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# Maps, Geography and the Representation of Space

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**After the First World War, the general staffs and military geographers of all the European nations agreed that the war at the front, but also at home, had led to a “geographical turn of mind.”<sup>[1]</sup> The experience of static warfare had fundamentally changed the demands placed on geographical knowledge and the ways in which it was represented. The map as a medium grew in importance, but it also posed new challenges for armies, ushering in a process of professionalisation and ultimately leading to both the medium and the body of knowledge on which it was based seeping into post-war society.**

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## Introduction

Although it has gone largely unnoticed by historical research until now, after the end of the First World War, several European nations held reviews and conferences where geographers, cartographers and surveyors of the general staffs and national geographic bodies were called to account for their actions during the war. Their almost unanimous assessment was that the map material provided at the start of the war was wholly insufficient and did not meet the tactical and day-to-day requirements in the field. It is true that this shortcoming was largely resolved over the course of the war; however, the [military and civil](#) aspects of this experience still had to be dealt with and conclusions had to be drawn for the future.

These self-critical assessments are surprising because, in popular perception, the First World War is inextricably linked with the widespread use of maps in military training, provision and activity. Digital platforms such as *Europeana* have helped in no small part to create this impression, but so have regimental correspondence and, in particular, the historical representations of the war published in European countries during the inter-war period. I argue here that research and self-representations (including diaries, for example) reflected a development which had its origins in the specifics and demands of the First World War and which was hugely accelerated as the conflict progressed. In static [warfare](#), maps were crucial for survival, since the knowledge they contained fulfilled several key functions, such as:

- orientation in space (front and home),
- basis of effective military technology (artillery and air forces),
- and supplies for the front and base (logistics, drinking water).

The enormous growth in the significance of maps led institutions to adopt them, and European armies to develop military surveying techniques. By the end of the war, this discipline had increased map production on an unprecedented scale and at an inconceivable speed.

At the same time, the growing need for reliable maps increased demands on the soldiers and their ability to handle the medium; in turn, their expectations of what a good map entailed changed and the maps' shortcomings became the subject of frequent complaints. The status that the medium enjoyed in the field helped to popularise it at home, generating different forms of representation and codes that visualised the holding of the front and, consequently, the lack of movement in space, without disclosing any information relevant to the war itself.

The use of maps developed after 1915 until they were practically ubiquitous, as ultimately shown in the wealth of memoirs, regimental correspondence and historical representations created, especially in the inter-war years. However, the map material, which was frequently extensive and detailed, not merely reflected the relevance of the medium, but also provided evidence and underlined the validity of the accounts presented. Numerous references along the lines of "as a glance at the map will

show”<sup>[2]</sup> are an eloquent expression of a function which has thus far been almost completely overlooked by the research community.

## State of Research

Although certain contemporaries were indeed referring to the changed perception of space and landscape as a “geographical turn of mind,”<sup>[3]</sup> the way maps grew in importance during the First World War, as outlined above, has barely featured in research up until now. A quick look at the latest reference works and international encyclopaedias highlights this gap. Readers will be hard-pressed to find entries such as “maps”, “map usage” or “map production”. What’s more, with the exception of just a few special studies, the relevant overviews provide no answers to the questions of how soldiers actually perceived their space and oriented themselves with the help of maps. Some more recent monographs do deal with the topic of space and touch on cartographic aspects.<sup>[4]</sup> However, a scholarly historical examination of the process of cartographic imaging, of the use of maps in training, in the field and in public, and finally, for their role in preparing for and conducting the peace talks in Paris – thus, one which really analyses the map as a medium – is still in its infancy.<sup>[5]</sup> By contrast, the renowned *History of Cartography*, which includes articles on “military mapping” and “World War I,” is still able to give some insights into military and martial cartographic developments at the start of the 20<sup>th</sup> century.<sup>[6]</sup>

In contrast to these scant research findings, however, there is an abundance of material that allows one to pose a number of questions and conduct numerous studies on subjects stretching from political history and the history of science through to the history of things. This article is only able to scratch the surface of this range of topics and, since research has until now paid little attention to the role the First World War had in opening up map production and use, it will focus on certain universal trends and problems in interacting with maps and outline different forms of visual representation.

## Cartography and the Military

At the beginning of the 20<sup>th</sup> century, military action and territorial knowledge were extremely closely linked, although the state and status of military cartography in the different European states varied considerably. Two types of military map are common to all nations. These maps had been growing in significance since the 18<sup>th</sup> century and their impact was felt far beyond military circles.

First, there are overview maps, which, with the exception of older types such as those from [China](#), have been used and handed down by the military since the early modern period. They record topographical features such as rivers and coasts, roads and bridges, usually in the vicinity of [fortifications](#). Prominent examples are Italian and English maps from the 16<sup>th</sup> century; these were frequently reproduced as wall hangings or tapestries, adorning palaces and even the walls of the House of Lords.

Overview maps of larger regions have been produced since the 17<sup>th</sup> century, when engineers working for the French king started surveying and mapping his territory. Similar developments took place in other European countries from the 18<sup>th</sup> century onwards. As nation-states began to form at the start of the 19<sup>th</sup> century, the importance of maps grew continually and significantly. While they define a state's borders as they change over time, they also collate information about activity within the territory, from its topography to its economy, its population and their characteristics. They document and visualise spatial knowledge, reflecting not only the national and cultural aspects of their particular time, but also taking into account different selection criteria and principles of representation, depending on the map's function. Charles Maier has called this process "territoriality" and numerous recent studies refer to maps and the role they play in the conflict that necessarily arises when the state tries to both help and monitor its citizens.<sup>[7]</sup>

A second type of military cartography is the battlefield map. This kind of map has also been used since antiquity to plan military operations, record situations as they unfold during a war and depict the events of a war after the fact in order to illustrate and learn from them. In the beginning, drawings that showed the relevant topographical features were frequently used to create such maps; comprehensive atlases have prevailed since the 16<sup>th</sup> century, representing campaigns and the events of battles through words and cartographic visualisations. The best-known work is surely the *Theatrum Europaeum* published by Matthäus Merian (1593-1650), a journal which also served the purpose of providing war reports from 1618 to 1718. In this respect, the work was aimed at an audience far beyond just military leaders.

