1:1 300 000]. – London: George Newnes; printed by L. Upcott Gill & Son [, 1915 (?)]. – 1 pictorial map: col.; 53 × 47, sheet 62.5 × 50.5 folded to 25.5 × 15.5 cm. – Map title identical to that on verso integral title panel. – Encircled logo: C[opyright (?)] B[yron] S[tudios]. – No graticule. – Extent: Belgrade – Gabrovitza – Gulf of Salonica – Sarajevo. – Price 6^{d}. net [£02.5] **[33]**

No. 1: The political map of Africa in July 1914. No. 2: Africa as it might have been in 1916. No. 3: Africa as it may be when the War is finished; No. 4: Africa and the white man or Caucasian sub-species. No. 5: Africa and the black, brown and yellow races. No. 6: The future great railways of Africa; No. 7: The mineral and vegetable values of Africa. No. 8: The dominant languages of Africa. No. 9: The germ diseases of Africa: man and beast/ H.H. Johnston. – Scale 1:45 000 000. – [London:] Royal Geographical Society, 1915. – 9 maps on 3 leaves: col.; each map 20 × 18.5, sheets 22.5 × 75.5 folded to 22.5 × 12 cm. – To accompany 'The political geography of Africa before and after the War' (read at RGS Meeting, 24.ii.1915) in *The Geographical Journal*, April 1915, **45**(4), pp. [273]–301 (includes post-lecture discussion) **[34]**

L'aquila sabauda si libra per portare il tricolore alle terre irredente / I. Carli dis[egnó]. – Scale not given. – Firenze: Prop[rietà]. Art[istica]. della Ditta 'Pubblicità Excelsior' [, post-May 1915 (?)]. – 1 map postcard: col.; 9 × 14, card 9.5 × 14 cm. – No graticule. – Extent: Kitzbüchel [!] – Stein – Fiume/Padova – Alpi dell'Ortler. – The Eagle of Savoy, flag in claws, looking north-east, is placed in centre above Venezia **[35]**

Ecole Française en Alsace / J.K. – Scale not given. – Paris: A.H. Katz [, 1915 (?)]. – 1 map postcard: col.; 9 × 14 cm. – 'Visé à Paris, Numéro au Verso': J.K. 9427. – Informal classroom scene (4 children at desks): blackboard has chalked "Nous aimons la France", cloth-covered table has terrestrial globe (centred on Atlantic Ocean with adjacent continental coasts) and, on wall-map of France, male tutor indicates, with a tricolour, Alsace. – Pen & ink message on verso (Bessancourt, 7.viii.1915) and inked stamp of 'Chambre synd[ica]le. française de la carte postale [. . .]' with monogram above 'shield' (Fig. 7) **[36]**

Maps to illustrate the paper on southern frontiers of Austria by Douglas W. Freshfield. – Scales 1:1 000 000 and *1:2 000 000. – [London:] Royal Geographical Society, 1915. – 5 maps on 1 sheet: col.; 17.5 × 22.5 cm or smaller, folded to 20.5 × 13.5 cm. – To accompany 'The southern frontiers of Austria' (read at RGS Meeting, 15.xi.1915) in *The Geographical Journal*, December 1915, **46**(6), pp. 414–35 (includes post-lecture discussion). – Contents: *Ethnographical map of Austro-Italian frontier; Present and proposed frontiers in the Trentino; The western Trentino: physical; Present and proposed frontiers north of Trieste; *The western frontier of Montenegro **[37]**

How the world is at war / [anon.]. – Scale not given. – London: Overseas Club (London: Sir Joseph Causton & Sons Ltd, printers) [, May] 1916. – 1 map: col.; 8.5 × 12.5, sheet 13 × 21 cm. – Legend distinguishes between 'British Empire', 'Our allies', 'Our enemies', 'Allied territory', 'Allied territory occupied by Germany' & 'German colonies captured by British'. – Surrounded by col. ill. (armed military & naval men with Empire flags). – A printed 'certificate' – "Presented on Empire Day 1916 To [pen & ink:] Herbert Tanner [. . .]" (Empire Day, celebrated from 1902, first officially recognised on 24.v.1916 until 1957; thereafter titles & dates changed) **[38]**

G[eographical]. S[ection]. G[eneral]. S[taff]. [No.] 2748, Grantham: Artillery training. – Scale 1:20 000. – [Southampton:] Ordnance Survey, 1916. – 1 map: col.; 50.5 × 80, sheet 69 × 90 cm. – Magnetic variation for 1915. – Contour interval of 5 metres; squared grid. – Includes 'Table for converting metres to feet' **[39]**

Diagrammatic map of Slav territories east of the Adriatic / Sir Arthur Evans. – Scale 1:2 000 000. – [London:] Royal Geographical Society, April 1916. – 1 map: col.; 32.5 × 36.5, sheet 39 × 57.5 folded to 22 × 12.5 cm. – To accompany 'The Adriatic Slavs and the overland route to Constantinople' (read at RGS Meeting, 10.i.1916) in *The Geographical Journal*, April 1916, **47**(4), pp. [241]–65 (includes post-lecture discussion) with 1 leaf of b&w plates ('Railway map of part of Central Europe', scale 1:6M). –

"Note. This map is, as regards outline and names, a photographic reduction of the map prepared by Sir Arthur Evans for the Balkan Committee, and the Serbo-Croat orthography there adopted does not agree with the system used for the 1/ Million map and generally by the R.G.S." **[40]**

Map of the Balkan States showing communications: to illustrate the paper by H.C. Woods. – Scale 1:1 750 000; conical proj. with errorless meridians and standard parallels 40° and 44°. – [London:] Royal Geographical Society, April 1916. – 1 map: col.; 39.5 × 54.5, sheet 45.5 × 72.5 folded to 24 × 12.5 cm. – To accompany 'Communications in the Balkans' (read at RGS Meeting, 7.ii.1916) in *The Geographical Journal*, April 1916, **47**(4), pp. 265–93 (includes post-lecture discussion) with map ('The Lower Danube: the River as a means of, and obstacle to, communication', scale 1:4M) on p. [269]. – Legend notes "Boundaries previous to the treaties and agreements of 1913–15 are uncoloured" **[41]**

News of the World war map of Europe and the adjoining fighting zones / Johnson Riddle & Co. – Scale of miles 50 + 400 = 141 mm; [ca 1:5 000 000]. – [London:] *News of the World* [newspaper] [, ca 1915 (?)]. – 1 map: col.; 61.5 × 93, folded to 24

sections to 22.5 × 12 cm. – Extent: Lake Peipus – Teheran – Alexandria – Cartagena/Cork. – Marks ‘ + |*Lusitania* |*sank here*’ (7.v.1915) off Ireland’s southern coast **[42]**

The Daily Telegraph gazetteer war map of Western Europe / compiled from official sources by Alexander Gross FRGS; produced by ‘Geographia’ Ltd. – Scale 30 miles = 75 mm; [ca 1:633 600]. – London: ‘Geographia’ Ltd [, July 1916 (?)]. – 1 map: col.; 72 × 99.5, folded to 19.5 × 11 in paper covers 21 × 12.5 cm. – (No. 4.). – Cover title: *The Daily Telegraph* gazetteer war map [. . .] (No. 4.) [. . .] A gazetteer index containing about 7,500 names accompanies each map. – Ind. (35 p.) stapled inside front cover as ‘Index to the *Daily Telegraph* gazetteer map of Western Europe (No. 4). By Alexander Gross, F.R.G.S.’. – Imprints on front cover and on internal advertisement (22 maps + 6 other items, including two *Daily Telegraph* war atlases) now amended to “London, E.C.4” (i.e. post-March 1917). – Includes “Line before the advance. June 30th. 1916. Shown thus” [*sic*]. – Relief in hachures with occasional ‘[black triangle]’ & height added in lieu of fuller cased roads and chequered b&w railway lines: cf pp. 2 – 3 (‘Western Front’) of *The Daily Telegraph war atlas*, that are now dashed single lines and open with regular vertical ticks. – Extent: Southend/Essen – Frankfurt (am Main) – Basel/Blois – Havre/London. – Eastern section of map is reduced on pp. 12 – 13 (‘Rhine Provinces’) in *The Daily Telegraph war atlas* **[43]**

The Daily Telegraph war map No. 14 of the Western Front Arras to Nancy / by Alexander Gross FRGS; produced by ‘Geographia’ Ltd. – Scale 20 miles = 89 mm; [ca 1:365 000]. – London: ‘Geographia’ Ltd [, 1914 (?)]. – 1 map: col.; 53.5 × 85, folded to 19.5 × 12 in paper covers 20.5 × 12.5 cm. – Cover title: *The Daily Telegraph* war map of the French fighting line Arras to Verdun (No. 14.) [. . .]. – Back cover verso has advert list (17 maps + 4 other items) **[44]**

Atlas de poche du théatre [!] de la guerre: 56 cartes / Librairie Larousse. – Scales differ. – Paris: Librairie Larousse, 1916. – [iii], 59 p.: chiefly maps; 19 cm. – Most recent dated action is ‘Offensive de septembre 1915’ (pp. 16–17). – ‘Belgique occidentale’, ‘Artois’, & ‘Ile-de-France’ (pp. 7, 10 & 13 respectively) have crossed swords (battle) symbols **[45]**

Dieser dreckige Stiebel muss ordentlich gewichst werden mit Deutsch-Österreichischer Glanz-Wichse 0.42 / aus dem *Kladderadatsch* von Paul Kalisch 1915. – [S.l.: s.n., 1915]. – 1 map postcard: col.; 11.5 × 8.5, card 14 × 9 cm. – (T.S.N. (m.) No. 2036 [?]). – Depicts ‘leg’ of Italy (marking & naming Genua, Venedig, Florenz, Rom, & Neapel) on right of which is col. ill. of 42 cm diam. artillery shell. – Verso has pen & ink message (Innsbruck, 23.x.1915); red ‘Zensuriert’ ink stamp; and purple inked stamp of ‘K. u. k. Not-Reservespital | Gruppe Hötting |Militärpflege’ (Fig. 6) **[46]**

The British Dominions Year Book 1916 / edited by Edward Salmon FRCI and James Worsfold FCIS [; with 4 special maps, coloured plates and other illustrations]. – London (printed at St. Mary Press Ltd.): The British Dominions General Insurance Company Limited, 1916. – 336 p., [10] p. of plates (chiefly col., 1 fold.): ill., portr. (b&w), ‘Lloyds Subscription Room 1800’ (reprod. of old print), Royal Navy badges of rank, British Army medal ribbons (officers, NCOs and men); 22 cm. – Contents (selected): –

The Panama Canal: specially drawn for The British Dominions General Insurance Company Limited [. . .] London, E.C. – Scale [ca 1:110 000 000] at 0° – N/S 20°. – 1 map: col.; 21.5 × 35.5, folded to 17.5 × 12.5 cm. – Pasted in opp. p. 80. – World map emphasising 'New Routes' in red *vs* 'Old Ocean Routes' in black

Industrial map of Europe: specially drawn for The British Dominions General Insurance Company Limited [. . .]. – Scale not given. – 1 map: col.; 21.5 × 34, folded to 17.5 × 12.5 cm. – Pasted in opp. p. 224

The Balkan States: specially drawn for The British Dominions General Insurance Company Limited [. . .]. – Scale in English miles 100 = 30 mm; [ca 1:5 500 000]. – 1 map: 21.5 × 17.5, folded to 19.5 × 12.5 cm. – Pasted in opp. p. 272. – Legend identifies 'Present [i.e. to ca Nov. 1915] frontiers', 'Former Turkish territory', and 'Railways' **[47]**

Western War area / George Philip & Son Ltd. – Scale Miles 60 = 29 mm; [ca 1:3 300 000]. – [London; Liverpool: George Philip & Son Ltd/The London Geographical Institute; Tokyo [etc.]: Maruzen Co. Ltd., 1916]. – 1 map; 14 × 17.5 cm. – Extent (2° interval graticule): Tilburg – Kaiserslautern – Montbéliard – Le Havre. – On front lining papers of *Philips' pictorial pocket atlas and gazetteer [:] 148 pages of maps, pictures and statistical diagrams, with gazetteer-index of 18,000 names* **[48]**

Eastern War area / George Philip & Son, Ltd. – Scale miles 60 = 26 mm; [ca 1:3 700 000]. – [London; Liverpool: George Philip & Son Ltd/The London Geographical Institute; Tokyo [etc.]: Maruzen Co. Ltd., 1916]. – 1 map; 17.5 × 14 cm. – Extent (no graticule): Tilsit – Brest Litowsk – Przemysl – Posen. – On rear lining papers of *Philips' pictorial pocket atlas and gazetteer [:] 148 pages of maps, pictures and statistical diagrams, with gazetteer-index of 18,000 names* **[49]**

The Daily Telegraph war atlas containing detailed maps of every theatre of war / by Alexander Gross FRGS. – London: 'Geographia' Ltd [, July 1916+]. – [iv] p., [16] p. of plates (col. maps); 25 × 38 cm. – Title & statement of authority from front cover. – Assumed publication date taken from p. 2 inset on 'Western Front (Ostend – Soissons section)': "Line of fighting before British advance June 30th. 1916" (coast north of Nieuport to River Somme). – Pagination includes covers. – Insets on pp. 4 'Russian Front (northern section)', 9 'British Front (southern section)' and 11 'The Near East' indicate "Line of fighting before Russian advance – May 1916", "Line of fighting Sept. 6th 1914" + [ditto] "May 1916" and "Sinai Peninsula and the surrounding countries" respectively. – Back cover has adverts, including (recto) list of Nos. 1 – 21 of the '*Daily Telegraph* war maps'. – Price 1/- net [£05p.] **[50]**

Le front de Salonique septembre 1916 / [anon.]. – Échelle au 500.000e. – Paris; Nancy: Librairie militaire Berger-Levrault, 1916. – 1 map: col.; 53 × 73, folded to 22.5 × 14 in paper covers 23.5 × 15.5 cm. – Cover title: Le Front de Salonique [:] Grèce – Albanie – Montenegro – Serbie – Bulgarie [:] carte au 500.000e en quatre couleurs. – Prix 1 franc **[51]**

The theatre of war in the Balkan Peninsula / Stanford's Geog[raphica]l. Estab[lishmen]t., London. – [Rev. state?]. – Scale 1:1 140 000. – London: Edward Stanford Ltd, 9th March [!] 1916. – 1 map: col.; 65.5 × 97.5, dissected in 32 pieces mounted on cloth, folded to 18.5 × 13.5 cm in hard covers 19.5 × 14 cm. – (Stanford's War Maps; No. 16). – Date code: 161016 [= 16.x.1916]. – 'Explanation' (legend) printed in sheet margin at lower left **[52]**

Le front oriental, carte K: environs de Salonique / R. Bolzé Delt. – Echelle 30 Kilomètres = 18 mm; [ca 1:1 520 000]. – Paris: Hatier [, ca Nov. 1916 (?)]. – 1 map: col.; 12.5 × 17.5, card 14 × 18 folded to 9 × 14 cm. – Extent: Istip – Xanthi – Cap Kassandra – Monastir. – Interior of: Les cartes du front [ind. to series of 9 map postcards from 'Les Flandres' to 'Verdun', here depicting as far south as No. 6 'Vosges et Alsace' only]. – Echelle [ca 1:5 000 000]. – Paris: A. Hatier [, 1914 (?)]. – No graticule. – 'Visa No. 1 Déposé'. – Verso headed 'Correspondance des Armées | franchise militaire', with pen & ink note "Salonique | Nov: 10th 1916". – Prix 0 fr. 15 **[53]**

Trench map. France, sheet 51B S.W. / Geographical Section, General Staff [, War Office]. – Edition 4.A. – Scale 1:20 000. – [Southampton:] Ordnance Survey, March 1917. – 1 map: col.; 49.5 × 79.5 cm, mounted on cloth folded to 16.5 × 12 cm. – (GS, GS 2742). – Title & edition statement from cover. – Magnetic north 12° 18' for 1917. – Trenches corrected to 4-3-17. – Front cover verso has 'Index to adjoining sheets'; includes 'Glossary' of French to English terms on 6 panels. – Extent: Tilloy – Hautcourt – St. Leger – Boiry-Ste. Rictrude. – Enemy trenches in red, British in blue **[54]**

The Daily Telegraph war map No. 22 / by Alexander Gross FRGS; produced by 'Geographia' Ltd. – Scale 5 miles = 70 mm; [ca 1:115 000]. – London: 'Geographia' Ltd [, ca March 1917 + (?)]. – 1 map: col.; 97.5 × 69.5, folded to 19.5 × 11 in paper covers 21 × 12.5 cm. – Cover title: *The Daily Telegraph* war map of the British advance on the Western Front (No. 22). – Inset: Fighting line before the advance of July 1st. 1916. Scale 10 miles = 22 mm; [ca 1:735 000]. 26 × 5.5 cm. – Both maps' graticules lack numerals. – Extent: Lille – Le Quesnoy – La Fère – Courcelles au Bois. – Inside front cover has advertisements (21 maps + 6 other items, including two *Daily Telegraph* war atlases) **[55]**

La guerre en mai 1917 [: avec cartes géographiques] / [anon.]; [maps by] Stanford's Geographical Establishment, London. – Scales differ. – Folkestone: Service spécial de propagande en pays envahis; Londres: [printed] Harrison & Sons [, June (?) 1917]. – 15 p., [i] folding leaf of plates: 7 maps; 25 cm. – Title completed from front cover. – Pages 14–15 are 'Resumé [!] chronologique du mois mai' (1 – 23 May). – Purple-inked stamp on p. [1] (sig. A): 'SERVICE SPECIAL [. . .] 60, SANDGATE ROAD, FOLKESTONE'. – The folding plate (pasted on front blue paper cover's verso) is map of Europe, showing 5 Fronts and 6 Fleets (latter named in 'labels'), scale [ca 1:25 000 000], 20 × 27 cm, extent: Petrograd – Caspian Sea – Suez – Ireland **[56]**

[Ordnance Survey of Scotland: Edinburgh area] / Ordnance Survey. – Scale of one inch to a statute mile; 1:63 360. – [Southampton:] Ordnance Survey, Aug[ust]. 1917. – 1 map; 46 × 61, sheet 56 × 66 cm. – Lacks marginalia (title, series/edition, sheet no.) from above top border; 'All rights of reproduction reserved' & price notes; ind. diagrams to surrounding 1" sheets + 6" source sheets; survey, engraving, revision & usual publication information from below lower border; and magnetic variation data. – Extent: Lochgelly – Prestonpans – Balerno – Linlithgow. – Pencil notes below scale (etc.) & 'Crown Copyright Reserved' statement: "Lafts [?] Hydro | until railway | l[eft] for Gorgie" **[57]**

[Italia]: cartolina postale / A[?]Della Valle. – Scale not given. – [S.l.: s.n., 1917 (?)]. – 1 map postcard: col.; 14 x 8.5, card 14 × 9 cm. – (113). – 'Riproduzione interdetta'. – Painting depicting lady (mother?) pointing out to boy (son?), dressed in green military dress (with rifle) and standing on chair, position on wall-map of Trieste as part of Italy's northern border (symbolised by line of Italian tricolours) limited to 'Veneto' and '[Lomb]ardia' (i.e. excluding post-Great War 'Trentino' & 'Istria'). – MS (pen & ink) message on verso dated 'Sept 30th 1917' from 'Joe' to Miss L. Wellsted . . . Sloane St, London, S.W.1'. – Purple oval stamped 'PASSED BY CENSOR' (pencilled initials in centre) & black stamped 'LONDON OCT 8 17A' **[57.1]**

I nostri confini orientali e le terre irredente / [anon.]. – Scala [ca 1:2 850 000]. – Gardone: E. Locatelli [, 1917]. – 1 map postcard: col.; 9 × 14 cm (map & card). – Graticule at 1° interval. – "Visto l'Ufficio di Censura di Bergamo – 22 Iuglio 1917". – Extent: A. dello Zillerthal – Littai – Pola/Mirandola – Chiari. – Purple pen & ink message on verso dated 'Le 17-11-[19]17– samedi soir' **[58]**

Remembrance of France / L[ithographie]. (?) As[…] (?). – Scale not given. – Paris: Artige [, ca 1917]. – 1 map postcard: col.; 14 × 8.5 cm (map & card). – (3018). – No graticule. – Map of British Isles with NE France (Nantes – Orléans – Dunkerque), including 'Edimboug', 'Glocester', 'Douvres' and Burnham, with (at top right) dark blue/purple, green & yellow floral-bordered vignette image of peaked cap-wearing British soldier in khaki. – Verso has pencil message dated 26/11/17; red-inked stamp '[crown]| PASSED | BY | CENSOR | No. | 4652'; and black-printed franking 'FIELD POST OFFICE | A | 28 NO | 17' **[59]**

Map of London together with general information respecting places of interest and accommodation for sailors and soldiers in London [cover title]. – London: Australian Young Men's Christian Association [, ca December 1917 (?)]. – 1 sheet (both sides); 34 × 37.5, folded to 17 × 9.5 cm. – Title from front cover panel. – On verso, in centre: Map and guide to places of interest in London: issued by the Australian Young Men's Christian Association / Alexander Gross FRGS, Scale ½ mile = 22 mm [ca 1:36 000], col. map 20.5 × 23 cm; with inset: [Australia outline map with symbol + motto 'Australian Commonwealth Military Forces in London' overprinted in red with YMCA logo]. – 'Copyright 'Geographia' L^{td}. 55 Fleet Str [!] London E.C.'. – Front cover panel continues: "Presented to members of the Australian Navy and the Australian Imperial Force with the compliments of the Australian Young Men's Christian Association (Aldwych Y.M.C.A. Theatre Buildi[n]gs)". – Printed predominantly in blue, map with red for 'Board and Lodging' locations & for key to their addresses and railway stations **[60]**

I nostri confini orientali e le terre irredente / [anon.]. – Scala [ca 1:2 850 000]. – Gardone: E. Locatelli [, 1918]. – 1 map postcard: col.; 9 × 14 cm (map & card). – Graticule at 1° interval. – "V[isto]. [l']Uff[icio]. Censur [!] – Bergamo 21-10-1918". – Extent: A. dello Zillerthal – Littai – Pola/Mirandola – Chiari **[61]**

Gorizia – Trieste redente / [anon.]. – Scala di 1:800 000. – Milano: Uff[izio]. Rev. Stampa No. 795 [, 1918 (?)]. – 1 map postcard: col.; 8 × 11.5, card 9 × 14.5 cm. – (G.F.M). – No graticule. – Extent: Folgaria/Tolmino – Sesana – Muggia – Vivaro **[62]**

Map to illustrate the paper on the geography of the Italian Front by Magg. Cav. F. de Philippi. – Scale 1:1 000 000. – [London:] Royal Geographical Society, 1918. –1

map: col.; 19.5 × 35.5, folded to 21.5 × 11 cm. – To accompany 'The geography of the Italian Front' (read at RGS Meeting, 26.xi.1917) in *The Geographical Journal*, February 1918, **51**(2), pp. [65]–77 (includes post-lecture discussion) with photogr. plates. – Legend includes 'International Boundary, July 1914', 'Furthest Italian Invasion of Trentino', 'Austro-Italian Front, Oct. 1917', 'Present Austro-Italian Front', & 'Range of panorama taken from point indicated by Roman Numerals' **[63]**

City of Babylon / surveyed on scale 3 inches to a mile by Survey Party, Mesopotamia Expeditionary Force, March 1918. – Scale 3 inches to a mile; [ca 1:21 000]. – Baghdad: heliozincographed by Survey Party MED, December 1918. – 1 map: col.; 30.5 × 25, folded to 13 × 8.5 cm. – (Reg. No. 311) **[64]**

Tre Venezie / Istituto Geografico de Agostini, Novara. – Scala 1:3 000 000. – Milano: Istituto Italo-Britannico [, post-15.vi.1918]). – 1 map postcard: col.; 9 × 14 cm (map & card). – Graticule at 1° interval. – 'Visto Censura Novara'. – Extent: Vetta d'Italia – Littai – Pola/Ferrara – Bergamo/Coira (Chur). – Shows 'Confine natural nord-orientale d'Italia', 'Confine del regno d'Italia al 24 maggio 1915' & 'La fronte italiana prima dell'offensiva austriaca del 15 giugno 1918' (Fig. 9) **[65]**

Remembrance of France / L[ithographie]. (?) As[. . .] (?). – Scale not given. – Boulogne-sur-Mer: Maison Stevenard; Imp[rimerie]. A. Gourdin [, ca 1918–19 (?)]. – 1 map postcard: col.; 14 × 8.5 cm (map & card). – (3018). – No graticule. – Map of British Isles with NE France (Nantes – Orléans – Dunkerque), including 'Edimboug', 'Glocester', 'Douvres' and Burnham, with (at top right) a red, green & yellow floral-bordered vignette image of peaked cap-wearing British soldier in khaki. – Verso, overprinted on the original `ARTIGE. – Paris' issue's normal address + message information, has advertisement of Maison Stevenard for its `Cartes postales', `Cartes postales bromures', `Fabrique de cartes fantaisies' etc. **[66]**

Europe nouvelle 1919 / dressé par Maurice Allain, Professeur de Géographie; Rollet, Wieme, Bertillon Cartg. [*sic*]. – Échelle 100 + 500 Kil[omètres]. = 94 mm; [ca 1:1 650 000]. – Paris; Strasbourg; Bruxelles: Librairie Aristide Quillet [, 1919 (?)]. – 1 map: col.; 76.5 × 91, folded to 20.5 × 28 in envelope 21 × 28 cm. – Envelope title: Carte de l'Europe nouvelle. Prime offerte à tous les abonnées de l'Histoire Illustrée de la guerre du droit. – Extent: N[ouve]lle. Zemble – M[er]. d'Aral – Grande Syrte – Lisbonne. – No relief depiction. – "Hommage aux Souscripteurs de L'HISTOIRE ILLUSTRÉE DE LA GUERRE DU DROIT, par M. Émile Hinzelin" **[67]**

Eastern frontier of Germany / [*The Times*]. – Scale 100 miles = 6 cm; [ca 1:2 725 000]. – (London: *The Times Supplement*, Saturday, 28 June, 1919). – 1 map; 27.5 × 20, printed area 34.5 × 21 cm. – [Map no.] 3045 set within text of p. xi in 'The full text of the Peace Treaty'. – Extent: Memel – Siedlec – Olmütz – Kolberg **[68]**

Iles britanniques. Théâtre de la Guerre / [anon.]. – Echelle [ca 1:11 000 000]. – Bruxelles: G. Rinquet [, 1919 (?)]. – 1 map postcard: col.; 13.5 × 8, card 14 × 9 cm. – Shows 'Glascow', 'Richemond' [Yorkshire], and Osborne (I. of Wight) [!]; and 'Carvick' & 'Cifford' (Ireland) with 'C. Landsend' & 'C. Duncansby'. – Anon. 'chain letter' message in purple ink headed 'Porte Bonheur' [!]; Belgium 5c (Albert I, green) stamp, franked at Brussels on 5.ix.1919 (13–14) and at Frasnes Lez [!] Buissenal on 6.ix.1919 (10–11) **[69]**

Megostoroztatott, kigúnyoltatott és keresztre feszíltetett = La Hongrie fouettée, insulté [!] et crucifiée = Hungary flogged, jeered and crucified = L'Ungheria beffata,

flagellata e crocifissa / pinxit: Kardos Brunó. – Scale not given. – [Budapest:] Magyarország Területi Épségének Védelmi Ligája (Budapest IX, Rákos-utca 1: Besskó Károly Grafikai Műintézete) [, 1919–21 (?)]. – 1 map postcard: col.; 8.5 × 13.5, card 9 × 14 cm. – Ára 1 korona 50 fillér **[70]**

Air raid map of the Metropolitan area and Central London / [anon.]. – [London:] The Amalgamated Press Ltd [, 1920]. – 2 maps: col.; printed area 30.5 × 43.4, folded to half-sheet 38.5 × 51.5 cm. – (Harmsworth's new atlas; supplement). – Main map: County of London. Scale [ca 1:80 000]. 26.5 × 42.5 cm. – Inset: Central London. Scale [ca 1:50 000]. 11.5 × 12.5 cm. Extent: [Islington] – Tower Bridge – Oval – Knightsbridge **[71]**

Air raids & naval bombardments / [anon.]. – Scale English miles 60 = 42 mm; [ca 1:2 350 000]. – [London:] The Amalgamated Press Ltd [, 1920]. – 1 map: col.; 27 × 20.5 cm, folded to 38.5 × 26 cm. – (Harmsworth's new atlas; supplement). – Inset: East Kent on enlarged scale. Scale English miles 15 = 33 mm; [ca 1:740 000]. 8.5 × 7.5 cm. – "Chart showing the exact localities in England and Scotland that suffered from hostile air raids and bombardments from December 16th, 1914, to June 17th, 1918" **[72]**

British Grand Fleet in the Great War [:] complete chart of North Sea movements 1914–1918 / [anon.]. – Scale [ca 1:1 600 000] at N 58° – 60°. – [London:] The Amalgamated Press Ltd [, 1920]. – 1 chart: col.; 68.5 × 43, folded to 38.5 × 26 cm. – (Harmsworth's new atlas; supplement). – Inset: Entrance to Scapa Flow on enlarged scale. Scale [ca 1:800 000]. 11.5 × 14 cm. – On verso: 'War Chart of the Grand Fleet': text, ill. (7 warships), & portr. (Lord Jellicoe) **[73]**

The Daily Mirror atlas of the world / by Alexander Gross, FRGS; produced for *The Daily Mirror* by 'Geographia' Ltd. – London: 'Geographia' Ltd for 'The Daily Mirror' [, 1920 (?)]. – [ii] p., 64 p. of plates (col. maps), 128 p. + folding leaf of plates (col. map) pasted at back; 19 cm. – Plates 53 – 62 contain maps of territorial changes, the 'British Front' and Western, Russian & Italian Fronts "with old international boundaries". – Price 3/9 [£0.18] **[74]**

Europe centrale en 1920 / gravé et imprimé par Charaire à Sceaux. – Édition provisoire. – Echelle du 1:4 200 000e. – Paris: Taride, [avril] 1920. – 1 map: col.; 81 × 94.5, folded (loose) in folder 28.5 × 19 cm. – (Coll. des Cartes Taride). – Title & edition statement printed in blue above top border; original title: Nouvelle carte de l'Europe centrale. – Folder title: Nouvelle carte de l'Europe centrale en 1920 d'après les Traités de Versailles: 28 Juin 1919, Traité de Saint-Germain: 10 Septembre 1919. – Below lower border, in blue, are additional conventional signs for 'Nouvelles frontières définitivement fixées', 'Frontières actuellement indeterminées (*Tracée approximatif*), Zones soumises au plébiscite', and for 'Zone d'occupation'. – Inset: [Northern Scandinavia, Finland & Russia (Stockholm & Petrograd northwards)]. Echelle 1:13 000 000. 11 × 12.5 cm. – Inset: Asie mineure. Égypte, Arabie etc. Echelle 1:17 500 000. 16 × 13 cm. – Extent: Cap Nord – Kasvin – Gabès – Lisbonne. – Folder's other 3 sides are advertisements (including ind. for Taride's 22-sheet cycling & motoring map of France). – Prix: 1 fr. 75 **[75]**

Manual of map reading and field sketching. 1921 / War Office. – London; Manchester; Cardiff; Edinburgh: His Majesty's Stationery Office; Dublin: Eason & Son,

Ltd; London: printed by Harrison & Sons Ltd., 1921. – 233 p., 32 leaves (some folding) or pages of plates (some col.): ill., maps; 22.5 cm. – (40 | W.O. | 7286). – Print code indicates 65 000 copies in October 1921. – Includes 'Appendix I. List of British, Dominion, Colonial, and foreign maps' (pp. 181–6); 'Appendix IV. Spelling of place names' (pp. 205–10), including '§ 91. R.G.S. II. System, 1921' (pp. 206–10). – Contents (selected): –

Plate II 'Styles of type & conventional signs for maps on scales from 1:50,000 to 1:250,000', G.S.,G.S. No. 2650a. (War Office, 1920). – Col. & fold. plate 19.5 × 35 cm

Plate VIII 'North-West Europe', 1:250 000 (War Office, 1920; Truscotts, London). – Col. map 16.5 × 20.5, folded to 22 × 13 cm. – Extent: Poperinghe/Ypres – Lille – La Bassée – St. Quentin

Plate IX 'Belgium and North-East France', 1:100 000 (War Office, 1920; Truscotts, London). – Col. map 17 × 21, folded to 22 × 12 cm. – Extent: Poperinghe/Ypres – Messines – Rabot – Flêtre

Plate XIV 'Military conventional signs to be used on trench & artillery maps. The signs are drawn to suit 1:20,000 scale maps' (Truscotts, London). – Col. & fold. plate 16.5 × 22 cm

Plate XVIII 'Conventional signs & lettering used in field sketching. Note: Words which should appear on the Sketch are shewn in black', G.S, G.S, No. 2960 (War Office, Aug. 1920; Truscotts, London). – Col. & fold. plate 19 × 25.5 cm

Plate XIX 'Illustration of the successive stages in the work of a plane table sketch', scale 4" = 1 mile (R.F. 1/15 840), 500 + 2000 yards = 145 mm (printed at the War Office, 1921). – Col. & fold. plate 20 × 24 cm

Pl. XXIII 'Typical panorama: view looking N.E. from Observation Post 44d. N.W.1. 24d. 1289 [. . .] Date: July 3, 1918. 0900 hours: weather fine, visibility good' / J. Smith, Lieut., R.A. (Truscotts, London). – Fold. plate 16 × 45 cm

Pl. XXIV 'Curves of equal magnetic variation (isogonals), 1920' (Truscotts, London). – Fold. plate 17 × 34.5 cm. – Price Three Shillings Net [£0.15] **[76]**

Map of Europe showing boundaries of states according to treaties 1921 / John Bartholomew & Son Ltd, The Edinburgh Geographical Institute. – Scale 1:5 500 000. – Edinburgh: Bartholomew [, 1921]. – 1 map: col.; 55 × 81, folded to 21.5 × 14.5 cm. – Cover title: Bartholomew's general map of Europe showing boundaries [. . .] to treaties. – "Areas left white are administered by League of Nations". – Inset: Boundaries in 1914. Scale [ca 1:24 000 000]. 15.5 × 14.5 cm. – In lower right-hand corner between neat-lines and outer frame: 2. – Extent: Wiborg – Nalchik – Malta – Lisbon **[77]**

Sketch-map showing routes of Captain Blacker's Detachment, 1918–20. – Scale 1/13 000 000. – [London:] Royal Geographical Society, 1921. – 1 map; 17.5 × 19, folded to 25 × 13 cm. – Extent: Aral Sea (Kazalinsk) – Leh – Karachi – Baku. – To accompany 'Travels in Turkestan 1918–20' by Captain L.V.S. Blacker (read at RGS Meeting, 2.v.1921) in *The Geographical Journal*, September 1921, **58**(3), pp. 178–98 (also includes 'Captain Blacker's route from Chinese Pamir to Yarkand. October, 1918', scale 1:1 250 000, 18 × 19 on folded page 25 × 26.5 cm). – Also discussed: plane-table survey methods and map reproduction ("To reproduce the

maps required for the immediate use of the troops we used ferrotype paper in a home-made printing frame . . . and we were fortunate enough to be able to prepare and print maps of the area in which fighting soon after occurred in time for issue to troop and company commanders concerned.") **[78]**

N.D. de Lorette: carte du champ de bataille d'Artois / [anon.]. – Scale not given. – Mulhouse-Dornach: Braun & Cie [, 1930 (?)]. – 1 map postcard; 8 × 11.5, card 9.5 × 14.5 cm. – Sepia reduced composite of parts of sheets 7 NE, 7 SE, 8 NO & 8 SO of 'Carte d'état major' 1:80 000 series (printings of 1898 to March 1930 inclusive) to benefit Association du Monument de Notre Dame de Lorette (Arras) **[79]**

Francis Herbert Hon. FRGS worked in the RGS Map Room for 35 years, retiring as Curator of Maps, RGS-IBG, in 2006. He became a Fellow of the British Cartographic Society in 1998 and of the Society for the History of Discoveries in 2013. For two periods he represented the RGS on BRICMICS; in 1981 he became a founder member of the Charles Close Society for the study of Ordnance Survey Maps. He was Research Editor for both *The Map Collector* and for *Mercator's World* magazines; and compiler from 1976 to 2005 of the 'Imago Mundi Bibliography', standardising its style and increasing its information content. In addition to articles in *Imago Mundi* he contributed to the *Lexikon zur Geschichte der Kartographie* (1986), to *Tooley's dictionary of mapmakers, rev. edn* (1999–2004), and to *British map engravers: a dictionary. . . to 1850* (2011). Other articles have appeared in *The Cartographic Journal* (BCS), *Cartographica Helvetica, The Independent* (London), *Journal of the International Map Collectors' Society, LIBER Quarterly, MapForum;* and reviews of Belgian, British, Dutch, French, German and Italian publications in the Brussels International Map Collectors' Circle's *Newsletter, The Geographical Journal* (RGS-IBG), *Geographical Magazine, IMCoS Journal, Scottish Geographical Journal* (RSGS), and Society of [University] Cartographers' *Bulletin*. He corrects the English summaries for the quarterly *Caert-Thresoor* (Netherlands), and checked all the English abstracts for the 25th and 26th International Conferences on the History of Cartography in 2013 (Helsinki) and 2015 (Antwerp). He is also on the editorial advisory board of *Terrae Incognitae : the Journal of the Society for the History of Discoveries* (USA), and - from winter of 2015 - assists the editor of The Brussels Map Circle's *Newsletter : Maps in History.* His article on the RGS is published in the History of Cartography Project's vol. 6 (University of Chicago Press, 2015).

Part II
Maps and the Aftermath of World War I

Mapping, Battlefield Guidebooks, and Remembering the Great War

James R. Akerman

Abstract Though battlefield tourism dates at least to the Battle of Waterloo, the few years after the First World War brought tourists and pilgrims to battlefield sites and cemeteries in unprecedented numbers. Guidebooks to the Western Front appeared in similarly unprecedented numbers, chiefly for British Commonwealth, American, and French readers. Foremost among them were those published by Michelin, which were distinctive from their competitors in their commitment to the private automobile as a means for touring the front. Michelin battlefields guidebooks combined historical narratives of campaigns; dramatic photographs of towns and landscapes during and after the war; and narrative battlefield tours, panoramas, and maps. The itineraries demonstrated a sophisticated understanding of the advantages automobility afforded tourists in the comprehension of battlefield topography, tactics, and chronology. Characterizing battlefield tourism as a form of pilgrimage, they were minimally commercial in approach but patriotic in tone. As such, they were suitable counterparts to the battlefield monuments and cemeteries memorializing the conflict, then under construction. At the same time, the guides and their maps illustrated the ironic ease with which the motor tourists who used these guidebooks could traverse territory so recently mired in bitter conflict notorious for its immobility cannot be overlooked. Michelin's battlefield guides marked the emergence of an automobile tourism and mapping that emphasized both free-ranging exploration of the countryside and national patriotic education.

1 Introduction

Despite the recent attention guidebooks have received from historians of travel and literary scholars (Buzard 1993; Koshar 1998; Francon 2001; Harp 2002; Parsons 2007), relatively little attention has been paid to their maps (but, see Olson 2010). This is a shame, for while guidebook cartography is rarely state-of-the-art technically, it is well placed to profoundly influence its reader's tastes, interests, and perceptions of place and landscape.

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Guides to historical battlefields are both a well-defined and somewhat unusual sub-class. Their first notable appearance responded to tourist interest in the field of Waterloo. In the late nineteenth century, Americans developed a robust industry in organized tours, maps, and guides to the battlefields of the American Civil War, particularly to those sites in Virginia, Maryland, and Pennsylvania that were easily accessible as short railroad trips from the major population centers of the Eastern seaboard (Lloyd 1998, pp. 19–23). However, a "veritable boom" in guided battlefield tours and guidebook publication "was unleashed by the first world war" (Parsons 2007, pp. 244–245).

On the surface, and from the distance of a century, the idea of touring battlefields such as the Ypres Salient, the Somme, and Gallipolli, so soon after the slaughter of so many young men, may seem macabre. We may appreciate the opportunity seized by commercial interests to regain business disrupted by the war, but we cannot help but ponder nevertheless the morality of the *Little guide to Paris and the battle fields of France, offered by the Printemps, the great department store of Paris* (1920). The booklet begins:

> Madam, The Magasins du Printemps, the most renowned stores in Paris, are glad to give you a hearty welcome. And to place at your disposal this booklet, which may help you in your visits of the metropolis and give you information concerning its amusements and its elegance. You will find at the Printemps, if you are kind enough to favour us with a visit, the latest examples of Parisian fashions and a trained staff of interpreters to assist you in making your purchases. (Printemps 1920 p. 3)

Inside, amid advertisements for the store's tea room and other in-store services are descriptions of guided excursions by the store to the former Western Front (as well as the chateaux of the Loire).

Private companies such as Thomas Cook & Son organized tours to the Western Front and Gallipoli almost immediately after the war, as did government and charitable agencies, such as the YMCA and the Imperial War Graves Commission. Alongside the curious were hundreds of thousands of bereaved relatives and comrades to those who died. Guidebooks consistently characterized battlefield visits as pilgrimages, both personal and patriotic, and urged those making the trip to maintain decorum and respect both for the fallen and the places in which they fell (Lloyd 1998, pp. 23–48). Whether the curious or bereaved, for many, visits to former war zones was motivated by a grim desire to comprehend the horrors of warfare so brutal, unrelenting, and efficient in its killing—themes, that Paul Fussell so eloquently argued, motivated much of British literary culture, popular accounts, poetry, and mythmaking during and after the war (Fussell 1975). It may be fairly said the marketers did not create the high demand for battlefield visits to the Western Front and elsewhere that occurred during the first 5 years after the war; curiosity, patriotism and, most importantly, loss did.

During the war a deluge of graphic media, including drawings, photographs, and maps, familiarised civilians with the geography and the topography of the Western Front. Special issue war maps and atlases provided overviews of the frontlines and detailed maps of specific sectors and battlefields. Illustrated magazines, such as the *Illustrated London News* and *l'Illustration,* saturated readers with images of trench

and air warfare, powerful artillery in action, and scenes of daily life on the front. Novel aerial images from military sources leant an unprecedented immediacy and authenticity to the representation of the combat landscape. To a far greater extent perhaps than for any previous war it was possible to gain from a safe distance a detailed picture of the war experience. But, though aerial photographs or sketches conveyed some aspects of the experience of combatants, they were nevertheless only pictures, detached from the landscapes and events they portrayed both in time and space. Post-war battlefield visits brought one in more intimate contact with the war, helping civilians, whether or not they had lost loved ones, to better understand the suffering they had witnessed from a distance. So argued the authors of Thomas Cook & Co.'s 1920 prospectus and guide for its organized tours of Western Front:

> There are few of us living to-day who have not in some way suffered from the war… We know only too well what war means now. Do we? Not quite—not until we have been to see what war did to others, and chiefly those who lived under the hideous hurricane of shot and shell and manifold hatred. We know what discomfort, what pains and suffering the war brought us individually, but we do not know—and we cannot know—what war really means until we have visited the Battlefields and the ruined towns and devastated miles upon miles in the North of France and Belgium. And it is our duty to visit them; it is a duty we owe to our manhood and womanhood and the common brotherhood which the best of us hope will now reign in the world. Let us, then, hasten to learn how not only our own loved ones must have fought and struggled and suffered, but how innocent peasants, women and little children lived and toiled amid devastation and horror…. We have read much of the soldiers' arduous and dangerous life, but our ideas of all this can be but vague and incomplete until we have visited the fields of battle and seen trenches and dug-outs, mine craters and wire defences and all the terrible business of warfare. (Thomas Cook & Co. 1920, pp. 2–3)

As the Cook prospectus also suggested, battlefield tourism required some urgency:

> [W]e must hasten to see them for ourselves, for the heroic and busy French peasant lets no grass grow under his feet, but works and digs and toils; and if we are not quick the traces will not have disappeared—it will take many a year for that—but they will have become fainter and more difficult to realize, for Nature, too, kindlier than man, will have covered much with her green mantle of oblivion.

2 Battlefield Guidebooks, Maps, and Automobility

The great demand for information about reaching and touring the Western Front may be readily discerned from the new editions of established guidebook series that were expanded or rewritten to incorporate sections and maps on the history of the war, battlefields, and cemeteries. Ward, Lock & Co.'s 1921 *Handbook to Belgium and the Battlefields* is typical of the conventional guidebooks to the war zones. It contains a number of unremarkable town plans and a general map of Belgian roads and railroads, to which was added a map of the battle lines, and a large complement of photographs showing the war's destruction. Its sole detailed map of a particular battle zone depicts the Ypres Salient, which it calls the "Holy Ground of British Arms." The guidebook is particularly sensitive to the travel needs of ordinary

Britons whose primary interest was visitation of cemeteries and other sites of personal interest:

> Both the Y.M.C.A. and the Church Army have a hostel at Ypres. Nearly all the accommodation is reserved for relatives visiting graves. Such persons can obtain tickets covering the double journey from London, board and lodging at the hostel, and guides to the cemeteries. Application for particulars should be made to the Graves Visitation Department, Y.M.C.A. Headquarters…or the Secretary, Graves Department, Church Army…. In the Ypres salient there are 250,000 graves in 400 military cemeteries, scattered all over the battlefields. The largest cemetery is a Remy Siding, behind Poperinghe…. It is important that relatives visiting graves should, before leaving home, have definite information respecting the grave or graves they wish to see. Inquiries can be made at the Imperial War Graves Commission… The full name, rank and unit should be given, and (if known) the place and date of death. (Ward, Lock & Co. 1921, pp. 54–55)

Findlay Muirhead's *Belgium and the Western Front* (1920) follows a conventional guidebook model, but is considerably more invested in cartography, including color maps, than Ward, Lock & Co.'s counterpart. Muirhead and his brother James were editors of the English-language Baedeker guides before the war, but having lost this connection in 1914 they formed a partnership with the French publisher Hachette to co-publish an Anglophone version of the venerable *Guides bleus,* founding the modern *Blue Guides.* The cartographic program of Muirhead's *Belgium* is comparable to those found in Baedeker or Hachette. A general map of Belgium and northern France showing roads and railroads opens the volume. There are 32 plans of cities and towns, many printed in three colors and large enough to require folding. (These are copies of existing Hachette maps, printed in France and in French.) Many new maps, apparently of British conceptions, were prepared to support either an appreciation of the history of the war or to accommodate visitation of its sites understanding of the war. These include a general map of the Western Front, 11 sectional maps of major battle zones, and 10 "sketch maps" of battlefields. The geographically organised text includes cultural and historical notes and notes typical to guidebooks of this genre, but these are interlaced with references to the events of the war, its surviving landmarks, and the British units involved in specific engagements. The extensive historical introduction to the war includes practical information for visiting grave sites and a short list of recommended books and maps, foremost among them the military maps of the British General Staff:

> For visitors to the British Front in Belgium and France the best maps are those issued, on different scales, by the Geographical Section of the General Staff, Each series is sold at 3s. per sheet and may be obtained from Edward Stanford, Ltd.… Of the map of North-West Europe (1:250,000; 3.95 miles per inch), perhaps the most useful of the series, Sheets 1 and 4 include the British Front…The larger map of Belgium and France (1:100,000; 1.58 miles per inch) is issued in sheets, familiar to soldiers. Of these the most important are Dunkerque (1a), Hazebrouck (5a), Tournai (5), Lens (11), Valenciennes (12), Amiens (17), St. Quentin (18), and Soissons (22). Sections of these maps, covering the battle-front continuously from N. of Ypres to S. of Amiens, are reproduced in the present handbook, and with their aid the various routes may be followed in detail.

The sectional maps in the guide offer no specific information about the front or fields of battle, but they are large enough in scale (a half-inch to the mile) to support

exploration in combination with the text. Muirhead provided information about guided visits to the battlefields, but he clearly expected many of his readers to explore the battlefields and cemeteries on their own, with the aid of a good map.

The vast majority of guidebooks to First World War theaters published in the period from the end of the war to the late 1930s concerned the Western Front, and no publisher was more prolific than Michelin & Cie. and its British, American, and Italian affiliates. Michelin had already published several guidebooks to France and adjacent countries by 1914, and the first editions of its iconic 1:200,000 sectional road maps of France appeared in 1911. But, as Stephen Harp has shown, the war sharpened and directed Michelin's considerable marketing talent towards the war effort. The appearance of the battlefield guides—remarkably as early as 1917—was an expression of the company's wartime and postwar embrace of patriotic and nationalistic rhetoric (Koshar 1998; Harp 2001, pp. 89–125; Harp 2002).

Michelin's patriotic rhetoric was not unique among guidebook publishers. What set its battlefield guides apart from their contemporaries was their commitment to the privately operated motorcar as the primary means of touring the battlefields, and their incorporation of maps designed, in a close working relationship with text and photography, to suit the navigational needs and possibilities of the automobile. Michelin's battlefield guides appeared not only at the end of a great war, but also astride a transition in the social reach of motoring itself. Since about 1910 both Europe and America had seen a steady expansion in automobile use from its urban and aristocratic base. The end of the war accelerated this growth and brought about parallel expansion and innovation in the publication of maps and guidebooks designed specifically for motorists. This trend was perhaps strongest in North America, where the economic recovery from war was easier and more rapid, but Michelin rode a wave of growth in the European market as well, and invested heavily in its expanding line of travel and cartographic products (Francon 2001).

All battlefield tourism involves visitation of the landscapes and relics of conflict, but as a destination the Western front had distinctive characteristics that encouraged, perhaps even required, some form of automobile touring. For more than 3 years, from late 1914 to spring 1918, the front was essentially static, and most of the great battles in the west unfolded within a relatively thin band of activity.

> The chief effect of two years of bombardment and trench-to-trench fighting across no man's land was to have created a zone of devastation of immense length, more than 400 miles between the North Sea and Switzerland, but of narrow depth: defoliation for a mile or two on each side of no man's land, heavy destruction of buildings for a mile or two more, scattered demolition beyond that. (Keegan 2000, p. 310)

Post-war tourists could potentially drive across this zone of destruction, passing through the former Allied and German lines, within a matter of minutes. One could, moreover, do this repeatedly as needed in the space of a single day's travel, all the while moving along the front so as to take in the tactics and objectives of entire offensives strung out along fronts of many miles. And, since these offensives had relatively little effect in moving the front in either direction over the course of several years in some sectors, such as the Ypres and Verdun salients, it was possible to traverse in close proximity the palimpsests of battles chronologically separated by 2

or 3 years. Intermixed among the surviving bunkers, trenches, and other battlefield features were hundreds of graveyards. These were small and dispersed during the first years after the war, and in the case of British Commonwealth cemeteries mostly remained so. Finding the grave of one special individual required traveling about.

It was possible to take railroads to cities and towns along the front, but railroads usually did not reach into the battlefields. Muirhead asserted that

> The best means of visiting the battlefields is unquestionably by road, a fact to which attention is paid in the arrangement and descriptions of this handbook. Railway communications along the entire front are infrequent and uncertain…. The pedestrian…will be able to accomplish the most thorough and intimate examination of the ground, but motorists and cyclists will have no difficulty in reaching practically any point. (Muirhead 1921, p. lxiv)

These traverses could and did utilize guided automobile tours, but the highly personal nature of some battlefield visitation required the freedom to vary the route. This was (and remains) a hallmark—as the term itself implies—of automobility.

3 Michelin's Battlefield Guidebooks and the Landscape of War

Though development of a market for its tires was initially the primary motivation for publication of its travel products, by the second decade of the twentieth century Michelin's mapping and travel guide arm began to take on a profitable life of its own. The first guide to a foreign country (Belgium, appropriately enough) was published in 1904. By 1914, the series had expanded to embrace Switzerland, Germany, Britain, and several Mediterranean countries, including colonial North Africa. Six English titles were published in 1911. The first guides to include mapped itineraries appeared in 1908 (Michelin 2004). *Les Pays du Soleil* (1911) was the first to map circuitous excursions from a touring base—the method that the Michelin battlefield guides would adopt and refine to great effect.

According to Harp, 29 titles were published in Michelin's battlefield guidebook series, the first editions appearing between 1917 and 1921. Sixteen of these titles were translated into English (co-published by Michelin's British and American subsidiaries), and one *(Verdun)* was translated into German in 1929. The entire Western Front series amounted to 3500 pages and 1000 maps. Some were centered on cities on or near the front, such as Lille, Amiens, Ypres, and Verdun. Others were devoted to frontal zones of particular significance, including Somme, Marne, and Champagne (Harp 2001, p. 96). An autonomous four-volume set covering the Italian/Austrian front, with maps by the Istituto Geografico de Agostini-Novara, appeared in 1919. A three-volume set, *The Americans in the Great War,* featuring sectors of the front where "doughboys" had served was published in 1920, reworking and augmenting previously published material in the hope of luring Americans and their much-needed cash to France. Michelin published more than 850,000 of its battlefield guides by January 1920, and more than 1,400,000 by January 1922 (Lloyd 1998, pp. 100–103).

No one can page through these guides without being moved in some measure the physical and emotional effects of the conflict, represented by its battered landscapes. According to Harp (2001, pp. 96–106), 4500 photographs appeared in the series—page after page documenting the obliteration of villages, ruin of churches and public buildings, and the decapitation of forests. Abandoned trenchworks, bunkers, and fortifications and fields of fresh graves somberly dot the landscape. The barrage of testimonial photographs, most of them supplied by the French propaganda services, also implicated the Germans in this destruction. Harp also argues that Michelin guidebooks' pretensions of recreating the battlefield experience was a limited, aristocratic one—an officer's view—since common soldiers were either too deeply dug in and too preoccupied with staying alive to be able to survey the battlefield as a photographer or cartographer could. Tourism to Belgium and northern France in the first years after the war was nevertheless robust, including both holiday seekers and grieving families.

Michelin's propagandistic motivations included the promotion of private motoring. Since the mid-nineteenth century European and North American railroad and other transport companies had been actively engaged in the publication of maps and guidebooks to specific regions and localities (Ward 1998; Musich 2006). In disseminating information about scenic or historically interesting places reachable by their routes, transportation companies found a powerful means of promoting use of their services. In the automobile era this tactic included the promotion of branded products. The covers, introductory and back pages of most of the Michelin battlefield guides, for example, featured advertisements for Michelin tires, other guides in the series, and Michelin's celebrated 1:200,000 series of maps of France.

Remarkably, the first volumes in the Michelin series were published before the end of the war: three volumes promoting tours of the setting of the First Battle of the Marne (September 1914). The first two parts, published simultaneously in French and English, concern the engagements along the Ourcq River and near St. Gond (Michelin 1917a, 1917b, 1917c, 1917d). The third part, *La Trouée de Revigny, Chalons Vitry-le-François—Bar-le-Duc* appeared in 1918 (Michelin 1918a). These early publications, while the war was still raging, require some explanation. By 1917, 3 years of the war of attrition along the Western Front had produced millions of casualties but little progress towards ending the war. The collapse of the Russian ally in the east brought the prospect of a German offensive in the west. Pressed hard by their commanders to gain a forestalling victory, French soldiers along several sectors of the front mutinied after a failed offensive in April, and the ability of the French to continue the fight was in doubt for some months. The industrial side of Michelin was considerably engaged in the industrial war effort, and the French propaganda ministry approached the hyper-patriotic André Michelin. In 1915, Michelin had already published a guide to western Germany, apparently in anticipation of an Allied invasion of same, and rumours circulated that Baedeker was itself preparing a German counterpart for northern France, a claim that Michelin himself made at a ceremony staged on the former battlefield dedicating the Marne guides in September 1917 (Harp 2001, pp. 96–98; Larabee 2010; Lottman 2003, pp. 104–130).

The foreword to the English-language edition of *The Ourcq Battle-Fields*, "dedicated to the memory of Michelin employees who died gloriously for their country," acknowledges the impracticality of war tourism for more of its readers, but persists in offering the details of a tour that will eventually be possible in brighter times:

> This book appears before the end of the war, but the country over which it leads the reader has long been freed. The wealth of illustration in this work allows the intending tourist to make a preliminary trip in the imagination, until such time as circumstances permit of his undertaking the journey in reality, beneath the sunny skies of France. (Michelin 1917a, p. 2)

This Ourcq sector was, however, close to Paris, and theoretically could be visited in 1917 by Parisians with comparative safety, as the Germans had been pushed back from the Marne in autumn 1914. Photographs of several places along the described tours show military officers and politicians visiting the former battlefield. Most importantly, "[t]he battle of the Marne represented France's ability to halt and roll back, at least partially, the German onslaught. The guidebook appeared in time for the third anniversary of a battle that had already attained mythological proportions." (Harp 2001, p. 98)

The brief historical sections that open all of the Michelin battlefield guides include many maps sketching out the geography and chronology of the battle. In *Le Ourcq/The Ourcq* there are 13 such maps showing daily movements of the front, underscoring both the threat to Paris of the German advance in September 1914, and its ultimate reverse.

In most volumes, the "tourist section" that follows comprises one or more motoring itineraries into the countryside, to be completed in 1–3 days, originating and returning to an urban center (e.g., Paris, Lille, or Rheims). There are usually prescribed itineraries for touring within cities and towns encompassed by the guide. In *Ourcq*, these include visits to Chantilly, Senlis, and Meaux. The introduction to the touring section prepares the tourist for a mix of scenery, culture, military tactics, struggle, destruction, and sacrifice:

> In the course of the journey the traveller will live over again the anxious moment when the Germans, having arrived within gunshot of the capital had to decide whether to continue their irresistible march on Paris or attempt first to put the allied army out of action; he will then reconstruct the tragic struggle which for five days confronted Gallieni, Maunoury, and von Klück…. The country traversed has the varied scenery of the Ile-de-France: from the vast forests of Valois, the tourist will come to the fertile up-lands of Brie, intersected by lovely valleys. He will become acquainted with Chantilly, the great Condé's town, afterward Marshal Joffre's Headquarters; Senlis, a jewel of ancient France, which narrowly escaped the fate of Louvain; Meaux, with its cathedrals, its old mills, and the ruins left by the war in the surrounding villages. (Michelin 1917a, p. 16)

Narratives of hardship, death, and destruction alternate with admiration for the landscape and architecture. The *Ourcq* guide includes detailed plans of the grounds and chateau of Chantilly, photographs of gardens, interiors, and artwork. The tour of Senlis mixes an appreciation of the architectural beauties of the city with accounts of their damage or destruction by the German bombardment. In other volumes, dedicated to cities that suffered occupation or extended bombardment, such as Lille, Amiens, and Rheims, itineraries take us floor-by-floor through art museums

or through cathedrals and *hôtels-de-villes*. We admire paintings and facades in the usual manner of guidebook text and illustration, including absent works damaged, destroyed, or pillaged by Germans, or hidden away from the invaders by French curators. Out in the countryside, readers are taken to fresh graveyards, newly constructed memorials; past trenchworks, bunkers, and destroyed tanks; and through leveled villages. We learn the names of units that fought there and their heroic actions, but we also pause to admire country churches and scenic panoramas, wherever these had not been marred by war.

4 Mapping and Navigating the Landscape of War

The cartographic program of the Michelin guides battlefield guides is, at first glance, modest. Introductory matter encourages readers to follow Michelin's 1:200,000 series of road maps of France, completed just before the start of the war. The maps incorporated in the guides themselves were highly specialised. Some outlined the itineraries described in the text. Others provided descriptive density to landscape and battlefield features and aided local navigation. Most are small and printed without color. And while they were executed with little flourish, they are always cleanly and clearly drawn in the Michelin style and carefully coordinated with parallel text and photographs.

