

The Battle of Frezenberg Ridge, May 1915. A micro-history using geographical information systems technology as an aid to analysis, interpretation and presentation.

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This paper uses the Battle of Frezenberg Ridge (4 - 13 May 1915) as a case study to investigate the merit of tactical micro-analysis in rendering comprehensible aspects of the large-scale, and usually amorphous and indecisive, attritional battles of the First World War. Stepping outside the mono-lingual constraints which colour much of the history of the period, it investigates the usefulness of German sources, when integrated with British sources, in understanding this battle. It uses geographical information system (GIS) technology, as an aid to analysis and presentation, and discusses its utility in the context of military history.

British unit war diaries at brigade and battalion level, together with a wide range of regimental histories and original mapping were combined with semi-official regimental histories and other material from German sources. Casualty statistics from both the Commonwealth War Graves Commission and the German Volksbund Deutsche Kriegsgräberfürsorgung were also consulted. Topographical data and data relating to tactical movement and operations were extracted from these sources and a detailed analysis was performed to identify anomalies or contradictions in this data allowing a coherent narrative to emerge. This analysis was assisted by the careful mapping of tactical movement using high quality cartography generated by GIS. The use of GIS in this context, together with its presentational use generally, was critically analysed. It has been demonstrated that this approach to the study of tactical warfare, even in circumstances where static, non-manoeuvre conditions apply, can lead to a greater understanding of the detail of complex military operations, both on the part of the historian but also his target audience.

Field warfare can be classified in a myriad of different ways. One particularly important categorisation is its separation into manoeuvre and attritional warfare.¹ Manoeuvre warfare is by far the more dramatic; success in battle depending on movement and speed. A

¹ Edward Luttwak, *Strategy, the logic of war and peace* (Cambridge Mass., 1987)



commander taking a manoeuvrist approach uses deception and intelligence to find, or create, a point of weakness in their enemy's position and then, by concentration of force at that point, break through and exploit this breakthrough using speed, tempo and surprise to keep the enemy off balance, thus bringing about the enemy's defeat through disruption of their command, control and supply systems and the paralysis and demoralisation of the units of their military force. It is a relatively economical form of warfare, particularly for the victor. Enemy collapse is achieved through disruption and demoralisation rather than destruction. The German offensive in France in 1940 and the Israeli victory in the Six-day War of 1967 are excellent examples of this style of warfare.

From an historian's point of view the analysis of manoeuvre warfare is an attractive proposition. The units involved at the critical points are often small in number relative to the total size of the armies involved. The local orders of battle can be easily comprehended; the movements are extensive, clear, and dramatic, and their effects easily understood.

The challenge to the historian in dealing with attritional warfare is in inverse proportion to that posed by manoeuvre warfare. In the case of the Western Front, a vast geographic area was involved and the number of units and combatants was also huge. Even when dealing with discrete battles the complexity was often overpowering. Little if any movement resulted from battle, and although objectives at both tactical and strategic level were often set by commanders, these made little sense in the context of the technology and doctrine within which the opposing forces were operating. The entire process of trench warfare has often been portrayed as a meaningless slaughter on an industrial scale, with little structure or form other than massive artillery bombardment followed by frontal infantry attacks in the face of machine-guns. Of course tactical and doctrinal improvements did take place throughout the duration of the war, particularly in the last year and indeed the Allied armies at this stage were very different and far more competent organisations compared to what they were at the beginning.

However, even in a battle as complex and indecisive as the Second Battle of Ypres (1915), the historical outlook is not necessarily all that bleak. Analysis, at a micro level, can achieve surprising structural clarity regarding tactical movement, particularly if the historian moves outside the English language sources and examines the actions from the point of view of the German forces, and their commanders, also. In the case of this study of the Battle of Frezenberg Ridge, a subsidiary battle within Ypres II, the assistance of geographical information system technology has also been invoked as a key aid in unravelling the tactical movements of the battle, and presenting the actions in a coherent and comprehensible manner. It might be noted in passing that this process of reducing military operations to tactical symbols and arrows on maps ignores a great many important components of combat. It is very much in the style of Liddell-Hart, where to cite Van Creveld, his approach 'consisted essentially of movement and characterised by means of coloured arrows stretching across a map, war was presented almost as if it were some kind of sophisticated game played between opposing teams'.² Despite Van Creveld's criticism, this cartographic approach to war and military history is a valid, albeit less than comprehensive, means of historical investigation and it is one of the particular tools with which this author has chosen to address the study of Frezenberg Ridge.

² Martin van Creveld, *The art of war, war and military thought* (London, 2000), p.178.

The methodology is straightforward. The sources, both British and German, have been carefully studied and detail relating to unit structure, unit commanders, unit location, unit movement and topography have been extracted from the relevant primary and secondary sources for each unit (in the British case battalions and in the German case regiments, and in both cases, where relevant, their sub-units). The material has been analysed on a chronological basis and any discrepancies or contradictions identified. On a thematic basis (the battle has been sub-divided into five phases of differing tactical character), the movements and actions of the units have been analysed for anomalies in terrain description and anomalies relative to the mapped locations of other units in contact or in proximity, both friendly and enemy. These anomalies will be discussed and reasons sought to account for them. As location and movement is the prime consideration of this study, other narrative details from the sources will receive considerably less emphasis.

Using GIS technology this data has been mapped and using the cartographic representation as a further means of analysis, a detailed narrative has been compiled together with a critical analysis of the issues raised. To briefly expand upon the use of GIS at this point, its tactical military uses fall into two broad categories:

1. High end GIS, required to manipulate the background geographical data that is the equivalent of the paper map.
2. Lower specification GIS, which would suffice to view the background data and manipulate the digital battle information that is analogous to an overlay trace. This overlay trace contains military-specific information traditionally drawn on transparent film overlain on the paper map.³

Both functions offer considerable benefits to the military historian.

In group 1: the ability to integrate a wide range of historical maps and, using scanning, geo-referencing and geo-rectification software, brings the mapping, and other geographic imagery, to a common reference datum, allows the historian to view detail on disparate maps in geometrically correct relationship. This functionality also facilitates the viewing of time sequences. Secondly, this technology allows the rapid compilation of specialist mapping drawn from a multiplicity of sources, to produce maps tailored to specific research or presentational aims.⁴

In group 2: GIS software provides the means of creating multiple overlays of tactically specific data facilitating the digital replication of traditional “talcs” (tracing paper overlays showing tactical information), with the added advantage that layers can be switched on and off at will, scales can be changed,

³ D. Swann, ‘Military applications of GIS’ in *Geographic information systems*, Paul A. Longley, Michael F. Goodchild, David J. Maguire and David W. Rhind (eds), (2 vols, Wiley VCH, 2005) ii, p. 894.

⁴ D. J. Maguire and Jack Dangermond, ‘The functionality of GIS’ in *Geographic information systems and science*, Paul A. Longley et al (eds), (Wiley, 2002) (<http://www.wiley.com/legacy/wileychi/gis/volumes.html>) i, pp. 324-30. (30 Sept 2015)

attribute data can be referenced to the map symbols, display can be generalised and relevant composite maps can be generated.⁵

Both of these techniques has been used in this study. A detailed review of the use of GIS, in both operational military use, and its use in military history, is provided in appendix 1.

In terms of organisation the study is structured as follows. First an outline of the events from the outbreak of war on the Western Front is provided, to set the actions under discussion in historical context. Secondly, primary and secondary sources are reviewed to assess their suitability for the purpose of the analysis. Thirdly, as mapping comprises a large and distinct component of the primary sources, a separate section will discuss mapping issues. The main body of the study, comprising five chapters, is devoted to an analysis of the five thematic phases of the battle. Four appendices, provide orders of battle, background to GIS technological issues, statistical analysis of British and German casualties, and details of the compilation of the base mapping.

Military Background

At the outbreak of war on the western front in September 1914, the British Expeditionary Force was compelled to retreat, under German pressure, from their original positions in the neighbourhood of Mons, Belgium.⁶ The German offensive was halted at the river Marne and the Germans driven back to the line of the Aisne.⁷ In October 1914, the British Expeditionary Force fought a major battle at Ypres in Belgium which halted the final German attempt at breakthrough and the western front settled into static trench warfare.⁸ In April 1915, after a period of relative quiet on this front, the German army launched an attack on the Ypres Salient, using chlorine gas and massed artillery.⁹ After the near collapse of the salient the Allied forces withdrew to a shorter defence line on the night of the 3/4 May 1915. From 8 to 12 May, German forces launched heavy attacks on the sector of the front immediately to the north and south of the Menin Road. These operations form the basis of the case study.

The operations from the 3 to the 12 May fall into 5 discrete phases:

1. A British tactical withdrawal.
2. A German advance to contact.
3. A German assault north of the Menin Road.
4. A German assault south of the Menin Road.
5. A confused series of attacks and counter-attacks for the possession of Hill 55.

⁵ D. J. Maguire and Jack Dangermond, 'The functionality of GIS' in *Geographic information systems and science*, Paul A. Longley et al (eds), (Wiley, 2002) (<http://www.wiley.com/legacy/wileychi/gis/volumes.html>) i, pp. 324-30. (30 Sept 2015)

⁶ A. Corbett-Smith, Maj, *The retreat from Mons, by one who shared in it* (London, New York, Toronto & Melbourne, 1917) and Robert Neillands, *The old contemptibles, The British expeditionary force, 1914*, (London, 2004)

⁷ Georges Blond, *The Marne, The battle that saved Paris and changed the course of the first world war* (Paris, 1962)

⁸ Anthony Farrar-Hockley, *Death of an army* (Herts, UK, 1967)

⁹ John Dixon, *Magnificent but not war* (South Yorkshire, 2003)

Each of these actions will be analysed separately and the detail from the primary and secondary sources will be integrated, anomalies and contradictions resolved and the actions integrated into a cohesive and intelligible narrative. GIS will be used as an additional aid to present this narrative in an understandable, simple and highly graphical form.

The geographic extent of the study area is defined, from west to east, by the western edge of Sanctuary Wood and the eastern edge of Stirling Castle (Schloß Beukenhorst) demesne and, from North to South, by the Menin Road and Armagh Wood.

A full order of battle, which is essential to an understanding of the battle, is provided in appendix 1.

In terms of internal organisation, a British battalion numbered 1,000 men in 4 rifle companies labelled A, B, C and D plus a machinegun section (2 MGs) and a HQ.¹⁰ The standard infantry weapon was the SMLE, .303 in. rifle.¹¹

The German tactical unit was the infantry regiment (IR) consisting of 3,286 men divided into 3 battalions (I, II and III) each of 4 companies, numbered 1 to 12 across the battalions (Companies 1, 2, 3 and 4 in Battalion I, 5, 6, 7 and 8 in Battalion II, etc.). The standard infantry weapon was the 7.9mm Gewehr 98 rifle.¹²

The Sources

Brigade war diaries for the British 81st and 82nd Infantry brigades were consulted. These are day to day manuscript diaries concerning events while the units were on active service. They cover such matters as orders, deployments, movements, enemy activity, casualties, reliefs, etc. They record most of the matters relevant to a mapping exercise, such as the one involved in this study. In some cases these higher level brigade sources are more detailed than the lower echelon battalion war diaries.

Battalion war diaries for the ten British battalions involved have been employed. These cover the same areas of activity but at a more localised level, as they apply to the battalions. They are all hand-written, sometimes almost indecipherable, and the amount of detail depends on the dedication and commitment of the recording officer. In the case of the diaries consulted, those of some units, such as the Princess Patricia's Canadian Light Infantry and the Gloucestershire Regiment,¹³ provide very considerable detail, while others, the diary of the Royal Irish Fusiliers for instance, provide hardly any information at all. This inconsistency of detail creates certain difficulties as mapping requires a standardised level of detail to ensure that mapped patterns are the result of variations in reality and not simply lack of data in certain places.

A full set of orders are extant for the British withdrawal to the new trench line during the night of 3 May.¹⁴ These run to three pages of handwritten, but detailed and precise,

¹⁰ *Field service manual 1914, infantry battalion (expeditionary force)*, (HMSO, London, 1914)

¹¹ *Musketry regulations, Part 1, 1909, General Staff, War Office* (HMSO, London, 1909)

¹² David Nash, *German infantry 1914-1918, A concise guide to uniforms, equipment, insignia and organisation* (London, 1971)

¹³ *War diary of the 2/Gloucestershire regt., 1 Nov 1914 – 31 Oct 1915* (National Archives, Kew, WO 95/2264/4)

¹⁴ 27th Division operations order no. 46, copy no. 3, dated 2nd May 1915, signed by R. H. Hare, Lt. Col. General Staff.

instructions in the style of formal military orders. While the information contained is comprehensive and exact, it must be remembered that these are orders for execution and there is never a guarantee that the orders were carried out as planned. In the circumstances of the present case study however, it is clear from multiple sources, including German sources, that the withdrawal was carried out without interference from German forces. Therefore it is a reasonable assumption that the movements and relocations were carried out in conformity with the orders.

Personal narratives for the period of the action have been compiled by certain participants. In this case by Maj. Gen. T. D'Oyle Snow, the divisional commander¹⁵ and by Captain Grazebrook of the Gloucestershire Regiment.¹⁶ Snow's narrative is in the form of a typescript and is undated. It purports to detail events up to the departure of the 27th division from the Western Front. Unfortunately, from the point of view of this case study, he has little to say about the actions at Frezenberg Ridge south of the Menin Road, during 4-12 May.

To supplement the war diaries, published secondary sources, in the form of regimental histories together with the official history of the war, were consulted. These histories (regimental) are of variable quality, but it is clear, from a careful comparison, that all are in conformity with the detail of the war diaries.

In the case of the German units all official documentation, including regimental war diaries, was destroyed during the Second World War. However, excellent regimental histories, compiled by reputable historians, often officers who took part in the actions described, exist. In some cases it is explicitly stated in the title that the history is based on official war diaries (nach den amtlichen Kriegstagebüchern). In general the German histories are written in much more 'matter of fact' style than their British counterparts and also provide much more detail of lower echelon units (companies and platoons) and the officers and NCOs who commanded them.¹⁷

General histories have been cited where background information is required to the events being analysed. These secondary sources do indicate the paucity of research already carried out into the action which is the subject of the study. Only one major book deals with the second battle of Ypres and this devotes a mere seven pages out of a total of 338 to the action at Frezenberg and is accused of being extremely Anglo-centric, neglecting the activities of the French, Belgians, and Germans.¹⁸

A number of official military manuals were consulted. These dealt, in the main, with organisation and tactics. By definition they are prescriptive, laying down guidelines and directions as to how certain matters should be done, rather than how they were actually done. However, they are clear, precise and authoritative.

Additionally a number of published sources were consulted on the same subject of organisation and tactics. These are by authoritative and well regarded authors, but again it

¹⁵ Snow, Maj.Gen. T. D'O., *Headquarters branches and services: general staff: narrative of the 27th division, 1 Sept 1914 – 30 Nov 1915* (National Archives, Kew, WO 95/2254/5)

¹⁶ Grazebrook, captain, *War narratives 1914-15, The Gloucestershire regiment* (Uckfield UK, 1923)

¹⁷ The relevant chapters have been translated into English by the author.

¹⁸ Chris Baker, 'Book review of *Magnificent but not war*' in Reviews: campaigns and battles, The long, long trail (http://www.1914-1918.net/reviews_battles.htm) (26 Nov. 2015)

should be emphasised that material from these sources is useful for illustration and understanding and is not central to the analysis.

A statistical study of the British and German casualties over the course of the eight day action, derived from data contained in the war diaries, regimental histories and the records of the Commonwealth War Graves Commission and Volksbund Deutsche Kriegsgräberfürsorge add considerably to an understanding of the action and this has been presented in Appendix 3.

The Maps

Maps used in this study come from a variety of sources. A full set of Belgian Institut Geographique National (IGN) maps at 1:10,000 scale was retrieved from Antwerp, before its fall to the Germans in 1914. This mapping formed the basis of British large scale mapping for the rest of the conflict. The British adopted the Belgian grid system, based on the Bonne projection and adapted it for military purposes by the addition of a system of alpha numeric map referencing and coordinates.¹⁹ Subsequently new mapping for infantry use was prepared by the British Ordnance Survey at 1:10,000 scale, which became the definitive “trench map”. This mapping was shipped to British units at the front in July 1915. In addition to trench location overprinting (German trenches only, for security reasons) the maps also provided an anglicisation of place names.²⁰ In 1950 IGN changed from the Bonne to the Lambert Conformal Conical Projection for their mapping. The geodesy was further revised in 1972.²¹ The current Belgian 1:20,000 mapping is constructed on this projection.²² The lists the maps which were used in this study are set out in figure (i).

