

*The Reichsamt für Landesaufnahme and the Ordnance Survey;  
a comparison of two mapping organisations between 1919  
and the Second World War (part I)*

*J L Cruickshank*

In a previous article in *Sheetlines* I noted that the German military maps of Britain (and several other areas of WWII military action) were not initially gridded. Indeed gridding was only very belatedly applied, if at all. I suggested that this appeared to reflect a failure to absorb the lessons of the First World War.<sup>1</sup> Further study has however revealed this to be an over-simplistic analysis. The present pair of articles began as an attempt to explain the delays (and inconsistencies) in gridding of German Second World War maps by comparing the national mapping organisations in Britain and Germany and their evolution during the inter-war period. The comparisons however allow us to view the Ordnance Survey itself in a different light.<sup>2</sup>

A detailed comparison of all aspects of the *Reichsamt* and Ordnance Survey during the 1920s and 1930s would of course be a very major task indeed. This account will therefore be limited to a few broad areas in which clear differences appear. Several of these differences were to be important during the Second World War and afterwards. Some wartime consequences will therefore be mentioned, but it must be emphasised that the sources used for this study can only indirectly illuminate German military mapping activity and its evolution during the war.

Since the history of the mapping of Germany may be unfamiliar to many members, in this first article I shall outline the development of the principal official mapping and survey body in Germany between the wars. This was the *Reichsamt für Landesaufnahme* (Reich Office for State Survey). This had originally been established as the *Preußische Landesaufnahme* (Prussian State Survey), a military survey organisation within the Prussian General Staff. As such it became the predominant survey organisation in the aftermath of the creation of a unified German *Reich* in 1871. Nevertheless it is important to appreciate that each of the component states of the *Reich* also had its own survey organisation with its own maps, history and traditions. While Prussia was the largest state within the *Reich*, and included most of northern Germany, it was by no means the best mapped. Württemberg, in particular, had long maintained a large-scale survey that had no equivalent in Prussia. Bavaria's General Staff Map at 1:50,000 was not only complete, but had completed its first revision. The General Staff Map of Prussia, and of the *Reich* as a whole, was at 1:100,000, half this scale. Across the *Reich* the usual scale of topographic survey was 1:25,000, producing maps that were still officially referred to as *Meßtischblätter* (plane-table sheets). Large-scale survey was performed for land registration and taxation, but was generally the

---

<sup>1</sup> J L Cruickshank, 'German Military Maps of the UK and Ireland of World War II', *Sheetlines* 69, 15-19.

<sup>2</sup> The comparative historical study of different national military mapping agencies is (at least in English) in its infancy. Peter Chasseaud has drawn attention to this, but with the very important exception of his own studies of the development of British, French and German mapping of the Western Front, there has been no recent published work comparing British and foreign practice during any part of the nineteenth or twentieth centuries. See Peter Chasseaud, 'Guest Editorial', *The Cartographic Journal*, 38 (2001), 117-118. See also Peter Chasseaud's recent PhD thesis: *An analysis and evaluation of British, French and German military field survey and mapping in the First World War. Which country produced the best survey and mapping of the Western Front?*, Dept of Earth Sciences, University of Greenwich, 2003.

responsibility of the local authority, not the state or the *Reich*. Major cities like Berlin and Hamburg maintained independent survey organisations that often used projections, scales and sheet lines unrelated to each other, or to the national ones. Smaller towns and rural areas commissioned private survey firms to map them as they felt the need.

The *Reichsamt*, like its predecessor, had a very clearly defined internal structure. It was divided into *Abteilungen* (departments), one for trigonometrical survey (including levelling), one for topographic detail surveying and fair-drawing, and one for cartography (which included everything concerned with map production, including preparing reproduction material from fair-drawings, and printing the maps themselves). A *Photogrammetrische Gruppe* (Photogrammetry Group) had also been formed. Although originally within the *Topographische Abteilung*, for most purposes this group formed an independent department within the *Reichsamt*. These different departments had little contact with each other, and less experience of each other's work. Rigid specialisation of skills was the norm. Under routine circumstances cross-posting of staff seldom, if ever, occurred, whether at craftsman or at officer level. Traditionally, serving military officers posted to the survey would be assigned to one *Abteilung*, and would stay there for several years until they returned to other staff or regimental duties. Traditionally also, service with the *Trigonometrische Abteilung* was a route to high rank not only within the *Reichsamt*, but also within the German General Staff as a whole.

During the late nineteenth century Helmuth, Graf von Moltke, as Chief of the General Staff, strongly promoted the Prussian military survey and set the standards for the Reich as a whole. Moltke was even caricatured with 'his' General Staff Map.<sup>3</sup> The *Preußische Landesaufnahme* became the coordinating cartographic body for the Reich, and in particular was concerned with the linking and standardising of the various triangulation nets. Nevertheless coordination and standardisation remained far from complete.

Peter Chasseaud has shown that during the First World War the development of German survey and mapping of the Western Front closely paralleled that of the Allies. In particular, gridded maps with a sound trigonometrical base became an essential tool for artillery fire control. However, just as the British and French surveys were never unified, the separate state military survey organisations within the German army produced maps with uncoordinated sheets and grid systems.<sup>4</sup>

The Treaty of Versailles that followed the war (28 June 1919) profoundly altered the German survey organisations. Article 160 laid down that the total effective strength of officers within the post-war German army, including the personnel of staffs, must not exceed four thousand. It also laid down that the Great German General Staff (which was essentially the Prussian General Staff) should be dissolved and not reconstituted in any form. Article 161 laid down that army administrative services consisting of civilian personnel should have such personnel reduced to one-tenth of those in 1913.<sup>5</sup> The *Preußische Landesaufnahme* was in particular a military body containing a large number of officers and civilian personnel. In 1919, like all the other German military survey bodies, it was therefore civilianised, and in 1921 it was reconstituted as the *Reichsamt für Landesaufnahme*, a civil office within the Interior Ministry. In the process it was merged with the *Sächsisches Topographisches Büro*,

<sup>3</sup> See David Kahn, *Hitler's spies; German military intelligence in World War II*, London, 1978, 33

<sup>4</sup> Peter Chasseaud, 'German maps and surveys on the Western Front, 1914-1918', *The Cartographic Journal*, **38** (2001), 119-134.