During the 19<sup>th</sup> century, these battlefield maps achieved much greater popularity, since cheaper atlases, and particularly historical school atlases published as teaching materials, received larger circulation.<sup>[8]</sup> New technological developments such as lithography, colour printing and cartographic symbols indicating movement gave the maps, which were static in and of themselves, a dynamic feel and made them more attractive. The term chosen by Merian, "theatre", was adopted into the titles of many such atlases, not least because of its allusion to a performance.<sup>[9]</sup>

Although the topographical accuracy of these maps was initially of little significance, this changed over the course of the 19<sup>th</sup> century due to the spread of ordnance survey maps. Depending on availability, they formed the basis for battlefield and historical maps. Users of contemporary maps in particular preferred topographically accurate versions that corresponded more closely with their own experience of the space, usually gained when they had spent time on the terrain as soldiers.

Until the 20<sup>th</sup> century, an important part of officers' training was to examine past strategic military decisions, using maps and reports as examples; evidence for this can be found in numerous memoirs. Alongside battlefield maps, ordnance survey overview maps had also become more significant in officer training since the end of the 18<sup>th</sup> century, as they were used to plan military operations and to make strategic decisions.

Depending on availability, the officers either used the actual maps themselves, or fell back on blueprints or reproductions which had been reduced to the essential topographical information, and then drew on the positions and movements of entire companies in colour. In terms of topographical features, map representations had been continuously adapted to the specific needs of the military since the early 19<sup>th</sup> century, for example by expanding the cartographic symbols of soil structures. The system proposed by Johann Georg Lehmann (1765-1811) in 1799 was revised and published in new editions many times right up to the 1840s. Almost all of Europe's military schools adopted his system, which was also introduced in [Great Britain](#) after it was translated into English in 1822.<sup>[10]</sup>

## The Maps Available at the Start of the First World War

However, the adoption of this system in no way means that the European powers were planning and conducting their operations with internationally standardised maps at the start of the First World War. Even forgetting the fact that some regions, like the Balkans, did not have any reliable maps in the first place, mapping within [France](#), [Germany](#) and [Belgium](#) was still far from uniform. Rather, various types of maps existed, which, since they were based on different systems of coordinates and projections, were not compatible with one another. For instance, Russian maps alone were based on three different spheroids, whilst in France, different spheroids were used depending on the time the survey was conducted. These variations were irrelevant for strategic planning on a chart table, but when it came to producing [artillery](#) maps for static warfare, they could mean the difference between life and death.

Typologically speaking, the maps available covered the full range from large to medium and small scale. Operational maps on small and medium scales offered a good overview of the terrain and facilitated strategic thinking. As a rule, general staffs would use map sheets on a scale of 1:100,000 to 1:800,000 when planning and deciding on troop movements, such as the German "Overview map of Europe and the Middle East."<sup>[11]</sup> This type of map, used for mobile warfare on a chart table or on the commanders' hill, became less important as the war progressed, in the end being used for aerial warfare only.

In contrast, the need for large-scale maps increased rapidly and continuously with the advent of trench warfare. The ordnance maps available at a scale of 1:100,000 for Germany and 1:80,000 for France used for training purposes could barely meet these new conditions. The French also had the *plan directeur* at a scale of 1:20,000 and cadastral maps from the 19<sup>th</sup> century (1:2,500). These were stored in the corresponding provinces and, on conquering the city of Lille in October 1914, the Germans were able to capture maps for the entire north of the country.<sup>[12]</sup>

These "captured maps" were a valuable commodity during the First World War, since at its start, the general staffs usually only had access to their enemies' small-scale map material. Indeed, the German capture of the Lille maps was a serious loss of information for the British and the French; it meant they had to rely on copies from Paris, while some regions even had to be surveyed and

mapped again.

On French terrain, both the British and the Germans were dependent on the ordnance maps and the *plans directeurs*, although once “the ground opened up”<sup>[13]</sup> and static warfare began in the trenches, they no longer offered much more than a makeshift solution. In the end, not even enlargements, which the armies had managed with initially, could meet the need for large-scale maps containing detailed information about soil structure. Problems related to production and logistics forced the general staffs to fundamentally rethink their approach to cartography; additionally, surveying departments had to develop new methods and [technologies](#).

## Map Production during the War

This completely new requirement, and its scope in particular, had far-reaching consequences for military surveying, whose origins can be found on the battlefields of the First World War.

