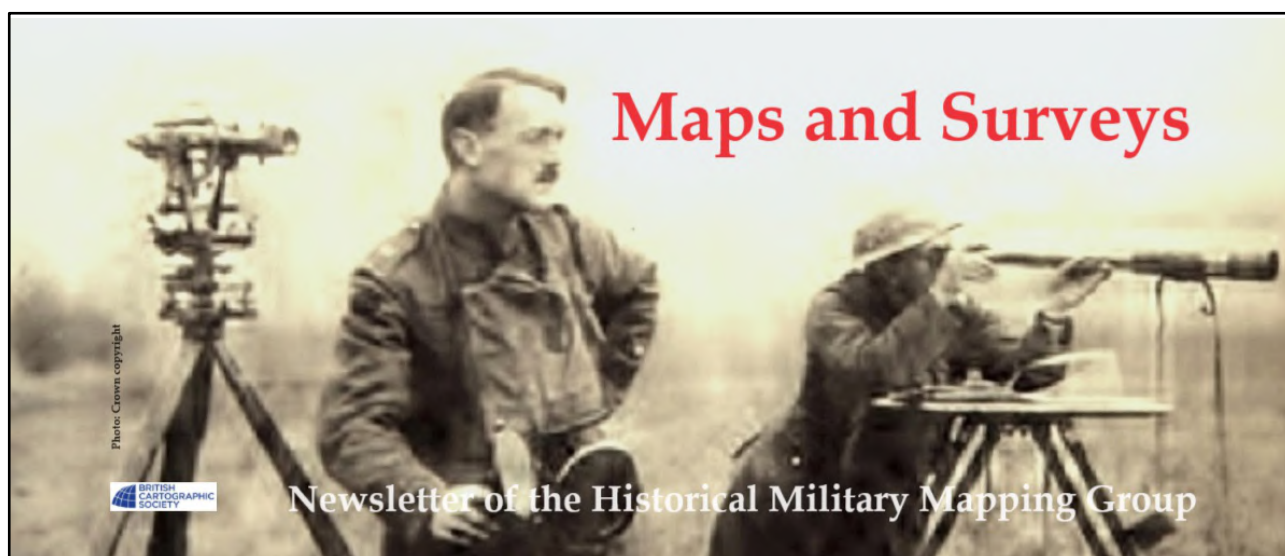




*Maps and Surveys* appears in spring, summer and autumn. The Newsletter welcomes contributions. Editor: Paul Hesp (Paul.Hesp@dreil.at).

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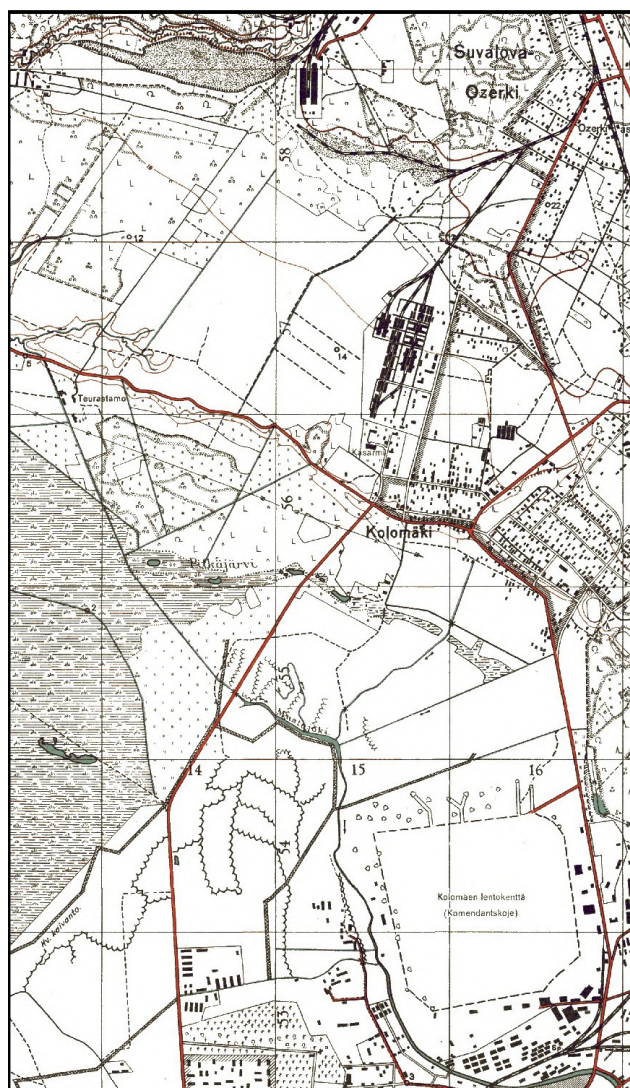
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## From the Editor

If you have no maps, an eye for terrain is a decisive advantage, as Robert Bruce demonstrated at the Battle of Bannockburn. If you're short of maps, see whether the enemy can help out: captured Soviet material played a key role in Finnish military mapping during World War II. And if you have the right maps, your armada can sail: the secret work of the Royal Navy's Hydrographic Department was of vital importance for D-Day.

Three years ago, *Maps and Surveys* made a fresh start in a new format. It's time to take stock. We've sent readers a questionnaire - suggestions for improving the Newsletter are most welcome!