Urban plans included in the guides are often concerned only with general orientation. Many, however, bear witness to war's damage where it leveled entire blocks or destroyed or threatened major buildings. In *Lille before and during the war* (Michelin 1919b) the map showing the first of four itineraries through the city concentrating on the vicinity of the Grand Place distinguishes between blocks that have been destroyed by bombs (in white), including the Hôtel de Ville, and those (in grey) that survived the war largely intact. In *Rheims and the Battles for its Possessions* (Michelin 1920b), a detailed map (Fig. 1) shows the locations of several hundred bomb craters in the vicinity of the great cathedral. Here again, structures shaded on the map (including the cathedral itself) survived the bombardment, while unshaded blocks populated with bomb strikes did not.

In the fields of battle, photographs and descriptions offer similar views of destruction of individual buildings, and in some cases the utter destruction of towns. In the *Ourcq* volume, a series of photographs highlight the ceremonial visits of clerical, military, and public dignitaries to newly constructed shrines and gravesites. Fresh fields of shallow graves, still with only wooden crosses to mark them, indicate where soldiers fell in their attacks or retreats. In later volumes devoted to battles along the static front (the First Battle of the Marne was largely a trenchless battle), the physical remnants of trenches, bunkers, barbed wire, and destroyed tanks populate photographs of landscapes stripped of their historic landmarks.

Orientation maps carefully guided the first waves of battlefields tourists through these mangled landscapes in ways that general maps could not. Itineraries through particular sectors of the battlefields begin with maps sketching the general path

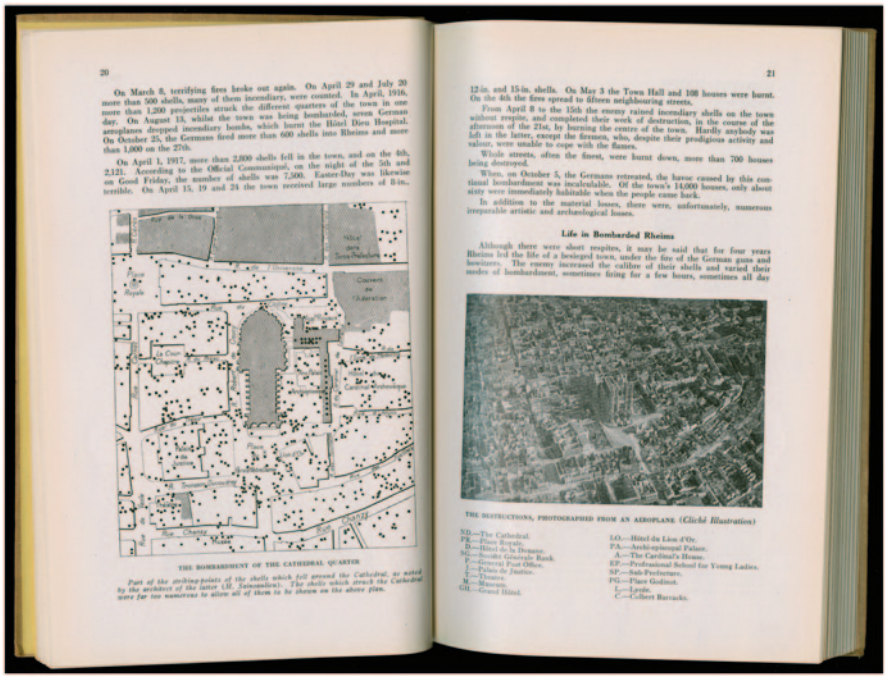

Fig. 1 The bombardment of the cathedral quarter. (In: Rheims and the battles for its possession. Michelin 1920a; Courtesy of the Newberry Library)

of the journey and identifying towns, crossroads, route numbers, and landmarks. Additional maps identify points-of-interest and guide motorists through intersections and other points of decision. For guides devoted to sectors that experienced prolonged and intense trench warfare, such as the Ypres and Verdun salient and the battlefields of the Somme, these are carefully framed and drawn maps, strategically inserted into the text blocks of the itinerary narratives and accompanying photographs. Despite their diminutive size they were among the most sophisticated road maps yet produced by the automobile era.

Excerpts from the description of an itinerary from the second of three volumes in the series *Americans in the Great War, The Battle of St. Mihiel* (1920) demonstrates how maps, text, and photographs helped the tourist navigate both the roads of the present and the landscape of the past. To set the stage for the American breakthrough at St. Mihiel in September 1918 that collapsed the German line in Lorraine, the first itinerary in the volume takes the tourist on a circuit of 80 km southeast of Verdun along Côtes de Meuse, reliving the battles of 1914–1916 that created the St. Mihiel salient. Motorists first follow the Calonne Trench *(Tranchée de Calonne),* an old forest road that was for a time the French front line.

> This picturesque road enables the tourist to follow the phases of the struggle which took place in the district of Les Eparges…. Formerly this road was used only by poachers, gamekeepers, and shooting-parties, being a well-known haunt of game. Calonne Trench will, in the future, evoke more tragic memories.

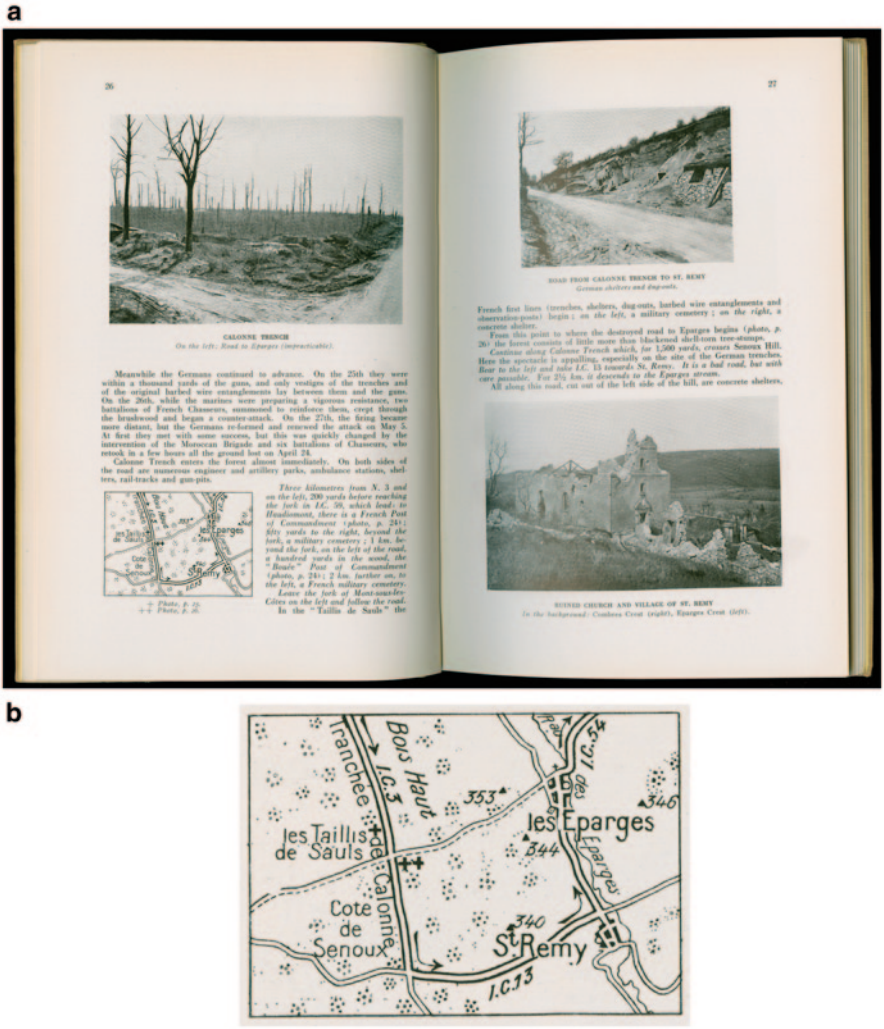

Fig. 2 **a**, **b** Itinerary and map leading from Calonne Trench to Les Eparges. (In: Americans in the Great War, the Battle of St. Mihiel. Michelin 1920a; Courtesy of the Newberry Library)

The motorist must pass by a crossroad that runs directly to Les Eparges. A photograph and a map show it to be rendered "impracticable" by war damage (Fig. 2a, b). The motorist then continues

> along Calonne Trench which, for 1,500 yards, crosses Senoux Hill. Here the spectacle is appalling, especially on the site of the German trenches. Bear to the left and take I.C. 13 towards St. Remy. It is a bad road, but with care passable. For 2½ km. it descends to the Eparges stream. All along this road, cut out of the left side of the hill, are concrete shelters, dug-outs, underground passages, German posts of commandment, and a few German graves.

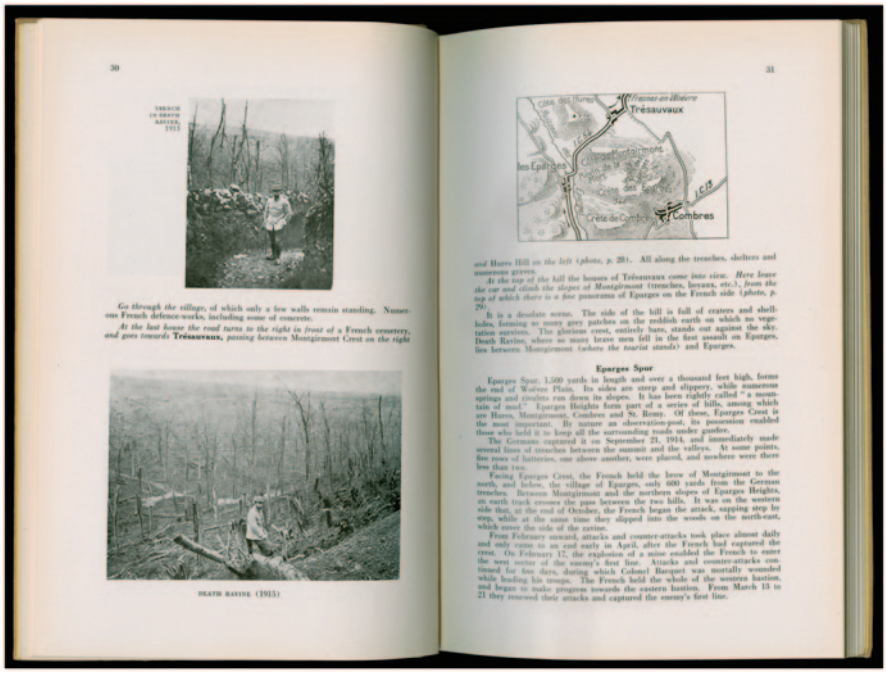

Fig. 3 Itinerary map and scenes on the road from Les Eparges and Trésauvaux. (In: *Americans in the Great War, the Battle of St. Mihiel*. Michelin 1920a; Courtesy of the Newberry Library)

After turning towards Les Esparges at St. Remy, travelers pass "through the village, of which only a few walls remain standing," and ascend on I.C. 54 the dividing ridge of the Côtes de Meuse towards Trésauvaux (Fig. 3).

> At the top of the hill the houses of Trésauvaux come into view. Here leave the car and climb the slopes of Montgirmont (trenches, boyaux, etc.), from the top of which is a fine panorama of Eparges on the French side (photo, p. 29). It is a desolate scene. The side of the hill is full of craters and shell-holes, forming so many grey patches on the reddish earth on which no vegetation survives. The glorious crest, entirely bare, stands out against the sky. Death Ravine [on the map: *Ravin de la Mort*], where so many brave men fell on the first [French] assault of Eparges [in April 1915], lies between Montgirmont (where the tourist stands) and Eparges. (Michelin 1920a pp. 24–31)

A similar passage from the volume devoted to the *Ypres and the Battles of Ypres* (1920) describes and maps a drive through the ridges southwest of Ypres in the vicinity of Mount Kemmel (Kemmelberg), scene of the final German attempt in April 1918 to reduce the Ypres Salient by outflanking it. The maps describing this itinerary work hard to guide the tourist through unusually rugged terrain (for Flanders) on bad roads dissected by the wounds of war. One particularly fine map (Fig. 4a, b) describes a winding route through terrain northwest of Kemmel, representing one of the greatest German penetrations towards Poperinghe, the supply town and backdoor key to the British salient. At two points on the route, the tourist is obliged

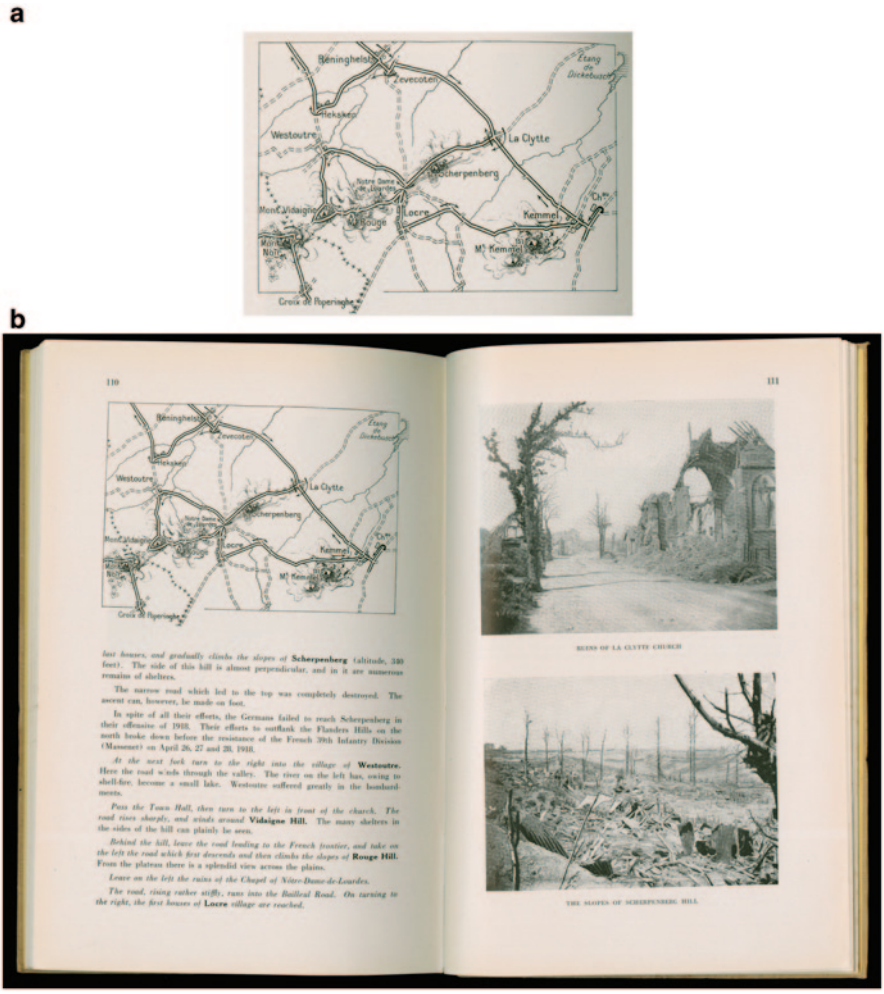

Fig. 4 **a**, **b** Map of itinerary in the vicinity of Scherpenberg Hill and accompanying photographs. (In: *Ypres and the Battles of Ypres*. Michelin 1920a; Courtesy of the Newberry Library)

to turn back from a single impassable intersection (at Notre Dame des Lourdes) near Scherpenberg Hill. The road ascending the hill itself is impassable to automobiles, but the ascent can, "however, be made on foot," something that the attacking Germans failed to achieve. The guidebook text gloats that "[I]n spite of all their efforts, the Germans failed to reach Scherpenberg in their offensive of 1918." (Michelin 1920c, pp. 108–113).

For a final example, we return to the Battle of the Ourcq, as described in a second, combined edition of the volumes devoted to the First Battle of the Marne. In a remarkable sequence of 28 pages describing the landscape and events along the extreme right flank of the German line near Meaux, at its closest approach to Paris, the

Fig. 5 Detail of Map of suggested tour route through the Meaux battlefield. (In: *Michelin guide to the battlefields of the World War*, vol. 1, The First Battle of the Marne. Michelin 1919a; Courtesy of the Newberry Library)

motor tourist is led northwards (for here the German right flank bent to the north) along the French line as far as Betz, then returns southward along the German line. A fold-out map (Fig. 5) outlines the route in red, guiding the motorist on a route of 17 miles, starting and ending at Meaux. Six points are identified on the map (panoramas A-F) where the motorist will find panoramic photographs of the battlefield.

We pick up the narrative at the town of Chambry, on the northbound journey from Meaux, roughly following the former French lines, which at this point faced eastward to the German lines. The action described, photographed, and mapped is that of the closest German approach to Paris of the entire war, near Meaux, September 5–9, 1914. The text describes the traveler's approach to Panorama B, which offers a view eastward from the French lines. It is worth quoting the text at some length so that it is possible to grasp how the map, panoramas, and text worked together to support the mobile travelers' survey and comprehension of the battle:

> On leaving the cemetery one sees in front, on the slope of the road, the remains of the trenches dug by the French to protect themselves against counterattack from the heights of Varreddes. Following the road one sees the harrowing sight of the Plateau of Chambry-Barcy, covered with graves. On the right, especially in the fields which were crossed by the troops rushing to attack from the hill visible on the photograph below, one can reconstitute the progression of the lines under fire by glancing along the succession of graves….
> The principal line of German defence [sic] during the days of the 7th, 8th, and 9th of September was established on a position leading from Étrépilly to Varreddes, plainly visible on panorama B (pp. 104–105). The height shown in the photograph below formed its southern extremity and most salient point. Trenches had been made there, supplied with machine guns and supported by batteries of 77's. One realizes what energy the French troops needed to advance thus over absolutely uncovered ground, under dropping fire. Several attacks were unavailing; one of them reached the trenches, but the Germans, who had every facil-

> ity for bringing up their reserves, which were kept sheltered in the declivity on the other side of the hill, thrust the French back on Chambry. At last, on the 9th of September, the Germans having begun their retreating movement, Zouaves, Moroccans and infantrymen hustled their rearguards and descended in pursuit of them into the hollow of Varreddes….
> Continuing along the same road the tourist comes to a fork. He turns to the left toward Barcy and soon comes to a group of poplars, whence the Panorama B (Fig. 6) was taken. This panorama shows the objective of the French right during the days of the 7th, 8th, and 9th of September. This was the little ridge which runs between Étrépilly and Varreddes, followed by a road bordered here and there with poplars. This road was filled with trenches and machine guns which easily swept the uncovered ground that had to be crossed before they could be reached…. The line fell on the 9th, but over the whole surface of this plain (which has been called the "the Calvary of the reserve divisions") lay numbers of dead who were buried, some where they fell, others in common graves. These graves, with their flags waving in the wind, give a veritable grandeur to this landscape of gentle undulations. (Michelin 1919a, pp. 102–105)

The route continues northwards for some distance and several pages along what was the French left flank as far as Betz, then doubles back along the facing German lines. Several images show the damage Germans had done to French towns on their side of the line. Finally, the reader and traveler make their way back to the viewpoint at Panorama D (Fig. 7). Photographs situated below the panorama show clusters of the dead—corpses rarely appear in the later Michelin guides—perhaps meant in part to emphasize the German failure.

> Turn to the right at the foot of the slope into Étrépilly and on leaving the village take the road on the left; cross the river, turn again to the left and follow the track which climbs the plateau. After a few hundred yards the right slope disappears. It was at this point that Panorama D was taken, showing, from the German side the battlefield seen from the French side in Panorama B (pp. 104–105). The road on which the tourist stands goes on to the heights of Varreddes. Bordered with trenches and machine guns, it constituted the principal line of German defence south of Étrépilly….
> Leaving the trenches hastily dug on the Chambry-Barcy factory of Marcilly line, the troops of the Lamaze group, before getting up to the German trenches had to cross about 1¼ miles of uncovered ground, under terrible fire…. In the counter-attacks, the Germans, as they left their trenches, also suffered serious losses, as one can judge from the photography above, which was taken in front of the position. (Michelin 1919a, pp. 120–121)

5 Conclusion

Embedded as they were in the narratives for which they were made, the maps in Michelin battlefield guidebooks are easily overlooked. I am struck however by the sophistication of their engagement with a new style of tourism that exploited the ability of the automobile to explore the interurban countryside at length. The visual, textual, and cartographic approach to automobile touring taken by these guides, epitomized by the examples cited here, was adopted explicitly by the regional guides of France begun in 1926, while evolved into the globally scoped expanded globally to become the famous *guides verts* (Francon 2001). These, too had their patriotic overtones, celebrating the provincial diversity of a re-emergent France (Harp 2002).

Fig. 6 "B. Panorama of the Étrépilly-Varreddes line." (In: *Michelin guide to the battlefields of the World War*, vol. 1, The First Battle of the Marne. Michelin 1919a; Courtesy of the Newberry Library)

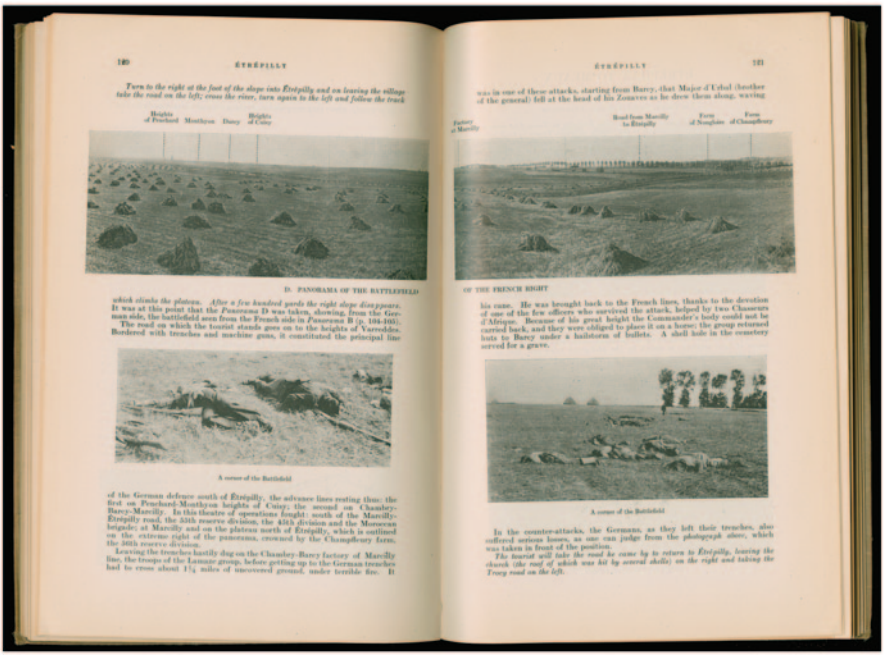

Fig. 7 "D. Panorama of the battlefield of the French right," with associated photographs. (In: *Michelin guide to the battlefields of the World War*, vol. 1, The First Battle of the Marne. Michelin 1919a; Courtesy of the Newberry Library)

In the immediate historical context, however, perhaps the greatest appeal of the Michelin battlefield guides drew on the irony that automobiles could move with relative speed across battlefields, reaching strategic points and passing through opposing lines of battled that many thousands of soldiers died trying to reach. The text and illustrations found in Michelin guides mostly document the destructiveness of the war of attrition and the difficulties and casualties of movement. The maps on the other hand depict a relatively easy movement about the urban and rural spaces of the Western Front. Throughout the twentieth century road mapping promoted and enabled the experience of landscape, scenic, historic, and cultural engendered by this new form of mobility.

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The Peace Treaty of Versailles: The Role of Maps in Reshaping the Balkans in the Aftermath of WWI

Mirela Slukan Altic

Abstract The Paris Peace Conference was a turning point in European history, but also a milestone in the way maps were used in the reshaping of territory and in the forming of new states. Political, administrative, historical, linguistic, and ethnographic maps served as one of the basic sources of information in that process. The American Geographic Society Library (AGS) at the University of Wisconsin–Milwaukee holds maps that were actually sent to the Paris Peace Conference of 1919, and based on which decisions were made about the new states and their borders. These maps were used by President Woodrow Wilson and the American delegation in the creation of new states. That makes them some of the most important maps of the early twentieth century, giving to cartography a completely new dimension regarding diplomatic activities and foreign affairs. One of the most complex negotiation processes was certainly the creation of the state of the South Slavs—the Kingdom of Serbs, Croats and Slovenes (later renamed Yugoslavia), which until then had never existed. In this paper we will present the maps used by the American delegation for shaping Yugoslavia's borders.

1 Between Politics and Diplomacy—A New Role for Cartography at the Dawn of the Twentieth Century

The period immediately post-WWI during which the diplomatic activity surrounding the creation of the new nation-states reached its peak, propelled cartography into the foreground as a powerful tool, not only in international, but also in intergovernmental relations. Thematic cartography became one of the key geopolitical techniques. As early as 1910 and onwards, there was an intensification in the cartographic production of thematic maps that addressed issues related to national identity—the territory, language, and ethnic composition of the population. The dissolution of the old empires and the reshaping of much of Europe created a fresh interest in mapping, regardless of whether it focused on the representation of one's

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own territory, or merely on territorial aspirations. Most national and international political debates were about the control of territory. In addition, the debates generally had a pronounced historical slant, since demands for territory were frequently made based on historical claims (Black 2000, p. 102). For cartography it meant that cartographic production would not be focused on the presentation of certain recent developments alone. On the contrary, the cartography of the time sought to anticipate future events by presenting possible future geopolitical relations, but also by evoking historical relations, as part of the effort to review the present and to ask for the future territorial and political reorganisation of Europe. This production reached its peak at the time of the Paris Peace Conference in 1919, when the actual process of the formation of the new states began on the basis of a number of peace treaties. The determination of the new states' boundaries was mainly based on the application of two principles—the historical principle, referring to a country's historical boundaries, and the principle of nationalities, which sought to place as large a portion of a population as possible in their home country.[1]

Among the basic sources of information in these discussions were political, administrative, historical, linguistic, and especially ethnographic maps that were used to define the spatial coverage and boundaries of the future states. Each of the negotiating parties of course advocated their own maps, using them as arguments for their particular territorial aspirations. Even before the end of the First World War, many participating countries were aware that, because of the dissolution of the old empires, the political picture of Europe was about to change significantly. Some of them began the process of acquiring historical, geographical, geopolitical, and other relevant data already during the war. For that purpose they appointed special bodies that were to come up with the best possible arguments for their particular claims when the armistice was declared. Accompanied by a large number of maps, their studies would play a crucial role in the post-war peace negotiations which commenced in Paris in 1919.

As early as 1917, a special expert committee, the *Comité d'études pour la paix*, was created in France to collect data and to produce the corresponding maps. The *Comité* consisted of the most prestigious French geographers of the time.[2] For the peace conferences in early 1919, the *Comité d'études* prepared a two-volume report, accompanied by a considerable number of thematic maps, designed to reinforce the

[1] The application of the principle of nationalities in the formation of the borders of nation states was already a well-established practice in international relations. At the negotiations leading to the Treaty of Frankfurt (1871), for example, Otto von Bismarck had referred to a linguistic map published by Augustus Petermann in order to support his claim to Alsace. Also, during the Congress of Berlin (1878), Bismarck often cited Heinrich Kiepert's ethnographic map of Eastern Europe (Palsky 2002, p. 113).

[2] Ernest Lavisse, the most prominent French historian of the time, was president of the *Comité d'études*; Paul Vidal de La Blache, founder of the French school of regional geography, held the vice-presidency (until his death in April 1918), while Emmanuel de Martonne, distinguished scholar in the field of geography, was appointed as a secretary. At the Peace Conference in Paris, the experts on the *Comité d'études* acted as close advisers to both the Minister for Foreign Affairs, André Tardieu, and the Prime Minister, Georges Clemenceau (Palsky 2002, pp. 111–112).

French negotiating position (Heffernan 2002, p. 219). In the UK, the Royal Geographical Society had the same role. Having the largest privately held map collection in London, they placed their personnel and their collections at the disposal of the British War Office. Maps collected and/or produced by the RGS cartographers were used as principal base maps for the Paris Peace Conference, strongly supporting the British interests in Africa and the Middle East.

Besides those European countries directly interested in the political and territorial reshaping of Europe, Africa and the Middle East, the United States as well immediately became involved in the race for a new division of the world. In April 1917, the American inquiry commission ('the Inquiry') was established with the task to collect data, compare competing claims to territory and map out possible future political boundaries (Crampton 2006, p. 731). The Inquiry's actions would not only determine the borders of new states, created in the aftermath of the First World War. It was also tasked with working out the principles for establishing new borders. These principles relied on the application of the founding principles, set out by the American President Woodrow Wilson in 1918, that would come to be known as Wilson's Fourteen Points. The idea of the right of peoples to self-determination and the formation of their nation-states, at a time when the world, at least formally, still consisted of large, typically multi-ethnic empires such as Germany, Austria-Hungary, Russia and the Ottoman Empire, was at the same time so revolutionary and controversial that Wilsonian principles would, to the largest extent, determine the course of not only the Paris Peace Conference, but of many subsequent peace treaties. Even though Wilson's other Points, such as the issue of reparation payments and the establishment of the League of Nations, also had great significance, the Paris Peace Conference was, first and foremost, about territory.

2 The Inquiry—Academic Advisory Support to the American Delegation

Set up in 1917, the Inquiry brought together about 150 prominent members of the American academic community: university professors who were leading experts in their respective fields of geography, law, economy, anthropology, etc., but who had almost no diplomatic experience. This shortcoming was later reflected in the inconsistent application of certain positions set forth in their studies. To increase its effectiveness, the Inquiry's work was divided by geographic region, so that each expert with his/her team was responsible for collecting data and writing briefing documents on a specific area. The Inquiry was under the direction of Sidney Mezes, a philosopher of religion and president of the City College of New York. Appointed as Chief Territorial Specialist, Isaiah Bowman, then Director of the AGS, had one of the most prominent roles in the Inquiry. He continued to carry out this function throughout the Paris Peace Conference. Charles Seymour (subsequently President of Yale) was charged with Austria-Hungary, Clive Day (from Yale University) with the Balkans, Charles Haskins (Harvard University) with the Franco-German border,

W.E. Lund (Haverford College) with Italy, and H.R. Lord (Harvard University) with Poland and Russia. Douglas Johnson (Columbia University) was appointed Boundary Specialist, A.A. Young (Cornell University) Economic Specialist, and Mark Jefferson (State Normal School, Ypsilanti) Chief Cartographer (Mezes 1921, p. 7).

On 22 December 1917, based on its insight into maps and numerous geographical studies, the Inquiry compiled a report containing guidelines for the American Commission to Negotiate Peace in Paris. The report, which included a discussion of the problems, accompanied by a collection of maps and recommendations on the boundaries, was used as a basis for the so-called Black Book, which was published in Paris on 21 January 1919 (Reisser 2012, p. 33).[3] The Black Book, comprising 98 pages, laid out the basic negotiating positions, and as such served as a sort of manual to members of the American delegation during the entire conference. In the end, the Inquiry produced nearly 2000 reports and 1200 maps. Although the study group was also considerably concerned with the issues of the Middle East, as much as 51% of the Inquiry's reports focused on Europe (263 in total). That number comprised 47 reports on Germany (accounting for 17% of the total number of reports), 52 on Austria-Hungary (20%), and as many as 63 on the Balkans (24%) (Gelfand 1963, p. 185). The high proportion of reports relating to the space of the future State of the South Slavs (for example, far exceeding the number of reports on Germany), further confirms the weight of the negotiations and the enormous controversies surrounding the formation of the borders of this emerging state.

On the eve of the conference, selected maps from the AGS holdings were carefully packed under the watchful eye of Isaiah Bowman and, in December 1918, dispatched to Paris on the USS George Washington (Seymour 1951, p. 2). It was perhaps the largest single shipment of maps ever to cross the Atlantic. The U.S. headquarters at the Hôtel Crillon on the Place de la Concorde was the place where the selected maps were to be used as the basis for the negotiations that followed (Heffernan 2002, p. 221).

3 Crafting the State of the South Slavs

The dissolution of the Austro-Hungarian Empire and the process of the creation of new states were accompanied by the reinforcement of national ideologies. This largely determined the approaches and political orientations of the political elites taking part in the Paris Peace negotiations. In Croatia, the idea of South Slavic unity was further reinforced by Italian pretensions to the Croatian territory as a result of the secret Treaty of London, signed in 1915 between Italy and the Entente

[3] The Black Book was officially titled *Outline of Tentative Report and Recommendations Prepared by the Intelligence Section, in Accordance with Instructions, for the President and Plenipotentiaries*. The manuscript copy is held at The Johns Hopkins University (Isaiah Bowman Papers Ms. 58 Box 13.13).

powers.[4] The subdivision of the Croatian territory was avoided by winning Serbia over to the unification of all South Slavic lands in one state (Stančić 2002, p. 205). In 1915, a political interest group called the Yugoslav Committee was established in London, consisting of Croatian, Slovene and Serbian politicians who advocated the idea of a need for South Slavic unity. The activities of the Committee created high tensions between the Croatian and the Serbian sides. Nonetheless, in 1917 both parties signed the Corfu Declaration, which announced a decision to unite all the South Slavic peoples into one country. Although the creation of the new state was officially proclaimed in 1918 after the end of the war and the official demise of the Austro-Hungarian Empire, the definition of its borders was a long and complex process. It began with the Treaty of Versailles and continued with the Treaty of St. Germain (between the Allied powers and Austria, 1919), the Treaty of Trianon (between the Allied powers and Hungary, 1920), the Treaty of Neuilly (between the Allied powers and Bulgaria, 1919), the Treaty of Rapallo (between the Kingdom of Italy and the Kingdom of Serbs, Croats and Slovenes, 1920), and the Treaty of Rome (between the Kingdom of Italy and the Kingdom of Serbs, Croats and Slovenes, 1924), respectively. Accordingly, although formally created in 1918, the Kingdom achieved its international recognition only in 1919, while the question of its borders was dealt with for years after the Paris conference.

The Kingdom of Serbs, Croats and Slovenes (later renamed Yugoslavia) was a completely novel state. Until then, its constituent parts had never belonged to a single state, a fact which particularly complicated the definition of its borders. The efforts in that regard relied primarily on the application of the principle of nationalities, where borders were determined based on the spatial distribution of individual nationalities, as documented by ethnographic and linguistic maps. This approach was further reinforced by President Wilson's Fourteen Points, from which Point 9, about 'a readjustment of the frontiers of Italy along clearly recognizable lines of nationality' stood out. It was sought to be applied not only for the demarcation of Italy's borders, but also for other countries.

The Yugoslav Committee claimed large portions of former Austria-Hungary to become constituent parts of the new state. Of the Austrian crown lands, they claimed the Istrian peninsula and Dalmatia, Gorizia and Gradisca (to the east and north of the Cormons-Gradisca-Monfalcone route), the city of Trieste, Styria, Carniola, and southern Carinthia, as well as entire Bosnia and Herzegovina. Of the Hungarian hereditary lands, Croatia and Slavonia were absorbed by the new state, while the territories claimed from Hungary included Međimurje, Prekodravlje and Prekmurje (Šišić 1920, p. 26). These countries would become united with Serbia and Montenegro which, in addition, also claimed the Banat, Batchka and Baranya

[4] The Treaty of London (1915) was a secret pact between the members of the Triple Entente (United Kingdom, France, and Russia) and the Kingdom of Italy, signed in London on 26 April 1915. According to the pact, Italy was to join the Triple *Entente* and enter the war, having been promised the following territorial gains at the end of the war: the provinces of Trentino and South Tyrol up to the Brenner Pass, Trieste, Gorizia and Gradisca, the entirety of Istria and the Kvarner, the Cres-Losinj (Cherso-Lussino) archipelago, and parts of northern and central Dalmatia, the port of Vlorë and the protectorate over Albania.

(today's Vojvodina) from Hungary, as well as the western edge of Bulgaria, and a part of Northern Albania (north of the Drin River).

4 Maps Used and Produced by the Inquiry

The American inquiry committee ('the Inquiry') used a large number of maps for its work. Being aware of the subjectivity of many maps in circulation and of the possibility of manipulation of the statistical data presented to them, the Inquiry sought to objectify the information needed for its work. Particularly the national movements in Central and Eastern Europe, which at that time were fighting for their self-determination, strongly influenced the content of maps produced by their national cartographies. They primarily promoted their national interests, often without taking adequate account of multi-ethnic areas in which it was difficult to draw a clear line of demarcation between different ethnic groups living together for centuries. Therefore, when assessing the actual ethnic composition of the population in a particular area, the Inquiry never relied on maps from a single source alone, but was constantly comparing the data it had received from all the interested parties. Their efforts to cope with this plethora of information, often quite contradictory, were exemplified in the fact that the Inquiry compiled, for their own purposes, a catalogue of all ethnographic maps of the Balkans (the list was 38 pages long!).[5] Generally, the maps used by the American delegation can be divided into two basic groups: maps collected from different national cartographies and used as the primary sources of information for the Inquiry (so called source maps) and maps compiled by the Inquiry which contained specific solutions or proposals.

4.1 Source Maps Used by the Inquiry and the American Delegation

To obtain a general overview of Yugoslav territorial claims, the Inquiry used a map prepared by the Slovenian anthropologist Niko Županič,[6] a member of the Yugoslav

[5] *Catalogue of the Ethnographic Maps of the Balkans*, The Inquiry Papers, MS 8, Yale University Library, box 8/74.

[6] Niko Županič (Griblje, 1876—Ljubljana, 1961) was a Slovenian ethnologist, anthropologist and politician. He was the founder and first director of the Ethnographic Museum in Ljubljana (1921), founder of the first Slovene ethnological journal *Etnolog* (Ethnologist) (1926), and Head of the Department of Ethnology at the University of Ljubljana. In Vienna, he started the cultural and historical newspaper *Jug* (The South) (1901). He excelled at political and journalistic work during the Balkan Wars, and, subsequently, as a member of the Yugoslav Committee (1915–1919). At the Paris Peace Conference, he was a member of the delegation of Kingdom of Serbs, Croats and Slovenes.

Fig. 1 The map of Yugoslav territory by Županič representing claims of the South Slavs. (Courtesy AGS Library)

Committee.[7] The map was first published in London in 1915 for the purposes of the Yugoslav Committee, and promoted the territorial claims of the South Slavs in the creation of their future state (see Fig. 1). The map later became much better known after it was published as a supplement to the book by A.H.E. Taylor entitled *The Future of the Southern Slavs* (New York, 1917). It was an ethnographic map that showed the territorial distribution of the South Slavs, Hungarians, Romanians, Germans, and Italians. The ethnic boundary of the territory that was predominantly inhabited by the South Slavs constituted the Yugoslav claim for the future state boundary line. That territory also included several disputed areas, inhabited by members of other nations as well, such as Southern Carinthia with Villach and Klagenfurt in the north, Prekmurje to the Rába River, Prekodravlje on the Nagykanizsa-Barcs railroad line, the entire Baranya with the cities of Pécs, Mohács and Baja,

[7] *Jugoslovenska zemlja: The Yugoslav Territory: Le territoire Iougoslave*/by Dr. Niko Županić.−1:1,500, 000.- London: Yugoslav Commitee, 1915.- Print; 64 × 55 cm. AGS Library, Map Collection, D463.Z3 1917.

Fig. 2 Ethnographic map of Jovan Cvijić which roughly outlined future borders of the state of South Slavs. (Courtesy AGS Library)

as well as Batchka to Szeged, and the entire Banat to Arad and Timişoara in the east. The claims in the west included the entire Istrian peninsula, Gorizia, eastern Gradisca, and the city of Trieste. Those claims were contrasted by the red boundary line of the Italian claims pursuant to the 1915 Treaty of London. Besides this map, the American delegation was also familiar with a map representing maximalistic Yugoslav claims that was not officially demanded at the conference, but often taken as a starting point for negotiations.[8]

For a more detailed insight into the ethnographic composition of the population of the South Slavic area, the American delegation mostly relied on the ethnographic map by Jovan Cvijić (see Fig. 2).[9] Teaching at the Sorbonne during the war, Cvijić

[8] *Handkarte des Jugoslawischen Reichs*.−1:1,500,000.-Wien: Eduard Hölzel, [1919]. Print in color; 68 × 76 cm, AGS Library, Map Collection, 662B-[1919?].

[9] Jovan Cvijić (1865–1927) was a renowned expert in the field of physical geography and anthropogeography. He studied in Vienna with Penck and subsequently taught geography in Belgrade

published his works in English, German and French. As a result, his work was well known in geographical circles throughout the world. The fact that Cvijić published a series of ethnographic maps in the prestigious *Geographical Review* with Bowman's approval was an acknowledgment of how well received his work was (Crampton 2006, p. 741).[10] A 1918 map of the Balkans by his hand was certainly one of the best known ethnographic maps used at the Paris Peace Conference. Because of its geopolitical significance, the map was published in German, French, and English (American and British) editions. A larger-scale manuscript copy of the map was also used by the American delegation.[11] Although this map did not attempt to propose any borders directly, it did suggest the territorial coverage of the Kingdom by showing the distribution of the South Slavic peoples, from the southern branches of the Alps in the west to Bulgaria in the east.[12] Cvijić advocated the thesis that all South Slavs were in fact members of a single nation, while describing diversities in their languages only as different dialects of the same (Serbian) language (Cvijić 1918, p. 268). He portrayed the territory to which he laid claim as the ethnically homogeneous space inhabited by the South Slavic population. His map had a very powerful effect on the American delegation, convincing them that the disputed areas along the northern boundary (Prekmurje, the Banat, Batchka, a part of Baranya), a part of Istria and, in particular, the city of Fiume should definitely be transferred to Yugoslavia. Cvijić explained Yugoslavia's claim to certain areas which the South Slavic population shared with a significant, or even dominant, portion of other populations (e.g., Northern Albania, Macedonia, or the eastern Banat) by arguing that, in those areas, the South Slavs had left a 'deeper impress than others'. It was the expression 'deep impress' that had such an exceptional influence on the Inquiry that the said expression could be found in several of the Inquiry's reports, especially if an explanation was required for deviating from the consistent application of the ethnic principle.[13]

Although gravitating toward Cvijić's views on the demarcation of Yugoslavia, the American delegation was faced with the claims of Italy, which considered Yugoslav proposals illegitimate, referring, among other things, to the fact that the state of

and at the Sorbonne in Paris. He worked on the ethnic composition of the Balkans for many years. Cvijić summarized his ethnographic studies in his most famous book entitled *La Péninsule Balkanique: géographie humaine* (Paris, 1918). He was a member of the Yugoslav delegation at the Paris Peace Conference.

[10] Cvijić's extremely good relationship with the American delegation was confirmed in 1924 when he was granted the award of the American Geographical Society (Cullum Geographical Medal).

[11] *Ethnographic map of Central Europe loaned to the Inquiry by the American Geographical Society*/Jovan Cvijić.- 1:1,000,000.- New York, 1918. Manuscript map in 14 sheets, 45 × 50 each, AGS Library, Map Collection, 600-c/b C−1:1,000,000 Cvijić.

[12] In his map above, Cvijić divided the South Slavs into Serbo-Croats (distinguishing between Eastern Orthodox, Roman Catholic, and Islamized and Albanized Serbo-Croats), Slavic Macedonians, Slovenes, and Bulgarians (distinguishing between Eastern Orthodox and Islamized).

[13] E.g., when speaking about Macedonia, Bowman said, "Though the Bulgarians at one time had possession of the region and though the racial character of the people is perhaps somewhat more closely similar to Bulgaria than to Serbia, the Serbs also held the country for a time and they left a deep impression there." (Bowman 1921, p. 168).

Fig. 3 Italian territorial claims on the 1919 map of the Istituto Geografico de Agostini. (Courtesy AGS Library)

the South Slavs was yet to be internationally recognized as a sovereign state. When reviewing the Italian claims, the American delegation also made use of some Italian maps showing the Eastern Adriatic from the Italian perspective. In their claims to the eastern Adriatic coast, the Italians primarily appealed to their historical right to that area. Istria and Dalmatia had been part of the Venetian Republic from the fifteenth century until the fall of Venice in 1797. Even though they were thereafter integrated into the Austrian Empire as Austrian lands, and in 1868 into the Austro-Hungarian Empire, Italy considered itself the successor state to the Venetian Republic, and thus laid claim to all the areas that had once been in the possession of mighty Venice. Consequently, all the maps produced in Italy normally referred to the territorial extent of the former Venetian rule in Istria and Dalmatia as Italian territory (hoping the Treaty of London, although not formally ratified, would have an impact). The map prepared by the Italian geographer Giotto Dainelli[14] and published by the Istituto Geografico de Agostini di Novara (see Fig. 3) evoked the Ve-

[14] Giotto Dainelli (1878–1968) was an Italian geographer, geologist, explorer and professor at the Universities of Pisa, Naples and Florence, who organized and led a number of expeditions, particularly to Eritrea and Central Asia (Kashmir, Karakoram, etc.). In the early twentieth century, he also explored the Eocene fauna of Dalmatia.

netian territorial expansions in Dalmatia in the period between 1669 and 1718. [15]In addition to invoking its historical boundaries, Italy appealed to the ethnic principle as well, arguing that Italians were the predominant population in Dalmatia. For each settlement, the map marked whether it was Italian ('nuclei mediocri e grandi/piccoli di italiani'), or Slavic ('popolazione slava'). It proclaimed that all Istrian and nearly all Dalmatian settlements were Italian (marked with a red symbol), whereas only villages at the foot of the Velebit mountain and in certain rural regions in the Dalmatian hinterland were marked as Slavic settlements (with a black symbol). This way, the map fully supported the Italian aspirations to the eastern Adriatic coastal region, as in fact stated in the subtitle of the map, which reads *"pubblicata sotto gli auspici della Pro Dalmazia."* [16]Italian territorial claims were even more directly represented on the map *Carta Base dei Nuovi Confini*, whose demands rely on state borders from 1914.[17] In terms of the Italian expectations, this map made by the Istituto Geografico de Agostini shows the same extent of territorial claims as the map by Dainelli. However, because of the different purpose of the map (it was made for the Italian delegation but also for the general public), the map does not include any historical demarcation besides the one from 1914.

In view of the obvious manipulation of statistics, the American delegation paid particular attention to the issue of Istria, Gorizia and Gradisca, and the cities of Trieste and Fiume—the areas on which Italy insisted most strongly, but in turn were also claimed by the Yugoslav Committee. In order to gain a more neutral insight into the actual ethnic composition of the population, the Inquiry relied considerably on a map of the area portraying both the spatial distribution and the proportions of Slavic and Italian populations (see Fig. 4).[18] The map was published by the eminent German publisher Justus Perthes of Gotha. It was accompanied by a short text explaining the argumentation for the Italian aspirations. Unfortunately, this map also failed to escape the trap of political engagement. Its author was the Austrian historian and geographer Dr. Martin Wutte, known for his nationalist views.[19] Though at

[15] *Carta della Dalmazia: pubblicata sotto gli auspici della Pro Dalmazia*/Giotto Dainelli.−1:500,000.- Novara: Istituto Geografico de Agostini, [1916]. Print in color; Map, 74 × 95 cm. AGS Library, Map Collection, 662.2-c.D34A-[1916].

[16] The map was accompanied by a short text serving as an additional rationale for Italian aspirations over Dalmatian territory. Pro Dalmazia was an irredentist movement, which advocated the creation of Greater Italy.

[17] *Carta Base dei Nuovi Confini d'Italia Secondo dei aspirazioni Nazionali*.- 1:3,000,000.- Novara: Istituto Geografico de Agostini, 1919.- Print in color; 57 × 51 cm. AGS Library, Map Collection, 655-B−1919.

[18] *Karte der Verbreitung der deutschen Sprache in Österreichischen Küstenlande: auf Grund der Volkszählung von 1900*/Dr. Martin Wutte.- 1.750,000.- Gotha: Justus Perthes, 1909.- Print in color; 31 × 38 cm. AGS Library, Map Collection, 640B-[1918].

[19] Martin Wutte (1876–1948) was an Austrian historian, geographer, and specialist in German studies. From 1923 on, he was Director of the Kärntner Landesarchiv (Carinthian Regional Archives) in Klagenfurt. His professional interests lay, in particular, in historical geography, historical mapping, and the linguistic picture of Carinthia. His theories about the relationship between language and ethnicity were a vital resource for the process of German assimilation of the Slovene-inhabited southern parts of Carinthia. That is, Wutte maintained that all German-speaking Slovenes were in fact Germans.

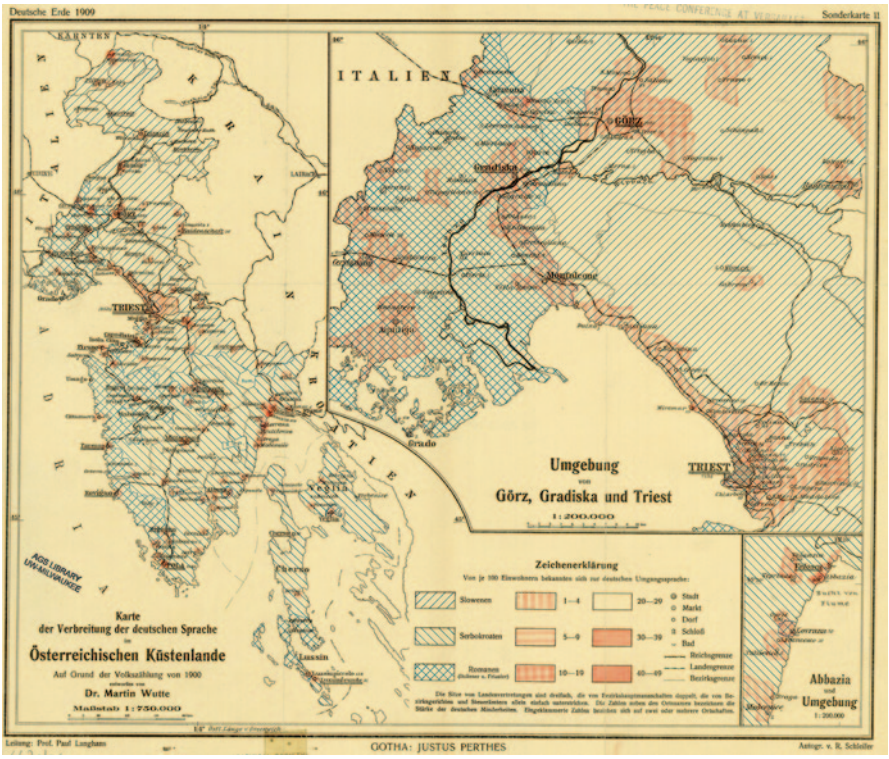

Fig. 4 Istria-Isonzo region on Wutte's linguistic map. (Courtesy AGS Library)

first glance an objective representation of the ethnic composition of Istria, Gorizia, Gradisca and Trieste according to the statistics of 1900, with dominating Slovenian, Serbo-Croatian (sic!), and, in western areas, Italian populations, the map in fact supported Wutte's pro-German stance stating that all German-speaking Slovenes were, in fact, Germans. This was also corroborated by the misleading title of the map. Though refraining from explicitly presenting any of the ethnic groups as German, the map was entitled *The Distribution of the German Language in the Austrian Littoral Region*. It suggested that because they could speak German, Slovenians were Germans. Furthermore, the map clearly identified that apart from their Slavic population, the disputed areas were also populated by a considerable number of Italians, primarily in western Istria, Trieste, Gorizia and Gradisca, who were much less visible on Cvijić's ethnographic map of the Balkans. Wutte's maps were also used as the main source of information for the Yugoslav-Austrian demarcation in the Carinthian region. Apart from Carniola, a significant number of Slovenes inhabited the southern parts of Carinthia and Styria on account of historical connections between Carinthian, Styrian and Carniolan lands. When identifying the ethno-linguistic boundary between Slovenians and Austrians, the Inquiry relied on two of Wutte's ethnographic maps of Carinthia that showed the composition of the

population according to the censuses of 1910[20] and 1918.[21] However, the Carinthian question proved to be considerably more complicated. The limitations of statistical methods for boundary determination on the basis of ethnic or linguistic affiliation were especially noticeable in that particular region. Even though that part of southern Carinthia was inhabited by a significant Slovene population, when a plebiscite on their future affiliation was organized in southern Carinthia in 1920, 59% of the population voted to remain part of Austria, among them also two fifths of Slovenian voters (Kardum 2001, p. 141). The political will of the voters outweighed the ethnic principle in that particular case. Therefore, the American delegation decided that its final proposal needed to reflect that will and that southern Carinthia should stay with Austria.[22]

The American delegation made considerable changes to its standpoint in regard to the northeastern borders of future Yugoslavia as well. Although Cvijić insisted that the entire Banat, Batchka and Baranya were predominantly South Slavic-inhabited areas, it was obvious even from his map that those areas were inhabited by significant populations of other ethnic groups as well. In order to revise Cvijić's proposal for the demarcation with Hungary, the American delegation to a great extent used a map of Hungary by Pál Teleki, a prominent Hungarian geographer and member of the Hungarian delegation to the Paris Peace Conference.[23] In 1910, he had compiled and published a map depicting the ethnographic make-up of the Hungarian nation. Based on the density of population according to the 1910 census, the so-called *Red map* was created for the peace negotiations.[24] Although this map was again characterized by insufficiently defined statistical categories promoting the

[20] *Distribution of the population of Carinthia according to their usual language on the basis of the census of 1910 (without military)*/drawn on the basis of the communities by Dr. Martin Wutte.- 1:1.400,000.- Vienna: G. Freytag & Berndt, 1918?.- Print in color; 25 × 47 cm. AGS Library, Map Collection 641-c.C37 C-[1918?].

[21] *Verteilung der Bevölkerung Kärntens nach der Umgangssprache auf Grund der Volkszählung von 1918 (Ohne Militär)*/nach den Ortsgemeinden entworfen von Dr. Martin Wutte.- 1:1,400,000.- Wien: G. Freytag & Berndt, 1918.- Print in color; 25 × 47 cm. AGS Library, Map Collection, 641-c.C37 C-[1918?].

[22] The members of the Inquiry did not have a unanimous opinion on the Carinthian question. Clive Day, Charles Seymour, and Sherman Miles thought that the will of the people expressed in the Carinthian plebiscite should be respected, and that southern Carinthia should remain part of Austria. In contrast, Douglas Johnson believed that the plebiscite had taken place under great pressure, and that the results were not reliable enough. Johnson believed that the majority of Slovenes identified themselves as Slovenes, and that, in that particular case also, the Allies were to be guided by the principle that a friendly country should take precedence in matters of division of territory (Almond and Lutz 1935, pp. 505–508).

[23] Pál Janos Ede Count Teleki de Szék (1879–1941) was Prime Minister of the Kingdom of Hungary from 19 July 1920 to 14 April 1921, and from 16 February 1939 to 3 April 1941. He was also a famous expert in geography, a university professor, and a member of the Hungarian Academy of Sciences. From 1911 to 1913 he was Director of Scientific Publishing for the Institute of Geography, and from 1910 to 1923 he was Secretary General of the Geographical Society.

[24] *Magyarország néprajzi térképe a népsürüség alapján*/szerkesztette Grof Teleki Pál = *Ethnographical map of Hungary based on the density of population*/by Count Paul Teleki = *Carte ethnographique de la Hongrie construite en la accordance avec la densité de la population*/par le

dominance of the Hungarian community, when contrasted with Cvijić's conflicting data the map contributed to adjusting the final solution for the demarcation of the border between Yugoslavia and Hungary. The largest portion of Baranya was left to the Hungarians.

An important role in determining a border between Yugoslavia and Romania was played by two Romanian ethnographic maps. [25] They were used to revise Yugoslav and Hungarian territorial claims in such a way that the eastern Banat region was confirmed as predominantly Romanian. At the same time, in the case of Bulgaria's demarcation, the situation was particularly complex in the border region with Serbia and Macedonia. Cvijić insisted on the annexation of the western rim of Bulgaria by Serbia (between the existing border and the Struma River). He explained this claim by arguing that it was necessary for making the Niš-Thessaloniki railroad route safe (Bowman 1921, p. 166). At the same time, Serbia insisted on keeping Macedonia within its existing borders and on the annexation of the entire Strumitsa Valley, which previously belonged to Bulgaria. Despite the Bulgarian map[26] by Hristo Danov,[27] which portrayed the Serbian-Bulgarian border which had been formed after the Balkan Wars in 1913, to the west of the Serbian claims corrections in favor of Serbia were made in four areas (the Timok Valley, Tsaribrod, Strumitsa and Bosilegrad) contrary to the historical and ethnic principle.

4.2 Maps Compiled by the Inquiry

Because of both the large quantity of source maps that were collected by the Inquiry and the contradictory nature of the data those maps provided, the Inquiry proceeded to compile 23 synthetic maps of disputed areas, covering the American delegation's proposals for future borders. Those maps, along with their accompanying explanations, were included in the aforementioned Black Book. Together with ethnographic source maps of individual countries or regions, they were the most frequently used maps at the conference (Reisser 2012, p. 38).

Comte Paul Teleki.- 1:1,100,000.- Budapest: Hungarian Geographical Institute, 1919.- Print in color; 58 × 82 cm. AGS Library, Map Collection, 642 C-[1919].

[25] *Carte ethnographique de la Roumanie et des régions habitées par les Roumains*/dressée par le Professeur A.D. Atansiu.- 1:1:1.250 000.- Paris: A.D. Atanasiu?, 1919.- Print in color; 19 × 29 cm. AGS Library, Map Collection, 666 C-[1919a].

Harta etnografica a ţinuturilor Românesţi de sub stapánirea Austro-Ungara cum şi parte din intinderea elementului Românesc/din dreapta dunarei lucrata de Aurelian Florinescu dupa cele mai noi date.- 1:1,000,000. Bucureşti: C. Sfetea, 1914.-Print in color; 77 × 60 cm. AGS Library, Map Collection, 666-c.W4 C-[1914].

[26] *Karta na tsarstvo Bulgariia*/Hristo Gruev Danov.- 1:1,000,000.- Plovdiv Khr. G. Danov, 1913.- Print in color; 32 × 53 cm. AGS Library, Map Collection, 663 B-[1913?].

[27] Hristo Gruev Danov (1828–1911) was a Bulgarian enlightener, teacher and book publisher of the Bulgarian National Revival who is regarded as the father of organized book publishing in the Bulgarian lands. After the Liberation of Bulgaria in 1878, he became a politician.

The European borders in the Austro-Hungarian Empire experienced the biggest changes due to the establishment of new states. The Empire was sketched on a separate map that confronted its old boundaries with a rough representation of the linguistic boundaries of the new states: Czechoslovakia, Austria, Hungary, Romania, and Yugoslavia.[28] It was a general map, envisaged to highlight the problems rather than offer concrete solutions. At a glance, it was clear that in the peripheral areas of all ethnic groups there would be wide areas subject to claim by several parties. However, most of the major territorial changes were already clearly portrayed on the map: the Austrian and Hungarian territories were drastically reduced and Transylvania was clearly defined as part of Romania, whereas the western Banat and Batchka were represented as part of Yugoslavia. Czechoslovakia lacked both the promised Slavic corridor toward Gradisca[29] and Ruthenia, indicated as an autonomous territory on the map (although it was incorporated into Czechoslovakia in 1919). Interestingly, the map depicts two versions of the Italian border in Istria: one along the eastern edge of the peninsula, awarding it almost entirely to Italy, the other, dividing Istria into two halves, the eastern Yugoslav, and the western Italian. Thus, this general map confirmed Istria's status as the hottest political issue. Resolving it would take years after the Paris conference.