¹⁹ John Peaty, ‘The Defence Geographic Centre and the centenary of the First World War’ in *The ranger-Journal of the defence surveyors’ association* (Winter 2014), iv, no.1, p. 28. (www.defencesurveyors.org.uk/images/Ranger/ranger%20Volumes/Ranger%20Winter%202014/203D.pdf)

²⁰ Ibid, p. 29.

²¹ Jean-Paul Donnay, ‘Systemes géodésique et projection “Lambert Belge”’ in *atlas numerique de Belgique, dossier cartographique* (Liege, 2012) (<http://www.atlas-belgique.be/cms/uploads/Dossier%20Lambert%20Belge.pdf>) (5 Oct 2015)

²² Sheet 28/1-2 Poperinge-leper and sheet 28/3-4 Gheluveld-Moorslede, 1:20,000 (IGN Brussels, 2001)

Scale	Date	Description	Sheet No.	Series	Publisher	Source
1:10,000	1915	Hooge	28 (part of)	2 nd Army Sh. 5	RE	McMaster
1:10,000	1916	Zillebeke	28 NW4 & NE3	GSGS 3062	OSGB	McMaster
1:20,000	1916	Belgium (ED 3D)	28 NW	GSGS 2742	OSGB	Imp. War Mus.
1:20,000	1916	Belgium (ED 3D)	28 NE	GSGS 2742	OSGB	Imp. War Mus.
1:20,000	1916	Belgium & Part of France (ED 3D)	28 SE	GSGS 2742	OSGB	Imp. War Mus.
1:50,000	1979	Ieper	28	M736	IGN Belge	IGN Belge
1:25,000	1974	Ieper-Poperinghe	28/1-2	M834	IGN Belge	IGN Belge
1:25,000	1974	Geluveld-Moorsele	28/3-4	M834	IGN Belge	IGN Belge
1:25,000	1965-77	Nieuwkerke-Mesen	28/5-6	M834	IGN Belge	IGN Belge
1:20,000	2001	Poperinge-Ieper	28/1-2		IGN Belge	IGN Belge
1:20,000	2001	Geluveld-Moorsele	28/3-4		IGN Belge	IGN Belge
	1915	German Trench Sketch			Gesch. IS172	ZMS Bw
1:56,500		Map (facing page 123, Hist. DCLI)			Unknown	TCD Library
1:57,900		Map 2, Hist. A&SH			HMSO	TCD Library
1:21,500		Battle of Ypres 1915 (Hist. Glouc.Reg.)			Unknown	TCD Library

Figure (i) – List of maps and their sources used in the case study.

The modern 2001 1:20,000 map series was selected as the primary base map and all other mapping used in this study was transformed to conform to this map base. The two sheets of this map series (Poperinge-Ieper 28/1-2 and Geluveld-Moorsele 28/3-4) were acquired in paper form and scanned to form JPEG digital raster images. The images were clipped and geo-referenced against a local metric grid and the relevant detail redigitised as vector maps by the author. All other paper map sheets were similarly scanned and clipped and were then registered and rectified against common topographical detail identified in both the base map and the mapping being registered. Visual checks and an examination of residuals were carried out to ensure an acceptable match between the base map and the mapping being registered against it. In the case of the mapping extracted from the McMaster University archive the processing varied slightly but broadly followed the same logic. These processes resulted in all the mapping being on a common projection and grid, such that, when viewed, each layer sits directly on top of the layer below and topographic detail between layers can be viewed and compared using transparency and swipe layer GIS tools.²³

The criteria involved in constructing a suitable base map are outlined in appendix 4.

PART ONE. The British tactical withdrawal 3/4 May 1915

As discussed above, the German assault, including the first use of chlorine gas in war, which opened the Second Battle of Ypres concentrated on the eastern half of the salient held by French colonial and Canadian troops. German advances in this area left British units in the west of the salient with a long and very vulnerable exposed flank. To remedy this dangerous situation a British withdrawal to a shorter, more coherent line was planned and

²³ Venkateswara Rao, *Geographic information systems* (ESRI, Lulu Press Inc. 2015), section 10.2.3.

this withdrawal was carried out during the night of 3 May. This withdrawal forms the subject of this part of the paper.

27th Division HQ

The British withdrawal was carried out successfully during the night of the 3/4 May. Divisional HQ of 27 Div. was ordered to withdraw from its existing location at Potijze to a farmhouse west of Ypres. A further farmhouse south of Busseboom was taken over as retired HQ. Beyond these two moves Maj. Gen. D'Oyle Snow, the Divisional commander has little or nothing to say about the fighting between 3 and 12 May.²⁴

27th division operations order no. 46 (copy no. 3) outlines the withdrawal procedure.

82 Bde. from present 5 Div. trench line in (I 30 e)²⁵ to where the new trench line crosses the fence east of the house marked in (J 14 c 1.7) inclusive (1/10,000).

81 Bde. from the fence not inclusive to fence 30 yards²⁶ north of Menin Road in (J 13 a).

80 Bde. from the left of 81 Bde. to the track (J 7 a 8.8) (west of Westhoek) not inclusive.

All roads and tracks south of the track from (J 7 b) level crossing (I 11 b) to Menin Road in (I 9 d) to be at the disposal of this division for the move.

81 Brigade deployment

The 81 Bde. operational order for the withdrawal required that an advanced brigade store be established in Sanctuary Wood near (I 18 D 8.5). 81 Bde. war diary describes the movements of the brigade as follows:

Bde. retired to new trench line in Sanctuary Wood (J13c & J19a).

New line taken up by support companies of 1/A&SH, 9/A&SH and 1/R. Scots.

1/Cam. H. and 9/R. Scots gone to Verloren Hoek, returning 0030-04.

The enemy seen advancing towards Stirling Castle, from Bodmin Copse and towards Clapham Junction 0700 on 4 May.

The new trench line was occupied by the support companies as follows:

1/A&SH (2 coys.) right

2/Glouc. (2 coys.) centre

²⁴ Maj. Gen. T. D'Oyle Snow, *A narrative of the doings of the 27th division from the date of formation to the end of its tour on the western front* (National Archive, WO95/2254/5) no date is given as to when this typescript was written.

²⁵ The grid reference system used on British mapping is fully explained in the marginalia of all the British trench maps.

²⁶ For distances and dimensions metric measure will be used throughout, except where direct quotations from original sources are concerned. In this case the measurement will be quoted as originally stated. Conversions will be carried out on the basis of 1 foot equals 0.3048 metres with the result being rounded appropriately.

9/A&SH (1 ½ coys.)	}	left
1/R. Scots (1 coy.)		
2/Cam. H.		... reserve in Sanctuary Wood

The following reliefs took place at 2000 on 4 May: 2/Cam. H. relieved 9/A&SH & 1/R. Scots. 9/R. Scots relieved 1/A&SH. 1/A&SH went to Sanctuary Wood. 9/A&SH moved to Zouave Wood. 1/R. Scots moved to west of Ypres.²⁷

2/Glouc.'s war diary describes their position in more detail:

In the battalion sector, which stretched roughly some 600 yards south of the Menin road, the new line was situated along the eastern edge of Sanctuary Wood, ...the right of the sector was bounded by a track leading SE towards Bodmin Copse, and the left rested on a track running from Sanctuary Wood to Stirling Castle. About halfway along this frontage the wood formed a right angle pointing ESE towards the enemy. At the apex of this and on slightly higher ground, was an old French OP and a short line trench. This was connected by two communications trenches with the new main line which cut off the corner of the wood. To B coy. under Maj. Nisbet, was allotted the right half of this new sector, whilst D coy. under Capt. MacMahon, were [sic] responsible for the left and for the advanced post. One MG was placed in the advanced post, whilst the other was positioned to the left of B Coy. A and C coys. were to go in support some 200 yards to the rear, in dug-outs with Batt. HQ.

1/A&SH withdrew from Bodmin Copse during the night of the 3/4 May. B coy. and 1 platoon of D coy. occupied the 1/A&SH section of the new trench line. A patrol under Lt. Neill remained in Bodmin Copse to observe and report the German advance to contact, which occurred at 0600 on 4 May. 9/R. Scots relieved 1/A&SH in front line trenches at 2000 on 4 May. German reported to be no nearer than 200 yards from front line at any point.²⁸

1/R. Scots withdrawal was more complicated. A coy. held a section of trench, described as the 'Subsidiary line' by the battalion war diarist, whose location is unknown, but would seem to be part of either the support or reserve trenches of the existing line. The frontline trench garrisons retreated through the A coy. position to Zouave Wood. D coy., which was in battalion reserve, also retreated through A coy. and occupied new line trenches astride the Menin road. A coy. then withdrew through the D coy. position to support trenches in the grounds of Hooze Chateau.

German advance to Clapham Junction was reported by 1/R. Scots scouts at 0400 on 4 May. Battalion dispositions were as follows: D coy. in fire trenches astride Menin Road, A coy. in support trenches, B and C coys. in battalion reserve in Zouave Wood and Batt. HQ in old 82 Bde. HQ .

²⁷ 81 Brigade war diary (National Archive, WO95/2263/1)

²⁸ War diary, 1/A&SH, May 1915 (National Archives, WO95/2263/2)

At 2000 on 4 May 1/R. Scots were relieved by 2/Cam. H. and withdrew by “devious and unhealthy” routes to Vlamertinghe.²⁹

At 1600 on 3 May, 1/Cam. H. and 9/R. Scots. marched to Verlorenhoek in support of 85 Bde. and returned to bivouac in Zouave Wood at 0130 on 4 May. At 2000 on 4 May 1/Cam. H. relieved the 1/R. Scots astride the Menin road. Battalion HQ was at the west end of Hooze village in dug-outs, south of the Menin road.³⁰

The map in figure (ii) shows the deployment of 81 Bde at the completion of the withdrawal.

The siting and construction of the British trenches requires comment. The official manual warns against siting trenches at the face of a wood, as such a location is an obvious target for enemy artillery.³¹ This authority recommended 30 to 50 yards inside the perimeter of the wood. However, such a location would prevent clear fields of fire across no man’s land to the defenders, particularly if the wood was still standing, and digging trenches through tree roots would be far more difficult and time consuming than in clear ground (although support trenches had indeed to be constructed in this fashion within the wood). 1/Glouc.’s reference to the trench line ‘which cut off the corner of the wood’ lend credence to the belief that the trench line followed the perimeter of Sanctuary Wood elsewhere. The manual also recommends the construction of a supervision trench immediately behind the fire trench. It is unlikely that such a system was used at Sanctuary Wood as the British trenches were constructed at speed and were unfinished when occupied. Trenches were also numbered. No maps have been found which clarify this numbering system. What slight evidence there is indicates that trenches were numbered within the brigade area, starting with trench no. 1 on the right, with up to 28 trenches in all. The manual gives dimensions for fire trenches and traverses; 5.5 - 9 m long bays, 2.75 - 3.65 m thick traverses, but make no mention of a numbering system.³²

²⁹ War diary 1/R. Scots, May 1915 (National Archives, WO95/2264/1)

³⁰ War diary 1/Cam. H., May 1915 (National Archives, WO95/2264/3) pp 33-35

³¹ Notes for infantry officers on trench warfare, compiled by the general staff, War Office (London, 1916)

³² Notes for infantry officers on trench warfare, compiled by the general staff, War Office (London, 1916)

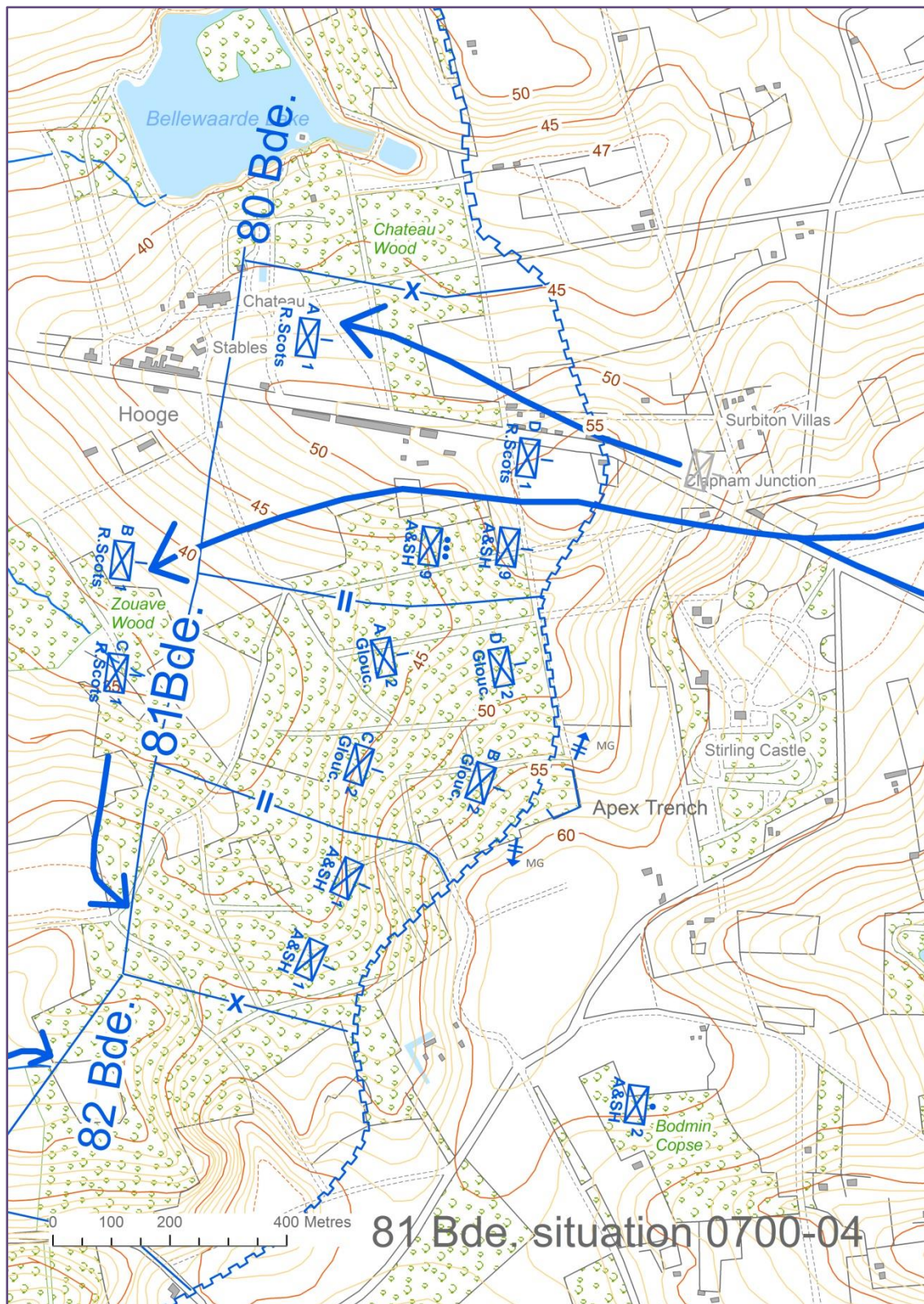


Figure (ii) – The situation of 81 Brigade at 0700 on 4 May on completion of withdrawal.

82 Brigade deployment

No operational order for the withdrawal of 82 Bde. remains in existence. The brigade was deployed as follows:

Brigade HQ moved back at 0400 on 4 May to an Orphanage in Ypres (Ecole de Bien Faisance).