Paul Hesp



*Fragment of a 1943 Finnish 1:20,000 map. Sheet 403204 Kolomäki shows Leningrad just north of the river Neva. An airfield can be seen at the bottom (rough square). The map is based on German 1:25,000 photomaps; geodetic control points and contour lines were taken from Soviet 'spoils of war' maps. Produced by the National Land Survey of Finland, which provided organisational support to the Military Topographic Surveys during World War II. See the article on p. 6.*

# Callum Watson AN EYE FOR TERRAIN

## Robert Bruce at Bannockburn

The earliest surviving maps of Scotland were, perhaps paradoxically, produced in England. During the late 1250s, Benedictine monk and chronicler Matthew Paris produced a map of Great Britain - including Scotland - to accompany an abridged version of his account of English history from c. 1000 CE to his own time (Figure 1). Roughly two hundred years later, John Hardyng, a former English spy, created the earliest

surviving standalone map of Scotland to illustrate a chronicle presented to King Henry VI of England, designed to encourage the king to mount a full-scale invasion and occupation of the kingdom (Figure 2). Paris's map offers a striking approximation of the general shape of Scotland's coastline, and both feature numerous identifiable locations in more or less the correct positions relative to one another. But neither would be much use

for navigating the kingdom. Instead, medieval Scots had to rely on a combination of memory and observation as they negotiated the landscape.

We have digital technology to re-imagine that landscape. In 2014, for example, a LiDAR survey of the Bannockburn area was undertaken. It was used to reconstruct the landscape (see Figure 3, next page) as it would have appeared at the time of the Battle of Bannockburn.

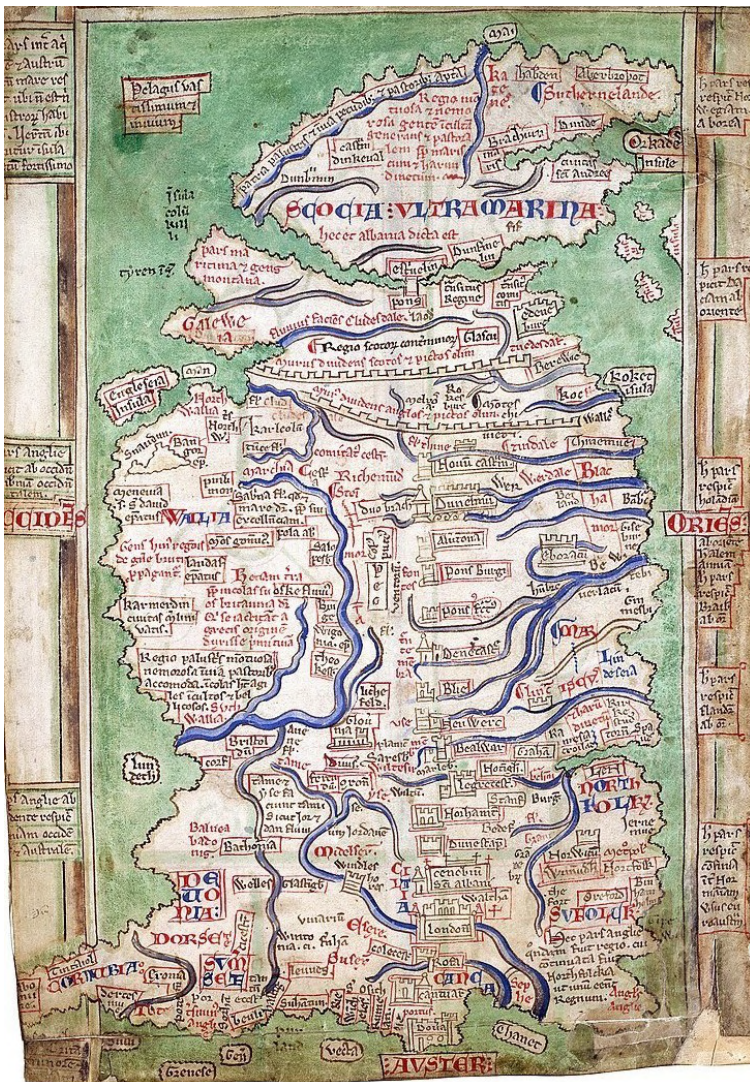


Figure 1 (left): Map of Britain by Matthew Paris. Figure 2 (above): Scotland's Central Belt on a fragment of John Hardyng's map (Strevelyn = Stirling). Source: National Trust for Scotland.

## Prelude to Bannockburn

There is perhaps no more remarkable example of this ability to engage with the landscape 'directly', as it were, than the victory of King Robert I (r.1306-1329) at the Battle of Bannockburn in June 1314. By the time the battle was fought, Scotland had been locked in a bitter struggle with England for eighteen years, with Scotland's status as an independent kingdom at stake. Robert Bruce had been King of Scots for only eight of these years but had revolutionised Scottish fortunes through a relentless guerrilla campaign against both his domestic opponents and the occupying English forces. By the time of Bannockburn, only the south-east of the kingdom and the increasingly isolated fortresses at Lochmaben, Bothwell, and Stirling remained in English hands. In November 1313, King Edward II of England (r. 1307-1327) announced his intention to lead an army into Scotland the following summer, hoping to force the Scots to meet him in battle. If Edward could achieve this, he believed he would smash the Scottish army to pieces and afterwards reoccupy the areas that Bruce had brought under his control since 1306.

### A talented war leader

Bruce's preferred strategy for dealing with this threat was to simply refuse to meet Edward in battle, waiting for Edward's money and patience to run out, before resuming his vigorous guerrilla campaign once Edward had withdrawn back across the border. This strategy had served

King Robert particularly well the first time King Edward had invaded Scotland in 1310. However, in May 1314, a deal was struck between the beleaguered English garrison at Stirling Castle (Figure 4, A, p. 4) and a besieging Scottish army – possibly instigated by Bruce's younger brother, Edward Bruce, earl of Carrick. Essentially, the two sides agreed that if no-one came to relieve the garrison before St John the Baptist's Day (24<sup>th</sup> June), the garrison would surrender the castle to the Scots and the Scots would allow the garrison to return to England unharmed.