Regarding the demarcation of Yugoslavia with Hungary and Romania, the Inquiry argued that the new boundaries should not follow the historical boundaries of the Hungarian lands, but required corrections following the ethnic principle. The tripoint of Romania, Hungary and Yugoslavia as based on the historical boundaries of the Hungarian lands was thus significantly revised.[30] However, the boundary line proposed by the Inquiry was not completely in accord with the proposals submitted by Cvijić. The eastern Banat region was awarded to Romania, the northern edge with the predominant Hungarian population to Hungary, while the biggest part, including the highly multi-ethnic area of the central Banat, was given to Yugoslavia. Although an effort was made to draw the border in such a way that it would minimize the disruption of minority populations, this division of the Banat left 7500 Romanians in Yugoslavia, while 6500 Serbs remained in Romania. The fact that Hungary was on the side of the defeated significantly affected the boundary, as the delegations showed an aversion toward Hungary in areas where Hungarian towns were surrounded by Romanian-inhabited countryside.[31] As for the Hungarian-Yugoslav

[28] *Inquiry map 664: Austria-Hungary*. The Johns Hopkins University, Isaiah Bowman Papers (MS 58), 13.13.

[29] Czecho-Slovakia was not granted the bridgehead south of the Danube into the Burgenland, nor did the anticipated corridor link with Yugoslavia ever come about. When discussing the Slavic corridor, the American delegation used the Czech map. Cf. [Slavic corridor].-[S.l: 1919].- Manuscript in color; 95 × 65 cm. AGS Library, Map Collection, 641-c.S6E2C- [1919].

[30] *Inquiry map 559: Serb frontier in the Banat and Bačka*. The Johns Hopkins University, Isaiah Bowman Papers (MS 58), 13.13.

[31] Prior to their discussion about how these states' new borders should be shaped, the Big Four States (Great Britain, France, United States and Italy) created the Committee for the Study of Territorial Questions Relating to Romania and Yugoslavia. Although only the Big Four were represented on the Committee, the Romanian Prime Minister Bratinau had the opportunity to address the Committee. As a defeated power, Hungary was not given this opportunity (Reisser 2012, p. 76).

demarcation, Yugoslavia was granted slightly more territory than that marked by the linguistic boundary on the map by the American delegation. According to the findings of the Inquiry, the linguistic boundary of the Serbian language passed through the middle of Batchka (south of Senta), leaving the northern part of Batchka on the Hungarian side. Eventually almost the entire Batchka was assigned to Yugoslavia (though not to the extent claimed by Cvijić). The same was true for Baranya, of which only the southern part was transferred to Yugoslavia, while the rest, because of its predominantly Hungarian population, was granted to Hungary.

The Yugoslav demarcation with Albania, whose borders were defined in 1912/1913 after the Balkan Wars, was not specifically discussed in Paris, partly because of its complexity and partly because of a lack of time (Reisser 2012, pp. 129–130). The American delegation generally accepted Cvijić's proposal for the annexation of part of Northern Albania with the city of Shkodër by the future South Slavic community. Thus, the map of the Albanian border attached to the Black Book showed the extent of the territory as claimed by Cvijić without any specific argument, except that it was a poorly organized and isolated, high mountainous region, which should be transferred to Serbia (Crampton 2006, p. 745).[32] However, the American proposal was not accepted. The boundary was ultimately only slightly revised in favor of Serbia, but on a much smaller scale than proposed in the map published in the Black Book.[33]

As could be expected, the biggest and most controversial debates were over the affiliation of Istria, Gorizia and Gradisca, and the cities of Trieste and Fiume (the Istria-Isonzo region).[34] The existence of the secret, though not officially ratified (because of Wilson's First Point—there shall be no private international understandings of any kind), Treaty of London strongly influenced not only Italian expectations, but ultimately also the outcome of the negotiations. It was clear that, if the ethnic principle was to be applied, the Italians were far from getting what they were promised under the Treaty of London. And while the existence of a significant Italian community was evident in the areas of Gorizia, Gradisca and the city of Trieste, Istria and especially Fiume were undoubtedly predominantly Slavic-inhabited.[35] At the same time western Istria, with a considerable Italian population in major urban centers, was surrounded by a wide belt of Slavic rural hinterland. Because of the large proportion of Italians in the cities and the economic dominance of such cities

[32] *Inquiry map 648: Albania*. The Johns Hopkins University, Isaiah Bowman Papers (MS 58), 13.13.

[33] The Zhur and Vrbica regions, until then parts of Albanian territory, were annexed to Serbia in 1919. Also, there were no significant changes to the southern border of Albania (northern Epirus), which Greece attempted to dispute. The final demarcation of the Albanian border was completed in 1921 (Slukan Altić 2006, p. 104).

[34] Inquiry map 653: Isonzo–Istria Region. The Johns Hopkins University, Isaiah Bowman Papers (MS 58), 13.13.

[35] In that regard, it was particularly important that the Inquiry was aware of the possibility to abusethe rigid application of language census data as boundary demarcation criteria. Because Italian had been imposed as the official language in Istria for centuries, a large part of the population also spoke Italian. However, according to the stand taken by the Inquiry, that fact alone did not make them Italians (Johnson 1921, p. 121).

over rural regions, it was generally concluded that the western part of Istria could be assigned to Italy. But where was the line that would cut Istria in half to be drawn? American experts on territorial and border issues felt totally at a loss. A passage from a book by Josip Smodlaka, a member of the Yugoslav delegation in Paris, who often visited Douglas Johnson in his study at the Hôtel Crillon, throws light on the complexity of the process and the many dilemmas the Americans were confronted with. On one occasion, Smodlaka wrote:

> When I visited him one morning, he [Johnson] waved his hand at me, and opened the door to the adjoining room. And what was in that other room to see? The entire floor was covered with maps. I came closer, and I was amazed. On an area of a few square meters, in all their geographical details, there were Gorizia, Trieste, Istria with the islands, and Fiume with the adjacent parts of Carinthia, Carniola, and Croatia. 'Last night,' said Professor Johnson to me, 'President Wilson and me both ended up sitting on the floor till two o'clock in the morning, studying the question of your boundary' (Smodlaka 1972, p. 109).

Trying to find a compromise between the Wilsonian ethnic metaphor and the Italian claims, the Inquiry determined a line which would perpendicularly divide Istria into two parts along the Oprtalj-Motovun-Kanfanar-Kavran route.[36] A map of this boundary was also attached to the Black Book. The said line roughly overlapped with the linguistic line that the Inquiry drew in the Istrian region. However, the Italians insisted not only on the entire Istrian peninsula, but also on the city of Fiume, and under pressure from them a second line of demarcation was proposed that would provide Italy with practically all of Istria, but without the city of Fiume which, according to a firm President Wilson, was to remain a free town.[37] Sometime later, the final version of the Wilsonian solution for the division of Istria was established as a compromise between the Yugoslav and the Italian claims. The latter dividing line, subsequently known as the Wilson Line, was drawn between the two previous proposals (the line followed the course of the Raša River), but as with the previous two proposals, it was never implemented. Under pressure of Italian insistence on Fiume and Dalmatia, the final treaty was signed at Rapallo in 1920 (Treaty of Rapallo). Under that Treaty, Italy was to be given all of Istria, Gorizia and Gradisca with Trieste, the islands of Cres and Lošinj, and the city of Zara and the island of Lastovo in Dalmatia. Yugoslavia in turn was left with Fiume, a free city, and the rest of Dalmatia. However, even with those concessions, Italy could not come to terms with its loss of Fiume and in 1924 Fiume was finally annexed to Italy by the Treaty of Rome.[38] Wilsonian efforts in applying the ethnic metaphor in Istria and Fiume were therefore completely disregarded.

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[36] In 1945, the British proposal for the line of demarcation between Italy and Yugoslavia would follow that same line.

[37] On April 24, 1919, Wilson published his celebrated manifesto dealing with the question of the Italian border in Istria and Dalmatia. He once again argued that the Treaty of London was illegal, and that the city of Fiume had to remain outside Italian rule (Šišić 1920, pp. 29–32). The Italians were very much offended by his publication, and briefly walked out of the Paris conference.

[38] Ignoring the suburb of Sušak, which housed 11,000 Yugoslavs and 1500 Italians, they claimed that the rest of Fiume held 22,488 Italians versus 13,351 Yugoslavs, and certain others. The occupation of Fiume not only entailed grave political consequences for Yugoslavia, it also resulted

5 The Bankruptcy of Effort—The Use and Abuse of Maps

Although many proposals of the American delegation were ultimately not adopted or even abused, the principles contained in Wilson's 14 Points (in particular the right of peoples to self-determination, and the ethnic principle as a basis for demarcation) constituted the basis for negotiations for all delegations. They also influenced border treaties concluded afterwards, even if such treaties ultimately were not complied with. Performing a comparative analysis of maps from different origins as a key negotiating tool became an international standard, which continues to be applied even today. Yet it must be said that the Black Book, as the basic guideline followed by the American President Woodrow Wilson, was not a neutral document. Not only was it based on different claims and interests of the parties involved, strongly influencing the American position, it was also to a considerable extent determined by American geopolitical interests in the new world order. The atmosphere in which the entire conference took place and the terms which the American delegation tried to mediate were described by Charles Seymour as follows: "Each nationality viewed affairs through the colored prism of its own ambitions. When the Conference assembled in January, 1919, it was confronted with the necessity not merely of drawing permanent boundary-lines but of composing the quarrels that had sprung up between the different nationalities, which threatened to break into open warfare" (Seymour 1921, p. 91).

The maps on which the American delegation decided to rely should thus be viewed in the light of broader international factors. For the state of the South Slavs, the ultimate consequence of some of the views contained in the Black Book was the loss of a considerable part of its territories in the coastal area. Despite the application of the ethnic principle, the final contours of the Yugoslav border ultimately did not satisfy either party. In 1920, pursuant to the Treaty of Rapallo (1920), Italy was granted the right to Istria, Gorizia and Gradisca, Trieste, the islands of Cres, Lošinj, Lastovo, and the city of Zara. In 1924 it was also given the city of Fiume under the Treaty of Rome. Consequently, about 370,000 Croats and Slovenes found themselves to be part of Italy. At the same time, that part of Northeastern Albania, which was predominantly inhabited by Albanian peoples, was granted to Yugoslavia, because of the Albanians' dispersion in high mountainous regions. The sheer complexity of drawing sharp ethnic lines was also experienced in former southern Hungary. The western Banat, Batchka and southern Baranya regions, which, in 1920, were transferred to the Kingdom of Serbs, Croats and Slovenes under the Treaty of Trianon, were mixed population areas. In 1910, their populations consisted of Hungarians (32.08%), Germans (22.53%), Serbs (29.33%), Romanians (5.78%), and Croats (4.87%). These predominantly Hungarian populations found themselves to be part of Yugoslavia in 1920. Furthermore, parts of the same historical provinces,

in unforeseen economic circumstances. Fiume's inclusion in Italy left Yugoslavia without the only port connected with the interior of the country by railroad.

the Banat and Baranya, were divided between Hungary and Romania, so that the northern Baranya was granted to Hungary and the eastern Banat to Romania. In the case of the border of the Kingdom of Serbs, Croats and Slovenes in the region of Vojvodina, such a misleading calculation was made possible by not distinguishing between individual ethnic groups, but instead adding up the proportions of all the South Slavs, so that, statistically, the Hungarians became a minority in that area. Last but not least, although Yugoslavia included comparatively few minorities, the differences between Croats, Slovenes, and Serbs did not promise a tranquil future.

Despite Wilson's efforts to persuade the European powers that his principles were just, his labors were of little avail in many cases. Territorial claims based on imperial policies and secret pacts were often a much stronger argument than trying to respect the right to self-determination, or to apply the ethnic principle. The nervous breakdown Wilson suffered in the fall of 1919 was the result of his struggle to convince both himself and the world that the agreement reached was based on the principles of justice. The futility of Wilson's efforts, which Charles Seymour (1951, p. 19), one of his closest associates, described as 'the bankruptcy of effort,' is best illustrated by the difference between what might have been and what actually happened following the conclusion of the peace treaties.

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The Role of Ethnographical Maps of Hungary and Romania at the Peace Talks After the Great War

János Jeney

Abstract The First World War was mostly static, not only in Western Europe, but also in Central and Eastern Europe, leaving the borders of the Austro-Hungarian Monarchy unchanged until the end of the war. Hungary was one of the two member countries of the Austro-Hungarian Monarchy which was the largest state in Central Europe. Although Hungary opposed the war, she was allowed no independent policy on foreign or military affairs and was compelled to enter the war as part of the Austro-Hungarian Monarchy.

Hungary, the country that lost the most territory at the end of the war, had very few military operations conducted on its soil during the war itself. There were however many military operations subsequent to the cease-fire agreement until the signing of the Peace Treaty of Trianon which concluded the war for Hungary. In preparation of the peace conference in Trianon, France, the US president Woodrow Wilson suggested that the new borders should be drawn along ethnic lines. Hungary was a multi-ethnic state, with nearly half its population non-Hungarian. To justify their particular territorial claims, all parties prepared maps showing the ethnic composition in their particular regions. The reader of these maps gets a different picture from each map of the ethnic composition of the same area. This raises the question whether the changes made to national borders were the consequence of military operations, or merely the outcome of the peace negotiations.

1 Introduction

After the First World War the borders in Central and Eastern Europe changed drastically. Of all the defeated countries, Hungary lost most territory, ceding areas to all of its neighbours, even to Austria. During the war military operations on Hungarian territory occurred only rarely, and Hungary did not lose significant territory before

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signing the cease fire agreement. The question is raised whether the loss of territory was a result of military operations or peace negotiations and what the role of maps was on the final outcome.

At the outbreak of the First World War, Hungary was one of the two member states of the Austro-Hungarian Monarchy (Austria-Hungary), which was formed in 1867 as the successor state to the Habsburg Empire. Both Austria and Hungary had the same ruler, who in Austria was the emperor and in Hungary the king (Csorba et al. 2008, pp. 29–30). The foreign and military policies of the two countries were common and determined by Vienna. In all other government affairs both states enjoyed sovereignty (Pollmann 2008, p. 12). Transylvania and the city of Fiume (today Rijeka) and its surroundings were transferred from Austria to Hungary.

Hungary entered the First World War without having a right to an autonomous foreign or military policy. The Hungarian Prime Minister, Count István Tisza, opposed the war. He argued that it did not serve the interests of Hungary, which at the time was a multi-ethnic state with some ethnic minorities wanting to cede from Hungary (Csorba et al. 2008, p. 206). In some parts of the country the various minorities made up the local majority, while in other parts the ethnic structure was extremely heterogeneous with no ethnic group dominant (see Fig. 1).

The Ethnographical map of Hungary by Jenö Cholnoky was compiled in 1906 from the 1900 census data. On this map every district was divided into rectangles, each rectangle representing a certain ethnic group, defined by its colour. The percentage of rectangles of a certain colour represented the percentage of a specific ethnic group in that particular district.

2 The Conflict Between Hungary and Romania

Count Tisza opposed the war even after the assassination of Franz Ferdinand on 28 June 1914. He could not convince the Austrian government not to declare war on Serbia and he was forced to agree to the declaration, but on condition that Austria-Hungary would not annex any territory from Serbia. Although Romania had territorial claims against Hungary, she was a non-combatant ally of the Central Powers (Csorba et al. 2008, p. 32).

Even though she was a member of this alliance, Romania signed a secret treaty with the Entente on 17 August 1916 known as the Treaty of Bucharest and attacked Hungary on 27 August 1916. Initially the Romanian army advanced rapidly into Transylvania as Hungary had virtually no forces there. In October 1916 a counter-offensive was launched and the Austro-Hungarian forces reached Bucharest on 6 December 1916 (Romsics 2005, pp. 34–35). When Romania's Russian ally signed the peace treaty of Brest-Litovsk, she was completely isolated from the Entente giving way to a pro-German government which took over. The new government signed the Peace Treaty of Bucharest on 7 May 1918 (Száraz and Tóth 2011, p. 8; The Peace of Bucharest 1918)[1], giving Romania a free hand to annex Bessarabia from

[1] The English translation of the original German text was used. The peace treaty has no official author. The text is on the Internet with no page numbers. The first paragraph was cited.

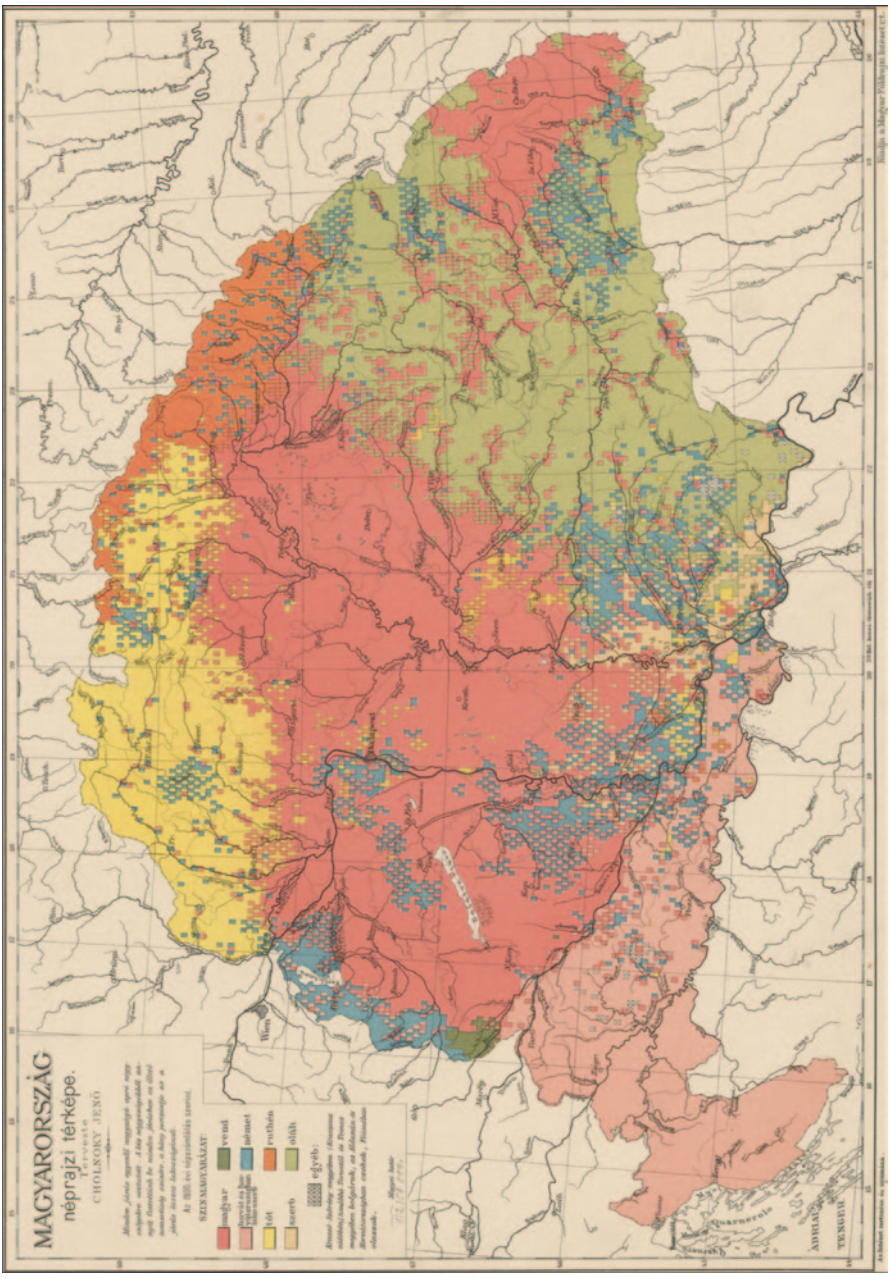

Fig. 1 Ethnographic map of Hungary by Jenö Cholnoky. (Map collection of the Institute for Military History, Budapest)

the Russians. On 10 November, less than 1 day before the cease-fire was declared which ended the First World War, Romania renounced the treaties of Brest-Litovsk and Bucharest, re-entering the war on the side of the Entente, thus becoming one of the victors in the war.

István Tisza announced on 17 October 1918 that the Central Powers had lost the war (Száraz and Tóth 2011, p. 8). He was deemed by many to be responsible for the war, as his opposition to it was not generally known. Some army units mutinied, removed the badges from their caps and replaced these by asters, which was a flower in bloom in Hungary at the time. This came to be known as the Aster Revolution. Mihály Károlyi, the leader of the revolution formed the Hungarian National Council on 23 October 1918, and by the end of October assumed power, dissolved the Astro-Hungarian Monarchy and also effectively dissolved the armed forces. They proclaimed the People's Republic of Hungary on 16 November 1918. At the same time a government delegation representing Austria-Hungary was in Padova and on 3 November 1918 signed a cease-fire which never came into force due to the dissolution of the Austro-Hungarian Monarchy. Since Hungary had no valid cease-fire agreement, the Hungarian government signed one in Belgrade. The cease fire agreement of Padova guaranteed the territorial integrity of Hungary, however that of Belgrade paved the way for Serbia and Romania to invade the country (Katonai egyezmény a szövetséges hadseregek és a magyar kormány között 1918)[2]. The remnants of the Hungarian army fought unsuccessfully against the Romanian invasion. Károlyi and his government resigned and Béla Kun took over, proclaiming the communist Soviet Republic of Hungary. Béla Kun attempted to re-constitute the Hungarian army, but eventually the Romanian army invaded the country with the exception of Lake Balaton and its surroundings. As the Romanian army entered Budapest on 2 August 1919, Béla Kun fled to Austria, giving way for the establishment of a new Hungarian government in Siófok on 7 August 1919. Two days later Admiral Miklós Horthy, last commander of the Austro-Hungarian navy, established the Hungarian National Army. He undertook to restore order in Hungary while enjoying the support of the British government. In order to end the Romanian occupation and all military operations in Budapest, Horthy led the National Army into Budapest on 16 November 1919. Eight days later the government resigned and a new government was appointed, paving the way for the peace negotiations which formally ended the war (Száraz and Tóth 2011, p. 36).

3 The Transition from War to Peace

3.1 The Creation of the Peace Treaty

The peace treaty was intended to divide Central Europe along ethnic lines to avoid having multi-ethnic states. Independent experts were to define these lines (Száraz

[2] The Hungarian text was cited. The peace treaty has no official author. The text is available on the Internet with no page numbers. Part three of the treaty was cited.

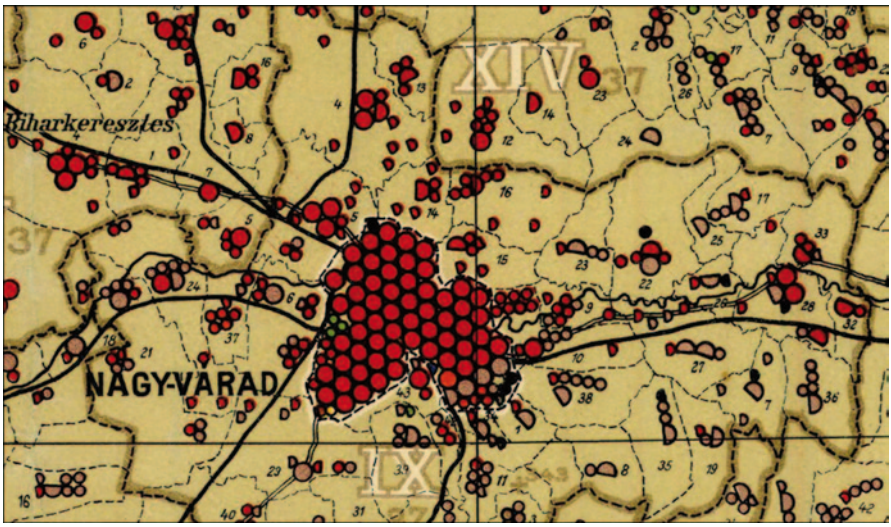

Fig. 2 The area of Nagyvárad on Sheet 7 of the Ethnographical Map of Hungary by Zsigmond Bátky and Károly Kogutowicz. The *red dots* show the Hungarians, the *orange dots* the Germans, the *purple dots* the Romanians, and the *green dots* the Slovaks. One *small semi-circle* represents 50 inhabitants, one *small circle* 100 inhabitants, one *large semi-circle* 500 inhabitants, and one *large circle* 1000 inhabitants. (Map collection of the Institute for Military History, Budapest)

and Tóth 2011, p. 8), and many ethnographic maps were prepared to determine where the different ethnic groups lived.

In 1919 Zsigmond Bátky and Károly Kogutowicz were mandated by the Ministry of Foreign Affairs of the Peoples' Republic of Hungary to prepare an ethnic map of the country (see Fig. 2). The map was compiled on a scale 1:300,000 and was based on the census of 1910 which was the last census of Hungary before its new borders were determined. The map depicted the population distribution using four coloured symbols with the colour of the symbol representing a specific ethnic group. Each symbol was representative of 50, 100, 500 or 1000 inhabitants. The purpose of the map was to show where each ethnic group lived. The map was printed on twelve sheets, making it difficult to get an overall picture, but on the other hand it showed all the available census information which made it a reliable source to compare with other maps. Unfortunately, this map was never considered at the peace conference.

In 1919 an Atlas entitled "Rummania through the Ages" *(sic)* (Comnéne 1919, p. 57) was published in Paris. This included ethnographic maps that were presumably used in the peace talks to determine the exact location of the Hungarian-Romanian border. The last map in this atlas, the author of which unfortunately cannot be identified from the map, was presented by the Romanian delegation. Romania wanted to establish a state which included all territories which had Romanian populations, regardless of whether they made up the majority of the local population or were in the minority. The ethnographic map referred to above was specifically prepared for this purpose under the title "Regions inhabited by Romanians". The map had a scale of 1:4,150,000 and showed the Romanian population in red, irrespective of whether they were the majority or not. This, at least, is the impression one gets

when comparing it to the map made by Zsigmond Bátky and Károly Kogutowicz. The uninhabited areas on this map were in most cases shown as being inhabited by Romanians.

Count Paul (Pál) Teleki, who subsequently became a member of the Hungarian delegation to the peace talks, prepared an additional ethnographical map of Hungary at a scale of 1:1,000,000 on which every coloured square millimetre represents 100 inhabitants (Teleki 1920)[3]. His aim was to produce a map which would be easy to read and would fit the entire country onto one page; would reflect the population density, and also indicate the uninhabited areas. As the Hungarian population was shown in red, the map became known as the *carte rouge* because of its dominant red colour.

The Hungarian government was only invited to the peace talks at Trianon in January 1920. The Hungarian delegation, led by Count Albert Apponyi, left Budapest for Paris on 5 January 1920. Although the Ethnographical map of Hungary made by Paul Teleki was presented on their arrival in Paris, they were immediately placed under house arrest in the hotel Château de Madrid which effectively prohibited them from taking part in the peace talks. Being under house arrest made it impossible for the Hungarian delegation to present any of the other maps they took with them to Paris. It was only after the final decisions had been made that they were invited to participate. On 16 January Count Albert Apponyi presented his famous speech in the building of the Ministry of Foreign Affairs in France in defence of Hungary. His speech lasted for two hours and was presented in three languages, namely French, English and Italian. Apponyi made it clear that Hungary demanded that the areas which had an overwhelming majority of Hungarians be left as part of Hungary, while in the disputed areas a referendum should take place as the optimum solution for self-determination. Apponyi deemed the conditions of the treaty unacceptable. His call for a referendum was supported by the Polish delegation, as well as by Field Marshall Jan Smuts, but as the fate of Hungary had already been decided, the points raised in Apponyi's speech were ignored. When the final peace treaty was signed in the Grand Trianon Palace in Versailles on 4 June 1920, the day was declared a day of national mourning in Hungary. Schools closed and traffic stopped as signs of the entire country's silent protest against the treaty (Száraz and Tóth 2011, p. 39). Poland and the United States of America never ratified the Treaty and the ratification was subject to great resistance in France and Great Britain. In May 1921 the British National Assembly still refused to ratify the treaty.

Prior to the conclusion of the Second World War the politics of Hungary were based on the country's efforts to regain its lost territories, especially the areas inhabited by Hungarian majorities.

[3] Map was printed on a single page and includes all explanations on the same page. Citation is from the legend of the map.

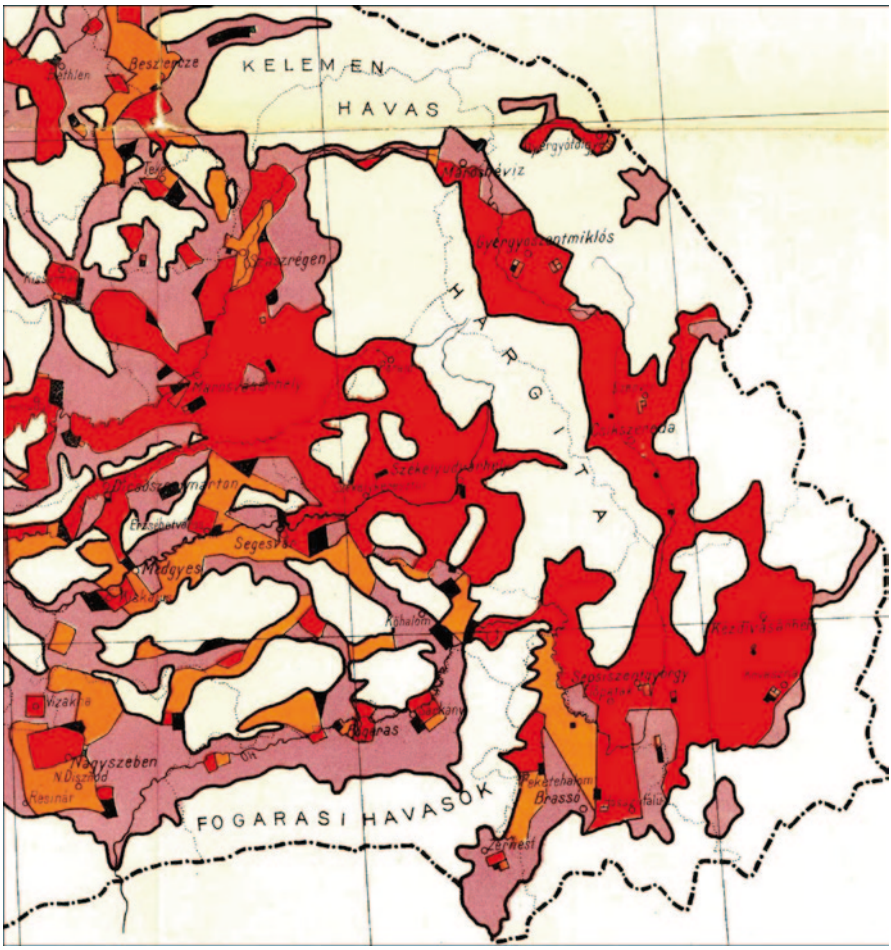

Fig. 3 An enlarged extract showing Eastern Transylvania as it appears on the ethnographical map of Hungary by Paul Teleki. (Map collection of the Institute for Military History, Budapest)

4 Comparison of the Maps Presented by the Hungarian and the Romanian Delegation

As could be expected, the maps presented at the peace conference by the Romanian and the Hungarian delegations showed very different pictures of the ethnic composition of the region. It is evident from Fig. 4 (the Hungarians are shown in yellow, the Romanians in red and the Germans in grey) that the uninhabited areas of Transylvania are here shown as inhabited and therefore gives the user a completely different impression of the ethnic structure of the region. On the Hungarian map in Fig. 3 (the Hungarians are show in red, the Germans in orange and the Romanians in purple) the Hargita Mountains are uninhabited, whereas the map in Fig. 4 shows

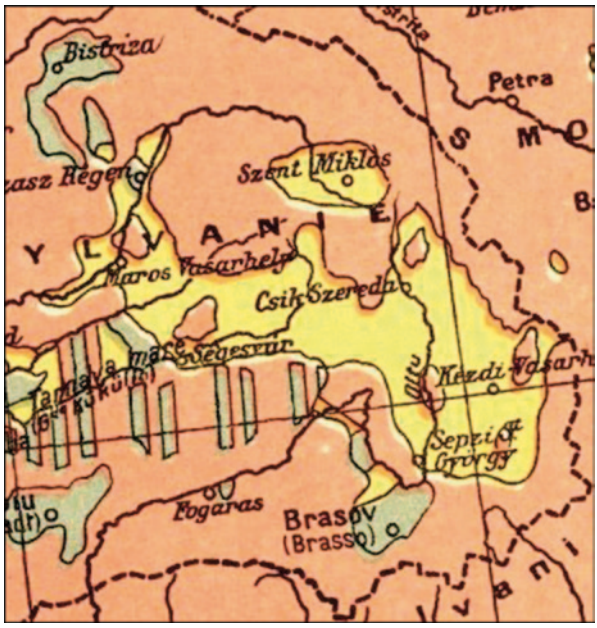

Fig. 4 An enlarged extract from Eastern Transylvania on the map "Regions Inhabited by Romanians". (Library of the Geographical Institute of the University of Tübingen)

Fig. 5 Uninhabited area in the Eastern Carpathian Mountains. (Picture taken by the author)

population groups of different ethnicity settled in the Hargita. Similarly, the Transylvanian Alps (Fogarasi havasok) are also uninhabited whereas the map in Fig. 4 depict them as populated by Romanians. The same is true of the eastern Carpathian Mountains which are shown as uninhabited in Fig. 3, whereas the map in Fig. 4 depicts these as mostly inhabited by Romanians, interspersed by some Hungarians. A modern photograph of the eastern Carpathian Mountains in Fig. 5 shows that the area is still mostly uninhabited. As neither of the maps in Figs. 3 and 4 shows any relief representation, the reader cannot form an idea of the terrain of the area.

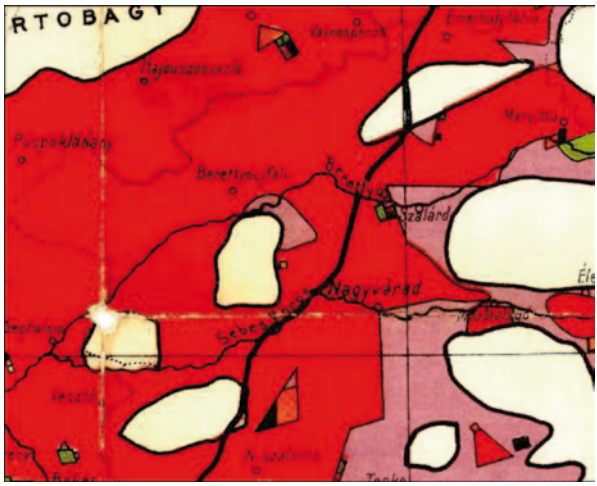

Fig. 6 Enlarged extract of the eastern part of the Great Hungarian Plain on the ethnographical map of Hungary by Paul Teleki. (Map collection of the Institute for Military History, Budapest)

Fig. 7 An enlarged extract from the eastern part of the Great Hungarian Plain on the map "Regions Inhabited by Romanians". (Library of the Geographical Institute of the University of Tübingen)

If this information was available, it would have been obvious that the uninhabited areas are in high mountains. Further differences regarding the ethnic structure of the population are also evident around Brassó (today Braşov) (Lelkes 2011, p. 156).

The mapped area in Fig. 7 (the Hungarians are shown in yellow, the Romanians in red and the Germans in grey) clearly shows that the indicated Romanian population in the eastern part of the Great Hungarian plain is much larger on the map in Fig. 7 than on the map in Fig. 6 (the Hungarians are show in red, the Germans in orange and the Romanians in purple). This is because the map in Fig. 7 indicates the population as Romanian even though the area includes other ethnic groups. The difference between the two maps is further accentuated by the by the fact that Fig. 7 shows uninhabited areas as being inhabited.

5 Aftermath of the Treaty in Hungary

The Treaty of Trianon was not widely accepted by the Hungarian population. Most intellectuals opposed it, and monuments were erected in protest. The most famous monument which was unveiled on 16 January 1921 could be seen on Liberty Square (Szabadság tér) in Budapest until 1945, when it was destroyed by the invading Soviet troops. (Száraz and Tóth 2011, p. 42). Many poets, amongst others Sándor Sajó and Attila József, wrote poems opposing the treaty. Cartographers such as Károly Kogutowicz who compiled an ethnographical map of Hungary to prove the treaty was unacceptable, also opposed the treaty. Kogutowicz' map was published on three occasions. The 1927 publication included some comments and made a distinction between the denser urban and the less dense rural populations. Urban populations were depicted in a darker shade of the same colour used for the rural population of the same group. Kogutowicz also used his map to comment on the Romanian statistics in that he accused the Romanians of forging the figures. (see Fig. 8). On his map is an inset of East Prussia, showing the large German population. (see Fig. 9). On another inset a depiction of Hungary with Székelyland shows the overwhelmingly Hungarian population. Székelyland, a part of Transylvania with an overwhelming majority of Hungarian population, was part of Hungary before the Peace Treaty of Trianon, when it was transferred to Romania. Kogutowitcz demanded that a referendum be held in Székelyland to decide whether it should be part of Hungary or Romania, in a manner that it was decided in East Prussia, where the outcome of a referendum decided that it should belong to Germany rather than Poland. Since Kogutowitcz felt that it was unjust that Székelyland was transferred from Hungary to Romania without a referendum, he deliberately made it unclear on his map in which country the territory is situated. The arrow on Fig. 10 points to Székelyland. The red rectangle added by the author of this paper on Fig. 11 also shows Székelyland on Kogutowitcz' map.

6 Conclusion

The positions at the peace talks defining the new national borders in central Europe after the First World War were largely effected by military operations which took place subsequent to the cease-fire agreement ending the war. Although the original goal was to create states comprised primarily of only one ethnic group, some of the ethnic maps brought to the peace conference had a significant impact on the demarcation of borders, while others were not taken into consideration at all. The maps brought to the peace talks by each delegation represented the interests of that party only and the methods which were used to depict the population distributions depended on what the cartographer wanted the map user to see. The result was that

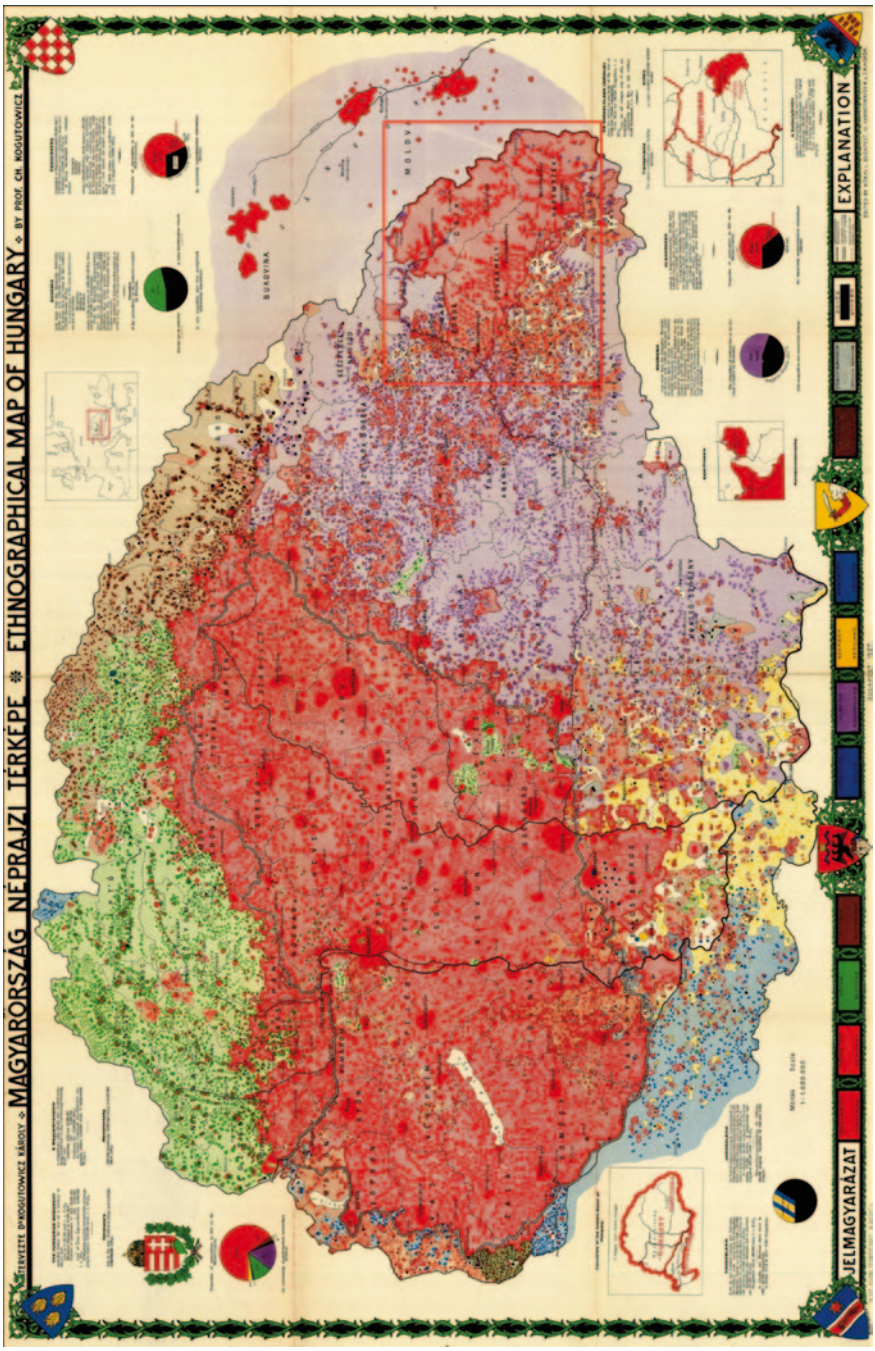

Fig. 8 Kogutowicz accusing the Romanians of forging the statistics. (Map collection of the Institute for Military History, Budapest)

Fig. 9 East Prussia as shown on the ethnographical map of Hungary by Kogutowitcz. (Map collection of the Institute for Military History, Budapest)

Fig. 10 Transylvania as seen on the ethnographical map of Hungary by Kogutowicz. On the *right* the author of the map points to Székelyland with and *arrow* and makes the statement that 490.000 Hungarians live in this area. (Map collection of the Institute for Military History, Budapest)

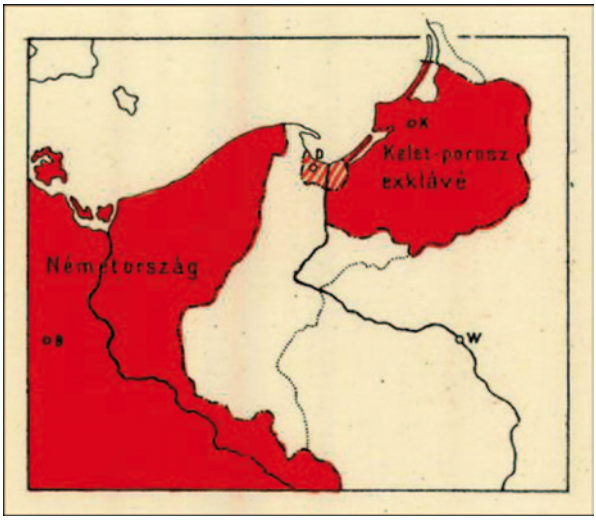

Fig. 11 Ethnographical map of Hungary by Károly Kogutowicz published in 1927. (Map collection of the Institute for Military History, Budapest). A *red rectangle* around Székelyland was added by the author of this paper

the Treaty of Trianon immediately became very controversial and had a major impact on the future of Central Europe.

The new borders of Romania as defined by the Treaty of Trianon converted that country into a multi-ethnic state, while Hungary simultaneously lost one third of its Hungarian speaking population. The circumstances and the outcome of the Treaty of Trianon yield the clear impression that the map presented by the Hungarian delegation was hardly considered, whereas those of the Romanian delegation played a dominant role in determining the new borders between Romania and Hungary.

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Ideological Changes in Ethnic Atlas Mapping of East Central Europe During the Twentieth Century

Marcus Greulich

Abstract Ethnic mapping after World War I underwent changes which are not only reflected by a shift of perspective, but eventually also by ideological alterations which strongly affected contested territories, e.g. the new border regions between Germany and Poland. All German and international map depictions prior to World War I display a homogeneous view which is consistent throughout. After 1919 a multitude of new states in Eastern Europe led to many new borders as well as minority areas. Earlier factual mapping was now put in the throes of the political zeitgeist. At first this produced deviations which swerved a neutral viewpoint but which still relied on a factual basis, but later on contained more and more ideologically distorted falsifications, the legitimacy of which primarily during the national socialist period was clearly based on political objectives or even wishful thinking.

Although these changes in German cartography occurred sporadically during World War I, they were not commonplace as yet. They emerged more commonly after the Great War, spread throughout most of the cartographic trade during the later 1920s, and became ubiquitous around 1930. It is clear that this development was indubitably no Nazi creation; after 1933 it merely increased rapidly and left a clear impact upon international cartography—an influence which still holds some sway upon early twenty-first century cartography.

1 Introductory Remarks

German map makers led the field of atlas cartography before World War I. Thus, the quality of the information shown in German atlas maps was generally considered as accurate. However, the Great War, often termed "the great catastrophe of the twentieth century", would leave a definite mark on German and international cartographic interpretations throughout the century to follow. This will be demonstrated by paying attention to examples of ethnic maps in German and international atlases

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depicting East Central Europe, especially the regions of Upper Silesia and Masuria which were disputed between Germany and Poland after World War I.

2 The Cartographic Situation Around the Time of the Great War

The German and international maps and atlases which were produced before WWI all displayed a clear Polish ethnic majority in Germany's eastern provinces of most of Upper Silesia and southern East Prussia (see Fig. 1). This also applies to national-chauvinistic German publications such as the *Alldeutscher Atlas* (1900). Because of the partition of Poland between Russia, Austria, and Prussia at the end of the eighteenth century, there was no Polish state and therefore no major border disputes in that area before 1914. With the emergence of new nation states within Eastern Europe following the Versailles/Saint-Germain Peace Treaties in 1919, these new countries often embraced regions with ethnic minorities, partially even areas where such minorities were the regional majority. The rise of irredentist movements was therefore almost predetermined. In the case of German-Polish relations, this, on the one hand, meant that Germany did not reconcile itself with the fact that the Polish "Corridor" (particularly the part linking Pomerania with East Prussia) and the eastern industrial area of Upper Silesia were lost to the new state of Poland. On the other hand, Poland had expected the ethnically Polish areas in Silesia and East Prussia to vote in favour of the Polish "motherland" (plebiscites in 1920/1921), disregarding other long-lasting influences, e.g. Protestantism in East Prussia, feelings of loyalty to the Prussian state and Germany, cultural and social developments cut off from the Polish-Lithuanian Commonwealth and reaching back over more than half a millennium. Because of this, East Prussia as well as most of Upper Silesia opted to side with Germany, thereby leaving a considerable Polish majority within the new Weimar Republic. The fact that Poland had designs on these territories was clearly demonstrated in the Polish Silesian Uprisings of 1919–1921.

The Germans were soon to notice that the accuracy of pre-war German ethnicity maps was detrimental to the German cause, especially in the eastern regions of Germany where there was no clear spatial separation of languages, ethnicity, and state loyalty. How could southern East Prussia or Upper Silesia legitimately be claimed for Germany while German maps show these territories to be largely of Polish ethnicity? Would this not solidify Polish demands for these areas?

German scientists, including geographers, cartographers, and historians such as Friedrich Ratzel, Paul Langhans, Dietrich Schäfer, and especially the very influential geographer, Albrecht Penck, soon developed a new ethnographic concept of the "natural living space of the German people" (*deutscher Volks- und Kulturboden*). "German people" in the German perception did not just include German citizens, but all ethnically German people in central Europe (within and outside Germany proper), regardless of their personal affiliation by citizenship or state loyalty. It could also include people of non-German descent, e.g. Upper Silesians and Masurians,

Fig. 1 Diercke [51]1915

Fig. 2 Diercke [63]1926

Fig. 3 Diercke [64]1926

who often were bilingual and had developed a strong cultural connection with Germany over the centuries. As this needed to be shown on maps, the maps began to change. The renowned Diercke school atlas is a characteristic example.

3 The German Perspective

3.1 The Diercke School Atlas (Westermann)

The Diercke school atlas is a representative example of these changes and also a good source as it was published annually.

The gradual process of these changes is easy to track. It commenced in the mid—1920s when the Polish speaking areas in Upper Silesia, East Prussia, and the Polish Corridor (West Prussia) were depicted differently than the rest of the ethnic Polish areas: not yet German but not Polish either (see Fig. 2). It seems that these modifications remained not completely unchallenged in the first place. The Diercke atlas soon made small revisions in southern East Prussia in 1926 (Diercke 64th edition 1926, see Fig. 3). Part of the plebiscite area around the East Prussian town of Allenstein/Olsztyn was displayed as being ethnically Polish again. This was done over several editions and does not seem to be a misprint as the region of Ermland/Warmia was a Catholic enclave within Protestant East Prussia and belonged to Poland until the first partition in 1772. Thus, there were still some closer connections to Poland which were also manifested in the plebiscite in July 1920. Most of the Masurian counties with an ethnically strong Polish minority voted in favour of

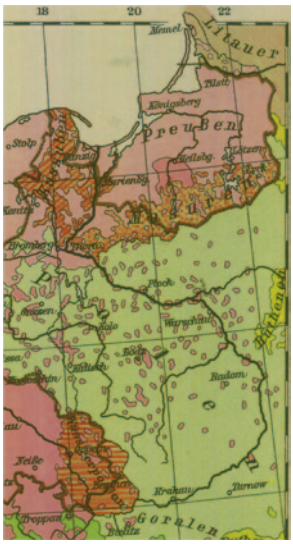

Fig. 4 Diercke [72]1931

Fig. 5 Diercke [73]1932

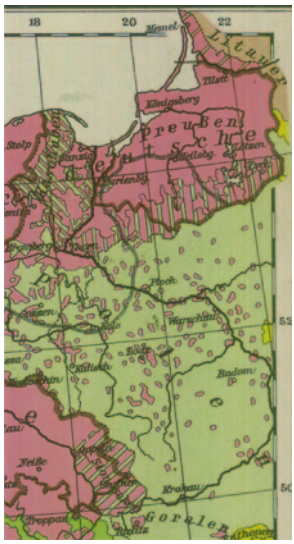

Fig. 6 Diercke [78]1937

Germany with percentages in the very high 90s or even approaching 100%. However, the region around Allenstein, despite having a much smaller Polish minority, voted with "only" 90% in favour of Germany, thus still clearly indicating the presence of a Polish minority. This is apparently the factual background to these first revisions around Allenstein. Here we can clearly see that by the later 1920s the Westermann publisher was still struggling with the problem of how to reconcile the zeitgeist with the facts. One decade later such concerns for a factual basis became irrelevant.

The fluid zeitgeist prevailed and around 1930 these small concessions to accuracy were retracted again (see Fig. 4). The next major cartographic change came in 1932, lasting for the next five years (Diercke 73rd edition 1932, see Fig. 5). While the previous change of the 1920s had still retained the green Polish colour as primary, this new change basically Germanized the regions of Silesia, East and West Prussia cartographically, leaving just a small indication of a Polish minority. This applies equally to the depiction of the Memel Territory in Lithuania and, in another adjustment, the Polish ethnic area in western Upper Silesia was reduced in size. It is worth noting that these cartographic changes took place before the Nazi party came to power in January 1933. It should also be kept in mind that until that moment all these alterations portrayed a certain change of viewpoint but nevertheless retained some connection to the factual basis, e.g. despite these modifications the overall extent of the ethnically Polish areas was still visible.

By the later 1930s the Diercke atlas contrived to keep the facts at bay. Now rapid ideological changes occurred. In 1937 the area of the Polish minority in Upper Silesia is reduced and the lettering "Masuren" disappears (Diercke 78th edition 1937, see Fig. 6). By late 1938 almost entire East Prussia is Germanized and any indication of a Polish/Masurian minority disappears, while the extent of the ethnic Polish minority in Silesia is slightly reduced (Diercke 78th edition 2nd printing 1938/1939, see Fig. 7).

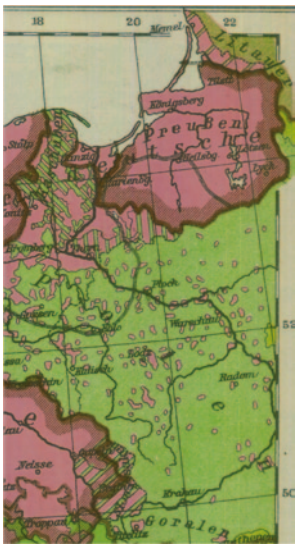

Fig. 7 Diercke [78.II]1938/1939

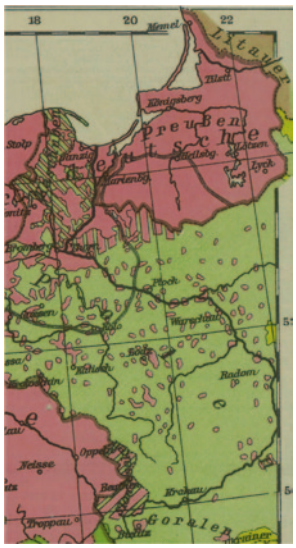

Fig. 8 Diercke [79]1939

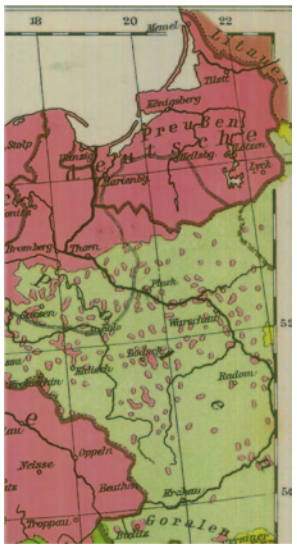

Fig. 9 Diercke [79.II]1939/1940

In 1939 the German part of Upper Silesia, the Memel Territory and ethnic Czech areas of the Sudetenland were completely Germanized (Diercke 79th edition 1939, see Fig. 8), thus all ethnic minority areas lying within the Greater German Reich were cartographically erased. The same happened to Poland's share of Upper Silesia and the Corridor after Poland's defeat in September 1939 when these territories were annexed by the Reich (Diercke 79th edition 2nd printing 1939/1940, see Fig. 9).

No major population changes took place until the beginning of the Second World War. It is obvious that such rapid alterations on the maps did not conform to any real events; they were clearly ideological falsifications. While the ethnic map of Central Europe vanished from subsequent Diercke editions, the falsifications continued on the German ethnicity map of southern East Central Europe.

The Diercke edition of 1941 (annexation of Polish territory east of Silesia) and the edition of 1942 (annexation of northern Slovenia) evidently point out that these revisions are in alignment with the territorial expansion of the *Großdeutsches Reich* or Greater German Reich (compare Figs. 10, 11, 12). These maps were strictly drawn according to the new political divisions but were not in agreement with any past or future linguistic circumstances. Such maps present a clear indication of the events to come if Germany had won the war.

3.2 Other German Publishers

All other German publishers show a similar cartographic development pattern in their post-mid 1920s atlases, e.g. Justus Perthes (Gotha), Herder (Freiburg), Bibliographisches Institut (Leipzig), or Wagner & Debes (Leipzig). This trend is

Fig. 10 Diercke [79.II]1939/1940

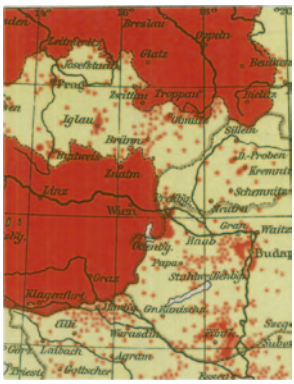

Fig. 11 Diercke [80.II]1941

Fig. 12 Diercke [81]1942

therefore ubiquitous. A closer look will be taken here at the publishers F.A. Brockhaus (Leipzig) and Velhagen & Klasing (Bielefeld). Brockhaus followed a comparable scheme:

Brockhaus' map of German dialects shows the traditional view before World War I (see Fig. 13), displays distinct changes by the late 1920s (see Fig. 14), and passes the German parts of Upper Silesia and East Prussia off as being completely Germanized by 1935 (see Fig. 15).

The same is true for Velhagen & Klasing, the publisher of the famous Andrees Handatlas, Putzger History Atlas, and various types of school atlases. With a run of nearly a century and a half, the Putzger is still published today. Like the Diercke, the Putzger exemplifies the evolvement of how German maps depicted the linguistic situation in East Central Europe and also represents the typical trend in German cartography after World War II. First deviations occur during the later 1920s and large-scale falsification of ethnic mapping begins after 1933 (see Figs. 16, 17, 18, 19, 20).

Fig. 13 Brockhaus [14]1908

Fig. 14 Brockhaus [15]1929

Fig. 15 Gauß/Brockhaus 1935

Fig. 16 Putzger [47]1926

Fig. 17 Putzger [48]1928

Fig. 18 Putzger [50]1931

Fig. 19 Putzger [51]1934

Fig. 20 Putzger [55]1938

Fig. 21 Putzger [79]1960

3.3 Post-War West German Atlases

After 1945 Putzger's History Atlas shows no immediate departure from previous manipulations. The first post-war editions of the 1950s return to the layout presented in the Putzger editions of the mid-1930s (see Fig. 21). With the major cartographic revision of all Putzger maps in 1961, the ethnic map of Eastern Europe was reorganized as well, partially erasing the pre-war revisions. This new map was republished over the next four decades up to 1999 (see Fig. 22). The next major revision of the Putzger in 2001 brought about a map of linguistic distribution which rectified the pre-WWI perspective (see Fig. 23). Astonishingly, this progress was reverted to the map of 1961 in the very next 104th edition of 2011 (see Fig. 24). Thus, there is still no uniform tendency—and this is also characteristic of the development of German historical cartography since 1945 regarding ethnicity in East Central Europe.

Almost all West German post-war publications displaying the ethnic distribution in East Central Europe during the first half of the twentieth century show a similar pattern. The publications of the 1950s and 1960s, in particular, often retain most of the cartographic alterations made during the 1920s and early 1930s (see Figs. 25, 26, 27, 28, 29).

Fig. 22 Putzger [80]1961

Fig. 23 Putzger [103]2001

Fig. 24 Putzger [104.III]2014

Fig. 25 Westermann 1953

Fig. 26 Atlas Ostsiedlung 1958a

Fig. 27 Atlas Ostsiedlung 1958b

The later clear-cut war falsifications deriving from the zenith of national socialist expansion in the early 1940s and especially pertaining to indisputably Polish territories, vanished immediately after 1945, most likely because they had no factual basis at all. Their ideological distortions were undeniable. But the earlier modifications of the late 1920s/early 1930s, especially the ones which covered territories within Germany proper, resembled, at least in part, real facts as well as ideological changes and could therefore not easily be identified as outright falsifications (see Figs. 25, 26, 27, 28, 29). Thus, these modifications were still suited for the restaurative political climate in post-war West Germany which still regarded the *Ostgebiete* or eastern territories as part of Germany albeit temporarily "under Polish administration" (the term literally taken from the 1945 Allied Potsdam Agreement).

The political climate began to change by the mid-1960s and the maps changed as well. List's Harms Geschichtsatlas published a disorderly map by the mid-1960s which went back to the view predating World War I. This "reverse development" was embraced by the mainstream publisher Bibliographisches Insitut in the early 1970s (see Fig. 30). However, the older traditional view and the newly changed perspective have continued to stick around until today (see Figs. 31, 32, 33).

Fig. 28 Atlas Mitteleuropa 1959

Fig. 29 Brockhaus Atlas 1960

Fig. 30 Meyers Enzy. Lexikon 1972

Fig. 31 Gr. Histor. Weltatlas [2]1979

Fig. 32 Brockhaus Enzykl. [21]2006

Fig. 33 K-P Weltgeschichte 2011

4 The Polish and East German Perspective

4.1 The Polish Viewpoint

Maps published in Poland about the ethnic composition of Eastern Europe during the first half of the twentieth century did not change before World War II (see Fig. 34). But in contrast to the receding German cartographic development, the Polish manipulations began after that war (compare Figs. 35, 36).