<sup>5</sup> *The treaty of peace between the allied and associated powers and Germany, ... and the treaty between France and Great Britain respecting assistance to France in the event of unprovoked aggression by Germany*, HMSO, 1919.

the formerly military survey organisation for Saxony. The former military *Chef* (Chief) was re-designated as *Präsident* (President) of the new body.<sup>6</sup> Even these changes required careful interpretation of Article 162, which decreed that the number of employees or officials of the (individual) German States should not exceed the numbers in their capacities in 1913. In any case the draconian restrictions on government expenditure, due both to the expense of the war and of the subsequent reparations, severely limited activity. In particular there was little money for the expenses of field survey work, and there was a bar on new recruitment that led to a very skewed age profile within the staff of the *Reichsamt*, and a profound loss of overall manpower.<sup>7</sup>

Nevertheless the *Reichsamt für Landesaufnahme* responded to its new civil status. In particular, after the death of its first President in 1924, the new President, Richard von Müller (previously head of the *Kartographische Abteilung*), began a campaign to publicise the maps of the *Reichsamt* to potential civilian users. In 1925 a quarterly journal, *Mitteilungen des Reichsamts für Landesaufnahme*, was launched. This replaced an earlier annual publication, the *Jahresbericht des Reichsamts für Landesaufnahme*, which had been published for five years but (as its title indicates) had been no more than an annual report. The new publication was very clearly targeted at a wide circulation, and in particular at geography and local-studies (*Heimatkunde*) teachers. Early issues were distributed free to a wide range of individuals and institutions. When, after a short period, the cover price had to be charged, educational discounts were available. The journal included an official section that included unsigned notices concerning the *Reichsamt*, publication reports and (initially in instalments) the Annual Report of the *Reichsamt*. It also included a non-official section containing a range of signed articles, many of which were clearly commissioned for the journal from staff members, or from others with links to the *Reichsamt*. These included articles describing and explaining the various products of the survey and their uses, and articles on the history, development, and activities of the *Reichsamt* and other official survey bodies. A very large group of articles were devoted to ideas for the use of maps for school work, while the use of the maps as *Wanderkarte* (walking maps) was also promoted. Finally the journal contained lists of library accessions of non-*Reichsamt* maps and books, a review of cartographical literature, and reviews of publications (including the *Reichsamt's* own).<sup>8</sup> This campaign to educate the public culminated in the publication of a substantial book describing and illustrating the survey and its maps.<sup>9</sup> Although contemporary with the two well-known pamphlets describing the Ordnance Survey maps, this was a much more substantial tome that should rather be compared to Brian Harley's much later compendium.<sup>10</sup>

<sup>6</sup> For an account of the stages in this transition see Oskar Albrecht, *Das Kriegsvermessungswesen während des Weltkrieges 1914-18*, München: Bayerische Akademie der Wissenschaften, 1969, 48-50.

<sup>7</sup> 'Das Reichsamt für Landesaufnahme', *Mitteilungen des Reichsamts für Landesaufnahme*, 1/1 (1925), 3-19, esp. p 3. 'Jahresbericht des Reichsamts für Landesaufnahme', *Mitteilungen des Reichsamts für Landesaufnahme*, 1/2 (1925), 1-19, esp. pp 1-3, and *Mitteilungen des Reichsamts für Landesaufnahme*, 1/3 (1925), 1-8.

<sup>8</sup> *Mitteilungen des Reichsamts für Landesaufnahme* was published quarterly from 1925. In 1936 the number of issues rose to six per year. In 1941 the journal was renamed *Nachrichten aus dem Reichsvermessungsdienst*, retaining the old title as a subsidiary title and continuing the sequence of volume numbers. Publication continued until October 1944, but the set used for the present account is incomplete after August 1943. Henceforth the abbreviation *MdRfL* will be used for citations of this journal under either title.

<sup>9</sup> *Das Reichsamt für Landesaufnahme und seine Kartenwerke*, Berlin, 1931. An elaborate illustrated prospectus for this book was also published the previous year.

<sup>10</sup> The OS pamphlets *A description of Ordnance Survey large scale maps*, and *A description of Ordnance Survey small scale maps* both went through multiple editions during the 1920s. Brian Harley, *Ordnance Survey maps; a descriptive manual*, Southampton, 1975.

The survey organisations in both Britain and Germany experienced severe limits on expenditure at this time.<sup>11</sup> The effects were rather different in the two countries because their remits, their problems, and their accumulated backlogs of work were different. In Britain the system of cyclical revision of the Ordnance Survey large-scale plans collapsed. In Germany the *Reichsamt für Landesaufnahme* did not have any similar large scale surveys. What it did have was over three thousand 1:25,000 maps, which were its basic survey.<sup>12</sup> A programme of cyclical revision had existed for these, but also collapsed during and after the war. The maps had been made to rather variable standards of accuracy by the different survey bodies of each *Land*. At the junctions between areas surveyed by different authorities there were frequent mismatches due in part to their being plotted from uncoordinated triangulation networks. The triangulation framework of the *Reich* had accumulated by the merging of the existing smaller networks originally established by the individual *Länder* (States). These had been made to different standards and had not originally been intended as the basis of a continuous series of maps extending from the Netherlands to the Ukraine. At 1:25,000 and even at 1:100,000 there were frequent significant inaccuracies. The framework certainly did not have the precision and accuracy required for larger scale mapping. In the post-war period the *Reichsamt* devoted much of its limited resources to overhauling its triangulation network. The quality of its height data was even weaker. The measuring or re-measuring of geodetic levelling chains thus also absorbed resources. In doing this many old benchmarks were found to have disappeared; not only did this increase the expense, but relating new levelling to old was frequently difficult.

Following the war the *Reichsamt für Landesaufnahme* started the process of overhauling and gridding all its 1:25,000 maps. Although slow, progress was steady. Since the map projection did not match the grid projection the grid had to be established individually for each sheet.<sup>13</sup> Even when grid values for the sheet corners had been established it proved impossible simply to draw lines on the existing maps.<sup>14</sup> In view of the known weakness of the original trigonometrical data, the *Reichsamt für Landesaufnahme* decided to recalculate the positions of all the trigonometrical points on each map, expressing their positions in terms of the grid, rather than as the geographical coordinates previously used. The positions of many points on the maps had to be changed, and the surrounding detail redrawn to reflect the new positions. The substantial alterations to lithographic stones involved in this process delayed progress. Nevertheless by March 1934 1,633 sheets out of a then total of 2,979 had been gridded, 276 having been done that year.