On the face of it, this deal obviously favoured the English. King Edward had been planning to advance north into Scotland since at least November, and his army had begun mustering at

Berwick from around March/April. The English king could therefore not fail to bring an army to Stirling before the deadline. Given the relative sizes of the two kingdoms, Edward could also not fail field a larger army than Bruce's. In the event, the English army probably numbered around 18-20,000, whereas King Robert only managed to rustle together somewhere in the region of 6-7,000 men. Moreover, the last time the Scots had dared to face the English royal host in open battle – at Falkirk in July 1298 – it had resulted in a catastrophic defeat for the Scots.

But King Robert was a more talented, and more cunning, war leader than the Scots had had at Falkirk, or indeed at any point in the war so far. The deal gave Bruce a guarantee that King



Figure 3: LiDAR-based map of the Bannockburn area. Source: National Trust for Scotland.

Edward and his army would be approaching Stirling from the south on or about 24<sup>th</sup> June. This in turn provided the Scottish king with a framework for a battle plan. From late May (Edward learned of the deal on 27<sup>th</sup> May, suggesting that it was likely concluded a day or two before that), Bruce had one month to prepare his army, survey the landscape, and come up with a way to overcome an army twice, perhaps three times the size of his own.

### The English army...

The army Edward had been raising for his Scottish invasion was designed to display the might and majesty of the English crown. This meant it would be big, but also slow-moving. It

would thus have to approach by road, since such a large and ungainly force would not be able to travel across country and still meet the deadline set by the deal. The main road into Stirling from the south in 1314 (Figure 4, B) likely ran parallel with the modern A872, crossing two steep-sided streams – the Bannock Burn to the south and the Pelstream to the north – as it approached the town. Between the streams sat a royal hunting reserve known as the New Park (Figure 4, C), which had been enclosed by a wooden palisade wall since 1288/9 and could only be entered where the road passed through it. Bruce reasoned that the New Park would serve as a suitably strong defensive position from which to block the English army's natural route to

the castle. The entrance at the south was narrowed further by digging honeycombed pits filled with sharpened stakes, ensuring that the English could not manoeuvre around the New Park anywhere on the northern side of the Bannock Burn (Figure 4, D).

Of course, when King Edward found the direct route blocked, he would not abandon the enterprise altogether. This was, after all, the first time in his seven-year reign that he had an opportunity to face Bruce in battle. Ideally, he would seek to circumnavigate the New Park and deploy his army north of the Scots, effectively trapping King Robert in the Park. To the west, however, wide areas of wetland – now known as Milton and Halbert's Bog – and the enormous bulk of Gillies Hill blocked the English army's progress (Figure 4, E). To the east, the Bannock Burn cut a deep trench for roughly 1.5 miles, a distance the English army was forced to traverse to reach a point where the ground became flat enough to get their horses and carts across (Figure 4, F). Shortly after the English army arrived on 23<sup>rd</sup> June, a small body of cavalry made an abortive foray towards the castle and was driven off near the village of St Ninians (Figure 4, G), establishing the difficulty the English would have in trying to use the ford at St Ninians to get north of their Scottish foes. Nevertheless, by sundown on 23<sup>rd</sup>, the English army had crossed the Bannock Burn and camped for the night in between the two streams (Figure 4, H). This provided access to the freshwater of the streams – vital for men and horses who had travelled 13 miles from Falkirk –



Figure 4: The LiDAR-based map showing troop movements. Source: National Trust for Scotland.

while simultaneously offering protection from any Scottish raiding that might take place under cover of darkness.

### **... walks straight into a trap**

In fact, the English walked straight into King Robert's trap. At the crack of dawn on 24<sup>th</sup> June, Bruce swiftly moved his army eastward from the New Park and deployed them with their right flank anchored against the Bannock Burn and their left flank anchored against the Pelstream Burn (Figure 4, I). This trapped the English in the narrow area between the two streams and neutralised their superior numbers. The Scots were on foot, wearing relatively light armour, and armed with long spears. The English cavalry charged this bristling wall of spears but could not penetrate it. As the cavalry withdrew, no doubt hoping to let the infantry through to soften up the Scottish spear men (as had happened at the Battle of Falkirk in 1298), the Scots began to advance, squeezing the English army into an ever-tighter space between the streams.

Eventually, King Edward fled the battlefield, narrowly evading capture, and on seeing their king had gone, the entire English army soon began to scatter. Some retreated north to the castle, becoming Bruce's prisoners when the castle was surrendered. These were the fortunate ones. Most of the army appears to have fled southward across the Bannock Burn, roughly retracing the steps that had brought them there the previous day (Figure 4, J). Of course, their passage over the burn on 23<sup>rd</sup> June had churned the clay on either side of the water into a quagmire. Anyone who slipped or fell in this morass would simply be trampled on by those fleeing behind them. A later Scottish poet, John Barbour, reports that by the end of the day, it was possible to cross the Bannock Burn on the backs of the trampled bodies without even getting wet feet.

### **Bruce's eye for terrain**

The political significance of Bannockburn started to become clear at a parliament at

Cambuskenneth Abbey in November 1314 (Figure 4, K). It was however the significance of the landscape itself that had been dramatically demonstrated by events in June. Moreover, Bruce's cunning exploitation of the landscape had been achieved without reference to any map, but simply what he could deduce from a visual inspection of the local area. This had been conducted in the month or so between the deal between struck with the garrison at Stirling and the English army arriving south of the Bannock Burn. It furnished Bruce with an intimate knowledge of the exact condition of the landscape in June 1314, which trumped the English leaders' vague recollections of the area built up since Stirling fell in 1304. When traced on the modern reconstruction of the early fourteenth-century landscape, the ingenuity and inventiveness of King Robert's tactics become readily apparent, which serves to reinforce his reputation as one of Scotland's most effective war leaders.

