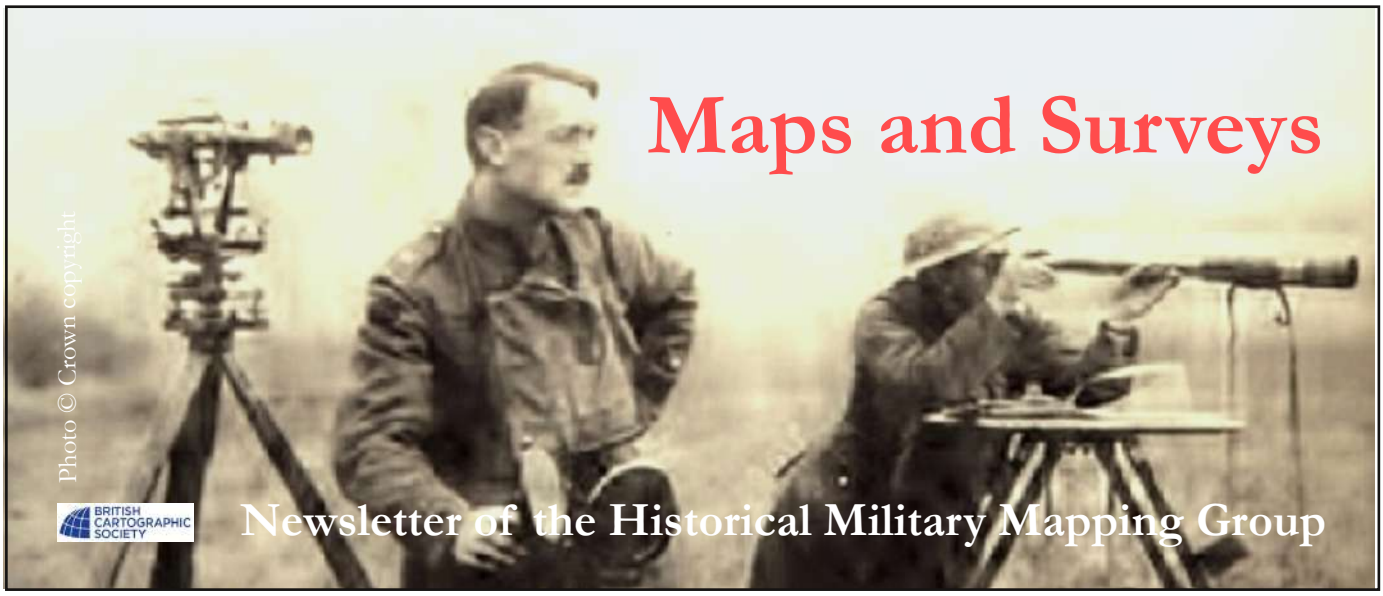


Maps and Surveys

BRITISH CARTOGRAPHIC SOCIETY

Newsletter of the Historical Military Mapping Group

Maps and Surveys appears in spring, summer and autumn. The Newsletter welcomes contributions - please contact Ros Derby, BCS Administration (*admin@cartography.org.uk*) for information. Editor: Paul Hesp (*Paul.Hesp@drei.at*).

From the Editor

We start this bumper issue with Chris Barrington Brown's retirement project: D-Day logistics. Peter Chasseaud presents his detective work on a little-known OS map series. A 1942 Belgian map triggered my exploration of the topographic services in countries under German occupation. All with a next instalment to look forward to. Of course, occasional small contributions (say, a front-page map) are also welcome!

Contents — Autumn 2023

A map with a long pedigree. Karte des Deutschen Reiches 1:100,000, Grossblatt 432NW (Tatra West). Undated reprint, with German text, of a 1934 Polish map. The right hand corner, Polish territory, is based on a 1932 1:25,000 Polish map. For Czech territory, a 1931 Czech 1:75,000 map was used. This in turn was a revision of an Austrian 1:75,000 map based on the 1:25,000 Third Military Survey. Source: collection editor. *See the article on p. 6.*

Chris Barrington Brown - THE LOGISTIC BUILDUP TO D-DAY: A RETIREMENT PROJECT

The invasion of Normandy on 6th June 1944, known colloquially as D-Day, initially involved about 170,000 men who landed, around 7,000 ships and 13,000 aircraft, mostly from the UK, USA and Canada, but with contributions from other nations. By the end of the first month approximately 171,000 vehicles and a million men were ashore, complete with over 566,000 tons of stores, fuel and ammunition – a staggering logistic feat.

Last year I sold my counter-terrorism and defence software business and retired. With a background in the military (regular and reserve), a computer-science degree, an interest in military history and an understanding of digital mapping, I looked for a project that would play to my strengths and keep me occupied. As any military person does, I had read about D-Day extensively, but most literature started as the troops approached the beaches. I wondered how they had got there. How had they been fed, accommodated, equipped, trained, hidden, mended when they (or their equipment) broke, etc? Perhaps there was a book to be written about that build up.

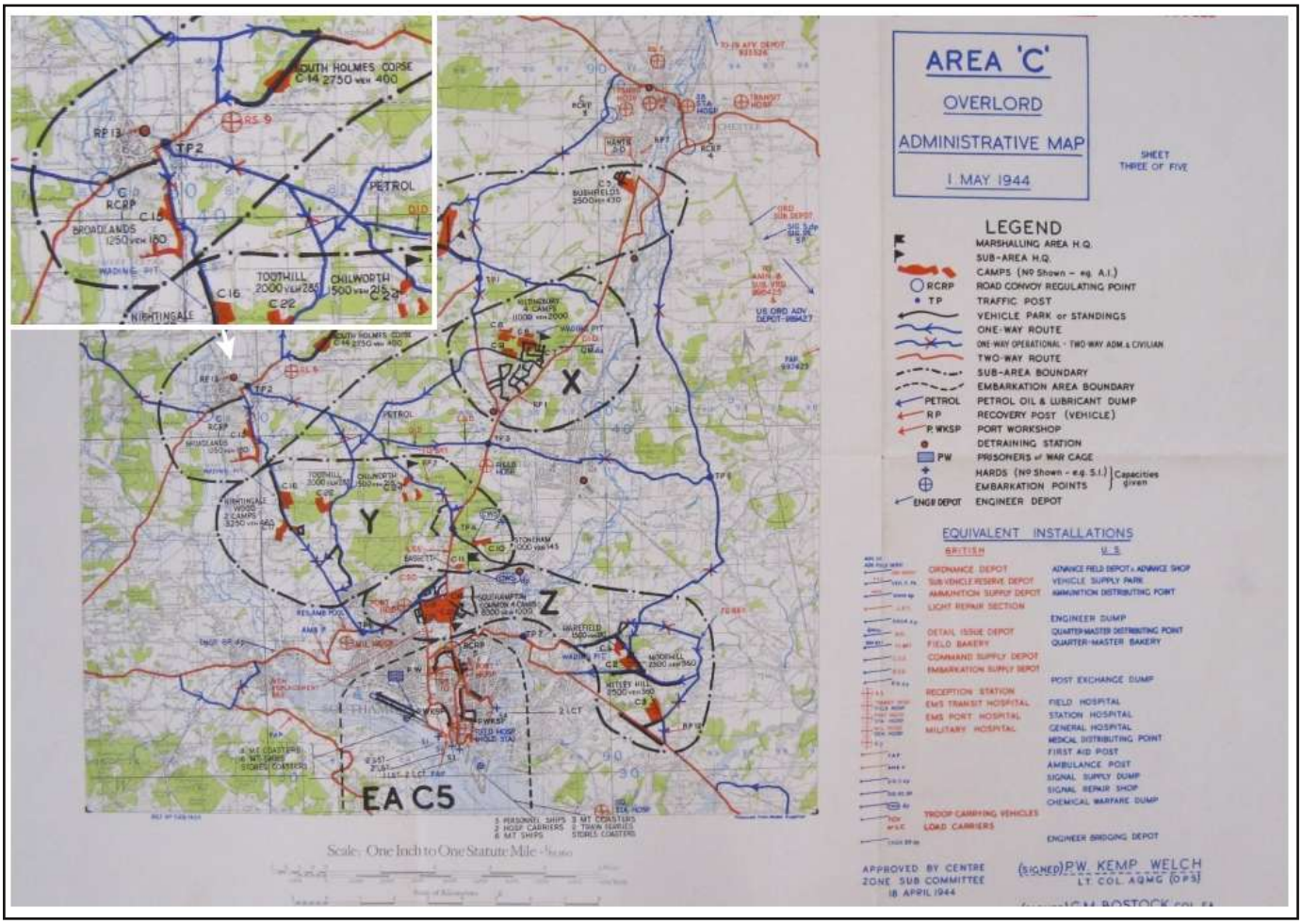
A light bulb moment

Then, as I was wandering around the D-Day Story in Southsea I came across a copy of the map below (Map 1) and had a 'light bulb' moment: it showed my home area near Southampton.

Every exercise or operation that I had ever been on in the military had such maps, overprints of the logistic infrastructure. Since it was of my home area round Southampton I thought it might be interesting to transpose the overprint information from the 1944, 1 inch to 1 mile, wartime Cassini gridded map to current Ordnance Survey of Great Britain (OSGB) mapping. People could see and explore on a web map what had been 'going on' in their area.

I started tracking down the other nineteen Marshalling Area maps and researching the logistic background. The current (still

Map 1. Ordnance Survey 1 inch to 1 mile adminstrative map of Area 'C', Operation Overlord. Inset: the area around the author's home. Source: The National Archives.



embryonic) result can be found at www.ddaybuildup.info.

Three questions

As I started to focus the project, I decided to try to answer three questions:

1. How did the logistics work? How did food, vehicles, men, ammo, fuel, etc move from the points of arrival/production to being on planes or boats to head for Normandy?
2. What installations were where? This involves trying to locate and then plot large amounts of locations derived from archives held at national (US/UK/Canadian), corps/regimental museum and County Record Office level.
3. Who was Where and When? This involves linking units (about 25,000 of them) to the locations of the previous question, over time, so users can answer questions such as 'who was in this camp?', 'where did this unit move through?', or 'what was the Order of Battle (ORBAT) for a particular unit or formation?'. To give some boundaries I decided on 1st January to 30th June 1944.

So far, I have captured data from about 1,400 archive folders (30,000 pages photographed) with many more still to find. In the interests of speed and cost I have built an initial Esri StoryMap which includes text and pictures to start to answer the 'How' question, with embedded maps from QGIS Cloud to answer 'What installations?'. As I get closer to 'Who was Where and When' question I expect to migrate everything to Esri's Experience Builder as it gives me a more functional platform to work with, albeit at a cost in money and time.