Although the impetus to grid these maps had been military, the practical needs of the time meant that civilian uses of gridded maps had to be emphasised and explained. This was done, for example, in an article in the *Mitteilungen* that has a very similar flavour to the

---

<sup>11</sup> For a retrospective evaluation of the situation of the *Reichsamt* at this period, written by the recently retired President of the organisation, see: R von Müller, 'Die Entwicklung der Kartographie beim Reichsamt für Landesaufnahme nach dem Weltkrieg bis Frühjahr 1934', *MdRfL*, **11** (1935), 235-259.

<sup>12</sup> The losses of territory following plebiscites reduced the number to 2,979.

<sup>13</sup> All the pre-WWI German series had been plotted on a polyhedral projection based on the meridian of Ferro. While this meant that the series could be extended indefinitely across meridians, groups of sheets did not form a flat surface. Following the First World War a series of rectangular 'Gauß-Krüger' grids at 3° intervals, based on meridians counted from Greenwich, were established to cover the whole country. Only the post-war Deutsche Grundkarte 1:5000 was plotted (and had its sheet lines) on this projection.

<sup>14</sup> R von Müller, *op cit.* (1935), esp. p 239. Nevertheless tables of the corner values of sheets were published, and it was suggested that users could use these values to grid their own copies of the maps. See Th. Siewke, 'Wie trage ich mir das Gitternetz in mein Kartenblatt ein?', *MdRfL*, **4** (1928), 15-25.

publications written in Britain after the Second World War to promote the OS National Grid.<sup>15</sup>

Similar problems affected the smaller scale maps. Although the need for a nationwide 1:50,000 map to replace the 1:100,000 series had been agreed before the war, only the long-established Bavarian series and a block of small sheets around Berlin had been completed. After the war a new specification and further pilot sheets were produced by the *Reichsammt* but further progress became stalled, although Bavaria and Württemberg did produce some sheets to the new specification.<sup>16</sup> In 1935 mapping at the 1:50,000 scale, including all the existing sheets, was decreed to be the business of the *Reichsammt* rather than of the *Länder*. Despite much preparatory work, this marked the end of progress at this scale.<sup>17</sup>

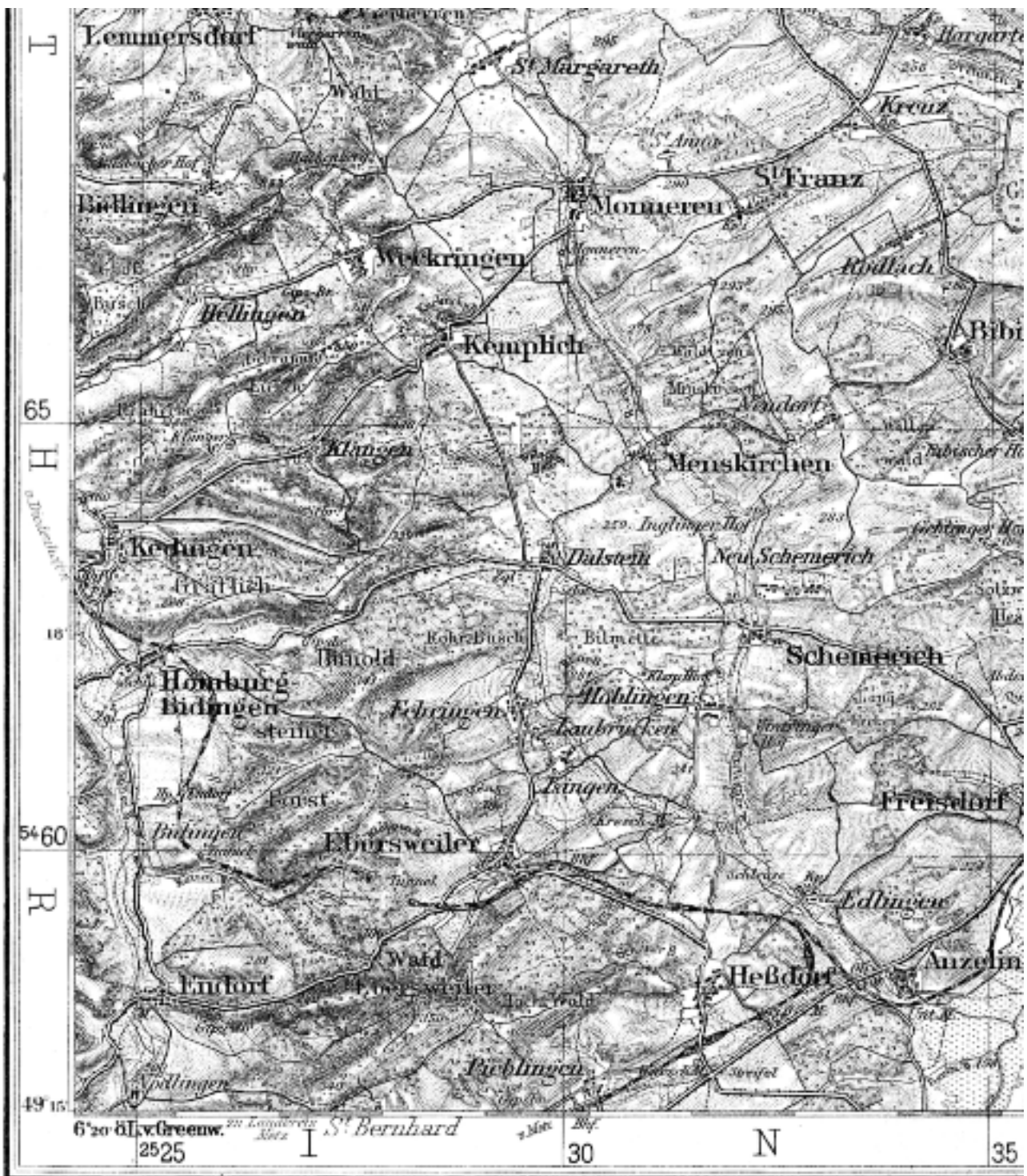
The German flagship product remained the *Karte des Deutschen Reiches* 1:100,000, commonly called the *Generalstabkarte* (General Staff Map). This had much in common with the Ordnance Survey Old Series one-inch maps.<sup>18</sup> It was a map engraved on copper showing heights by black hachures and occasional spot-heights. Although impressions from the copper plates were available, prints from transfers to lithographic stones were the usual form sold. Some of the sheets were available with up to four lithographic colour overprints emphasising woods (brown or dark green), meadows (light green), water (blue), and roads (red). The colours added no extra topographic information to that on the black plate, although they did cheer up the appearance of sheets that, without colour, carried such a dense mat of fine black detail that they could be intimidating to read. Rather like the Old Series one-inch maps, the artistic qualities of General Staff Map, particularly in the form printed directly from copper, were a source of great pride to the *Reichsammt*. Although the absence of contours did attract external criticism, the *Reichsammt* only very occasionally acknowledged this. Nonetheless, even within the *Reichsammt*, the map was recognised to be old-fashioned. The series was maintained, and the black edition was slowly but steadily gridded. The series-sheets were very small, and the imperative to generate income led to a large number of (mostly) un-gridded district and tourist derivatives being produced for sale. An important group of these derivatives were the so-called *Einheitsblätter*, sheets combining (usually) four of the small series-sheets into more practical larger sheets. The *Einheitsblätter* and some other tourist sheets were sold in cream book-fold card covers with striking black lettering and a large German eagle on the front.