*Callum Watson has a PhD in Scottish medieval history from the University of Edinburgh. Since 2016, he has worked as a guide at the Battle of Bannockburn Visitor Centre near Stirling. He has served as a historical adviser on the Netflix film Outlaw King and appeared in the BBC documentary Rise of the Clans and Channel 5's Britain's Lost Battlefields. His first book, 1314: The Year of Bannockburn, is out now.*

# Erkki-Sakari Harju SPOILS OF WAR

## Finland's use of Soviet maps in the Continuation War

The Winter War between Finland and the Soviet Union began without a declaration of war on 30.11.1939 and ended with the Moscow Peace Treaty on 13.3.1940. It was preceded by the shelling of the Russian border village of Mainila on 26.11.1939, which the Soviet Union claimed was a Finnish hostile act; in reality, the shots were fired by the Soviets themselves.

In early January 1940, Finnish forces became engaged in a battle in the Suomussalmi area with the 163rd division of the Soviet Union. The aim of the Soviet Union was to reach Oulu and split Finland in two at the country's narrowest point. The forces of the enemy had come to the border along tracks that the Finns were not aware of, and managed to take the Finns by surprise. The Ukrainian 44th division of the Red Army also joined the attack. On the Raate road in the Suomussalmi area, in the intense frost and deep snow, the Finns forced the Soviet forces to retreat. A substantial amount of war material was left the road by the fleeing troops, including a large number of topographical maps.

Image 1 gives an overview of the 1:100,000 scale topographic maps captured by Finnish forces. The Finns themselves had a limited number of up-to-date topographical maps suitable for military use, and these only covered part of the area on the north side of Lake Ladoga and the part of the Karelian Isthmus that belonged to Finland. These were the areas where the military threat from the Soviet Union was felt to be the most substantial. The collection of 1:100,000 Soviet maps now available covered the area behind Finland's eastern border along almost its whole length.

### The early phase of Eastern Karelia Map production

When the Moscow Peace Treaty was signed, it was already known that the peace would be temporary. The military-political situation resulted in Finland preparing for a new war, ending up as an ally of Germany. Because the captured maps covered the areas of military operations that were expected, the original maps were modified for reprinting based on retouched negatives, first only in black. Later on, colour separation based on filters was adopted, which made it possible to make multi-coloured reprints. These modified

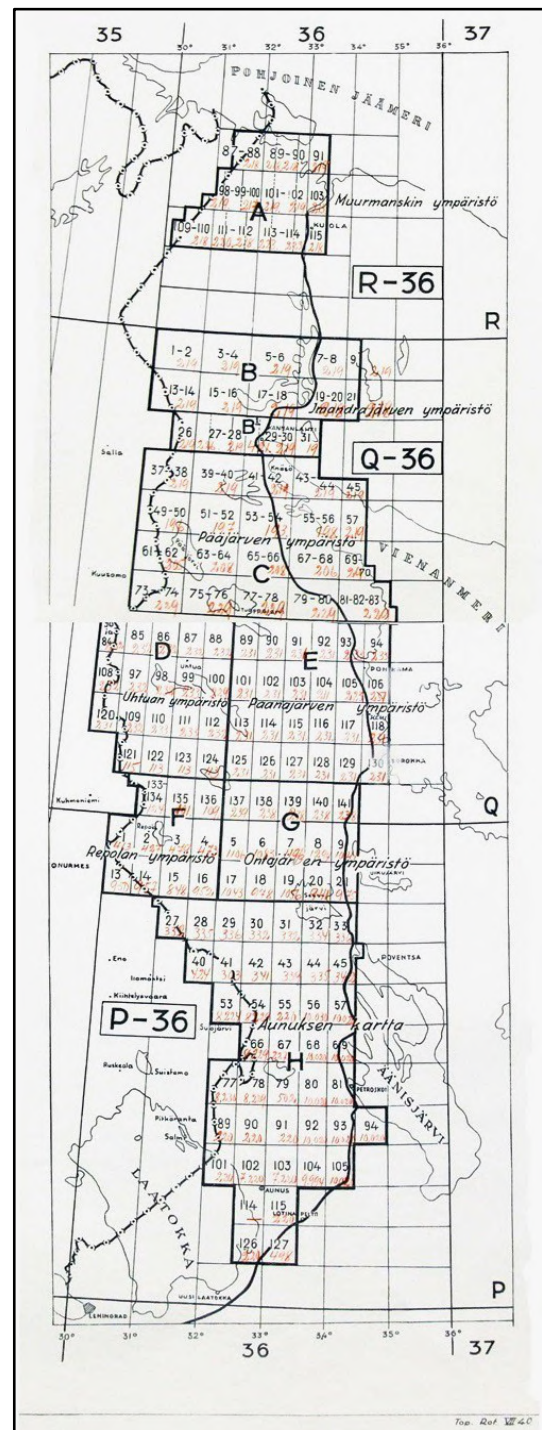


Image 1: Overview of maps captured by the Finnish army during the winter war. Source: file T-11014/9, National Archives of Finland.

maps shall be referred to as spoils-of-war maps. Most of the reprints produced during the wars were made by the Helsinki-based Tilgmann Lithographic Print firm. The spoils-of-war maps were given the apt Finnish name of Itä-Karjalan-Kartasto (Eastern Karelian Map Series). When preparing the print originals, the map content was edited at the same time. This meant bringing transport connections and settlement information up to date; Russian nomenclature in Cyrillic script was complemented by Finnish forms in Latin script (see Image 2).