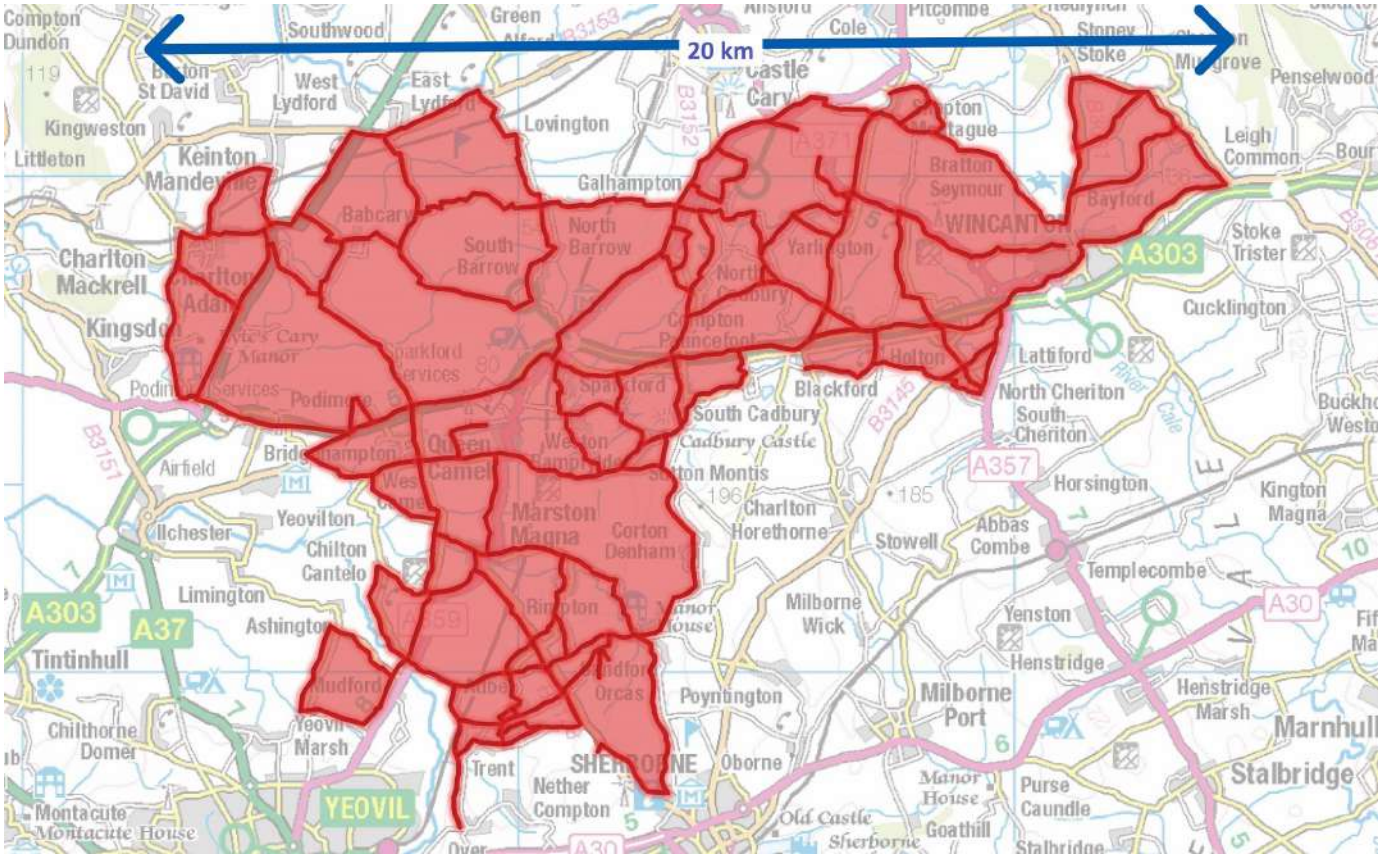
Examples of maps

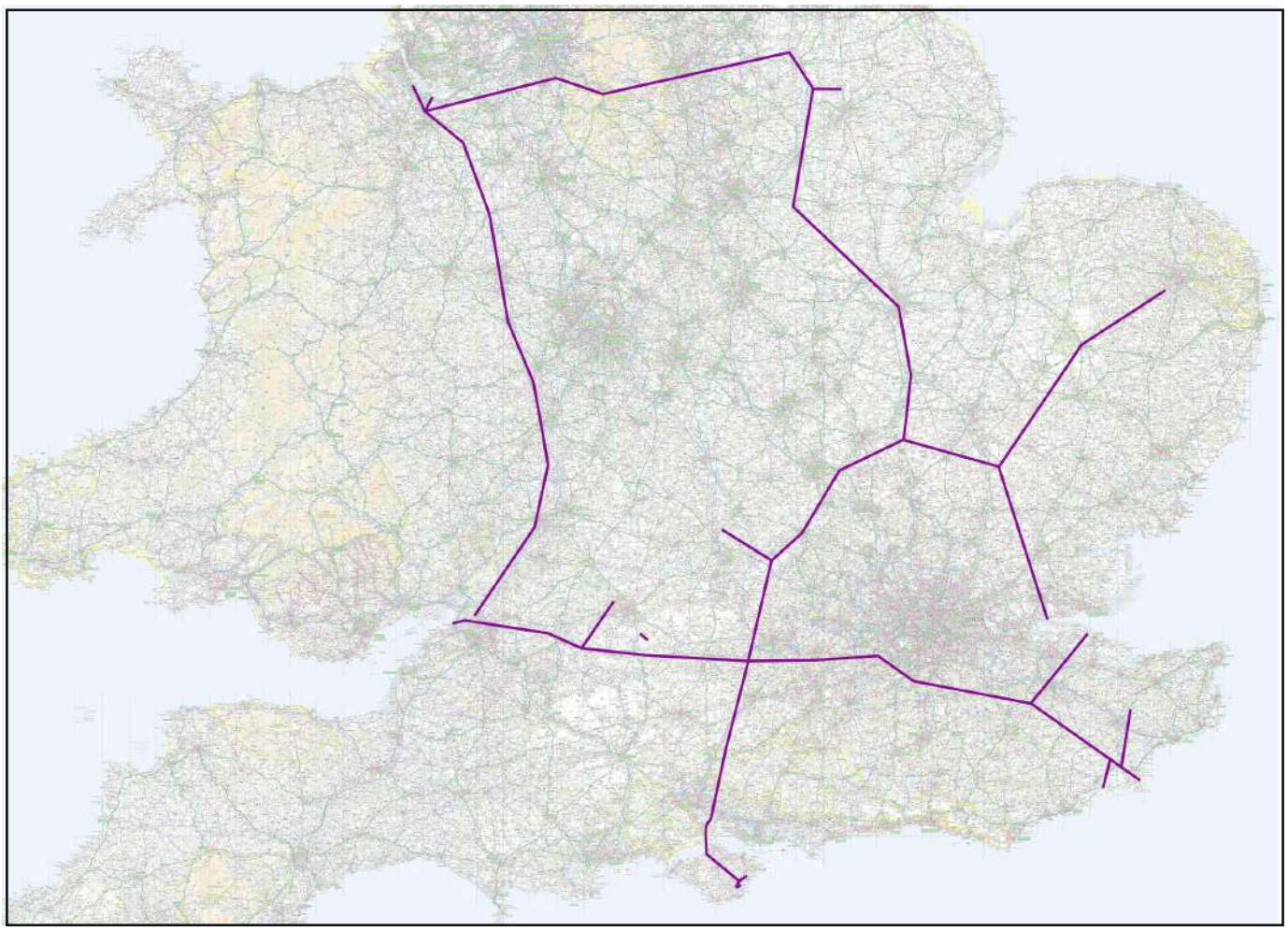
To give an example of what sorts of mapping you can currently explore, consider a ground-based ammunition dump. Many were set up all over England and Wales to receive, hold and supply the vast quantities (of the order of 1 million tons) of ammunition required. Without access to purpose-built surface or sub-surface depots, ammunition was ground-dumped in shelters like the one shown in the photo above.

Source: US Army from NARA, Washington, DC.

Each cluster of shelters might hold 100 tons of ammunition, and each cluster had to be at least ¼ mile from the next. This led to large lengths of country lanes being requisitioned, such as the US depot at Marston Magna in Somerset which held 45,000 tons (Map 2). An

Map 2. The huge US depot area around Marston Magna. Background mapping: Ordnance Survey.





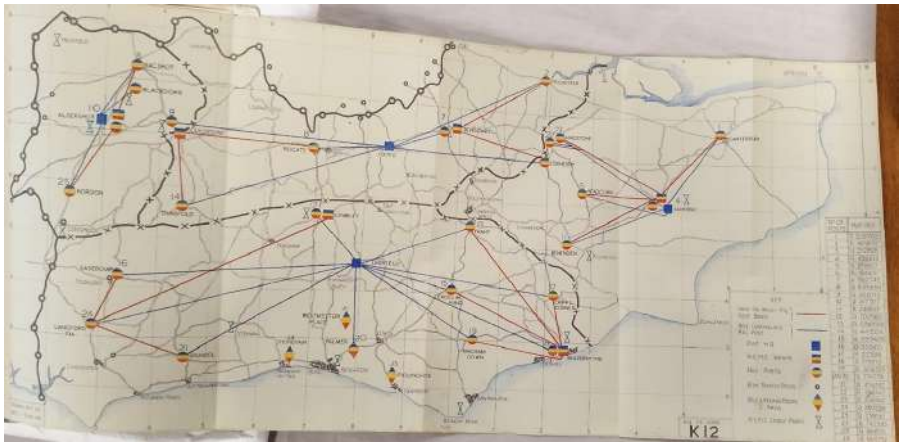
Map 3. The pipeline sytem reached as far north as Liverpool. Background mapping: Ordnance Survey.

amazingly large area to manage, secure and conceal, while still in use by the local population.

Another example is petrol, oil and lubricants (POL). Many have heard of the Pipe Line Under The Ocean (PLUTO). This was a pair of pipelines (actually 21 individually laid pipes) from England to France, deployed in the weeks after D-Day. The one from the Isle of Wight to Cherbourg (codenamed BAMBI) was not actually very useful, since by the time it was in service in September 1944 the forward troops were in Belgium. However, its sibling, DUMBO, from Dungeness to Boulogne, was used to move around 172 million gallons of fuel to France and, through extensions to the pipeline, into Germany. But without the strategic pipeline network behind it in the UK this would not have been possible. By June 1944 the network looked as shown in Map 3.

I have found diagrams and maps in many places. Diagram 1 below (detailed view next page) shows the vehicle repair system in the South East of England. If vehicles broke down there was a network of Repair Points which could try to fix the vehicle at the road side. If they could not, it would be taken to a Workshop for repair. If that was going to take more than two hours a new vehicle would be called forward from a local vehicle park and the load and crew transferred to continue their journey to the coast. The dead vehicle would be fixed in slower time and sent to the vehicle park, or dragged to a 'crock park' to await longer term repair or salvage. The organisation shown here in the South East repaired 971 vehicles during the initial assault phase and 5,615 vehicles during the subsequent two months.

Diagram 1. The vehicle repair system in South East England. Source: REME Museum, Lynham.



There are many 'rabbit holes' that I may be tempted to explore, or I may leave them for others to work on in some sort of 'crowd sourcing' model. If there is sufficient interest amongst HMMG members I may use another slot in the Newsletter to expand on one or two of them.