<sup>15</sup> Th. Siewke, 'Die Anwendung des Planzeigers für die Punktbestimmung auf neueren Karten des Reichsammt für Landesaufnahme', *MdRfL*, 1/4 (1925), 31-37. Compare with *A brief description of the National Grid and reference system*, Ordnance Survey Booklet no. 1/45, HMSO, 1946.

<sup>16</sup> Descriptions of a few examples of these new small-scale maps are given in A R Hinks, *Maps and Survey*, third, fourth and fifth editions, Cambridge, 1933-1947, 96-99, but the absence of contextual description makes it difficult to appreciate their relative significance.

<sup>17</sup> For the 1935 *Neuordnung* decrees, see below. For a description of work at 1:50,000 see Otto H Krause, *Neue Wege der Kartenherstellung im Reichsammt für Landesaufnahme*, Sonderheft 9 zu den *MdRfL*, second edition, Berlin, 1936, 46-57. The British Library's copy of this booklet provides an analogy for the tangle of inter-relationships in the history of twentieth-century Central European mapping: while its title page was annotated by a German institution in 1942, its uncatalogued cover, applied by a later owner, the Polish Survey College, is made from part of a cloth-backed British GSGS 1:50,000 map of France. A (now itself historical) British Library bookplate has subsequently been used to stick the cover and the booklet together.

<sup>18</sup> It should be noted that none of the supposed example plates in Charles Close, *Textbook of topographical surveying*, first edition, 1905, or second edition, 1913, HMSO, and in the War Office *Manual of map reading & field sketching*, 1906 ed., 1912 ed., or 1912 ed. with additions 1914, are representative of the normal appearance of German (or Swiss) maps. They all should purely be seen as examples of Charles Close's experiments in the colour printing of maps. The third edition of the *Textbook*, 1925, includes a reasonably representative plate of the monochrome style of the Prussian 1:25,000 map.



Zusammendruck 1934 aus der Karte des Deutschen Reiches 1:100 000.  
Herausgegeben vom Reichsamts für Landesaufnahme, Berlin.

Die rückwärtsliegenden Zahlen  
geben das Jahr der Herausgabe  
bzw. der letzten Nachträge an.

21	540	29	541
St. Bernhards	St. Bernhards	St. Bernhards	St. Bernhards
21	554	21	555
St. Bernhards	St. Bernhards	St. Bernhards	St. Bernhards



Cover from *Einheitsblatt 129*, Saarburg i. Rhld. – Birkenfeld – Saarlouis, 1934, much reduced.  
An extract from the map itself is shown on the previous page, approximately to size.

Smaller scales fared particularly poorly. Development, and even maintenance, of the 1:200,000 *topographischer Übersichtskarte des Deutschen Reiches* came to a complete halt.<sup>19</sup> The older 1:300,000 *Übersichtskarte von Mitteleuropa* was slowly updated, and by April 1934, of the 105 sheets available, 69 were gridded. Only two of these, however, had been gridded in the previous year.<sup>20</sup> The 1:800,000 series of Europe and the Near East, in 80 small sheets, also came to a halt and was eventually deemed to be superseded by the sheets of the International 1:1 Million Map of the World.<sup>21</sup> The *Reichsamt* was allocated as many as

<sup>19</sup> In origin this map was the early-nineteenth-century Reymann map that had later been bought by the Prussian government. An entirely new specification for the map had been developed in the 1890s. This new form with contours was supposed to have been the future small-scale map of the Reich, and as such was to have replaced the 1:300,000 map. The individual sheets were however very small, covering only a quarter of the land area of a 1:300,000 sheet. This enabled colour printing directly from copper plates, but made the series too fragmented for practical use in the 1920s and 1930s.

<sup>20</sup> The 1:300,000 map had been engraved on stones, with a graticule ruled on the black outline stone. Gridding the map involved removal of this graticule (which passed through much fine detail) before the grid could be added. The process was slow and tedious.

<sup>21</sup> The 1:800,000 map was however used as the topographical base for a group of two-sheet maps of the Reich. These included the 1929 'Bürokarte des Deutschen Reiches' (Office Map of Germany), and a 1930 map showing the new official road-numbering system.

five sheets of this map. The first two of these were produced in 1928, with the remaining three appearing at intervals between then and 1932.

In the mid-1930s a number of important changes in the organisation of the *Reichsamts* took place. Of immediate importance in April 1934 was the retirement, on reaching 65, of Generalmajor Richard von Müller as President, and his replacement by Generalleutnant Vollmar. Although Vollmar had remained a serving military officer until immediately before his appointment, his career had been closely linked to the *Reichsamts* and its predecessors. He was a former head of the trigonometrical department, and had been the liaison officer between the *Reichsamts* and *Reichswehrministerium* (Ministry of Defence). As such he was an entirely traditional candidate for the vacant post. Of greater long-term importance was the seizure of power in the previous year by Adolf Hitler and his NSDAP (*Nationalsozialistische Deutsche Arbeiterpartei*; the Nazi Party). Already at von Müller's retirement ceremony the rituals of Nazi rhetoric had appeared, with greetings of 'Sieg Heil!' and 'Heil Hitler!', and formalised praise for the Nazi party, its policies, and its leader.<sup>22</sup>

In fact Nazi penetration of the organisation had begun before the seizure of power. In 1936 Vollmar, as President of the *Reichsamts*, had to host a commemoration of the foundation five years previously (in December 1931) of an *NS Fachgruppe* (Nazi technical group) within the *Reichsamts* by three named (and possibly fairly junior) employees. Vollmar produced the then politically correct rhetoric, alongside the representative of Joseph Goebbels who produced more, but except in death notices the *Reichsamts* had never previously named any junior employees in the *Mitteilungen*, far less celebrated anything they had done. Furthermore in 1931 such covert political organisation within a once-military civil-service office would have been seen as improper, if not illegal. Vollmar must have found it profoundly uncomfortable to praise and publicise such insubordination.<sup>23</sup>