1/Lein. was in line in trenches to the extreme right of the 82 Bde. position. Their No. 1 trench adjoined the trenches of the Bedfordshire regiment in 5th Division. The regimental history states:

The new line took in the small hill to the right of the battalion's sector no. 1 trench, but immediately north of it the line switched off at right angles to the old one and in some cases companies that had been facing south-east now looked east of north.³³

The orientation of 1/Lein. trenches requires comment. No available mapping shows actual British trench location for this period in this location. The position and orientation of British trenches had therefore to be estimated based on text descriptions and the front line trench locations shown on the relatively small scale maps attached to the official history.³⁴ Comparison of the lines shown on these official history maps, in areas where the location of trenches is better mapped at large scale and is known with greater precision, provides reasonable confirmation of their accuracy, accepting, of course, the caveats due to scale and generalisation. From map based evidence 1/Lein. trenches faced almost due south, while after withdrawal and realignment they would have faced approximately ESE. The regimental historian would seem to have got his direction wrong in this case.

1/RIR, which was on detachment to the 10th division and was in position south of Wieltje, was ordered to evacuate its position and return to 82 Bde. At 0200 on 4 May they left their trenches and moved to a field west of Ypres and at 0900 on 5 May they proceeded to Hooge to rejoin 82 Bde. They relieved 2/RIF after 2200 on 6 May, taking over trenches 7, 8 and 9.³⁵

From this it can be inferred that 2/RIF were in trenches 7, 8 and 9 after the withdrawal on the night of the 3/4 May. 2 DCLI's war diary also records that 2/RIF took over their Bn. HQ in Sanctuary Wood.³⁶ As further confirmation of the deployment of units in the front line the DCLI regimental history states:

two battalions held the front line, i.e. 1st Leinsters on the right, 2nd Royal Irish Fusiliers on the left³⁷

³³ Frederick Earnest Whitton (Lt. col.), *The history of the Prince of Wales Leinster Regiment (Royal Canadians), late the 100th Prince of Wales Royal Canadian Regiment, Vol. 2 – The great war and the disbandment of the regiment* (Aldershot, 1924), p.125. (henceforth cited as Whitton, *Leinster Regiment history*)

³⁴ Brigadier-General J. E. Edmonds & Captain G. C. Wynne, *Military operations: France and Belgium, 1915 - volume I: winter 1914-15: battle of Neuve Chapelle: battles of Ypres* (London, 1927)

³⁵ War diary of the 1st Battalion the Royal Irish Regiment (National Archives WO95/2266/4) (henceforth cited as *War diary, 1/RIR*)

³⁶ 2/RIF war diary cannot be traced and the regimental history has nothing to say on this deployment.

³⁷ Everard Wyrall, *A history of the Duke of Cornwall's Light Infantry 1914-1918*

2/DCLI, who were in position at Bellewaarde Lake, returned to 'demi repos' dugouts and huts in Sanctuary Wood at 2000 on 3 May and remained there throughout 4 May.³⁸

1/Camb. HQ moved to Maple Copse at 2330 on 2 May accompanied by C coy. At 2230 on 3 May B coy. retired in two parties, leaving a small covering party under Lt. Hopkinson to cover withdrawal. At 2230 on 3 May 3 A coy. was in close support of 1/Lein. in right sector and C coy. was in close support of 2/RIF, both in Sanctuary Wood. On 4 May D coy. withdrew in two parties to Maple Copse and slept in the open as no dug-outs had been constructed. Sanctuary Wood was shelled throughout 4 May and A and C coys. took casualties.³⁹

A number of matters are clear from the above process. From the point of view of the historian attempting to come to grips with the detail in their sources, GIS offers only limited added capabilities. It certainly equips them with an excellent topographic base on which to plot the movements and actions described in the sources. It also provides them with great flexibility with regard to scale at which detail can be displayed, allowing more and more locational detail concerning minor units (down to company and platoon level, if such information is available) to be included. It is excellent at allowing the historian to see graphically complex locational relationships between units, which could not be readily comprehended from the written description. Topographic and geographic anomalies, if there were such, would immediately become clear from this process (there were none in the case of the British withdrawal). It cannot, however, compensate for omissions in the sources. GIS is a data hungry technology and functions best when a richness of data is available. It is also at its best when this data is comprehensive and structured, because almost all GI systems are based on relational database technology, with data being stored in tabular form. By comparison with the records of the other battalions involved, the absence of data on 2/RIF leaves a lacuna with regard to this unit's activities. At the other end of the spectrum, 2/Glouc.'s war diary, regimental history and Capt. Grazebrook's commentary provide incomparably better details than any of the other equivalent sources. The absence of any map, making reference to the trench numbering system, has already been commented on. It is possibly one of those occurrences, common in military history, where the detail was so self-evident to the diarist, at the time, that it was felt unnecessary to record it. To subsequent users of the record the matter may not be at all so self evident. Finally it should be noted that the choreography of the withdrawal, as outlined by the 1/R. Scots diarist for his own battalion, i.e. a half distance withdrawal by part of the unit with the remaining companies 'leap-frogging' through this half way position to more permanent prepared trenches, further to the rear, was probably replicated for the other battalions, but was not considered worthy of comment in their war diaries or regimental histories.

³⁸ *War diary of the 2nd Battalion the Duke of Cornwall's Light Infantry* (National Archives WO95/2266/2) (henceforth cited as *War diary 2/DCLI*)

³⁹ *War diary of the 1st Battalion the Cambridgeshire Regiment* (supplied as a typescript of the original manuscript war diaries in a personal communication from the Cambridgeshire Regiment Association) (henceforth cited as *War diary 1/Camb.*)

Battle of Frezenberg Ridge. 1915

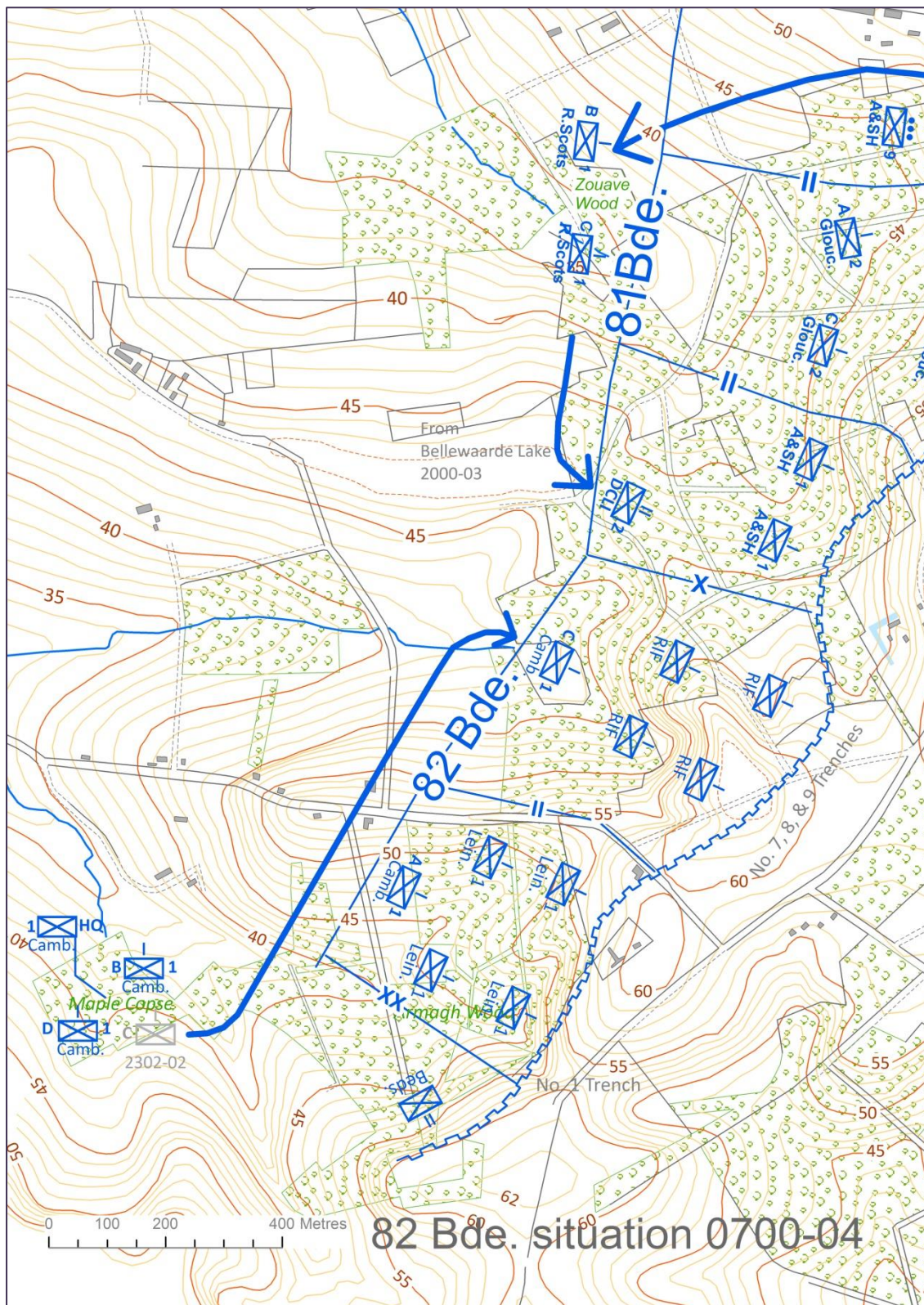


Figure (iii) – The situation of 82 Brigade at 0700 on 4 May on the completion of the withdrawal.

PART TWO. The German advance to contact, 4 May 2015

Following the British withdrawal, which was successfully carried out in secrecy, there was a brief pause while the German units facing the withdrawing British forces carried out reconnaissance to establish what exactly had happened to their front. They then commenced the delicate process of advancing to contact so as to re-establish engagement with their opponents. This process forms the subject of this part of the paper.

IR172

Towards morning on 4 May IR172 received notification from XXVII Reserve Corps of British withdrawal. Bn. I which was in the front line, sent forward patrols which found the British trenches empty. Bn.I then advanced all four of its companies until they came under fire in front of Sanctuary Wood. They reached the edge of the demesne surrounding Schloß Beukenhorst (Stirling Castle) and began to dig in, extending their line in the direction of Zillebeke. The regimental history continues:

to the right the regiment adjoined IR132 and to the left we adjoined IR126. Bn.II followed up the advance of Bn.I and occupied the former front line in reserve. Comp. 8 dug in the park of Herenthage Castle. Bn.III was withdrawn into divisional reserve in Geluveld.⁴⁰

IR132 Bn.II

According to the regimental history of IR132, Oberleutnant Kloth of Comp.6 of IR132 received word of the British withdrawal from the neighbouring unit RIR248 and Comp.6 and 7 sent out patrols towards the British positions to confirm the withdrawal. By 1800 VfdR Faißt of Comp.6 had located of the British positions 'west of the woods, approximately in the neighbourhood of the road from Ecksternest (Ost) southwards. Haupt. Schwedler allowed Comp.6 and Comp. 7 to move forward at 1830'. These companies became merged during their advance with elements of RIR248 immediately south of Nonne Boschen.⁴¹

Comp.5 and Comp.8 which were in reserve to the regimental commander were returned to Bn.II at 1815, to take part in the advance, but were withdrawn and placed in reserve in the second line soon after.

IR132 Bn.III

Bn.III received orders to advance at 0700 from regimental HQ and sent patrols forward with the companies following on. 'The left flank company (Comp.10), under Oberleutnant Hofmann, succeeded in reaching the castle, 300m south of the bend in the road, near Hill 55, which was weakly occupied, and seized it.'⁴²

This company (Comp.10) occupied the castle with a detachment under the command of Unteroffizier Magnus and dug in around the castle to the right and north of the building.

⁴⁰ Hans Wegener, *Die Geschichte des 3. Ober-Elsässischen Infanterie-Regiments Nr. 172.* (Thüringen, 1934) p.74 (henceforth cited as Wegener, *IR172*)

⁴¹ Joseph Steuer, *Das 1. Unter-Elsässische Infanterie-Regiment Nr. 132 im Weltkriege* (Berlin, 1931) p.132 (henceforth cited as Steuer, *IR132*)

⁴² Steuer, *IR132*, p.133

Comp.11 was in position on the right of Comp.10, while Comp.9 was at a similar distance forward, with two platoons south of the Menin Road and one platoon to the north.

Captain Grazebrook states that:

from 7am onwards, small parties of the enemy appeared amongst the trees round Stirling Castle (Schloß Beukenhorst) and more especially on the high ground to the left of the Chateau. Here they were seen to be busy getting under cover and digging or improving trenches along the western edge of the chateau grounds... In many cases this was the first time that men of the 2nd battalion had really seen a Bosche, and there was considerable excitement and eagerness to get a shot. Several of the enemy were hit and were seen to be dragged back to safety. The range was about 600-700 yards.⁴³

Range, measured from the map, is actually much less; 300m. This detail is confirmed by an account, from German sources, of the deaths of a number of infantrymen of IR172 in this location at this time.⁴⁴

A German sketch map (the author's redrawing of the detail on this map is shown in figure (iv)) attached to the regimental history of IR172, indicates the German trench line as of 4 May. An interesting feature of this sketch is the location of guns (presumably machine guns, but possibly 'whizz bang' field artillery) at the projecting trench angles south-west of the chateau, the westernmost of which is ideally located to enfilade the British front line at the edge of Sanctuary Wood.

All units of Bn.III, north of the Menin Road, had now crossed the road to Ecksterneck and were a short distance on the British side of this road. Steuer states: 'A further assault by part of Comp.9, beyond a group of projecting houses failed'.⁴⁵ Comp.12 was pulled back into the second line on the right flank. 'At this point a fairly wide gap opened between Bn.III and Bn.II. This was bridged by patrolling.'⁴⁶

From the machine gun company, Rüchenmeister's platoon had gone forward with Comp.7 and Morlock's platoon with Comp.9.⁴⁷

⁴³ R. M. Grazebrook, '2nd battalion the Gloucestershire regiment, Ypres 1915' in *War narratives 1914-15, the Gloucestershire regiment* (1923)

⁴⁴ Werner Bernhard Sendker, *Auf Flanderns Feldern gefallen, Deutsche und ihr Verhältnis zum Ersten Weltkrieg* (Osnabrück, 2004)

⁴⁵ Unfortunately it is not possible to identify this group of houses on the map with any certainty. Neither is it possible to identify any topographical reason for the gap which opened between units.

⁴⁶ Steuer, *IR132*, p.133

⁴⁷ Ibid.

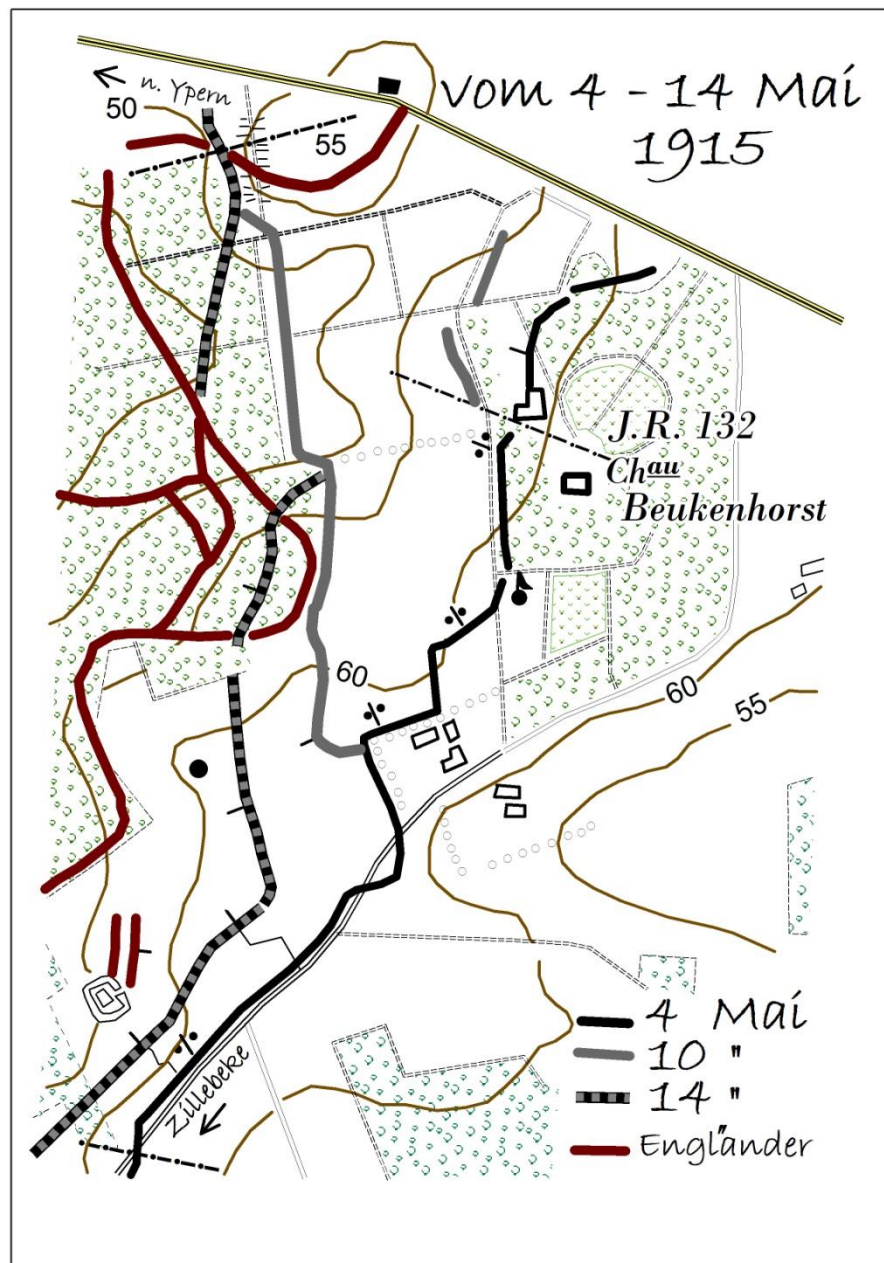


Figure (iv) Sketch map showing German positions as set out in IR172 regimental history.