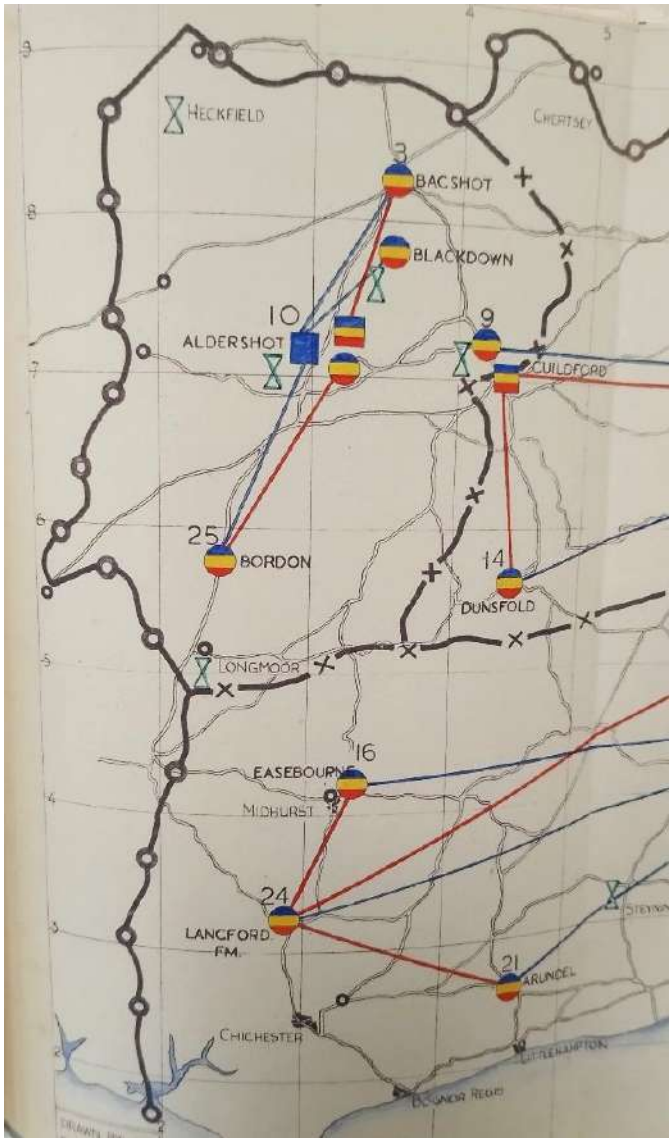
The question of legacy

Finally, there is the question of legacy. If I were writing a book the process would be clear: write, publish and let the book sit on a shelf for anyone to read for the next 100 years or more. However, the information that I'm trying to collect is really a searchable database with a geographic front-end, not a 100-page book with 10,000 pages of annexes. How can that be available in only 20 years' time (the 100th anniversary of D-Day, for which I would like the data to be still accessible)? GIS technology seems to have a life of five to ten years, while web 'standards' seem to change faster than that. When I am gone (or at least unable to support a website) how will it continue? Some of the museums that I have talked to are quite unable to handle a digital archive, and others want quite a large dowry to take on the task of maintenance.

Hopefully this sort of question will be addressed before I need to decide on the future 'home' for my project. In the meanwhile, I continue to research, catalogue, digitise and make the data available – I suspect for many years to come.

Chris Barrington Brown spent twelve years in the Regular Gunners and thirty-three in the Reserves. He is a proud computer geek, occasional orienteer, and amateur map-maker and historian. He retired from his defence and counter-terrorism software business last year.

If you have answers to any of the issues raised above, or would like to be part of any 'crowd-sourcing', you can contact him at chris@barringtonbrown.co.uk



Detail of Diagram 1.

Notice Board

Digital mapping of Allied bombing: volunteers wanted

Professor Patrick Major is working on a digital map of Allied bombing in Europe during World War II. The map has 10 layers, each devoted to a different aspect: active and passive defence, the war economy, area targets, etc. The whole is conceived as a reference work, and professor Major is looking for collaborators who could look for material in places convenient to them. He can be contacted at (p.major@reading.ac.uk). For an impression of what the map looks like, see: https://www.google.com/maps/d/edit?mid=1qM6hgm8GPR0NKz7tgNkyeOAUiUm_4-Py&usp=sharing.

Paul Hesp - MAPS FOR THE ENEMY (I)
Topographic services under occupation: Belgium and the Netherlands

This is the first of a two-part article on the Belgian, Danish, Dutch and Norwegian topographic services during the German occupation. The country selection criteria were the author's (passive) knowledge of the languages of these countries and easy access to material. The material found was very heterogeneous, but a thorough comparative study was not intended. The article starts with a brief sketch of German military mapping in the run-up to and during World War II. The second article will conclude with some remarks on such questions as collaboration with the enemy.

Military mapping during the Nazi era

Nazi Germany's mapping services expanded rapidly from 1935 onwards, a national mapping agency replacing former federal structures. Stationary facilities for the armed forces were supplemented with mobile surveying, printing and map distribution units were for the army in the field. The 1938 *Anschluss* added the Austrian topographic service, a goldmine of information on Central and Southeastern Europe, to Germany's resources.

The collection of geographical information on European countries started well before the war. Topographic maps were acquired through purchases, exchanges with foreign topographic services and other means. Covert air photography and field surveys were used to update this material (see Map 1, next page, for an example).

In occupied countries, the map and survey directorate of the German army general staff (*OKH Abteilung für Kriegskarten und Vermessungswesen*) established local offices and military geography (*Mil-Geo*) units. The latter produced country handbooks with key geographical information, lists of available maps and annotated maps. For an online 1943 overview of all these handbooks see Sources, *Oberkommando des Heeres*.

Initially, the German maps of occupied countries were mainly reprints of maps obtained locally with minor revisions (*Sonderausgaben*); later, where capacity was available, improved updates were produced on the basis of air photography and field work, and a unified German Army Grid (*Deutsches Heeresgitter*, also known as *Europäisches Einheitsgitter* or European Standard Grid) based on the Gauß-Krüger projection was introduced, along with a *Heeresmeldenetz* (Army Coordinate Grid). Depending on where and when they were produced, German WW II maps vary greatly in character and quality.

Topographic services in the countries discussed here remained nominally independent except in the Netherlands (and briefly Belgium) but were pressed, to varying degrees and with varying success, into providing survey data, maps, printing facilities and staff time. We will now see how the topographic services in Belgium and the Netherlands fared.

Belgium

'The printing presses [of Belgium's Institut Cartographique Militaire*] were running at full speed, serving both the Germans and the Belgians.' (Bracke p. 197)*

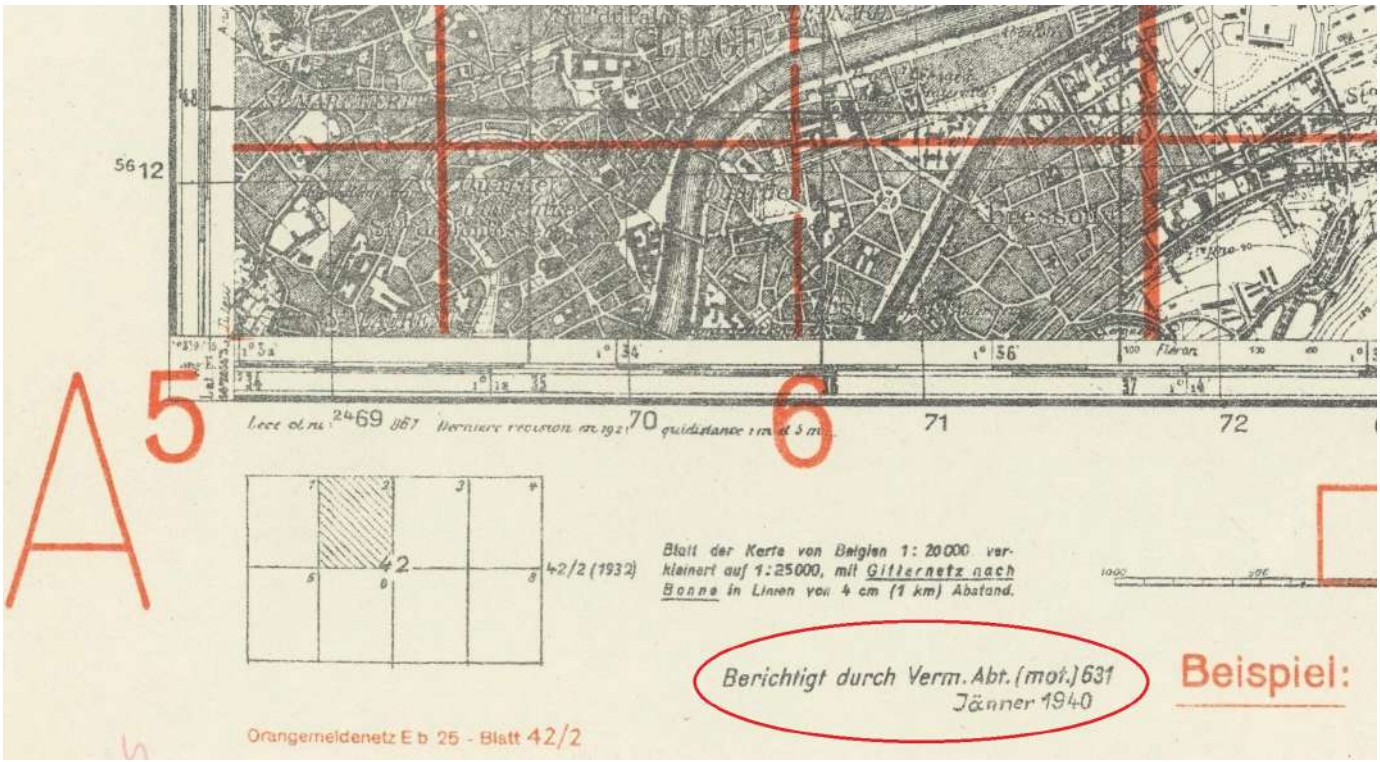
Belgium's military cartographic institute (*Institut Cartographique Militaire* - ICM) was the only one of the four topographic services able to evacuate staff, equipment and documentation after war broke out. The ICM ended up in southern France, where it was traced by the Germans. In late August the ICM began the move back, during which part of the equipment and documentation was lost. Upon return to Brussels, it found that had to share its offices a German *Karten- und Vermessungswesen* unit.

While Belgium was under German military administration during most of the war, the ICM continued its activities under Belgian management. The institute carried out surveys, particularly in connection with urbanisation, for the *Commisariat Général à la Restauration du Pays*, a commission for national reconstruction, and – as before the war – supplied maps to national and local authorities and other customers. The organisation was demilitarised in 1941 and attached to said commission. The Germans controlled the printing facilities and provided supplies and maintenance. Some ICM staff worked full-time for them. A number of former ICM staff asked to be taken on board again, as this provided a safeguard against *Arbeitseinsatz* in Germany.