At the start of the war, the German Empire had no central surveying department; rather, land surveys and map production were in military hands under the general staffs of the states of Prussia, Bavaria, Württemberg and Saxony. The *Felddienstordnung* (field service regulation) of 1908 made no provision for organising mapping and surveying in the event of war; in the spring of 1914, the Prussian army had set up just three stronghold surveying departments.<sup>[14]</sup> The British and French general staffs were better prepared, since they had their own surveying departments, following reforms and institutional restructuring work. In France, the *Service Géographique de l'armée* (Army Geographical Service) had been established as early as 1887, although it was dissolved by the staff in 1911 and developed into an independent department within the army. Geographer [Robert Bourgeois \(1857-1945\)](#) was responsible for this department from the time it was reorganised and all throughout the war. In Great Britain, a Topographical Section, later renamed Geographical Section, was assigned to the general staff in 1904 (Geographical Section, General Staff or GSGS). Until 1911, this section was headed by [Charles Frederick Close \(1865-1952\)](#), who reformed organisation and training based on his experiences of surveying in [India](#); after that, he took over as Director General of the Ordnance Survey.<sup>[15]</sup>

During the mobilisation effort at the start of the war, employees of the land surveying departments in many German states were drafted, as they were in both France and Great Britain, where sixteen out of a total of twenty Ordnance Survey staff members donned a uniform. The remaining workers and surveying units were soon overwhelmed by the demands of static warfare. In 1915, therefore, the German *Kriegsvermessungswesen* (Military Surveying Department) was set up within the general staff under the leadership of [Siegfried Boelcke \(1876-1930\)](#) from the Prussian *Landesaufnahme* (Land Surveying Department). In addition, surveying departments were created for the individual armies. By the end of the war, there were twenty-nine surveying departments and nine printing trains that covered the ongoing need for maps. In January 1915, the British sent an entire surveying unit of eleven topographers and three engineers to France under the leadership of [Harold Winterbotham](#)

(1878-1946) to produce a map at a scale of 1:20,000.<sup>[16]</sup> On the British side, 5,000 people were involved in surveying work by 1917, a number that no command or general staff would have predicted before the start of the war.

Recruiting suitable personnel, as well as educating and training officers and soldiers, presented a challenge. These tasks were taken over, not only in Germany, by those with knowledge of a closely related field, such as cartographers, geographers and geologists.<sup>[17]</sup> Training courses in surveying were organised for British officers, with artillery survey training being introduced over the course of the war. Even the French, who, by German standards at least, were relatively well trained due to measures introduced by the *Service Géographique* since the 1890s – including teaching of surveying techniques and the continuous revision of their maps –, held regular conferences on surveying for officers during the war. These meetings covered all relevant topics, from projection and cartography to ballistics and survey organisation. The American surveying units were being prepared for their work as well, practising how to map trenches, even though they did not yet realise just how vital this skill would be to their survival:<sup>[18]</sup>

Mapping on a desolate terrain that has been shot to pieces is a very arduous task. One has to climb from one shell crater to the next, trenches and wire entanglements blocking your way everywhere, and many thousands of dud bombs, which one would rather steer well clear of, are hiding under the soil or lying around on the ground. All you really need to do is look at the shell craters, which are often really deep, the emplacements and the dugouts, most of which go right through the clay and into the layer of chalk.<sup>[19]</sup>

Surveying a landscape where the over- and underground conditions fluctuated on a daily basis bore little resemblance to the techniques learnt during peacetime. Additionally, even before the war, the basic triangulation nets used by the French and Belgians were nothing like the ones used by the British, so the systems on which the maps were based were not immediately compatible. On top of that, triangulation and measuring points, particularly church spires, had been destroyed during the war, so the surveyors had to make do with poles, wooden scaffolding and sometimes even makeshift trees.

The surveyors were assisted by balloons and aeroplanes, which took aerial photographs whilst on reconnaissance missions. New techniques of evaluating aerial photography, performing stereophotogrammetry and rectifying the images during cartographic conversion were established even before the end of the war, and were refined at an international level in the inter-war period.<sup>[20]</sup>

The demands that static warfare placed on map production were manifold; alongside speed, the accuracy and reliability of the maps became even more essential. These requirements applied to everything a soldier might do, whether on a march, in combat or even during periods of rest; of all the corps, however, it was the artillery units which were especially dependent on up-to-date, reliable maps. When dealing with ordnance with a range of up to 100 km, it was vitally important that battery and long-range maps were surveyed and represented accurately in order to achieve successful indirect fire and avoid friendly fire.<sup>[21]</sup> The material from which the maps were made presented yet

another problem: since paper is susceptible to moisture and curls up, battery maps were mounted onto wood or metal. An American protective cover and a carry handle made the battery charts (boards) very popular, with the British Ordnance Survey alone sending out 11,000 units.<sup>[22]</sup>

## Map Representation

Trench warfare was increasing the need for up-to-date, reliable maps, whilst at the same time expectations were changing of what information those maps, which had been based on military practice and the everyday experience of war, should contain. Over the course of the war, therefore, map representations and cartographic symbols changed, too, thanks to continuous adaptation and expansion. This development took hold simultaneously within the two coalitions, and was accompanied by a process of indirect transfer, since information from captured maps and prisoners of war ultimately did reach the enemy, despite efforts to keep it secret. After the war, all sides took notice of these developments, establishing many of the innovations as new cartographic standards. In January 1919, during a presentation in front of the Royal Geographical Society, the British officer Colonel Winterbotham illustrated this change in map representation with the help of several map extracts.<sup>[23]</sup>

These maps already show one of the fundamental innovations from the summer of 1915, namely, the introduction of a grid, a feature that has survived to the present day. Initially introduced by the French to enable the artillery to determine positions quickly, other nations adopted the grid, too, albeit with significant changes in the British version. Concerned about the soldiers' abilities, the British decided against a metric system, which in hindsight proved to be not only an error, but also an additional complication: due to the lack of compatibility with the French maps, this move actually made things more difficult in practice.<sup>[24]</sup> The map grid was then explained to the soldiers. In addition, the "compilation diagrams," which explained the information on which the map was based and detailed when mapping had been performed, also helped to make the map easier to use.<sup>[25]</sup>