It is obvious that publishers in pre-war Poland had no incentive to change maps to the detriment of the Polish side. After the war Poland acquired large portions of former eastern Germany, territories which were mostly ethnically solid German areas, except for Masuria and Upper Silesia. The border dispute between West

Fig. 34 Mały Atlas Geogr. [11]1931

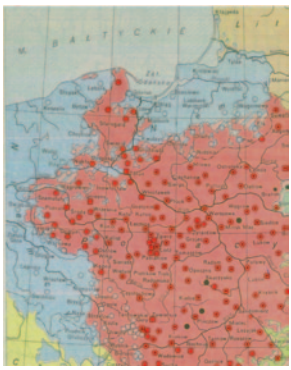

Fig. 35 PPWK Atlas Polski 1967

Fig. 36 PPWK Atlas Świata 1974

Germany and Poland was not settled until 1990 when the united Germany eventually recognized the frontier marked by the two rivers, the Oder-Neisse. Thus, regarding the official recognition of its western frontier, post-war Poland had been left in the lurch for decades and faced territorial claims from West Germany. Such tensions were likely to have repercussions in the social sciences, too.

In communist Poland the state-owned PPWK publisher had a monopoly with regard to cartographic publications for educational purposes. Therefore, its publications can be seen as representative of that period. In 1967 it published a new *Atlas Historyczny Polski* (Historical Atlas of Poland), including a very impartial ethnic map of pre-war Poland which conformed to pre-war Polish maps as well to pre-WWI German maps, thus showing the large extent of former ethnic German areas in Poland (see Fig. 35). Such even-handedness could have served German revisionist ambitions and was officially uncalled for. Probably for that reason all subsequent editions in communist Poland ([2]1970–[9]1989) did not include this map, but it reappeared in the 10th edition in 1990 after the fall of the Iron Curtain. In the meantime, PPWK published the new *Atlas Historyczny Świata* (Historical World Atlas) in 1974 with a noticeably different map for the ethnic and linguistic situation around 1900 (see Fig. 36). Territories which were said to be Germanized from the seventeenth to nineteenth century were displayed with the Polish primary colour and just some dots in the German colour. These diligent alterations leave to the uninitiated reader the impression that, for example, the majority of the population in the vicinity of Breslau/Wrocław in 1900 was Polish speaking. Short of being a downright falsification, this map is apparently intended to give facts a wide berth in order to yield to ideological and/or political motives. In post-war Poland, about one third of its area being former German territory, it appeared to be advantageous to belittle the magnitude of the annexation and incorporation of merely German areas in order to justify the acquisition of the so-called “recovered territories”.

More recent Polish ethnic maps return to the traditional view as it was agreed upon before the Great War (see Figs. 37, 38, 39), in one instance (Fig. 37) even being close to early German post-World War I revisions.

Fig. 37 Atlas H. Gimnazjum 2000

Fig. 38 Wielki Atlas Historyczny

Fig. 39 Historia Polski 2011 2005

4.2 The East German Position

There are not many East German historical atlases to be found, and only one of them includes an ethnic map. The major East German *Atlas zur Geschichte* (Atlas of History, two vols.) from the 1970s depicted the ethnic situation in Eastern Europe around 1900 in such a way that it partially resembles the Polish communist

Fig. 40 Atlas zur Geschichte [2]1976

viewpoint, especially the situation in Silesia (compare Fig. 36, 40). While the East German view is far from being identical with the Polish view of the 1970s, it is interesting to note that it follows the view of its communist "sister nations" in certain aspects. The Polish ethnic areas in Upper Silesia and Masuria are clearly visible. But, in contrast to all pre-World War I German, international, and pre-World War II Polish maps, there are certain areas marked as minority regions which were not identified as such by anyone before, e.g. eastern-most Pomerania and central Silesia directly north and south of Breslau/Wrocław. The marking does not allow the reader to make the distinction between ethnic Polish minority and majority areas. The reader is supposed to get the impression that these are all regions with an overall Polish ethnic majority. This is supported by the fact that even evidently smaller German ethnic majority areas near Bromberg/Bydgoszcz-Thorn/Toruń (in the Corridor region) are indiscernible on this East German map but mostly identifiable on Polish ethnic maps, even on the ideologically distorted map of 1974 (see Fig. 36).

This means that East German atlas cartography displayed some regions as Polish around 1900 which did not even have a noticeable Polish ethnic minority at that time, e.g. in the vicinity of Breslau. Yet, it does not toe the line as far as the Polish viewpoint of the 1970s is concerned, where German cities lying even further west, like Grünberg/Zielona Góra, Glogau/Głogów, and Stolp/Słupsk, seemed to be Polish. As a result, East German cartography takes a clearly anti-German stance. As a matter of fact, this anti-German nationalist attitude of the East German communists is also strengthened by the large southward extent of the Lithuanian minority in northern parts of East Prussia. This is a political concession unnecessary to curry favour with Moscow or Warsaw.

5 Influences upon International Cartography

Since German atlas cartography was at its peak at the beginning of the twentieth century, these pre-war cartographic revisions had an impact upon international cartography that in some cases lasts until today.

While there is a clear tendency towards the traditional perspective, it is quite common to come across renowned international publications which continue to display some of the pre-war German ideological revisions (see Figs. 41, 42, 43, 44, 45, 46).

As a matter of fact it cannot be assumed that after the passing of a whole century the cartographic repercussions of World War I have disappeared entirely. The Great War's legacy lives on.

6 Conclusion

World War I shook Europe's foundations to the core in many respects, the cartographic trade not being the least. One of the earliest cartographic modifications was made in 1916 by Dietrich Schäfer, a right-wing historian. In contrast to all previous

Fig. 41 Times Atlas History 1985

Fig. 42 Hist. Atlas C. Europe 2002

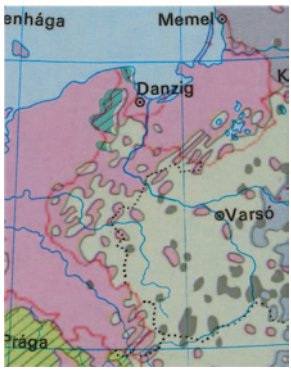

Fig. 43 Történelmi világatlasz 2005

Fig. 44 Hölzel-Geschichts 2007

Fig. 45 Shepherd's Atlas 1980

Fig. 46 Historische Atlas 2010

German publications his map *Karte der Länder und Völker Europas* makes a clear distinction between the ethnic Polish areas in Germany and in Russia, something which was previously unheard of (see Fig. 47).

Poles lived in three empires and fought in three armies. Understandably, the Polish question was finally brought to the fore. German and Austrian eastern territories were in danger of being lost—as eventually happened in 1919/1921. On the one hand, the Germans realized that their own maps were well-suited to supporting subsequent claims by the Polish side. On the other hand, it was also obvious to them that there was a significant difference between those ethnic Polish areas of Greater Poland which had belonged to the Polish Commonwealth until the first and second partitions in 1772 and 1793, and the regions of East Prussia and Upper Silesia with a Polish majority. This became also evident in the two plebiscites in East Prussia in 1920 and Silesia in 1921 with results favouring the German side. The Germans became aware of the fact that they needed to change their ethnographic maps in order to avoid a weakening of their cause when their very own maps were used at the Versailles peace conference in 1919.

By the mid to late 1920s a general consensus surfaced that the ethnic composition of eastern German territories had to be displayed differently so as not to lose

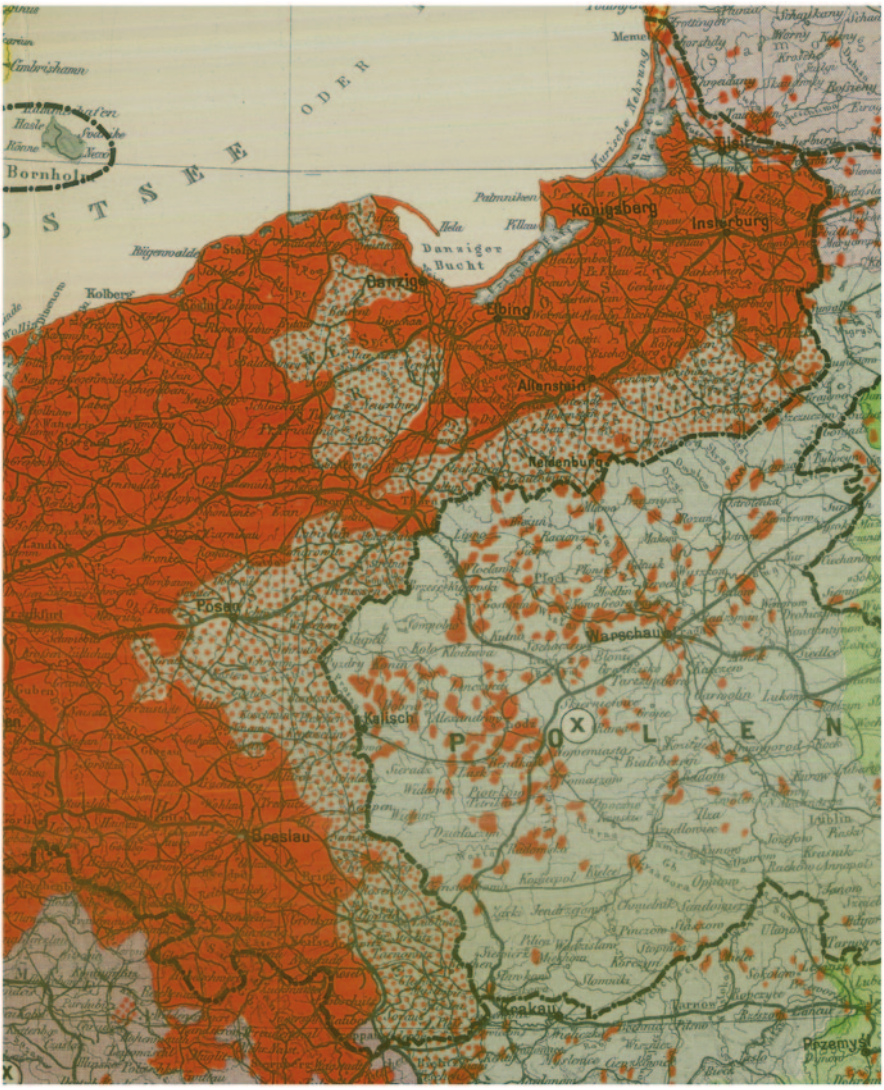

Fig. 47 Schäfer: Länder u. Völker Europas [2]1916

more territory in the future (or even to regain parts of lost territories). It is very interesting to note the hypocrisy of nationalism in this aspect. Previously, ethnic maps were solely based upon linguistic distribution regardless of state loyalty, but thereafter this began to change. Minority regions like Masuria or Upper Silesia with a great affiliation towards Germany were now viewed as basically German (in mind) no matter what the ethnographic or linguistic situation was, thus they 'deserved' to be shown differently. The cartographic transformation is therefore also a change of methods as the ethnic maps were no longer identical with the linguistic distribution.

It is noteworthy that the same criteria were not applied to the lost territories in the west (Alsace-Lorraine) because the result would be undesirable for the Germans. In the case of Alsace-Lorraine the linguistic distribution was essential. Thus, ethnic maps became a combination of more or less objective linguistic and ethnic characteristics as well as subjective and ascribed features of affinities. This means that the former accuracy of such maps was blurred since their content was now open to interpretation.

All this was not a uniform process in itself. Some German publishers started out earlier, and some later, but eventually all followed the same path. The Bibliographisches Institut (Meyer) was the last to heed this trend—it yielded in 1933. But most publishers began modifying their maps during the second half of the 1920s. In general it can be stated that most of the revisions before 1933/1935 did not completely erase minority areas but still had a connection to the facts on the ground and were not entire falsifications. The later changes of the late 1930s or early 1940s abandoned an even stretched factual basis. They were unclouded falsifications and the rapidity of subsequent changes reflects, on the one hand, the radicalization of German society, whereas on the other it is an indication that there was still no central government agency to implement these specific cartographic changes. But these falsifications also direct attention to upcoming developments/plans for the regions in question.

After World War II the Polish side turned to similar methods of portraying maps in a way which was useful for certain political purposes but refrained from outright falsification. In contrast to the German side, these Polish modifications never really had an effect upon international cartography, possibly due to restricted circulation in the West and general distrust in the reliability of publications issued behind the Iron Curtain. The majority of today's international historical maps about ethnicity in pre-war Europe seem to prefer the traditional view, but there are many publishing houses which still adhere to some of the changes of the late 1920s. Therefore the here discussed inter-war changes in cartographic representation are all but a short-lived phenomenon in German atlas cartography.

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A New Kind of Map for a New Kind of World: 1919, the Peace, and the Rise of Geographical Cartography

Peter Nekola

Abstract The years immediately following the First World War saw an increasingly widespread acceptance of a concept of the geographical understood not as the description of location, but as the study of the earth's surface conditions. This concept was philosophically unique in several ways. Firstly, representing conditions did not entail representing discrete units or objects with fixed or necessary identities. Conditions were understood as neither purely subjective nor objective but as dynamic phenomena subject to informed interpretation. Secondly, maps were designed and arranged to encourage correlation among such conditions, thus making substantive geographical knowledge of an area possible. This correlation process and the maps it employed did not assume or represent discrete political units, empires, or nations, as essential categories. Arguably, this concept of the geographical effectively constituted a critique of such units, ultimately regarding them as inadequate assumptions for substantive geographical study. I suggest that the timing of the articulation of this "geographical cartography" was no coincidence. A profound dissatisfaction with territorial thinking as a worldview had been a strong intellectual current after the War, as was the appeal of increasingly compelling alternatives. The articulation of geographical cartography and the concomitant rejection of territorial maps in many publications after the War may be considered an example of such dissatisfaction.

1 1919: The "New World"

In 1921 Isaiah Bowman, president of the American Geographical Society of New York and a close advisor to US President Woodrow Wilson at the 1919 Paris Peace Conference, published a substantial volume entitled "The New World." "The effects of the war" Bowman wrote, "were so far-reaching that it was indeed a new world in which men found themselves." Bowman wrote of "a profound change that took place in the spiritual and mental attitudes of the people that compose this new

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world. There came into being a critical spirit of inquiry into causes, of challenge to a world inherited from the past, of profound distrust of many existing institutions" (Bowman 1921, p. 1) Many people had, for perhaps the first time, thought at length of far-off places consumed in or shaped by the fighting and negotiating and had sought a clearer sense of where these places were in relation to themselves and the world they knew. Many had lost loved ones in the War and remained unsure why it had happened in the first place. While many accounts had spoken of nations as the primary actors in the conflict, implying that it was in the nature of such nations to go to war, an increasingly educated and skeptical population found reason to question such accounts.

It was this "spirit of inquiry" Bowman had identified which brought about this new demand for collections of detailed maps of the world for the home, library, and classroom. Atlases had the benefit of offering maps drawn to multiple scales and covering many areas and topics with an incomparable mix of detail and breadth of coverage. These maps could be drawn and arranged to cater to concerns and interests of the day, and many did. The new "post-war atlases," as Bowman's colleague Wolfgang Joerg would refer to them in a 1923 edition of the *Geographical Review*, had quickly found ways to accommodate this new demand. They worked to publish at the earliest possible date, to include greater detail, to offer competitive prices, and, in some cases, to include information tailored to what publishers estimated to be of interest to this new and vast pool of readers. However, the information they printed and the style in which they printed reflected deeper concerns than locating places. Arguments for knowledge in 1919 were increasingly taken *as* arguments, and there was less general enthusiasm for accepting information on the basis of authority. It was a time of reevaluating what humans might have taken for granted, and how various assumptions many had held may indeed have been mistaken.

1.1 A New Geography

On February 27, 1919, three and a half months since the armistice, five weeks into the Peace Conference, and one month after a committee had been elected to draft a covenant for the proposed League of Nations, J. Paul Goode of the University of Chicago addressed the National Education Association of the United States on the topic "What the War should do for Our Methods in Geography." The First World War had been one which, he insisted, "more than any other war in history [had] focused the world's attention upon the map." Newspapers had published visual chronicles of locations and events acquainting the public with the medium of cartography, yet the "lesson of the map" demanded more. The adoption of geographical thinking, Goode argued, offered humanity tools to help ensure a lasting peace.

According to Goode (1919, p. 179) the flows of world commerce demanded an end to provincialism and a "general acquaintance with the world at large." Taking "responsibility" for such commerce required "the study of the geographic principles underlying the production of the raw materials of commerce and the distribution of

these materials in the markets of the world." The responsibility of maintaining the League of Nations, its principles, and its mission to "make it forever impossible for the world to be drawn again into a general war," rested, Goode argued, on recognising the importance of global communications and transportation networks as well as commerce, and allocating the energy and resources necessary to maintain all of these. This was most effectively done visually, through successions of relevant maps, published together and meant to be read together.

Goode lamented that the opportunity for students at an early age to develop the skills to consider broadly the earth's surface and its conditions had become scarce, and described how "place geography," the general description and location of places, had come to be disparaged in some circles as "sailor geography" resulting in the entire field's neglect by many schools and colleges, with no sense that geographical study might involve a more substantive kind of knowledge pursuit. The first years of the Peace offered a "new day" with its own "call," a call which demanded the recognition of "…some of the larger needs the world war has shown us." Goode entreated his audience to "realize that geography is much more than the knowledge of the map; that it is much more than industry and commerce." It was essential to understand the earth's surface not in terms of territories or identities but in terms of "the relation of all life to its physical environment." As such, Goode argued that geography "touches the life and welfare of the human race more intimately and fundamentally than that of any other science," and he challenged his listeners to "awake at the call of the new day and prepare…for the new era now being ushered in."

Goode's argument was not that geographers should change their methods, but that the broader academic and pedagogical establishment, and the public in general, had to learn that geography had distinct methods above and beyond description and location, and that the varieties of knowledge such methods could make accessible could play an important part in preserving the Peace. Goode's 1919 speech, anticipating the publication of his atlas, questioned the centrality of territorial thinking that had long seemed to command public imagination and attributed it to a lack of education in geographical thinking. Goode's address proposed an alternative which his atlas would work to deliver in the years to follow—introducing students at all levels to a kind of study of the earth's surface not confined to any national frame, but engaging the world, as closely as possible, in terms of the *conditions* it presented. Goode's response to what Bowman had described as the "profound distrust of existing institutions" in the wake of the War was not to provide the public with an argument for why it should assume particular institutions could be trusted. Goode instead argued that knowledge claims could not be validated by one political institution or another, but by sound reasoning. As the path to war had been forged by both prejudice and uncritical acceptance of convention, a liberally educated public could potentially be a foundation for a lasting peace.

Geographers had been members of several national delegations to the Peace Conference, had been consulted by attendees, or, like Goode, had addressed the negotiations domestically in speeches and print (Martin 1980, pp. 81–97). United States Army Captain Thomas G. Chamberlain, author of the 1919 pamphlet *Why We Fought* and "missionary tour" promoter of Wilson's idea for a League of Nations,

had made similar arguments for a nonterritorial approach to geographical education, and Colonel Lawrence Martin would offer a bibliography of maps, atlases, and history texts characteristic of the "new geography" in support, with the help of the Carnegie Endowment for International Peace (Martin 1924). All held the common view that the War had been a mistake. The idea that territoriality and power were somehow fundamental to human life, among the War's philosophical underpinnings, was similarly mistaken. A geographical approach to knowledge, most visibly in the form of new maps, which eschewed territoriality in favor of representation of the earth's surface conditions, was articulated in service of not a national or even an international peace, but a postnational peace for a postnational world.

1.2 Carto-Historiography of the Peace

The immediate years after the First World War have been recently characterised as a "Wilsonian Moment." According to Erez Manela, the call in Wilson's fourteen points to justify the placement of borders and territories on the basis of national "self-determination," or the "self determination of peoples" would leave a legacy of "anti-colonial nationalism": Wilson's work to secure peace by shifting international norms of legitimate governance away from an imperial/colonial model of administration appears, in this evaluation, doomed simply to result in different kinds of wars. The Interwar years carried this weight in much historical work as a "moment" of failed internationalist idealism (Manela 2007). The history of cartography has provided examples of this story as maps, and particularly world atlases for general public consumption, in many cases translated the work of the Peace Conference into simple adjustments of borders and territories. The nature of the claims behind those borders and territories was most often lost in this translation. Maps simplified such claims in a way that presented a territorial understanding of the earth's surface as *de facto* geographical reality; borders and territories were beyond philosophical question. The questions of the day concerned not *whether* they should be drawn, but *where* they should be drawn.

The history of cartography suggests this story is more complex, but recent articles addressing the cartography of 1919 and the Peace Negotiations have emphasised borders, boundaries, and territorial claims, thus promulgating this perception, if unintentionally (Crampton 2006; Palsky 2002; Richardson 2000). Despite new work on these years as a time of cosmopolitanism and international collaboration (Gorman 2012; Tworek 2010), from the perspective of the history of cartography the story of 1919 appears closed. The years following the War, and their maps, mirrored a larger historical *zeitgeist* of a world in ideological transition from imperialism to nationalism. Discrete and bounded units still appeared on the map, without question of their fundamental philosophical status. In 1919, however, it was this very status that was subject to critique, and some of this critique came from the historical profession, albeit a historical profession that had begun to embrace a line of questioning it would attribute to *geographical* thinking. The era beginning in

1919 saw increasingly critical approaches employed in historical practice, as well as increased questioning of territories or nations as the basic units of historical study. A "New History" was a growing intellectual force, and a "geographical" perspective was among the key approaches its proponents had employed and advocated.

1.3 A New, Critical, "Geographical" History

The British delegation to the Peace Conference included the young historian Arnold Toynbee. Taking a job after the War in the newly-created British Institute for International Affairs at Chatham House, Toynbee's primary task was making sense of the Peace of 1919, the events that had set it and the War itself in motion, and the underlying currents that had made such events possible, insofar as historical work could make such sense. It was a dedication to understanding those currents, in the service of the peace that would compel Toynbee to question the "unit of historical study." Toynbee would begin his multivolume *A Study of History* with that very question: What constitutes an "intelligible unit of historical study?" and would go on to argue that "no single nation or national state of Europe can show a history which is in itself self-explanatory," characterizing both the "nation-states of the modern West" and the "city-states of the Graeco-Roman world" as "arbitrarily insulated fragments" of larger phenomena (Toynbee 1934).

Toynbee had been one of many such historians to question the unit of historical study in the years after the War, a group that included Henri Pirenne of Ghent University. Pirenne had previously written a massive national history of the Kingdom of Belgium, albeit one which reflected broader historical concerns. According to Genevieve Warland, Pirenne's experience of the war, much of it from the vantage point of the camp where he had been interned, did not result in a hardened sense of patriotic resolve but in a more sustained questioning (Warland 2014). It would prompt him to "revise his historical methodology" in a way that definitively rejected nationalist thinking, favoring a transnational, comparative perspective that, in Carole Fink's words "he considered the indispensable antidote to the catastrophe that had overwhelmed the profession during the Great War," a point made most clear in a speech on method he gave to the Fifth International Congress of Historical Sciences in Brussels in 1923 (Fink 1989, p. 106). Pirenne's work came to reflect an understanding of the nation itself as a moment, a series of negotiations with conditions. His vast *Economic and Social History of Medieval Europe* begun during his captivity, traced the history of Medieval Europe via towns, estates, and markets; it was "a single whole," and only an "international standpoint" could show its essential character (Pirenne 1936). Lucien Febvre and Marc Bloch would found the journal *Annales d'histoire économique et sociale* at the newly French-speaking University of Strasbourg, in consultation with Pirenne, who in 1929 would write the first article to be published in the new journal.

Febvre, who had also been in discussion with geographer Paul Vidal de la Blache, had come to identify the broader approach to history he pursued "geographical,"

and the new journal, like its founders, made much use of maps, new and old, for purposes of historical interpretation. The "geographical" approach to history they practiced had little use for the kinds of territorial maps which had become so popular in the nineteenth century. Maps Bloch would employ many such maps in his work reconstructing what he had referred to as the "conditions" of life in the past, both "material" and "mental" (Bloch 1931). Many maps from feudal times illustrated the shape and content of fields and towns, allowing for such a reconstruction through interpretation and correlation of data.

Vidal, in his 1893 *Atlas Général*, had distinguished *geographical* from *historical* cartographically as well as philosophically. Historical explanation was territorial, geographical explanation concerned, as Alexander von Humboldt had understood, the study and correlation of conditions on the surface of the earth. Though Febvre and Bloch would disagree with Vidal's more territorially-drawn historical maps, his geographical work had helped to define this new concept of the geographical for Febvre (1924). The consideration of *Conditions/Conditions/Condizioni* (English, French, Italian) and *Bedingungen* (German) had permeated methodological discussions of geographical work in the interwar years, both in reference to what was studied in the field and what would form the subject of many geographical maps. This language also appeared in informal discussions of geographical methodology among Peace Conference delegates and advisors, many of whom were unhappy with the unabashedly geopolitical emphasis of the official negotiations. Nationalists and politicians promoted territorial maps from all directions, but the consensus among geographers present was, increasingly, that this was not geography.

In sum, what geography was or was not, and what its units of study were and what they were not, was the subject of much debate in the years after the war, and a particular surge of writing on the subject appeared in 1919. The creation of the International Map of the World, proposed in 1893, had finally begun to achieve substantial commitments from governments to produce sheets *en masse*. If there was a scholarly consensus concerning the nature of geographical knowledge and reasoning at the time, that consensus either decentered territorial thinking or rejected it entirely.

2 *Goode's Atlas*: A Liberal Education for a Lasting Peace

The atlas J. Paul Goode would assemble and expand in 1921, 1922, and 1923, and 1932 had been among many in development just after the War. Despite urging from his publisher, Rand McNally and Co. of Chicago, its initial editions contained few or no maps drawn to emphasize territorial/political divisions of the world. Unlike several other "post-war atlases" mentioned in Joerg's 1923 review, and unlike another atlas of similar size published in the same year by the same publisher, *The Rand McNally Premier Atlas of the World, Goode's Atlas* made no mention of the War, new states, or new borders at any point, despite beginning with an introduction and fairly analytical explanation in the way of a foreword which grew in length in

each successive edition. Unlike those atlases it began with a methodological explanation by way of a foreword, followed by an illustrated explanation of how orographic/hypsometric coloring was meant to represent landscape; a page devoted to the history of map projections, culminating various interrupted projections as well as the polyconic projection employed by the International Map of the World, all of which the atlas employed; and by a visual "study in scales."

Following this introduction was a succession of world maps, ocean currents and vegetation, relief, world climate, January and July surface temperatures, isobars, prevailing winds, annual rainfall and cloudiness, density of population, cyclone tracks, ocean cables and commercial routes, commodity flows, and steamship routes (small insets for "race" and "religion" would disappear in later editions). Most of these world maps employed an interrupted "homolosine projection" of Goode's own design, developed with the help of then-graduate student Richard Hartshorne. "Geographic purposes" required consistency in areal representation as opposed to ease in "laying a course," a reference to the Mercator projection Goode had abandoned in his atlas, as its use was not "geographic" but "navigational." Subsequent editions published in the Interwar years further realized Goode's vision with such maps comprising roughly a third of the atlas, all emphasizing a different surface condition or distribution. Maps in the atlas were regularly updated to reflect current geographical research, and as such included variations on A. J. Herbertson's map of surface temperature regions and Wladimir Köppen's map of climatic regions. Late-nineteenth century distinctions between "physical" and "human" geography characteristic of the early geological-geographical work of William Morris Davis had also disappeared. The atlas proceeded from those maps of temperature and climate, vegetation and ocean currents, to maps of communications networks, principal occupations, and eighteen pages of maps of the extraction, production, and exchange of natural resources, agricultural commodities, and manufactured goods.

These world maps were followed by a series of quadrangles spanning the globe in the fashion of the 1:1000000 scale International Map of the World (IMW), though mostly on a reduced scale of 1:4000000. The IMW's scale of 1:1000000 was indeed employed, though only for heavily urbanized or industrialized "regions" such as a map of England's "Central Manufacturing Region" that emphasized developed infrastructure and dense population in the area around the Mersey River and Manchester Ship Canal (Goode 1932, p. 119) or a map in the same edition of the Los Angeles and Santa Ana Basins, Coastal Plain, and San Fernando Valley (73). This latter map was a quandrangle drawn not to accommodate administrative boundaries or make any sort of territorial claim but to suggest regional coherence in settlement and infrastructure. The boundaries of the map were also roughly contiguous with the range of the Pacific Electric Railway and with the low-lying areas with the most concentrated infrastructure and densest population, shown in red. Untitled maps of this sort dominated many pages of the 1922 and 1923 editions, all on a 1:1000000 scale and all emphasizing urban areas as parts of larger systems to be studied geographically (see Fig. 1). In this example, page 19 of the 1923 edition, the map at upper right showed urban development and infrastructure along the strait of Juan de Fuca and adjacent sounds, inlets, and canals, with no sign whatsoever that the area

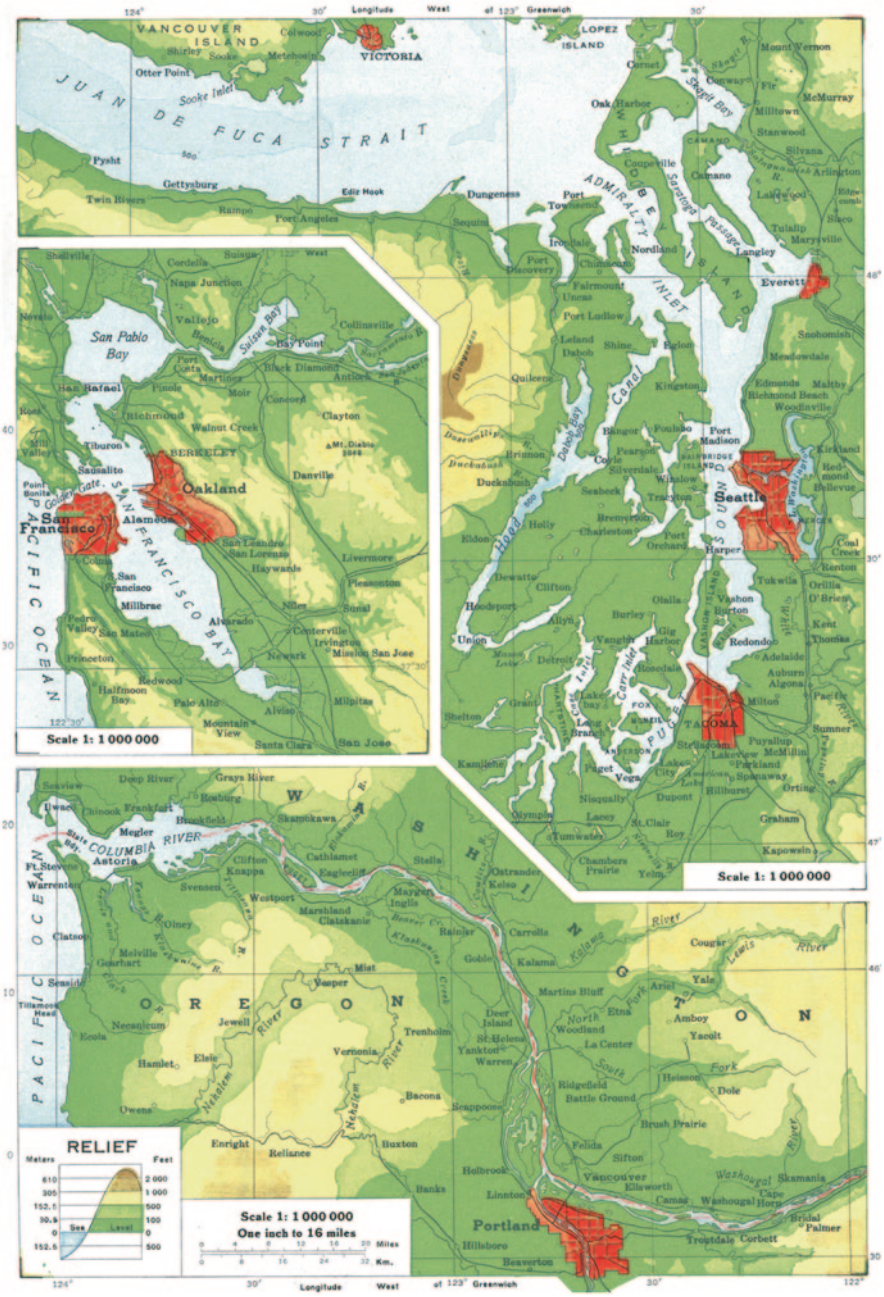

Fig. 1 *Goode's School Atlas*, 1923 Edition: 19. (Courtesy of the Newberry Library, Chicago)

represented was bisected by an international border. The map at bottom showed the urban area of Portland in relation to the Columbia River Valley and Pacific Ocean, emphasizing its economic-geographic context as a deep water ocean port, with only minor mention of the entire area's bisection by a state border. The map at center left was framed to include the entire San Francisco Bay area, suggesting the Bay's geographical importance as a system, though by 1923 only small sections of the Bay's shores had urbanized.

Goode's foreword introduced the reader to this kind of thinking, suggesting geography was "not merely a matter of space relation, neither is it a matter of description only." It involved a synthesis of natural and social sciences, a synthesis necessary for the systematic study of the earth's surface conditions. "Place maps" which "show where people live" were indeed geographically relevant, though, as Goode argued, they should not be expected to take the form of territorial claims or municipal identities. A geographical study of "where people live" showed patterns of settlement and population density, as well as conditions which had helped make such patterns possible and which continued to support them, through map-studies of economic and agricultural activities that "show how men make their living," as well as among map-studies of other conditions such as weather, climate, and vegetation, or access to waterways and resources. *Goode's* map of Los Angeles and Environs would undertake this on a basic level, with the help of other maps in the atlas.

Though Goode had intended the reader to make correlations among various conditions on various pages, at no point did *Goode's Atlas* actually insist that a particular unit or entity was an effect of a particular cause or determination. The lack of such insistence here, or in any other publication of Goode's, suggests an additional benefit of the use of maps for geographical study: Geographical maps could not claim to represent anything more discrete than conditions, and therefore could not hope to assert definitive cause or determination, but only offer the reader options for possible correlation. As Bowman would argue, conditioning and determining were philosophically very different concepts (Bowman 1934, p. 225). The pedagogical context here was also significant. The student or reader was left to engage in both interpretation and correlation, not provided with facts to digest.

Goode had developed and honed these ideas in his work to develop and sustain the geography curriculum at the University of Chicago, emphasizing geography throughout as a reasoning process. His atlas was designed to fill that philosophical and pedagogical role. Its "choice of material and order of presentation" had been "made specifically to meet the needs" of students at schools, colleges, teachers' colleges, and universities. Its primary purpose, which Goode emphasized in his 1923 and 1932 forewords, and anticipated in a 1920 essay "The Scope and Outlook of Visual Education," given as an address on several occasions in 1919, was to introduce the student to the "geographical thinking" that he understood as an essential component of liberal education (Goode 1920, 1923, 1932). This, as he had suggested in 1919, was in turn an important condition for sustaining a lasting peace. Geographical thinking, geographical reasoning, entailed the provisional use of units of study, each unit an interpretive device enabling the deeper study of a particular topic. But there was no single or singular unit of study that could reasonably frame all geographical studies. Hence, no absolute, discrete, or determinate entities,

objects, or units of study would appear in his Atlas with any consistency. And in the "new world" after the War, *Goode's Atlas* was not alone in this.

3 Wolfgang Joerg: Post-War Atlases and Geographical Reasoning

In 1923 Bowman's American Geographical Society colleague Wolfgang Joerg published a review of several of the many new or substantially revised atlases that had appeared in the immediate years after the War. Some, such as *Harmsworth's Atlas of the World* (London, 1921) and *Westermann's Weltatlas* (Braunschweig, 1922) had dedicated substantial space to exploring the conflict and territorial dimensions of the Peace. Others, like the new editions of *Andrees Allgemeiner Handatlas* (Leipzig, 1921) and *Stielers Hand-Atlas* (Gotha, 1920), remained dominated by territorial maps, but had made a few nods toward a geographical approach. All of these atlases, according to Joerg, were of the sort generally regarded as "locational" in their cartography. Goode's had represented a new and different sort of atlas that would appear after the War: the "geographical atlas." While locational atlases were devoted to illustrating territorial claims, geographical atlases involved study of the earth's surface conditions. Joerg went on to describe several of the latter sort, including Mario Baratta and Luigi Visintin of the The Instituto Geografico de Agostini's *Grande Atlante Geografico* (Novara, 1922) and J. G. Bartholomew of the Edinburgh Geographical Institute's *Times Survey Atlas of the World* (London, 1920), which had just replaced an earlier edition of *Andrees* as the official atlas published for readers of the *London Times*.

3.1 The Times Survey Atlas

According to Joerg, the *Times Survey Atlas* would make the "distinctive contribution" of publishing the bulk of its maps not based on territorial divisions but emphasizing maps with contour, colored orographically to represent relief, a method which "makes it possible to visualize the broad general distribution of highlands and lowlands at a glance." This, in turn, worked to "familiarize the general public with this method and thereby acquaint them with this fundamental element in human distribution and activities" and, in so doing, "advance the cause of geography." Representationally, the goal of such maps was to "reflect natural conditions." Throughout the atlas such conditions were presented in succession with varying degrees of complexity, including the "orography," "vegetation," ethnography, "population," of "regions" around the world, though the role of "ethnography" would be minimized and the subject would be entirely absent from later editions.

The world that the *Times Survey Atlas* presented was, in the fashion of national or international survey series, divided up into quadrangles of fairly consistent scale,

colored in most cases to show elevation and depth. These quadrangles would in most cases determine page coverage by dividing up large landmasses geometrically, not territorially. Nations, states, and other territories were no longer presented visually as the primary or constitutive units of the earth's surface, except in cases where national borders more or less corresponded to the boundaries of smaller landmasses or island masses like Malay Archipelago or the Japanese Empire, or in cases where quadrangles centered on waterways such as the Gulf of St. Lawrence or the Aegean Sea. Though the titles of many of quadrangles made reference to nations or states of which they covered sections, dividing the world in this way more or less ensured that map and page borders would not correspond to territorial boundaries. The visual effect of these "bathy-orographical" quadrangles was a mix of greens, yellows, and browns of landmasses shown in relief and the hues and tints of blues representing water and its depth.

Urban areas, similarly, and like the examples in *Goode's Atlas*, were represented in terms of infrastructure and the built environment. Following the style of British Ordnance Survey maps of the era, their coverage emphasized density of development and character and intensity of land use. A map of "London and Environs" was a rare case that included some administrative boundaries, though as these represented county and police district boundaries which did not correspond to one another, nor to the edges of pink-colored, street-gridded urban development, interpretation and categorization was left to the reader. Finally, the very nature of coverage and of projection and representation was presented as a kind of academic exercise with its own history of errors, faults, and benefits, with the suggestion that the maps in the Atlas should be considered more as *studies* than as claims to unequivocal accuracy. All of these aspects and others prompted Joerg to describe this atlas as the most "geographical" and least "locational" of those he reviewed.

3.2 The Grande Atlante Geografico

Though qualifying it as not such a complete rejection of the "locational model" as the *Times Survey Atlas*, yet a substantive contribution to geographical cartography nonetheless, Joerg also extolled the accomplishments of the *Grande Atlante Geografico*, which included "a series of 21 world maps in 1:150,000,000 showing the distribution of plants, animals, and minerals of economic importance; in the case of such commodities as wheat, cotton, coal, the export and import routes are indicated, the width of line being proportional to the amount transported." Constituting "the bulk of the atlas" were orographic maps "of the various regions of the world, accompanied by economic maps of the corresponding region. These economic maps, which show food and mineral resources and agricultural and industrial areas, either directly face the corresponding physical maps or are so disposed that comparison is easy." These, in turn, were presented along with additional maps of local conditions such as climate, vegetation, transportation infrastructure, and population.

Though, as Joerg noted, a fair number of territorial maps had made it into the *Grande Atlante*, on more occasions the regional and the survey-quadrangle format that had constituted the bulk of maps in the *Times Survey Atlas* also dominated the *Grande Atlante*, including quadrangles drawn to the proportions of bodies of water or to encompass not states or nations but "regions," including the "Balkan" and "Carpatho-Danubian" "Regions," "Central Europe," the Pampas of South America, and a quadrangle containing the most densely populated area of Brazil, designating no national or territorial context at all. The *Grande Atlante* was working to explore and embrace the study of regions, following its initial consideration of climatic, ecological, economic, and demographic conditions; as such it merited, in Joerg's view, the "geographical" designation. In Joerg's words, it struck "a happy mean between the general reference atlas as we have come to know it, mainly locational in its point of view and becoming increasingly overburdened with names, and the European school atlas, which breathes the real spirit of geography but has necessarily to confine itself to essentials." Like *Goode's* and the *Times Survey Atlas*, the *Grande Atlante* had succeeded in employing the "vision" and "courage" to "introduce real geography to the general public" (Joerg 1923, p. 592).

3.3 Units and Regions

According to Joerg, two of the most notable "non-locational" or "geographical" atlases of the immediate post-War years were multivolume projects that had by the time of writing only extended their coverage over particular regions of Europe, such as the *Atlante di geografia fisica, politica ed economica* compiled by Assunto Mori of the University of Rome (Turin, 1918) and the incrementally-published *Methodischer Atlas* compiled by Max Friedrichsen of the University of Königsberg (Hanover, 1920). Yet it was not their surficial but their intellectual scope that would characterize the most significant geographical contributions of these atlases: Emphasizing successive maps of geographical conditions and framing maps in terms not of territories or nations but by more coherently geographical regions.

Joerg's generally favorable view of Friedrichsen's atlas did not make for an unequivocal endorsement of concept like "natural region," which Friedrichsen had employed to mean framing maps and geographical studies around such areas as the North and Baltic Seas or the Iberian and Italian peninsulas. There was a potential danger here of appearing to endorse what some had called an "anthropogeographical" approach to territorial thinking, its own origins in the romantically-conceived idea that distinct human identity claims were somehow "natural," thus "geographically" justifying territorial thinking. Joerg made clear that such terms should be understood as interpretive devices, as he understood Friedrichsen had. This view also characterized the main argument of Joerg's earlier article: "The Subdivision of North America into Natural Regions: A Preliminary Inquiry," which reviewed a body of work on that topic up to its own publication in 1914 and emphasized the place of such concepts within the context of what he would refer to as "geographical

reasoning." Such a region, as a "unit of investigation," was only to be provisionally described as "natural" so it may allow for contrast with "artificial units" such as "political divisions" which "rarely fulfill" the "requirements of geographical reasoning."

Though occasionally spoken of as "fundamental units of geographical investigation" in publications from the first years of the twentieth century, Joerg suggested that this was the wrong way to refer to such units: They were not "fundamental" but established conditionally and provisionally, insofar as they could inform practical work from economic and agricultural development to resource and land conservation, preservation, and what would later come to be known as ecosystem management. The artificial/natural distinction Joerg had employed was just that: Provisional; conditional upon the practical demands of such reasoning; a way to categorize the kind of study of and correlation that can be made between "constitutive" elements of the earth's surface such as "structure and relief," "climate," and "vegetation," and to distinguish it from very different kinds of interpretive devices such as political divisions and national identity claims. Topics such as economics and population were identified here as "geographical," yet not "natural," at least in the same "constitutive" sense.

While geographical atlases sought to exclude territorial maps, the handful that did appear, often at the insistence of publishers, were most certainly decentered in the former, and were treated in the latter as phenomena subject to historical change, development, and obsolescence, effectively engaging in another sort of decentering. Territorial claims in this conception of geographical knowledge were not to be understood as somehow organically embedded in landscape, nor as political, cultural, or ethnic effects of environmental causes. When considered at all, their consideration was brief, among many other topics in a long list of conditions. Like the "new history" articulated in the years after the War, among the most defining characteristics of this concept of the geographical was a critical approach to conventional categories as *units of study*. While one some occasions this was done by omission, as in the case of *Goode's* and other works which simply excluded such categories, in other studies territorial thinking was engaged directly. That the events of 1919 and the Peace Conference were a constant presence in life, thought, and mapping was perhaps nowhere better reflected than in one of 1919's grayer areas, Upper Silesia, which would become the subject of a series of map-intensive geographical studies undertaken by Richard Hartshorne in the early1930s.

4 Richard Hartshorne in Upper Silesia

Many territorial maps published immediately after the War left uncolored places such as the area around what would be designated as the semi-autonomous "Free City" of Danzig/Gdańsk in Articles 102–108 of the Versailles Treaty. Article 88 concerned the area known as Upper Silesia. The larger region known as Silesia had stretched westward along the Odra/Oder Valley from the area around present-day

Katowice and had been associated with a Western Slavonic language or dialect similar to Polish, but also more or less mutually intelligible with Czech and Slovak, and had also incorporated elements of Moravian dialect. During the medieval period a duchy roughly commensurate with the lands identified by Silesian dialect was one among many components of the Holy Roman Empire. The Silesian duchy would be among the earliest to fall under the rule of the expanding Kingdom of Prussia in the eighteenth century, though some sections identifiable as Silesian would remain under Hapsburg rule, others would fall under the rule of Tsarist Russia (Lukowski and Zawadzki 2001; Tooley 1997). For centuries the area had been sparsely populated, its economy dominated by agriculture and forestry, but in the nineteenth century the upper, eastern part of the region would become what F. Gregory Campbell has called "one of the richest mineral and industrial areas of the continent." It would quickly attract investment, labor, infrastructure, and intense settlement from surrounding Hohenzollern, Romonov, and Hapsburg-controlled lands. "At the close of the First World War" Upper Silesia, in Campbell's words, "lay in the midst of dissolving empires," though it "included a vital economic area of Central Europe" (Campbell 1970).

It was this particular situation, coupled with the dissolution of empires and a mix of new nationalist assertions riding the "Wilsonian" wave of national self-determination movements, countered by nationalist and strategic motivations to assert or retain elements of German authority after the First World War, that Article 88 would seek to resolve as pragmatically as possible, in this case by calling for the economic/population core, or in Campbell's words, Upper Silesia's "industrial triangle," to be divided between the new Polish Republic and the German-speaking Weimar Republic. In theory, this kind of "boundary delimitation" would be undertaken, in Cambridge geographer Arthur Hinks's words, "according to the wishes of the people expressed by vote, and guided by the geographical and economic conditions." To inform commissions of such conditions was the primary reason professional geographers such as Emmanuel de Martonne and Isaiah Bowman had been brought to the Peace Conference in the first place, even if their ultimate influence on such commissions would be minimal. Hinks, reporting on "Boundary Delimitations in the Treaty of Versailles" for *The Geographical Journal* in August 1919, wrote of "awkward responsibility" that was "thrown" at the commission specifically charged with delimiting Upper Silesia, as "supposedly accepted" boundary principles borne out in the past in other areas did not seem to make sense in the context of local conditions. "The new boundaries here discussed are almost exclusively based on nationality," but nationality was difficult to establish or define, and would be, ultimately, "conditional" (Hinks 1919, pp. 109–112).

It is this issue that Hartshorne's 1933 and 1934 studies of The Upper Silesian Industrial District would engage, with the aid of maps. The issue had been politically decided, at least for a time, in 1922, and a series of jagged lines were drawn through the urban fabric of the area. But Hartshorne's conclusion was, ultimately, that none of the successive divisions of Upper Silesia along supposedly ethnic lines made sense. Geographical study revealed no "natural borders" or boundaries, simply a heavily integrated conurbation with one or another language forced upon its

schools or street signs, and borders and checkpoints which made life difficult for local residents. Hartshorne would write "Race, in the strict anthropological sense, has in this district, as in general in Europe, no geographical, and perhaps no cultural significance" (Hartshorne 1934, pp. 204–206).

In the longer of Hartshorne's two articles on the region an initial "chorographic" map provided a frame of land use possibilities, and the two maps that followed showed established human patterns; the two following those, presenting results of the March 1921 plebiscite, showed no such pattern in the "industrial triangle," and suggested no clear consensus on German or Polish choice of nationality in these most urbanized areas (Hartshorne 1934, pp. 210–211). The final nine maps would make the clearest case for Hartshorne's methodological argument. A first map showed the heavy concentration of highway and railroad crossings of political boundaries in the most urbanized and industrialized areas. A second map showed trade routes in relation to political boundaries, which "interfered" with such routes as they shifted. A third map showed nearly contiguous industrial development across the region, though western areas that had ostensibly received greater investment showed a greater emphasis on production, eastern areas a greater emphasis on extraction.

The following six maps, depicting the region's electric power system, water supply system, network of underground coal, zinc, and lead mines, and operating connections of one of the principal zinc companies, together showed a footprint in which industry, infrastructure, population, and commerce operated in concert, though they had been bisected by a new national border for a decade. Hartshorne's argument is clear: Upper Silesia had grown in population and prosperity as natural resources were extracted and the area was transformed by urbanization and industrial development. A complex web of infrastructure—commercial, industrial, transportation—reflected this; it was this web that gave coherence to the area as a region. Regional coherence could be studied in a succession of maps emphasizing networks of population, infrastructure, and commerce, and such study identified "a major industrial district of dense population" divided between national territories not according to any sort of geographical reasoning but by "diplomatic compromises" (Hartshorne 1934, pp. 212–224).

Though Joerg's review of the 1921 edition of *Andrees Allgemeiner Handatlas* had classified that atlas squarely as "locational" given the bulk of its cartographic offerings, it had notable exceptions, including a map of the "Oberschlesisches Industriegebiet" (see Fig. 2) which had in some ways anticipated Hartshorne's critique. Published before the plebiscite of 1922, this map did show a pre-War boundary line, but that line was barely discernible next to the key features of the map, explained in the key as rail lines, tram lines, main and secondary roads, and industrial sites. Like Goode's maps of urban areas with significant regional contextualization, this was a map of "where people live" and how and where they "make their living." The message of this quadrangle, like that of the maps in Hartshorne's studies, was that its constant partition spoke little or nothing to the geographical conditions of the place, to where or how people lived and made a living. A map that represented such conditions disacknowledged divisions that did not fit or were not justified on the ground. Such a map was implicitly a critique of such partition.

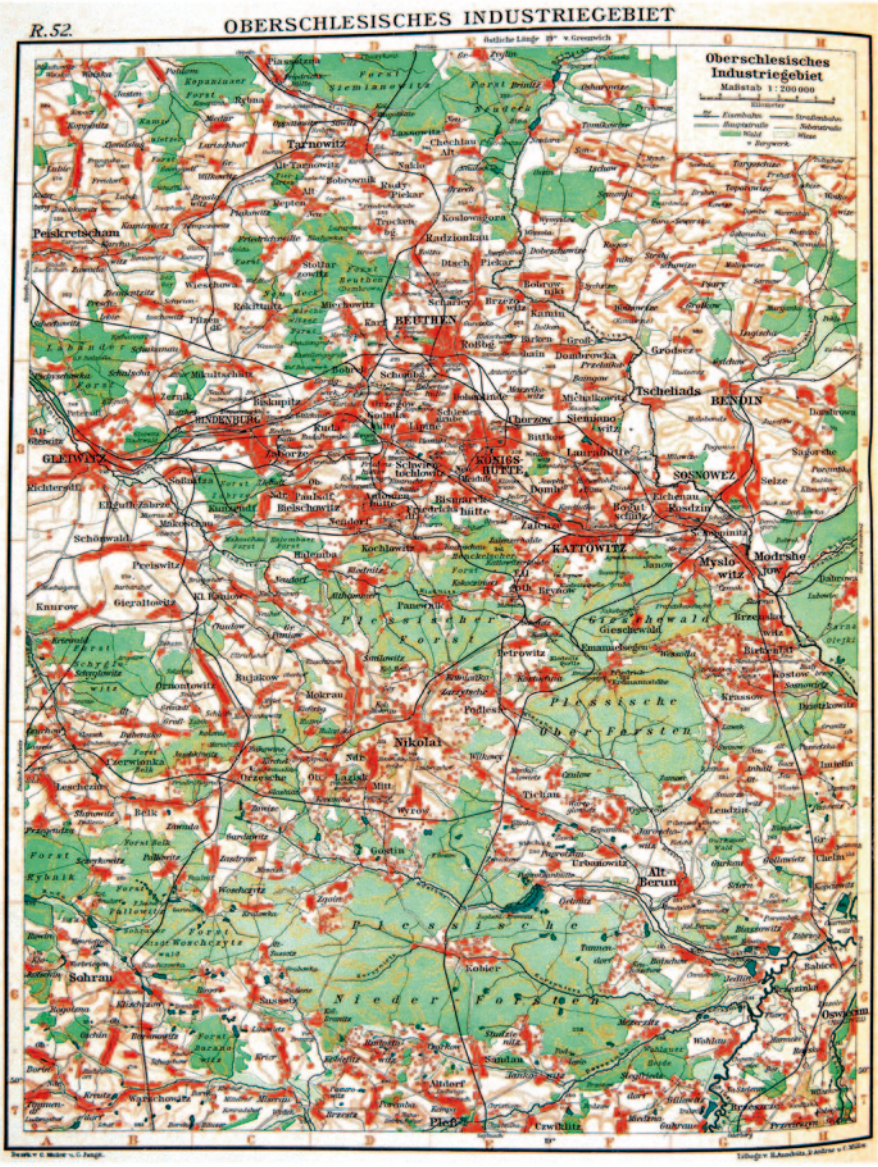

Fig. 2 Oberschlesisches Industriegebiet, in *Andrees Allgemeiner Handatlas*, 1921 Edition: R52. (Courtesy of the Newberry Library, Chicago)

The story of mapping after the War is not closed, historically or historiographically. The years after the War, and their maps, showed much more than a world in ideological transition from imperialism to nationalism: Those years saw the articulation of alternatives to both. They made not an *ideological* claim of international-

ism, but an *epistemological* claim that happened to be consistent with internationalist ideas: Territorial maps drawn on the surface of the earth did not satisfy the criteria that would qualify them as geographical knowledge. The representation of *conditions*, and the possible patterns and relationships that could be studied through the *correlation* of conditions could, and did, satisfy such criteria.

Hartshorne's work on Upper Silesia, undertaken in part to make sense of the peace in 1919, was taking shape just as that peace was becoming increasingly threatened in the 1930s. Despite its various territorial divisions, Hartshorne's point was that it remained a coherent region. National boundaries and "ethnic determinism" did not make sense. They were bad geography. Geographical work could ask questions of "What?" "Where?" And "How?" But had no answers to questions of "Whom?" or "Whose?" From such a "geographical" point of view, the lessons of the war were not to be found in a *reassignment* of territory, but in a *reassessment* of territory or territoriality; a reconsideration of the very idea, at least as purported knowledge of the earth's surface. There was much more for geographical cartographers to map in the Interwar years, years which would see the emergence of global commerce—and ecological problems—on an unprecedented level. Geographical work had brought to light a new way to see the world, in a sense, a new kind of world, with a new kind of map.

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Part III
Military Cartography on Various Fronts

Military Mapping Against All Odds: Topographical Reconnaissance in the United States from the Revolutionary War to the Civil War

Imre Josef Demhardt

Abstract Most map collections abound with cartographic items documenting military operations. On closer inspection, however, it becomes evident that the vast majority of these items are *post festum* drawings of what happened in the actual theatres of war. Much rarer are *ante bellum* mappings of possible theatres of war in response to the common wisdom that timely preparation does spare a good deal of trouble in time of need. This paper[1] explores some aspects of anticipatory and reflective military mapping in the United States during the eight decades between the Revolutionary War (1775–1783) and the Civil War (1861–1865).

1 From the Revolutionary War to the War of 1812

Although General George Washington already in 1777 had received approval from Congress to employ army topographers "*to take sketches of the country, the seat of the war*", their positions were abolished only months after the Peace Treaty of Paris (September 3, 1783) was signed. In fact, the cash strapped post-independence U.S. Army only in 1802 established a Corps of Engineers, the scope of which was focussed on military constructions rather than on topographical reconnaissance (Schubert 2005, pp. 3–4; Walker 1981, p. 365). The Louisiana Purchase which added the western half of the drainage basin of the Mississippi and thus doubled the territory of the just 20 years old United States, also did not help to strenghten the need for a dedicated topographical reconnaissance of the almost unknown acquisitions which were not only contested by the native Indians, but also by the Spanish and the British. President Jefferson's 'Corps of Discovery' which was commissioned in 1803, was a short-lived episode which terminated with his presidency in 1809 and is best remembered for the 1804–1806 Lewis and Clark-Expedition which crossed the

[1] An in-depth appraisal of the military reconnaissance undertaken with the emphasis on the period between the War of 1812 and the U.S. Mexican War 1846–1848 is scheduled for about 2017 in Jim Akerman (ed.): *The War of 1812 and the Rise of American Cartography*, currently under review by the University of Chicago Press.

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continent from the Missouri River to the mouth of the Columbia River. Lewis and Clark's field notes and route sketches contributed several route maps to the official account of the expedition which was published in 1814, but the lack of longitudinal readings grossly exaggerated the width of their journey (Goetzmann und Williams 1993, pp. 136–137; Goetzmann 1991, pp. 27–29).

Of much greater relevance from a cartographic point of view was the despatch of Lieutenant Zebulon Pike who, in July 1806, crossed the south-western plains into what later became Colorado, to be taken prisoner by the Spanish who claimed that territory. Having probably been provided by the Jefferson administration with a copy of the map Alexander von Humboldt had drafted of that area during his stay in Mexico City in 1803/04, and which he then courteously lend to the president during his visit to Washington DC in May 1804, Pike achieved some dubious fame among map historians by the publication of a survey map of the areas in which he had travelled. Although his map depicts some eye-witness revisions in the Colorado region, it was largely plagiarised from Humboldt's compilation which ironically only appeared after Pike's map in 1810 (Demhardt 2011, p. 23).

In June 1812 the United States and the United Kingdom slipped into a military confrontation which became known as the War of 1812, a conflict which was concluded by the Peace of Gent on December 24, 1814. The hostilities focussed on the U.S.-Canadian boundary area between the Atlantic Ocean and the Great Lakes and saw a *déjà vu* of the Revolutionary War a generation earlier. Both the strategic leadership in the capital Washington DC and the tactical commanders at the front lines were literally acting in uncharted territory as there was a general lack of printed maps of sufficient large scale. This was especially prevalent when advancing into enemy territory and led to more than one military setback. On March 3, 1813 this situation prompted the Congress to (re-) authorize that topographical engineers should be attached to the general staff of the army with the explicitly stated task to do terrain reconnaissance for the troops. However, the eight topographical officers and the same number of assistants were too small a unit and were also brought in too late to make any significant impact. When, by the Act of March 3, 1815 the army was returned to its peace time size, topographers were once again abolished from the army (Schubert 2005, p. 4; Thian 1901, p. 483).

2 Three Applications for the U.S. Army Topographical Engineers: Preventive, Reactive or Civilian

That this decision was not the end of the story, hinged on the fact that the army topographers had begun a survey of the about 1500 km long boundary with British Canada from Maine to the Great Lakes, prompting President James Madison to use his administrative powers to commission two of the officers to conclude the survey. Their 1816 report recommending "*the completion of a frontier military survey of the whole interior and exterior of the United States*" (cited after Traas 1993, p. 11), was instrumental to convince lawmakers in Congress that the pre-war reconnaissance of

potential theatres of war was a worthwhile expenditure. Nevertheless Congress only approved ten topographical engineers, or 'Topogs' as they had been nicknamed, to serve in the army's staff and in each of the eight peacetime brigades.