Official reports played down the ICM's role in supporting the German war effort. However, as with all government agencies in the occupied territories, compromises as a result of pressure by the Germans were inevitable; in any case, they simply requisitioned (or destroyed) material if that suited them. Bracke has found ample evidence of work done for the Germans. The ICM printed Belgian 1:20,000 maps and German 1:25,000 maps derived from these (see Map 2). Maps were updated using Belgian

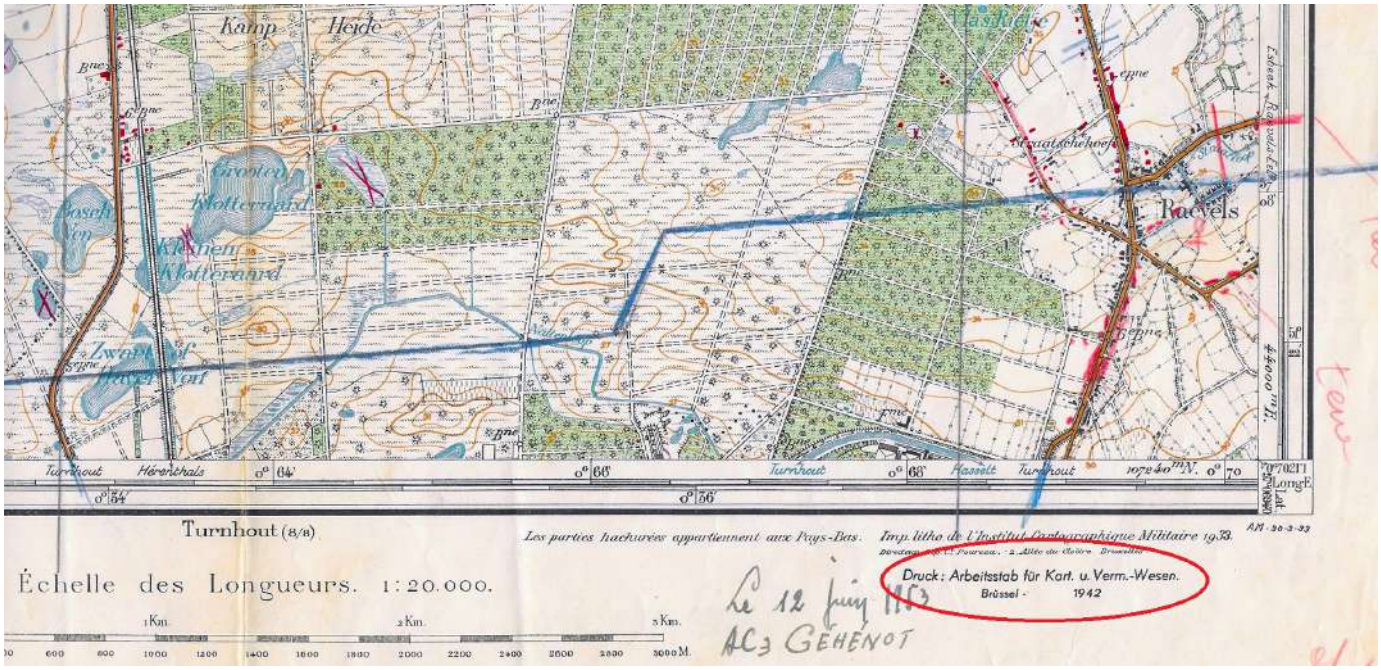
revisions. A 1944 German publication mentions the availability of printing plates for the 72 sheets of the Belgian 1:40.000 map, along with 18 of the 23 printing plates for maps of areas around garrisons at the same scale - 'a cartographic tool of the first order' (Bracke p. 188).

In late July 1944, the ICM received a formal demand to start working on the reduction of 1:40,000 maps of Belgian territory east of Brussels to the 1:50,000 scale used by the Germans and on the revision of maps with German air photos. The Belgians refused to do so, whereupon the Germans took over the Institute; but they cannot have achieved anything before the liberation. The ICM resumed activities on September 5, two days after Allied troops reached Brussels. The equipment had remained intact, though the archives were a 'terrible mess' (Bracke p. 183, quoting a staff member's report).



Map 1. Fragment of Belgian map 1:20,000 Liége 42/2, 1932, updated in January 1940 (circled text) and reduced to 1:25,000 by German mappers. The same text is found on 7 of the 8 sub-sheets of sheet 42, which covers the Liége-Verviers area, a major concentration of industry with the main road/rail connection Cologne-Brussels (the future invasion route of Germany's Fourth Army). Orange lines: Heeresmeldenetz; thick black lines: Belgian Bonne grid; thin black lines: Gauss-Krüger grid. Source: Belgien 1:25 000 (berkeley.edu).

Map 2. Belgian map 1:20,000 Weelde 8/4, 1933, printed in Brussels by the German mapping unit in 1942 (circled text). Fragment of a worksheet for a 1953 Turnhout area map revision. Source: collection author.



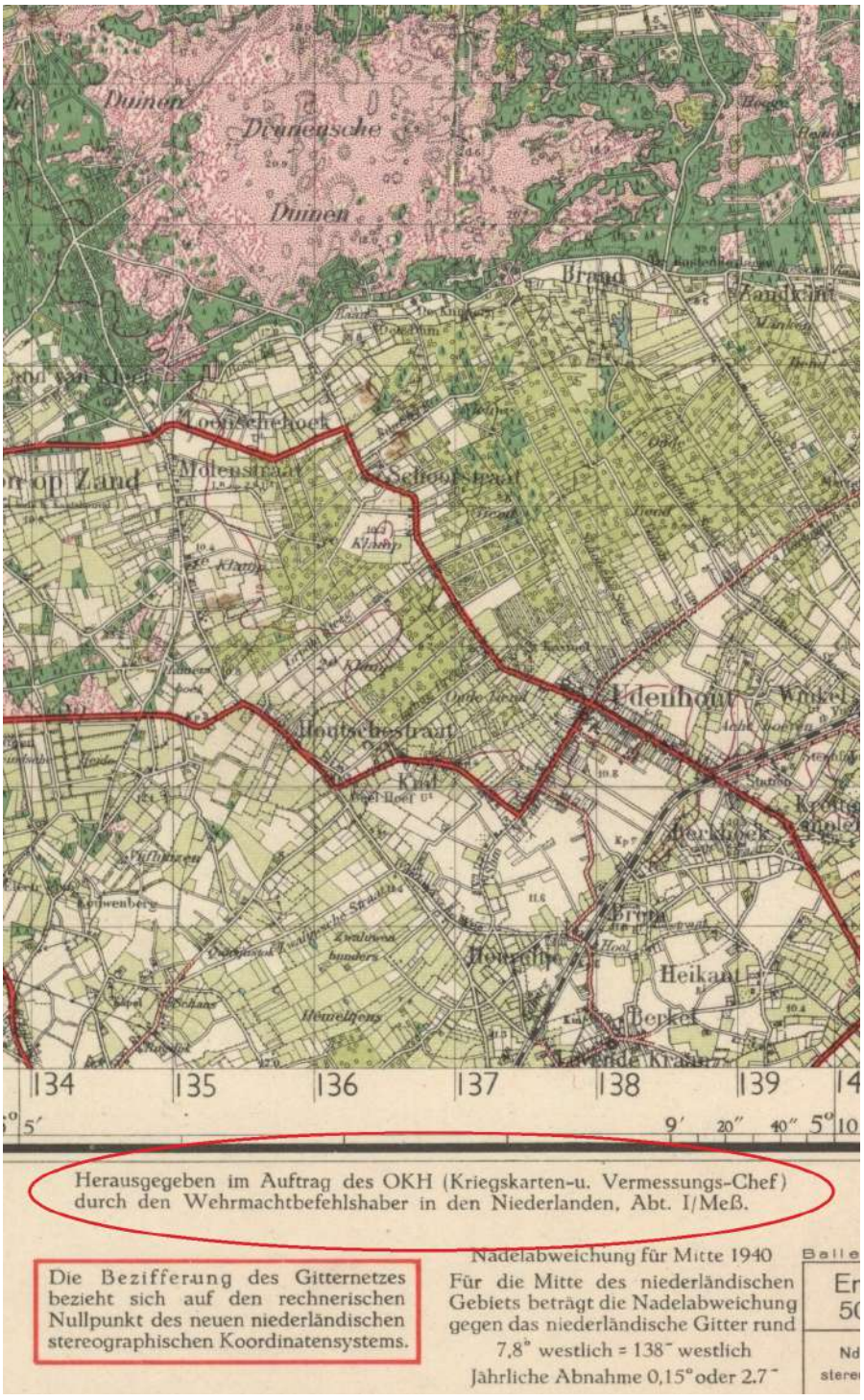
The Netherlands

'We should surely pay homage to the Topographic Service in The Hague, which provides us with extensive [sic] *and precise maps.' (*De Zwarte Soldaat*, periodical of the Dutch equivalent of Germany's SA, 16-01-1942, quoted by den Boer, p. 40)*

A major objective of the German airborne attacks on the Netherlands was to capture the Hague, the seat of government and the residence of the Queen. The topographic service (*Topografische Dienst* – TD) was also located there. The attack on the Hague failed completely, but after the bombing of Rotterdam on May 14 and with virtually no air defences left, the Commander-in-Chief, general Winkelman, decided to capitulate. He ordered the destruction of military equipment and archives, to the extent possible. The TD archive was overlooked in this order, and 'the Germans would gratefully make use of [it]' (De Jong [a], p. 379).

After the capitulation, Winkelman, to whom government powers had been transferred by the Dutch cabinet when it moved to London, was still able to issue an order that work that might support the German war effort was forbidden. The TD director was severely reprimanded for printing maps of Belgium and France at the request of the Germans. But many private enterprises were reluctant to stop working on lucrative orders, and Winkelman would in any case soon be a prisoner of war. On May 29 a German government under *Reichskommissar* Seyss-Inquart took over from the military administration already in place, and the total subjugation of Dutch society started.

The TD's acting director and the head of surveys were dismissed in September 1940, a German officer being put in charge. He immediately restricted the provision of maps to



Map 3. Truppenkarte 1:50,000 44 Ost. Geertruydenberg, 1941, minor corrections 1943. Apart from the German text the map is identical with the contemporary Dutch map, including the grid. Circled text: 'Issued by order of the Army General Staff... by the German Army Commander in the Netherlands...'. Source: CC_BY Kadaster.