The Nazi seizure of power was the trigger for extensive organisational change, not just within the *Reichsamts*, but throughout the German civil and military services. A clear reflection of this is seen in the 'official' section of the *Mitteilungen*. Publication was initiated there of what became a steady flow of new laws, rules and regulations. These eventually came to dominate the section; by 1942, when publication of the Annual Report and Publication Reports had ceased, they became its only component. Another striking change in the *Mitteilungen* is that the formerly numerous advertisements by private-sector firms, selling all sorts of map-making instruments and supplies, disappear. The last two appear in the 1934-5 volume. Thereafter the only advertisements are for *Reichsamts* products. Other signs of the times include the appearance in August 1935 of an article for geography teachers, triggered by the introduction of compulsory military service, which discusses the use of maps in paramilitary training (*Wehrsport*). Thereafter, however, articles aimed at schoolteachers disappeared altogether. By 1936 the journal had become completely focussed on professional cartographers and their trainees. From 1936 the journal's cover was redesigned. The *Reichsamts*'s own logo showing a map of Germany overlaid with a grid disappeared, and after one issue on which the previous (rather un-military) German eagle was replaced with a new harder-edged (but still non-political) eagle, this too was replaced with the well-known eagle-logo incorporating the Nazi swastika within a wreath.

<sup>22</sup> 'Wechsel im Präsidium des Reichsamts für Landesaufnahme', *MdRfL*, **10** (1934-5), 1-9. Vollmar's final military posting had been as *Generalleutnant* in Stettin; see *MdRfL*, **16** (1940), 41.

<sup>23</sup> 'Feierstunde im Reichsamts für Landesaufnahme', *MdRfL*, **13** (1937), 1-4. It should be noted that party membership was forbidden to serving members of the German Army until 1944.





*The original eagle, from a 1928 Mitteilungen cover, and its 1936 replacement.*

The first new law printed was the ‘*Gesetz über die Neuordnung des Vermessungswesens vom 3. Juli 1934*’ (Decree on the new arrangement of surveying matters), printed in May 1935.<sup>24</sup> With its subsidiary ordinances of May and June 1935 this profoundly changed the balance of power between the central government, the *Reichsamt*, and the survey departments of the *Länder*. The Interior Minister, Wilhelm Frick, was given sole power to order all arrangements for survey and mapping matters throughout the *Reich*, in both the official and private sectors. The ordinances established that the *Reichsamt* was to have sole responsibility for the first and second order triangulation of the *Reich* and sole charge of official map production at 1:50,000 and all smaller scales. All personnel within the survey bodies of the *Länder* involved with mapping on these scales became subject to the orders of the President of the *Reichsamt*. The June ordinance peremptorily abolished the *Beirat für das Vermessungswesen*, an independent advisory council on surveying set up by *Reichspräsident* Hindenburg in 1920 with a broad remit to review surveying and mapping matters, to comment and make suggestions on them, and to issue guidelines that aimed to ensure that the otherwise independent survey authorities did follow a common practice. Although it thus had a unifying role, the *Beirat* had also been set up as an important brake on the ability of any one person or body to impose policy on all the different survey authorities. Its abolition left Frick, and through him Hitler, without any practical restrictions on his authority over the mapping of Germany.<sup>25</sup>

Nonetheless, there was an immediate benefit to the survey from the Nazi power-seizure. The resources and manpower that had been denied to the *Reichsamt* all through the 1920s suddenly increased, and continued to increase.<sup>26</sup> From 1934 onwards the revision of maps and the issue of gridded maps both increased rapidly. The priorities of the *Reichsamt* did not change, but many of the backlogs of work were sharply reduced. Projects that had been shelved after the First World War, like the renewal of the 1:200,000 map, were resumed. Surveying and production of the 1:5000 *Deutsche Grundkarte* accelerated. The gridding of the 1:25,000 maps in particular made rapid progress, peaking at 370 newly gridded sheets in 1934-5 and continuing at around 250 per year thereafter. It was at long last completed during

<sup>24</sup> ‘Gesetz über die Neuordnung des Vermessungswesens. Vom 3. Juli 1934’, *MdRfL*, **11** (1935), 1-2. The supplementary regulations implementing this were also printed: ‘Begründung zum Gesetz über die Neuordnung des Vermessungswesens vom 3. Juli 1934’, *MdRfL*, **11** (1935), 2-4; and ‘Zusammenschluß der Landesvermessungen’, *MdRfL*, **11** (1935), 5-6.

<sup>25</sup> The formalities of abolition of the *Beirat* seem only belatedly to have been observed, suggesting that the abolition was not achieved as smoothly as it might have been: see *MdRfL*, **11** (1935), 53-57.

<sup>26</sup> Total personnel increased from 539 in 1935, to 1030 in 1936 and 1325 in 1937: see ‘Die Reichsamt für Landesaufnahme auf der Ausstellung "Gebt mir vier Jahre Zeit"’, *MdRfL*, **13** (1937), 226. For comparison the OS establishment had been reduced from 2077 before the First World War to 1462 in 1920, and 1000 in 1922. By 1936 it had risen again to 1334. The Davidson Report envisaged an establishment of 4000 by 1944. Sources: W A Seymour, *A history of the Ordnance Survey*, Folkestone: Dawson, 1980, 230, 235, 265.

the year to March 1940. Gridding of the 1:100,000 also made rapid progress and was completed by March 1936. In contrast gridding of the 1:300,000 lagged behind, and effectively stopped in 1937 when less than 70% of the series had been done. Instead, gridding of the newly recommenced 1:200,000 map began that year. Work on the 1:300,000 restarted in 1939, but by March 1940 neither of these series was anywhere near completely gridded.<sup>27</sup>