IR132 Bn.I

Bn.I was held in divisional reserve at Kruseik. They marched to Geluvelt at 0705 and reached it at 0800. They were withdrawn to Reutelbeek-Grund at 1000.⁴⁸

The German regimental histories demonstrate the variation in consistency between accounts. IR132 deals with the advance to contact in one short paragraph,⁴⁹ while IR172 details the regiment's advance, battalion by battalion, company by company and indeed, in the case of Bn.3, platoon by platoon. Locations and unit commanders are given for all units, including the machine-gun platoon commanders.⁵⁰ The location of the German FEBA is somewhat uncertain at this stage. IR132 give the location of the British trench line as 'west of the woods, approximately in the neighbourhood of the road from Ecksternest (Ost) southwards'. However, the record then states that 'all units of Bn.III, north of the Menin Road, had crossed the road to Ecksterneck and were a short distance on the enemy side of this road'. This would indicate that the British trenches were some distance further west in the neighbourhood of Bellewaarde Chateau woods. These locations will be reviewed in more detail in the next part of this paper dealing with the German assault of 8 May.

⁴⁸ Ibid. p.133

⁴⁹ Wegener, *IR172*, pp 73-4

⁵⁰ Steuer, *IR132*, pp 132-4

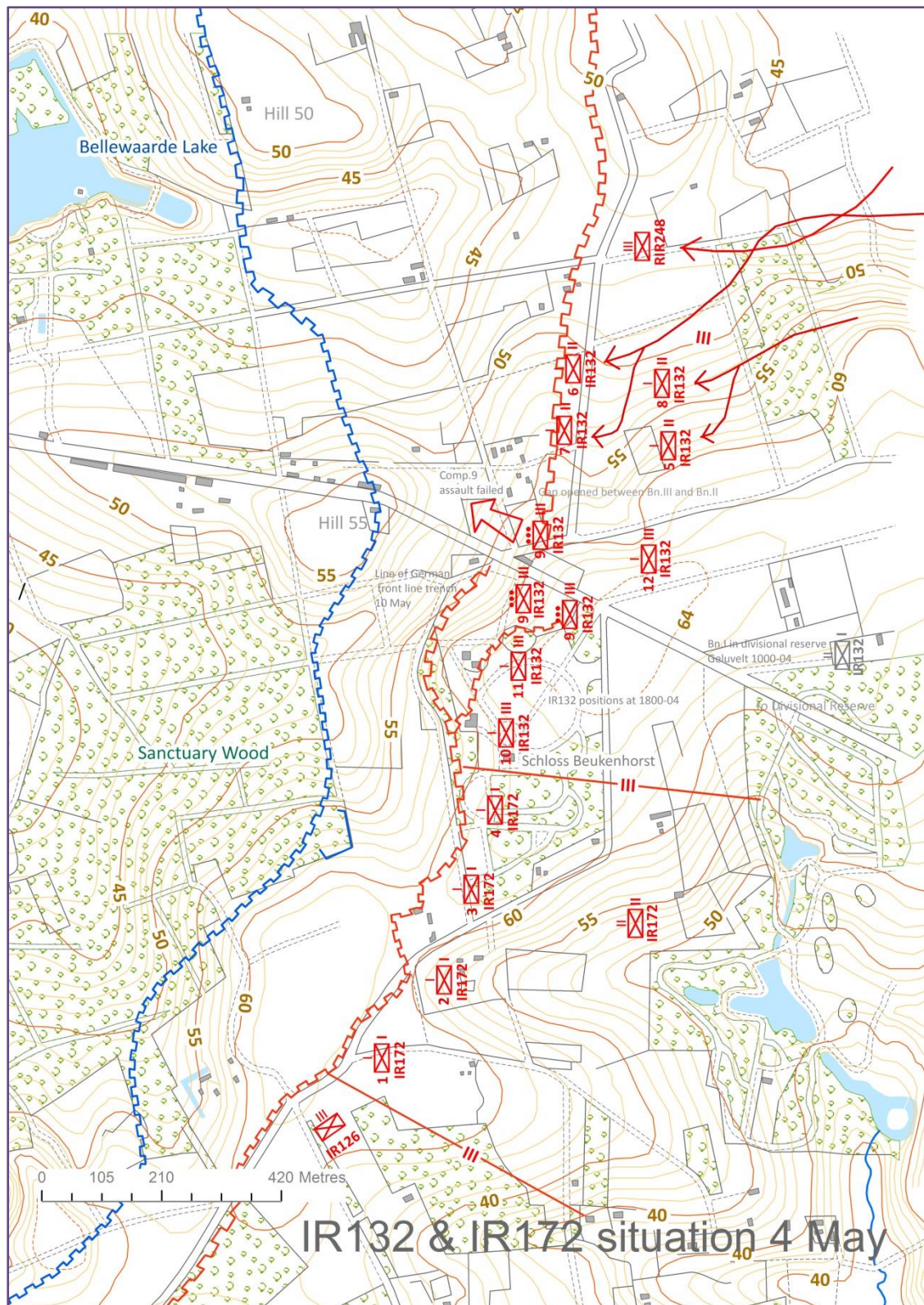


Figure (v) – The situation of IR132 and IR172 on 4 May.

PART THREE. The German assault north of the Menin Road

Having successfully advanced to contact and dug in in the new positions opposite the British line, the German army made plans for assaults on that line, with the intention of pushing the British units back to the line of the Yser Canal. To this end a meeting between the divisional staff (39 Infanterie Division) and regimental commanders took place at Koelberg on the afternoon of the 7 May. The basis of the plan was that Armee Korps XV, in cooperation with Reserve Corps XXVII on their right, would attack between Ecksternest (Westhoek) and Bellewaarde Lake (see figure (vi)). The entire artillery resources of the army would provide preparation for this attack. IR132 was tasked with seizing the line from Hill 50 to Hill 55, 'Hill 55 being located at the bend in the Menin Road, northwest of the Castle.' The attack was to commence on the morning of the 8 May. Bn.I was to be restored to regimental command for this battle.⁵¹

On the morning of 8 May the planned violent onslaught was unleashed on the British Line. The German plan was to carry out a massive infantry assault on the British front between the Roulers railway and the Menin Road having first obliterated the British defences with an overwhelming artillery bombardment using the bulk of the German artillery in concert. Steuer⁵² states that:

Oberstleutnant Freiherr Grote first of all shifted the right wing as far as necessary to the right. To this end Hauptmann Schwedler placed No.7 Company to the right, next to No. 8 Company. The Menin replacements – Dietrich's company - came behind in the second line.

At 2345 the comprehensive written regimental orders for the attack were issued. The 2nd Battalion were to advance through Hill 50 towards Bellewaarde Lake. The 3rd Battalion was to maintain contact to the right and advance on the left flank towards Hill 55. No. 2 Company and No. 3 Company from the regimental reserve were placed at the disposal to the 2nd Battalion, and the 3rd Battalion respectively and located in trenches behind the battalions on the 8th May from 6.00 am onwards. No. 1 and No. 4 Companies remained in regimental reserve behind the right half of the Regiment's positions in old fire trenches. The artillery preparation was to be controlled at army level with regard to targets and fire distribution so that the fire would remain unbroken, from 0800 am to 1030, with the exception of 2 pauses of 10 minutes each. The infantry breakthrough was ordered to commence at 1030.⁵³

It is clear from the map that the 'shift to the right' ordered by Grote was considerable. IR132's objective, in the coming assault, was the British trench line between Hill 55 and Hill 50. From the details of the advance to contact, IR132's line stretched from Schloß Beukenhorst to north of the Menin Road. How far north is not mentioned. Comments regarding the gap between Bn.II and Bn.III, which had to be 'bridged by patrolling', might indicate that Bn. 2 was further north in the direction of Ecksternest (Westhoek) and that this gap was wider than indicated on the 'advance to contact' situation map (figure (v)). However, it must be accepted that in the coming assault, IR132 would not move diagonally across the enemy's front and that therefore the assaulting units were face on to the line of their objective. IR132's units are therefore so shown in the following situation map (figure (vi)). A

⁵¹ Steuer, *IR132*.

⁵² Ibid.

⁵³ Steuer, *IR132*.

point to be noted from this map is the considerable distance between Hill 50 and Hill 55 (approximately 750m) and that there is lower ground, indicated by the dotted form line, between them. As the attack progressed it was likely that the lines of advance of Bn.II and Bn.III would diverge.

Although the entire British front occupied by the 27th and 28th Divisions was subject to artillery bombardment, the heaviest fire fell on the trenches in front of Bellewaarde Lake and Chateau Wood occupied by Princess Patricia's Canadian Light Infantry (PPCLI)⁵⁴ and the 4th Battalion of the King's Royal Rifle Corps.⁵⁵ After a day of intense and desperate fighting with massive casualties on both sides, the British line held, but only just. The relationship of the units as outlined in their relevant histories is somewhat unclear; not surprising, perhaps, given the fury of the battle. Few enough of the officers or NCOs were left to tell the tale. Documents and maps relating to PPCLI place this unit's position squarely on the high ground immediately in front of Bellewaarde Lake, with the KRRC to their right.⁵⁶ The map attached to the PPCLI is unfortunately not precisely dated. It indicates the situation for 'April-May 1915'. As a result, the time for which the PPCLI trench lines are valid, cannot be defined. The trench line south of the Menin road would appear to be indicative only because of its straightness and simplicity. This line, as shown on the PPCLI map, is indicated on the map in figure (xvii).

A look at the German casualty figures for the day show that the heaviest casualties by far were suffered by RIR 247, closely followed by RIR 245, RIR 242 and to a lesser extent by LIR 77, RJB 25 and RIR 248 with IR 132 bringing up the rear, having suffered significant casualties but nothing like those of the other units. As RIR 248 was on the immediate right flank of IR 132 with RIR 247 to its right again, this would seem to indicate that the unit most heavily engaged on the German side was RIR 247 with the ferocity of the attack tapering away as one moved to the left of the German line. The unit to the left of IR 132 was IR 172, which suffered only light casualties on the day. The regimental history of IR 132 would seem to place the regiment's line of attack through Hill 50 towards Bellewaarde Lake, directly against PPCLI into the bitterest cauldron of the fighting. However, the casualty figures would indicate that this joy was reserved for RIR 247 and IR 248, IR 132's neighbours to the right, meaning that IR 132's attack took place a little closer to the Menin Road against the 4th Battalion of the KRRC and the Argyll & Sutherland Highlanders.⁵⁷

⁵⁴ *Princess Patricia's light infantry – war diaries 1914-1919*, Michael Thierens (ed) (2008)

⁵⁵ Lt. Gen. Sir Christopher Wallace, *The King's Royal Rifle Corps – A brief history 1755-1968*, (Winchester, 2005)

⁵⁶ 'Map No. 2, Second Battle of Ypres – Bellewaarde Ridge' in *Princess Patricia's light infantry – war diaries 1914-1919*, Thierens, Michael (ed) (2008)

⁵⁷ See appendix 3 – German casualties

Battle of Frezenberg Ridge. 1915

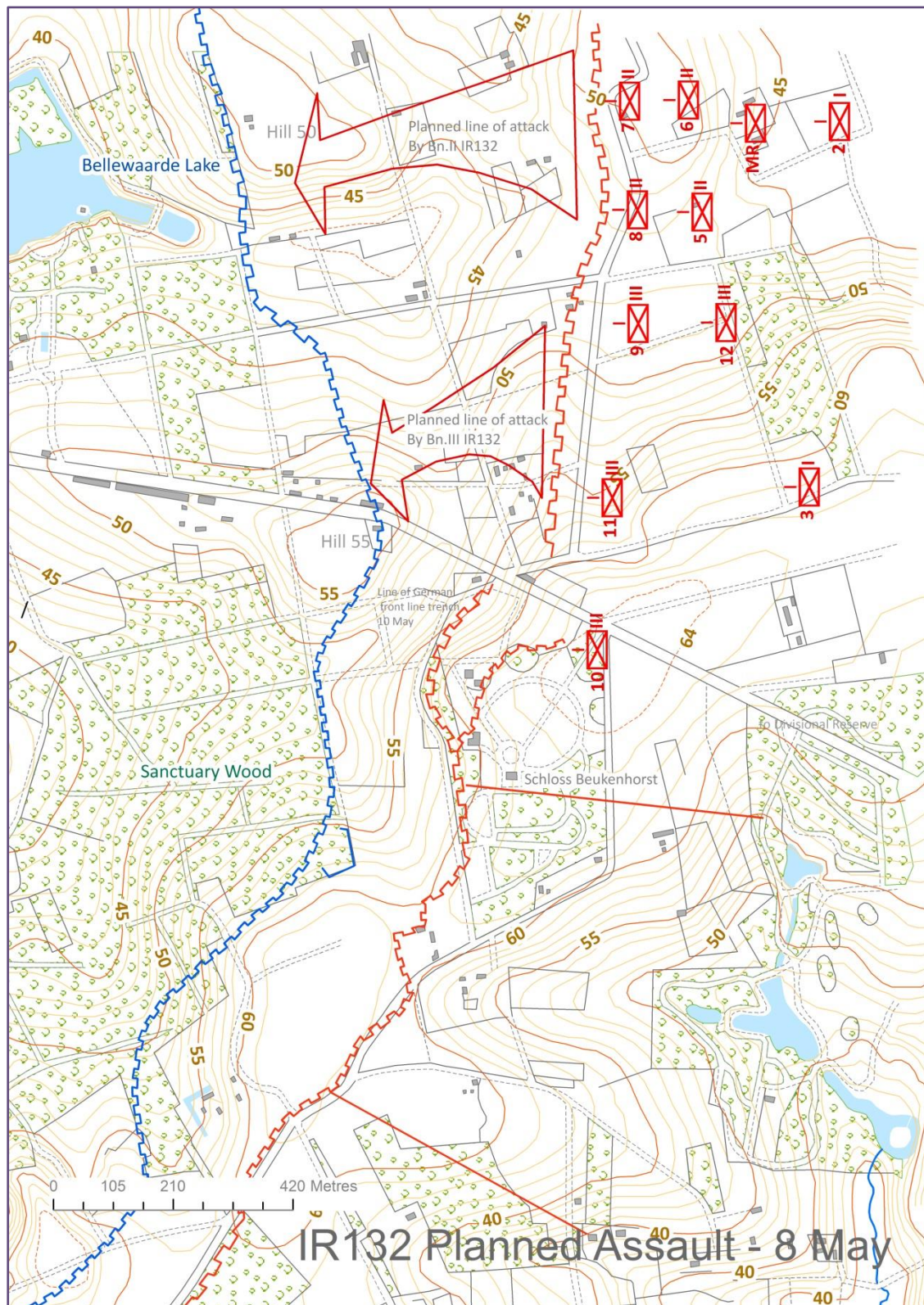


Figure (vi) – Assault planned by IR132 for 8 May

The historian of IR132 continues his commentary as follows:

No. 7 Company managed, in cooperation with R.I.R. 248, to advance, reaching Hill 50 and take an enemy trench. By 12.50 pm the Regiment could report that it was in possession of Hill 50.