Based on experiences during the War of 1812 when the movements and actions of U.S. troops were greatly hindered by the lack of military reconnaissance, the constitutive war time regulation summarized the duties of the Topographical Engineers as follows:

> to make such surveys and exhibit such delineations as the commanding generals shall direct;
> to make plans of all military positions which the army may occupy and of their respective vicinities,
> indicating the various roads, rivers, creeks, ravines, hills, woods, and villages to be found therein;
> to accompany all reconnoitering parties sent out to obtain intelligence of the movements of the enemy or of his positions;
> to make sketches of their routes, accompanied by written notices of everything worthy of observation therein;
> to keep a journal of every day's movement when the army is in march,
> noticing the variety of ground, of buildings, of culture, and distances, and state of roads between common points throughout the march of the day;
> and lastly, to exhibit the position of contending armies on the field of battle, and the dispositions made, either for attack or defense. (American State Papers 1860, p. 492).

This somewhat sweeping job description which could be applied to military topographers in most European armies in the first half of the nineteenth century, did not answer the question whether the role of the Topogs was understood as a preventive rather than a reactive approach. The geopolitical circumstances at the time of the final institution of military reconnaissance pointed in both directions, with a third possibility looming in the horizon.

When in 1803 the Louisiana Purchase shifted the territorial limits of the United States from the Mississippi to the Rocky Mountains, there still remained a vast tract of land east of the Mississippi under the (nominal) control of a European country: Florida with a largely unpacified Indian population which lived in the hinterland of its subtropical coasts. Although President Madison had issued a proclamation on September 1, 1815 not to "*conspiring together to begin and set on foot, provide, and prepare the means for a military expedition or enterprise*" against Spain, with which the United States "*are happily at peace*", it was U.S. General Andrew Jackson, the hero of the War of 1812, who re-captured New Orleans from the British invaders. In December 1817 Jackson, under the thin disguise to end the safe haven status of Florida for runaway U.S. slaves, invaded and effectively triggered the First Seminole War (1817–1819) as it was the Indians rather than the weak Spaniards which came up with persistent resistance. Only one of the then newly appointed ten 'Topogs' was seconded to this campaign, but no map was printed to record either the movements or reconnaissance observations for future use (Schubert 2005, p. 23). In 1819 the Spaniards pulled out and handed Florida with its hostile Seminole over to the United States in return for the recognition of their claims over Texas and the territories to the west of the Rocky Mountains and south of the 42nd degree of northern latitude.

A decade later the war hero Andrew Jackson became President of the United States and pursued the Indian Removal Act, an instrument of ethnic cleansing which

he managed to push through Congress in June 1830. The result was that most remaining Indians from fertile areas east of the Mississippi underwent forced 'resettlement' into 'reservations' on the barren prairie west of that river. Prime targets of this removal were Jackson's old enemies in Florida, the Seminole Indians. It stands to reason that neither the outbreak of hostilities in the form of the Second Seminole War (1835–1840), nor the need for field reconnaissance of the likely theatres of war in the central and southern Florida hinterlands, should have come as a surprise to the civilian and army leaderships. However, when a Seminole ambush in December 1835 triggered the 5 year long fighting, there was not sufficient reconnaissance to guide the U.S. Army operations, just an overview map which Topographical Engineer William H. Swift had compiled in 1829 (see Fig. 1). The result was that by the end of 1836, eight of the ten Topographical Engineers were withdrawn from their assignments and deployed with the troops in Florida, whereas in 1839 not fewer than six Topogs were deployed across the peninsula. In 1837 the "Map of the Seat of the War in East Florida" was printed.

Throughout the Second Seminole War Topogs and detailed Army officers provided—with much delay—topographical data of the middle portion of the peninsula which, in 1839, enabled Captain John Mackay and Lieutenant Jacob E. Blake to compile and publish a detailed map which drew on surveys executed by not fewer than four other Topographical Engineers. In the 1840s this small group of Topogs spearheaded nothing less than three new maps of central and southern Florida, thereby adding considerably to the geographical knowledge of this huge peninsula (Beers 1942, p. 290). These maps provided an adequate base for the army operations of the Third Seminole War (1855–1858) during which the objective to forcibly remove the Indians was largely achieved. However, sufficient Seminoles managed to stay in, and subsequently reclaim, their homeland to make them the only native group who successfully withstood the U.S. army in three bitterly fought wars.

While the three Seminole Wars in Florida serve as a case study of reactive reconnaissance employment and were by far the biggest operations requiring the military engagement of the relatively little known Topographical Engineers, these early years also hint at the pursuit of a preventive approach. In 1818 the U.S. Army was sent up the Missouri River, deep into the (in 1803 acquired) Louisiana Territory with the dual mission to drive all British fur traders out and pacify the Indians who during the War of 1812 had in huge numbers sided with the British. Part of this otherwise failing show of force which got stuck in south-eastern Iowa, was Topographical Engineer Major Stephen H. Long who, with a group of Scientists, got detached on a paddle steamer further up the Platte River in the foothills of the Rocky Mountains. Here in Colorado, Long's expedition marched south before splitting up to turn back to the foremost frontier forts down the Arkansas and Canadian Rivers. The famous cartographic result of this first preventive reconnaissance expedition by a Topog was Long's "General Description of the Country Traversed by the Exploring Expedition", privately published in 1823 along with the best map of the Trans-Mississippi West of the United States. This report and map invented the so-called "Great American Desert" (see Fig. 2) which was located across the upper great plains west of the Mississippi and based on the perceived hostility of the high

Fig. 1 Extract of "Map of the Territory of Florida", compiled 1829 by Topographical Engineer William H. Swift. (Courtesy of the J. Thomas and Lavinia W. Touchton Collection of Florida Maps, Tampa Bay History Center).

Fig. 2 Extract of the "Country drained by the Mississippi", published privately in two sheets in 1823 by Topographical Engineer Stephen h. Long. (Courtesy of the David Rumsey Map Collection, www.davidrumsey.com, List No. 0343.004)

plains towards settlement because of the lack of rivers and forests: "*In regard to this extensive section of country*, […] *it is almost wholly unfit for cultivation, and of course, uninhabitable by a people depending upon agriculture for their subsistence*. […] *The scarcity of wood and water, almost uniformly prevalent, will prove an insuperable obstacle in the way of settling the country*" (Goetzmann and Williams 1993, pp. 144–145, citation on p. 144). Although the 'Great American Desert' ultimately proved not to exist, its concept and its placing on the best map of the area contributed significantly to the long delay in settling these plains.

It took the army topographers two decades to return to the Great Plains for another major survey task in preventive reconnaissance. In the wake of the Indian Removal Act of 1830 and the forced 'resettlement' of the eastern Indian nations in 1839, the Topographical Engineer Captain Washington Hood was assigned to resurvey and demarcate the boundaries of the Indian reservations west of Missouri and Arkansas which were originally established and marked on the ground by the Bureau of Indian Affairs. Because of "*the known looseness with which these surveys are generally made*", the commanding officer of the Topogs, Colonel John J. Abert, in his Annual Report pro 1839 openly surmised that he had every reason to assume that the surveys were full of errors. However, Abert sided with his officer's observation that any correction would "*unsettle present and acknowledged boundaries, and create dissatisfaction among the various tribes*." On finding that re-surveys and subsequent corrections of the boundaries of the Shawnee reservation on the Missouri state line would have a ripple effect to change virtually all reservation boundaries west of the Mississippi, Captain Hood reported to Colonel Abert: "*The result of our surveys would, in my opinion, cause a clashing among all tribes bordering the frontiers of Arkansas and Missouri, would create the greatest mass of confusion and discontent*" (Message from the President of the United States 1840, pp. 17–19) (see Fig. 3).

What prevented the Topographical Engineers to undertake more preventive reconnaissance on the western frontier and thereby ensure that the reactive measures which had been applied in Florida would never be repeated? In 1824 a decision by the U.S. Supreme Court held that the Commerce Clause of the Constitution gave Congress powers, and also the obligation, to improve interstate communications including roads and waterways. Congress reacted swiftly and on April 30, 1824, passed the General Survey Act. This legislation called for surveys and estimates of road and canal projects for which the politicians could not come up with more 'cost neutral' agents than the seemingly otherwise not fully utilized U.S. Army's Topographical Engineers. Already in the first year four of the ten Topogs were commissioned to undertake survey work on the Chesapeake Bay–Ohio Canal. With the ensuing mushrooming of railways, the civilian requirement for Topographical engineers became so serious that the War Department had to decline many assignments (Traas 1993, p. 13; American State Papers 1860, p. 109). Although the General Survey Act formally ended in 1837, most of the Topographical Engineers were until the Civil War occupied by neither preventive nor reactive reconnaissance, but by being beasts of burden for civilian infrastructure projects.

Fig. 3 Extract of "Map illustrating the plan of the Western & North-Western Frontier …", compiled 1837 by Topographical Engineer Washington Hood. (Courtesy of the David Rumsey Map Collection, www.davidrumsey.com—List No. 2393.000)

3 From the U.S.-Mexican War in 1846–1848 to the Civil War of 1861–1865 and Beyond

It was the belief that the United States should expand as far as the Mexican-held Pacific counter-coast of the continent (commonly debated as Manifest Destiny in the 1840s) which ultimately provided almost all Topographical Engineers with a brief distraction from internal improvement duties. When the Republic of Texas, which had seceded from Mexico in 1836, joined the United States late in 1845 and President James Polk took over the extremist Texan view of the location of its new southern boundary, this served as *casus belli* for Mexico and hostilities started in May 1846 along the Rio Grande. Since 1842, only Lieutenant John C. Fremont had been detached from the Topogs for three westward reconnaissance expeditions into

Mexico's northern territories. As a result, when U.S.-Mexican hostilities broke out, only a few map sheets—and the not quite helpful map series tracking the Oregon Trail—were available to the army (Chaffin 2002). Soon after the first shots were fired on the Rio Grande in May 1846, the majority of Topographical Engineers were withdrawn from their civil engineering assignments and seconded to the swiftly forming army units which were about to invade Mexico. At the peak of hostilities, two thirds of the then 36 officers accompanied all columns of progressing expeditionary U.S. forces deep into Mexico (Beers 1942, p. 349), providing hastily compiled field sketches for the actual advancement of the troops and topographical observations for the swiftly but still *post festum* printed battle maps of the campaign (see Fig. 4).

When the U.S.-Mexican War ended on February 2, 1848 with the Peace Treaty of Guadelupe Hidalgo which handed over more than a third of the Mexican territory to the United States, the Topographical Engineers returned to their civilian duties comprising various internal improvement tasks. Due to the huge territorial gains of the war, the few officers had to cover even more ground with infrastructure projects with the effect that in the years between the U.S.-Mexican War and the Civil War the Topogs only rarely engaged in topographical reconnaissance of the newly acquired territories. Given the uneasy relationship between the Mormons and U.S. administrations, the only assignment with a strategic potential was the detachment of Captain Howard Stansbury and Lieutenant John W. Gunnison to the Great Salt Lake in 1849–1850 with the foresighted order to scout a wagon road, a landing place on the lake and a site for an army fort (Beers 1942, p. 350). The Stansbury-Expedition was also the only preventive reconnaissance assignment which carried out some geodetic survey to provide a backbone for the map of the Great Salt Lake area. Nevertheless, the accomplishment for which the Topographical Engineers are best remembered in the United States today is another internal improvement assignment. The gold rush of 1848 had led to such an increase in commerce and population that California already in 1850 had been admitted as a state into the Union. The urge to connect the east and west coasts became pressing and in 1853 Congress assigned to the Topographical Engineers four simultaneous railroad reconnaissance expeditions to find "the most practicable and economical route for a railroad" between the Mississippi and the Pacific Ocean (Demhardt 2013, pp. 14–19). Based on the reports by the Topogs all four routes were eventually realized as railroads, the Central Pacific Railway being the first one in 1869.

With the election of Abraham Lincoln as the new president in November 1860, the United States started spiralling downwards to the Civil War which ultimately erupted on April 12, 1861 when Confederated forces shelled Fort Sumter in the harbour of Charleston, South Carolina. The vast majority of recent and former Topogs remained loyal to the Union. When the United States with the election of Abraham Lincoln as the new president in November 1860. It initially seemed as if the Civil War had brought an innovative method of reconnaissance into the ranks of the Topographical Engineers: In July 1861 aviator Thaddeus Lowe became 'Chief Aeronaut' of the newly formed Balloon Corps which, due to its primarily reconnaissance duties, initially got assigned to the 'Topogs'. The civilian contractors and their seven

Fig. 4 Extract of "Siege of Vera Cruz …" in March 1847, compiled by Topographical Engineer John McClellan. (Courtesy of the David Rumsey Map Collection, www.davidrumsey.com, List No. 3482.000)

balloons were successfully engaged in the battles of Bull Run, Seven Pines, Yorktown, Fair Oaks and Vicksburg where, on occasion, aerial reconnaissance in 'true time' was telegraphed for the use of the Union forces. However, due to the illness of Lowe and the ignorance of the bureaucrats and mental old timers in the U.S. Army, the Balloon Corps was effectively dissolved in July 1863 (Evans 2002).

Throughout their history the Topographical Engineers were entirely made up of officers only, their numbers never exceeding 34 prior to the Civil War. Although requests for a 'company of pioneers' to assist in survey duties had been repeatedly

made in the past, it was not until August 1861 that a company of topographical engineer enlisted men was authorized by Congress. However, as the Corps was at that time in competition with other volunteer units, the enlistment effort foundered. The just three (!) enlisted men were transferred to the Corps of Engineers. This paved the way for the fate of the Topographical Engineers as well. After two gruesome years of warfare it had been proven that the army did not need two engineer units and on March 3, 1863 (Beers 1942, p. 352), the very day of the 50th anniversary when the first Topographical Engineers were authorized during the War of 1812, the small group of Topogs was absorbed by the older and much larger Corps of Engineers.

With the dissolution of the Topographical Engineers in March 1863, the U.S. Army Corps of Engineers evolved into the U.S. government's principal executive arm for civil engineering projects after the end of the Civil War in 1865. They continued the internal improvement tasks assigned to the Topogs in times of reactive crisis, which had effectively kept them away from preventive reconnaissance and mapping. However, the need for the geodetic and topographic survey of the United States did not fade away with the Topogs. To address these needs Congress in 1871 charged the Coast Survey with the geodetic surveying of the interior which in 1878 morphed into the U.S. Coast and Geodetic Survey—but this is a different story.

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The Peninsular War 1808–1814: French and Spanish Cartography of the Guadarrama Pass and El Escorial

Pilar Chías and Tomas Abad

Abstract Many roads which still cross the Sierra de Guadarrama mountain range to connect the two plateaus in the centre of Spain date back to Roman times. The mountain passes of Somosierra, Navacerrada, La Fuenfría and Guadarrama were consolidated between the Middle Ages and the eighteenth century as necessary stages on the routes from Bayonne (France) to Madrid and Andalusia. In particular, the passes of La Fuenfría and Guadarrama linked the San Lorenzo de El Escorial Monastery and Segovia with the Spanish capital, and were progressively improved by the Bourbon kings, as was reflected in detail in Spanish maps. As strategic passes, they played an important role during the Peninsular War, and consequently they were also mapped by English and French cartographers. Much of the cartography from before, during and after this war comprises a largely unpublished collection of very interesting maps that are held in Spanish archives. The objectives of this research were, firstly, to study and disseminate the maps of these mountain passes produced around the time of the war. Secondly, to analyse the collaboration of Spanish cartographers with their European colleagues, a process which began with Philip V in 1700 and continued throughout the eighteenth century. And, thirdly, to analyse the influence of this cartography on post-war maps.

1 Background and Contexts

1.1 Background

The maps examined for this Project have remained largely unpublished and have not previously formed the subject of a specific and contextualised monographic study. They were produced around the time of the Peninsular War and are held in major Spanish archives, in particular those at the Ministry of Defence, the National

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Library and the Royal Palace, all in Madrid. The present study covers a period of 100 years, during which time close relations were established between the Bourbon kings who ruled simultaneously in France and Spain. Collaboration in the field of cartography began in 1700, coincided with the accession to the Spanish throne of Philip V, grandson of Louis XIV of France, and lasted until the mid-nineteenth century.

The westernmost passes of the mountain range called the Central System are located in the geographical area of the Sierra de Guadarrama mountain range, and include the Guadarrama and La Fuenfría passes. Historically the area has been considered strategic for routes between Madrid and Segovia, some of which extended as far as Paris via Burgos and Bayonne (see Fig. 1).

Due to the fact that these roads also led to the royal sites of San Lorenzo de El Escorial (in the northwest of the province of Madrid and on the southern side of the mountain range), Valsaín and La Granja de San Ildefonso (both in Segovia, on the northern side of the mountains), the documentation on them is abundant and covers the period from the sixteenth century to the present. The records include two catalogues of exhibitions held on the occasion of the centenary of the advent of the Peninsular war: *Madrid 1808* (2008), and another published by the Spanish Ministry of Defence in 2008. There is also a monograph on the architecture of the royal sites (Sancho 1995) which includes an image of the map by Villanueva (see Fig. 3). The latter, however, is not accompanied by a detailed study.

1.2 The Historical Context: A Century of Spanish-French Cartographic Collaboration

The need for modern, updated maps of Spain became obvious during the War of the Spanish Succession (1701–1713) which had been triggered by the childless death of Charles II, the last Habsburg king of Spain. Since the accession of the first Bourbon king, and throughout the eighteenth century, the *Pactes de Famille* promoted French influence in Spain in all areas related to map production.

This influence was primarily embodied in three lines of action. Firstly, those responsible for producing maps were encouraged to undertake training in Paris. Secondly, many joint cartographic and geodetic campaigns were carried out which involved cartographers and military engineers from both countries. And thirdly, new institutions were created along the lines of their French antecedents. The ultimate goal was to produce a general map of Spain comparable to the *Carte de Cassini*.

Training for cartographers and engravers was mainly provided in Paris and London. Cartographers and military and naval engineers as important as Jorge Juan and Antonio de Ulloa (1748–1749), Tomás López (1752), Jiménez Coronado (1785) and Mendoza Ríos (1789) all attended such training, and they took advantage of their time abroad to perform espionage. Other officers were commissioned to acquire scientific instruments, books and other materials that were

Fig. 1 Francisco Lorenzana, *Mapa geográfico y topográfico de los contornos de Madrid*, 1783. Detailed manuscript map of the Madrid surroundings describing both the old road crossing the pass of La Fuenfría and the new one across Guadarrama. It also depicts the *grids* used for topographic and geodetic work. Approximate scale 1:130,000. Size 110.9 × 137 cm. (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid. Bookmark: Madrid 5)

intended for the different Spanish observatories as well as for the Geographic Cabinet of the Army in Madrid.

Throughout the eighteenth century, scientists and experts from both countries also collaborated on numerous cartographic and hydrographic campaigns. In addition to the famous expedition to Peru led by Godin and La Condamine to measure a degree of meridian in which Jorge Juan and Ulloa (1735) also participated, there were many other lesser known expeditions. In 1776 José Varela participated in

Table 1 Activities developed within the Spanish-French collaboration, 1700–1868. (Chias and Abad)

the hydrography and astronomy campaigns led by Jean-Charles Borda which were undertaken in the Canary Islands and on the West Coast of Africa. A decade later the *Comisión de Límites* (borders commission) composed of French and Spanish military officers was established to map the Pyrenean border between Spain and France (1786–1792), while in 1792 joint work was carried out to extend the meridian of Paris to Barcelona, a project supplemented with a second campaign between 1803 and 1806 (see Table 1).

The third line of action focused on the creation of training institutions for the military corps and naval officers which would be the mirror image of their French antecedents, and on the collection and organisation of maps and hydrographic works. To this end, a military engineering corps (1711) was created to emulate the French *Ingénieurs pour les camps et armées* (1691). In addition, the Cadiz Academy for Naval Cadets was founded in 1717; the Royal Observatories of Cadiz and Madrid in 1753 and 1790 respectively; the Hydrographic Depository in 1789; the Geographic Cabinet of the Army in 1795; and the Directorate for Hydrographic Works in 1797.

1.3 Spanish Cartography Prior to the Treaty of Fontainebleau (1807)

With the exception of the Spanish coastline which had been accurately mapped by Tofiño in his *Atlas Marítimo* (1789), the cartography of the Peninsula at the beginning of the eighteenth century presented some notable deficiencies. This fact was stressed by the military and by politicians imbued with Enlightenment ideas: "Geographical maps. There are no accurate maps of the kingdom or its provinces; nobody knows how to engrave them, nor do we have any others than the imperfect ones produced in France and the Netherlands. Consequently, we do not know the true location of towns or their distances, which is a shameful state of affairs. […] The benefit that would accrue from this measure is not limited to a knowledge of the specific location of each place; it would illustrate the extent of the territory, […] the course of rivers, the places they could irrigate, and the navigation for which they could be used, the use and exploitation of land, with the harvests that could be produced, the royal and private roads, and other information important for good governance by the monarchy and for the advancement of trade. It would tell us how many feet Spain as a whole and each of its provinces measures […] and in which locations […] to establish factories, which is one of the most delicate points that may arise". (Marqués de la Ensenada, *Puntos de Gobierno*, 1748; cit. in Rodríguez Villa 1878: 161–162).

The *Carte de Cassini* became the model to follow and between 1751 and 1807 several projects were proposed to produce a map of Spain by scientific methods and to create the corresponding name index. This last proposal was made by the distinguished cartographer Felipe Bauzá (Barber 1996) who reasoned that "without a good geographical map, the government cannot design roads or canals, nor know how rivers should be connected or their limit of navigability […] nor can they ensure the people's welfare; nor can they select the essential locations for the country's defence, in other words, provide the means for its preservation and security" (Bauzá 1970).

Unfortunately most of these initiatives remained incomplete due to a lack of sustained support from the government. As a result, the only maps drawn on a sufficiently large scale which were available in the mid-eighteenth century in peninsular Spain were the hand-drawn maps by Pedro de Esquivel (1566–1580),[1] and an incomplete map attributed to the Jesuits Carlos Martínez and Claudio de la Vega (1739–1743)[2]; There were also the general and regional maps printed by Tomás López (compiled by means of an armchair study rather than by doing fieldwork), compiling information from various sources (Manzano-Agugliaro et al. 2013). However, these maps were unsuitable for military purposes due to their inaccuracy and the fact that they were of different scales—between 1:400,000 and 1:164,000. Nonetheless, a large number of local and route maps were produced throughout the century, most of which were manually drawn and relatively accurate. Many of these

[1] Madrid, Library of the Monastery of El Escorial, Bookmark MS. K.1.1.

[2] National Library of Spain, Bookmark Mr/033/224.

Fig. 2 Francisco Nande, *Mapa del Puerto de Guadarrama y sus contornos en que se demuestra la nueva carretera*, 1749. Manuscript map of the new *road crossing* the pass of Guadarrama, making a distinction between the works already carried out and those just planned. Approximate scale 1:24,000. (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid. Bookmark: Madrid 126)

maps were compiled as a result of the Bourbon monarchy's desire to improve land and river communications inside the country as a basis for stimulating economic development, something which required the production of numerous hand drawn, accurate maps (see Fig. 2). These maps focused on strategic points such as the mountain passes, or on areas that were of particular interest such as Crown properties, or the environs of major cities such as Madrid, and town plans.

The maps of roads which commenced in Madrid and led northwards across the Central System via the passes of Guadarrama, La Fuenfría or Navacerrada, formed part of this series. These routes also connected the capital with the royal forest of El Escorial and with the royal sites of El Pardo, La Granja de San Ildefonso and Valsaín. Drawn between 1749 and 1788, they were highly accurate as is evident when they are compared with present-day maps. The map by Juan de Villanueva (see Fig. 3) is of particular interest because it applies the criteria of Baroque scenog-

Fig. 3 Juan de Villanueva, *Plan que demuestra el trozo de camino que se proyecta ejecutar desde el Real Sitio de San Lorenzo hasta unirse con el camino antiguo que desde el mismo Sitio conduce a El Campillo y Guadarrama*, 1788 Manuscript map developed by the architect of the Prado Museum, who designed a baroque urban plan for San Lorenzo de El Escorial. Size 180 × 807 mm. Approximate scale 1:13,500. (Courtesy of Archivo del Palacio Real, Patrimonio Nacional, Madrid. Bookmark: 718)

raphy to the road drawn between San Lorenzo and Guadarrama. As a result some circular plazas were rithmically disposed along the route with the main avenues converging on them (Chias 2013, 2014; Chias and Abad 2012a, 2014).

The Peninsular War brought a change to Enlightened reformist projects, and especially to scientific mapping at a national scale of which only a few isolated geodetic observations remained. However, all these cartographic materials proved to be insufficient to produce the large map of Europe which Napoleon dreamt of.

1.4 Cartography in France During the Consulate

The need to adopt new methods and criteria in cartographic representation in order to transmit information accurately and unambiguously was early detected by General Sanson, director of the *Depot de la Guerre*, the body responsible for cartographic documentation. Between September and November 1802 a commission was appointed in France to simplify and unify map symbols and conventions, and to specify the criteria to be applied to topographical maps and drawings. Its findings were published in the *Memorial topographique et militaire* and later repeated in numerous practical manuals (Hayne 1806). Other important criteria concerned the use of the decimal system for measurements and scales, the reference to the origin of the altitude scale at sea level, the elimination of the depiction of geographical elements in perspective or when flattened, the standardisation of symbols, and the use of colour. The criterion for representing the relief by means of maximum slope lines was improved with the introduction of shading which was considered to make "the drawing of maps an art of imitation, a new genre of geometric painting" (Bacler d'Albe 1803, p. 21).

2 Mapping in Response to the New Needs of War

The innovative military tactics which Napoleon deployed in his campaigns relied on the mobility of the armies and the light artillery. His strategies necessitated careful planning, and this in turn required a detailed and accurate knowledge of the terrain, the topography, and the hydrography. It was necessary to possess information about the roads and their characteristics, i.e. their slopes, surfaces, capacity, fords, bridges, etc., as well as the distances and the time required to cover them. Given that the French army could only advance approximately one league—about 3.9 km—in half an hour, they could in 1 day cover between 20 and 30 km, and even 40 km on a forced march (Castañón and Puyo 2008). To collect information on the surroundings of these routes was equally important. Details of the vegetation—forests, shrubs, crops—were essential since it might have concealed enemy troops, slowed progress or hindered supplies. It was also necessary to identify the most suitable places for setting up camp, stocking up on water and food, and obtaining other types of supplies, as well as to ensure the maintenance of communications. Accumulating

this information required topographic maps drawn at scales between 1:20,000 and 1:100,000, and a general map of Spain at a scale of 1:200,000. In addition to this, the geographical information which Napoleon needed also required the production of long distance route maps, 1st, 2nd and 3rd order surveys, town maps, plans of fortifications, visual inspections, battle maps and drawings of war events.

2.1 French Cartography of Spain

To meet these needs, Napoleon created several cartographic corps which work was unfortunately not coordinated. In 1807 he organised the *Dépôt de la Guerre* composed of geographical engineers. Other corps which were established were the Staff Officer's Corps, the *Genie* or Engineering Corps and the *Cabinet Topographique de l'Empereur*.

Since its inception the *Dépôt de la Guerre* began to gather all the maps of Spain which were held in France (Villèle 2008). To their surprise the available printed cartography was limited to a French translation of Tofiño's *Atlas Marítimo* which was of an excellent quality and accuracy; the 1799 *Carte d'Espagne et de Portugal* in nine sheets by Pierre-Gilles Chanlaire at an approximate scale of 1:1,000,000; the 1774 *Carte d'Espagne et Portugal comprenant les Routes des Postes et autres de ces Royaumes* in six sheets by Brion de la Tour, drawn to an approximate scale of 1:1,380,000; the map of the Pyrenees by Roussel and La Blottière published in 1730 and not updated and, lastly, an incomplete copy of an outdated edition of the *Atlas* by Tomás López.

There was also a series of hand-drawn maps representing small areas of the country which mostly dated back to the War of the Spanish Succession, but which were outdated and of little use. The same was true of the 1768 survey conducted by General de Grandpré on the border at Alduides.

Judging from this limited collection, Napoleon did not have access to the required accurate maps of the entire Spain. In February 1808, General Sanson described this situation as follows:.: "the paucity of engraved topographic materials on Spain has imposed on the geographical engineers of the *Bureau* the duty to urgently collect, with all possible devotion and the most painstaking care, everything that they know to exist or suspect might exist in public archives such as the War and Naval Depository in Madrid and the archives of scientific societies, provincial universities, the nobility and the church, etc. The same care must also be taken to obtain astronomical and trigonometric results" (Sanson 1808).

The shortage of maps was exacerbated by a lack of knowledge of the rugged topography of the Peninsula due to inaccuracies in the representation of the relief which was drawn according to the techniques of Philippe Buache who first drew the river network before filling in the mountain ranges. The description by Jean-Baptiste Bory de Saint-Vincent (1823, p. 7) of his experience in the Peninsular War is an accurate reflection of the lack of reliable topographic information: "Confused by such indications, the soldier makes his calculations about obstacles or defensive

Fig. 4 Comisión de Jefes y Oficiales a las órdenes del Ministro de la Guerra, *Mapa itinerario de los contornos de Madrid*, 1795. Spanish itinerary showing the environment of the Monastery of El Escorial and the road to Guadarrama pass, along which there are signs such as a red hand indicating where bandits used to hide. Size 41.1 × 65.0 cm. (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid. Bookmark: Madrid 136)

points that he will not find anywhere; the naturalist dreams of rugged terrain conducive to his research, but this will be transformed into an arid and horizontal plain".

French officials were unaware that the Spanish troops were frequently accompanied by the military organisation called the Company of Guides who knew the terrain and who provided information which was rarely contained in maps. The map compiled by the Commission of Spanish Chiefs and Officers dated around 1795 accurately identified hazardous points on the roads leading to the Sierra and San Lorenzo where highwaymen could hide. These are indicated in the legend next to an extended red hand: "Sites where thieves usually position themselves due to the thicket that hides them and the vast expanse of country that can be seen from there". In addition to its graphic clarity, the map is notable for its ornamentation which is concentrated on the left side of it (see Fig. 4).

In order to obtain geographical information on the Iberian Peninsula to produce the necessary maps, Napoleon, on February 1808, created the *Bureau topographique de l'Armée d'Espagne* which had to report to the *Dépôt de la Guerre* and was directed by Commander Auguste Chabrier. This cartographic unit which remained active until 1811, was composed of French geographical engineers. From the outset they faced numerous problems such as permanent interference from Paris, contradictory orders, a constant reduction in the number of personnel, and the aforementioned

Fig. 5 Bureau topographique de l'Armée d'Espagne, *Route de Ségovie à Madrid*, 1808. Detail of a French manuscript map depicting the pass of Guadarrama and the Royal Woods of El Escorial which was drawn according to the new cartographic conventions. Approximate scale 1:13,000. Size 135.1 × 44.8 cm. (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid. Bookmark: Madrid 137-3)

absence of useful maps of Spain in the French archives. Among their tasks was that of producing a *Carte des postes et étapes d'Espagne*, an assignment which was carried out by Chabrier on a scale of 1:1,000,000, and sent to Paris in 1809. The resultant map was probably the origin of the later military map of the Peninsula.

Simultaneously with this, maps were drawn in stages at provincial and local scale, which contained the information collected on the ground concerning the quality and surface of the roads, the condition of bridges and fords, the slopes, and the vegetation (Núñez de las Cuevas 1991, p. 190) (see Fig. 5).

The second group of French cartographers was formed by specialised officers from the general staff. They were placed under a commanding officer to assist in their decisions, and they devoted themselves to carrying out surveys on the ground.

Finally, the *Genie* or Engineering Corps was responsible for directing sapper companies which were essential in sieges and to garrison strongholds. They thus focused their cartographic work on surveys of fortifications which were often carried out "by visual inspection" and with little accuracy, but which were nevertheless

Fig. 6 Baron Louis Albert Ghislain Bacler d'Albe, *Souvernirs pittoresques du Général Bacler d'Albe. Monument élevé sur le sommet du Guadarrama, á la limite des deux Castiles*, 1820–1822 Size, 20.1 × 14.1 cm. (Courtesy of Museo de Historia de Madrid, Madrid. Bookmark: IN 2003/17/598)

useful. Following the guidelines of the *Memorial topographique* (1803) defined by the French Army (see Table 1) they also made drawings of the landscape, some of which were engraved after the war and were used to illustrate travel books such as the aforementioned one by de Bacler d'Albe (see Fig. 6).

The French maps were the result of surveys on the ground, conducted in the face of open hostility from the population and difficulties in communications. The maps were frequently intercepted which prevented the flow of information—not only cartographic—between the troops in the Peninsula and Paris. The French army produced highly accurate maps which were accompanied by descriptive reports. They also produced military routes, maps of cities and fortifications, and depictions of battles and other war events.

The difficult working conditions and the absence of a complete geodetic network in Spain meant that the maps produced during the Peninsular War did not serve Napoleon's purpose of creating a general map of the Peninsula that could be linked to European cartography. Nevertheless, Chabrier's initiatives of drawing a map at 1:1,000,000 and commencing a series of military maps at 1:100,000 can be considered important.

The large volume of work carried out also did nothave any military use beyond the specific military campaigns, since there was no effective system of reproduction available that would have made it possible to distribute the maps among the army commanders. In fact, it was common to circulate the original maps in Spain in the midst of war, thereby exposing them to damage and loss.

2.2 Spanish Cartography During the War

French cartography had a beneficial effect on the maps produced by Spanish cartographers as it promoted the introduction of the modern cartographic techniques established by the *Commission topographique* of 1802. The result was that Spanish cartographers adopted the use of the decimal metric system, new methods of representing relief, and more or less conventional cartographic symbols, paying special attention to the representation of vegetation and crops. They also began to define the geographical characteristics of the environs of towns and roads with greater accuracy and even included information on the time which was needed to cover certain distances (see Fig. 7).

Meanwhile, despite their known inaccuracies, the maps drawn up by Tomás López were frequently used during the war by the English, French and Spanish armies alike. The fact that even Wellington used them during his campaigns of 1809 and 1814 confirmed their reliability. This fact is supported by the existence of a factitious atlas in the National Library of Spain (Bookmark GMG/858 and GMG/859) which contains 66 printed maps grouped into two volumes. It is known as the Wellington Atlas as it preserves an autograph of the general on the flyleaf and is dated 1810 (see Fig. 8).

Fig. 7 Depósito de la Guerra *Plano de los alrededores de Madrid*. Spanish copy of the French map *Land compris et depuis Somosierra jusq'à Tolède Ocana*, 1809, at a scale of 1:100,000, located in the Service Historique de la Défense in Vincennes, Bookmark: L12B3 343. Three sheets of 161 × 65 cm. (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid. Bookmark: Madrid 144)

Fig. 8 Tomás López Atelier., *Atlas Geográfico de España. Mapa de la provincia de Madrid, comprehende el Partido de Madrid y el de Alonacid de Zorita*, 1810. This map was compiled in 1773. Along the right side appear notes made by a British officer. There is also a red line drawn in pencil indicating one of the routes. Scale 1:230,000. Size 34 × 38.5 cm. (Courtesy of Biblioteca Nacional de España, Madrid. Bookmark: GMG/832)

3 Cartography in the Post-War Period

Despite the large number of maps intercepted in the French post, most of those produced by Napoleon's army were unknown to Spanish cartographers until the 1820s. Nonetheless, the usefulness of these maps was evident in the post-war period both in terms of reproducing them for commercial purposes and of stimulating interest to complete the cartographic projects commenced. The accumustion of unpublished geographical information and cartographic material on the Peninsula was considered to be not only useful, but also profitable.

At the end of the war some French officers such as Bory de Saint-Vincent and Calmet-Beauvoisin who had worked in Spain during the war, proposed to conclude the abandoned work on the general map of Spain and the 1:100,000 map, guided not only by scientific but also by commercial interest. However the "hundred days of Napoleon" which marked the return of Napoleon, delayed these projects, which would not materialise until the decade of 1820s.

Apart from his other commitments Bory de Saint-Vincent wrote a report on the physical geography of the Iberian Peninsula which he included in his *Guide du voyageur en Espagne*. He based his maps on original documents and the experience he had gained during the campaigns, taking particular care to avoid using the symbols employed on the pre-war maps that had caused such confusion when compared with reality. As a scientist, geographer and naturalist, he not only proposed names for the main mountain ranges in the Peninsula which remained in use until the mid-twentieth century, but also developed a concept of the orography which was subsequently followed by Alexandre Laborde, among others.

For his part Marie-Antoine Calmet-Beauvoisin made use of his knowledge and experience in *l'Armée d'Espagne*, and also his ability to access funds from the *Dépôt de la Guerre* to carry out a mapping project that consisted of publishing—by subscription—a new atlas of Spain and Portugal at an approximate scale of 1:200,000 which would include maps of major towns. The publication of the atlas was delayed for various reasons, and the project was finally abandoned in 1830 (Ministerio 2008).

Spurred on by the entry of the "hundred thousand sons of Saint Louis" l'Expédition d'Espagne in 1823, the work began in the military campaigns was continued, although this time with Spanish and French cartographers working together. During this period, Capitaine's map of France at a scale of 1:345,600 was extended southwards, and work was continued on the military route map at a scale of 1:740,000. Fieldwork and visual surveys at a scale of 1:20,000 were also completed, as well as a series of descriptions and statistics which are held in custody by the French Military Archives and the Spanish Ministry of Defence Archives.

The *Map of the Surroundings of Madrid* in forty-eight sheets was produced during this period, and was based on surveys conducted by Joseph Charles Marie Bentabole in 1809, improving its accuracy by means of a new triangulation measurement in June 1823. Although De Castres, the director of the work, was required to return to France before the completion of the map, the work was concluded in November 1824 under the supervision of the staff officers Desjardins and Harmois. They were responsible for representing the topography by means of hachures, a method of relief representation which was already outdated by this time (Castañón et al. 2008) (see Fig. 9).

Once the military offensive was concluded, the first stage of Spanish-French collaboration lasted until 1827. The result was a large number of maps compiled by the French with Spanish support within the framework of a cartographic exchange agreement signed by both States. It allowed the French military access to all the information available in the War Depository in exchange for sending copies of the drafts to Spain.

From 1827 until 1840 the second stage of the work was conducted by teams of Spanish and French cartographers and geodesists who carried out intensive field work. As an example, maps of the environs of Madrid and the Sierra were extended northwards on a scale of 1:50,000 (see Fig. 10).

One of the most important consequences of these agreements and joint campaigns between the two States was undoubtedly that the eminent Spanish cartographer, Francisco Coello, was able to consult French maps of Spain in Paris. This

Fig. 9 Depósito de la Guerra, *Plano de los alrededores de Madrid*, 1823–1824 Spanish manuscript copy of a French map in 48 sheets. In the *upper left* is indicated the "Parque de El Escorial". Sheet 1, onionskin. Approximate scale of 1:13,000. Size 35.1 × 44.8 cm (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid Bookmark: Madrid 137–1 (2))

enabled him to, in 1844, start his *Atlas of Spain and her Overseas Possessions*. His provincial maps (on a scale of 1:200 000), maps of urban environs (1:100,000), and maps of towns (1:10,000–1:20,000) would accompany Pascual Madoz's *Geographical and Statistical Dictionary*. Although Coello's project was never completed, his incorporation together with Madoz and Figuerola into the Statistical Commission led to a decisive change in cadastral work and launched the modern cartography of Spain (Nadal and Urteaga 1990). These works finally enabled completion of the national geodetic network and the national topographic map on a scale of 1:50,000, the origins of which dated back to the middle of the eighteenth century.

4 Conclusions

The fact that the Bourbon dynasty reigned throughout the eighteenth century in both Spain and France, facilitated the Spanish-French collaboration on scientific and cartographic matters. Several Spanish cartographers were trained in Paris. Car-

Fig. 10 Hipólito Obregon, José Coello and Benigno de la Vega, *Plano de Madrid y sus contornos*, 1856. Spanish manuscript map on 9 sheets, each sheet approximately 70 × 79 cm. Scale 1:10,000. Contains details of the buildings, facilities and services of Madrid, as well as detail of the surrounding crops, boundaries, and some data about the accommodation of troops (Courtesy of Archivo Cartográfico y de Estudios Geográficos del Centro Geográfico del Ejército, Ministerio de Defensa, Madrid. Bookmark: Madrid 61(1))

tographic institutions and bodies were created in Spain very soon after similar ones had been founded in France. Spain enacted the corresponding regulations and ordinances of engineers. Scientific instruments were acquired in France and Great Britain, studies were made of their observatories and advances in navigation, and many joint Spanish-French campaigns were initiated.

After a century of collaboration in the fields of cartography, geodesy and astronomy, the training and expertise of professional cartographers was similar on both sides of the Pyrenees. However, the differences observed between maps produced in Spain and those produced in France were due to the fact that scientific and cartographic work received very different levels of political support in the two countries and that French cartographicn projects made more progress than those in Spain.

The distribution of hand-drawn Spanish maps was also very different, as these were rarely printed since they were subject to the requirements of secrecy which had been implemented since the sixteenth century as regards maps of the Spanish Crown's territories.

The importance of the maps which were produced as a result of the collaboration between the two countries is even evident today. Spanish archives hold a large set of maps dating back to the period prior to the Peninsular War, but also of maps drawn both during and after the war. These maps, the majority of which have

remained unpublised, primarily consist of hand drawn maps at different scales, but also includes routes, geodesic work, local and town maps, plans of fortifications, and visual surveys. Maps of the mountain passes in the Central System connecting the capital of Spain with the north comprise one example of this important cartographic heritage.

Lastly, the influence of mutual cooperation between Spanish and French cartographers proved decisive in the development of modern Spanish cartography.

The need to disseminate the available historical cartographic collection on the study area to students and the wider public has led the authors to create a 'digital map library' at the University of Alcalá. The aim of this project, entitled *Ancient Spanish Cartography e-Library*, is to facilitate the access to and study of Spanish cartographic heritage via the Internet (Chias and Abad 2010, 2012b).

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Partisan Cartographers During the Kansas-Missouri Border War, 1854–1861

Karen Severud Cook

Abstract A precursor to the American Civil War erupted in Kansas in 1854 after the U.S. Congress gave homesteaders in the Kansas Territory, newly opened for settlement, the right to vote whether Kansas would be a free or slave-holding state. Conflict between settlers from adjoining slave-holding Missouri and anti-slavery settlers from New England resulted in the guerrilla-style Kansas-Missouri Border War, 1854–1861. At the same time, the Territory was being surveyed and mapped for settlement according to the Public Land Survey System. Surviving documents reveal how political views and cartographic activities mingled in the lives of three surveyors active in Douglas County, the site of both Lecompton, the early pro-slavery capital of Kansas, and Lawrence, the Free-State headquarters. While surveying and mapping the Kansas Territory, Albert Dwight Searl, Isaac Cooper Stuck, and John Brown not only promoted its settlement but also put their lives on the line in opposition to slavery.

1 Introduction and Historical Context

Events leading up to the American Civil War began in Kansas in 1854, 7 years before the Confederates seceded from the Union and made the war official by firing on Fort Sumter in North Carolina. In 1854 the U.S. Congress approved the Kansas-Nebraska Act that gave homesteaders who raced to the Kansas Territory, newly opened for settlement, the right to vote whether Kansas would become a free or slave state. As settlers from the adjoining slave-holding state of Missouri jostled for land with anti-slavery settlers from New England, conflict erupted. During the ensuing period of the Kansas-Missouri Border War from 1854 to 1861, recurring guerrilla warfare earned the nickname "Bleeding Kansas" for the Kansas Territory. The town of Lawrence, Kansas, was founded in 1854 by settlers sponsored by the anti-slavery Emigrant Aid Society in Massachusetts. Situated in Douglas County between the pro-slavery towns of Lecompton (the territorial capital) and Franklin, anti-slavery Lawrence became a lightning rod for the conflict. After several abor-

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tive attempts, a constitution declaring Kansas to be a free state was finally approved by popular vote in 1861. Kansas statehood coincided with the formal outbreak of the Civil War (Goodrich 1998).

In 1854 the newly created Kansas Territory also began to be surveyed and mapped according to the U.S. Public Land Survey System. The outcome would allow settlers' claims and other land transactions to be properly recorded by land agents. Surveyors were contracted by the U.S. government to establish meridians and baselines and lay out township and section lines, a process that lasted from 1854 to 1876 for the Kansas Territory (Grim 1985, p. 178). The government surveyors could not be everywhere at once. They were sometimes preceded by surveyors working for private individuals or for associations promoting settlement. Private surveys had to be reconciled later with the government surveys. The territorial years were also a time of conflict when the likelihood of violent encounters with political opponents, pro- or anti-slavery, inhibited free travel within Kansas. Being engaged in the common activity of land surveying could allay suspicions and sometimes provided a convenient cover for scouting terrain and spying on the activities of the opposition.

The activities of three early surveyors who mapped Douglas County and neighboring areas in Kansas offer insights into the tumultuous environment of territorial Kansas on the threshold of the Civil War. Original field notes and plats form the earliest detailed written and cartographic records of the Kansas landscape, while later cadastral maps and atlases record land ownership and use. Various historians have already drawn upon such records to write about the land surveying and mapping process (Fruehauf 1982, pp. 121–138; Grim 1985, pp. 177–197, 1990, pp. 89–109). Additional primary sources, such as photographs, settlers' manuscript letters and descriptions of events, and early Kansas newspapers, many of them now accessible as digitized collections on the Internet, have amplified the personal stories of the three surveyors. The early Kansas newspapers performed a major community service in collecting and sharing news of local government, politics, business, personal, and social events with their readership. Eye-witness accounts of Territorial Kansas were also plentiful due to the awareness of early Kansas settlers that they were participating in historic events. They wrote about events both at the time and also later in life when memorial gatherings of early settlers or military units prompted them to write down and publish their recollections.

2 Albert Dwight Searl (1831–1902)

Albert Dwight Searl, the first of the three surveyors, reached the Lawrence town site on September 9, 1854. He had traveled with the second group of settlers sent to Kansas by the Emigrant Aid Society, an anti-slavery organization founded by Eli Thayer, Amos Lawrence, and other Massachusetts business men to promote the development of Kansas into a free state (Andreas History 1883, pp. 308–313). Searl had graduated in 1852 from Williston Seminary (which survives as a college

preparatory school) in Easthampton, Massachusetts, a mill town. Samuel Williston, an industrialist, had founded the Seminary in 1841 to increase local educational opportunities. Searl had studied civil engineering in the Seminary's scientific curriculum rather than the alternate classical academic curriculum (Williston 2013–2014).

The Emigrant Aid Society's first party had arrived at the Lawrence town site just over a month earlier on August 1, 1854. Lacking a qualified surveyor, they had laid out their land claims roughly. As one of the settlers, B.R. Knapp, described, "After pacing off a half mile square, we drive down a stake at each of the four corners; on one of the stakes we write: 'I claim 160 acres of the lands within the aforesaid bounds, from the date of claim.' This is then copied and taken to the register and recorded" (Andreas History 1883, pp. 312). The arrival of a qualified surveyor with the second group of settlers led to the decision to pool all the claims already staked and begin again, "Then after reserving a city plot two and one half miles on the [Kansas] river, and one and one half miles from the river south, to proceed on the arrival of the second party to survey farm lots in number equal to the claimants in both parties" (Andreas History 1883, p. 313). Searl, who was soon appointed City Surveyor, began to lay out the Lawrence town site on September 25, 1854. Searl "established the meridian line … by setting a row of lights up and down Massachusetts Street in the evening and running a line by the North Star" (Savage 1870, p. 1). W.L Brigdon, an early settler who assisted Searl, recollected later that the tall prairie "grass wore out their pants to the knees till they had to cover them with flour sacks for protection" (Anon 1869, p. 3). This was not the only problem encountered. In October 1854 Searl was accosted by a band of pro-slavery men who pulled up his survey stakes, tore down a tent, and made threats. Soon after a gathering of 50 Free-State men issued warnings in response, and surveying the town site continued (Anon 1879, p. 553). In January 1855 copies of Searl's map of Lawrence, drawn at the scale of 450 feet to 1 inch, arrived from the lithographer, L.D. Bradford & Co. of Boston (Anon 1855a, p. 2) (see Fig. 1). The layout of old Lawrence remains much the same today, although the four parks near the town center were later consolidated to allow more room for house lots. By 1858 a lithographically printed bird's eye view shows the buildings of Lawrence spreading across the grid of streets laid out by Searl (Anon 1858).

Searl was also employed to survey other town sites. At the beginning of January 1855 he was busy laying out the city of Topeka, now the state capital (Brougham 1855, p. 1). His plan of the town of Osawatomie, surveyed in February 1855, was received from the Boston lithographer in October 1855 (Anon 1855b, p. 2). His other city plans included Palmyra and Prairie City near Osawatomie, both surveyed in February 1857 (Searl 1857a, p. 2, b). Like the Osawatomie plan, they include inset location maps, probably intended to orient prospective settlers.

The author of a newspaper article praising the Osawatomie map wrote that, "Mr. Searl, from his long residence in the Territory, and his general acquaintance with every part of it, seems to us well qualified for getting up a complete map of Kansas, and we hope he well [sic] be induced to prepare one immediately after the completion of the surveys" (Anon 1855b, p. 2). Soon the Territorial Legislature decided to employ Searl to make a map of Kansas (Anon 1856a, p. 2). Searl undertook the

Fig. 1 A.D. Searl's plan of Lawrence City, Kanzas [sic] Territory, lithographed in Boston by L.D. Bradford & Co. in 1855. (Courtesy of Kansas Historical Society, Topeka)

map project with a partner, Edmund Burke Whitman, an 1838 graduate from Harvard University who had joined the anti-slavery contingent in Lawrence in 1855 (Anon 1860–1869). They spent a year traveling about the Kansas Territory collecting information and compiling a map of Eastern Kansas, the part of the Territory that had so far been settled. In April 1856 the unpublished manuscript was shown to the editor of the Kansas Herald of Freedom, who praised its inclusion of, "carefully indicated", all rivers and creeks, with their names, main-travelled roads to the various sections, post offices, towns, trading posts, forts, mission stations, Indian reserves, noted mounds, guide meridians, base and township lines (Anon 1856b, p. 2). At that time the plan was to embellish the map with views of Constitution Hall in Topeka, the town of Lawrence, and the Free State Hotel or Eldridge House, the headquarters of the Free State movement. However, on May 21 before the map had

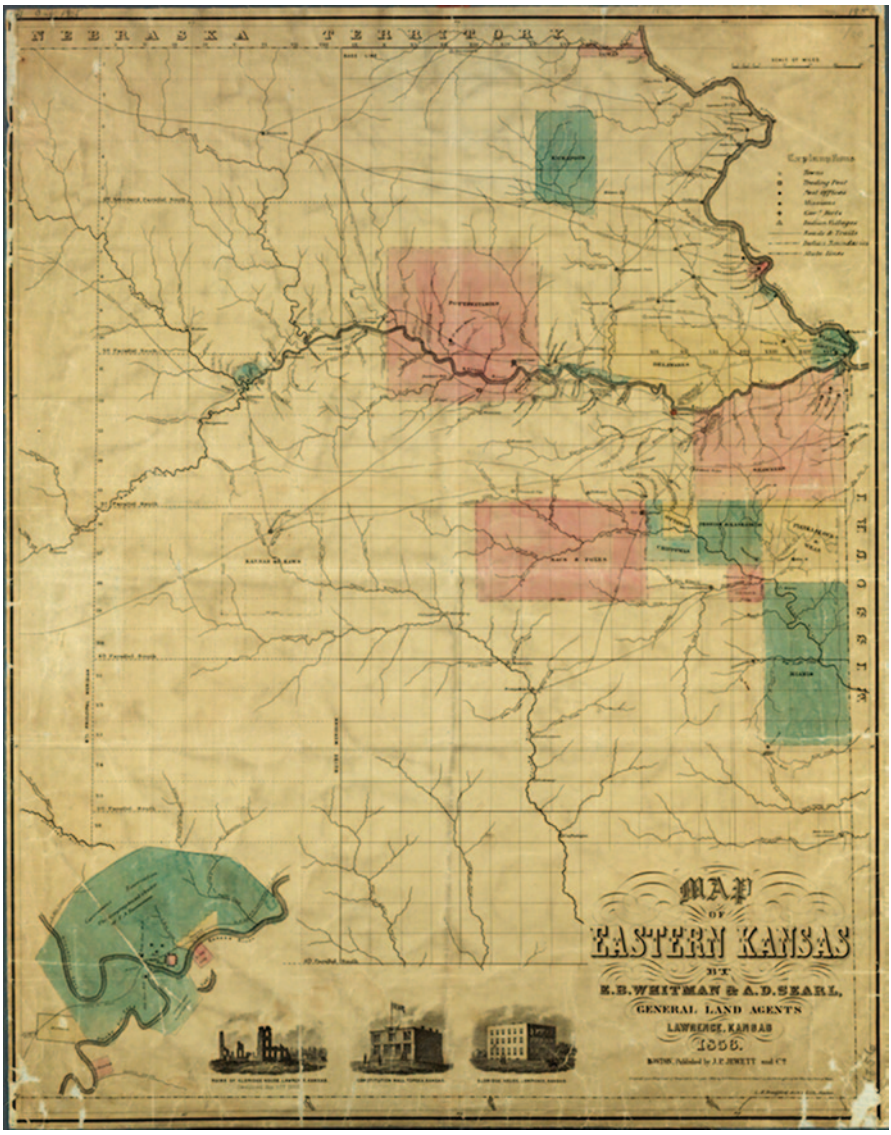

Fig. 2 E.B. Winchell & A.D. Searl's Map of Eastern Kansas lithographed in Boston by J.P. Jewett and Co., 1856. (Courtesy of the Kansas Historical Society, Topeka)

been published, pro-slavery raiders attacked Lawrence and burned down the hotel. The map commemorates the disaster by showing two views of the Eldridge Hotel, the new building completed in April and the ruins burned on May 21 (see Fig. 2).

Along with numerous other buildings, Searl's office on Massachusetts Street, the main street of Lawrence, was raided and ransacked. Searl testified that: "… I had among my papers notes of surveys of different parts of the Territory, some had

been sent to me, and some I got by travelling about the country; I think there was a description of 30 or 40 localities; these localities were not connected, except by estimated distances, got for the purpose of making a map of the Territory, they were worth $100; I also had notes of the surveys of Lawrence and Topeka, worth $10; … and 100 or 150 deeds for lots in the town of Lawrence were mostly destroyed; I held them as collateral security for fees for laying off the town site of Lawrence, there was $4 due on most of the deeds, on some $11; the total damage from loss of deeds was $50 … The transit instrument was injured, the axis of the telescope was bent, and the screw that secures the axis to the upright pieces that support the telescope was broken and rendered the instrument unfit for use; the transit cost … $200 … it has never been a good instrument since; part of three cases of drawing instruments were taken away; the boxes cost about $10 each on average; the instruments left were worth $5 or $10; drawing materials destroyed was worth $15 or $20 … The door of the office was broken open, some window lights broken, two chairs injured; the drawing table besmeared with whisky and sugar, and the house dirtied up by oyster cans, &c." (US Congress 1861, pp. 867–868). A witness, George F. Earle, who had "occasionally worked for Mr. Searl in making surveys, and was frequently in his office" added that Searl "was well dressed before the said robbery, and looked seedy afterwards. His papers, consisting of deeds of town-lots, notes of surveys, notes and letters, drafts of different localities, obtained for the purpose of making a map of the Territory, appeared to have been thrown on the floor, assorted over, and examined. An oyster supper had been eaten in the office, and the papers had been dirtied and defaced, and nearly ruined" (Committee 1861, p. 866).

An interesting outcome of Whitman and Searl's Kansas map project was the opening of their Emigrant's Intelligence Office in Lawrence in May 1856 (Whitman and Searl 1856a, p. 3). The need they sought to fill is exemplified by a March 1856 letter from Hiram Hill, who wanted to know if Indian-held land in Kansas had yet been released for sale (Hill 1856). By setting up as general land agents Whitman & Searl offered to share the information they had gathered about Kansas and the contacts they had made to help new settlers locate suitable land. Searl had laid out the city of Lawrence and was "the only person who can trace back all the lots to their original holders, and show the valid titles," while Burke was "superintending the erection of the new church, and is making it the best and most substantial building that has been put up in the place" (Whitman and Searl 1856b). They advertised that they were "prepared to lay out town sites and to survey farm claims,—to negotiate the sale and transfer of town property generally,—to investigate the validity of titles,—to superintend the erection of buildings, and to act as Agents for the care of property owned by non-residents" (Whitman and Searl 1856c). They also circulated a public letter around Kansas with questions about natural resources, agriculture, industries, employment, transportation, schools, religion, politics, and the existing population. By responding with current information about their localities Kansans could help to recruit more settlers (Whitman and Searl 1856b). The sources so far discovered do not indicate whether the Emigrant's Intelligence Office prospered. Burke left Kansas in 1858, most notably serving as Superintendent of National Cemeteries after the Civil War, and spent his last years in Cambridge, Massachusetts (Anon 1860–1869).

Searl and his family remained in Lawrence. At the beginning of the Wakarusa War in November 1855 Searl had joined the Free State army's Kansas Rifles No. 1. Searl and most other members happened to be short in stature, and he must have had a good sense of humor. He proposed renaming the Kansas Rifles as the Stubbs because, as he said, "Stumpies were in the majority," and the motion passed (Caldwell 1937, pp. 124–125). The Stubbs saw much action during 1856 (Caldwell 1937, pp. 130–131). Searl was twice captured by pro-slavery forces and narrowly escaped hanging (Anon 1879, p. 553). In 1861 Searl joined the 8th Kansas Volunteers of the Union Army as a private but was soon promoted to 2nd and then 1st lieutenant (Anon 1879, p. 554). During the last years of the war, Searl transferred to the 9th Kansas Cavalry and mustered out as a captain just before the war ended in 1865 (Anon 1879, p. 554).

Although Searl still did some land surveying and was elected City Surveyor again in 1873, he shifted his focus toward railroad engineering. From 1865 to 1871 he was frequently away supervising the planning and construction of a railroad line from Pleasant Hill in northern Missouri to Lawrence (Anon 1865c, 1871b). The line, intended as a shortcut bypassing Kansas City, was completed but failed to attract the anticipated traffic (Quastler 1995).

In 1868 Searl and William Fletcher Goodhue, a younger civil engineer also employed in Kansas railroad construction, undertook to compile a new and more detailed map of Lawrence. On June 28, 1868 an article in the Daily Kansas Tribune in Lawrence reported on the plan. The printed map was to be 4'4" × 5'10" "covering 3 miles square, or 9 miles of the country in and about Lawrence." The margins were to include 25–30 representations of public buildings, businesses, and the better class of private dwellings. Each map would be backed with cloth, handsomely finished, varnished and mounted (Anon 1868a, p. 3). Holland Wheeler, then Lawrence City Surveyor, saw and approved a pre-publication copy of the map. Goodhue was supposed to oversee the lithographing, but errors in the numbering of city lots crept in somehow. The initial plan was to have the map printed in St. Louis but apparently that was changed to a printer in Chicago. Proofs and corrections were sent back and forth, but significant errors remained (Anon 1870b, p. 3). In the end, Searl refused to accept the defective copies sent to Lawrence by the printer in August 1870, and they were turned over to a local bookseller (Anon 1871a, p. 2). Attempts to use the map as the basis for land transactions attracted severe criticism of its errors (Anon 1870a, p. 3). Wheeler, Searl, and Goodhue responded in print, defending their work and laying the blame on the lithographic printing establishment (Anon 1870b, p. 3). So far a surviving copy of this map has not been located.