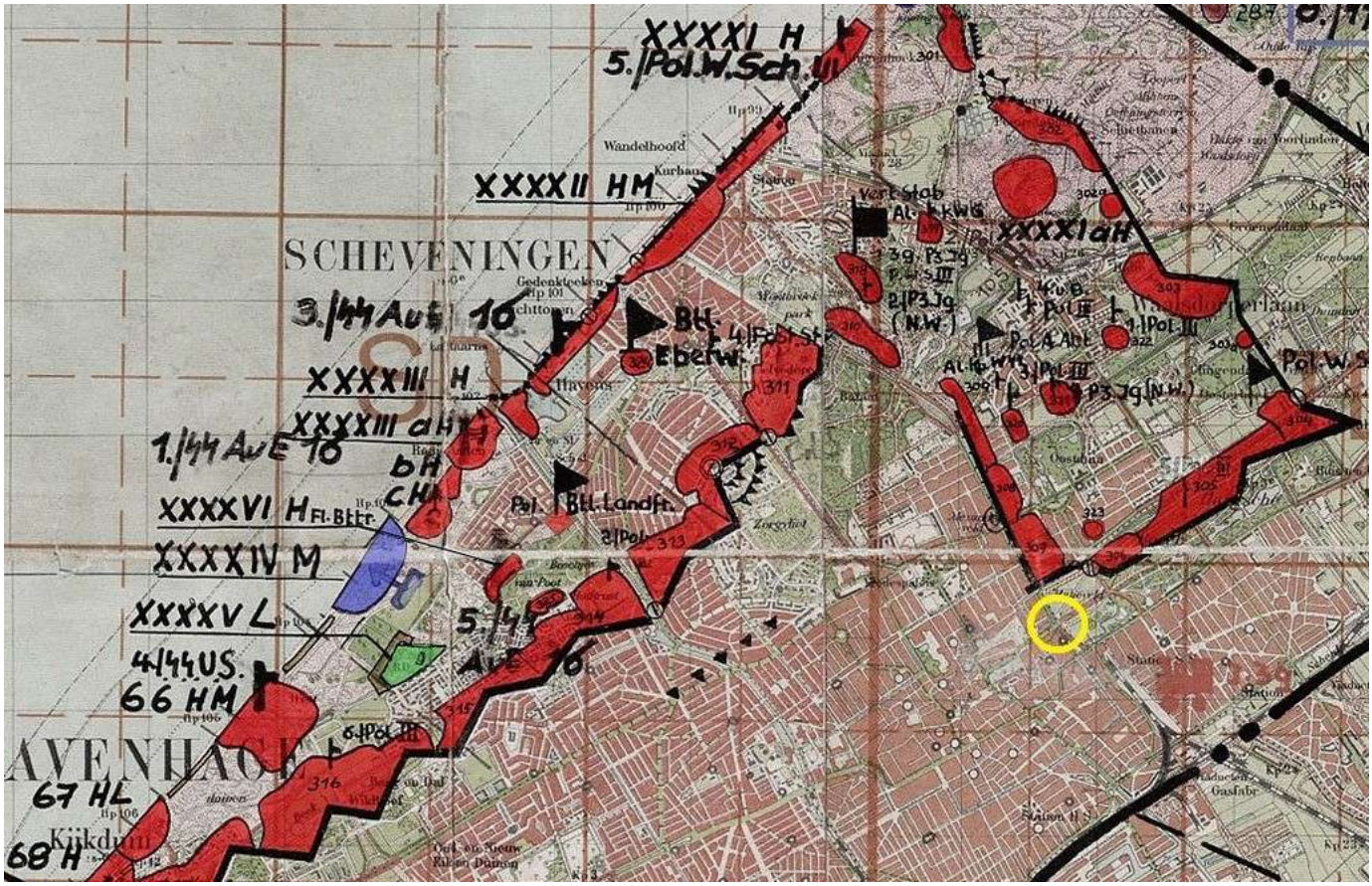
Dutch government agencies (which continued to be responsible for the country's everyday administration). Staff remained Dutch, and the German officer in charge initially had an honorary Dutch advisor, the geodesy professor Schermerhorn (he was interned by the Germans in 1942, went underground after his release, joining the resistance, and became prime minister after the war). As in the other countries, the Germans established a separate cartographic unit, some TD staff being directly employed by it. The TD also worked on the adaptation of Dutch maps for German use.

In late 1943, the TD was ordered to move to Utrecht, taking over the offices of a trade union (where the German *Kriegskarten- und Vermessungsamt* was housed as well)

and a local printing works. A major reason for this move could have been the construction of Atlantikwall, for which large parts of the Hague were destroyed. The TD offices would have been right behind the frontline in the case of Allied landings (see Map 4). Field work stopped. In late August 1944, the Germans ordered the shipping of all map stocks to Brussels, but the Dutch refused to cooperate and when Allied troops reached Brussels on September 3 the order became redundant. The TD essentially stopped operating at this time. Staff managed to hide part of the materials, but all printing plates were stolen or destroyed by the occupiers.

After a variety of occupations, Paul Hesp studied Geography at Amsterdam University. He later settled in Vienna, where he worked for the UN Industrial Development Organization. Maps have fascinated him since he was given his first school atlas.

Map 4. Fragment of topographic maps 30 West and 30 Oost 's Gravenhage 1:50,000 (year unknown), showing the Atlantikwall and German units in the Hague. Brown grid: Heeresmeldenetz. Yellow circle: location TD office. Source: Atlantikwall Museum The Hague.



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Dr Peter Chasseaud - THE 'A' SERIES MYSTERY: MAPS FOR A BREAKTHROUGH? (I)
Maps of Belgium and part of France, 1914-15

This article introduces the short-lived and little-known 'A' Series maps of Belgium and part of France at 1:20,000 (GSGS 2742), and later at 1:40,000 (GSGS 2743?). These maps should not be confused with the regular or 'B' Series 1:20,000 and 1:40,000 sheets carrying the same GSGS serial numbers. The second article will explore more fully the context of the 'A' Series and its demise, and the question of its sheetlines and coordinates relative to the 'B' (regular) Series.

The mysterious and short-lived 'A' Series of 1:20,000 (and later also 1:40,000) sheets, clearly based on Belgian national survey mapping and data, and including a considerable amount of pre-war French 1:80,000 and *plan directeur* material, covered, or was intended to cover, much of Belgium south of Brussels and west of Namur, and parts of north-east France. While the 'Maubeuge salient' and adjacent Franco-Belgian frontier areas were covered by pre-war 1:20,000 fortress and frontier *plans directeurs*, there is no indication that these were available to the British before the war. Once trench warfare had begun, these *plans directeurs* were supplied by the French to the British, who began to compile new large-scale maps of the front area.

The 'A' Series is mysterious because of a particular lack of references and documentation in the official accounts and in memoirs, giving the impression that the key players found it, in retrospect, an embarrassment. Determining its raison d'être and dating its instigation and stages of development is a problem. The designation 'A' Series distinguishes it from the 'B' or regular Series which (according to Colonel E.M. Jack's post-war *Report on Survey on the Western Front, 1914–1918*) signified the extension of the Belgian national sheet-lines across France. Both 'A' and 'B' series were begun at the same time – October–November 1914 – when the BEF had just moved, from the Aisne to Flanders. They shared the GSGS serial number 2742 with two other series of the same scale, the *plan directeur* of Lille (6 sheets), and the 'Artillery Training Maps' of the UK (eventually some 200 sheets), but the last-named series was soon renumbered 2748.

Abbreviations & Glossary

BEF	British Expeditionary Force
C-in-C	Commander-in-Chief (Sir John French, until the end of December 1915, then Sir Douglas Haig)
GHQ	General Headquarters
G in Gap	A humorous rendition of the British Army's pre-war map-referencing system, and its wartime obsession with the notion of 'breakthrough'
GSGS	Geographical Section, General Staff (War Office, London); MO4 until end of 1915, then MI4
L-of-C	Lines of communication; map store at the base on the coast
Mag. Var.	Magnetic variation
OS	Ordnance Survey
WO	War Office

The terms 16-square, 48-square, etc., refer to the number of 1,000-yard squares in a larger, lettered rectangle in the reference system (proto-grid).

Genesis of the 'A' Series

The 'A' Series sheets were the first large-scale war maps to be redrawn from Belgian and French original material by Ordnance Survey draughtsmen on 1,000-yard-square sheetlines (effectively a 1,000-yard grid, whose rectangular coordinates ran from the Belgian origin). Printed in black, with brown contours, green woods, blue water and the squaring overprinted in red, they bore sans-serif typed names (serif for woods) and had a contour interval of 5 metres. The detail and contours on sheets 122 and 123 covering France showed a correspondence with those of the *plan directeur* of Lille. Those for the Belgian area were taken directly from the Belgian survey. The series promised continuity of squaring, topographical detail and contours across the Franco-Belgian border, thus avoiding the problem of a discontinuity of cartographic and firing data during an advance.

Practically from the outset, British policy was to redraw the hachured, monochrome, French 1:80,000 *Carte d'Etat-major* (but not in general the Belgian national sheets) with British conventional signs, and to print in colours. The maps were enlarged to 1:40,000 and 1:20,000. While the first 'B' Series sheets were not redrawn from the Belgian originals, those of the 'A' series were from the start redrawn to a British military specification from the original Belgian and French source material and, crucially, had sheetlines cast to fit the British 1,000-yard artillery squaring system, the projection, origin, azimuth, spheroid, etc., being those of the

Belgian national survey. To begin with, the series comprised only 1:20,000 sheets, but these were later renumbered as quarters of 1:40,000 sheets (e.g. 73NW - see Maps 3 and 4 on p. 16), which were produced as well. The series therefore comprised both scales in a second phase. Both phases will now be described in detail.

A)

A 1:20,000 series, numbered 122, 123, 124, etc., with sheets 16,000 x 12,000 yards (plus 1,000-yard overlaps on two sides), apparently dating from October-November 1914, and possibly intended to cover much or all of Belgium. The sheets of this series so far identified are, in their rows and columns:

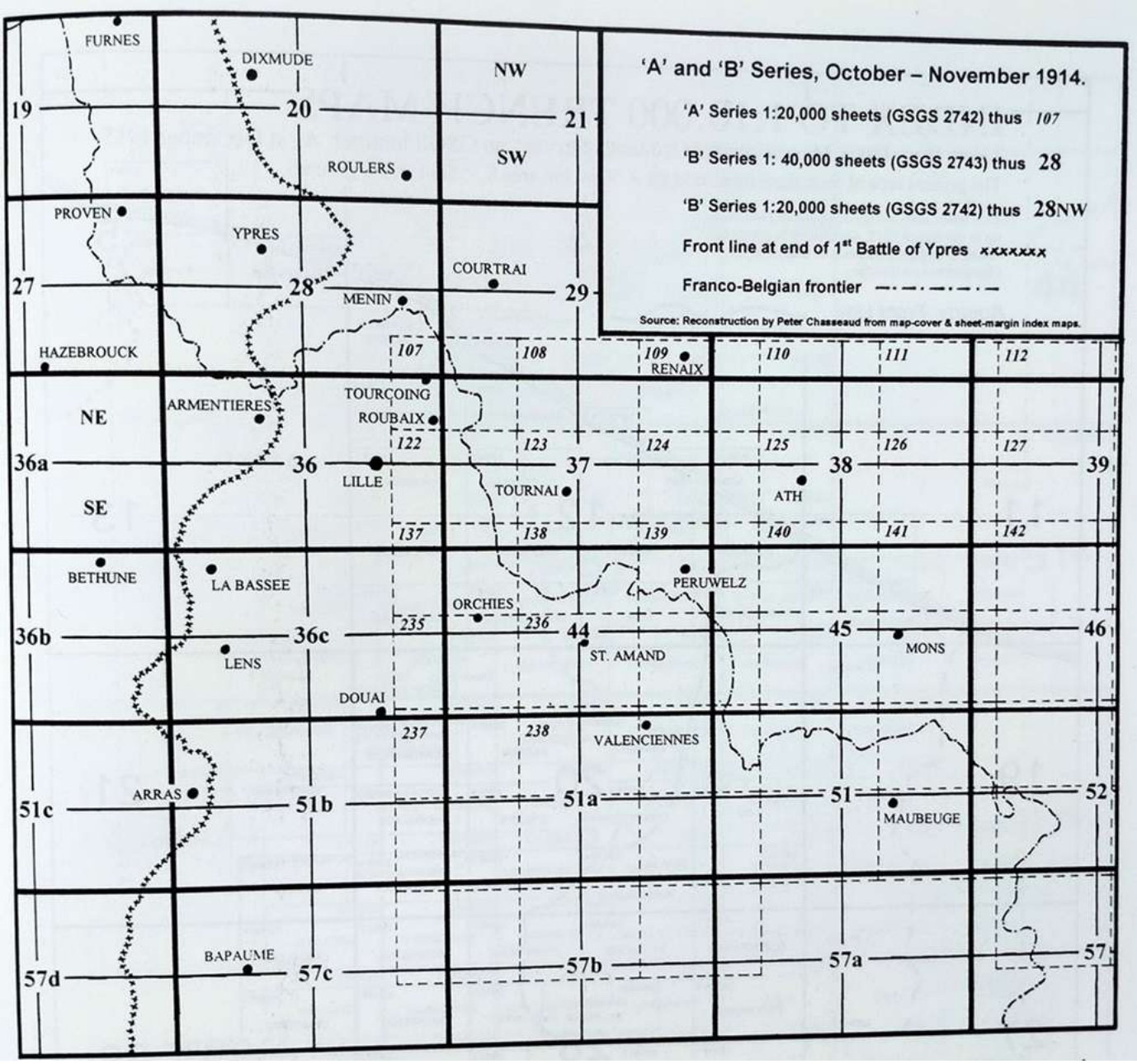
107	108	109	110	111	112
122	123	124	125	126	127
137	138	139	140	141	142
235	236				
237	238				

This is not to say that all these sheets were actually produced. The last four (235–238) comprised the four quarters of the later 'A' Series 1:40,000 sheet 78, and their out-of-series numbering implies a certain finality, at least for the time being. This sheet layout suggests that they were prepared for use in an attack eastward between Arras and Lille, past Douai: for example, in the Allied offensives in Artois (Loos–Vimy Ridge–Arras) of May and September 1915. More about these offensives below.