The 1934-5 New Order (*Neuordnung des Vermessungswesens*) did not however remain unchanged. Firstly, in 1936, *Vermessungskommissaren* (Survey Commissars) were established under the Minister of Finance in each region of the Reich. Each commissar was also the regional *Gauleiter* or *Statthalter*, the official appointed by the Nazi party to exercise effective control of the regional government. Furthermore the loss of power by the different *Länder* was not accepted gladly, and the *Reichsamts*'s initial gain in power had only been a means to the achievement of greater central power. From the beginning of 1938 the pendulum began to swing to a different extreme. Fourteen so-called *Hauptvermessungsabteilungen* (*HVMA*) were established, each in a major city. The former survey authorities of the South German *Länder* remained recognisable, the Baden and Württemberg departments being merged into one *HVMA*, while the Bavarian authority became a separate *HVMA*. Although these South German survey bodies had ceased to be responsible to the *Land* authorities, they were still to be funded by them. While they now reported through the *Reichsamt* to the *Reichsminister des Innern*, their tasks remained much as they had been since 1935, *i.e.* to survey, prepare and maintain the 1:5000 and 1:25,000 maps of their territories. The *Kartographisches, früher Militärgeographisches Institut* in Vienna, which had until the *Anschluß* (also of 1938) been the survey authority of an independent country with its own long and proud tradition (and largely incompatible mapping), became *HVMA XIV*.<sup>28</sup>

The effect of this reorganisation on the *Reichsamt* itself was to be more profound. The *Reichsamt* had originally been formed as a highly centralised survey organisation for the whole of Prussian north Germany. Now each of the Prussian regions was to have its own devolved survey organisation equivalent to those of the south-German *Länder*. Following the model of the *Reichsamt* itself, each was to have a trigonometric survey, topographic survey, cartographic (map drawing and reproduction), and administrative department. Each was to be based in a provincial city. Their resources were to be those until then used by the *Reichsamt* for the 1:5000 and 1:25,000 surveys of Prussia. Their heads were to be directly appointed by the Minister of the Interior. In effect the *Reichsamt* was to be broken up into a dozen smaller organisations. The rump of the organisation would only have direct responsibility for geodetic triangulation and levelling, and for the preparation of small-scale derived mapping series. It was otherwise to be a coordinating body. This was clearly a major blow to the *Reichsamt* and to Vollmar, its President. The annual reports for the succeeding years contain increasingly transparent excuses for Vollmar's glacially slow progress implementing this structure. The outbreak of war in 1939 did not change this plan, but was used to provide a veneer of plausibility for the excuses.

<sup>27</sup> The reason for the U-turn is not given in the Annual Report, but may be related to the sudden inclusion that year of much of Poland within the *Reich*. The pre-First World War 1:300,000 had extended far beyond the frontiers of the *Reich*, and Poland had subsequently maintained a similar 1:300,000 series that could readily be used to update the German maps. No similar 1:200,000 material was available. Wartime 1:300,000 sheets covering parts of Poland cite the Polish series in their compilation notes.

<sup>28</sup> 'Gesetz über die Bildung von Hauptvermessungsabteilungen, vom 18. 3. 1938', *MdRfL*, **14** (1938), 58. 'Runderlaß von 7. 6. 1938: Bildung von Hauptvermessungsabteilungen', *MdRfL*, **14** (1938), 179-183.

The rapid successive annexations of territory to the Reich from 1938 onwards made the mapping of Germany into a greater and more complicated task. Political considerations meant that the annexation of the Sudetenland in October 1938 had rapidly to be followed by the publication of maps showing the complex new boundary. The existing Czech mapping was at 1:75,000, since it derived ultimately from the Austro-Hungarian survey of 1870-1886. It was thus incompatible with German standards, but derived maps at 1:75,000 were hurriedly produced. These then had to be replaced with further derived maps on which the Czech names had been replaced with official German ones (which were not necessarily those that had appeared on the original Austro-Hungarian mapping). Administration of the Sudetenland (which formed a rim around three sides of Bohemia) was however split between the adjacent parts of Germany. Surveying and mapping of the annexed area was thus divided between the four adjacent *HVMAs*, those of Breslau, Dresden, Munich and also Vienna (itself newly incorporated into the Reich). In March 1939, six months after the annexation of the Sudetenland, the remainder of Czechoslovakia was occupied, and partitioned between Germany and Hungary. The former Czech survey organisation in Prague was taken over as part of the German 'Protectorate of Bohemia and Moravia' (using staff transferred from the *Reichsamt*). This could have simplified things, but for political reasons the Sudetenland areas still had to remain within the surrounding German administrations.

During 1939 there were also successive boundary changes in the east. Memel was joined to the Reich in March 1939, and roughly half of Poland was annexed in September 1939.<sup>29</sup> Much of this territory had been part of pre-war Germany. A framework of old German mapping therefore existed of these areas, but revising these maps from more recent Polish surveys was nevertheless a substantial job. Mapping those areas not previously German was more difficult. For much of this area there was out-dated German mapping derived from pre-World War I Russian surveys at 1:42,000.<sup>30</sup> In southern Poland the territory of the former Austro-Hungarian Kingdom of Galicia had originally been mapped at 1:75,000. There was no existing German mapping of this area. There was a strong political imperative to bring the mapping of all these areas rapidly into line with that of the rest of Germany. One expedient was the production of 47 'Germanised' (*verdeutsche*) sheets of the existing Polish 1:100,000 map.<sup>31</sup> The process was however disrupted by the piecemeal introduction of a large number of changes in the official names and boundaries of administrative areas within the region. Each change had to be incorporated onto the maps, leading to repeated needs to revise sheets.<sup>32</sup> The magnitude of this task was enormous; between March 1938 and March 1941 the number of 1:25,000 sheets required to cover the *Reich* rose by 524 (from 2979 to 3503),

<sup>29</sup> The complexities (and brutalities) of the German administration of different areas within the parts of Poland annexed in 1939 are analysed in C Madajczyk (trans. B Puchert), *Die Okkupationspolitik Nazideutschlands in Polen 1939-1945*, Köln: Pahl-Rugenstein, 1988. The administration of the areas conquered from the Soviet Union from 1941 was different again: see A Dallin, *German rule in Russia 1941-1945*, second edition, London, 1981. Neither account mentions policies on mapping these territories, although both contain useful sketch-maps of the respective German administrative divisions.

<sup>30</sup> The *Reichsamt* had old, but contoured, 1:100,000 maps of almost all of Poland (north of former Austrian territory), all of Lithuania, and much of Latvia. These had been derived before and during the First World War from captured Russian maps. Existing derived 1:300,000 mapping extended further east to a line Viborg – Moscow – Kiev, but also did not cover former Austrian territory in Poland, or most of the Ukraine. See *Das Reichsamt für Landesaufnahme und seine Kartenwerke*, Berlin, 1931, 260-265 & 279-290.

<sup>31</sup> Annual Report to 31. 3. 1941, *MdRfL*, 17 (1941), 230-247, esp. 245.