North of the Menin Road, 2 platoons of No. 9 Company, 3rd Battalion had moved forward in contact with the 2nd Battalion, at 10.30 am. They were forced however to retreat because of the intensity of the enemy fire, as also were parts of No. 11 Company, which could not reach the enemy trenches because of heavy enfilading enemy fire from a southerly direction. No. 12 Company was inserted to fill a gap between No.9 and No. 11 Companies.⁵⁸

The source of the enfilading fire from the south is unclear. The map shows the British trench line projecting forwards to include Hill 55. There is no direct evidence that the British occupied Hill 55. However the events of the night of the 11/12 May, when this feature is fought over repeatedly, would indicate that it was part of the British line at this stage of the battle. Also, the indication of a quadrant of British trench (labelled 'Engländer') surrounding the feature, on the sketch maps attached to the IR172 history, provide further evidence that Hill 55 was in British hands at this stage. If this were the case then this would be the most likely source of the British enfilading fire. (see map figure (vii))

The IR132 narrative continues:

Following an order of 1.30 pm Major Marschall advised his companies of the situation; Hills 50 and 47 (500 m southeast of Hill 50) had been occupied. No. 9 Company had reached close up to the enemy line and was digging in; No. 10 Company should remain in its current position until further orders were received, or its neighbouring unit, to the left, I.R. 172 moved forward, etc.⁵⁹

According to the situation in the morning Comp.9 had been driven back to their own trenches by enfilading fire. We now find that it was 'close up to the enemy line and was digging in'. We must assume that it has managed to overcome the enfilading fire and moved forward. Comp.10 has now been located. It formed the left of IR132's position and has not moved, but remained in place beside the neighbouring IR172. Hill 47 is a mystery. There is no contour or spot height with this value in the position indicated.

According to a report of No. 7 Company (Oberleutnant Blanalt) at 1400 the British continued to hold strongly at the edge of the woods on the western slope of the hill (Hill 50). By this time all of No. 7 Company and two platoons of the Menin replacements had been deployed. 'No. 5 Company had become separated from No. 7 Company by a gap of 200 m, as No. 8 Company had dropped back, and wanted the last two companies of the Menin replacements to be deployed in the trenches.' Behind No. 5 and No. 8 Companies, No. 6 Company had moved forward, in the first instance to the trenches previously occupied by the companies in front. They then pushed forward into the front line.

⁵⁸ Steuer, *IR132*.

⁵⁹ *Ibid*.

At 1320 they reported that they were on the hill “left” i.e. to the south of “the hollow” and were in contact with No. 5 and No. 9 Companies. At 1500, because No. 8 Company had fallen behind, they requested the support of a machinegun.

At 1645 pm the regiment’s positions stretched from Hill 50 southwards, occasionally touching the edge of the woods, turned in the direction of the bend in the Menin Road, and ended immediately east of the bend at the original line.⁶⁰ The maps in figures (vii) and (viii) shows the main movements of the German attack outlined above.

On the opposing side the war diary of the PPCLI reads like a horror story. Trenches being blown in by high explosive shells; men and machine guns buried, terrible casualties.⁶¹ 3/KRRC and 4/KRRC who were to the right of PPCLI suffered equally; 3/KRRC suffering 542 casualties and 4/KRRC suffering 493 casualties during the course of the battle.⁶² 1/A&SH were moved from their position south of the Menin Road to support PPCLI but were withdrawn when the action subsided.⁶³ By the end of the day’s fighting the British positions had been pushed back to their support trenches and inside the woods of Bellewaarde Chateau. ‘Bellewaarde Wood was now and impenetrable abattis, and the two rifle battalions were thus enabled to lend close and valuable assistance against the concentrated enemy attacks to the south upon the neighbouring troops at Hooge.’⁶⁴

⁶⁰ Steuer, *IR132*.

⁶¹ PPCLI suffered 93 KIA, 79 MIA and 203 wounded during 8 May. *Princess Patricia’s light infantry – war diaries 1914-1919*, Michael Thierens (ed) (2008)

⁶² Lt. Gen. Sir Christopher Wallace, *The King’s Royal Rifle Corps – A brief history 1755-1968*, (Winchester, 2005)

⁶³ *War diary of the 1/Argyll & Sutherland Highlanders, 1 Dec 1914 - 31 Oct 1915* (National Archives, Kew, WO 95/2263/2)

⁶⁴ Lt. Gen. Sir Christopher Wallace, *The King’s Royal Rifle Corps – A brief history 1755-1968*, (Winchester, 2005)

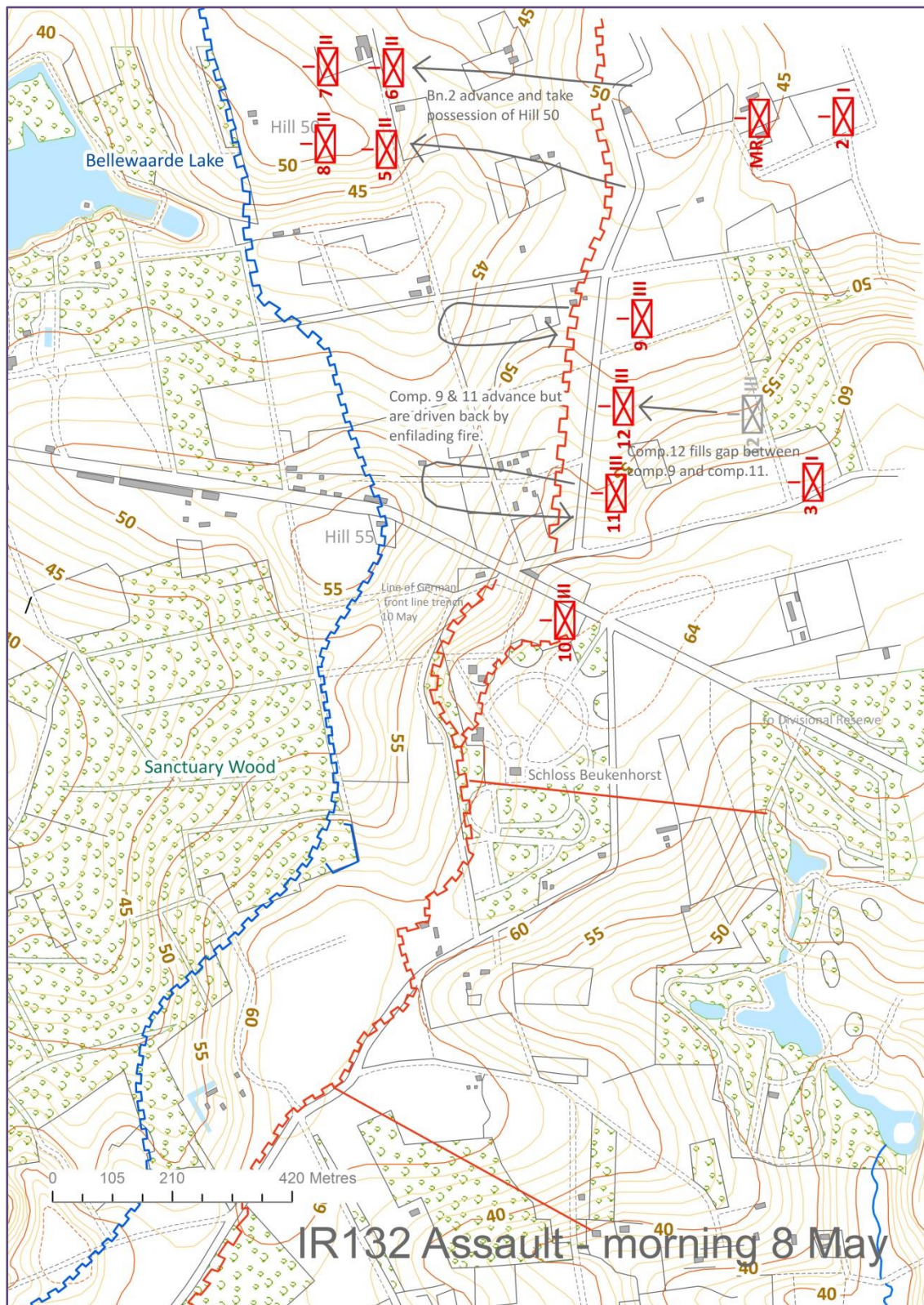


Figure (vii) The assault by IR132 on the morning of 8 May north of the Menin Road.

Battle of Frezenberg Ridge. 1915

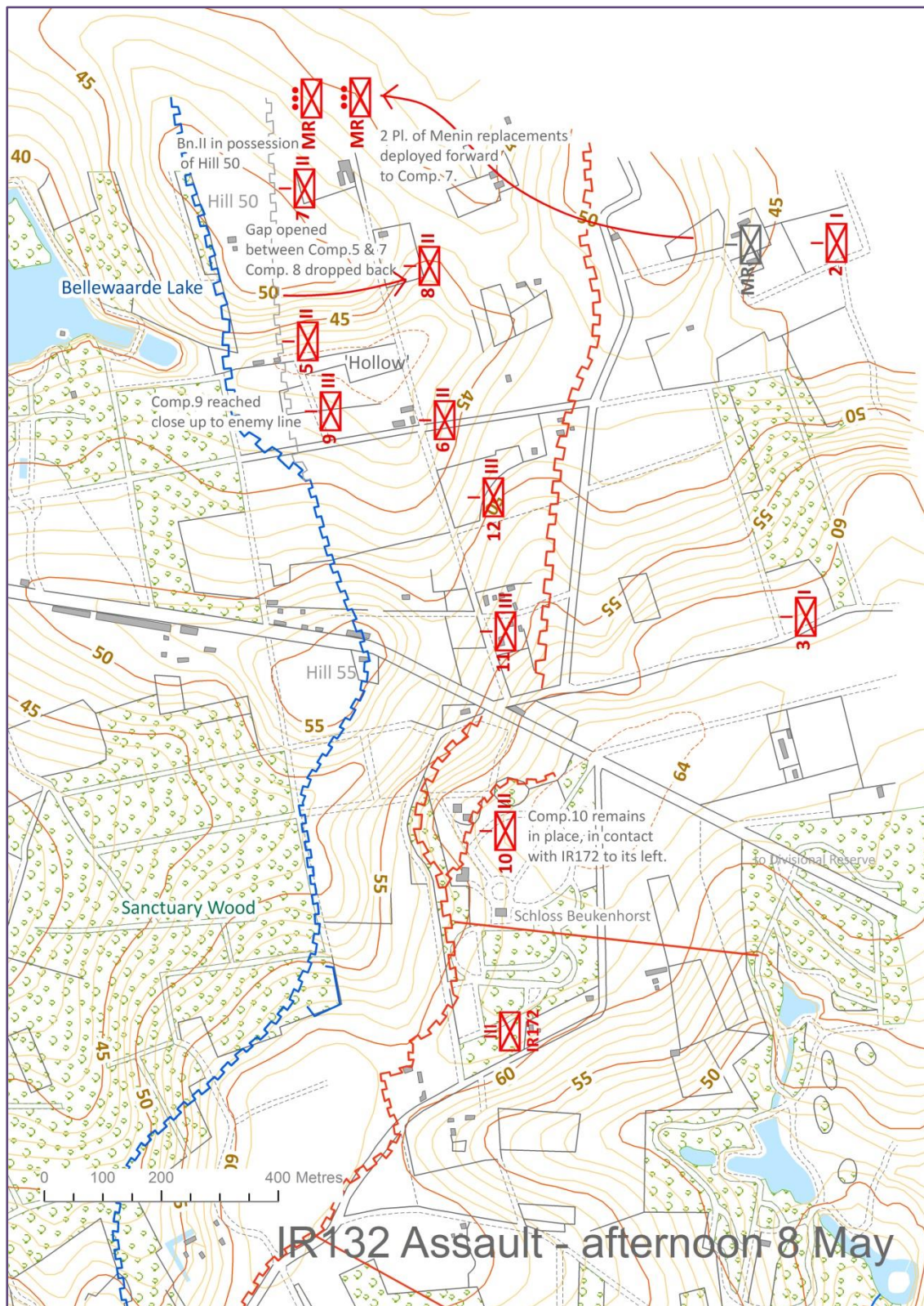


Figure (viii) The assault by IR132 on the afternoon 8 May.

PART FOUR. German assault south of the Menin Road

It is proposed to treat this phase of the battle in a more cursory manner than the other phases. From a manoeuvre point of view it offers little of interest. The assault consisted of a straightforward artillery barrage followed by a frontal infantry assault. Action commenced at around 0730 on 9 May with the artillery barrage and the infantry assaults, by IR132 and IR172, went in at 1030 and concentrated on the trenches being held by the B and D companies of the Gloucestershire Regiment. The fighting centred particularly on 'Apex trench' at the most forward point of the British line and the fighting was intense and brutal.

⁶⁵ Interestingly, in the context of Hill 55, 2/Glouc.'s historian make reference to 'a circular bit of trench round a bump in the ground in the centre...[which] proved defensible...but their (German) reinforcements kept coming in from the corner of the wood.' This would almost certainly refer to the arc of trench shown on the German sketch map in figure (iv) on the eastern rim of Hill 55.⁶⁶ This provides some evidence that Hill 55 was still in British hands at this stage of the battle.

⁶⁵ Steuer, *IR132*, pps 139-140 and Wegener, *IR172*, pps 74-75

⁶⁶ Everard Wyrall, *The Gloucestershire regiment in the war 1914-1918* (1931). p. 107.

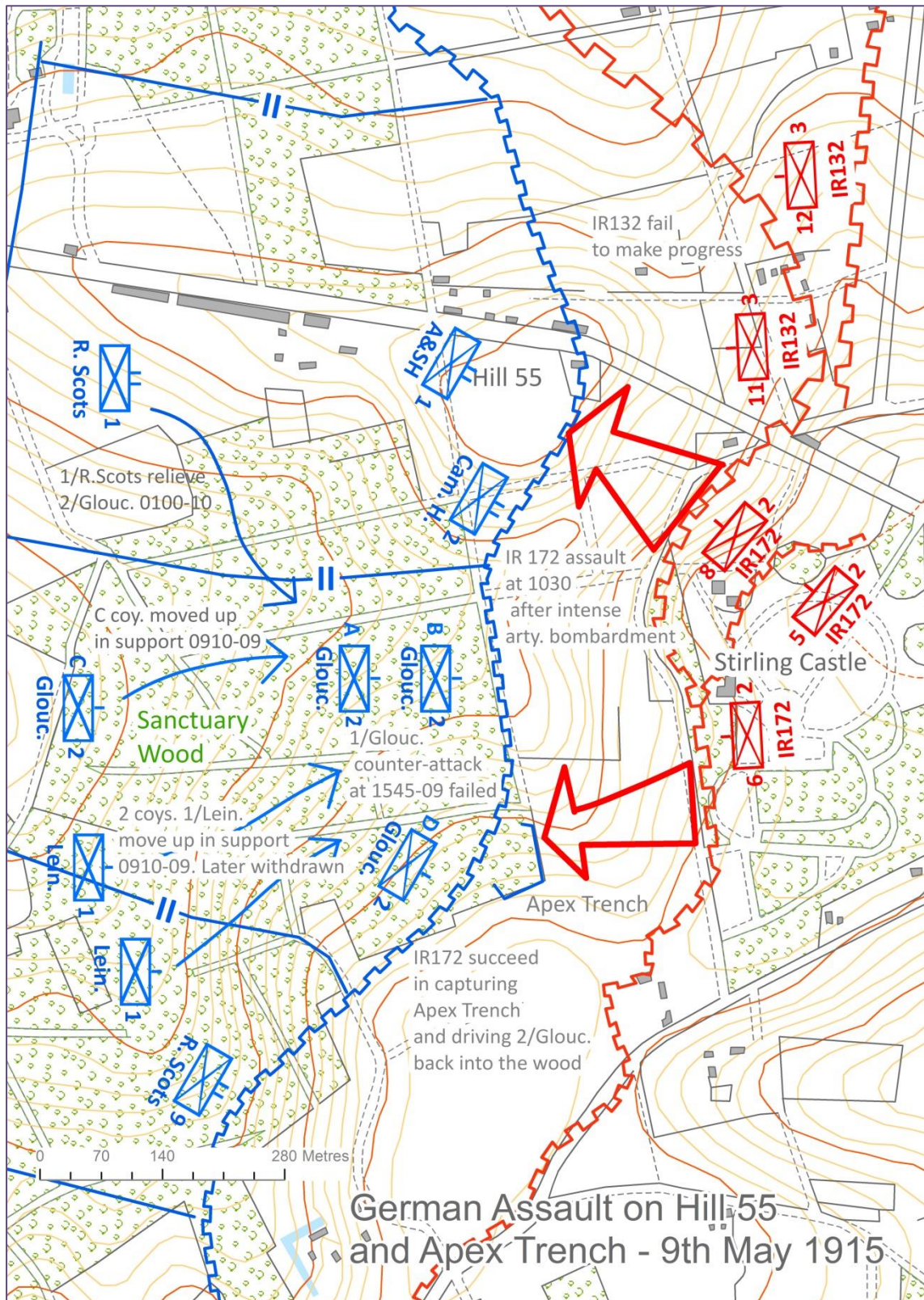


Figure (ix) – The German Assault on Hill 55 and Apex Trench 9 May.