With a wife and two children to support, Searl must have welcomed additional income. In 1866 he invested in a billiard parlor and saloon (Anon 1866, p. 3). His partner, Almerin Tryon Winchell, had formerly been the proprietor of the Eldridge House Saloon. Their business was still advertising in 1871 but had been given up by 1875 (Anon 1875, p. 3).

Meanwhile, during 1874–1875, Searl was away engineering the Scioto Valley railroad in Ohio (Anon 1876, p. 4). By 1877 he had shifted his engineering activities to Colorado, where he surveyed the Denver and Rio Grande Railroad (Sparr 1877,

p. 2). He also became involved in mining ventures in Ouray, Eureka, and Leadville (Anon 1880, p. 2, 1881a, p. 4). In 1878 a visitor from Lawrence to Colorado wrote, "I saw that indefatigable A.D. Searl … Searl and his lop-eared pony have traveled nearly 1000 miles since he came out. … He looks as tough as rubber" (Learned 1878, p. 3). Searl's choice of mount may have given him his nickname, Pony Searl (Anon 1881a, p. 4).

Searl's family remained in Lawrence, and he visited as often as he could. In the evening of July 7, 1881, for example, a large group of Lawrence friends surprised Searl with a party to celebrate his 50th birthday (Anon 1881b, p. 4). By then his children were grown, and in 1883 his daughter was married in Lawrence (Anon 1883, p. 4). By 1890 the elder Searls were living in Leadville, Colorado along with their children and grandchildren (Searl 1890, p. 4). Searl died there in 1902 but chose to be buried in Lawrence's historic Oak Hill Cemetery, where his wife followed him in 1914 (Anon 1914, p. 4). The final revelation about Searl in the published account of his funeral was that, as an agnostic, he had insisted on a military non-religious burial (Anon 1902a, p. 2, b, p. 6).

3 Isaac Cooper Stuck (1829–1889)

The second of the three mapmakers to reach Kansas was Isaac Cooper Stuck. Born in 1829 to Ferdinand Fairfax and Jane Cooper Stuck of Loudon, Virginia, he was named after his maternal grandfather, who had been a picture framer and gilder in Washington, D.C. (Stuck—Family (2013–2014). From 1842 to 1847 he studied civil engineering in Washington (Gregg 1874, p. 86). He began work as a canal engineer on the Chesapeake and Ohio Canal in 1848, moving on to the North River Canal in 1851. In 1852 he shifted to railroad engineering for the Morris & Essex Railroad in New Jersey (86). Later in 1852 he worked for the Iron Mountain Railroad Company, first as a draftsman and later on the construction of the railroad line, before returning to Washington. After that he changed careers again, taking up land surveying and mapping for the federal government.

Stuck was hired by contract as a Deputy U.S. Surveyor. In April 1855 he arrived in Kansas where he would have been responsible for hiring his own surveying crew of surveyors, chainmen, flagmen, and axemen (Grim 1985, p. 178). Stuck and his party began surveying the Township Lines and subdivisions in Richardson County, Nebraska, that October (Norris 1958, p. 5). Payment was by mileage: $12 for standard lines, $7 for township exterior lines, and $5 for section lines (Secretary of the Interior 1860, p. 319). Stuck continued surveying in Kansas and Nebraska until 1860 (Gregg 1874, p. 86). It is possible to trace the extent of his activity by the amounts he was paid. For example, in 1857 he received $1100 for surveying in Kansas (US Secretary of State 1857, p. 83). This may have included payment for surveying 24 plats of lands reserved for Indian landowners, when other lands included within the boundaries of the Shawnee Indian reservation of 1854 in Johnson County, Kansas, and surrounding counties were being made available to settlers (Stuck 1857) (see Fig. 3).

Fig. 3 Detail showing road eastward from Lawrence to Westport (near Kansas City) from plat drawn in 1857 by I.C. Stuck of Township 13, Range 21 South, 6th Principal Meridian East in the Kansas Territory. (Courtesy of Kansas Historical Society, Topeka)

It was also in 1857 that Stuck compiled a land ownership map of Douglas County, based on information from the Surveyor General's Office. It was lithographed and printed in St. Louis, Missouri by L. Gast & Bro. It was sold by John Halsall & Co., 120 Main St. in St. Louis (see Fig. 4).

In 1858–1859 Stuck surveyed 680 miles of section lines and was paid $244.25, as well as $94.50 for surveying meander lines (US Secretary of the Interior 1860, p. 319). In 1860 he took up farming and received only $3.41 for surveying (US Secretary of the Treasury 1861, p. 188). The Census of 1860 lists the 29-year-old J. [i.e. I] C. Stuck residing in Monticello Township in Johnson County, Kansas as a farmer. He owned land valued at $800 and personal assets at $1500 (US Census 1860, p. 350). By 1864 he was married to Sarah (Sally) E. with a son, Steamer (Kansas State Census 1865, p. 38).

The Civil War had begun, and in March 1864 he asked to be appointed an officer in the Regiment of African Soldiers. His petition mentions his experience as a civil engineer. It also says that he is a captain in the state militia and has seen active service on the border (Stuck 1864). His obituary provides the information that he was Captain of Co. C, 13th Kansas State Militia and saw active service on the western border of Missouri but says nothing about later military service.

In April 1864 the local newspaper, the *Olathe Mirror*, notes with amused affection the arrival in town of "our long tried and worthy citizen, I.C. Stuck—an original genus, all by himself.—He was smoking—as usual—his corncob pipe"

Fig. 4 I.C. Stuck's land ownership Map of Douglas County, Kansas Territory printed in 1857 by L. Gast & Bro and sold by John Halsall & Co., both of St. Louis, Missouri. (Courtesy of the Kansas Historical Society, Topeka)

(Anon 1864, p. 3). By 1865 the Kansas State Census records Stuck's occupation as County Surveyor, but with real estate valued at $7320 and with personal assets of $400 (Kansas State Census 1865, p. 38). In 1865 he attended several meetings about plans to build railroads in Kansas (Anon 1865a, p. 2, b, p. 2). Johnson County paid him $50 in 1865 for making a map of Indian lands and $60 in 1866 for making a map of county roads (Henderson 1865, p. 3, 1867, p. 2). In June 1866 he was still living near Olathe, where he served as Chairman of the committee organizing the local Fourth of July celebration (Wines 1866, p. 3).

However, he sold the farm in 1866 and went to New Mexico to survey public lands for the government (Gregg 1874, p. 86). In 1867 the Surveyor General's Office paid him a total of $9327.18 for surveying correction lines, section boundar-

ies, and section subdivision lines and for drafting maps (US General Land Office 1867, pp. 304–305). In 1868 he received $5511.52 for the same range of work (US Secretary of the Interior 1868, pp. 372–373). He must have worked in New Mexico only during the first half of 1868, because the *Olathe Mirror* welcomed him back on June, 1868, again with a touch of humor: "Stuck, the admirable Stuck, stuck-in-the-mud—stuck as tight as a brick, stuck generally—no, we mean that I.C. Stuck, Esq., late of New Mexico, Maryland and Washington, has arrived in town. We congratulate him on his safe return. Roy and Steamer [his sons] are both with him" (Anon 1868a, p. 3). In 1869 Stuck was elected and served as County Surveyor of Johnson County, Kansas, but he turned to full-time farming after several years.

This time he settled on a farm southwest of Olathe. The 1870 Census of Agriculture for Olathe Township recorded that he owned 90 acres of improved land and 70 acres of unimproved land. The cash value of his farm was $6000 plus farming implements and machinery worth $200. He paid hired help $400 wages and board that year. He owned 9 horses, 2 milk cows, 6 pigs for a total value of $450. He produced 120 bushels of wheat, 1200 bushels of corn, and 250 bushels of oats (US Census of Agriculture 1870a, p. 3). His family has grown, too, to three children. According to the 1870 U.S. Census, he employed a female domestic servant, as well as a hired man (US Census of Population 1870b, p. 603). During 1872 he was paid for surveying and platting roads and the poor farm, but his obituary says that he quit surveying in 1873 (Gregg 1874, p. 86). During the mid-1870s a 4th child was born, and his first wife died.

The Olathe newspaper is silent about Stuck's activities from the mid-1870s until the 1880s. Then the newspaper reports his participation in civic activities and with his new wife (he had married Ella (Elvira) D. Pitts in 1880) in various social activities (Anon 1886, p. 3). Two children were born to them. In 1886 Stuck went to Wyandotte and worked as a draftsman in the office of the Wyandotte & Western Railroad. During that time he was also elected President of the Engineers Union of Kansas City. His health began to fail in the summer of 1887, and he returned home to the farm near Olathe. In the spring of 1888 Stuck suffered a paralytic stroke. He had recovered enough by mid-summer, aided by a recuperative visit to the baths in Hot Springs, Arkansas, to get around without a cane. In September 1888, however, Stuck had a second stroke while visiting a friend, and passed away (Anon 1888a, p. 7, 1888b, p. 2).

4 John Brown (1800–1859)

At the age of 55, John Brown was much older than either Searl or Stuck when he came to Kansas, joining his sons in Osawatomie in October 1855 (Connelley 1971, pp. 123–124). Recently trained as civil engineers, still unmarried, and newly launched in their careers, Searl and Stuck were a generation behind Brown. By then Brown had been married twice and had sons older than they were. He had tried various business ventures, including surveying, with mixed success. Born in Connecti-

cut but raised in Hudson, Ohio, where his father farmed and ran a tannery, Brown had learned those trades, as well as a hatred of slavery from his devout father (Connelley 1971, pp. 80–86). After an abortive attempt at higher education in Massachusetts and Connecticut, Brown returned to Ohio, married, opened his own tannery, raised cattle, and undertook some surveying jobs (Connelley 1971, pp. 87–88). As a teenager in Ohio he had taught himself surveying using a copy of the standard manual, *Flint's Survey* (Sanborn 1891, p. 32). He involved his sons in surveying, too. When surveying land near Columbus, Ohio for Chauncy Harris in 1838, Brown employed his eldest son, John Brown, Jr., as chainman (Brown 1838). Brown was often on the move, spending time in Ohio, Pennsylvania, Massachusetts, Virginia, and New York, although with little financial success in his business ventures. For example, Brown's hopes were raised in 1840 by the prospect of surveying, settling on, and becoming sales agent for land on the Ohio-West Virginia border that had been donated to support the recently founded Oberlin Institute (now Oberlin College). He made an initial visit to scout the land in question, recording his expenses and field notes in a pocket memorandum book (now in Boston Public Library). His hopes were dashed, though, when Oberlin's administrators, entangled in financial difficulties, decided instead to offer the land to a creditor in settlement of a large debt (Du Bois 2007, pp. 18–19).

Over time Brown became increasingly active as an abolitionist organizer, receiving donations that helped to fund his travel for the cause. He raised his children to oppose slavery, too. After the Kansas Territory was opened for settlement in 1854, Brown's half sister, Florella, and her husband, Samuel Adair, a Congregational minister, had settled in Osawatomie, Kansas. In 1855 five of John Brown's sons followed them there, established claims and began farming, hopeful of a better life for their families (Abels 1971, pp. 39–40). On June 22, 1855 John Brown, Jr. wrote his father a glowing letter, including a hand drawn map of their claims and the surrounding area. There is a blank square for the town site of Osawatomie (that Searl would survey in 1857) (Brown Jr. 1855b) (see Fig. 5). Soon, however, Brown's sons and their families were beset by illness and the growing threat of attacks by proslavery neighbors and by raiders from Missouri. John Brown rushed to their aid, taking with him a wagon full of firearms and ammunition and swords given to him by an Ohio neighbor and supporter, General Lucius Bierce (Brown 1855a; Morris 1995, p. 17; Villard 1910, pp. 82–87).

After Brown arrived in Kansas, he took on surveying jobs with his sons in the Anderson, Linn and Bourbon counties. John Reader, an early settler, recalled being asked by Brown for directions to a camp of Free State men located on Pony Creek in Brown County on Aug. 3, 1856 (see Fig. 6). Brown also worked with Simon McGrew, a trained surveyor who had settled near Mound City, Kansas. Equally opposed to slavery, McGrew, who carried a pair of Colts Navy revolvers, was nicknamed "The Fighting Quaker". It was said that Brown used his surveying activities as a ruse when spying on the pro-slavery opposition (Connelley 1971, pp. 196–1971; Kansas Historical Society 2014; Villard 1910, p. 83, 93, 133, 137).

Brown and his sons joined the Free State militia (Hanway 1959, p. 6). Brown attended Free State meetings and was given responsibilities within the organization

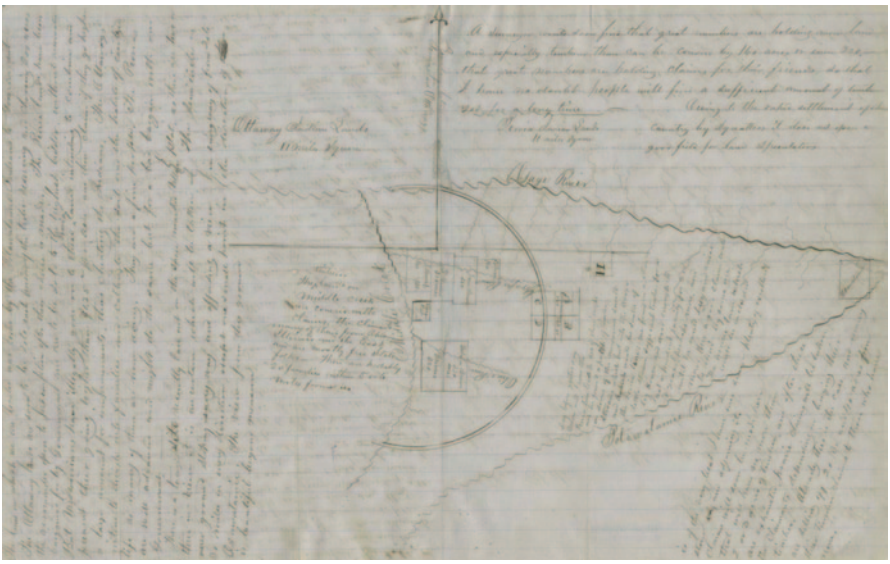

Fig. 5 Sketch map by John Brown, Jr. of Brown family land near Osawatomie, Kansas Territory in a letter to John Brown, dated June 22, 1855. (Courtesy of Kansas Historical Society, Topeka)

Fig. 6 SJ Reader's 1906 painting depicts his meeting with John Brown and son, shown with surveying equipment on their wagon, on August 3, 1856. (Courtesy of Kansas Historical Society, Topeka)

(Villard 1910, p. 91). Brown was outraged by the pro-slavery attack on Lawrence on 21 May 1856 and the failure of the antislavery partisans to respond in kind (Villard 1910, p. 138). On May 24 Brown and his sons attacked and killed five pro-slavery settlers living near Pottawatomie Creek (Hanway 1856). In retaliation Missourians led by Captain Henry Pate captured two of Brown's sons and destroyed their homestead (Connelley 1971, p. 257). On June 2 John Brown and 29 men defended Palmyra, Kansas, a Free State settlement, against an attack by Pate's force. Brown released Pate, who promised to free Brown's 2 sons, but their release was delayed until September. On August 30, a company of 300 Missourians killed another of Brown's sons and a neighbor (Connelley 1971, pp. 295–296). Brown and his men used guerrilla warfare tactics to kill at least 20 of the raiders and wound about 40 more, but the odds were overwhelming, and Osawatomie was sacked (Connelley 1971, p. 297). Still, Brown's bravery and shrewd tactics made him an abolitionist hero. When about 2700 pro-slavery Missourians descended on Lawrence on September 7, another battle seemed inevitable, but the new governor of Kansas, John W. Geary, ordered both sides to disarm (Connelley 1971, p. 299). Brown and three of his sons soon left Kansas (Connelley 1971, pp. 307–308).

5 Conclusion

Surveying and mapping activities and support of the anti-slavery cause blended in the lives of all three men, although in each case the balance was different. Their surveying and mapping work for federal and local governments and private enterprise was not their sole livelihood. It was combined with other ventures, including farmer, tanner, wool merchant, saloon proprietor, land agent, mining investor, abolitionist organizer, and soldier. Although they were devoted to their families, work and war took them away from home for long periods of time. All three put their lives on the line for the anti-slavery cause during the Civil War and its prelude in Kansas. Searl and Stuck survived the war and led successful lives. Brown attacked Harper's Ferry in October 1859, was captured and later executed. Still controversial today, he is regarded as either the worst villain or the greatest hero of the conflict.

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Mapping for Empire: British Military Mapping in South Africa, 1806–1914

Elri Liebenberg

Abstract This paper discusses British military mapping in South Africa by initially reviewing the early military cartography based on existing Dutch maps, and the cartography resulting from the shift of the centre of military gravity from Cape Town to the Eastern Frontier. Attention is subsequently given to the cartography which emanated from the various "small wars" or skirmishes which took place in the Orange Free State (1848), Basutoland (1868), Sekhukhuniland (1868), Zululand (1879), Bechuanaland (1885), and the Transvaal (1880–1881) during the half a century it took Britain to decide whether it wanted to be a permanent player in southern Africa. The British Army's response to the challenge to provide in the huge demand for maps created by the Boer War (1899–1902) is dealt with in some detail and, to conclude, the change in the mapping policy of the War Office towards Britain's colonies after the War is discussed with reference to the level of mapping in southern Africa south of the Limpopo by 1914.

1 Introduction

When Britain occupied the Cape in 1795 and permanently took possession of it in 1806, it was not because of its economic importance, but because of its strategic location as the "Gibralter of the South" guarding the seaway to India. The latter was seen as the "jewel in the British crown" which should be protected from especially France who was Britain's main enemy at that time. The primary role of the Cape garrison was to defend the colony's ports against a maritime attack, while that of the resident Royal Engineers was to provide the necessary maps and plans needed for such a venture. This situation changed with the expansion of the colonial frontier towards the east and the north of the country, and by the end of the nineteenth century the retention of the Cape had drawn Britain increasingly into the affairs of the interior (Fig. 1).

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Fig. 1 British possessions in southern Africa, 1885 (Scottish Geographical Magazine 1886)

2 Early Military Mapping of the Cape

In 1795 a small detachment of artificers under the command of Captain George Bridges, RE, arrived in the Cape to carry out fortifications and coastal surveys and to compile such plans and maps as were necessary for the defense of the settlement. In 1806 Bridges was succeeded by Captain James Carmichael Smyth, RE, an able engineer and administrator who also acted as colonial secretary. Smyth is especially known for the large 1805 map of the Cape Colony[1] dedicated to him by Aaron Arrowsmith in acknowledgement for the topographical information on the interior of the colony he had passed on to the London cartographer. When Smyth left the Cape in 1808, he was succeeded by Captain Henry Smart as commanding officer of the Royal Engineers' Office.

Although the interior of the Cape Colony was by 1795 still unknown, the coastline and the Cape peninsula had been adequately mapped under the supervision of

[1] Arrowsmith, A (1805) *To Captain Carmichael Smyth of the Corps of Royal Engineers..., this Chart of the Cape of Good Hope is inscribed by his obedient and most humble servant, A. Arrowsmith*. London: A. Arrowsmith. 4 sheets, each 71 x 61 cm.

the Dutch Governor Jacob van de Graaff who served at the Cape from 1785 until 1791. Van de Graaff was an expert in the field of military fortifications and was ordered to the Cape with the express instruction to improve the military defense systems. He implemented extensive new cartographic projects which resulted in a large collection of maps and plans. To prevent these from falling into the hands of the English, he took many maps, charts and plans with him when he left South Africa for Holland in 1791 (Koeman 1952, 1988). Following the British take-over in 1806, copies of some Dutch manuscript maps of the South African coast must have still been available at the Cape after he had left as a number of important maps were adapted, improved and translated into English by Captain Bridges and his successors[2] (see Fig. 2).

Having access to coastal maps compiled under Dutch rule, Carmichael Smyth and his successor Henry Smart initiated only a few surveys of the area around Cape Town. That no systematic mapping was undertaken, is verified by the fact that Smart was at times the sole Royal Engineer in office. In 1812–1813 this situation changed when the Cape Regiment was ordered to the eastern Cape to protect the frontier farmers against attacks by the Xhosa who repeatedly crossed the Fish River which was at that time the eastern boundary of the Colony. It was clear that the political situation on the Eastern Frontier would henceforth justify a military presence and with it, some military cartography.

3 A Trigonometrical Survey

With the development of stock-farming during the eighteenth century, frontier farmers of the northeastern part of the Cape Colony kept pushing the frontier further northwards towards the Orange River. Boundary lines were uncertain and in the absence of reliable maps the government at the Cape found it almost impossible to exercise any jurisdiction with regard to land claims, to ascertain whether crimes were committed inside or outside the Colony, or to decide whether a particular frontier farmer had the right to claim protection from the colonial government.

In an effort to alleviate some of these problems, the Governor, Lord Charles Somerset, in 1819 commissioned the officer in charge of the Royal Engineers' Office, Captain William Cuthbert Holloway, to supervise a general trigonometrical survey of the Cape Colony in order to "lay the foundation of a map of this colony".[3]

[2] Examples are (a) British National Archives (hereafter BNA), MPHH 522. Cape of Good Hope. MS map of Cape Peninsula, signed by G. Bridges, Capt. RE, 1899. Also in Barrow, J. 1801; (b) BNA, MPH 697. MS Coast of Africa from Table Bay at the Cape of Good Hope to Saldanha Bay. Size 71 x 26 cm; (c) BNA, MR 1293. MS Plan of the Southern Coast of Africa between St Helena and Algoa Bays. Signed by Henry Smart, Capt RE, 1815. Size 148 x 81 cm; (d) BNA, MR 457. MS Plan of the Town and Fortifications at the Cape of Good Hope. Signed by G. Bridges, Capt RE, 1798. Size 86 x 82 cm.

[3] Cape Archival Repository (hereafter CAR), CO 165, "Extracts of a Dispatch….", Donkin to Bathurst, 15 June 1821.

Fig. 2 **a** and **b** Plan of the town and fortifications at the Cape of Good Hope (see note 2). *Top:* Original Dutch plan of 1779 (Dutch Archives, 4JSF 43). *Below:* A copy dated 1789 held by the British Archives (BNA, MR457)

In 1921 the acting governor, Sir Rufane Donkin, managed to persuade the British Treasury to pledge an annual amount of £300 to pay for the survey. Work on the project started in August 1819 in the eastern and northeastern districts but had to be abandoned in 1825 when the British Board of Ordnance voted against the annual expenditure.[4] By that time approximately 10,000 of the estimated 120,000 square miles of the Colony had been covered by the fieldwork, reduced and drawn to a scale of 4 miles to an inch.

One of the maps which was compiled as part of Holloway's survey, is the "Map of the North-Eastern frontier of the Cape of Good Hope" which was executed in seven sheets or "sketches" by Captain John Bonamy of the sixth Regiment of Foot.[5] That Bonamy's surveys and mapping were held in high regard by his peers, is evident from the fact that his "sketches" were in 1843 amalgamated into an impressive "Plan of the North Eastern Frontier of the Cape of Good Hope" by Lieutenant WFD Jervois, RE [6] (see Fig. 3). Although none of the sketches by Bonamy and his col-

Fig. 3 Detail showing the area around Graaff-Reinet from the MS map compiled by Captain WFD Jervois, 1843. (CAR, M3/88)

[4] CAR, GH 1/56, General Despatches: Hill to Officer Commanding at the Cape of Good Hope, 30 June 1826, no. 801, p. 63.

[5] CAR, M2/133 (sketch no 1), M2/134 (sketch no 2), M3/90 (sketch no 3), M2/135 (sketch no 6); Garson 1992. *Versatile Genius, The Royal Engineers and their maps*. Johannesburg: Library of the University of the Witwatersrand. See Map 4 (sketch no 4) and Map 3 (sketch no 7).

[6] CAR, M3/88. MS Plan of the North Eastern Frontier of the Cape of Good Hope.

leagues were published, and although the Surveyor-General of the Cape subsequently found the overall quality of Holloway's survey suspect,[7] its results nevertheless found their way into ensuing maps of the Cape Colony.

4 The Eastern Frontier

The Eastern Cape Frontier played an important role in South African history as it constituted, for many years, the primary contact zone between white colonists and black indigenous tribes in the country. As frontier farmers seeking hunting and grazing land for their cattle moved eastwards during the eighteenth century, the Southern Nguni (Xhosa-speaking people) moved westwards, seeking the same. It was primarily a struggle for land and between 1779 and 1879 nine frontier wars were fought between white frontiersmen and Xhosas over who owned what. Successive Cape governments attempted to limit the interaction between the two factions, but war and bloodshed could not be avoided. After 100 years of violence, the ultimate result was that the Frontier moved further eastward and that the Xhosa lost the greater part of their land (Bergh and Visagie 1985).

The Cape government was initially reluctant to be drawn into the skirmishes between the colonists and the Xhosa, but soon realised that the situation required a permanent military presence on the Frontier and that the defences of the area had to be reinforced by building military posts or forts. It was especially the latter which in 1818 required the strengthening of the number of military engineers available and led to the arrival of five additional Royal Engineer officers together with some sappers and miners under the command of Major William Cuthbert Holloway, RE.

From 1835 to 1866 numerous fortifications were constructed and maintained in the area between the Kei and the Keiskamma Rivers (Webb 1998). Apart from fortified camps which were built during the wars and which were of short-term duration, some thirty forts were erected and large numbers of British troops were stationed at the various forts and in military camps at Grahamstown, King Williams Town, and Fort Beaufort. From 1839 onwards the Royal Engineer Department had a branch office with its own commanding officer in Grahamstown, the members of which provided services in the fields of building, engineering, surveying and mapping. The maps which were compiled were mostly manuscript maps done in a piecemeal way to cover areas where military operations took place.

The military history of the Eastern Frontier zone is complicated and to provide even an abbreviated account of what happened during the 100 years of conflict, falls outside the scope of this paper. What is important, is that the topographical information which was collected and recorded by the members of the Royal Engineer Department in maps, plans and sketches was not merely confined to official military reports, but also found its way into the work of other mapmakers of the day. Two important maps which owe their existence to this type of information are the 1848

[7] CAR, CO 403, Michell to Bell, 6 December 1832. Enclosure to Despatch no. 32 of 20 Dec 1832.

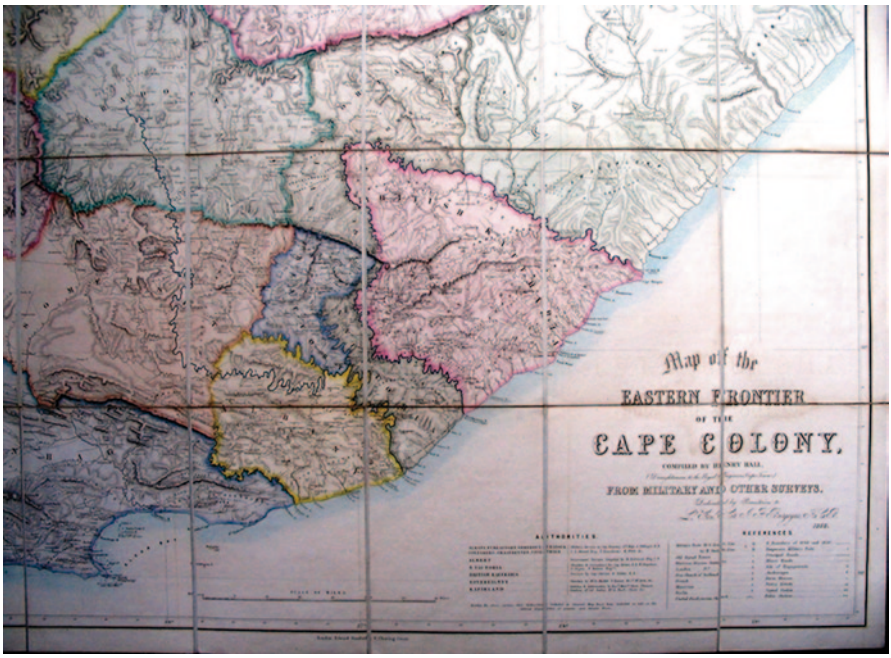


Fig. 4 Henry Hall's map of the Eastern Frontier, 1856. (University of Cape Town, African Studies Digital Collection 160952)

map of the Eastern Frontier by John Arrowsmith[8] and the 1856 map of the Eastern Frontier by Henry Hall (see Fig. 4)[9], the Clerk of Works in the Royal Engineer's Department.

5 Mapping South Africa's "Little" Wars

In his book *Queen Victoria's Little wars*, the author Byron Farwell states that from 1837 to 1901, in Asia, China, Canada, Africa, and elsewhere, military expeditions were constantly being undertaken to protect resident Britons or British interests, to extend a frontier, to repel an attack, avenge an insult, or suppress a mutiny or rebellion (Farwell 1972, p. 34). Continuous warfare became an accepted way of life in

[8] Arrowsmith, J. (1848) *Eastern Frontier of the Colony of the Cape of Good Hope (and part of Kafirland), from Algoa Bay, to the Great Kei River chiefly from MSS Surveys and Sketches communicated by Lt Col Michell, Surv^r. Gen^l. of the Colony Pub^d. 4th June 1848*. Size 49 x 60 cm. London: Arrowsmith.

[9] Hall, H (1856). *Map of the Eastern Frontier of the Cape Colony, compiled by Henry Hall, from military and other surveys, dedicated by permission to Lt. Gen. Sir I F Burgoyne, KCB*. Size 96 x 101 cm. London: Edward Stanford.

the Victorian era. This was also true of South Africa where various military maps of parts of the interior of the country were compiled on an *ad hoc* basis to illustrate some political situation on the ground. As southern Africa was at this stage still unmapped, many of these maps were labelled "sketch maps" and were of a small scale. To have a better understanding of their origin and characteristics, we should briefly refer to the history of the collection of geographical data for military purposes in the British War Office during the nineteenth century.

During the first half of the nineteenth century, British colonial and military affairs were united in a single department under a Secretary of State for War and the Colonies. The collection of topographical information and the preparation of maps of the colonies were taken care of by the topographical branch of a Depot of Military Knowledge which was established in 1803. The maps published during this period were compiled by the Topographical Department of the Quartermaster-General's Department which was located in the Horse Guards, the latter being a building between Whitehall and the Horse Guards Parade in London (Jewitt 2011, pp. xxvii–xviii). The Crimean War of 1853–1856 stressed the need for geographical information for military purposes, and when the War and Colonial Office was divided into two separate departments in 1854, a Topographical and Statistical Department with a geographer as superintendent was created within the War Office. From its inception, this department was heavily oriented towards the "topographical" as opposed to the "statistical" side of its title, and the principal product of the office were maps (Fergusson 1984, p. 22–23). By the 1870s, rapid technological change in warfare such as the use of the steam engine, railways, breech-loading rifles, armored ships, and the telegraph, made it obvious that military intelligence comprised more than just maps and statistical information and on 1 April 1873 the Intelligence Branch of the War Office came into existence (Jewitt 1992, p. xi). In 1888 the Intelligence Branch was redesignated as the Intelligence Division, War Office which was regularly abbreviated as IDWO. In February 1904, after the Boer War, the Directorate for Military Operations was formed as a branch of the Department of the Chief of the General Staff. The practical implication of this was that thenceforth all new maps bore the serial number TSGS (Topographical Section, General Staff). In April 1907 the Topographical Section was renamed Geographical Section, after which all maps of foreign areas carried the serial number GSGS (Geographical Section, General Staff). Maps printed and issued in South Africa by the Field Intelligence Department during the Anglo-Boer War were designated FID.

5.1 Orange River Sovereignty, Basutoland and Griqualand West

During the 1830s and 1840s large numbers of white frontiersmen crossed the Orange River in search of grazing for their livestock and settled in an area which the Griqua people considered as belonging to them. The Griqua expected the Cape Government to support them in getting the Boers off their land, and in 1848 the Governor of the Cape, Sir Harry Smith, proclaimed Britain's sovereignty over the

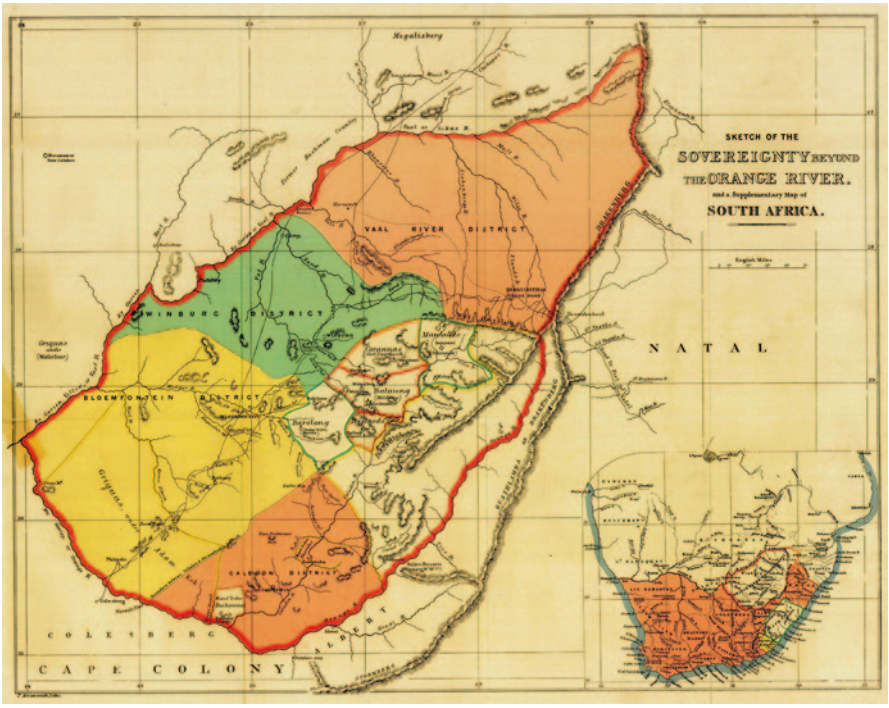


Fig. 5 Map of the Orange River Sovereignty by Charles Bell 1851 (British Parliamentary Papers 36, Enclosure no. 3. Also Free State Archives, Map 2/83)

area between the Orange and the Vaal Rivers, calling it the "Orange River Sovereignty". One of the first maps to be made of this new acquisition was compiled in 1851 by the Surveyor General of the Cape, Charles Davidson Bell, and published by the British cartographer John Arrowsmith[10] (see Fig. 5). Although not a *bona fide* military map, Bell's map was made by order of the Cape Governor, Sir Harry Smith, and was the first relatively accurate map of the area north of the Orange River.

From 1858 until 1868 a series of wars were fought between the Basotho kingdom of the area now known as Lesotho, and the Republic of the Orange Free State. The wars resulted in the Free State acquiring large tracts of land from Basutoland and in 1868 Basutoland was granted British protection. In 1871 Basutoland was annexed the Cape Colony, but it soon became clear that the Cape Government could not control the territory, and in 1884 the British government returned Basutoland to Crown colony status, granting it internal self-government in the process.

By 1884 the only available map of Basutoland was an 1847 map by Hamilton Dyke, a member of the Protestant French Mission at Morija. To effectively manage

[10] Bell, Charles D. (1851). "*Sketch map of the Sovereignty beyond the Orange River, and a supplementary map of South Africa"*, in *British Parliamentary Papers, Colonies Africa 36*, 1851. Lithographed by J. Arrowsmith. Size 50 x 55 cm.

Fig. 6 IDWO 739, Map of Basutoland, 1888. (Royal Geographical Society, MR Lesotho G.5)

the affairs of the new colony, a more up-to-date map was in 1880 compiled at the Intelligence Department, Horse Guards[11] which, in turn, was in 1888 replaced by IDWO 739[12] (see Fig. 6).

The discovery of diamonds at Kimberley in 1871 resulted in a period of intense political rivalry between the Transvaal or South African Republic (ZAR), the Orange Free State and the indigenous Griqua tribe who all laid claim to the diamond fields. The Free State in particular claimed the area as it lay inside the natural borders created by the Orange and Vaal Rivers. Britain and the Cape Colony had no presence and no claim in their own right, but British interests concealed themselves behind the claims of Waterboer, the Griqua chief. Following the mediation which was overseen by the governor of Natal, RW Keate, the decision was in favour of Waterboer who placed himself under British protection. Consequently, the territory known as Griqualand West was proclaimed a British territory on 27 October 1871.

The task of representing Britain in the demarcation of the controversial border between Griqualand West and the Orange Free State was given to Lieutenant-Colonel Charles Warren, RE, who, together with the Free State representative, defined the border in 1877. Using Warren's data as well as other sources, the Intelligence

[11] *Map of Basutoland and adjacent territories*. Compiled at the Intelligence Dep[t]. Horse Guards from the latest information obtained from the Surveyor General Cape Colony, the Resident Magistrates & other available sources. November 1880. Scale 1:633,600. Size 58 x 59 cm.

[12] Map IDWO 739, *Map of Basutoland*. Compiled at the Intelligence Division, War Office from all the available sources together with information supplied by Lt. Col. Sir Marshall Clarke KCMG, HM Commissioner for Basutoland, 1888. Revised 1892. Scale 1:380,160. Size 66 x 94 cm.

Fig. 7 Map of Griqualand West, 1879 (CAR, M2/729)

Branch of the Quartermaster- General's Department published the first reasonably reliable map of Griqualand West in 1879 (see Fig. 7).[13]

5.2 The Transvaal Rebellion (First War of Independence) of 1877–1881 and the Sekhukune War

Fired by the acquisition of the diamond fields and the desire of the Colonial Secretary, the Earl of Carnarvon, to unite all the South African states into a federation, the Transvaal or ZAR was declared a British colony on 12 April 1877. Transvaal was at this stage embroiled in a minor war about land with the indigenous Pedi empire in the north-eastern part of the country, and there were also struggles over

[13] Warren, C. *Map of Griqualand West and adjoining districts*. Compiled from the Survey of Eastern Boundary by Lieut. Colonel C. Warren C.M.G. Royal Engineers, the itineraries of Capt HME Brunker twenty-sixth Reg^{t} and other sources. August 1879. Compiled & Lithographed at the Intelligence Branch Q^{r} M^{r} Gen^{ls} Dep^{t} 1879. Scale 1:633,600. Size 56 x 63 cm.

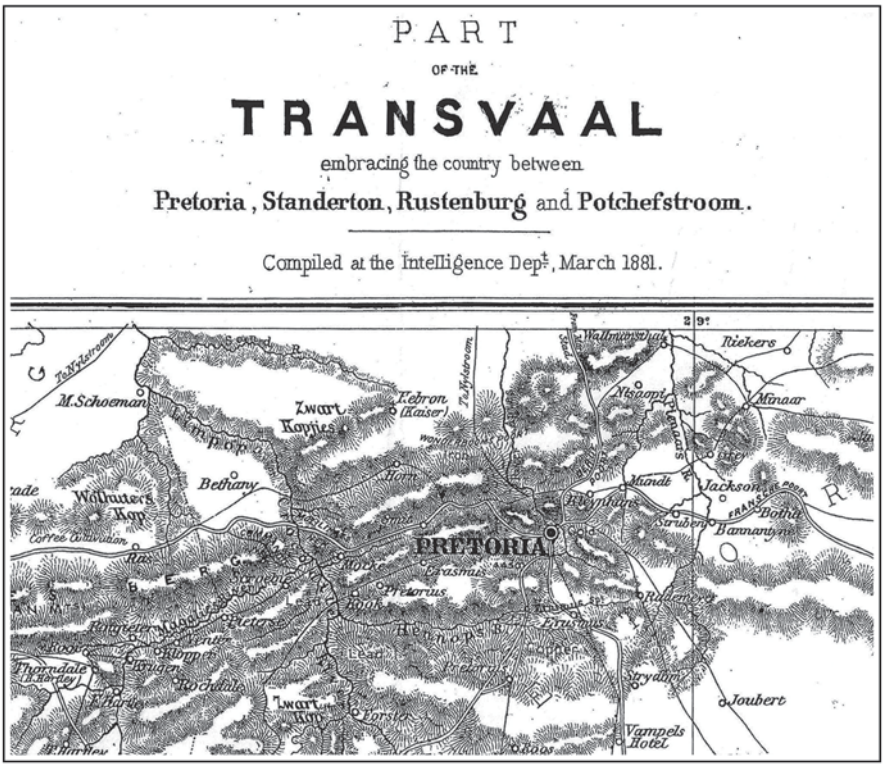


Fig. 8 Map IDWO 11 of the Transvaal Highveld south of Pretoria, 1881 (British Library, MCE Superceded)

labour following the migration of Pedi men to the diamond fields. The ZAR army invaded the Pedi chiefdom in 1876, but the Pedi resistance was so successful that the Boers had to abandon the exercise. Fearing that African states might combine and act against the burgeoning British rule, the British High Commissioner, Sir Garnet Wolseley, decided to take action against the Pedi, and thereby also win over the Transvaal. British troops were sent to Sekhukuneland and the Pedi were defeated in December 1879.[14]

The Transvaal Boers had in the mean time decided on armed resistance and to redouble their efforts to undo the annexation of 1877. On 16 December they formally declared independence from Britain, and the war began with skirmishes at Potchefstroom and Bronkhorstspruit (see Fig. 8)[15] After experiencing crushing defeats in

[14] For a list of the sketch maps of Sekhukuni's Territory by the Intelligence Branch Q^{r} M^{r} Gen^{ls} Dep^{t} Horse Guards, see Jewitt, A C (2011), *op cit*., 301.

[15] Map IDWO 11, *Part of the Transvaal embracing the country between Pretoria, Standerton, Rustenburg and Potchefstroom*. Compiled in the Intelligence Dep^{t}, March 1881. Scale 1:633,600. Size 29 x 35 cm.

Northern Natal at Ingogo, Laing's Nek and at Majuba Hill, the British government decided to reinstate Transvaal's independence and on 8 August 1881 the republican flag was again hoisted in Pretoria.

5.3 Natal and Zululand

During the 1870s serious tensions developed between the Transvaal Republic, the Zulus led by King Cetshwayo, and the Colony of Natal. Upon taking the throne, King Cetshwayo had expanded his army and had also started equipping his impis with firearms. Whereas the Transvaal mostly had border problems with the Zululand, the British administrators saw a strong Zulu kingdom as a potential threat to peace and prosperity in South Africa and as a stumbling block in Lord Carnarvon's plan to establish a confederation of states in southern Africa (Laband 2005, p. 20). The elimination of the Zulu kingdom would also prevent the Transvaal from gaining access to a port on the east coast. In December 1878 the Zulus were given an ultimatum that they should disarm and that the Zulu King Cetshwayo should forsake his sovereignty. The Zulus refused, and in January a British army of 7000 men invaded Zululand. Instead of being swift and decisive, the Zulu War of 1879 lasted months during which the British suffered several humiliating defeats, notably at the Battle of Isandlwana. The British, however, fought back and in the end managed to break the Zulu resistance. King Cetshwayo was captured and exiled to the Cape, and the former kingdom divided into thirteen toothless petty chiefdoms.

By 1879 the only military map of Natal was Captain J Grantham's map[16] which excluded Zululand. Prior to the invasion of Zululand and during the campaign, various military maps of the area were issued by the War Office[17] (see Fig. 9).

6 British Bechuanaland

After the annexation of Griqualand-West in 1877, conflict erupted on the western border of the ZAR between the local Tshidi-Rolong tribe and a group of mercenaries – mostly Boers from the Transvaal and some adventurers from Britain and other

[16] Grantham, J (1863) *Map of the Colony of Natal*. Surveyed by Captain Grantham, RE, FRGS, Assoc. I^{n} CE &c.in 1861 with additions from the Surveyor General's Office Natal. Lithographed at the Topographical Department of the War Office, 1863. Scale 4 miles per inch.

[17] Examples are (a) *Map of Zululand*. Compiled at the Intelligence Dept, Horse Guards, from the Military Trigonometrical Surveys and the various Topographical Sketches made by Officers during the Campaign of 1879. Scale 1:253,440 or 4 miles to 1 inch. 2 sheets. Compiled and Lithographed May 1881; revised July 1885. (b) *Military Map of Zululand* compiled from most recent information. Intelligence Branch Q^{r} M^{r} Gen^{ls} Dep^{t}. Scale 1:31,668 or 5 miles to 1 inch. March 1879. Size 64 x 87 cm. For a list of sketch maps pertaining to different areas of Zululand, see Jewitt, A C (2011), *op cit*., 372–373.

Fig. 9 Extract from *Military map of Zululand*, March 1879 (BNA, CO 700/Zululand 4/1)

European countries. In 1882–1883 two small republics, the Republic of Stellaland, and the State of Goshen were established in Bechuanaland west of the Transvaal. During their short history, these small states became a focal point for conflict between the British Empire and the South African Republic, the two major players vying for control of the territory. In 1885 the British Government sent an expeditionary force of 4000 men under General Charles Warren to remove the Republics of Stellaland and Goshen. The area north of the Molopo was constituted as the Bechuanaland Protectorate whereas the two small republics and other territories to the south of the Molopo River were to be administered as the Crown Colony of British Bechuanaland. Warren, a Royal Engineer, seized the opportunity to compile a map of Bechuanaland comprising of 14 sheets on a scale of 1:126,720 from his own surveys and existing material provided by the Bechuanaland Field Force[18] (see Fig. 10a, b).

[18] Map IDWO 502–517. 1886. *Map of Bechuanaland*. Scale 1:126,720. 14 sheets, each 88 x 52 cm. The sheets are designated IDWO 504–517 and numbered respectively Sheet 1–14.

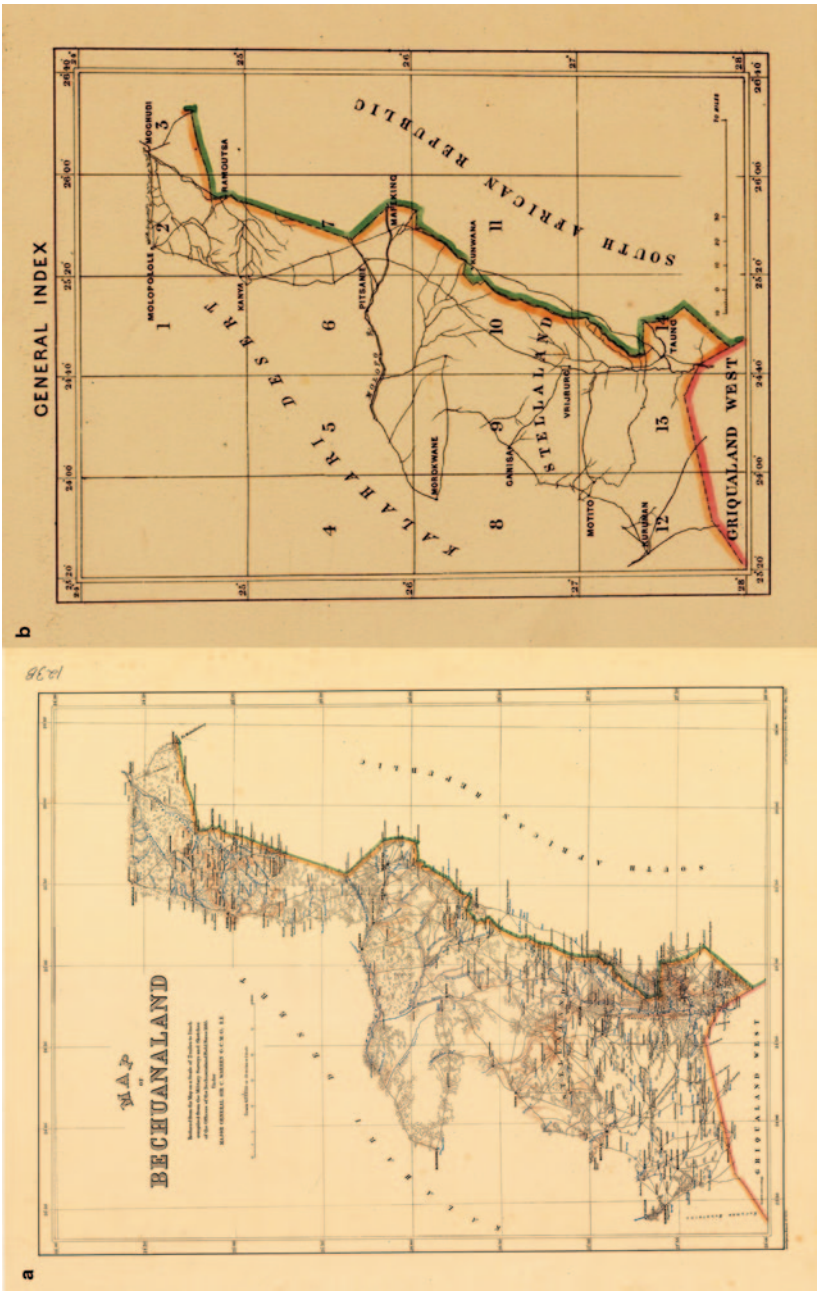


Fig. 10 a (cover sheet) and 10 b (index sheet) of Map IDWO 502–517. Map of Bechuanaland, 1886 (CAR, M4/811 and M4/812)

7 The Boer War

The Boer War (also known as the South African War) was fought by the two Boer Republics (the Orange Free State and the South African Republics) against the British Empire from October 1899 until May 1902. The two impoverished republics had gained their sovereignty by signing treaties with Britain in 1852 and 1854 respectively. Ongoing clashes between the Boers and black tribes in the ensuing years did much to fuel British humanism back home and, with the discovery of diamonds at Kimberley in 1869–1870, the table was set for imperial intervention. When the world's richest goldfields were discovered on the Witwatersrand in 1885 it was a matter of time before British politicians manoevered the Transvaal and the Free State into a position where they had to either fight or capitulate. The relationship between Britain and the two Republics deteriorated steadily after 1895, and when Britain decided to use the presence of thousands of cosmopolitan town-dwelling fortune-hunters who had descended on the Transvaal to overthrow the local government, armed resistance was inevitable. On 12 October 1899 the Boer Republics declared war against the British Empire, and thus began the Anglo-Boer War which would last for almost 3 years.

Almost no topographical surveying had been undertaken in southern Africa before 1899 with the result that when the war broke out, the two fighting parties found themselves without reliable topographical maps. The reason for this must be sought in British colonial policy whereby the British government constantly tried to cut back on colonial expenditure and left all matters regarding surveying and mapping to its colonies. The cash-strapped colonies did not deem topographic maps a necessity and lacked the funds and infrastructure to establish the required trigonometrical network (Amery 1909, p. 350). With the advent of war, the Boers, who were intimately acquainted with the terrain, entered the war without any significant official maps or cartographic material. The British, on the other hand, were in the unfortunate position that they had to wage war in an unknown and virtually unmapped country five times the size of the United Kingdom.

Before the war, the best Britain could do was to produce sketch maps of strategically important areas bordering on the two Republics, and to collect as much topographical information on the Transvaal and Orange Free State as possible and make it available in map form (Royal Commission, Report 1903a, p. 160). Two map series were produced, namely IDWO 1223[19] of Northern Natal which was compiled by Major SCN Grant, and IDWO 1367[20] which covered the Transvaal and the Orange Free State. Northern Natal was a strategically important area but Grant's maps, though beautifully printed by the Ordnance Survey, were inaccurate and of little use for military purposes. IDWO 1367, also printed by the Ordnance Survey, was compiled from information contained in reports, reconnaissance sketches, plans supplied by local surveyors, and the oral accounts of travellers and transport

[19] Map IDWO 1223. 1897. *Military sketch of the Biggarsberg and of communications in Natal north of the parallel of Ladysmith*. Scale 1:63,360. London: Intelligence Department, War Office. 19 sheets, each 59 x 67 cm.

[20] Map IDWO 1367. 1899–1900. *Transvaal and Orange Free State*. Scale 1:250,000 London: Intelligence Department, War Office. 28 sheets, each 70 x 82 cm.

riders. The maps were unreliable and it is questionable whether they were ever used for strategic purposes (Close 1933, p. 71).

At the outbreak of the War Britain immediately took steps to remedy the shortage of suitable campaigning maps by sending two survey sections and three mapping sections to South Africa. The survey sections carried out surveying work in the field while the mapping sections were based in Pretoria, Cape Town and Bloemfontein where they were responsible for the compilation, printing and editing of maps (Jackson and Casgrain 1902). Once the two republics were occupied by British forces, it was the Offices of the Surveyors General which would yield the most information. The title diagrams of farms (land parcels) filed with the Surveyor General were considered to be the most authoritative cartographic source material available and were joined together by the staff of the British mapping sections into makeshift cadastral compilations fitted together like the pieces of a jig-saw puzzle. This information was subsequently supplemented by actual topographical surveys undertaken by the survey sections, as well as by boundary, mining and railway surveys and relevant sketches and traverses. The result was a compilation map which was never a source of professional pride but which had to be used as it was the only type of map available. The Offices of the Surveyors General also acted as depots from where the Royal Engineers attached to the survey sections could venture out to undertake topographical surveys of strategic places. The maps locally printed by the Field Intelligence Department were designated FID, whereas the ones published by the War Office in Britain bore the serial number GSGS (Geographical Section, General Staff).

Three series of compilation maps were published by the FID during the War, namely the *Imperial Map of South Africa* (Board 2004) (see Figs. 11 and 12), the

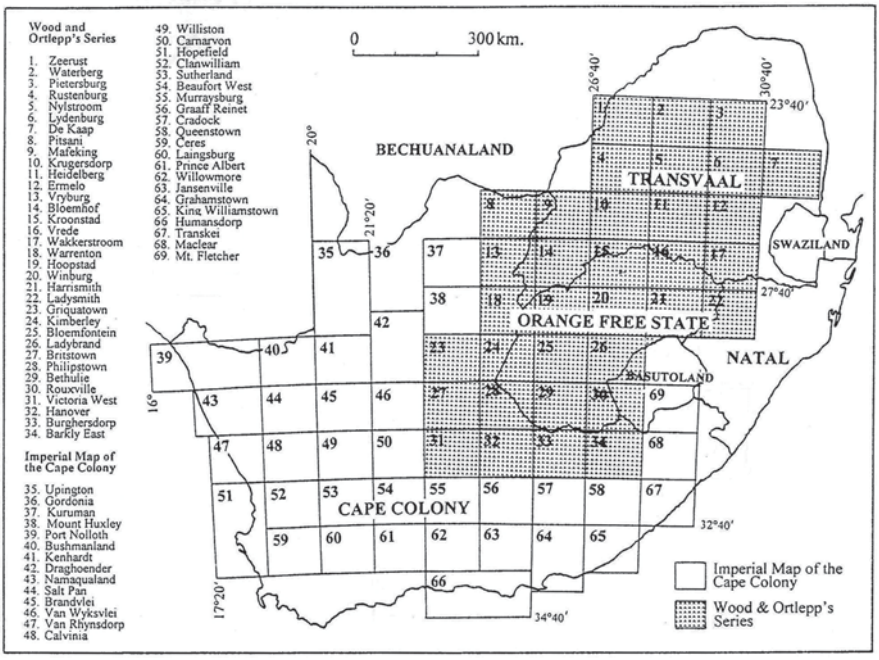


Fig. 11 Index map of the *Imperial Map Series*, 1899–1902

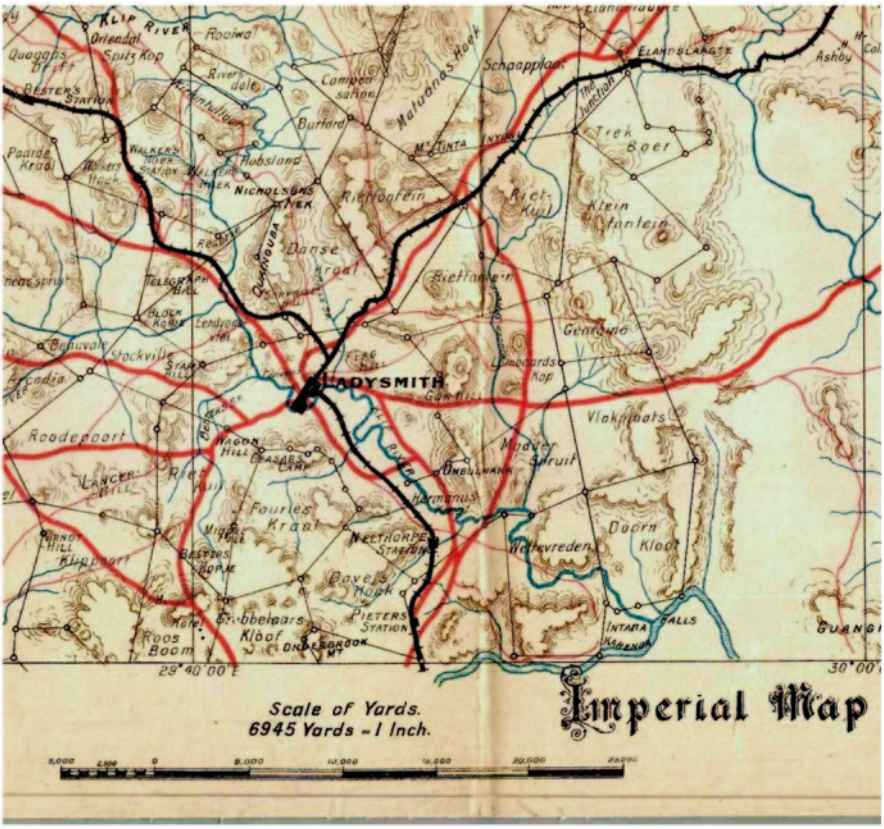


Fig. 12 Extract from the Ladysmith sheet of the Imperial Map Series

Major Jackson's Transvaal and Natal Series (Liebenberg 2014) (see Figs. 13 and 14), and the *Orange River Colony (ORC) Degree Sheet* Series (see Figs. 15 and 16). Although not accurate, these maps played a valuable role as they provided place names and vital information on the physical topography of the country.

After the war the Surveyor General of the Transvaal Colony revised the *Major Jackson's Series* within new sheet lines according to the style of the ORC Degree Sheets. Of all the compilation maps, these *Transvaal Degree Sheets* left the most lasting legacy. Contrary to the *Imperial Maps* and the *Major Jackson's Series* which were military maps in the imperialist mould, the *Transvaal Degree Sheets* had a colonial function as they were repeatedly revised after the war and were still in use as late as the 1930s (Surveyor General (Transvaal) 1920, p. 4).