<sup>32</sup> A consolidated list of revisions to the official 1939 list of local authority names appears as 'Die Kreisnamen in den eingegliederten Ostgebieten', *MdRfL*, 17 (1941), 269-270. Subsequent revisions are listed in *MdRfL*, 18 (1942), 56-57; also *MdRfL*, 19 (1943), 58-59; also *MdRfL*, 19 (1943), 211-212.

of which 250 remained to be published. The number of 1:100,000 sheets rose from 529 to 719, of which 45 had yet to be produced. Derived maps of local government areas had also to be produced.<sup>33</sup> Not only did the topography of these areas have to be surveyed, revised and mapped, but most of the trigonometrical framework was inadequate. The published 1941 annual report details many areas of the east that had been re-triangulated. By implication, more were outstanding.<sup>34</sup>

The expansion of the Reich not only expanded the task of mapping at medium and small scales. In 1942 the *Mitteilungen* printed an account of how aerial survey was being used rapidly to produce entirely new 1:5000 mapping of the parts of Poland previously only covered by small-scale Russian mapping. Although the account attempts to justify the civilian need for such mapping (of sparsely settled country), it does concede that publication at 1:10,000 or even smaller scales might be needed in practice. While the account probably describes surveying for military rather than civilian purposes, that extensive mapping of the east at such scales could be considered (or even be discussed) over a year after the opening of the Russian Front beggars belief.<sup>35</sup>

The expansion of the workload of the *Reichsamt* led to severe shortages of skilled technical staff, most particularly of cartographic draughtsmen, copper-engravers and lithographers. Between 1925 and 1933 only 36 technical staff had completed their training, and by 1938 only five of these remained with the *Reichsamt*.<sup>36</sup> After attempts to recruit unemployed adults with drawing or drafting skills (who were found to be unsatisfactory), the *Reichsamt* resigned itself to expanding the traditional process of recruiting school-leavers as apprentices for four years. These then had leave to perform two and a half years of compulsory military and labour service before returning as fully trained craftsmen. In October 1938 there were said to be a hundred and ten apprentices in training, plus sixty more doing their military service. The first of these were due to return in the autumn of 1940.<sup>37</sup> For a time, recruitment of trained staff from the private sector also took place, but this was perceived by the leaders of the industry as poaching, and produced a backlash. What took place behind the scenes does not appear in the *Mitteilungen* (and the regulations were only belatedly printed there), but in 1937-8 a series of decrees were made which effectively made it impossible for cartographic craftsmen to move between employers within the industry, or

---

<sup>33</sup> Unrevised copies of a large number of these sheets, covering the whole of pre-Versailles Germany east of the Oder, remain available from the *Bundesamt für Kartographie und Geodäsie*. For details, see their website [www.ifag.de/GI/shop/index.html](http://www.ifag.de/GI/shop/index.html). The index shows that most 1:25,000 sheets covering the boundary between the Soviet 'Sphere of Interest' (under the terms of the German-Soviet non-aggression pact of August 1939) and the Memelland and East Prussia are only complete to the boundary of the (then) *Reich*. Those shown of most areas of inter-war Poland within the German 'sphere' are complete to the sheet margins, the exceptions being along the southern boundary of East Prussia. I infer firstly that wider, but still incomplete, coverage of German-occupied Poland was once available, and secondly that the *Reichsamt* (as opposed to the military mapping organisations) did not extend its 1:25,000 mapping into the Soviet sphere of interest, even after the attack on the USSR in 1941. Note that even during the First World War German military 1:25,000 mapping had been made of battle zones well beyond these frontiers both by *Vermessungsabteilungen* and by the predecessor of the *Reichsamt*.

<sup>34</sup> For an account of the complex of incompatible triangulation values that had accumulated within the former Danzig corridor and adjacent areas see: B Huber, 'Die Festpunkte und ihre Koordinaten im Reichsgau Danzig-Westpreußen', *MdRfL*, **19** (1943), 21-30. This was of course the annexed area with the best existing *Reichsamt* mapping.

<sup>35</sup> F Nowatsky, 'Die schnelle Herstellung der Deutschen Grundkarte 1:5,000 in den Ostgebieten', *MdRfL*, **18** (1942), 225-232.

<sup>36</sup> A breakdown of the numbers in each of the 21 trades in the *Kartographische Abteilung* in April 1937 is given in 'Die Reichsamt für Landesaufnahme auf der Ausstellung "Gebt mir vier Jahre Zeit"', *MdRfL*, **13** (1937), 227.

<sup>37</sup> Speech by Direktor von Loeschebrand to the *Deutsche Kartographische Gesellschaft* meeting of October 1938, 'Gegenwartsforderungen in der Kartographie', (printed in) *MdRfL*, **14** (1938), 324-329, see especially p. 328.

to leave it. It was also made illegal to entice workers to another employer by ‘inappropriate means’, like offering higher wages or other advantages.<sup>38</sup>

In the early part of the 1938-9 reporting year, the *Reichsamt* was presented with another new task that was to exacerbate the shortage of skilled technical personnel. The *Kartographische Abteilung* was divided into two separate *Abteilungen* (imaginatively designated as *Kart. I* and *Kart. II*). While *Kart. I* continued the routine civilian output of maps, *Kart. II* was devoted entirely to *Sonderaufgaben* (special projects).<sup>39</sup> The ‘special projects’ were in fact the production of maps of areas outside Germany in preparation for the coming war. It should be noted that only one *Abteilung* of the *Reichsamt* was duplicated. Neither triangulation nor compilation staff were allocated to the preparation of these maps. This was to have a profound effect on the maps produced. While the staff of the new department had great (if rather old-fashioned) skills in the reproduction and printing of maps, computational and compilational skills were the prerogative of others. It was therefore almost inevitable that the maps produced by the new department would be technically-good copies of existing maps, rather than new derived maps incorporating additional material. Only if a grid (or other form of squaring) was already present on the original map would it appear on the copies. There was no mechanism within the new department for calculating grid values for maps outside Germany. Indeed the routine that had been established for the German 1:25,000 maps, which required the renewal of the trigonometrical framework as part of the process of gridding a map sheet, was inapplicable to maps for which original trigonometrical data was unavailable. No other system or routine was in place to be used.