As can be seen when my reconstructed index diagram is exended to the east, the origin of the sheetlines (not the coordinates) was at, or close to, the common corner of the 'B' series 1:40,000 sheets 46, 47, 52 and 53.

Without more information, and ideally an original index diagram, it does not seem possible to reconstruct the layout of the sheets to the north of the 107–112 row, except to observe that about ten rows of such

Index diagram of the 'A' and 'B' Series sheets, 1914. Source: author.



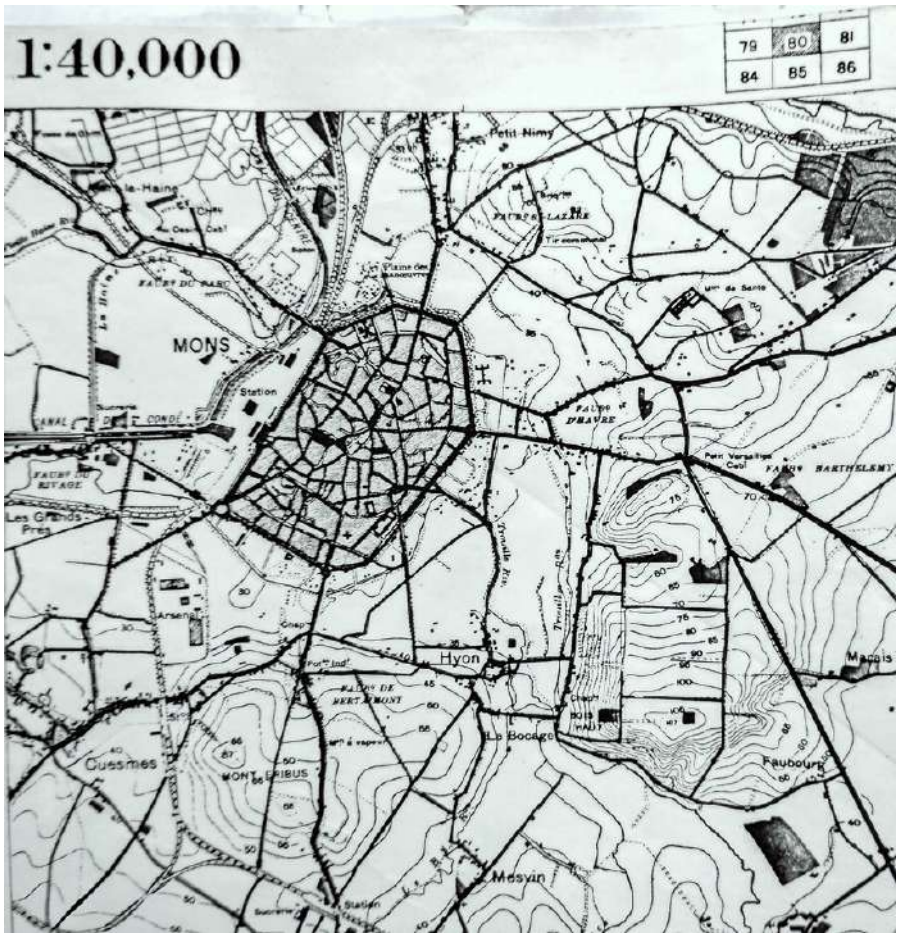
sheets would fit between the sea and the latitude of the origin of the Belgian Bonne projection and national coordinate system south of Brussels.

B)
A 1:40,000 and 1:20,000 series, numbered 73, 74, 75, etc., into which the early 1:20,000 series was subsumed, each 1:40,000 sheet comprising four 1:20,000 sheets designated, e.g., 73 NW, NE, SW, SE. Each 1:40,000 sheet extended 32,000 x 24,000 yards. Sheets 73 to 90 have been identified in L-of-C stocksheets and index diagrams on maps.

The only surviving 1:40,000 sheet seen by the author, Belgium and Part of France, Sheet 80 (Maubeuge and area to north and east including Mons), magnetic variation 1914, O.S.O. 1915, appears to be a proof copy (Map 1). It is unsquared and carries no GSGS designation. The four component sheets at 1:20,000 scale seem to have been drawn in 1914-15. The sheet numbering had been changed, apparently late 1914 or early 1915, to accommodate both scales. 'A' Series 1:40,000 sheets (73-75, 78-80) first appear in L-of-C stocksheets dated 3 March 1915, before the Neuve Chapelle battle.

Index diagrams on the covers (verso) of 'B' Series sheets show that the layout of the sheets of the second 'A' Series sheet-numbering system (1:40,000 sheets divided into four 1:20,000 sheets) was irregular on the western side, broadly following the configuration of the Belgian frontier, but including quite a lot of France, and not just areas covered by pre-war *plans directeurs*. There was an unexplained hiatus more or less covering the area of regular series sheet 57a (south of Maubeuge – the BEF's August 1914 concentration area). On the eastern side, there was a column and a half of 1:40,000 sheets (three 1:20,000 sheets) east of the Brussels meridian, and no more – i.e., a vertical termination of the series, as confirmed by the sheet numbering, at 48,000 yards east of the Brussels meridian. The area included Namur but fell far short of Liège, the east of Belgium and the German frontier. On the northern side of the 1:40,000 series, the sheet numbering, starting at 73, following on directly from the Belgian national (British regular) 1:40,000 series numbering (1 to 72), indicated that no rows of sheets further north were now contemplated despite the earlier presence of a row of 1:20,000 sheets to the north of this limit.

We hear no more of the 'A' Series after early 1916, so presumably (having been declared obsolete) all sheets in stock were then destroyed. The sheets so far identified are shown in the table below, in their rows and columns ('all' = all quarter sheets envisaged unless otherwise stated).



Map 1. Fragment of sheet 80 1,40.000. Source: TNA WO 297/5902.

'A' Series sheets identified so far.

73 all	74 all	75 all	76 all	77 NW, SW
78 all	79 all	80 all	81 all	82 NW, SW
83 all	84 NW, NE, SW	85 NW, NE, SE	86 all	87 NW, SW
		88 NE, SE	89 all	90 NW, SW

The 'A' Series and Alled strategy

Apart from the obvious advantage of the British squaring system perfectly fitting sheets constructed on thousand-yard sheetlines (and thus having the potential to be used as a theatre grid), the purpose of the 'A' Series seems clear. Its intended function may have changed over time, but the coverage suggests that it fits into the pattern of Allied strategy. The original 1:20,000 series of October–November 1914 perhaps originated with a drive eastwards in mind, from the line Arras–Lille, to the south of Brussels (Joffre's intention in late-September 1914 was that the BEF should move from the Aisne to concentrate in the Lille area). The later expansion to a 1:40,000 and 1:20,000 series may

have been the result of the development in strategic thinking by the Allies in December 1914, aiming at an enveloping movement to destroy the German armies in the great Noyon salient – a giant Cannae, with the British supplying the northern arm and the French the southern. This became the Allies' main aim in 1915. A 1:20,000 series was clearly required for offensive, exploitation and follow-up operations. A redrawn series on yard-sheetlines was initially the preferred option, but with the salving from Antwerp of the Belgian national cartographic material it was quicker and easier to adopt the original Belgian maps and their sheetlines.

As the Germans, moving in the opposite direction, had realised before the war, and then experienced in August 1914, operations through Belgium towards Germany were constrained by two primary geographical factors: the Dutch frontier around the Maastricht (or Limburg) appendix to the north, and the Ardennes Forest to the south. These effectively channelled an Allied offensive towards Aachen (Aix-la-Chapelle) into a very narrow bottleneck. The most important communications feature for the Germans were the railways, on which most troop, ammunition and supply movements were made, and in this context, the British Official Historian stated:

'The most vulnerable part of the [German] northern lines of supply, two hundred miles in length from the Rhine, lay in the plain of Douai, which contains the important communication centres of Valenciennes, Aulnoye, Douai, Cambrai and St Quentin. The plain itself, some thirty miles across, forms a natural gateway from the north into France, hemmed in on its eastern side by the Ardennes, and on the western limited by the Artois plateau ... Three lines of operation against these enemy communications offered prospects of decisive results.'[1]

These three lines of operations were:

1) An advance from the Artois plateau eastwards, driving the Germans from its western border, north and south of Arras, and thence across the plain of Douai.

2) An advance from the Champagne around Rheims northwards against the Mézières–Hirson railway and then the railways in the gap between the Ardennes and the Netherlands (crucially, those leading to the Namur–Liège railway bottleneck).

3) An advance from the Verdun–Nancy front northwards, through the Rhine provinces of the left bank, would sever the German communications close to the Rhine crossings and, in addition, would carry the war into the enemy's country.[2]

As far as the 'A' Series is concerned, and assuming that this was not begun before the war with operations from the BEF's Concentration Area around Maubeuge in mind, we are mainly concerned with the first of these. The key area to be attacked was the plain of Douai, and the main target was the German railway communications.

The British survey organisation in France (Major E. M. Jack and his 'Maps GHQ' at St Omer, under instructions from Sir John French's General Staff) and at home (Colonel Hedley at GSGS and Colonel Charles Close at the OS) reacted extremely quickly to events at the front. Judging by its early and rapid development, we can surmise that the 'A' Series was ordered to be speedily drawn and printed at the OS when plans were being made, at the very end of September or early October 1914, to move the BEF from the Aisne to Flanders, to a new concentration in the Lille area to attack the German right flank; alternatively in late October or November, once the line in Flanders had stabilised. Whichever the case, it is remarkable how quickly the Series was envisaged and put into execution.

In the static trench warfare conditions, the Series developed to cover more of the German-held area and transformed into one which included 1:40,000 sheets, and in the event of a successful breakthrough – at Neuve Chapelle in March 1915, Aubers Ridge in May, or Loos in September, for example – the 'A' Series would cover the most likely line of advance of the British army, due east between Lille and Douai. The Series provided the large-scale topographical basis for offensive and exploitation operations ('through the G in Gap') towards Brussels, Mons and Charleroi, and ultimately across Belgium's far frontier into Germany, not unlike those of late-1918.