The more entrenched the war became from the summer of 1915 onwards, the more vital knowledge about the geological conditions on the ground, which were recorded in overview maps, became. Such information was not only necessary to create trenches and bunkers, but also to ensure the water supply to and the groundwater removal from the trenches, which required geological expertise. Geological maps of resources and mining opportunities were produced, too, in order to utilise the occupied territory for the benefit of the wartime economy.<sup>[26]</sup>

While the geologists were largely able to fall back on familiar forms of representation and cartographic symbols for this type of mapping, the trench system itself called for new forms and symbols to represent underground sites that were not visible from above ground. Knowledge of the enemy's trench system was just as useful and necessary as information about the designations, codes, names and numbers the soldiers gave to the batteries, trenches and entry points in order to orient themselves and communicate with one another. The soldiers gave their own survey points,

trenches or supply routes, as well as those of the enemy, names such as *Russenstraße* (Russian Street), *die Spinne* (The Spider), *Zickzackwäldchen* (Little Zigzag Wood), “Baby Trench,” “Cactus Point”, *Tranchée des Homo-Sexuels* (Homosexual Trench) and countless others, which in certain cases were even adopted by the enemy and retained after the war was over. These names, as well as the trench numbering system introduced by the French in 1915, were always treated in the strictest confidence. If captured maps revealed one’s own information to the enemy, this had to be marked in subsequent versions, too.<sup>[27]</sup>

Maps of trenches and positions have survived in different variations, most showing considerable signs of use. They range from individual drawings to printed sheets with handwritten notes. In order to stay up to date, units in the field often drew blueprints of map sheets or used “plotting sheets”, on which they entered the relevant information, stating the template and the date. The names that had become established in the troop unit were just as important in this process as symbols and colour codes for marking one’s own and the enemy’s positions. Right up until 1918, the British frequently only marked enemy positions and trenches on the maps, in red, whilst over the course of the war, the Germans had begun to record their own positions, too, in blue. In 1918, the British changed their map colours, adopting the French system that marked one’s own positions in red. However, this type of standardisation also entailed the risk of users becoming confused; to counteract this, the maps contained clear warnings, reminding users of the change.<sup>[28]</sup> The keys therefore became very important, since they explained the cartographic symbols used and ensured the map was legible before systematic attempts had been made regarding standardisation and organisation. They were the subject of regular officers’ conferences and included in soldiers’ – usually brief – training, as many war volunteers had only limited knowledge and experience of such things, and it was feared they could make the maps less uniform.<sup>[29]</sup>

During the first year of the war, unforeseen problems arose in particular when the British used French maps. The French place names proved tricky for the British soldiers to master; this only started to become less of an issue in the autumn of 1914, thanks to the use of concordance lists and an increasing familiarity with the region and the terrain. But the difficulties were not restricted to matching up French place names; they were more fundamental than that, since the skills of map reading and using a map to orient oneself were not a systematic part of basic training in every army.<sup>[30]</sup>

## Map Reading and Training

We still know very little about how geospatial reading and orientation skills were taught in armies or in societies at large at the start of the 20<sup>th</sup> century. In the spring of 1915, *The Times* stated that people were severely lacking in map reading and comprehension skills, and that “surveying terrain and drawing” were theoretically indeed part of military training even in peacetime, but were rarely actually taught.<sup>[31]</sup> The difficulties experienced at the start of the war and the wealth of instruction manuals

published beginning in the spring of 1915 underline the impression that there was a considerable skills shortage below the officer ranks. The extent to which the French army was an exception to this must be the subject of future research. As has already been mentioned, the surveying departments and provision of maps in the French general staff were basically in a class of their own even before the First World War (see Section 3). However, this primarily refers to small-scale maps, which were not suitable for orientation on the terrain or in the trenches.

On the German side, the new challenges experienced during the war and the lack of drawing and map-reading skills exhibited by a large number of soldiers resulted in ministerial orders imposed in the summer of 1915. These required that drawing lessons be re-introduced into [schools](#) in order to train the eye and sharpen the ability to “depict what one is looking at in a quick sketch”. The sluggish implementation of this order moved [August von Trott zu Solz \(1855-1938\)](#), the Prussian minister of culture, to issue a new order in November 1915, emphasising that the re-introduction should focus “on rapid realisation and on producing sketches and diagrams of terrain”. These exercises were to be complemented by “instruction in understanding maps, which should concentrate especially on reading plane survey sheets and on exercises for drafting sketch maps,” as prescribed in the 1901 geography curricula.<sup>[32]</sup>

A number of guides on sketching terrain and reading maps then appeared in the form of newspaper articles and monographs to help teachers, trainers and soldiers. Starting in 1916, the very popular *Stuttgarter Bilderbogen* published several guides, including ones on “map reading”, which explained the basics of everything from scales and cartographic symbols to representations of the terrain that were relevant to the military, such as the crest of a hill or a salient.<sup>[33]</sup> In the USA too, where courses in “topography, map reading, sketching and map making” were compulsory for acceptance into the divisional Intelligence Department, the number of guides rose significantly, as one reviewer noted whilst scanning the library shelves after the war.<sup>[34]</sup> Hardly any of these works were new editions or revisions of existing publications; rather, the majority offered a rigorous introduction, but in the reduced form of a pamphlet or a thin volume with a limited scope. The cost was relatively low, with the *Stuttgarter Bilderbogen* guides costing just twenty-five pfennigs, so that even soldiers could buy them or receive them as gifts from their families on the home front. The widespread use of these publications is further emphasised by the high circulation numbers and by the assets of deceased soldiers, which sometimes included training materials of this type.