The opening months of the Boer War were characterised by a series of crushing defeats of the British Army which plunged London into gloom and subjected the Intelligence Division of the War Office to severe criticism. That this criticism was not unfounded, was revealed in 1902 when the Royal Commission on the South African War learnt from the Director of Military Intelligence, Major General Ardagh, that

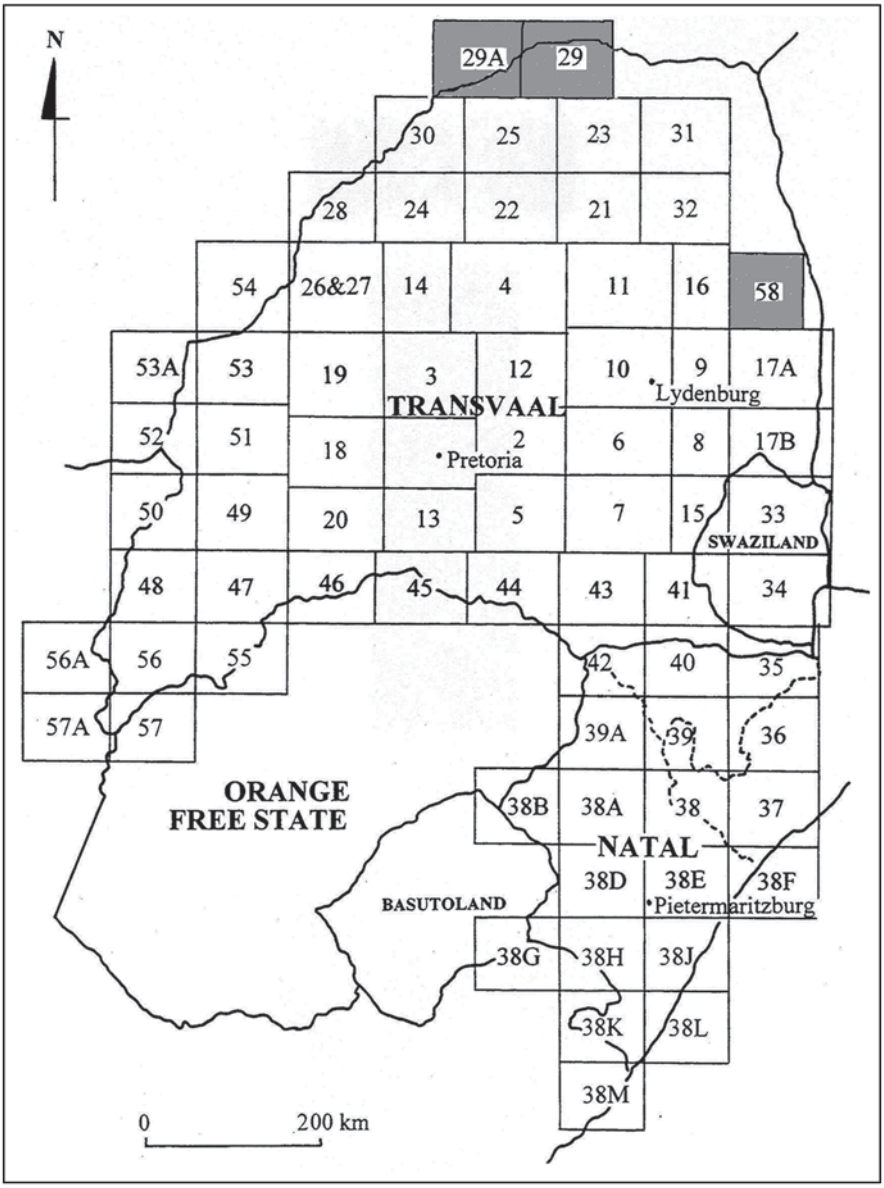


Fig. 13 Index sheet of the Major Jackson Series

Fig. 14 Extract from the Ladysmith sheet of the Major Jackson Series

the Intelligence Division was by 1899 understaffed and insufficiently funded (Royal Commission 1903b, *Minutes of Evidence* I, pp. 210–218). Although everything possible was done to map the parts of the country deemed most important, the inadequacy of the maps provided to field commanders in especially the early stages of the war did, in several instances, contribute to British defeats (Fergusson 1984, p. 114).

8 After the War

The Anglo Boer War proved to be a watershed in the history of both British military cartography and the cartography of southern Africa. Cartographically the War emphasised the significance of reliable topographical information for military purposes and in the short term compelled the British forces to revert to unorthodox methods of cartography to provide in the huge demand for maps. In the long term it made Britain realise that if it wanted to retain its political supremacy in southern Africa, it would have to make provision for the systematic mapping of the region. In March 1904 a topographical congress of the surveyors general of South Africa and Rhodesia was held in Cape Town to discuss the possibility of establishing a central survey and mapping department for British South Africa south of the Zambesi (Topographic Survey of South Africa 1904). All the participants were in favour of

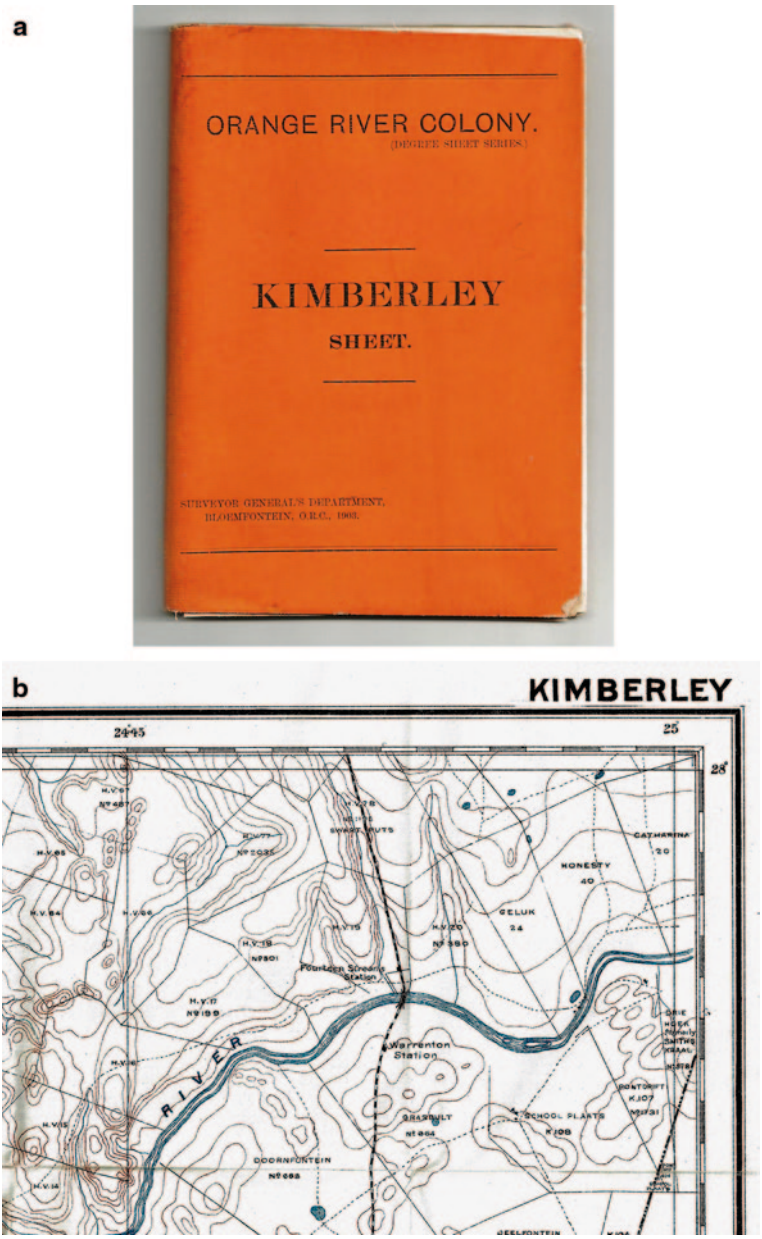


Fig. 15 **a** and **b** Extract from the Kimberley sheet of the O.R.C. Degree Sheet Series

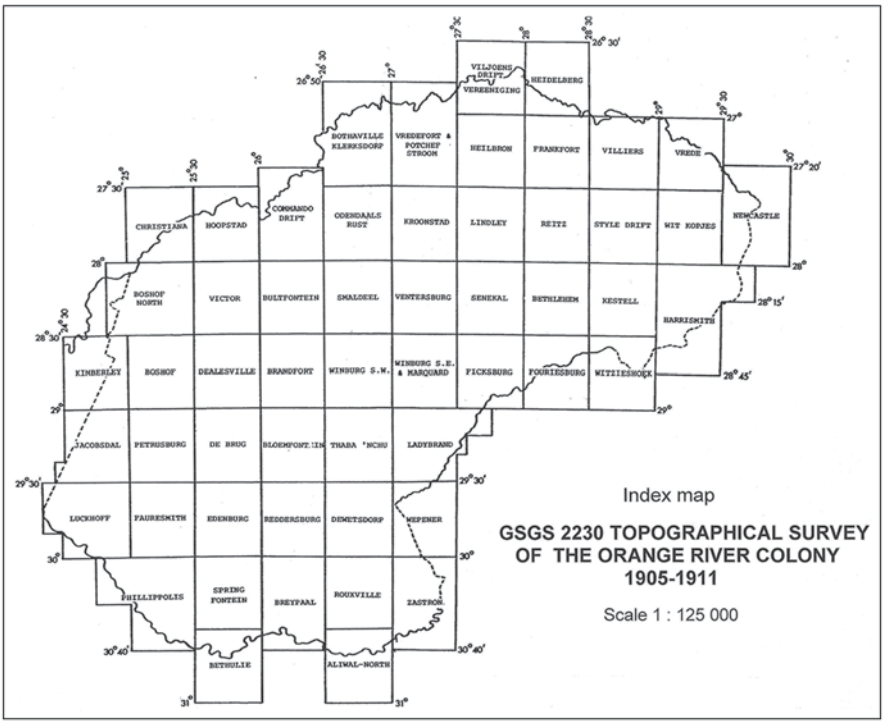


Fig. 16 Index map of GSGS 2230 of the Orange River Colony

such a proposal, but in May 1905 the idea had to be indefinitely postponed because of a lack of funds (Liebenberg 1973).

In Britain the War raised important questions about the cartographical capability of the War Office and much time was spent discussing how the future mapping of Africa should be conducted. By August 1905 some coordination was effected when the Colonial Survey Committee (CSS) was established to advise the Foreign Office and the Colonial Office on all matters concerning the survey and exploration of British Africa (Colonial Office 1907, p. 1). The CSS consisted of a representative of the Colonial Office, the Director-General of the Ordnance Survey, and the officer in charge of the TSGS (later GSGS). The latter was to be responsible for the compilation of maps and the Ordnance Survey for the reproduction of all maps except cadastral plans. Specific technical requirements as well the mapping scales to be used for topographic mapping were laid down, and from 1906 until 1946 all survey and mapping work in British Africa was regulated by the CSS. By 1906 survey departments had already been established in most British colonies and protectorates and after 1905 parties of Royal Engineers were purposefully sent to Africa to execute topographical surveys.

The fact that southern Africa was virtually still unmapped, was not forgotten. As head of the Geographical Section, General Staff, Sir Charles Close used his influ-

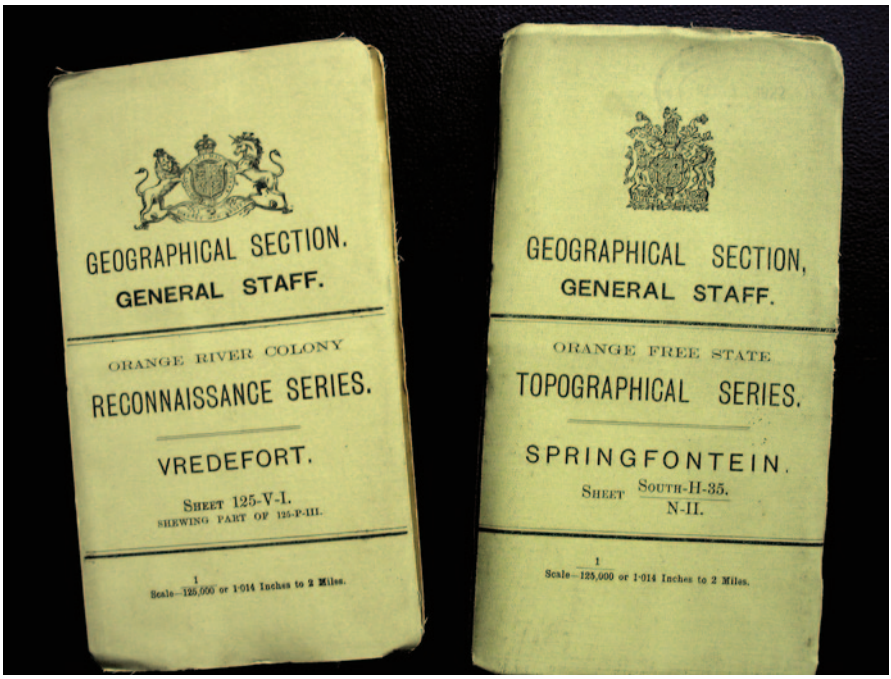
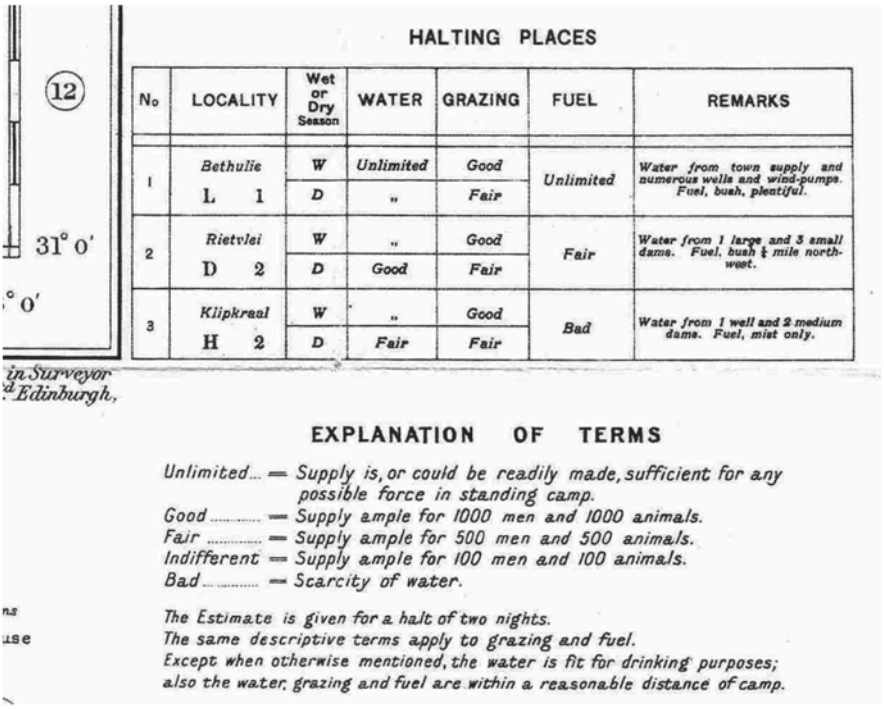


Fig. 17 Examples of folded GSGS 2230 maps

ence to persuade the War Office to send the CSS to the Orange River Colony to undertake a topographical survey of the colony from 1905 to 1911. The map series which emanated from this survey is known as GSGS 2230 (Liebenberg 1997) and the maps which were initially produced were military maps compiled for a war to be fought on horseback in an arid region (see Figs. 17 and 18). Two similar map series which were also undertaken by the War Office were GSGS 1764[21] (see Fig. 19) based on a reconnaissance survey of the north-western Cape Colony and Basutoland from 1903 to 1911 (Board 2009), and GSGS 2618[22] based on a topographical survey of the southern Transvaal from 1910 to 1911. Although political factors such as the unification of the four British colonies in South Africa (the Cape Colony, Natal, Transvaal and the Orange River Colony) in 1910 and World War I (1914–1918) greatly retarded the production of these maps, they were used to good account in South Africa as they were for many years the only maps available.

[21] GSGS 1764. 1906–1914. *Reconnaissance series of the Cape Colony and Basutoland*. 33 sheets, each 65 x 61 cm. London: War Office, Geographical Section, General Staff. Scale 1:250,000.

[22] GSGS 2618. 1913. *Topographical survey of the Transvaal*. 8 sheets, each 65 x 61 cm. London: Geographical Section, General Staff. Scale 1:125,000.



12

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in Surveyor
d Edinburgh,

HALTING PLACES

No	LOCALITY	Wet or Dry Season	WATER	GRAZING	FUEL	REMARKS
1	Bethulie L 1	W	Unlimited	Good	Unlimited	Water from town supply and numerous wells and wind-pumps. Fuel, bush, plentiful.
		D	"	Fair		
2	Rietvlei D 2	W	"	Good	Fair	Water from 1 large and 3 small dams. Fuel, bush ½ mile north-west.
		D	Good	Fair		
3	Klipkraal H 2	W	"	Good	Bad	Water from 1 well and 2 medium dams. Fuel, mist only.
		D	Fair	Fair		

EXPLANATION OF TERMS

Unlimited... = Supply is, or could be readily made, sufficient for any possible force in standing camp.
Good ..... = Supply ample for 1000 men and 1000 animals.
Fair ..... = Supply ample for 500 men and 500 animals.
Indifferent = Supply ample for 100 men and 100 animals.
Bad ..... = Scarcity of water.

ns
use

The Estimate is given for a halt of two nights.
The same descriptive terms apply to grazing and fuel.
Except when otherwise mentioned, the water is fit for drinking purposes; also the water, grazing and fuel are within a reasonable distance of camp.

Fig. 18 Information in the margin of a GSGS 1764 sheet on the availability of water and grazing

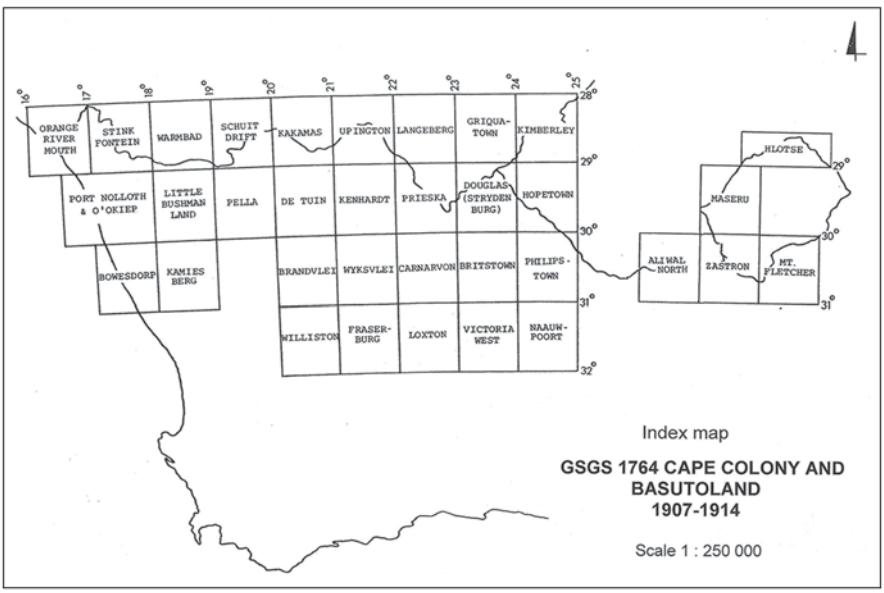

Fig. 19 Index map of GSGS 1764 of the Cape Colony and Basutoland 1905–1911

9 Conclusion

Throughout the nineteenth century Britain's military mapping of southern Africa was done in a piecemeal fashion to cater for areas where military intervention was required. The practical implications of the Empire's negligence to invest in a systematic topographical mapping of its colonies only became apparent during the Boer War. The lessons learnt in South Africa were, however, not forgotten and in the decades following the war Britain made a concerted effort to improve the topographical mapping coverage of its colonies. That some measure of success was achieved is evident from the fact that during the period 1900–1913 as many as 480,000 square miles of Africa were covered by topographical maps resulting from reliable surveys (Winterbotham 1936, p. 298).

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From Peninsular War to Coordinated Cadastre: William Light's Route Maps of Portugal and Spain, and His Founding of Adelaide, the 'Grand Experiment in the Art of Colonization'

Kelly Henderson

Abstract William Light's appointment as Leader of the South Australian Colonization Commissioners' 'First Expedition', as first Surveyor-General of the new British Province of South Australia, and his founding of the City of Adelaide in 1837, owes much to his military experiences in the British Royal Navy, and in the British Army where he served as a cavalry reconnaissance officer and Deputy Assistant Quarter Master General during the Peninsular War (1809–1814). In 1813, Light's mapping and assessment of routes through northern Portugal and Spain assisted in planning of the Vitória campaign and thereafter. For the advance of infantry, cavalry and artillery, he reported on inaccuracies and details omitted in Lopez's maps, on the condition and practicability of routes through Portugal's Tras os Montes, Spain's Castilla y León, and crossings of the Esla and Ebro rivers.

This paper examines Light's unpublished Peninsular War diary, route maps, sketch maps and topographical watercolour paintings of Portugal, Spain and South Australia. It also discusses the links between the surveying and route mapping he undertook during his military service and the work he did in peacetime, as well as his original coordinated cadastre for 'the Adelaide Plain, exemplified by the beautiful 1838 watercolour' manuscript map Plan of the Preliminary Country Sections in the District of Adelaide, and design of a transport network for the Adelaide Plain which is still largely intact to this day.

1 Introduction

William Light (1786–1839), a Eurasian born in Kuala Kedah, Malaya, was the natural son of Englishman Francis Light, founder of the British settlement of George Town, Penang. He was sent to England for schooling, entered the British Royal Navy as a volunteer boy aboard HMS *Clyde* and served for 3 years, reaching the rank of midshipman. In December 1803, he was interned as a 'gentleman' at Ver-

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dun, France, escaped across the Rhine, and travelled to India where his brother-in-law Major James Welsh was serving with the 3rd Native Infantry (Dutton and Elder 1991).

After returning to England, Light joined the 4th 'Queens Own' Dragoons British Regiment of Cavalry and served during the Peninsular War with the rank of Lieutenant, and as a Deputy Assistant Quartermaster General (DAQMG) and reconnaissance officer (see Fig. 1), and was promoted to captain without purchase. He served in Belgium, France, the Channel Islands, Scotland and Northern Ireland, and was ranked as a Captain/Brevet Major when he left the British Army, but later received the rank of Lieutenant-Colonel as Aide-de-camp to Sir Robert Wilson in the Spanish constitutional cause. He then travelled in Europe, the Mediterranean, and Turkey, and was in Egypt when fellow Peninsular War veteran (later Sir) Charles Napier put his name forward for a post in the new British Province of South Australia. En route from Egypt to England in late 1835, Light met William Pullen (later Admiral) at Malta, and mentioned 'he was going to Australia to found a new colony … of which he was to be the Surveyor-General upon the recommendation of the late Duke of Wellington, on whose staff he had served during the Peninsular War.'[1] South Aus-

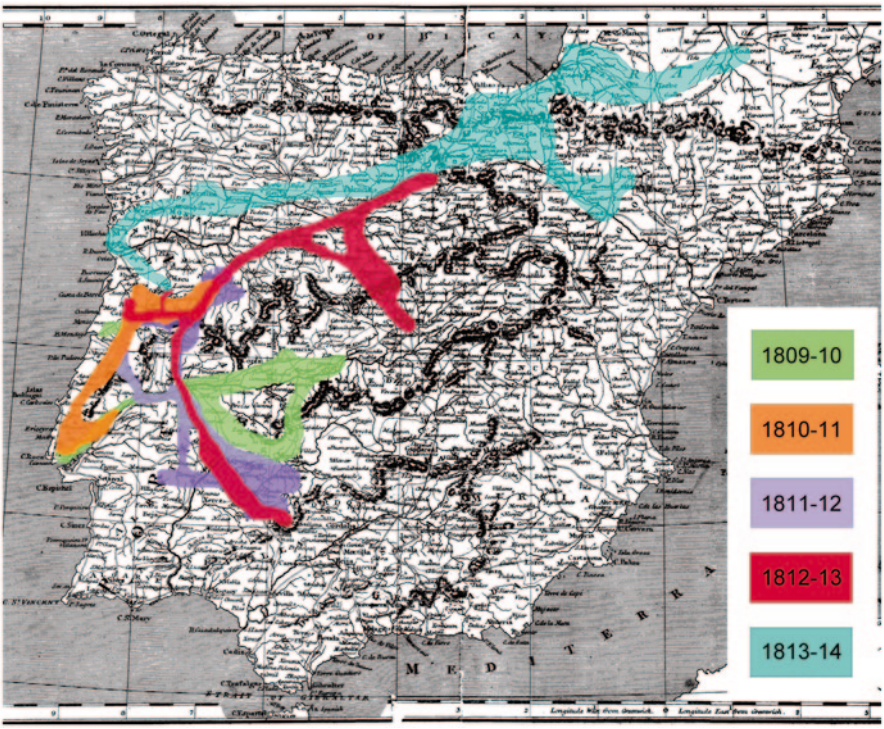

Fig. 1 William Light's Peninsular War service, April 1809–1814

[1] Admiral Pullen, *Abbey and Cheshunt Weekly Telegraph*, republished in *South Australian Register,* 9 March 1875, p. 6.

tralia, the 'Great Experiment in Political Science, Humanity and Religion',[2] was designed as a practical test of Edward Gibbon Wakefield's 'Art of Colonization' theory (Wakefield 1829, 1833; Henderson 2006). English philosopher Jeremy Bentham referred to this as 'the vicinity-maximizing dispersion-preventing principle' in the proposal he wrote for the National Colonization Society, to establish a settlement on the east coast of Gulf St Vincent.[3] When considering real property and land registration, to ensure landed property titles did not 'remain floating in the ocean of uncertainty' Bentham proposed an 'all-comprehensive map' like Cassini's work in France where a *Charte Trigonometrique* formed 'an appendage to a correspondingly all-comprehensive cadastre' (Bentham 1832).

Wakefield's principles were embodied in *An Act to empower His Majesty to erect South Australia into a British province or provinces and to provide for the colonization and government thereof* (4 & 5 Wm IV Cap. 95, assented to 15 August 1834) which passed the House of Lords with the Duke of Wellington's support. A Board of Colonization Commissioners was appointed to implement the Act's provisions. South Australian land was to be sold, and the sale monies were to form an Emigration Fund to pay for the passages of young male and female labourers, and land was to be surveyed before being selected. The Commissioners prepared instructions for a 'First Expedition', sent to explore South Australia's coastline and select the 'best' site for the seat of government, and to plan and survey this first town and the surrounding country.

Light, at that time employed in the Pasha of Egypt's navy, was recruited as the expedition's leader, captain of the Commissioner's survey brig *Rapid* and South Australia's first Surveyor-General. The Commissioners considered him to be 'particularly and pre-eminently qualified' (Colonization Commissioners for South Australia 1836), and delegated to him sole responsibility for selecting the site, and designing the plan, for the capital of the new colony (Elder 1984; Dutton and Elder 1991). To achieve this with limited time and resources he invented and pioneered a co-ordinated cadastre, adapting navigational methods for fixing a ship's position (co-ordinates of latitude and longitude) to land survey and defining the position of property boundaries.

2 Military Reconnaissance, Route Mapping and Intelligence

At the time of the Peninsular War, the few published maps of Portugal and Spain were incomplete or erroneous, lacking information necessary for Army operations. The *Carta Militar das principas Estradas de Portugal* and maps by Tomás Lopez could not be relied upon—Lopez's maps were based on drawings by town priests

[2] South Australia The Great Experiment in Political Science, Humanity, and Religion, *The South Australian Colonist*, March 10, 1840, p. 4.

[3] Jeremy Bentham, Proposal for the Colonization Society, MSS 8, University College London.

Fig. 2 Light's reconnaissance (*in white*) from Mirandela via Vimioso (Portugal) and Alcaniçes (Spain) to Bragança (K Henderson 2014) Base map: Detail of Plate II, Lopez de Vargas Machuca Tomás (1731–1802); Neele, Samuel John (1758–1824) grav. met., A New General Military Map of the Kingdom of Portugal… John Stockdale, London; Neele Sculpt, Strand. 5th Nov[ember] 1811 (Biblioteca Nacional de Portugal. C. A. 382 A)

and their answers to questionnaires, rather than topographical surveys (San Antonio Gómez et al. 2011). Discovery of practicable routes for infantry, cavalry and artillery north of the Douro River was crucial for the success of Wellington's 1813 campaign; outflanking and outmanoeuvering the French by launching the larger part of Wellington's Army into northern Spain via Portugal's Tras os Montes required route information gathered by reconnaissance officers.

Wellington's Quartermaster General (QMG) George Murray had received detailed reports and maps from DAQMGs sent to examine Portugal's Tras os Montes (Ward 1957), but in April 1813 he issued new instructions for a rapid route reconnaissance traversing northern Portugal to the Spanish frontier. He sought information on 'the best Halting places, the supply of forage to be expected, and any other particulars that may be worth mentioning',[4] and reports of 'the nature of the road, the distances, the accommodations, the best bivouacking places' (Wellesley 1872, p. 205).

On 25 April 1813, Lieutenant Light, 4th Dragoons, who had served as a DAQMG from November 1812, set out from Porto. Filling in gaps in Lopez's and other maps, and earlier Army surveys, he travelled east across the Tras os Montes, crossing the Spanish border and reconnoitering to the Esla River (see Fig. 2). Lopez's map (see Fig. 2) did not show roads for the Mirandela–Alcaniçes (Spain) route on which Light reported (see Fig. 3). He paid particular attention to the condition and practicability of routes for infantry, cavalry and artillery. He noted, for example, a bridge unsuitable for artillery 'only fit for Infantry or one horse at a time'; the 'immense labour' of very steep and long descents and ascents at the Sabor River, and a destroyed bridge badly repaired with wood on the Maças River. Route orders for May

[4] National Library of Scotland, Sir George Murray Collection. Murray to Brigadier-General D'Urban, Freneda, 19 April 1813.

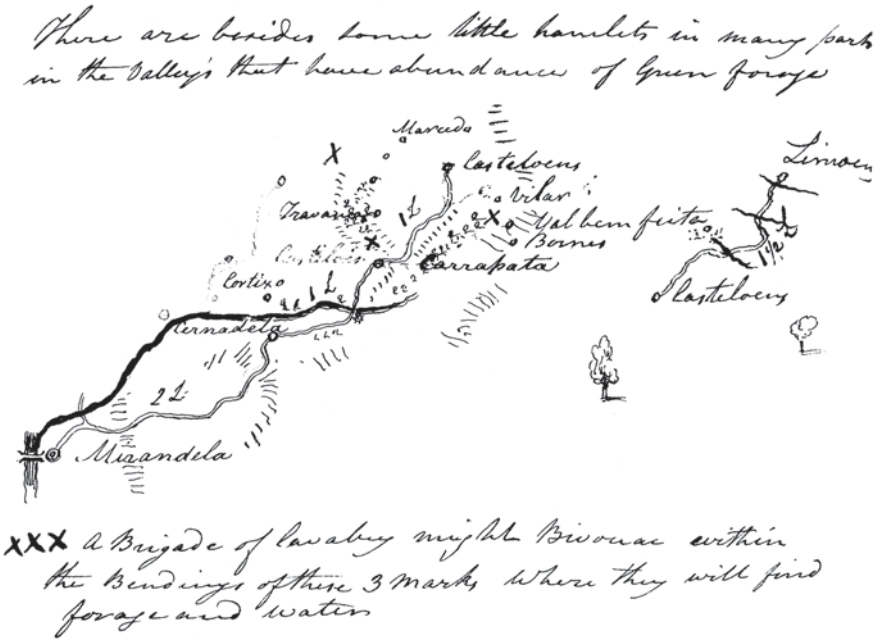

Fig. 3 Detail from Colonel William Light's diary, 3 May 1813. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000674/8)

1813 show that sections of Light's route were used by Brigadier-General Ponsonby's Cavalry Brigade, and the 3rd Infantry Division. Apparently heeding Light's warnings, artillery and other wheeled carriages took an alternative route.

Light gathered information in accordance with requirements set out in Sect. 4 of the '*Instructions for Officers of the Quarter Master General's Department*'. He had transcribed the Instructions, in full, into his field book. These stated one of the first duties of the officers of the Department was 'to acquire a Knowledge of the country, which is the theatre of operations of the Army', and listed the observations that should be made under several heads: [1st Topographical details] and 'the nature of the country in reference to the operation of Troops'; 2nd River and Lesser Streams & Canals; 3rd Population and Resources; 4th Roads; 5th Camps and Positions. Further points 'to be particularly attended to… [when] attached to Divisions of the Army or other Corps of Troops' required AQMGs to fix upon ground to be occupied when encamped, 'lose no time' in becoming 'acquainted with the country in the neighbourhood of the cantonments', and 'make a tracing or sketch of it shewing the situation of the several villages, the roads by which they communicate, the Rivulets &c.' In practice, several of these duties devolved to Deputy AQMGs, including Light.

During the 1813 campaign, Light interspersed his diary entries with small sketch maps. He recorded information associated with his DAQMG duties, his reconnaissances, and the line of march of the left wing of Wellington's Army under Graham's

command through Castille y León and in pursuit of the French to Tolosa after the battle of Vitória. Many route details can also be found in his diary, such as: the location and order in which he laid out the encampment of Cavalry regiments (3rd, 4th and 5th Dragoons, and 12th and 16th Light Dragoons) between Tábara and Faramontanos (28 May); the course, and crossing, of the Canal de Castilla (9 June); the successful outflanking manoeuvre to take the Vitória-Bilbao road (19–21 June), and the crossing of the Basque Mountains via the Puerta [tunnel] of San Adrian (23 June).

Several of the diary sketch maps indicate that on the advance to Vitoria, Light was detached from Graham's column to reconnoitre crossings of the Ebro River. West of Burgos, on 10 June, he estimated the number of horses that could be accommodated in various villages, presumably to provide cavalry cantonments whilst the Army besieged Burgos. A few days later, when Wellington decided to cross the River Ebro after the French abandoned Burgos (Oman 1986, VI, p. 359), Graham's column advanced north, crossing the Ebro via San Martin des Elines (14 June). Light was further east, assessing the condition and practicability of roads and crossings of the River Ebro. Riding two days ahead of General Hill's column, Light noted the Quintanaloma route was 'impracticable for Artillery', and recorded routes and bridges passable for Cavalry and Infantry, including at Puente Arenas where the Duke of Wellington later crossed the Ebro.

On 13 July, Murray asked for Light to reconnoitre and report on an area west of Tafalla, between the River Ebro and the Pamplona-Salvatierra-Vitória road. Sketching the Izurdiaga to Undiano route on 8 September, mapping roads, villages and river crossings, Light noted 'Lopez's Map of this part is extremely incorrect' (see Fig. 4). Lopez's 1810 map placed Echarri north of Arteta, rather than south, and did not show any roads west of the Tafalla–Pamplona high road (see Fig. 5). Light later identified potential Cavalry cantonments between Lopez's Vidaurreta [Bidaurreta] and Pamplona (see Fig. 6).

By October 1811, William Light had taken up sketching and watercolour painting, and some of his surviving artworks depict Portugal and Spain from his Peninsular War service. These include his drawing of San Ildephonso Palace (see Fig. 7), watercolours of two mountain landscapes (see Figs. 8 and 9) and *The Attack of Tolosa by the Portuguese under Sir Thomas Bradford 1813* showing the heights, river, roads, town and bridge (see Fig. 10). A brief description of the combat of Tolosa and 'attack of the Bridge' appears in his diary with a rough sketch map (see Fig. 11), along with a note that the 'Enemy were at length forced by our people on the Calzada blowing open the gates with cannon'.

Field research has tentatively identified Fig. 8 as Castelo Novo and the Serra da Gardunha, near Fundão, Portugal. On 12 August 1811, Light recorded that his unit marched to Alpedrinha and Baldiphasenes [Val de Prazenes, 'Valley of Pleasures'], situated on the edge of the mountains and 'extremely picturesque'. Over the next few days he 'rode up into the mountains… to Fundão and beyond' and 'several times commented on the beautiful views and lovely countryside' (Elder 1987, p. 24). The exact location for another of Light's Peninsular watercolours, thought

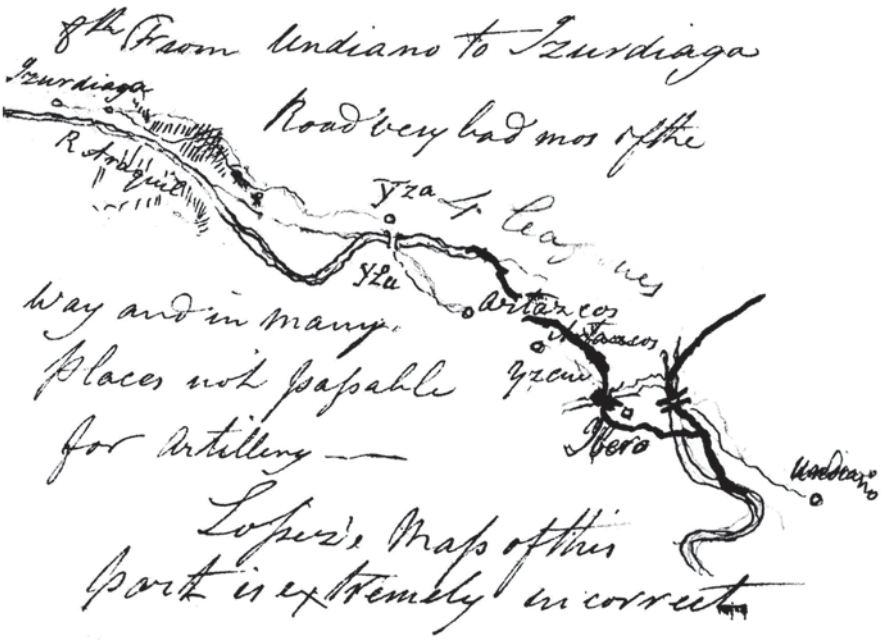

Fig. 4 Extract from Colonel William Light's diary 8 September 1813. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000674/8)

Fig. 5 Diagram of the area Light reconnoitered for cavalry cantonments (*in grey*). (derived from Mapa general de España, dividido en sus actuales provincias, islas adyacentes y reyno de Portugal/ Por Don Tomás López, Madrid, 1810; (Biblioteca Virtual del Patrimonio Bibliográfico, Ministerio de Educación, Cultura y Deporte, Gobierno de España, http://bvpb.mcu.es/es/consulta/registro.cmd?id=407851; Public Domain Mark 1.0, see http://www.europeana.eu/portal/record/2022701/lod_oai_bvpb_mcu_es_407851_ent1_.htm))

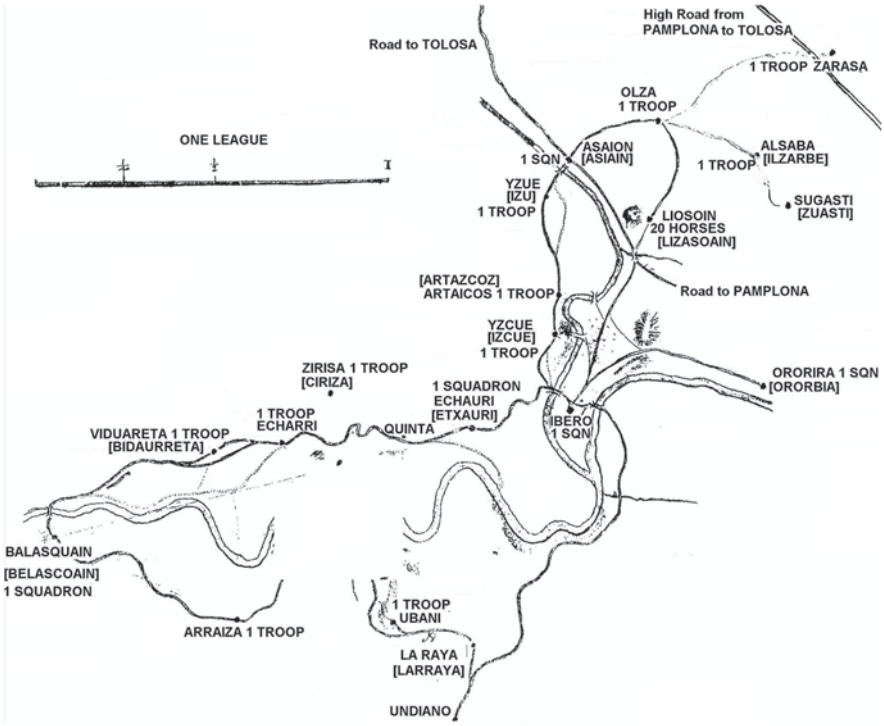

Fig. 6 Diagram based on William Light's sketch map of Cavalry cantonments (area reconnoitred 7 September–22 October 1813), rotated to position Pamplona (not shown) on the top right (*eastward*). (Base image courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000674/8)

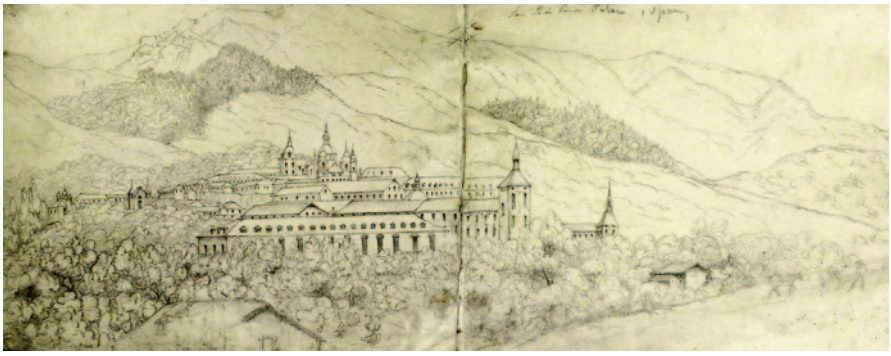

Fig. 7 Detail by Colonel William Light of 'San Il de Fonso Palace (Spain)' [San Ildephonso], pencil drawing. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000720a)

Fig. 8 Watercolour by Colonel William Light, 'Mountain village, probably in Spain'. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000645). Tentatively identified as Castelo Novo and the Serra da Gardunha, near Fundão, Portugal

Fig. 9 Watercolour by Colonel William Light, 'A scene in Portugal near Covilha'. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000516)

Fig. 10 Watercolour by Colonel William Light, 'The Attack of Tolosa by the Portuguese under Sir Thomas Bradford 1813'. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000644)

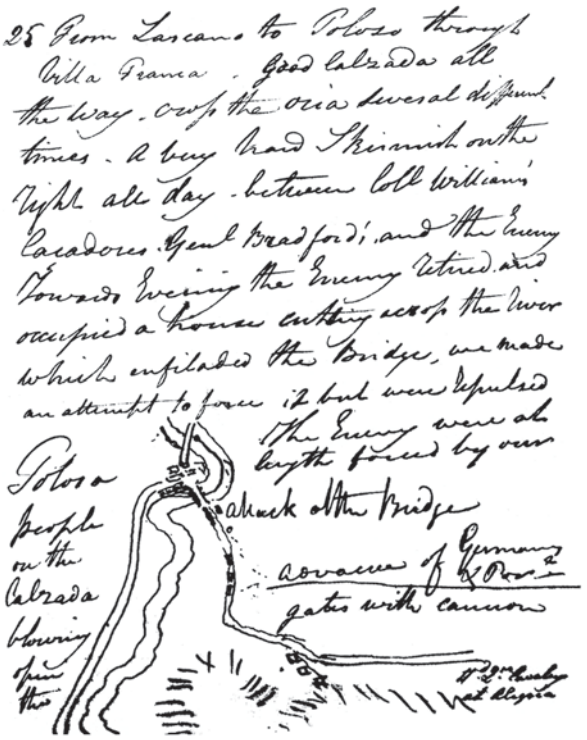

Fig. 11 Detail from Light's diary of the combat of Tolosa, 25 July 1813. (Courtesy of Adelaide City Council, City of Adelaide Civic Collection CC000674/8)

to depict Spain or Portugal's Tras os Montes (see Fig. 9), is currently unknown, but his painting contains sufficient topographical detail for the site to be identifiable.

Years later QMG Willoughby Gordon, who had noted Light's ability, could 'perfectly well recollect Major Light, both in person and character, a young lieutenant of Cavalry… he appeared to me full of zeal, activity and intelligence.'[5] Brigadier-General Benjamin D'Urban had 'never met with a more zealous, intrepid, or intelligent officer. [Light] draws well, is very prudent and discreet, and equally fit for any duties of a staff officer [whether in the office or in the field]. During the whole of the war he was never absent from his duty owing to sickness or any other cause.' (Mayo 1937, pp. 197–198).

3 The Grand Experiment in Systematic Colonisation

South Australia's Colonization Commissioners gave Light insufficient time and resources to complete a near impossible task. After captaining the survey Brig *Rapid* to the far side of the world, he was to select the best site for a capital, with a 'commodious harbour, safe and accessible in all seasons', from 1500 miles of

[5] Willoughby Gordon to Brigadier-General Sir Benjamin D'Urban, 1819.

coastline, and then plan and survey a city of 1000 saleable acres. He was then to survey the surrounding country into 134-acre sections giving freedom of choice for holders of 437 preliminary land orders, and provide a regional transport network consisting of a public road adjoining every country section. After free choice of hundreds of preliminary country sections had added the element of unpredictability to his remaining task, he was required to re-survey unselected land into 80-acre sections whilst ensuring each still adjoined a public road (Colonization Commissioners for South Australia 1836; Porter 2010). To make matters worse, Light's departure was delayed by two months due to illness, and when the Commissioners gave in to South Australian Company demands, ships sailed from England before the *Rapid* left the Thames, and arrived in South Australia before Light.

3.1 South Australian Maritime and Land Survey

British concern about France's colonial ambitions may have played a part in securing the Duke of Wellington's support for colonising central southern Australia (see Fig. 12). This region had been named 'Terre Napoléon' by the French, and a French Atlas published during the Peninsular War contained detailed charts of Golfes Bonaparte [Spencer] and Joséphine [St Vincent] (*Carte Générale des Golfes Bonaparte et Joséphine (à la Terre Napoléon, Nouvelle-Hollande) par M. M. L.*

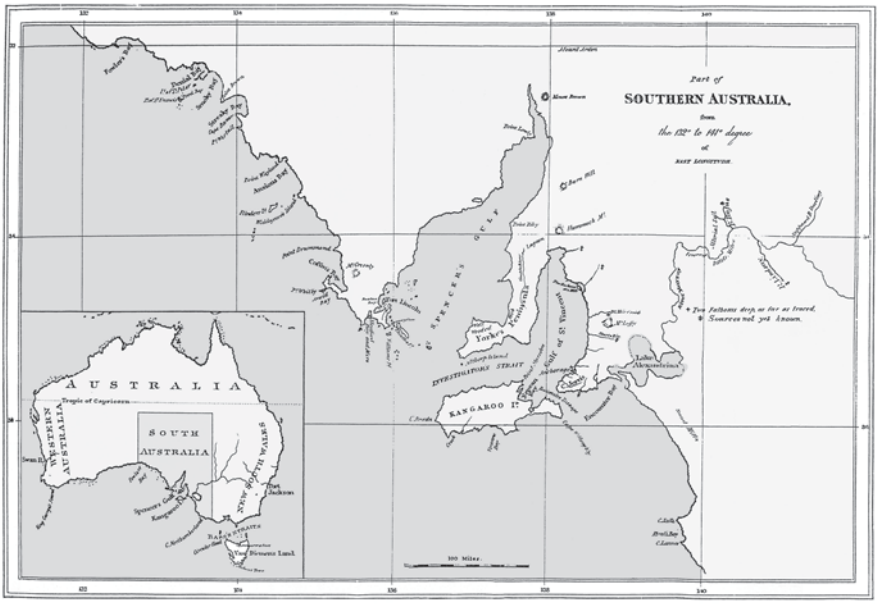

Fig. 12 South Australia, showing Spencer and St Vincent's Gulfs. (Colonization of South Australia, R. Torrens 1836; coloured by K Henderson)

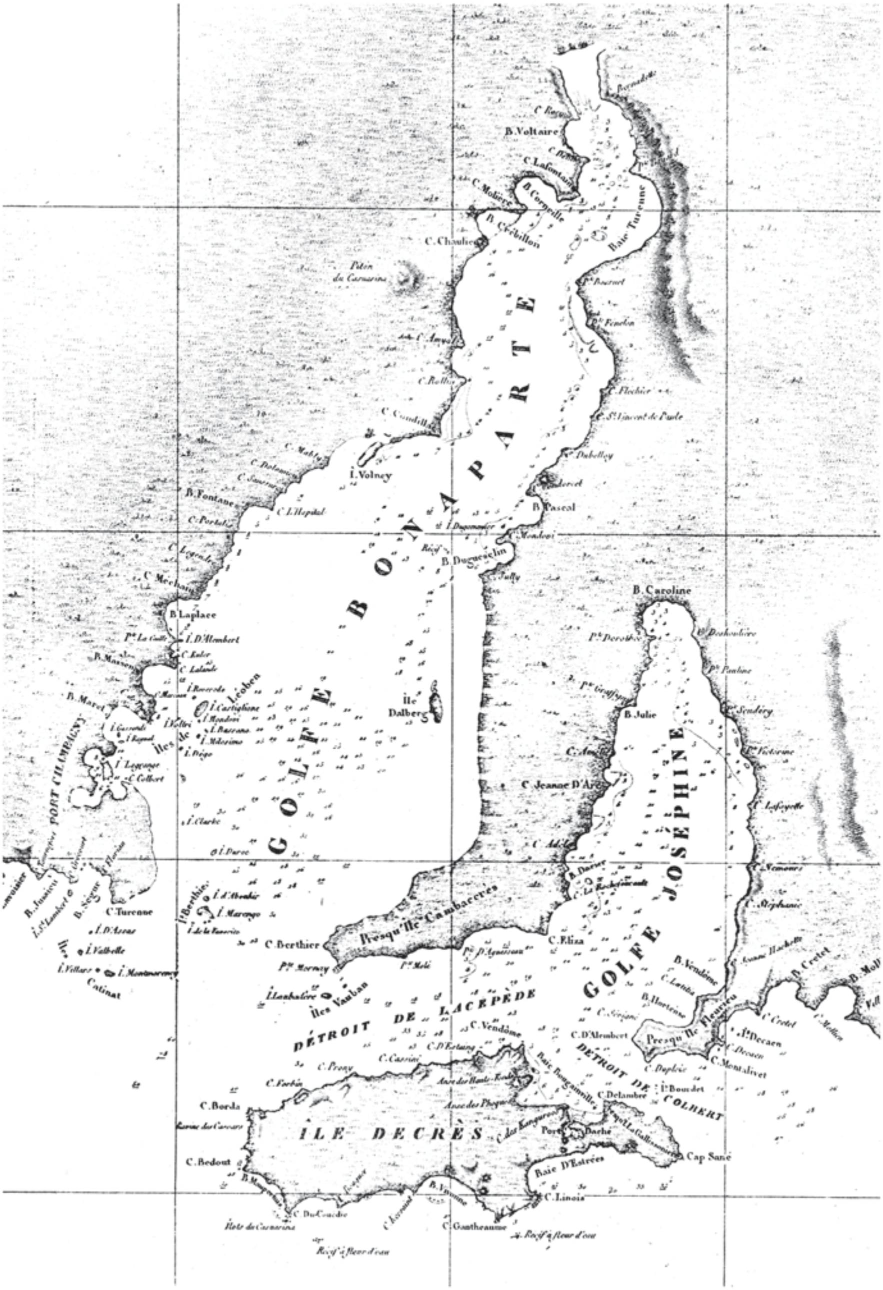

Fig. 13 Detail of Carte Générale de la Terre Napoléon (à la Nouvelle Hollande.) Rédigée d'après les travaux éxécutès à bord de la Corvette le Géographe et de la Goëllette le Casuarina, par M. L. Freycinet, an 1808; showing Golfes Bonaparte [Spencer Gulf] et Joséphine [Gulf St Vincent]

Fig. 14 Light's South Australian maritime explorations in 1836, reconstructed from his Brief Journal

Freycinet et Boullanger 1803 in *Voyage de découvertes aux Terres Australes*, Paris, 1811) (see Fig. 13).

After examining Gulf St Vincent and accurately locating the Port River (not previously charted by the British or the French), Light sailed to Spencer's Gulf to examine the Port Lincoln area (see Fig. 14) and rejected that location due to lack of abundant surface water, comparatively poor soil, and potential shipping hazards. He decided Encounter Bay was unsuitable for the capital, recognised the south-eastern coast was a dangerous lee shore, and rejected South Australia's western and southern coastlines based on examination of the charts of Flinders and D'Entrecasteux. Convinced of its advantages, Light selected the well-watered fertile Adelaide Plains on the east coast of Gulf St Vincent, with a safe harbour of the Port Adelaide River as the site for first town (see Fig. 15).

Light's experience and skills as a topographical artist and watercolourist accustomed to field work are evident in his South Australian hand-coloured charts and maps and faithfully depicted landscapes. As Light accurately recorded topographical features his South Australian watercolours are an important source of historical information, prior to alteration of the landscape by European occupation, and those held by the Adelaide City Council, Art Gallery of South Australia, and in private collections are reproduced in David Elder's The Art of William Light (Elder 1987).

Lieutenant-Governor and Chief Justice Sir Samuel Way (Way 1905) credited Light's topographical instinct with preserving the infant community of South Aus-

Fig. 15 Detail of Sketch of the Coast showing Holdfast, Deception, and Yanky-lilly Bays. W. Light, Rapid Valley, 3rd Novr 1836. (Courtesy of the British National Archives. CO 700/SOUTH AUSTRALIA1/1)

tralia from being strangled at birth and lauded him as 'the saviour of the State of South Australia'. According to Assistant Surveyor BT Finniss, Light's judgment should be credited to his service in the Peninsular War:

> … [Light's] experiences on the battlefield… in the bivouacs; in preceding and observing the march of divisions in the enemy's vicinity, his selection of camping ground for the troops all went to form his mind and mature his judgement, as to the necessities of position in meeting the wants of large bodies of men.[6]

Unlike Flinders, who finished his charts in comparatively comfortable conditions ashore at l'Île de France (Mauritius), Light had no permanent building in which to draw up his chart of the East Coast of Gulf St Vincent (see Fig. 15). The Rapid Valley survey camp consisted of tents, and the only other accommodation available to him was the survey brig *Rapid* riding at anchor in Rapid Bay. His watercolour sketch map of the site of Adelaide bearing his handwritten ink annotations, completed on site in about February 1837 and received by the Commissioners in London in August, records his proposal for the City's unique figure-eight of Park Lands: 'The dark green round the Town I proposed to the Resid[en]t Commissioner to be reserved as Park grounds'. Light's maps were coloured consistent with customary eighteenth century European military and British Ordnance Survey map-making with the settlements in red, (potential) pasture and arable land in greens and browns, rivers and lakes in blue and ochre for roads (see Fig. 16).

3.2 Coordinated Cadastre

In January 1837, Light designed the Town plan and commenced surveying Town Sections (completed in March). His 1837 Plan of the City of Adelaide, South Australia, demonstrates topographical genius: an ideal city melded with its landscape, the urban form set on rising ground avoiding areas liable to inundation, with river valley and surrounding land dedicated as open space—his unique figure-eight 'Adelaide Park' (Henderson 2008, 2010). Light's love of beautiful sites, rivers and valleys was evident during the Peninsular War and often mentioned in his diary. He states he chose the difficult site for Adelaide because it was 'the most beautiful position for a town in the country' having the best connection with the River Torrens. With its gravity-fed water supply from Mt Lofty and its foothills, the site was reminiscent of the gardens of Spain's La Granja de San Ildefonso (see Fig. 7), nestled on the flank of the Sierra de Guadarrama, which Light had visited and admired during the Peninsular War.

According to John R Porter, former Surveyor-General of South Australia, Light's equipment was 'state-of-the-art for the 1830s', and his trigonometrical survey four times more accurate than the British Ordinance survey (Porter 2007). In addition

[6] BT Finniss, 'Some Early Recollections.' Transcription by Special Collections Librarian Gillian Dooley, from the original manuscript in the Borrow Collection, Flinders University of South Australia, p. 24.

Fig. 16 Plan of the Preliminary Country Sections in the District of Adelaide as surveyed by Wm Light Esqr and Assistant Surveyors. The first points for the Trigonometrical Survey were fixed by Messrs. Light, Ormsby, Finniss and Cannan. In the town Mr. Jacob. In the field Messrs. Pullen, Lindsay, Hardy, Simmonds and Mr Winter. Drawn by Henry Nixon, late Lieutenant 96th Regiment. (Courtesy of the British National Archives, CO 700/SOUTH AUSTRALIA2Pt1(4))

to its historical 134-acre sections, the 1838 watercolour 'Plan of the Preliminary Country Sections in the District of Adelaide' (see Fig. 16), is a valuable source of environmental information precisely delineating watercourses and distribution of treeless grasslands and wooded areas. Although recorded as '[d]rawn by Henry Nixon, late Lieutenant 96th Regiment', Nixon's only known artwork is a pencil

drawing, incorrectly described as a 'watercolour'. Given Light's large portfolio of watercolours dating from the Peninsular War, and two publications, *Sicilian Scenery* and *Views of Pompeii* based on paintings from his Mediterranean travels, Light may have hand-coloured the plan. Accurate depiction of landscape, hydrology and vegetation was crucial as purchasers were to choose their country sections from this map, a pictorial representation of the remarkable co-ordinated cadastre designed by Light.

Property boundaries of country sections were not marked on the ground until the land was selected and '*on anyone's application* for his section (at the office) *he was put in possession in two or three days and sometimes even the next day*' (Light to Wakefield 22 July 1838 in Mayo 1937, p. 244). According to BT Finniss in his letter dated 1 August 1837, Light devised this scientific solution:

> … Colonel Light determined, therefore, to commence with a proper trigonometrical survey, and make a correct map of the tract of country proposed for occupation; the sections can then be marked out upon the paper and numbered, purchasers can choose from the map, and the boundaries of sections can be marked off according to the order in which the possessor intends to occupy them; in this manner great expense will be saved–no lands need to be re-surveyed.

In addition to Wellington Square, named for Arthur Wellesley, 1st Duke of Wellington, South Australia's maps commemorate other Peninsular War veterans and places. In December 1837, on an exploration north-east toward the River Murray (named after Sir George Murray by Captain Charles Sturt) Light named Lynedoch [Lyndoch] Vale, the Barrosa [Barossa], and Greenock for Peninsular War veterans General Sir Thomas Graham, Lord Lynedoch, and Lieutenant-Colonel (later General) Charles Cathcart, Lord Greenock (Elder 1984, p. 55). However, Light was not responsible for the proliferation of places named for the second Governor, George Gawler (52nd Regiment), who 'strange to say…was almost the only officer of that regiment [Light] had no recollection of' although he 'used to be on brotherly terms with the whole corps' (Light to Palmer, April 16, 1839 in Mayo 1937, p. 255).

In July 1838, Light resigned on receiving instructions to change to an inaccurate running survey, and 11 Survey Department officers, having 'respect and esteem' for him and 'confidence in his skill', refused to work for his successor and promptly quit. Of these, surveyors Finniss, Nixon, Jacob, and draughtsman RG Thomas formed Light, Finniss & Co's survey and land agency, which planned the townships of Gawler, Glenelg and Marion. Light designed Gawler with three squares, set it between the North and South Para Rivers, and reserved the river banks as parklands. On 6 October 1839, he died of tuberculosis and was buried in Light Square, the square nearest the City and District surveys' starting point, his Trigonometrical Station A.

Light designed the City of Adelaide with all entrances to the town through a park, and a hierarchy of street widths. Although some contemporaries criticised the wide streets and large reserves of open space for public walks, he provided for future population and transport needs. Adelaide became the model for parkland towns in Australia and New Zealand. Georges Benôit-Lévy, champion of the French garden city, referred to Adelaide as a 'typical Garden City' in *La Cité Jardin*, and

Adelaide's Park Lands influenced Britain's Ebenezer Howard, who used them as an exemplar in his *Garden Cities of To-Morrow*.

4 Conclusion

As a result of his naval experience and Peninsular War service, William Light was pre-eminently qualified for his role as the South Australian Colonisation Commissioners' Surveyor-General and Leader of their 'First Expedition'. His military experience informed his strategic selection of Adelaide's site; his navigation skills inspired innovative use of triangulation to create a co-ordinated cadastre for the Adelaide district facilitating selection and survey of land parcels. Integrating his town and regional plan with the landscape, Light planned the city of Adelaide as the centrepiece of his design which spanned the Adelaide Plain from the Mt Lofty foothills to the coast. His topographical and artistic genius created a spatial layout that has proven to be inspirational, resilient and enduring. His diaries, sketch maps and artworks provide valuable details of the Peninsular War, the founding of South Australia, the history of South Australian cartography and his founding of the City of Adelaide.