The maps produced of Britain exemplify the results. The 1:100,000 series of ‘England und Wales’ and of ‘Schottland’, produced between 1938 and 1940, are meticulous copies of the corresponding 1:126,720 Ordnance Survey maps. In fact, as a result of redrawing or re-engraving, the line-work is finer than on the originals, despite the enlarged scale. The only substantive change in the content of the maps was that contours and spot-heights were given metric values.<sup>40</sup> Even this was a sufficiently novel task to *Kart. II* that in December 1939 it was thought worthwhile for the *Reichsamt* to print instructions and tables for the conversion of imperial to metric measures in the *Mitteilungen*.<sup>41</sup> The maps were produced to a very high standard, but being un-gridded, would have been useless for artillery purposes, and sub-optimal for many other military uses.

The production of these maps was, of course, at the time secret. The use of a civilian body to produce such maps had likewise to be kept secret. Accordingly, and contrary to usual practice, the maps bore no indication of the agency that had produced them. Once the war had started, secrecy about the body producing them became less important. Furthermore within the torrent of legislation pouring from German government bodies was an Order of February 1940.<sup>42</sup> This largely concerned increasing the level of secrecy of maps, and in particular it required that all recently surveyed detail of economic or military importance,

<sup>38</sup> ‘Bekanntgabe des Präsident der Reichsanstalt für Arbeitsvermittlung und Arbeitslosenversicherung betreffend den Arbeitseinsatz von Kartographen, Lithographen, Kupferstechern und Druckern’, *MdRfL*, **14** (1938), 273-274.

<sup>39</sup> ‘Jahresbericht des Reichsamt für Landesaufnahme vom 1.4.1938 bis 31.3.1939’, *MdRfL*, **15** (1939), 178.  
‘Jahresbericht des Reichsamt für Landesaufnahme vom 1.4.1939 bis 31.3.1940’, *MdRfL*, **16** (1940), 166.

<sup>40</sup> J L Cruickshank, ‘German Military Maps of UK & Ireland of World War II’, *Sheetlines* **69** (2004), 15-19.

<sup>41</sup> ‘Hilfstabellen zur Verwendung englischer Maße in metrische. Maßtäbliches, Erddimensionen und Berichterstattung’, *MdRfL*, **15** (1939), 317-324.

<sup>42</sup> ‘Verordnung über die Veröffentlichung kartographischer Darstellung vom 6. Februar 1940’, and ‘Erste Durchführungsbestimmungen zur Verordnungen ... vom 6. Februar 1940’, *MdRfL*, **16** (1940), 42-45.

such as railway stations and yards, and new roads, should be omitted or falsified. However, to enable policing of the measure, it also enacted that all maps had to bear the name and address of a publisher, printer or maker. Thereafter *Kart. II* did use an imprint identifying it as the maker of its maps.

There was a German military mapping authority, the *Abteilung für Kriegskarten- und Vermessungswesen*, a department within the rear echelon of the *Generalstab des Heeres* (the Army General Staff).<sup>43</sup> In 1940 its Chief was Generalmajor Hemmerich, who in his official capacity attended a formal celebration for Vollmar, the President of the *Reichsamt*, on his reaching forty years service.<sup>44</sup> A small but important indication of the relative status of the two bodies in 1940 is that Generalleutnant Vollmar thus outranked the Chief of the military mapping and survey department.<sup>45</sup> While the publications of the *Reichsamt* make no comment about the organisation's military counterpart, it seems that during the build up to war the General Staff's department did not have the capability or capacity to produce the huge number of maps required. Given that the *Reichsamt* was the successor to the military body of the First World War, and that until Hitler's rearmament of Germany the country was supposed not to have any General Staff, this might hardly be surprising. Although the *Abteilung für Kriegskarten- und Vermessungswesen* produced the intelligence booklets for the invasions of the Low Countries, France, Denmark and Norway, and for the planned invasions of Britain and Ireland, the *Reichsamt* produced the maps. Despite the explicitly military tasks of *Kart. II*, it remained a civilian department within a civilian organisation. It continued to produce war maps until February 1941, when it was once more merged with *Kart. I*. This may mark the point when the *Abteilung für Kriegskarten- und Vermessungswesen* became able to produce its own maps, but may simply be the point when the *Reichsamt* ceased to differentiate between its war work and its civilian tasks.<sup>46</sup>

The differences in the history and development of the *Reichsamt* and the Ordnance Survey left them with very different strengths and weaknesses. In the second article of this pair I shall explore the implications and results of some of these.

---

<sup>43</sup> Initially called the *Abteilung für Heeresvermessungswesen und Militärgeographie (9. Abt.)*, this department was established in October 1936. Until mobilisation for war it formed part of the *Zentralabteilung of Generalstab des Heeres* under *Oberquartiermeister I*, but on mobilisation of the Field General Staff, it remained in Berlin under *Oberquartiermeister V*. The *Chef des Kriegskarten- und Vermessungswesens* thus became an officer within *Generalstab des Heeres 2. Staffel*. Stephen E Ambrose (ed.), *US War Department handbook on German military forces*, Washington, 1945, reprinted Baton Rouge, 1990, 24. Rudolf Absolon, *Die Wehrmacht im Dritten Reich*, Schriften des Bundesarchivs 16, Boppard: Harald Boldt Verlag, 1975-88, 16/III 152, 16/IV 178, 16/V 58-9. There was also an equivalent officer and body within the *Luftwaffe* General Staff. The status of the *Luftwaffe* body progressively increased from 1934 onwards, as did the rank of Ernst Drechsel, its leader during this time (Fliegerkommandant 1934, Oberstleutnant 1935, Oberst 1937, Generalmajor 1942).

<sup>44</sup> *MdRfL*, 16 (1940), 41.

<sup>45</sup> When it had been a military body, the *Chef* of the *Preußische Landesaufnahme* had traditionally held the rank of *Generalleutnant*. General von Bertrab, the penultimate *Chef* had been promoted to full *General der Infanterie* during the war. Weidner, the last *Chef* and first President, had been a *Generalleutnant*. His successor, Richard von Müller, had left the army in 1919 as a *Generalmajor*. When he was subsequently promoted to the Presidency his military rank on the retired list remained unchanged. Vollmar's appointment restored the status of the Presidency. A useful list of the names of those prominent in German surveying and mapping in 1940, with their military or civil ranks and appointments, is given in 'Eröffnungstagung und 1. Fachsitzung des Forschungsbeirats für Vermessungstechnik und Kartographie', *MdRfL* 16 (1940), pp 93-109.

<sup>46</sup> The bald statement in the 1941 Annual Report that *Kart. I* and *Kart. II* had been merged makes no comment about what the implications for their respective workloads or personnel were to be.