## Distribution

### Production and Distribution at the Front

The low level of map-reading skills is evidenced by the equipment given to soldiers at the start of the war. After the war, numerous geographers, cartographers and surveyors in the European general staffs appeared convinced that, at the start of the conflict, soldiers were not adequately provided with maps at all, and the ones they did receive failed to meet the tactical and everyday needs of the field.

In France, where the *Service Géographique* had compared, checked and corrected the army's maps regularly even before the war, the rules only stipulated that officers should be given such equipment. In the spring of 1914, the full equipment for the First Cavalry Division was a package of 775 sets of maps, consisting of ten different map series, plus individual sets of provisional and special maps, such as those for automobile traffic. The map series covered France, Germany and Belgium, with each country usually taking up several sheets. With 339 specimens, the map of France at a scale of 1:200,000, which was considered particularly useful to the military, took up almost half the entire package. Other troop units were not much better equipped; given their importance in the ensuing trench warfare, the comparatively poor equipment provided to the artillery stands out.<sup>[35]</sup> In compiling the map material for individual officers, much thought went into the size and weight of the package; the thirty-one sheets that comprised the map of Germany weighed over 1.5 kilogrammes alone.

By the time static warfare had set in, the majority of these map sets had been proven unusable, with soldiers complaining in letters, diaries and memoirs that there was simply not enough material overall, let alone reliable maps. In his diaries, Ernst Jünger (1895-1998) documented discussions he had had with his superiors time and again about the lack of map material and recorded specific combat situations in little sketch maps:

After arriving in Section F again, I immediately wrote a report in which I did not mince my words and explained the whole shitty situation both groups out there found themselves in. It's easy for the higher-ups to order the capture of a section of trench in theory, but in the bloody reality of war, such deliberations made on painted maps will come back to bite you in the end. Gentlemen, go out there for once to see what's going on; and if a bullet whistles past your nostrils, don't worry: others have been used to that for four years now.<sup>[36]</sup>

Some soldiers even had their families send maps out to the field that had been advertised in newspapers with the outbreak of war<sup>[37]</sup> others were pleased to hear about captured maps. This applied in particular to regions which had been mapped relatively poorly, such as the Syrian-Egyptian border area:

The English had an excellent map of the Sinai at a scale of 1:125,000, which had been drawn up from 1911-1914 and published by the geographical department of their general staff. However, the map was for official use only and not available in the shops. Over the course of our operations, we got our hands on some sheets of this wonderful map from dead and imprisoned Englishmen.<sup>[38]</sup>

The general staffs responded to the clear shortcomings in terms of map provision by setting up and augmenting surveying departments; however, the technical prerequisites and logistics of how to distribute the maps to the front presented yet another problem. According to reports from the French surveying departments, the first two years of the war were wholly inadequate when it came to the provision of photographic technologies and printing presses; often, they could not produce appropriate material until they had requisitioned the necessary technical equipment.<sup>[39]</sup>

As for the British, it was not until after the Battle of the Somme that they began equipping their surveying battalions with printing presses, which produced up to 700 maps per hour, thus enabling them to respond quickly and flexibly to changing positions. Relocating the units was very laborious and costly, as the heavy machines could only be moved using special [technology](#) and lorries.

Up to this point, the British had had all their maps printed by the Ordnance Survey in Southampton, then brought quickly to the war theatres through a combination of train and lorry, plus their own dedicated steamboat line. After this route was hit by delays in 1917, they set up an “Overseas Branch”, where 149 soldiers, forty-nine of them women, worked printing maps. By the end of the war, at least one million maps had been produced there, on top of the 32 million already printed in Southampton. Over 250 million maps were printed in Germany, with estimates that more than 800 million were printed in total over the course of the First World War.

### The “View” of the War at Home

The dependency on reliable, up-to-date maps, plus their growth in both importance and number, concerned not only the army, but also the population at home. Although large-scale maps subject to the strictest secrecy were indeed usually required at the front, European societies preferred small-scale overview maps which illustrated the progress of the war and any shifts in positions. Right from the start of the war, newspapers and publishing houses responded to this by offering maps of the different theatres, frequently even combining overviews of all the theatres in a “war atlas”. “Theatre of war maps”, published weekly in the newspapers and as supplements, brought the war into the living room, informed people about recent developments at the front and allowed readers to take part in the war simply by moving their fingers across the map:

When reading in the newspapers that the Armies are moving to such and such a position; that a bombardment of some port has taken place, or that a certain town has fallen, the full importance of such an occurrence can only be realised by referring to an accurate map drawn on a generous scale.<sup>[40]</sup>

The performance-like quality was more than just a sales argument, since, in conjunction with the text and explanations, it put readers right on the front and helped to overcome the actual distance between front and home. A similar role was played by charity map sales, which, for instance, funded the construction of a hospital for wounded soldiers in Scotland and supported soldiers’ families in Germany.

An eye-catching type of presentation, and one largely ignored by the scholarly community until now, were huge posters, such as those which showed the public the European theatres of war in Madrid in 1914, thus popularising cartographic models beyond newspaper readers.

Maps were also featured in newsreels, documentaries, [propaganda](#) films and feature [films](#) to indicate locations, since the images shown of trenches and shot-up landscapes did not give any clue as to where they actually had been taken. Graphics that visualised the troops and their movements on

maps were used early on as well. They took the viewer “along with them” to the region concerned, but due to the scale involved, still kept them at a distance with an overview of everything.<sup>[41]</sup> This view matched that of the general staff who, as Ernst Jünger had noted so critically, had moved whole armies around on “painted maps”. The large-scale maps of static warfare, with their detailed information about the trenches that were barely even visible on the overview maps, were less susceptible to such media manipulation, although this was not desirable in any case.