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Contours of Conflict: the Highs and Lows of Military Mapping at The National Archives of the United Kingdom

Rose Mitchell

Abstract Five centuries of military mapping in arenas around the world are held at The National Archives of the United Kingdom, which is the main official archives of British central government including the military. Earlier maps provide context for the majority of maps, which date from the nineteenth and twentieth centuries. They all illustrate ways in which the armed services used maps; for intelligence and planning purposes, reconnaissance, campaigns, 'going'; to report action and as records for posterity.

This paper uses the theme of relief to explore what light maps from the Archives can shed on the question of how its depiction changed over time, and the extent to which the requirements and challenges of war led to innovations in mapmaking. Examples chosen reflect the response to different military manoeuvres and technical advances, and to the broad spectrum of landscapes encountered by military personnel, from mountains to trenches and desert dunes.

1 Introduction

Advantages of Relief Depiction for Military Use Despite the difficulty of depicting altitude cartographically, there are obvious advantages in doing so, especially in a military context. Height allows command of territory and superior opportunity for observation, whether obtained through a permanent structure such as a fort, or through temporary occupation of a hill by military strength. Access to the air increases these advantages and offers different angles on the ground. Delving below ground can offer safety from enemy fire, and opportunities to tunnel in order to mount surprise attack at ground level and to mine below an enemy-held area.

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2 Early Depiction of Relief: Sixteenth to Eighteenth Centuries

The depiction of relief has always been a challenge for mapmakers. From the sixteenth century onwards hills were usually drawn in profile, often as a simple inverted cup shape, sometimes with elementary shading. Mines were generally shown by a circle and legend to denote the type of pit: clay, gravel, coal. It would be some centuries before more sophisticated representation came into use in the form of various types of hill shading, hachures and contours.

Maps and plans began to be used in England to inform defence and policy from the sixteenth century. Tilbury in Essex, on the River Thames downstream from London, was where Queen Elizabeth I rallied her troops in the face of threat from the Spanish Armada, which Tilbury fort was designed to repel. A section through the fort's construction shows defensive ditch work and palisading. Italian engineers were at the forefront of military construction at the time, and this plan by Genebelli (see Fig. 1) is an example of the latest style, representing many fortification plans, which often had contoured outworks.

Examples from the eighteenth century illustrate how different depictions of engagements showed the landscape in different ways, according to their purpose. A case in point was General Wolfe's victory at the Battle of Quebec in 1759. A chart by the

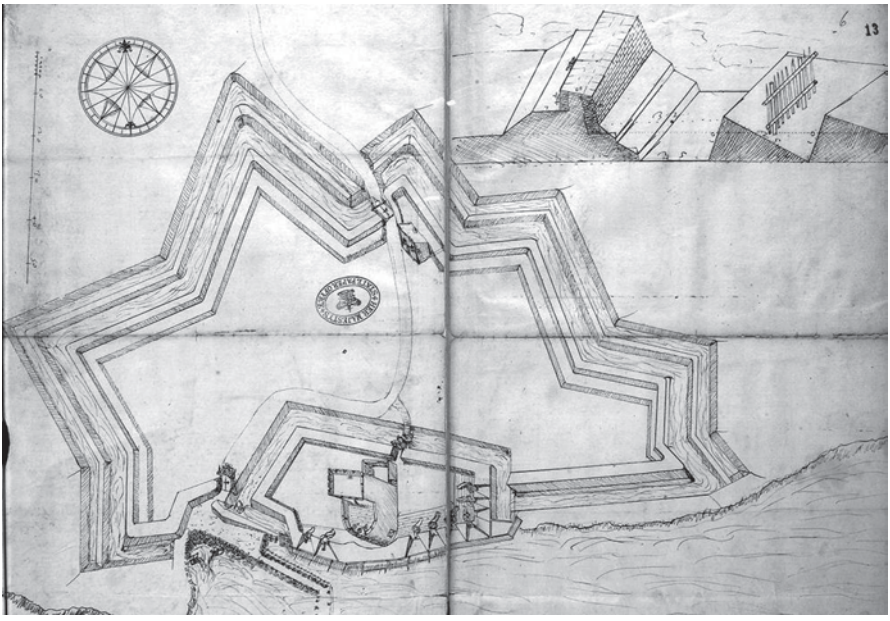

Fig. 1 Tilbury Fort, London, 1588. Document reference MPC 1/212. (Reproduced by permission of The National Archives as are all other figures in this article)

pilot of the British fleet's flagship carrying Wolfe shows soundings and obstacles in the St Lawrence River seen from river level as he sailed to Quebec, with no indication that the city actually lay on a high plateau. A battle plan by Captain Samuel Holland, who served in the battle and who later became Surveyor General of British North America, shows troop dispositions, but not how Wolfe mounted a surprise attack from the river, his men climbing a cliff to the Plains of Abraham. A map made at a much later date to cater for public enthusiasm about historic British battles, still gives only a slight indication of cliffs, but its inset view illustrates the feat of ascent by Wolfe's men, to give a sense of action which the plans lack.[1]

The French were arguably ahead of the British in military mapmaking in the earlier part of the eighteenth century. The French cartographic style was conveyed to England by men such as Isaac Landmann who had taught at the École Royale Militaire in Paris before becoming professor of artillery and fortification at the Royal Military Academy at Woolwich, from 1777 to 1816. An example of his style is a plan of Mont-Louis near Boulogne.[2] One of his many cadets was his son George, who graduated as an officer and went on to serve and make maps during the Peninsular War. A new military education in technical aspects including practical military mapmaking was a factor leading to more and better maps in that campaign.

3 Examples from the Nineteenth Century: Peninsular and Crimean Wars

3.1 The Peninsular War

This campaign was to prove a watershed in British military mapping, by providing an unfamiliar and often mountainous terrain which challenged the army to make a different kind of map. Wellington was one of the first military leaders to recognise the importance of detailed maps for planning and executing military campaigns, in addition to small-scale overview maps used at high level.

Wellington's Deputy Quarter Master General was Major George Scovell, the Man Who Broke Napoleon's Codes (Urban 2002). He had learnt the importance of 'topography' during training for new officers at the Royal Military College in Wycombe. His papers contain many sketch maps, some of which were made by himself, and some by local Portuguese and Spanish guides and surveyors. As they all worked closely together, the terrain and route maps of the latter probably influenced the mapping style of the British army map-makers in terms of detail of terrain and hill shading.[3]

[1] General Wolfe's attack on Quebec: Pilot book, 1759, TNA MFC 1/100; Samuel Holland battle plan, 1760, CO 700/Canada19; Alfred Hawkins map of the battle, Quebec, 1841, CO 700/Canada99. Not all examples used in the talk could be included or illustrated.

[2] TNA WO 78/1037/58.

[3] An example by Albano da Silvera, a Lieutenant in Scovell's Corps of Guides, is at TNA MPH 1/1010/9.

Fig. 2 Sierra de Gata relief map by Thomas Mitchell, c.1811. (Document reference MR 1/167/5)

Another Englishman on the Quarter Master General's staff, Thomas Mitchell, worked in topographical survey and intelligence with such skill (see Fig. 2) that he later became the first Surveyor General of Australia. Any feature which might assist troop movements is included on this reconnaissance map of the Sierra de Gata: roads, mountain passes, and fords passable at different times of year and by infantry, cavalry or even artillery. It is clear from his map that military needs generated much topographic mapping.

3.2 The Crimean War

The Crimean War spawned vast numbers of maps. Examples include a large-scale terrain map showing coastal cliffs near Balaklava by Captain Wolseley, later British commander in chief; a battle plan of the Charge of the Light Brigade showing how the engagement was much affected by terrain; and a sketch map with incised close-knit contours showing British forces at Sevastopol, the strategic Russian naval base

Fig. 3 Plan of tunnels under Sevastopol showing explosion damage *top left*. (Document reference WO 78/1028/2)

on the Black Sea which was a focus for military action from 1854 to 1855.[4] A factor perhaps less well known is the subterranean warfare that was waged during the long siege of the city, as is shown in a plan of tunnels and countermines between a French battery and the Russian-held central bastion (see Fig. 3). What is interesting, is that this evidence of undermining in a siege context is dated rather earlier than the famous instances of mining enemy tunnels on the Western Front in the First World War.

3.3 Military Mapmakers' Work on International Boundaries

Military mapmaking experience was also applied to more peaceful ends, specifically to colonial survey work, as seen with Thomas Mitchell, and to the delineation of international boundaries. By the late nineteenth century British surveying expertise was universally respected to such an extent that there was often a British commissioner on international boundary commissions, even when Britain had no direct interest in the territories concerned. Military survey officers from the respective countries would demarcate the precise line on the ground and produce definitive maps to record the agreed boundary. Notable examples of such men include Colonel

[4] TNA WO 78/1030/23; WO 78/1078/1/4; MPI 1/701/11.

Thomas Holdich, Captain Charles Close, Major General Sir John Ardagh and Field Marshal Simmons.[5]

4 The First World War

The trench map of the Western Front is perhaps the most widely known example of below-ground representation across series of map sheets. The National Archives holds a major collection of trench maps, but as this has been widely documented[6], this paper looks at other ways of depicting underground features and at other aspects of mapmaking during this conflict, including field survey and the beginning of mapping from aerial surveys.

4.1 Photographic Interpretation

Flat areas of land containing trenches were difficult to capture on paper, as well as in reality. The trench map used a complex system of lines differentiated by colour and shape, made intelligible by means of a key. Another way to indicate the position of (otherwise invisible) trenches in the landscape was simply to add legends to a panoramic photograph. Taking the example of Gravenstafel, a small place northeast of Ypres and southwest of Passchendaele, panoramic photographs taken in April 1915 were annotated to show British and 'enemy' trenches plus surface landmarks such as farmhouses. These notes aid the interpretation of a scene (see Fig. 4).

4.2 Geological Maps

What lay below the trenches? The relatively young science of geology was harnessed to determine which places were better for digging trenches, and where fresh water could be accessed from underground. Two professors of geology offered their

[5] For Holdich's work on the Russo-Afghan boundary through the Pamirs in 1895, see TNA FO 93/81/54, and on the 1902 Argentine-Chile boundary commission, see FO 925/1209B; Close's 1898 report on the Nyasa-Tanganyika boundary is in FO 881/7115; for material on Ardagh's work early in his career on the Bulgarian and Turco-Greek frontiers, see his private papers in record series PRO 30/40. Simmons' papers are in record series FO 358, including his work on the Turko-Russian border in Asia. For more on this subject see the podcast on The National Archives website, Lines on the map: records of international boundaries, Rose Mitchell, 25 November 2014. http://media.nationalarchives.gov.uk/index.php/lines-map-records-international-boundaries/

[6] See in particular publications by Dr Peter Chasseaud such as: Chasseaud (1999)

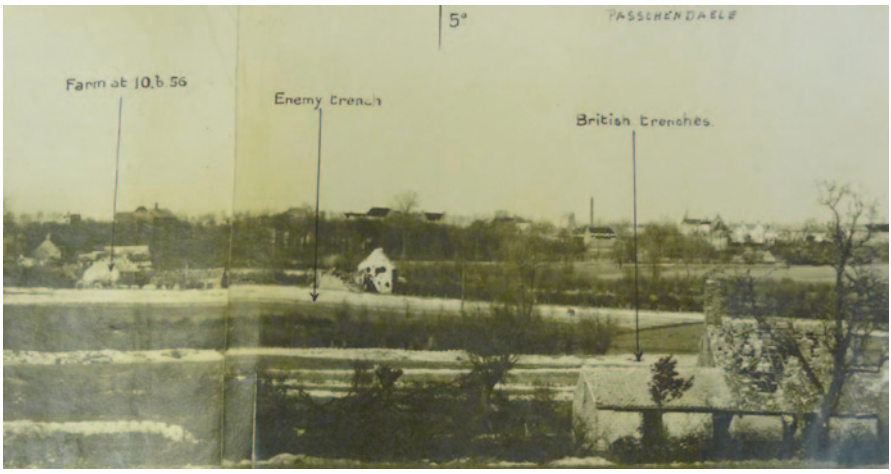

Fig. 4 Part of a panoramic photograph of Gravenstafel, Belgium, 1915. (Document reference WO 316/34)

expertise to the British war effort. Major William King suggested the best places to sink boreholes to ensure a fresh water supply to the troops. Lieutenant Colonel Edgeworth David became Chief Geological Adviser to the British Expeditionary Force, and advised on the construction of trenches and tunnels. The geological maps he compiled played an important role in the placing of tunnels and mines beneath German positions at Messines and enabled a massive explosion which led to the capture of the Ridge. On his maps better ground was marked in shades of pink, and unsuitable ground in greens. Belgian boreholes appear as squares while English boreholes are round (Fig. 5).[7]

4.3 The North Russian Front

Less well known than the trenches of World War I are the underground defences used on the North Russian Front after the Russian Revolution in 1917, when British forces supported the pro-regime Whites against the Bolsheviks. A remarkable set of maps, drawings and photographs give a vivid picture of operations of the North Russia Expeditionary Force from 1918 to 1919. Figure 6 shows defences in the Archangel region in the area around Lake Kholm and Lakhta village. The key notes contours, trenches, blockhouses, machine-gun posts (some dug into the hillside) and wire rays. The blueprint process which was used allowed for rapid

[7] For more about military geological mapmaking see Professor Rose's articles such as: Rose Edward (2009)

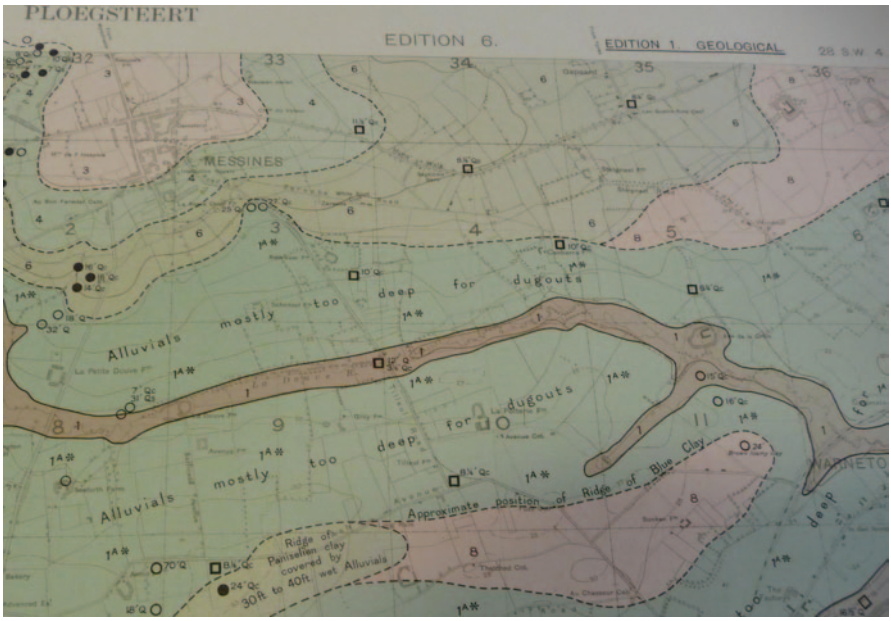

Fig. 5 Part of geological map sheet 28 SW4 for Messines, May 1918. (Document reference WO 297/2485)

reproduction. A drawing shows a machine gun emplacement dug into a hill, while a photograph (not shown here) captures a dugout entrance.

4.4 Field Survey Plane Table Sheets, Macedonia

Theatres outside the Western Front in the First World War were less well supplied with printed maps. Efforts were made to provide cover, as it became clear that they would be needed. The survival of 237 manuscript Field Survey plane table sheets of mountainous Macedonia, produced by members of a British Survey Section assisted by an Indian Survey Detachment, provide an insight into the method of working. Each sheet names the surveyor and checker, and notes how many days it took to compile—the sheet depicted in Fig. 7 took 30 days. Some sheets note working days lost to weather, shifting camp, or shellfire. There are often examiner's remarks, such as 'a difficult bit of ground, carefully surveyed'. Also given might be the name of the man who adjusted the sheet margins—a necessary step when compiling a printed multi-sheet survey. This corpus of maps provides a realistic idea of the map-making process in war conditions on extreme terrain.

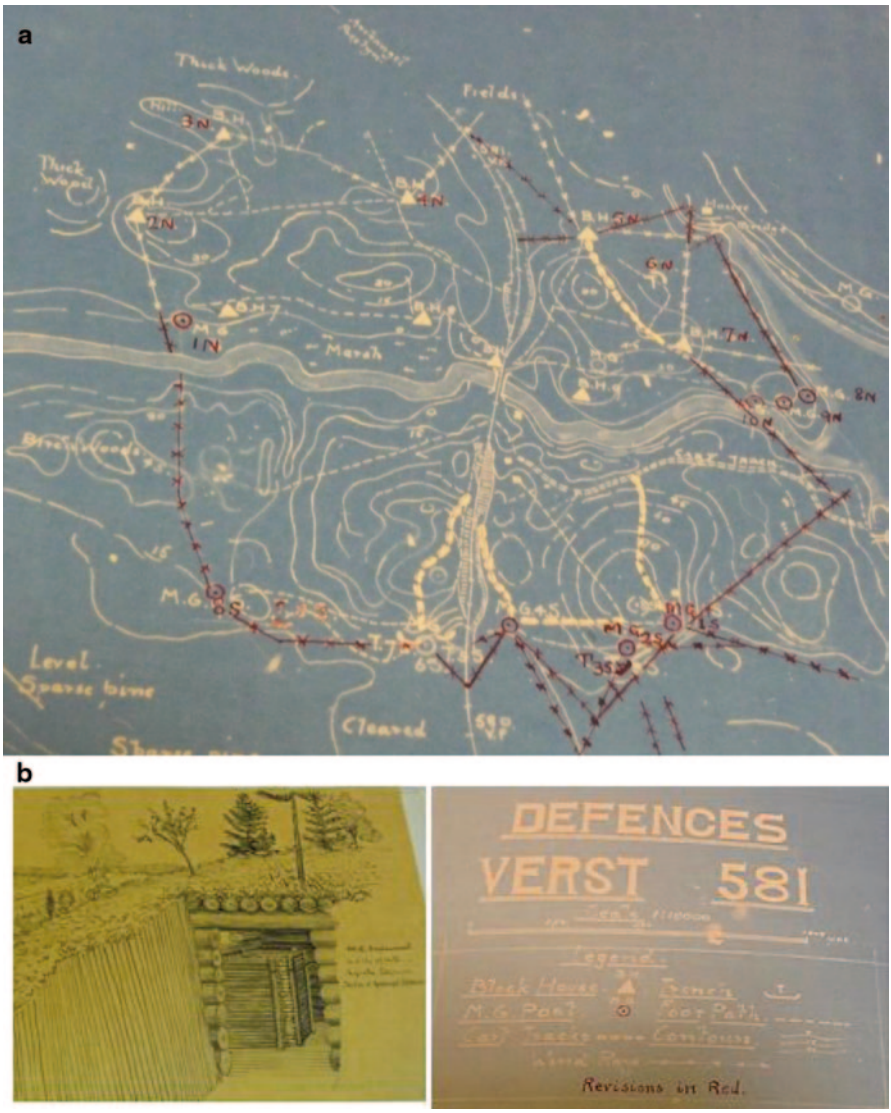

Fig. 6 Map of defences on the Russian Front, Archangel region, 1919. (Document references MFQ 1/208 (map) and WO 32/5705 (file in which maps originally found)

4.5 Balloon Survey Panorama, Salonika

Figure 8 illustrates how height was a surveying advantage in mountainous terrain. This view from a survey kite balloon, one of a series taken from different heights,

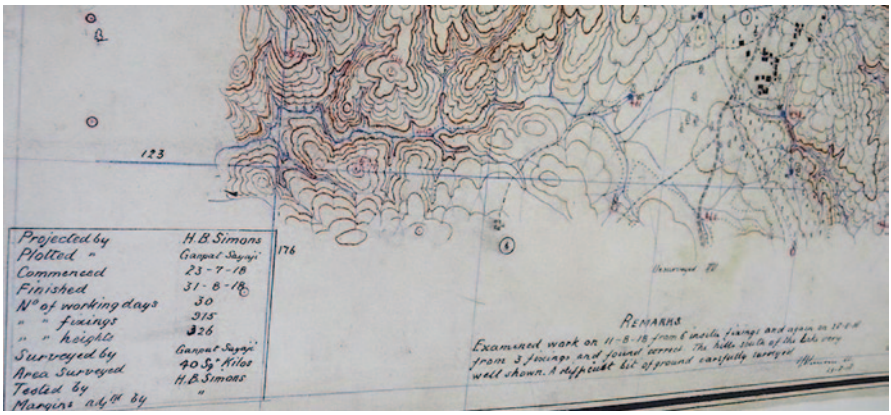

Fig. 7 Macedonia: part of plane-table survey sheet, 1918. (Document reference WO 78/290/256)

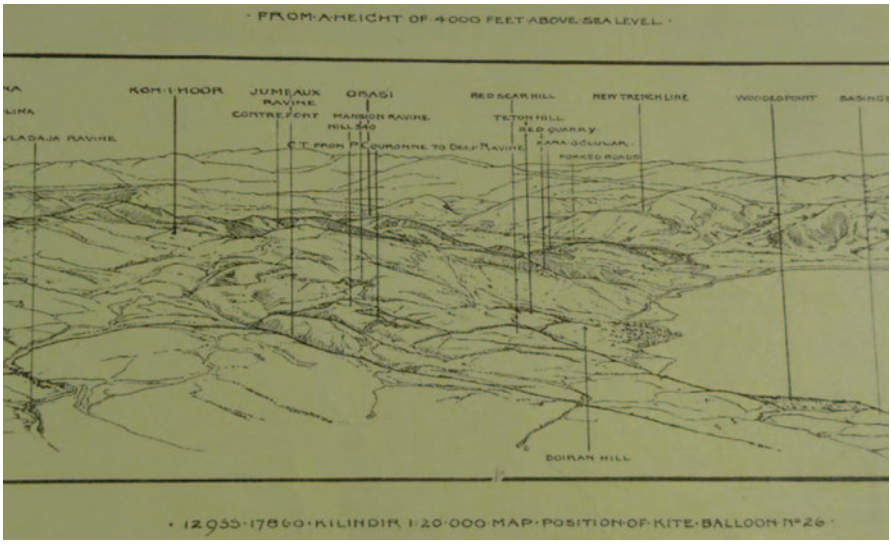

Fig. 8 Salonika: kite balloon survey, April 1917. (Document reference WO 153/1345)

displays landscape features from different angles in the area between the Varda River and the Doiran Lake in northern Greece. It was drawn by W T Wood of the Royal Engineers Survey Company. The legends indicate ravines, roads, and other useful information to be used by an invasion force. This apparently peaceful scene saw much fighting at the time and also later that year.

Fig. 9 Photograph of part of the Gaza Operations model [1917]. (Document reference WO 303/488)

4.6 Gaza Model and Index Map

Model-making was another response to the need to provide terrain intelligence. Turning to the Middle East, Fig. 9 is a photograph of a model made in 1917 of an area below Gaza city for planning operations around Gaza. Details show how local names were used for wadis, but how otherwise British names such as Sleepy Hollow and Salisbury Crags were applied at the top left. Hills called David and Goliath (lower centre) suggest relative height by their names. Models were thus a different and graphic way of showing contours for briefing purposes.

4.7 Record Map of Action at Et Tafila

In contrast to maps made for planning or showing action, maps may show efforts to create an historical record of what happened, some time after the event. A small file on the action at Et Tafila in January 1918, part of the campaign for Damascus, bears a number of copies of a map, which show the strategic location of the town on a high plateau commanding a plain. This map (Fig. 10) was annotated by Colonel T E Lawrence, 'Lawrence of Arabia', to indicate that a strategic ridge on which his name was placed should, he felt, "as a matter of manners" be named instead for the Arab commander during the action, since Lawrence himself "only spectated that day". A later map on tracing cloth shows that this change was made for the record.

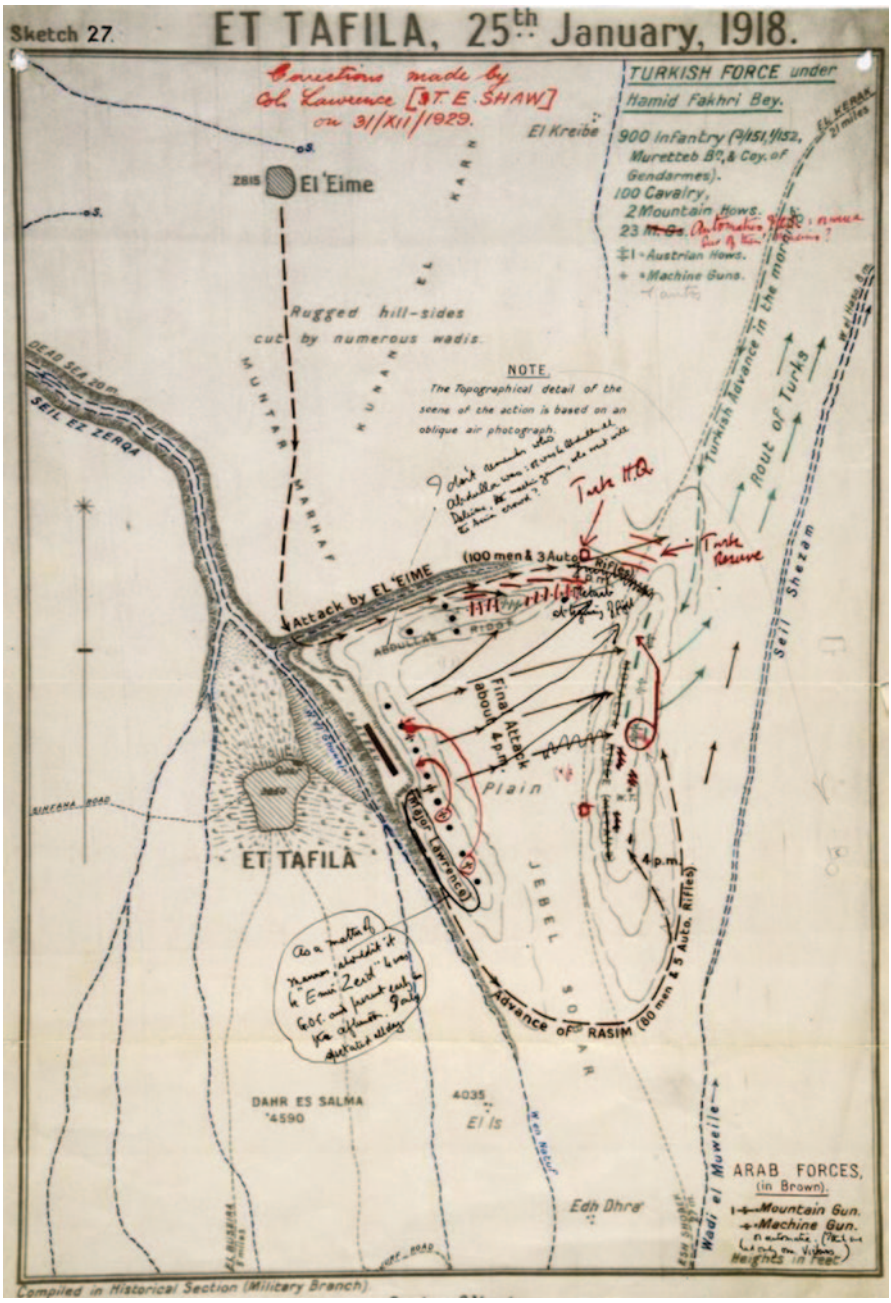

Fig. 10 Draft map of action at Et Tafila, by Historical Section. (Document reference WO 153/1047/1)

5 The Second World War and Beyond

There is room in this paper for just a couple of examples from the Second World War which focus on terrain and new ways to depict it to aid intelligence to commanders in planning operations.

5.1 Maps for the D-Day Landings

The hybrid chart-map shown in Fig. 11 was produced as a response to the demands of planning for an amphibious invasion force; this kind of assault required a new type of map, to show information for all parts of the operation. To the base map of the coastal strip and its hinterland was added overprint detail of German defences and obstacles in the sea, such as mines and stakes faced by Allied troops on Omaha Beach in the Normandy D-Day landings of 6 June 1944. The sheet also bears a coastal profile below the map which highlights how the beach was bounded by steep cliffs that favoured the defenders. Notes about secrecy and limited circulation indicate that this was a high-level planning map for Operation Overlord.

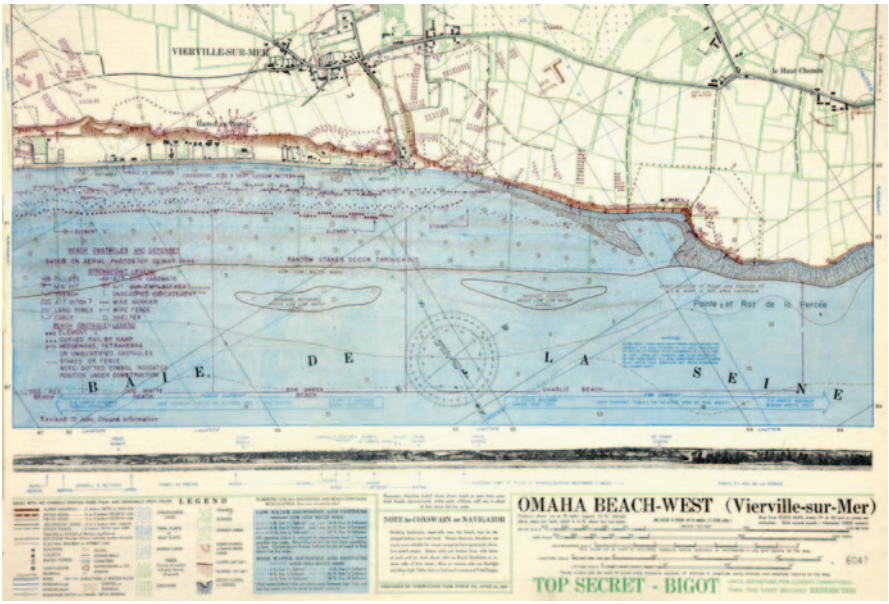

Fig. 11 Omaha Beach, Vierville-sur-Mer, Normandy, 1944. (Document reference MPI 1/450/4)

5.2 Model Making

Planning for Operation Husky, the invasion of Sicily by the Allies in 1943, was aided by models made by the Middle East Interpretation Unit whose work was documented in a photograph album. The first stage was to model the basic shape of the terrain, with contours cut out at 100 metre intervals. The next step was to apply paint and other surface detail, often using maps for reference (see Fig. 12). The finished model was called a 'relief map'. The photograph at Fig. 13 appears in a briefing pack for the Royal Navy, which was assembled by lighting the model for night operations and for an approach from the sea. The advantage of a model over an air photograph was that it allowed re-use for briefings about operations to be carried out under different conditions of light and weather, from air, sea or land, and that it was not dependent on real-time cloud cover. Both models and photographs were also used in mapmaking.[8]

Fig. 12 Model-making. (AIR 23/7088)

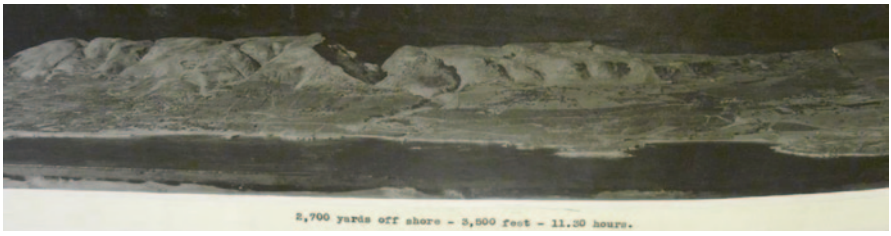

Fig. 13 Model of Sicily for Operation Husky, 1943. (AIR 23/7088)

[8] For more on construction methods and use see Pearson (2002)

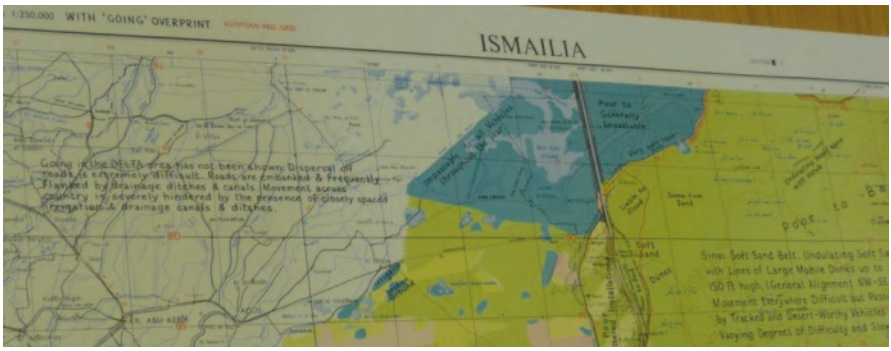

Fig. 14 Suez campaign map with 'Going' overprint, 1956. (Document reference WO 322/54)

5.3 Suez: 'Going' Overprint, 1956

During the 1950s air photographs were used in the compilation of 'Going' maps, which were made particularly for use during the Suez campaign (see Fig. 14). Like earlier maps used in the Peninsular War, they stressed the importance of intelligence about routes, in this case providing vital information about the presence of soft sand which required the use of 'Tracked and Desert-Worthy Vehicles'.

6 Conclusion

From the examples shown, it is clear that to keep pace with the evolving requirements of warfare, there were changes over time in the way terrain was depicted with regard to height and depth. New developments were harnessed, such as the application of photography, air power and geological science for military mapping. Newer types of topographical products were made such as the model, the chart-map and especially the production of large multi-sheet printed maps and overprints to show specific features, with keys to symbols.

There are also broad themes which thread through the history of military maps across the centuries: of reconnaissance—the need to know the lie of the land; route and 'going' maps for different types of military movement; and maps to illustrate what happened at a specific place and time. There is thus both change and continuity in the shapes and features which the encounters of conflict with landscape have made, on land and on paper, from Tilbury to Suez, across five centuries of the highs and lows of military maps in The National Archives[9].

[9] There are a number of examples of maps illustrating the theme of relief in Mitchell and Janes (2014). Examples used to illustrate the talk: hypothetical attack by British balloons and rockets on the major French naval base at Brest, to illustrate an inventor's new means of attack using height c.1800, during the Napoleonic Wars. pp. 118–119 2] A battle plan produced in evidence at a court case some years after the Charge of the Light Brigade on 25 October 1854 during the Battle of Balaklava, an engagement much affected by terrain. pp. 120–121. 3] A sketch map of challenging terrain in the environs of Bulaybil in Transjordan to illustrate the war diary of a battalion of the London Regiment engaged in operations the 1] re in May 1918. pp. 126–127.

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Whose Islands? The Cartographic Politics of the Falklands, 1763–1982

Benjamin J Sacks

Abstract For nearly 250 years a desolate, rocky archipelago between Tierra del Fuego and the Antarctic Peninsula has captivated, inspired, and angered the empires of the Atlantic world. The Falkland Islands have witnessed the clash of cultures and politics, the competing destinies of Britain, France, Spain, Argentina, and even the United States. Although recent tensions between London and Buenos Aires have renewed interest in the Falklands, scholars and commentators alike continue to omit the vital historical and contemporary role cartography plays in this longstanding dispute. This article demonstrates that at significant moments in the Falklands' past, maps and their makers acted both as potent visual manifestations of national propaganda and imperial interest, as well as important tools of negotiation. Ultimately, Falklands cartography proves to be an invaluable asset of historical knowledge as well as a problematic source of friction and confusion.

1 Origins

1.1 Introduction

This is a story about *cartographic persuasion*; the use of maps to convince allies, foes, and those states and peoples who remain on the fence. It is about an on going, 300 year-old public relations battle to persuade international audiences that their respective assertion to the Falkland Islands, or Islas Malvinas, is the only legitimate claim. Since at least the end of the Seven Years War (1756–1763), a variety of state and non-state actors have commissioned, produced, and circulated maps of the Falklands with a highly particular 'knowledge', or selective version of the historical record to promote their claim (Harley 2009, pp. 129–131).

The Falklands constitute a roughly 200-island archipelago some 300 miles east of Tierra del Fuego in the South Atlantic Ocean. Only the two largest islands, East and West Falkland, contain any sizeable population. Stanley is the archipelago's

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capital and the only substantial settlement (Shackleton 1983, p. 1). Following the 1982 Falklands War, the United Kingdom significantly enlarged the existing Mt Pleasant Airport into a major Royal Air Force base (Taylor 2003, p. 270). Until the development of a tourism industry in the early 2000s sheep herding and woollens sustained the Falklands' economy. Recent evidence of oil deposits within the archipelago's territorial waters continues to fuel antagonism between Britain and Argentina.

The Falklands' early history remains controversial, but the basic chronology is well known. The islands lay uninhabited when Christopher Columbus arrived in the New World in 1492. The following year, Spain and Portugal signed the Treaty of Tordesillas, the Papal edict dividing the Americas into respective halves. The Spanish however were unaware of their existence. Englishman Sir Richard Hawkins likely first sighted the islands in 1574, and in 1690 captain John Strong made the first recorded landfall (Clifford 1955, p. 27). During Anglo-Spanish negotiations toward the 1748 Treaty of Aix-la-Chapelle Lord George Anson, recently returned from a circumnavigation of the globe, pressed the British government to formally settle the islands (Fogg 2001, p. 83; Wallis 1983, p. 276). Eager to conclude the treaty, diplomats rejected his scheme (Archer 1986, p. 18; Hertz 1908, pp. 110–112).

In an effort to resettle some of the Acadians expelled from Nova Scotia and rebuild France's Atlantic colonial presence following the Seven Years War, in 1764 explorer and polymath Louis Antoine de Bougainville established Port Louis at Berkeley Sound on East Falkland (Hodson 2010, p. 256; Hodson 2009, p. 206; Wilhelmy 1963, p. 54). The settlement proved short-lived. As part of negotiations to cement the Franco-Spanish alliance, the French government transferred Port Louis (renamed Puerto Soledad) to Spain on 1 April 1767 (Tracy 1975, p. 45). Meanwhile, Royal Navy captain John Byron established Port Egmont on Saunders Island (immediately northwest of West Falkland), apparently without any prior knowledge of France's concurrent effort. British officials resisted Spain's demand to remove the settlement, but reluctantly withdrew in 1774 in response to the empire's rising financial difficulties stemming from agitation in the Thirteen Colonies. The Spanish maintained a nominal settlement until they, too, entirely withdrew in 1811 in the midst of empire-wide fiscal and political unrest. Neither country renounced their respective claim, and both left metal plaques proclaiming their continued sovereignty over the islands (Freedman 2005, pp. 4–5; Reisman 1983, p. 287; Calvert 1983, p. 409).

In 1820 the newly independent Republic of the Río de la Plata, roughly comprising the present-day province of Buenos Aires, declared itself the successor state to all of Spain's existing colonial claims in southern South America, including the Falklands and portions of Brazil and Chile. After a series of diplomatic incidents involving Buenos Aires, Britain, and the United States, in 1833 the Royal Navy recolonised the islands. Apart from the short but brutal 1982 war, the Union Jack has remained flying since.

Despite this tantalisingly enigmatic and controversial past, Falklands cartography remains chronically under-studied. No book- or atlas-length analysis exists. Jordana Dym and Karl Offen's recent and otherwise superb reader on Latin American cartography entirely ignores the Falklands. Article-length scholarship fares little better. The

notable exception is Argentine historian Carla Lois (2009, 2002), who has authored masterful studies of Argentine, South Atlantic, and Antarctic cartography, politics, and nation-states. R V Tooley's concise 1982 *Map Collector* overview is in dire need of revision. In *Imago Mundi*'s 80-year history, only Francis Herbert (1998) and Jorge Guzmán-Gutiérrez (2010) have paid attention to Falklands cartography.

1.2 Conceptual Approach

This article considers three questions when analysing the geopolitical purpose of Falklands maps. First, who commissioned the map(s) in question? Who surveyed, published, and distributed it? Second, what does the map include or omit? Finally, who was the target audience?

Such texts and material objects as maps both intentionally and unintentionally influence culture and decisions beyond their initial appearance or use (Fernández-Armesto and Sacks 2012, pp. 304–305). The collection, production, and dissemination of geographical information can successfully promote an idealised, selective vision of lands and peoples, while deliberately obscuring other claims and realities (Edney 1997). Louis de Vorsey Jr convincingly demonstrated how James Oglethorpe and Benjamin Martyn published and distributed highly selective maps of the southern Eastern Seaboard to successfully 'sell' their new colonial scheme of Georgia. Oglethorpe and Martyn 'borrowed' Thomas Nairne's 1708 map of the Carolinas and Florida (published with Edward Crisp's work in 1711). To convey the region's stability, peace, and fertility, they removed any reference to neighbouring French and Native American settlements and clashes, shifted the Spanish city of St Augustine much further south than its actual location, and exaggerated the size of the Savannah River (1986, pp. 35–38). The ploy worked.

Historians and geographers alike are increasingly cognisant of the influential role cartography plays in geopolitical persuasion, legitimation, and development. In his oft-cited article 'Three Concepts of the Atlantic World', David Armitage proposed a part-historiographical, part theoretical means of describing the transnational movement of peoples, goods, and ideas in the early modern era. Three intrinsically related forms of circulation existed: *circum*-Atlantic, or as a distinct 'zone of exchange'; *trans*-Atlantic, or comparative; and *cis*-Atlantic, or the development and legitimation of 'particular places as unique locations' as influenced by other circulations (2002, pp. 16–21). Although the scope and extent of each remain debated between Atlantic and other historical schools, all three types articulate that ideas and peoples only gained legitimacy and influence through cyclical conversations (including cartographic discourses) across space, time, and language. Similarly, Federico Ferretti detailed how, following Italy's 1861 unification, geographers, politicians, and cartographers collaborated to promote the new country as a singular, powerful national entity. In Europe, Asia, and the Americas they circulated maps, pamphlets, and visuals depicting the Italian Peninsula as one nation-state. This public relations campaign successfully replaced prevailing international conceptions of pre-national

'Italia' as a weak set of quarrelling city-states with an impression of a strong, united imperial country (2014).

2 Hydrography as Territorial Assertion

2.1 A Neutral Map?

When in 1773 John Hawkesworth published *Hawkins's Maiden-Land*, updated with James Cook and John Byron's recently collected hydrographic and coastal data of the Falklands, Britain's political elite was still coming to terms with an empire that had suddenly expanded in size, scope, and responsibility (Lockett 2010; Colley 1992). At initial glance, *Hawkins's Maiden-Land* was a remarkably apolitical map (see Fig. 1). Incorporating the islands' English, French, Dutch, and Spanish names, the cartouche carefully reflected the Falklands' disputed status and complex history of sighting and colonisation. Hawkesworth and Byron similarly labelled East and West Falkland 'Great Malouine' and 'Little Malouine', an awkward but respectable attempt to straddle the parallel English and French settlement efforts (and its Spanish derivative, 'Malvinas'). They even noted where Bougainville had established his short-lived colony, and included some of his harbour and coastal soundings.

But a deeper examination reveals how Byron and Hawkesworth deliberately conveyed the pretence of neutral comprehensiveness to promote the legitimacy of

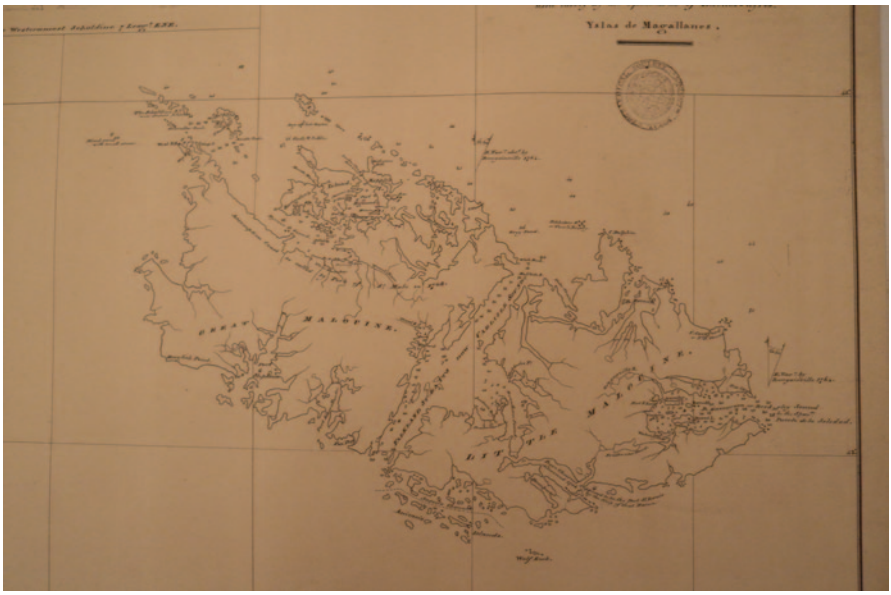

Fig. 1 John Byron and John Hawkesworth, Hawkins's Maiden-Land, 1773. (Courtesy Royal Geographical Society Mr S America S1 27)

Britain's claim. As Lisa Radding and John Western have pointed out, all toponyms are assigned to convey a particular definition. But over time, many place names become 'opaque', or lose the immediacy of their initial meaning (2010, pp. 395–397). Subsequent cartographers, historians, and politicians are free to manipulate, erase, or re-assert them, especially if the toponym's origins have been blurred by memory and time. On the cartouche itself, Byron and Hawkesworth's specific toponymic arrangement reminded viewers of some place names' importance and history, while intentionally obfuscating others. The headline 'Hawkins's Maiden-Land', emboldened in italicised capitals, therefore prompted viewers that an Englishman, not another European, first sighted the islands. Directly linked below, 'Falkland Islands' printed in by far the largest font size, strongly evoked a sense of political continuity. Only afterward, and in considerably smaller italic text, did the authors acknowledge French claims. Spain's assertion, while technically noted, was immediately invalidated by the qualification 'lately by the Spaniards of Buenos-ayres'.

This act of cartographic political persuasion under the guise of mere hydrographic chart making was by no means coincidental. Both Byron and Hawkesworth were involved in the on-going Anglo-Spanish dispute over the islands' future. An intimate of Lord Anson, Byron had returned from establishing Port Egmont convinced of their utility to the Royal Navy. His circumnavigation with Cook (1768–1771) cemented his belief that the Falklands could link the largely British-controlled Atlantic world with the Pacific's untold, exotic opportunities. (Gough 1990, pp. 279–280).

Byron's lobbying excited and concerned MPs torn between expanding imperial trade and maintaining a fragile peace with Spain. Parliament established a committee to ascertain the future of Britain's Port Egmont settlement and asked Samuel Johnson, by then one of Britain's most influential public intellectuals, to author a treatise manoeuvring through this dilemma. Johnson's *Thoughts on the late transactions concerning Falkland's Islands* (1771) agreed with Anson and Byron's case for a way station, but condemned 'war-mongers' with a (ultimately false) declaration of the islands' limited flora, fauna, resources, and climate (Shackleton 1983, p. 1; Clifford 1955, p. 406). Britain however provided little further investment in the diminutive settlement.

To reinforce his position, Byron undoubtedly approached Hawkesworth for his prestigious social connections as much as his publishing acumen. An influential member of London's Georgian elite, he was a long-time editor of its leading periodical, *The Gentleman's Magazine* (Montluzin 1991, p. 272; Reitan 1985, p. 54). A colleague and publisher of Johnson, Edmund Burke, and Benjamin Franklin, he was ideally placed to disseminate Byron's map (Williamson 2004; Abbott 1982; Tierney 1978).

2.2 Flying the Flag

As *Hawkins's Maiden-Land* aptly demonstrated, cartographers and politicians gradually conceived of hydrographic surveying as a potent means of asserting territorial claims. The diverse activities of the Dépôt des Cartes et Plans de la Marine,

established in 1720 and greatly expanded under Jacques-Nicolas Bellin and the Delisle-Bauche dynasty, illustrated hydrographic charts' multifaceted purposes and audiences (Pastoureau 1993, p. 66; Chapuis 1992, p. 90). First and foremost, they were essential navigational aids. The accuracy of a particular chart's depth soundings could mean the difference between safe passage and destruction on a shallow reef or basin. But to achieve this level of accuracy, hydrographic charts required men, ships, supplies and time. Most sailors, hydrographers, cartographers, and scientists involved were military officers in their own right, and needed additional protection. From the mid-eighteenth century the Ministère de la Marine et des Colonies institutionalised hydrography as a tool of imperial assertion, sending such specialists as Jean-Baptiste D'Après de Mannevillette to survey the waterways around France's Indian Ocean possessions (McClellan and Regourd 2000, pp. 37–38), at once advancing French scientific knowledge and signalling to other European powers its regional colonial ambitions.

En route to the Pacific Northwest, in 1789 the Spanish naval vessels *Descubierta* and *Atrevida* arrived off the waters off Port Egmont. Commanders Alejandro Malaspina and Jose Bustamante y Guerra's mission was twofold: to deepen hydrographic knowledge about the Pacific coasts; and to re-assert declining Spanish power in a part of the Americas already falling under British (and some Russian) influence (Cutter 1991). Little is known about this surviving manuscript map, now held at the Royal Geographical Society (see Fig. 2). However, its detailed, even exacting depth soundings of Byron Sound and the passages between Saunders, Keppel, and West Falkland Islands suggests two key motivations. Certainly, there existed a genuine need to obtain a more complete understanding of the archipelago's safest navigational passages. But such information also proved valuable intelligence in the event of a possible British return to the Falklands. Like most hydrographic charts, the *Descubierta*/*Atrevida* map would have been available only to a few privileged eyes within the Spanish Admiralty.

Nearly 150 years later, the Royal Geographical Society and private sponsors tasked the British Graham Land Expedition with a similar scientific exploratory mission: to obtain the scale and extent of Graham Land, Antarctica, and to determine whether it was a peninsula or a series of large islands. On their way to Antarctica, John Rymill and Robert Ryder executed a precise survey of several Falkland inlets and bays, including William Sound. The expedition continued onto Antarctica itself, discovered that Graham Land was indeed a peninsula, completed detailed surveys, meteorological, geological, and biological experiments, and returned to Britain in 1937 (British Graham Land Expedition 1936, p. 166).

Although adventurer Henry Watkins initially proposed the exploration of Graham Land, the Colonial Office soon joined the Royal Geographical Society in sponsoring the scheme. The 16-strong party included at least six naval officers, three surveyors, and two engineers. Rymill himself declared that the entire region was 'British territory', and in subsequent years various British administrations cited the expedition in their Antarctic territorial claim over Graham Land (Rymill 1938, pp. 297–300). New topographical features were named for British monarchs (notably King George IV Sound) and explorers; the process of circulation that

Fig. 2 Plano del Puerto Egmont en las Islas Malvinas, 1789. (Courtesy Royal Geographical Society Mr Atlantic Ocean S48)

subsequently occurred in *The Geographical Journal* and *The National Geographic Magazine* served to propagate, publicise, and hence legitimise international conceptions of the Graham Land as British sovereign territory.

At first glance the Falklands hydrographic surveys appeared to be a sideshow given the Graham Land Expedition's context and stated goals. Three factors however conspired to motivate the group to undertake new soundings. The presence of so many specialist surveyors, hydrographers, engineers, and naval officers in the islands' vicinity at one time provided an ideal opportunity to update long out-dated Admiralty Office coastal charts. But rapidly changing geopolitics likely played as significant a role. The British Empire's dissolution could already be sensed. Since the First World War, Ireland, Egypt, and Iraq had already gained independence, and in India a strong, largely peaceful resistance movement threatened the Raj. In 1931 the Statute of Westminster officially proclaimed the White settler colonies of Canada, Newfoundland, Australia, New Zealand, and South Africa—historically the

backbone of Britain's international leverage—fully autonomous within a Commonwealth and on equal terms with the United Kingdom. Closer to home the National Socialist German Workers' (Nazi) Party had seized absolute power in Germany. In such an unstable international climate, as Klaus Dodds forcefully argued, the United Kingdom needed to reassert its hegemonic spheres of influence, including the South Atlantic (2002, p. xvii).

A restive Argentina also concerned the Colonial Office and the expedition's private business sponsors. Although never a formal part of the British Empire, Argentina constituted a vital link in the United Kingdom's informal empire, or what John Gallagher and Ronald Robinson famously termed 'the imperialism of free trade'. By 1913, for instance, at least 25% of all British overseas investment was directed to Latin America, much of it to Argentina (1953, pp. 9–10). Even into the early 1920s British investors controlled Argentine dockworkers, transport firms, and railroads (Pineda 2009, p. 550; Adelman 1993, p. 90). But by the 1930s British fortunes were rapidly changing. Britain largely lost its trade of industrial and consumer machinery to American and German companies, and Argentine elites increasingly looked to break free of their previous subservient bilateral relationship (Pineda 2009, pp. 554–556). The Falklands had not been on Argentina's 'radar' during the nineteenth century; officials were far more concerned with the conquest and settlement of Patagonia. It was only in the 1930s, when Argentine sentiments shifted towards such rivals to British power as Germany, that the Falklands again became a national issue (Chehabi 1985, p. 222). The presence of the Royal Navy, surveyors, and expedition aircraft would have sent a message to Argentine officials, even if the hydrographic survey's results remained confidential.

3 Popular Cartography

3.1 The Letts-Stanford Atlas

By the mid-1870s, the Falklands' population was self-sufficient, largely employed in whaling, sheep herding, and the maintenance of Royal Navy vessels. At home, the islands had all but disappeared from the national consciousness—a tiny outpost serving *Pax Britannica* (Royle 1985, pp. 210–212). Cartography however held a more enduring interest for Britons. The London Society for the Diffusion of Useful Knowledge's significant efforts to produce high quality, inexpensive maps for Britain's burgeoning working and middle classes highlighted both heightened public interest in Britain's global role, and the Society's interest in promoting a 'British World Order' (Barrow 2004, p. 677; Cain 1994, p. 151). In 1836, the Society produced an inset map of the Falklands as part of their 'Islands of the Atlantic' plate (see Fig. 3). Apart from the plate's evident (and truthful) networking of disparate-appearing Atlantic island colonies, the publisher added the following, surprisingly neutral and dispassionate caption:

Fig. 3 1865 Falklands Inset Map, London Atlas of Universal Geography. (Courtesy David Rumsey Associates 2326059)

> These islands have been colonised and abandoned by France, England, and Spain successively, but are now in the possession of the English. They contain many excellent ports, some good soil, innumerable horned cattle, rabbits, game and fish; and though no wood plenty of peat fuel (126).

Such references of natural harbours and inlets, ‘good soil’, ‘game and fish’, and ‘peat fuel’, mimicking contemporaneous descriptions of Ireland, served to familiarise general readers with an otherwise exotic archipelago 8000 miles distant.

In 1848 the Society ceased to exist, a victim of rising costs and changing domestic politics. Its valuable cartographic plates were sold to Letts, reappearing in the *London Atlas of Universal Geography*, this time directly marketed to educated middle class Britons and citizens of the White settler colonies. The original caption nonetheless remained unchanged in post-1848 editions. Geography publisher Stanford took over the production of the *London Atlas*, releasing its first, revised issue in 1887 (Herbert 1989, p. 106). But accounting for the changing geopolitical dynamic, Stanford’s cartographer quietly changed the Falklands’ caption, replacing the apolitical description with a triumphant expository on the islands’ position at the intersection of the Atlantic, Pacific, and Antarctic:

> They [the Falklands] are now of considerable value for provisions and repairs on the route to our Australian colonies, this becoming every year more apparent. The population…is rapidly increasing. Port Stanley is the harbour most frequented.

Few, if any viewers would have bothered to compare descriptions. With a single stroke Stanfords altered the meaning of their Falklands map without changing the base layer, much as Oglethorpe and Martyn had manipulated Nairne's map nearly two centuries previously. As the atlas's inset frontispiece advertisements for fashionable goods evidenced, the future political leaders increasingly targeted by *The London Atlas* would have seen the revised description without any knowledge of the original's existence.

4 Argentine School Maps

In his 1946 election manifesto Juan Perón stressed the importance of the Argentine nation and the end of its economic reliance on the United States and Western Europe. Decree 8.944 of 1946 prohibited the publication and distribution of any national-scale map of Argentina that did not include its claims to the Falkland Islands and Antarctica (Troncoso and Lois 2004, p. 294). The 1951 creation of the Instituto Antártico Argentino—a response to Britain's establishment of permanent scientific bases in Antarctica (1943) and the Falkland Islands Dependency Survey (1946)—reinforced this legislation (Dodds 2009, p. 506; Hattersley-Smith 1986, p. 369; LeShack 1963).

The Institute's maps, like those produced by the military (with which it enjoyed an intimate operating relationship), were collected and distributed by the Instituto Geográfico Militar to public institutions, primary and secondary schools, and universities. Frequency of publication and dissemination underscored the official *Mapa de la República Argentina*'s effectiveness. Annually revised, and distributed in a diverse array of pamphlets, school atlases, wall charts, and posters, the *Mapa de la República Argentina* soon became a fixture of Argentine historical, cultural, and political education. These national maps at 1:10,000,000 scale were supplemented by both institutes' projections of Tierra del Fuego, Antarctica, and the South Atlantic islands at 1:5,000,000 and historical maps at 1:4,000,000 (Royal Geographical Society collections).

4.1 Subliminal Maps

To publicise and legitimise their respective claims, both British and Argentine authorities, as well as the Falkland Islanders themselves, have used maps in unconventional, even subliminal settings (Davis 1985). In 1992 Walter Klinefelter examined a little noticed but on-going stamp war between the Argentine Post Office and the Falkland Islands Philatelic Bureau. Argentina fired the first shots in 1964 during Operación 90, a major military-scientific operation to promote its South Atlantic claim. This particular stamp depicted the province of Tierra del Fuego, Antarctica, and the South Islands. Tierra del Fuego's prominence on the stamp deliberately suggests an elegant 'geographical flow', a continual connection from Andes, down

Fig. 4 2014 50 Peso Argentine banknote. (Courtesy The Telegraph 3 April)

through Ushaia and the Straits of Magellan, on to the South Atlantic islands, and finally to the General Belgrano Research Station and the South Pole. The 4 Peso stamp is beautiful cartographic propaganda: simple, straightforward, aesthetically pleasing, and containing only just enough information to hammer home its central point (Klinefelter 1992, pp. 7–8).

The Falkland Islands' government responded in kind, printing a series of stamps to weave a narrative of continuous British control. Byron and Hawkesworth's *Hawkins's Maiden-Land* reappeared on the 10 Pence stamp. Only the archipelago's outline was visible, the words 'Hawkins's Maiden-Land' gracefully stretched across both West and East Falkland. Argentina's retort came into the form of a memorialisation to Jacinto de Alto Laguirre, a late eighteenth century Spanish governor of the islands, replete with a period map with 'Malvinas' across both islands. In 1977 the Falklands Philatelic Bureau embarked on a different tack, celebrating 50 years of wireless communication. In this 'map of the airwaves', the radio transmitters at Fox Bay (West Falkland) and Stanley (East Falkland) appear to seamlessly connect with one another and the archipelago's entirety.

Subliminal cartographic propaganda continues to be an effective weapon in the Falklands dispute. On 3 April 2014 the government of President Christina Kirchner announced the release of a 50 Peso banknote with an obverse map of the Falklands (see Fig. 4). Evoking the 1964 4 Peso stamp, the 50 Peso banknote is an exercise in cartography beauty. The Falklands' emboldened outline is seamlessly draped over a faded relief map of Tierra del Fuego, binding the regions together in a graceful, natural, unbroken curve (Perry 2014). In the lower right corner, the Argentine Mint placed the official *Mapa de la República Argentina* familiar to school children and their parents. The cartographic struggle over the Falklands continues.

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