In the spring of 1941, Finland joined Germany in planning Operation Barbarossa, the attack on the Soviet Union, joining the war on June 25, 1941. The goal of the Finns was to take back the Karelian Isthmus, lost in the Moscow Peace Treaty, and to advance into Soviet Olonets Karelia all the way to the western bank of Lake Onega. These goals were achieved in the autumn of 1941 and on October 1, 1941, the Topographical Department of Headquarters, responsible for the mapping of Eastern Karelia, could set up its office in Petrozavodsk (known as Äänislinna during the Finnish occupation), the capital of Soviet Karelia. In the offensive stage of the Continuation War, the

Topographical Department of Headquarters mostly produced 1:20,000 scale quick maps based on air photography, to be used by the artillery.

The spoils-of-war maps were very useful for this purpose. From them, it was possible to work out an adequate geodetic control points network for the maps, which was essential for the offensive. Geodetic calculations were made using the Finnish coordinate system, but already on July 25, 1941, computations started using the Russian military coordinate system. The situation changed radically in October, when complete information on the Karelian geodetic network was found at the University of Petrozavodsk. Indeed, in the summer of 1942, the Topographical Department and the Land Survey of Finland decided to shift to the Russian geodetic system for all Finnish mapping of the area of Eastern Karelia.

In the trench warfare stage, work on spoils-of-war maps became even more significant for the map service. The sheet divisions of the Finnish 1:20,000 maps and the Russian 1:100,000 maps of Eastern Karelia were shown side by side on the map index of the theatre of war (Image 3, next page). The Finnish 1:20,000 maps were primarily air photo map sheets

Image 2: Fragment of spoils-of-war sheet Q-36-77 Lohilahti, 1:100,000, with toponyms in Finnish and Russian. The Russian abbreviation 'oz. ('ozero', lake) generally remained untranslated. Source: file T-11016/13, National Archives of Finland.



that were produced in accordance with the Finnish sheet division, extended to Eastern Karelia. In the spring of 1942, the production of printed Finnish 1:20,000 scale maps began as well. These used the Finnish map style and were made for both military purposes and use by the Finnish civilian administration set up in the war area.

### Expansion of the map range

The range of spoils-of-war maps expanded during the Continuation War. Reprinted maps were made at the scales 1:25,000, 1:50,000, 1:100,000, 1:200,000, 1:500,000 and 1:1,000,000. Maps produced earlier were brought up to date and reprinted. A note at the top right corner of the map shown in Image 2, for example, shows that this is the third update (Image 4). Up-to-date information was obtained, among other things, by interviewing enemy prisoners of

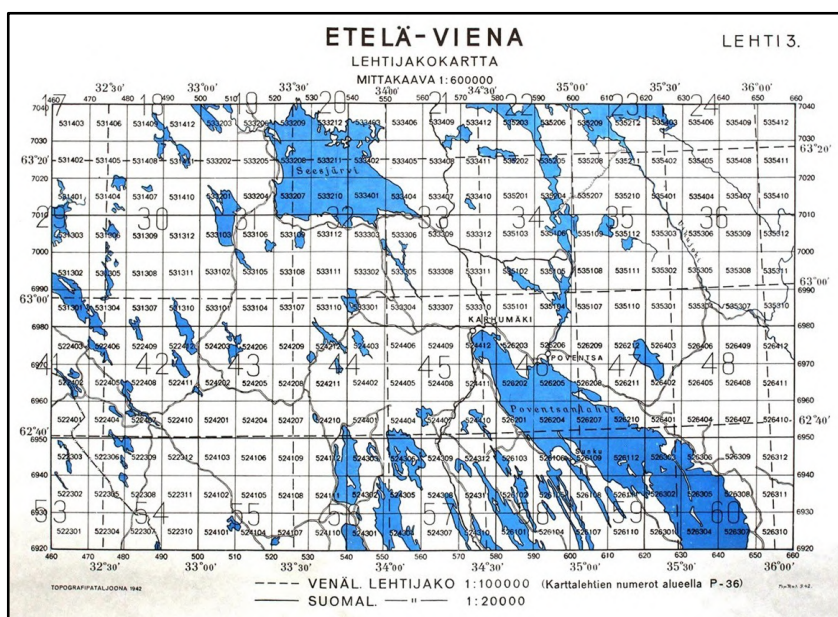
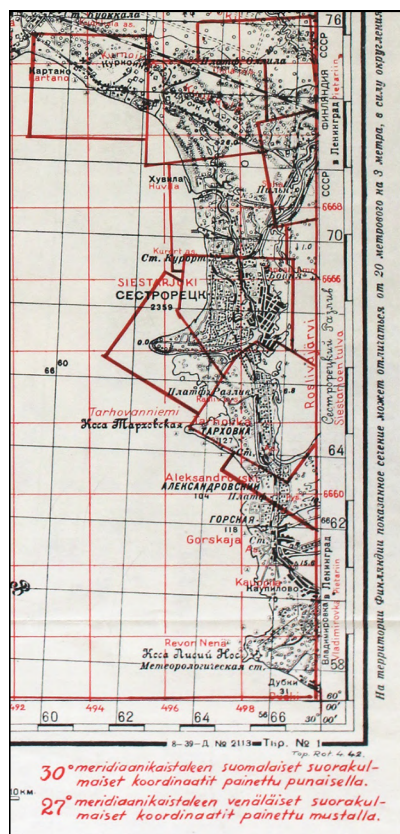


Image 3: Map index with both the Finnish 1:20,000 and Russian 1:100,000 sheet division. Source: Office Archives of the Military Topographic Surveys.