People at home came into contact with used maps of positions and fronts through personal mementos, but also at the exhibitions of captured maps that attracted attention after the end of the war. The successes presented therein trained the audience’s eyes and map reading skills by providing a platform to debate cartographic traditions and the quality of the maps. In November 1918, for example, *The Times* declared the skill that went into creating the German maps in an exhibition hosted by the Royal Geographical Society to be “very disappointing and greatly inferior to that put into maps by the British, who made use of colour printing, which the Germans failed to adopt”.<sup>[42]</sup>

At the time of that exhibition, the USA, along with Great Britain and France, had already been compiling materials and information for a post-war system for over a year as part of a secret inquiry. Isaiah Bowman (1878-1950), Director of the American Geographical Society, was responsible for territorial issues, collating and producing more than 1,200 different maps in a map programme that cost the USA over 16 million dollars.<sup>[43]</sup> As a delegate to the Paris Peace Conference, he and his team not only brought extensive map material to the table, but were also able to provide technical expertise on the question of territorial reorganisation. The “geographical turn of mind”, which *The Times* had recognised as “one of the minor morals” of the war as early as 1915, continued during the inter-war period in debates about space and fantasies of order.

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## Notes

1. ↑ The Map Sense, in: *The Times*, 6 April 1915, p.9. I would like to thank the German Historical Institute in Paris (DHIP), which supported the research on this paper with a Karl-Ferdinand-Werner Fellowship in autumn 2016. Nina Szidat supported me in the English version of the paper.
2. ↑ Edmonds, James E.: *History of the Great War based on official documents. Military Operations. France and Belgium, 1914*, Third edition, with maps, London 1937, p. 283.

3. † Lewin, Kurt: *Kriegslandschaft*, in: Graumann, Carl Friedrich (ed.): *Kurt-Lewin-Werkausgabe*. Band 4 *Feldtheorie*, Bern 1982 [1917], pp. 315-325; *The Map Sense*, in: *The Times*, 6 April 1915, p. 9.
4. † An exception are the studies conducted by Peter Chasseaud, which nevertheless concentrated on aspects of surveying technology, whilst Mike Heffernan focused his thinking on the Royal Geographical Society. Christoph Nübel recently published a history of spatial perception, although cartographic methods play a lesser role. See Chasseaud, Peter: *Artillery's Astrologers. A History of British Survey and Mapping on the Western Front 1914–1918*, Lewes 1999; Chasseaud, Peter / Doyle, Peter: *Grasping Gallipoli. Terrain, Maps and Failure at the Dardanelles, 1915*, Staplehurst 2005; Heffernan, Michael: *Geography, Cartography and Military Intelligence. The Royal Geographical Society and the First World War*, in: *Transaction, Institute of British Geographers* 1996, pp. 504-533; Nübel, Christoph: *Durchhalten und Überleben an der Westfront. Raum und Körper im Ersten Weltkrieg*, Paderborn 2014.
5. † In his dissertation, Oliver Kann concentrates on some of the aspects mentioned. See Kann, Oliver: *Der Stellungskrieg im Kartenbild. Die deutsche Kartographie an der Westfront des Ersten Weltkrieges*, in: Nowak, Lars (ed.): *Medien – Krieg – Raum*, Paderborn 2017 (forthcoming). I am indebted to him for a great deal of suggestions.
6. † *Military Mapping*, in: Monmonier, Mark (ed.): *The History of Cartography*, volume 6. *Cartography in the Twentieth Century*, part 1, Chicago 2015, pp. 884-950; Collier, Peter: *World War I*, in: Monmonier, *The History of Cartography* 2015, pp. 1770-1775. In 2014, Jürgen Espenhorst expressed his amazement at these gaps in the research and provided a very good overview of the situation at the start of the war. Espenhorst, Jürgen: *A Good Map Is Half The Battle! The Military Cartography of the Central Powers in World War I*, in: Liebenberg, Elri / Demhardt, Imre Josef / Vervust, Soetkin (eds.): *History of Military Cartography. Fifth International Symposium of the ICA Commission on the History of Cartography 2014*, Cham 2016, pp. 83-130. There are also now some informative pages on the use of maps in certain articles on the First World War found online. See also *Sources de la Grande Guerre.fr*, online: <https://sourcesdelagrandeguerre.fr/> (retrieved: 1 March 2017).
7. † Maier, Charles S.: *Leviathan 2.0. Die Erfindung Moderner Staatlichkeit*, in: Rosenberg, Emily S. (ed.): *Geschichte der Welt. Weltmärkte und Weltkriege*, Munich 2012, pp. 33-286; Scott, James C.: *Seeing Like a State. How Certain Schemes to Improve the Human Condition Have Failed*, New Haven 1998; Sassen, Saskia: *Das Paradox des Nationalen. Territorium, Autorität und Rechte im Globalen Zeitalter*, Frankfurt am Main 2008; Konvitz, Josef W.: *Cartography in France, 1660–1848. Science, Engineering, and Statecraft*, Chicago 1987; Schulten, Susan: *Mapping the Nation. History and Cartography in Nineteenth-Century America*, Chicago 2012.
8. † Droysen, G. / Andree, Richard: *Allgemeiner Historischer Handatlas in Sechsunneunzig Karten Mit Erläuterndem Text*, Bielefeld et al. 1886.
9. † Dioramas and panoramas, which historical research has taken little notice of until now, provided further stages for battlefield theatres.
10. † Lehmann, Johann Georg: *Die Lehre der Situation-Zeichnung, oder Anweisung zum Richtigen Erkennen und genauen Abbilden der Erd-Oberfläche in topographischen Charten und Situation-Planen. Zwei Theile mit 17 Kupfertafeln in einem Bande*, Dresden 1816.
11. † The majority of strategic work was conducted on the larger scales of 1:100,000 to 1:500,000 offered by traditional ordnance maps. Eckert also referred to the *Reichskarte* as the “true German war map”. See Eckert, Max: *Die Kartenwissenschaft. Forschungen und Grundlagen zu einer Kartographie als Wissenschaft*. Band 2, Berlin et al. 1925, pp. 758-759.