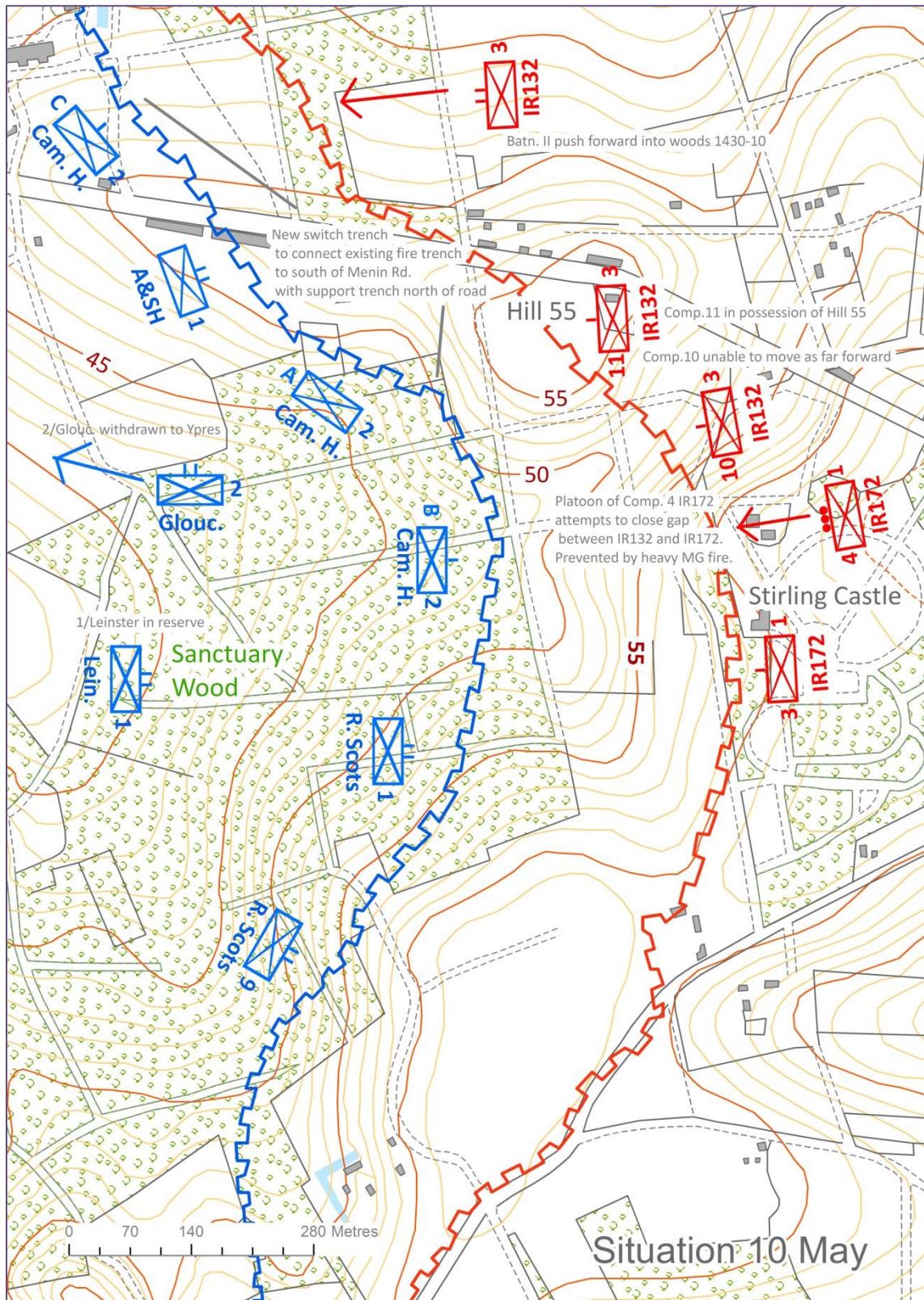


Figure (x) – The situation south of the Menin Road 10 May

PART FIVE. Attack and counter-attack, the night of 11/12 may

This part of the paper deals with very disjointed actions involving attacks and counter-attacks towards the end of this phase of the battle. The main thrust of the German attempts at break through would appear to have been spent at this stage and the purpose of these operations would appear to consist of 'tidying-up' actions to rationalise the trench line and to ensure possession of locally important tactical features.

Position and movement in this phase of the battle depended to a large extent on trenches. Survival in the open was impossible. It would be useful therefore, before examining the events of the night of 11/12 May, to look at the trench layouts in the vicinity of Hill 55. Figure (x) provides a general picture of the military situation and the topography in the relevant area. The most authoritative of the sources for trench location is the British trench map of 1916 at a scale of 1:10,000.⁶⁷ The trench locations, as delineated on this map, are shown on all subsequent maps in this paper as *British Trench Map 1916* and coloured olive green. Three series of maps indicate trenches occupied at various points during the battle.

1. The front line positions for 4, 8 and 13 May from the three relevant maps attached to the official British history have been mapped as shown in figures (xv) and (xvi), but the small scale and generalisation of these maps make them less useful for detailed locational purposes.⁶⁸
2. The German trench positions for 4, 8 and 14 May, as delineated on the IR172 sketch map, shown in red, and the location of British trenches, also from the IR172 map, shown in blue on the map in figure (xvii).⁶⁹
3. The trenches, as shown on the map attached to the PPCLI war diaries is shown in dark blue and overlaid on the IR172 map in figure (xvii).⁷⁰

It is clear that the German trench locations from the IR172 map approximate quite closely to the surveyed locations on the British trench map, but are not identical, which provides a considerable degree of corroboration for their accuracy i.e. that they were new delineations and not merely tracings of previous maps. What remains anomalous, however, is the British trench line extending from Hooze village and curving around the 55 metre contour of Hill 55 to meet with the Menin Road. This trench line coincides with no line shown on any other source. Yet its existence is strongly indicated in the narrative of the battle of the night of 11/12 May as detailed in the British war diaries, particularly those of 2/Glouc.⁷¹ and 1/Leinster.⁷² It is also possibly referred to in 2/Glouc.'s regimental history narration of the events of 9 May.⁷³ Towards the end of the action numerous references are made to a switch trench between the remaining British front line trench and the support trench to which the British have been forced to withdraw north of the Menin road. The general line of this trench

⁶⁷ GSGS 3062, Zillebeke 28NW4 & NE3 (OSGB, 1916)

⁶⁸ J. E. Edmonds, Brigadier-General & G. C. Wynne, Captain, *Military operations: France and Belgium, 1915 - volume I: winter 1914-15: battle of Neuve Chapelle: battles of Ypres* (London, 1927) Maps 9, 10, 11 and 12.

⁶⁹ Wegener, IR172.

⁷⁰ *Princess Patricia's light infantry – war diaries 1914-1919*, Michael Thierens (ed) (2008)

⁷¹ *War diary of the 2/Gloucestershire regt., 1 Nov 1914 – 31 Oct 1915* (National Archives, Kew, WO 95/2264/4)

⁷² *War diary of 1/Leinster Regt., 1 Dec 1914-31 Oct 1915* (National Archive, Kew, WO 95/2266/3)

⁷³ Everard Wyrall, *The Gloucestershire regiment in the war 1914-1918* (1931). p. 107.

is clearly discernable on the *British Front Line Positions* map (pale blue), but it doesn't coincide with any of the lines shown of the 1916 trench map. Possible trench lines can be surmised for this switch trench but it would be impossible to select from the various options with any degree of confidence.

On the morning of 11 May IR132 and IR172 made preparation to renew the assault on the British trench line with the express intention of seizing and holding Hill 55.⁷⁴ No.1 Comp. of IR172 advanced at dawn and found the British trenches to their front surprisingly unoccupied and the company commander, Oberleutnant Burmeister, reported that the British had withdrawn and fortified new positions 100m inside the woods. Surprise was expressed that the British has abandoned this position 'which overlooked ground between the woods and the castle park.'⁷⁵ From the description it is clear that the position seized by IR172 was Hill 55. The reason for its abandonment by the British would seem to have been the result of mistaking early morning mist for a gas attack. 2/Cam. H. reported that:

At daybreak on the 11th A and B companies were still holding the north-east edge of Sanctuary Wood; on their left was a company of the 1st Argyll and Sutherland Highlanders...About 0700 the Germans opened a heavy bombardment on the angle of the battalion's front in the north-east corner of the wood, and again using gas, attacked the position' The day continued with a series of German attacks and British counter-attacks.

IR132 declared itself to be in possession of Hill 55 and a section of the edge of Sanctuary Wood at 1030-11. IR172 also advanced at 1100 and stated that 'at 11.15 the strongpoint was in the hand of Nos. 11 and 12 Companies.' However, as a result of 'blue on blue' artillery fire and British counter-attack they were forced to retreat. Shortly after midday the situation had stabilised and the IR132's commander, Oberstleutnant Karl Freiherr Grote, made detailed plans to renew the attack at 1600. However, the proposed assault did not go ahead as planned due to the failure of the artillery bombardment to materialise and the intervention of a further British counter-attack. Despite this confusion IR172's history states the Lt. Graf von Bredow of No. 9 Comp. occupied the strongpoint at around 1615.

Two counter-attacks had been made by the British prior to 1600, both by 2/Cam. H. and 1/Royal Scots, with B coy. 1/Leinster in support.⁷⁶ The direction of the British counter-attacks is shown on the map in figure (xiv).

2/Glouc., had now returned to the front line and Capt. Vicary of that battalion carried out a night time reconnaissance of Hill 55. Despite the intense darkness he 'walked right over the hill to the cutting beyond';⁷⁷ (Cameron Gully, the semi-circular line of trench?) and made his way back after some scary moments among the Germans.⁷⁸

⁷⁴ Steuer, *IR132*.

⁷⁵ Wegener, *IR172*.

⁷⁶ Whitton, *Leinster Regiment History*.

⁷⁷ Grazebrook, R. M., '2nd battalion the Gloucestershire regiment, Ypres 1915' in *War narratives 1914-15, the Gloucestershire regiment* (1923)

⁷⁸ From Grazebrook's description of the reconnaissance, the distances travelled and the prominence of Hill 55 would seem to have been much greater than today's reality would suggest. The photos below show Hill 55, as it appears today, from both the German and British positions. (author's collection)



Figure (xi) Hill 55 as seen from the German positions (author's private collection, 2014)

The night continued with two further counter-attacks carried out by A & C companies of 1/Leinster,⁷⁹ in which the battalion suffered very severe casualties.⁸⁰ A number of further attempts to recapture Hill 55 were made by 2/Glouc., but all failed, leaving IR132 and IR172 in occupation. Thus ended the struggle for Hill 55 on the morning of the 12th May 1915.



Figure (xii) Hill 55 as seen from the British positions (author's private collection, 2014)

⁷⁹ Whitton, *Leinster Regiment History*.

⁸⁰ 1/Leinster suffered two officers and 21 other ranks killed and four officers and 128 other ranks wounded. The author's uncle, Peter Butler, was numbered among the dead.

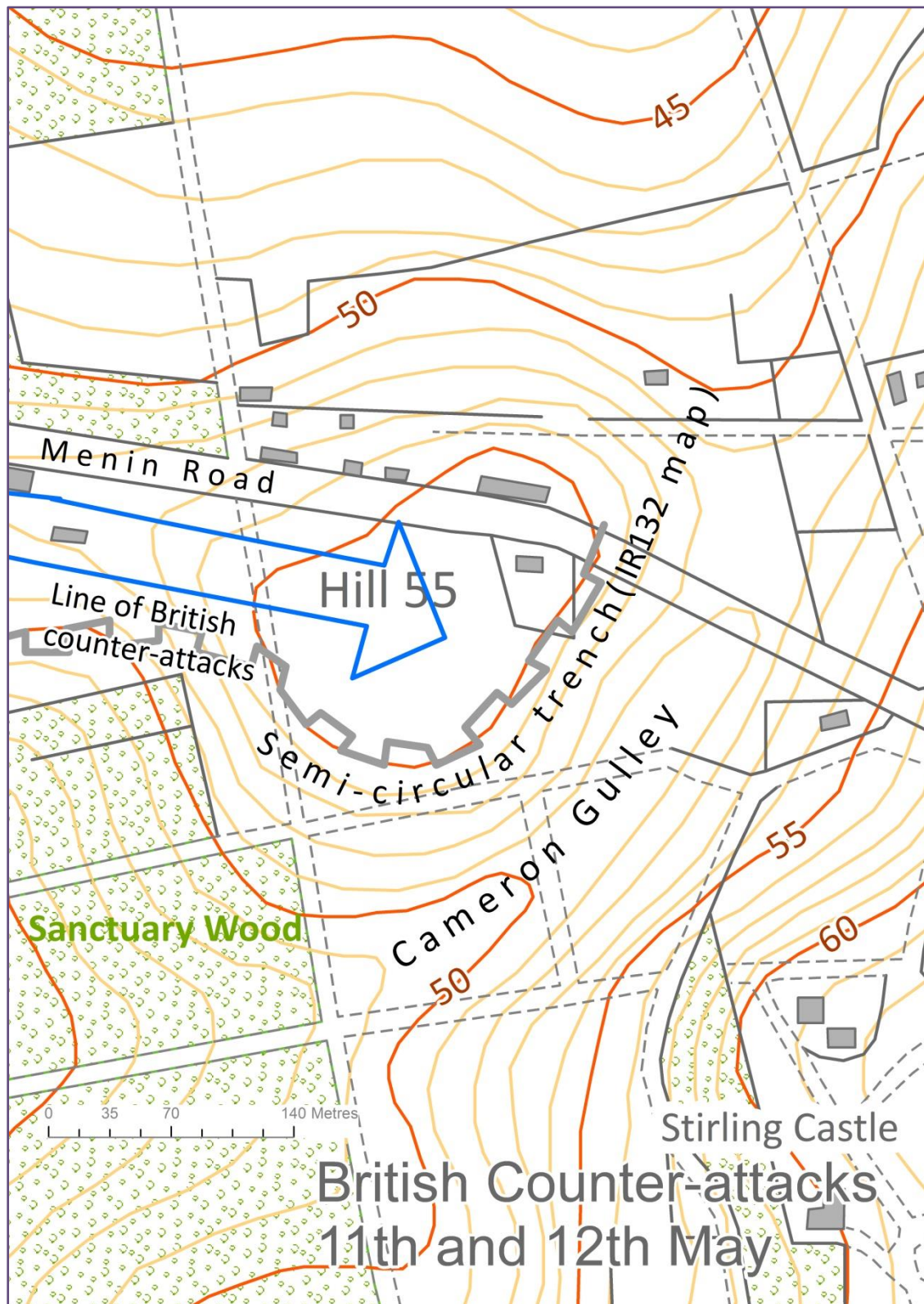


Figure (xiii) British counter-attacks 11 and 12 May.