Image 4: Fragment of sheet Q-36-77 Lohilahti, with indication that this is the third update. Source: see Image 2.



war and through Finnish army reconnaissance activities. The print quantities were large, as many as 10,000 copies being made of one map sheet.

Although the geodetic systems of both Finland and the Soviet Union were based on the same conformal Gauss-Krüger projection, they had a few fundamental differences. In Finland, the width of the projection zone was three degrees, in the Soviet Union six degrees. In Finland, Hayford was used as the reference ellipsoid, whereas in the Soviet Union it was the Krasovsky ellipsoid. For this reason, particularly for the sea and coastal areas at the east end of the Gulf of Finland and for the area near Leningrad, maps produced for the artillery showed the coordinate grids of the geodetic systems of both countries (Image 5).

There was close cooperation between Finland and Germany with regard to the use of captured maps. Already towards the end of the spring of 1940, Finland passed on copies of all the new reprints to the Germans, and in return received all the new map sheets taken from the Red Army that interested the Finns. At the end of 1941, the Finns helped the Germans in printing the large-size German maps based on captured material of the White Karelia and Kandalaksha areas and in March 1943,

Image 5: Fragment of spoils-of-war map P-35-144 Siestarjoki, 1:100,000, showing the two coordinate systems. Finnish central meridian: 30°E (red); Russian central meridian: 27° E (black). Source: file T-11916/13, National Archives of Finland.

the Topographical Department received 707 map sheets of Eastern Karelia from Germany's Military Mapping Department, at different scales. The cooperation went so far that, in February 1943, there were discussions in Berlin about linking Finland to Germany's military map system. A few experiments were carried out, but the Finnish side did not approve the project and it was dropped.

Two product groups were made from captured maps during the Continuation War. The first was the Eastern Karelian Map Series. As I've explained above, the map series was made of updated reprints of Russian topographical maps at different scales. The other product set was the Operational Map of Eastern Karelia 1:300,000. The scale was selected to be in line with that of the operational map of the German army. The sheet division of the map series is in Image 6.

Image 7 (next page) shows the index of the captured 1:100,000 maps obtained by the Topographical Department of the Headquarters. An interesting detail is the line of maps going across Finland. This supports what I said at the start about plans of the Soviet Union to split our country into two parts, separating it from the land connection to Sweden and Norway.

Erkki-Sakari Harju started his working career as Cartographic Engineer in the Lithographic Print of the National Land Survey of Finland in 1969. In 2009 he retired from the private company Karttakeskus (Map Center) as its Chief Cartographer. In retirement, he has written 18 non-fiction books including a doctoral thesis about Finnish historical maps.

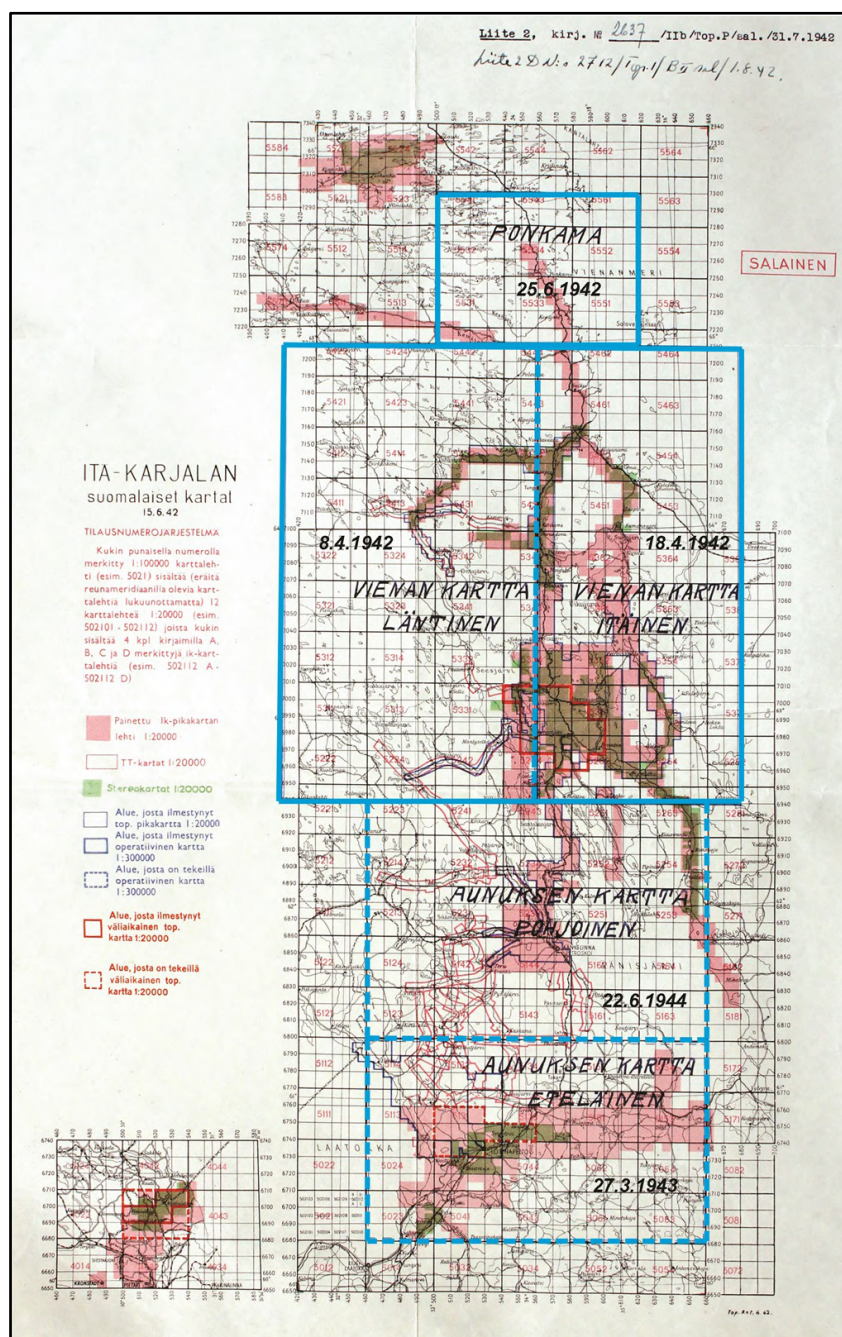


Image 6: Sheet division of the Operational Map of Eastern Karelia 1:300,000 (blue rectangles), with sheet names and publishing dates. Source: file T-11916/13, National Archives of Finland.