12. ↑ Hinks, Arthur R.: German War Maps and Survey, in: *The Geographical Journal* (1919), pp. 30-44, here p. 42; Winterbotham, H. S. L.: British Survey on the Western Front, in: *The Geographical Journal* (1919), pp. 253-271, here p. 263.
13. ↑ Boelcke, Siegfried: Das Kartenwesen, in: Schwarte, Max (ed.): *Der Große Krieg 1914–1918. Band 8.1, Die Organisation der Kriegsführung*, Leipzig 1921, p. 447.
14. ↑ Albrecht, Oskar: *Das Kriegsvermessungswesen während des Weltkrieges 1914–18*, Munich 1969; Landmann, Jochen: *Das militärische Karten- und Vermessungswesen in Südwestdeutschland. Ein Beitrag zur Geschichte im 20. Jahrhundert*, Stuttgart 1996.
15. ↑ Collier, Peter / Nolan, Mike: Military Mapping by Great Britain, in: Monmonier, *The History of Cartography* 2015, pp. 894-904; Boulanger, Philippe: Military Mapping by France, in: *Ibid.*, pp. 904-909; Neumann, Joachim: Military Mapping by Germany, in: *Ibid.*, pp. 909-921; Gough, Paul: “Calculating the future”. Panoramic sketching, reconnaissance drawing and the material trace of war, in: Saunders, N. J. / Cornish, P. (eds.): *Contested Objects. Material memories of the Great War*, London 2009, pp. 220-236.
16. ↑ Chasseaud, *Artillery’s Astrologers* 1999.
17. ↑ “Professor Stille has been leading the geological work along our army section for four months now. What’s more, for example, Passarge is the geologist at the Ypres section. Georg Beck, a student, has recently started work in the coal basin in northern France. Professor Stille said the regional geological offices have spread the majority of their geologists out across the fronts. They are mainly involved in producing groundwater profiles, so explosives can be used in dry conditions. It is a strange feeling when the charge is set, for me personally, it is the first time I have sat in an ‘explosive house’.” Erwin Scheu to Joseph Partsch on 9 March 1917, in Brogiato, Heinz Peter / Schellhaas, Bruno (eds): “Die Feder versagt...” *Feldpostbriefe aus dem Ersten Weltkrieg an den Leipziger Geographie-Professor Joseph Partsch*, Leipzig 2014, p. 271 (my translation). Similar correspondence and references to deployments and work in the field can be found in the archives of the Royal Geographical Society, London, the American Geographical Society, Milwaukee, and the Service historique de la Défense, Paris.
18. ↑ “I have spent the last week making maps; it is fairly simple work but fuzzy; we are mapping the trench system near the camp and of all intricate and complicated things to map trenches take the cake”. J. K. Wright on 19 March 1918, in the archive of the American Geographical Society, Milwaukee, Box 357, Folder 36. In a letter dated 8 January 1918, Scheu talks of a “high-speed geological press” in “4-week courses”, in Brogiato / Schellhaas, “Die Feder versagt...” 2014, p. 274. See also Boulanger, *La géographie militaire française* 2002, p. 57-182; Fels, Edwin: Das Kriegsvermessungswesen im Dienste der Geographie, in: *Petermanns Geographische Mitteilungen*, Gotha 1919, pp. 81-89; Winterbotham, *British Survey on the Western Front* 1919, p. 268. For information on French army conferences, see for example references 9 N 110, 3 M 561 and 1 K 153 in the Service historique de la Défense, Paris.
19. ↑ Hans Rudolphi to Joseph Partsch on 10 August 1918, in Brogiato / Schellhaas, “Die Feder versagt...” 2014, pp. 236-239, here p. 239 (my translation).
20. ↑ Schramm, Manuel: *Digitale Landschaften*, Stuttgart 2009; Espenhorst, Jürgen: The Eye of the Army. German Aircraft and the Aero Cartography in World War I, in: Liebenberg et al., *History of Military Cartography* 2016, pp. 61-82.
21. ↑ The introduction of indirect fire by the British artillery earned the head of the surveying unit, Colonel Winterbotham, the nickname “The Astrologer”, because the soldiers “attributed to him occult powers”. Winterbotham, *British Survey, Discussion*, p. 273; Edmonds, *History of the Great War* 1937, p. 436.
22. ↑ Seymour, W. A (ed.): *A History of the Ordnance Survey*, Chatham 1980, p. 225.