A closer look at the 'A' Series

We will now take a closer look at the maps. As mentioned earlier, the 'A' Series was based on the technical data of the Belgian national survey – i.e. its origin, azimuth, figure of the Earth, scale and Bonne projection. Its yard-sheetlines (the British gunners insisted that the squaring should be in yards) were parallel to the Belgian national sheetlines, on the Brussels ruling meridian (4º 22' 12.7" E of Greenwich, through the old Brussels Observatory), which was the origin of the E–W coordinates of the Belgian (and, from now on, British) coordinate systems. The origin of the N–S coordinates was the parallel of latitude 50º 24' 00.82" North. In terms of what became the established Western Front, this ran westward through Drocourt Church Spire to near Souchez and Givenchy-en-Gohelle at the north end of the Vimy Ridge (all in 1:20,000 'B' Series sheet 36cSW).

The origin of the Belgian Bonne rectangular coordinate system was the intersection of that meridian and that parallel at Goutoux, just east of Fontaine l'Evêque (near Charleroi). The Belgian national coordinates being in metres, these were converted by the British into yards to provide the sheet-corner coordinates for plotting their yard-grid sheetlines. In the second half of 1915, the British survey organisation began to print the sheet-corner-coordinates in yards on its 'B' Series large-scale maps, but in early-to-mid 1916 changed these to metres, the squares remaining in yards. These coordinates were particularly important because, while crucially acting as survey coordinates, they also enabled gunners to calculate range and bearing from gun to target across sheetlines. For a reason as yet unknown, none of the few 'A' Series sheets seen carried corner coordinates, which may suggest that no sheet was printed after mid-1915.

Square references on 'A' Series sheets bore no relation to the square references of the same point of detail on 'B' Series sheets. The recasting of the Belgian sheetlines on a yard-grid could have been avoided by adopting a metric grid or squaring system, but at this stage of the war this was a step too far for the Royal Artillery; in late 1918 it was, however, adopted (using the French Lambert projection and grid system) for the intended 1919 campaign rendered unnecessary by the Armistice of November 1918.

The first mention of the 'A' Series found in any records was in the L-of-C stocksheet for 1 December 1914, when 1,000 copies of sheet 122 and 1,500 copies each of sheets 123 and 124, all overprinted with squares (16□ system), were recorded as being held at HQ L-of-C. It follows that these sheets had been printed in October or November, and there is a strong possibility that 500 copies of sheet 122 (east of Lille, its western edge being at Fives-les-Lille) had actually been issued to troops. The six sheets of the 1:20,000 *plan directeur* of Lille (which overlapped the 'A' Series) were listed in the same stocksheet, but if they had all been printed by the British - sheets 2, 4, and 6 had possibly not yet been printed - they must all have been issued, as none was held in stock[3]. The *plan directeur* sheets of Lille must therefore also have been printed in October or November. Index diagrams on the cover (verso) of 'B' Series 1:20,000 sheets (e.g., 36aNE and 36aSE, GSGS 2742a, both enlarged without redrawing from the hachured French 1:80,000, with 'Instructions as to the Use of the Squares' in English and French, and the 1914 system of squaring[4]) show both the 'B' Series and the 'A' Series (sheets 122, 123, 124, 137 of the latter). This indicates that both Series were being produced simultaneously between October and December 1914.

The early 'A' Series sheet-numbering system (122, 123, 124, etc.) designated only 1:20,000 sheets, with no reference to 1:40,000 sheets, indicating that 'A' Series 1:40,000 sheets were not at first envisaged. This suggests an artillery purpose, as does the construction of the Series around 1,000-yard grid squares. At this stage of the war, the squared 1:20,000 was only envisaged as an artillery issue; other arms had to make do with smaller scales.

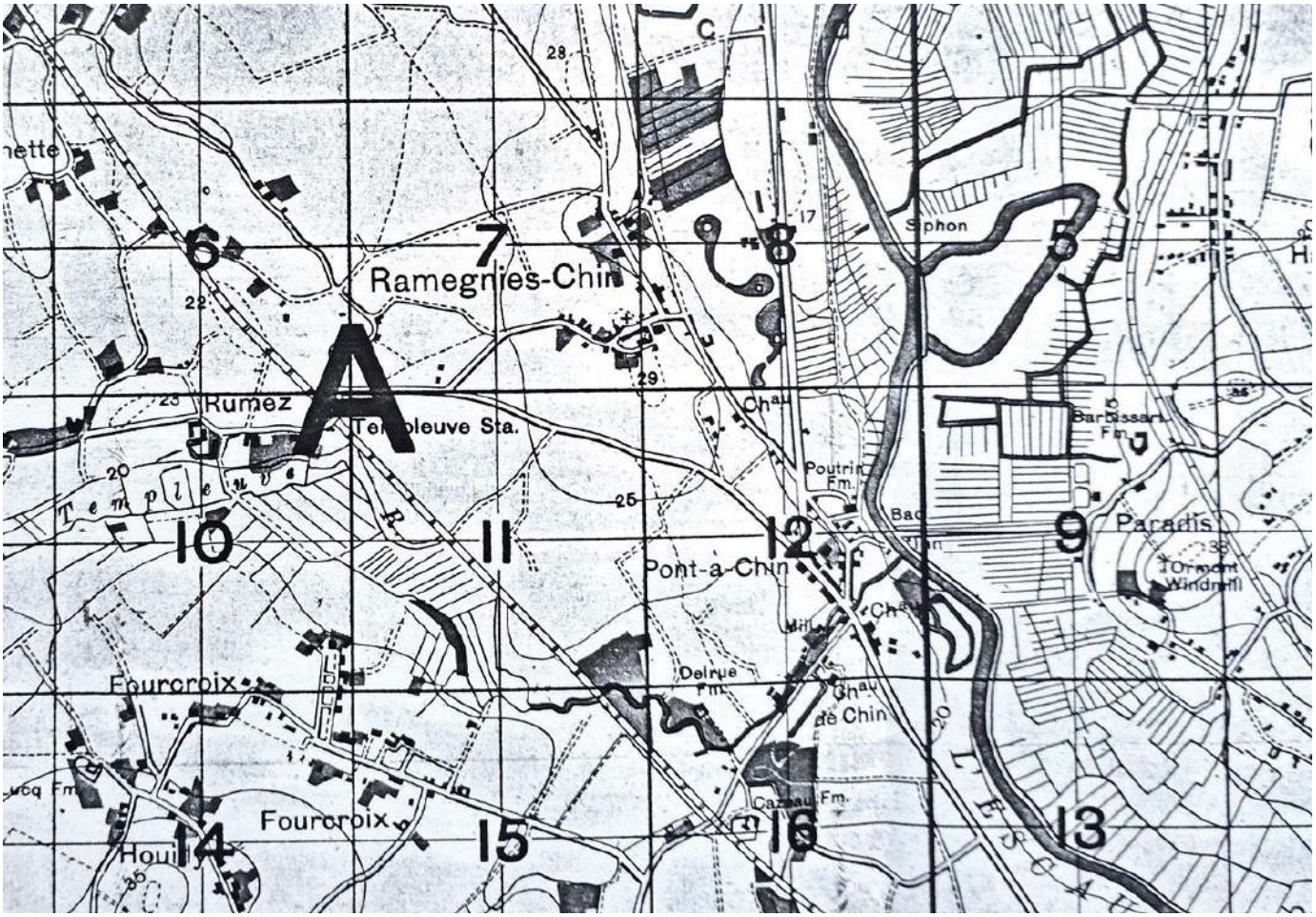
Except for brief entries in the L-of-C stocksheets, no documentation has been found concerning the 'A' Series. Therefore practically everything we know about it comes from the internal evidence of the few surviving sheets, and from index diagrams on the covers of these and 'B' series, sheets. While index diagrams show intentions, they are unreliable as to which sheets were actually printed.

There are indications that, understandably, the early 'A' Series 1:20,000 sheets were a rush job as far as the compilation, drawing and production was concerned. Take sheet 123 (16□ system), with magnetic variation for and produced in 1914 (Map 2, next page). Many place-names contain mis-transcriptions or typos by draughtsmen unfamiliar with French (e.g., Beaureyard Fm. for Beauregard, Le Toquet for Le Touquet - see Map 3, next page); and why were out-of-date sources used, why was so much detail, much of it of military significance (lone trees, windmills) omitted? Probably only material to hand could be used, and it was a race against time.

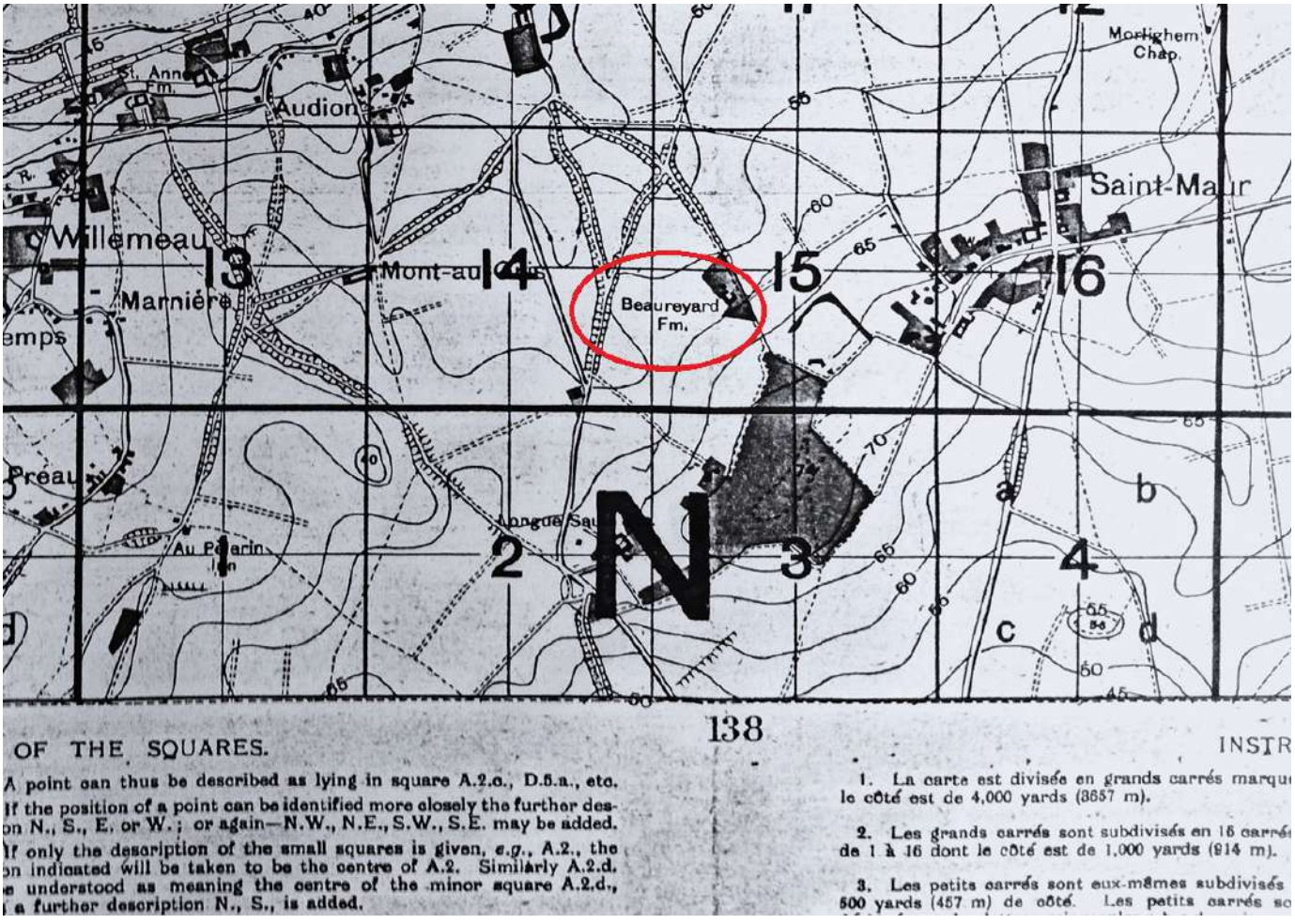
The 1:20,000 sheet 73NW (old sheet 122) produced a few months later in early 1915 (Maps 4 and 5, p. 16) was to a similar specification to sheet 123, again with no road-fill. But it included tree signs in the green woods and a version (48-square) of the 'Revised System of Squaring' introduced for all large-scale maps from 1 January 1915. It also included various other differences in marginal information, such as the addition of the legend 'Brussels is the Ruling Meridian' and meridian of longitude shown by ticks in upper and lower margins. This gave an indication of true north, enabling officers and NCOs to test the magnetic deviation of their compasses.