## Endnotes

- <sup>1</sup>Harju 2015, p. 21.
- <sup>2</sup>Harju 2015, p. 22.
- <sup>3</sup>Harju 2016, 198–201.
- <sup>4</sup>Harju 2023, 251–255.
- <sup>5</sup>Harju 2016, 219.
- <sup>6</sup>Harju 2016, 203.
- <sup>7</sup>Harju 2016, 182–188. Map: Sonderausgabe IV.41 Rußland 1:100,000.
- <sup>8</sup>Harju 2016, 204–205.
- <sup>9</sup>Harju 2016, 207.

## Sources:

Harju, Erkki-Sakari: *Suomen sotilaskartoitus 400 vuotta*, AtlasArt, Riga 2016.

Harju, Erkki-Sakari: *Kielletyt kartat N:o 4*, AtlasArt, Viljandi, 2015.

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# Venäläisen 1:100 000 kartan lehtijako

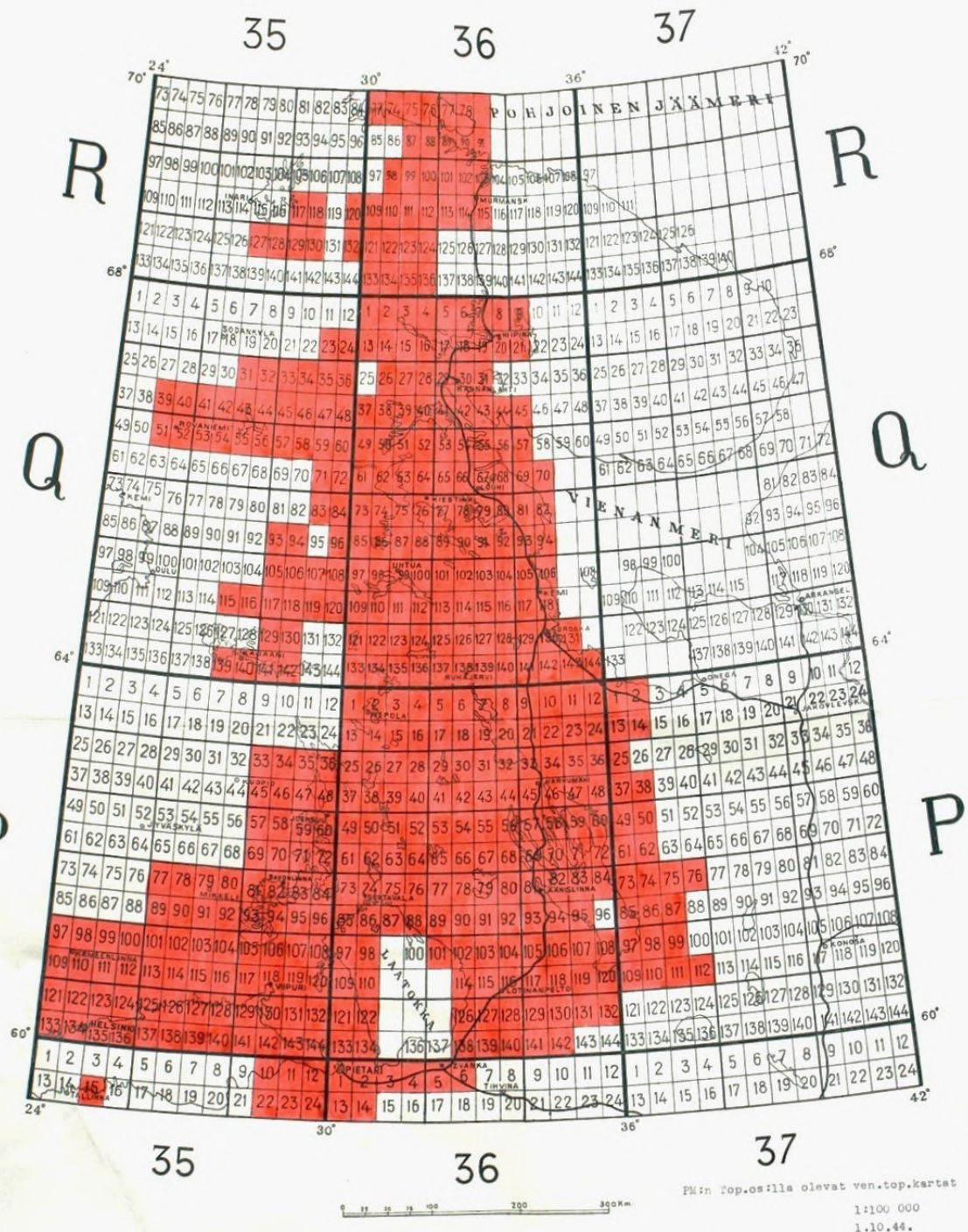


Image 7: Maps captured by the end of the Continuation War. Source: file 17902/6, National Archives of Finland.