23. ↑ Winterbotham, British Survey on the Western Front 1919, p. 266.
24. ↑ Winterbotham, H. S. L. et al.: British Survey on the Western Front. Discussion, in: *The Geographical Journal* 53/4 (1919), p. 272.
25. ↑ See the comprehensive map material on Europeana 1914-1918.eu, online: <http://www.europeana1914-1918.eu> (retrieved: 2 January 2017).
26. ↑ “We have had an incredible amount of work to do these last few months. We had to make geological military preparations for the advance the 4<sup>th</sup> Army was involved in. We produced 6 sheets of 1:50,000 as a geological military map (as far as Calais-Boulogne!). The French map material had to be translated using lots of reference works, with Gosselet and Barrois in particular really helping us out (the latter personally!). We also created a map of the water supply (1:100,000 in total), showing the water pipelines [underlined in original] of the French cities at the coast, as well as the difficulty or ease of supplying the advancing forces with water. Plus we produced a map of raw materials [underlined in original].” Erich Schröder to Joseph Partsch on 16 May 1918, in: Brogiato / Schellhaas, “Die Feder versagt...” 2014, pp. 281-282 [my translation].
27. ↑ See Schneider, Ute: Grenzen auf Karten, in: Kuhn, B. / Windus, A. (eds.): *Der Erste Weltkrieg im Geschichtsunterricht. Grenzen – Grenzüberschreitungen – Medialisierung von Grenzen*, St. Ingbert 2014, pp. 117-128.
28. ↑ See the map material provided by the National Library of Scotland.uk, online: <http://maps.nls.uk/ww1/trenches/info1.html>; Sources de la Grande Guerre.fr, online: <http://sourcesdelagrandeguerre.fr/?p=4037>; Great War 1914-1918.co.uk, online: <http://www.greatwar.co.uk/research/maps/british-army-ww1-trench-maps.htm> (all retrieved: 10 January 2017).
29. ↑ Letter from Hedley to Hinks on 31 December 1914, in RGS-CB8-61, Royal Geographical Society London.
30. ↑ Edmonds, *History of the Great War* 1937, pp. 145, 152.
31. ↑ *The Times*, 6 April 1915, p. 9. “This task is already harder to complete in and of itself in the field than at a site during peacetime; it is a totally different kettle of fish to going to the villages along the Parthe River to do some drawing, well equipped with paper, pencils and a chair. In the field, the task has to be done within a set time, in poor weather, wind, rain, concealed from view. It places quite different demands on one’s body. Sitting on a swaying tree top, up to one’s knees in water or in the midst of an area crawling with enemy infantry and artillery.” Stiehler, Georg: *Allgemeinbildendes Geländezeichnen für die deutsche Jungmannschaft mit Rücksicht auf militärische Notwendigkeiten*, Leipzig 1916, p. 11 (my translation). This is based on my remarks, partially verbatim, in Schneider, Ute: *Geländezeichnen im Ersten Weltkrieg*, in: Heilmann, M. et al. (eds.): *Lernt Zeichnen! Techniken zwischen Kunst und Wissenschaft, 1525–1925*, Passau 2015, pp. 129-137.
32. ↑ Quoted in Stiehler, *Geländezeichnen*, p. 13.
33. ↑ Grosse, Wilhelm: *Geländekunde. Eine Anleitung zum Beobachten in der Heimat insbesondere bei Wanderungen*, Stuttgart 1916; Grosse, Wilhelm: *Kartenlesen. Eine praktische Einführung mit Abbildungen und Karten*, Stuttgart 1917; Haag, Robert: *Das Gelände-Zeichnen nach der Natur. Eine kurze praktische Anleitung*, Stuttgart 1916.

34. ↑ J. K. Wright on 19 March 1918, in the archive of the American Geographical Society, Milwaukee, Box 357, Folder 36; Blake, A. J.: Everybody's Aid to the Map Reading of Central Europe, compiled with special regard to Germany, London 1915; Johnson, Douglas W.: Some Recent Books on Military Geography, in: Geographical Review (1920), pp. 60-63; United States War Department / Committee on Education: Special Training. Surveying, with sections on map reading, military sketching and topographic drawing, Washington 1919. Map reading skills were a significant component in the training of British recruits, too. See Francis, H.L. Errington: The Training of Officers, in: The Times, 3 December 1914; p. 9.
35. ↑ Tableau de Répartition des Cartes de Mobilisation destinées à 1 Division de Cavallerie 1914, in Reference 9 N 110, Service historique de la Défense, Paris.
36. ↑ Entry of 22 July 1918, in Kiesel, Helmuth (ed.): Ernst Jünger. Kriegstagebuch 1914–1918, Stuttgart 2010, pp. 411-412.
37. ↑ In The Times, Michelin advertised maps of France “for Military, Business or Pleasure”. The Michelin Map, in: The Times, 12 April 1916, p. 4.
38. ↑ Friedrich Freiherr Kress von Kressenstein, Mit den Türken zum Suezkanal, Berlin 1938, p. 44.
39. ↑ “Vers la fin de l'année le groupe réquisitionna une presse à bras de dimension COLOMBIER dans une imprimerie d'ARRAS et put ainsi commencer à effectuer quelques tirages lithographiques.” Historique des groupe des Canevas de Tir de la Xe Armee, p. 13, in Reference 3 M 561, Service historique de la Défense, Paris.
40. ↑ The Times War Atlas, in: The Times, 28 August 1914, p. 4.
41. ↑ “The latest movements of the armies in the field are depicted in the animated war maps, which continue to be one of the most popular features of the entertainment [...]. The entire production is of a most interesting and educative character, bringing as it does vividly before the spectator the characteristics of the different armies engaged in the fighting and to a great extent the conditions under which they fight.” The Picture Theatres, in The Sunday Times, 31 January 1915, p. 13.
42. ↑ Inferior to British, in The Times, 19 November 1918, p. 3. See also Hinks, Arthur R.: German War Maps and Survey, in: The Geographical Journal (1919), pp. 30-40.
43. ↑ Gelfand, Lawrence E.: The Inquiry. American preparations for peace, 1917–1919, New Haven 1963.

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