Battle of Frezenberg Ridge. 1915

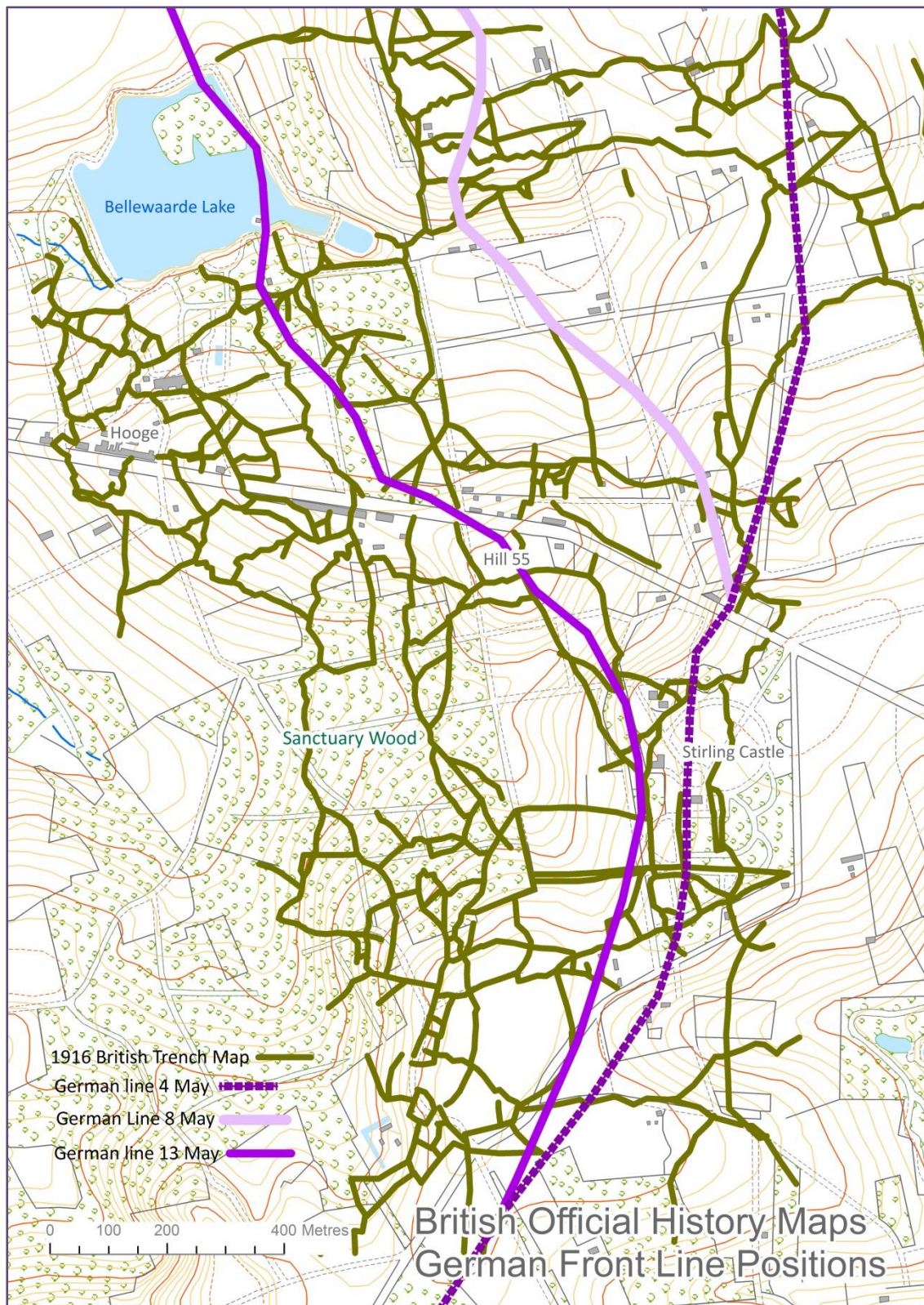


Figure (xiv) German front line positions as indicated on the maps in the British official history.

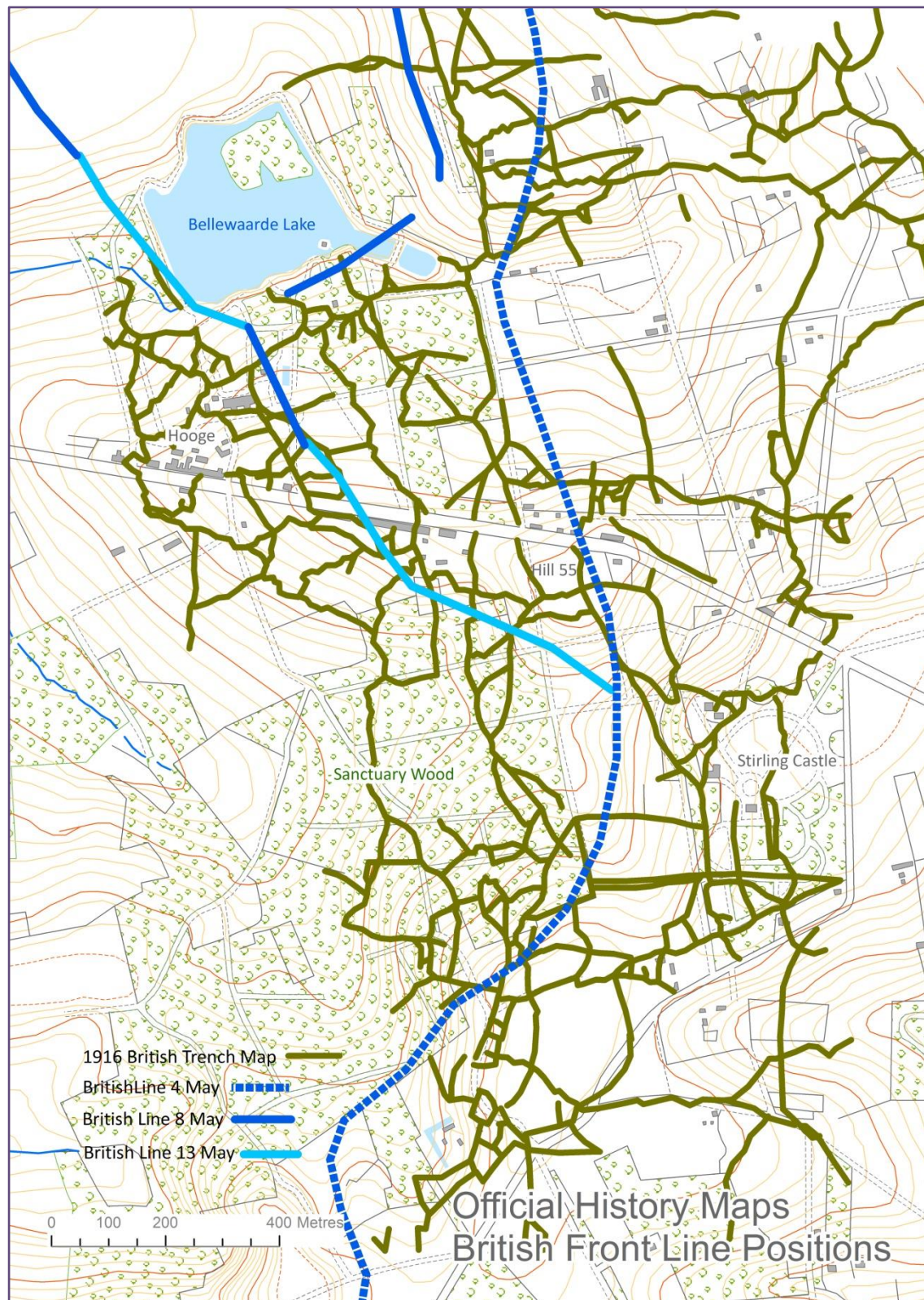


Figure (xv) British front line positions as indicated on the maps in the British official history.

Battle of Frezenberg Ridge. 1915

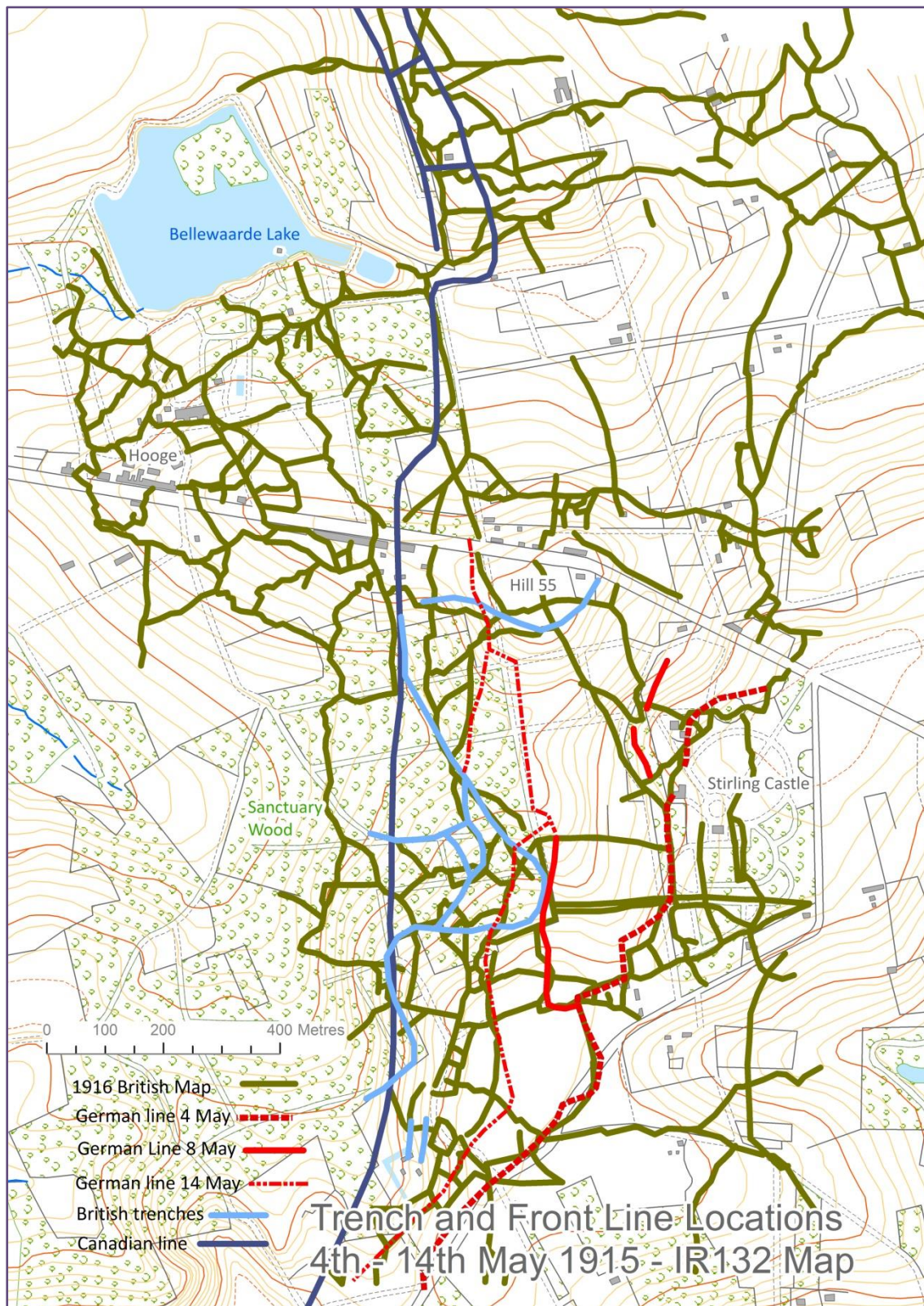


Figure (xvi) Trench and front line locations 4 -14 May as indicated on the German sketch map (Wegener, IR172, p.5)

CONCLUSION. Micro-tactical analysis and the use of GIS for battle analysis and battle presentation.

The key analysis has been the detailed investigation of tactical movement in a form of warfare renowned for its stagnation in terms of terrain and movement. It has been demonstrated that a reasonably forensic interrogation of the sources coupled with the use of certain cartographic tools can provide a clarity which might not be possible from textual description alone. In terms of geographical information systems, the primary benefit in battle analysis is the rigour it forces on the historian to examine his sources in spatial terms. Battle is not a neat linear narrative. A great many things happen simultaneously and this simultaneity is poorly represented in a sequential narrative. The mapping of source information exposes discrepancies in the sources. For instance, lack of continuity in deployments. IR132's advance to contact shows the companies and battalions of that unit to be in positions which do not match the locations from which they are subsequently described as carrying out an assault. During IR132's assault on 8 May a company is described as 'dropping back' and gaps opening in the line, for which no apparent reason can be found in terms of enemy action, location, or terrain.

The habit of military staff, of describing height features by their enclosing contour, i.e. 'hill 50', is ambiguous, particularly in Flanders, where the flat landscape may throw up many features in relatively close proximity with the same contour value. In the same section of narrative, reference to a 'hollow' is also ambiguous. A clear hollow with a dotted 41 metre form line is shown on the IGN and subsequent British trench map and it is reasonable to suppose that this is the feature referred to, but there can be no certainty.

These anomalies do not spring from the German use of different mapping to the British. The contouring and detail on the German sketch map in figure (iv) indicates clearly that the same Belgian base mapping was used by both sides. The modern practice of using grid coordinates, although practiced at this time by the British does not seem to have been a feature of German practice, although without the existence of the German war diaries and other contemporary documentation it is impossible to be dogmatic.

Again, it must be stressed, the key advantage of GIS to battle analysis is the clarity of mind it brings to the historian. Matters of space, time and location, which could seem plausible when reading written accounts, may fall apart when plotted on a map. In addition, the act of plotting battlefield movements assists greatly in making the historian master of his material. When individual tactical units have been symbolised and drawn on a map, the reality of men, weapons and topography become much more firmly comprehended. In a very specific way the process of mapping identifies lacunae in the sources which might otherwise be glossed over. The historian is forced to address these omissions, either by carrying out further research to locate sources that might bridge these gaps, or by explicitly admitting their existence and restricting his conclusions to fit the available information rather than indulging in, perhaps unwitting, leaps of supposition.

In the context of the case study one further matter needs comment. Most of the damage to the British positions and most of the British casualties were caused by the massive German artillery bombardment, yet this matter plays little part in the analysis. The preparation of an artillery fire plan to support an assault is a complex matter requiring the compilation of

target lists, target overlays and schedules.⁸¹ Although the source cited is modern, the basics of artillery fire planning has changed relatively little since the First World War and the fire plan proformas and layouts would have been broadly similar. Access to the German artillery fire plans for the period of the case study would have been very useful in locating the targets of the artillery fire preceding the German assaults, but unfortunately no such documents are still extant.

To return to cartographic issues, the ease with which maps can be generated, using GIS, is also a major facilitating factor. Once a base map is in place, the overlay of tactical symbols can be quickly inserted, adjusted and moved against the map background without having to laboriously redraw maps. Most of the maps in the case study were generated and adapted with considerable ease and speed, to illustrate detailed aspects of the various narratives.

The issue of simultaneity and complexity is even more relevant when the other research issue of this paper is examined, i.e. the presentation of military history by the historian to the reading public. It must again be reiterated that battles do not occur in a neat sequential order of events. All of the various units and sub-units on both sides of a battle are in action at the same time, very often in overlapping and confused ways. To communicate the actions intelligibly to the readership is difficult using written narrative alone. Written narrative forces the historian to present his work in the same deconstructed and analytical form that he has developed to comprehend the action in the first instance. The problem is that while the historian has the diligence, patience and training to carry out these tasks and become master of their subject, the average reader has no such ability, or indeed inclination. GIS has considerable capabilities which allow the reintegration of the material into a coherent presentation of events.

Like many digital and internet processes digital map presentation has its critics. Noting again Van Creveld's criticism of Liddell-Hart; war and battle are not simply the movement of symbols on a map.⁸² It can be argued that a GIS approach to military history, particularly battle narratives, risks the trivialisation of war. The cold choreography of tactical symbols and the sound bite text style hides, sanitises and perhaps over-simplifies a more brutal and complex reality. S.L.A. Marshall in his seminal work on command in battle and the psychology and behaviour of soldiers under fire provides cogent evidence that battles and wars are not altogether won by generals, in relatively comfortable command posts, with their S2s and S3s marking situation maps and their executive officers issuing orders.⁸³ The critical and deciding factor may be dependent on the reactions of a very frightened and exhausted man in a rifle pit.