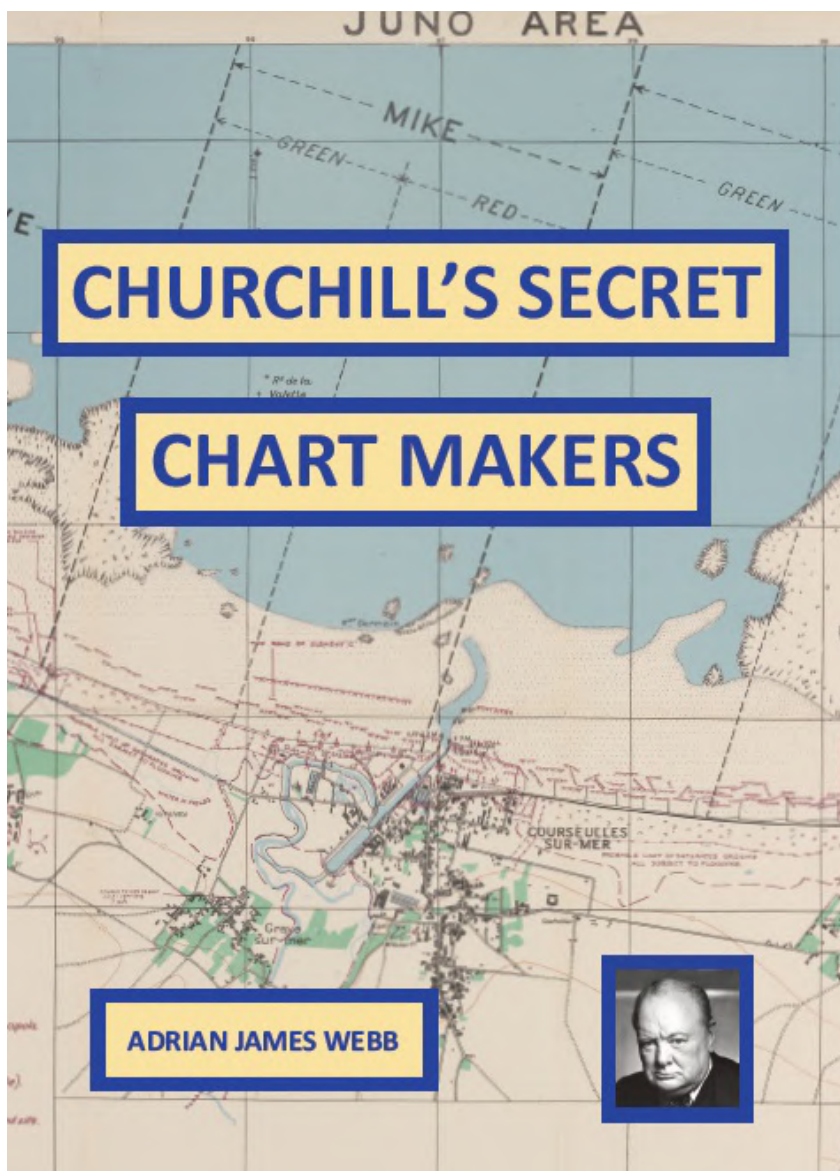
# Adrian Webb CHURCHILL'S CHART MAKERS

## A top secret World War Two activity brought to light

Eight decades after the invasion of France during World War II, British and foreign allied services still attended events to remember and celebrate those heroes who ventured all. The importance of the preparations for the invasion is well documented and publicised, though great secrecy surrounded them.

The thousands of Allied ships which would sail in tight formation from British ports on D-Day, which was delayed by storms until the 6<sup>th</sup> of June, all needed charts and other navigational products designed, compiled, proofed, printed and distributed by the Hydrographic Department of the Navy. The vital work of its offices in Taunton and Bath, without which the invasion would fail, was undertaken in total secrecy. All that outsiders knew was that the buildings were simply 'the Admiralty'.

The numbers of charts produced by the Department are staggering: in 1938 only just over one million were issued, compared with almost seven million in 1944. During the war 30.7 million charts and diagrams were supplied to 4,969 vessels from fourteen allied countries, compared with an average of 3.5 million over a similar period in peacetime. This increase created a tremendous work load for chart-making staff in the Department.



The stories of these top secret chart-making activities is told for the first time in *Churchill's Secret Chart Makers: the Road to D-Day and Beyond in Somerset, 1939-1945*. It details the work of the Hydrographic Department, predominantly based in Taunton and Bath, with satellite operations in Exeter, Frome,

Ironbridge, Armadale, Nottingham and London.

Chapters cover survey work undertaken by men from Taunton and Bath in the Far East to support Allied operations there, the building of a new purpose-built chart making factory in Somerset, top secret tidal calculations for D-Day, the

trials and tribulations of working under top secret conditions during World War Two and select biographies of key members of staff. Appendices contain transcripts of key documents in the wartime story, information about graduate cartographers, stories from women who worked in the Department, plus a lot more.

The book brings to light the importance of the work undertaken by the Department. Based on a wide range of sources, including interviews with war-time staff, this fully illustrated hardback book contains 272 pages. It is available at £25 from [www.somersethistory.com](http://www.somersethistory.com).

Former Head of the UK Hydrographic Office Archive, Adrian is a freelance researcher and consultant. He holds an MA and PhD from the University of Exeter in Naval History. He produced and edited the Maritime History of Somerset series, authored Thomas Hurd RN and his hydrographic survey of Bermuda, 1789-1797, as well as Charts and surveys of the Somerset coast, c.1350-1824. He has lectured on numerous hydrographic subjects and is currently working on an edition of Lieutenant Henry Mangles Denham's correspondence during his survey of the Bristol Channel.

One of the book's illustrations