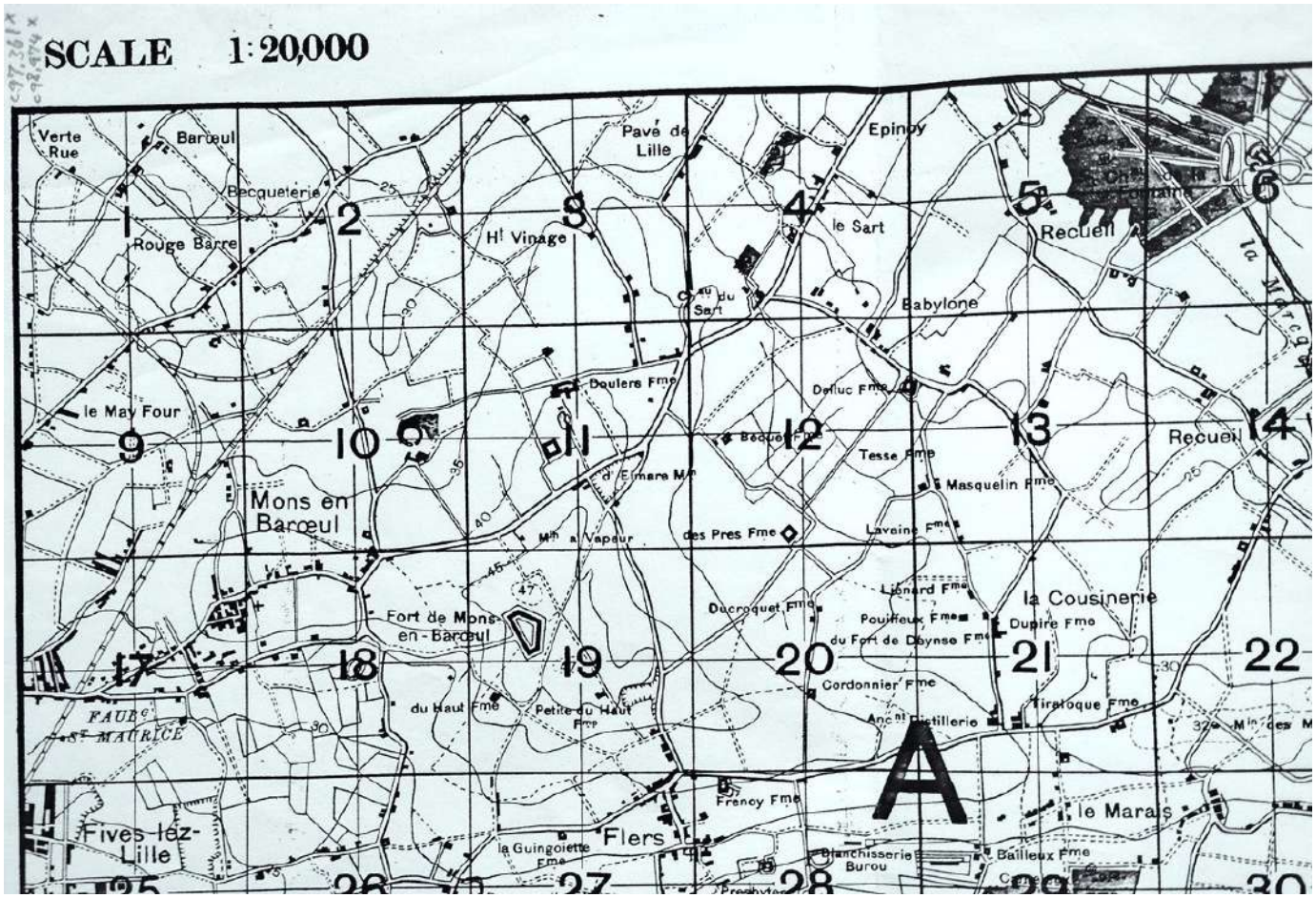
Summary

The 1:20,000 'A' Series (designated GSGS 2742 like the plan directeur of Lille, the regular series 1:20,000 sheets of Belgium and N.E. France, and early 1:20,000 'Artillery Training Maps' of the UK) covering the area east and south-east of Lille, on new British sheetlines based on thousand-yard units rather than metres, was probably begun at the Ordnance Survey in October-November 1914. These sheetlines were cast to accommodate the British system of

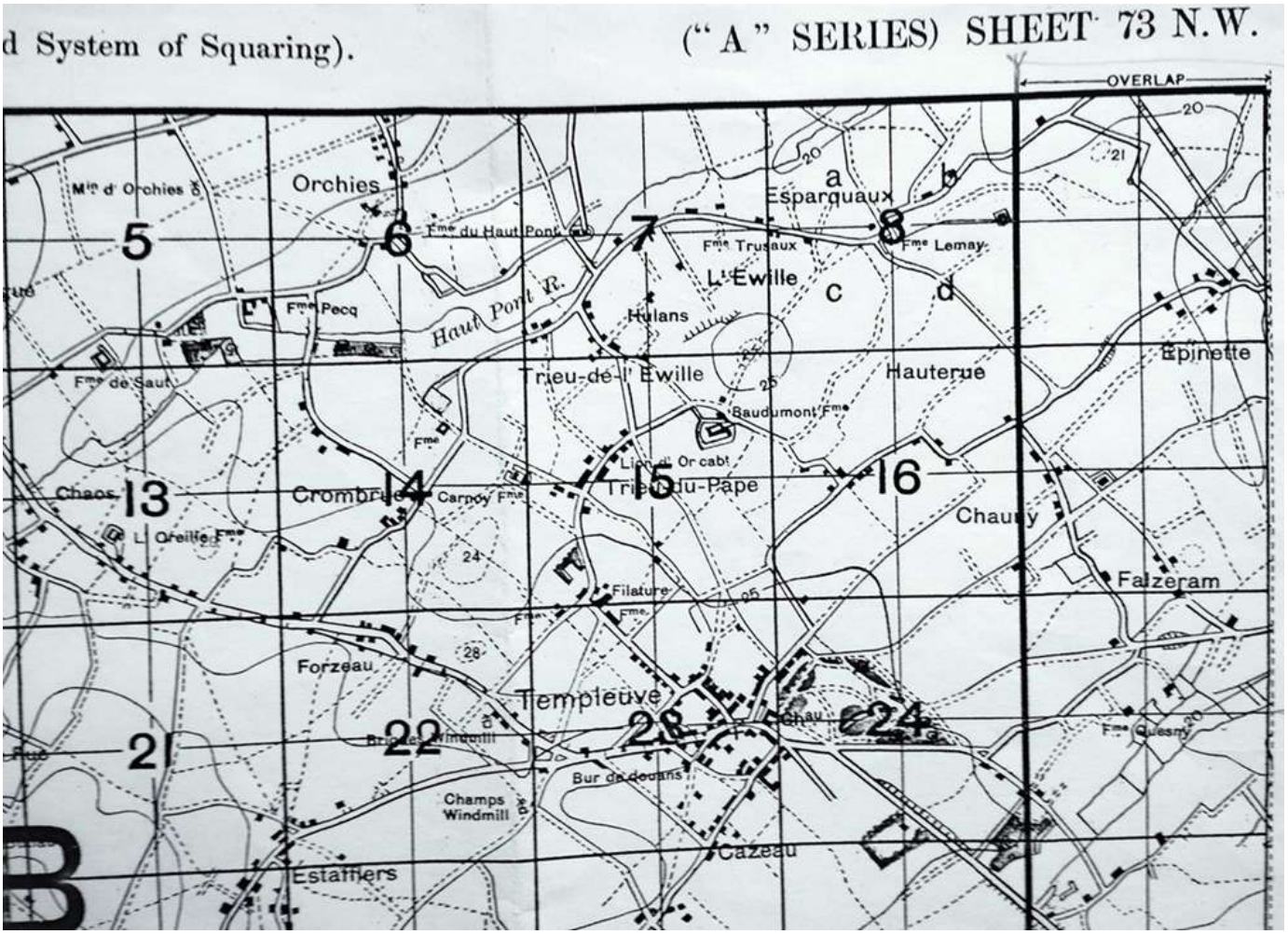


Map 2. Fragment of the oldest (1914) known 'A' series sheet 123 1:20,000. Source: TNA WO 297/4164.
Map 3. '... mis-transcriptions or typos by draughtsmen unfamiliar with French (e.g. Beaureyard Fm. for Beauregard)...'





Maps 3 and 4. Fragments of sheets 73NW (old 122) 1:20,000. Source: TNA WO 297/4147.



16 1,000-yard 'artillery squares' grouped into larger 4,000-yard squares. Ignoring the overlap, the sheets were 16,000 yards by 12,000 yards, an exact fit for three rows of four 4,000-yard squares. The series was compiled and redrawn from the Belgian 1:20,000 survey, sheets of the *plan directeur* of Lille (and adjoining frontier zones), and enlarged French 1:80,000. Judging by the sheet numbering system, the Series was intended to cover the whole of northern Belgium, extending only into the frontier zone of France (not west of Lille or Douai).

References

[1] Edmonds, J. E. - *Military Operations, France & Belgium; 1915*, Vol. 1, London: Macmillan, 1927, p. 68.

[2] Ibid.

[3] War Diary of Officer i/c Lines of Communication Map Section, The National Archives (TNA): TNA WO 95/3986.

[4] IV Corps Maps, TNA WO 153/140.

Dr Peter Chasseaud has been researching military survey and mapping – especially that of the First World War - since the 1960s. His doctoral thesis at the University of Greenwich was a comparative study of British, French and German survey and mapping in the First World War. In 2000 he was instrumental in founding the Greenwich Group, and when that soon became the HMMG of the BCS he became the first Convenor of that Group. His many books include Topography of Armageddon, Artillery's Astrologers, Grasping Gallipoli, Rats Alley, Mapping the First World War *and* Mapping the Second World War.

North of Verdun, 22 September 1918: trenchlines and artillery positions of the 1st Austrian Infantry Division. Special combined issue (Sonder-Zusammendruck, Abschnitt 1) of German 1:25,000 maps, printed in September 1918. Source: collection editor.