There is little that can be done regarding these failings. They are intrinsic to each medium. However, despite these disadvantages, the reality is that the source material upon which history is based is both opaque, indigestible and often inaccessible to a general readership. The historian stands as the mediator between these sources and a reading public who want to know about, and understand, the past. In carrying out this act of mediation they rely on their expertise, knowledge and judgement as a historian and the tools available to them.

⁸¹ 'Chapter 5 - the fire plan' in NATO AArty P-1(B) artillery procedures (April 2009) (http://zumorc.de/focourse/AArtyP-1_B.pdf)

⁸² Martin van Creveld, *The art of war, war and military thought* (London, 2000), p.178.

⁸³ S.L.A. Marshall, *Men against fire, the problem of battle command* (Oklahoma, 2000)

The shortcomings which apply to GIS as an analytical and presentational tool does not, of course, invalidate its usefulness as a part in the jigsaw of presenting military history, but rather indicates that it should be supplemented by other approaches, or perhaps be itself a supplement to other methods. Personal memories of ordinary soldiers, such as are presented in Lynn Macdonald's classic,⁸⁴ memoirs of fighting soldiers such as that of Ernst Jünger's,⁸⁵ the bombast of generals as in French's 1914⁸⁶, set battle pieces such as John Dixon's treatment of the battle used in this case study,⁸⁷ and indeed such things as documentary film, war poetry and war art, all play a valid part in presenting the story of war to the general public.

Each of these in their turn can be subjected to criticism because of what they lack as a result of their very nature. For instance the traditional battle set piece can impose impossible information overload on the reader. Antony Beevor's excellently researched and well written volume on the German Ardennes offensive of 1944 is a case in point.⁸⁸ The book totals 369 pages. In a single 21 page chapter (chapter 9 – Sunday 17th December) 46 different military commanders are mentioned, 67 different military units, 61 separate towns, villages, rivers and other places, and 56 different weapons systems or other technical military terms. All of the other chapter follow the same pattern and the orders of battle extend to 18 pages of closely spaced type. For a reader to follow this narrative intelligently, or even intelligibly, would require hours of detailed map study, in advance, to become familiar with the terrain, to memorise the order of battle, both unit designations and individual commanders and to become thoroughly familiar with the weapons systems in use and their capabilities. None but the specialist is likely to make such an investment. Similarly, video documentaries are seriously curtailed by the time slot assigned by TV programmers, normally an hour, and are seriously biased by having to concentrate on events for which visually interesting video, photographic material, and appropriate interviewees, are available.

While suggesting a multi-faceted approach, as offering the best possibilities in our attempts to understand the wars and battles of the past, it is proposed that the new technology of geographical information systems is not the least useful of tools at the historian's disposal. It is unparalleled in its analytical and integrational ability and its presentational power, and should take its place as a key component of the military historian's arsenal. It is hoped that in this case-study something worthwhile has been added to our knowledge of the events of early May 1915 to the east of the Flemish town of Ieper.

⁸⁴ Lynn Macdonald, *Somme* (London, 1993)

⁸⁵ Ernst Jünger, *Storm of Steel*, translated by Michael Hoffmann (London, 2004)

⁸⁶ John French, Field Marshal Viscount French of Ypres, K.P. O.M. etc. 1914 (London, 1919)

⁸⁷ John Dixon, *Magnificent but not war* (South Yorkshire, 2003)

⁸⁸ Antony Beevor, *Ardennes 1944, Hitler's last gamble* (London, 2015)

APPENDIX 1. British and German orders of battle

British order of battle

V Corps Gen. Sir Herbert Charles Onslow Plumer

27 Infantry Division Maj. Gen. Sir Thomas D'Oyley Snow

81 Brigade

1/Royal Scots

9/Royal Scots

1/Argyll and Sutherland Highlanders

2/Cameron Highlanders

2/Gloucestershire Regiment

82 Brigade

2/Royal Irish Fusiliers

1/Royal Irish Rifles

1/Cambridgeshire Regiment

1/ Leinster Regiment

2/ Duke of Cornwall's Light infantry.⁸⁹

German order of battle

XV Corps General der Infanterie Berthold Karl Adolf Von Deimling

39 Division Generalleutnant Herman Karl Joseph Ludwig von Bertrab

61 Infanterie Brigade

Infanterie Regiment 126

Infanterie Regiment 132

82 Infanterie Brigade

Infanterie Regiment 171

Infanterie Regiment 172⁹⁰

⁸⁹ A. F. Becke, *Order of battle of divisions, The regular British divisions* (2 vols. London, 2007) i.

⁹⁰ Hermann Cron, *Imperial German army 1914-18, organisation, structure, orders of battle* (Helion, 2013)

APPENDIX 2. Geographical Information Systems and their military application

Geographical Information Systems have been in existence since the last quarter of the 20th Century.⁹¹ GIS can be defined as ‘an organised collection of computer hardware, software, geographic data, and personnel, designed to efficiently capture, store, update, manipulate, analyse, and display all forms of geographically referenced data’⁹². This is normally considered to involve a spatially referenced computer database and appropriate applications software.

Given that geography, in the form of terrain, space and time, is an integral part of military operations, it was inevitable that the military would take a lively interest in GIS and would develop it to meet their needs⁹³. In the military sphere GIS functionality can be categorised under the following headings⁹⁴:

Base-plant

- Digital Geographical Information (DGI) management
- DGI production
- Mapping production
- Map catalogue production
- The management of geographical requirements
- Map stock control

Barrack

- Range management
- Range control systems
- Natural resource management
- Facilities management
- Environmental management
- Hydrology
- Barrack reorganisation and closure
- Emergency response
- Wildlife management
- Airfield damage repair

Battlefield

- Situation mapping
- Terrain analysis
- Air space management
- Track management
- Command, control, and communications Simulation
- Map distribution and supply

⁹¹ P. A. Burrough, *Principles of geographical information systems for land resources assessment, monograph on soil and resources survey No. 12* (Oxford University Press 1986)

⁹² ESRI, *Understanding GIS, The ArcInfo method* (ESRI, CA, 1990)

⁹³ Dornier military systems, Geogrid, Geographisches Informations-Darstellungsgerät – geographical information display (Friedrichshaven, 1990)

⁹⁴ D. Swann, ‘Military applications of GIS’ in *Geographic Information Systems*, Paul A. Longley, Michael F. Goodchild, David J. Maguire and David W. Rhind (eds), (2 vols, Wiley VCH, 2005) ii, p. 890.

Terrain visualisation
The production of military situation overlays
Targeting
Maintaining battle records and war gaming.'

In a slightly more technical way GIS systems in military use can be classified according to the following list⁹⁵:

'Command, control, communication, information operations and intelligence systems
Unit/troop tracking systems (GPS)
Intelligence and operations systems
Logistic information systems
Electronic warfare systems
Radar coverage and frequency analyses systems
Common operational picture (COP), land/maritime/air recognized picture
3D terrain modelling, drape and fly through systems
Military map browsing systems'

Examining these two lists the following applications stand out as having particular relevance to the research, analysis and presentation of military history. From list 1 – Situation mapping, terrain visualisation, the production of military situation overlays, maintaining battle records and war gaming. From list 2 – intelligence and operations systems, 3D terrain modelling, drape and fly through systems and military map browsing systems.

One major GIS software company has specialised in the production of suites of applications aimed specifically at the military. ESRI Inc. has produced and marketed Military Analyst as an add-on module to their ArcGIS mainstream software package. An additional add-on, known as MOLE (Military Overlay Editor) facilitates the manipulation of standard military symbology for map overlays to MIL-STD-2525B and the North Atlantic Treaty Organisation (NATO) APP6a specifications⁹⁶

In the context of military history, such industry standard applications have disadvantages. Firstly they are tailored to operational military use, where the context is more environmentally demanding and the software is also expensive.

Referring again to the list of potential GIS uses in military history, only one type of application has been exploited to any extent so far, namely terrain visualisation, comprising 3D terrain modelling, raster draping, fly-throughs and view shed analysis. Pioneering work has been carried out in this area on the Gettysburg, American Civil War battlefield.⁹⁷

⁹⁵ L. Ucuzal, A.Kopar 'GIS (geographic information systems) in CCIS (command & control systems)' (<http://www.isprs.org/proceedings/XXXV/congress/comm2/papers/206.pdf>) (29 Sept 2015)

⁹⁶ 'ArcView military analyst' and 'military overlay editor (MOLE)' in *ArcView for defence - industry solutions* (<http://commerce.esriuk.com/software/arcgis/defence-solutions/military-overlay-editor-mole>) (30 Sept 2015)

⁹⁷ Anne Kelly Knowles, 'What could Lee see at Gettysburg' in *Placing History. How maps, spatial data, and GIS are changing historical scholarship*, Anne Knowles (ed.), (ESRI Press, CA, 2008)

APPENDIX 3. GERMAN AND BRITISH CASUALTIES

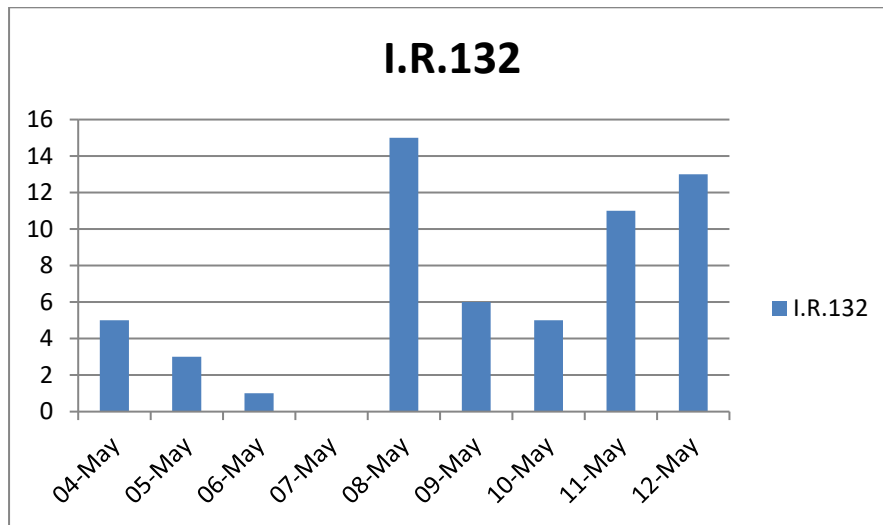


Figure (xvii) German deaths (burials) during the period of the battle IR132

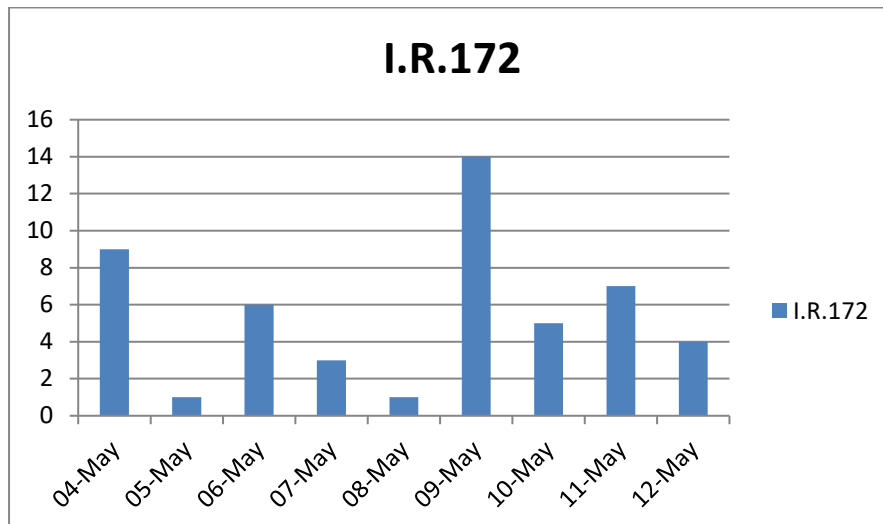


Figure (xviii) German deaths (burials) during the period of the battle IR172

Source for both Figures (xvii) and (xviii): Volksbund Deutsche Kriegsgräberfürsorge database.

Note the discrepancies between the VDK record of burials and the casualty returns given for the same units in their regimental histories over the same period.

Battle of Frezenberg Ridge. 1915

IR132

	Officers	NCOs & Other ranks	Total
Dead	12	207	219
Wounded	18	574	592
Missing		40	40
Total	30	821	851

IR172

	Officers	NCOs & Other ranks	Total
Dead	5	126	131
Wounded	7	344	351
Missing		5	5
Total	12	475	487

1/Leinster

	Officers	NCOs & Other ranks	Total
Dead	2	21	23
Wounded	4	138	142
Missing	0	55	55
Total	6	214	220

2/Glouc.

	Officers	NCOs & Other ranks	Total
Dead	4	96	100
Wounded	4	253	157
Missing	0	0	0
Total	8	349	357

1/R. Scots

	Officers	NCOs & Other ranks	Total
Dead	5	332 (dead & wounded)	341
Wounded	4		
Missing	0	0	0
Total	9	332	341

9/R.Scots

	Officers	NCOs & Other ranks	Total
Dead& wounded	2	93	95
Total	2	93	95

1/A&SH

	Officers	NCOs & Other ranks	Total
Dead	3	132	135
Wounded	7	339	346
Missing	0	0	0
Total	10	471	481

Figure (XiX) Tables of casualties over the period from British regimental records.

Sources: respective battalion war diaries and regimental histories.

APPENDIX 4. The case study maps

Existing maps rarely provide a suitable base map for the analysis and presentation of military history, particularly the analysis and presentation of battlefield manoeuvre. The problem is fourfold:

The amount of topographic detail and annotation, contained in an existing map, that is extraneous to the analysis in hand, clutters the map and degrades the readability of the important overlay material which is the subject of study.

The inability to adjust scale and generalisation to suit the degree of detailed representation required for a case study forces the use of inappropriately scaled and generalised mapping which impedes comprehensive understanding.⁹⁸

The narrow window of scale legibility intrinsic to raster maps contribute to the previous issue. If raster maps are enlarged or reduced outside these limits, degradation of image through pixelisation or fallout occurs.

The impossibility of including sufficient textual data on the map to explain the tactical situation fully without rendering the map illegible by a visually excessive amount of captioning, is a serious problem.

GIS offers a solution to these problems by facilitating the compilation of necessary detail from a variety of geo-referenced map sources while controlling the cartographic representation and symbolisation of these features to provide a suitable background (or backgrounds) for military analysis. It also allows attribute data to be attached to map symbols, which can be displayed or dismissed simply by clicking on the symbol.

For the case study in hand the following data layers are required:

1. **General topography:** field boundaries, buildings, forestry, roads, pathways, tracks and ride lines.
2. **Relief:** contouring to the finest resolution available, spot heights.
3. **Drainage:** Rivers, streams, rills, drainage channels, ponds and lakes.⁹⁹

General topography and drainage was derived from Zillebeke 1:10,000 trench map of 1916.

Contouring, at 5m intervals, was derived from the same map. Contours at 1m intervals were taken from the Hooze map of 1915. It should be noted that these contours are almost certainly interpolations and not surveyed contours, as IGN mapping does not show contouring to this resolution and it would be impossible to survey contouring to this resolution under war conditions. The line work for this map was digitised on screen using ArcEditor 9.3 software. The resultant vector map, unlike the raster base mapping from which it is derived, can be displayed at a wide range of scales without degradation of the image, though care must be exercised to respect the precision standard inherent in the underlying raster mapping. As a general rule a scale of 1:7,500 has been chosen as a

⁹⁸ Arthur H. Robinson et al, *Elements of cartography* (5th Ed., New York, 1984)

⁹⁹ Louis C. Peltier and G. Etzel Pearcy, *Military geography* (New Jersey, 1966), p. 28

Battle of Frezenberg Ridge. 1915

suitable compromise for most of the tactical mapping, but with scales of 1:5,000 and 1:2,500 being used in certain instances where increased resolution was required.