

# Gabriel's Map

## *Cartography and corpography in modern war*



# **Gabriel's Map**

## ***Cartography and corpography in modern war***





# WILLIAM BOYD

AN ICE-CREAM WAR



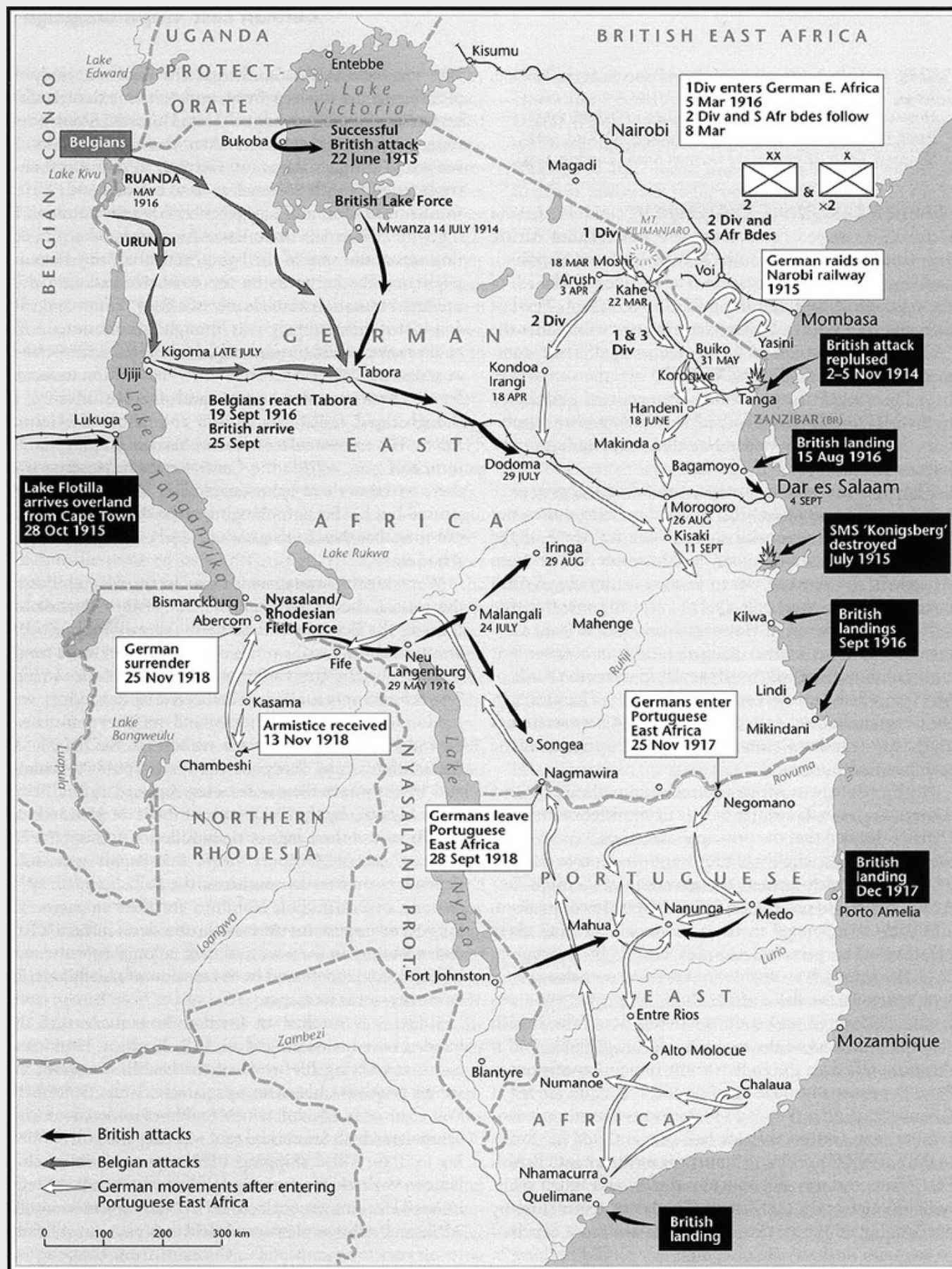
***‘Gabriel thought maps  
should be banned. They  
gave the world an order  
and reasonableness it  
didn’t possess.’***



**I: ‘I would rather be in France ...’**







## Tanga 2 November 1914

‘Gabriel ... pushed his way through the press of soldiers to the stern of the lighter, where Major Santoras and six of the other officers were gathering, all peering at copies of the map by the light of torches...

“What’s this mark?” someone asked. “It’s a railway cutting,” Major Santoras replied. “Between the landing beaches and the town.” He went on less confidently: “There’ll be bridges over it, I think... Should be, anyway.”

“Anyone know what the country’s like beyond the beach?”

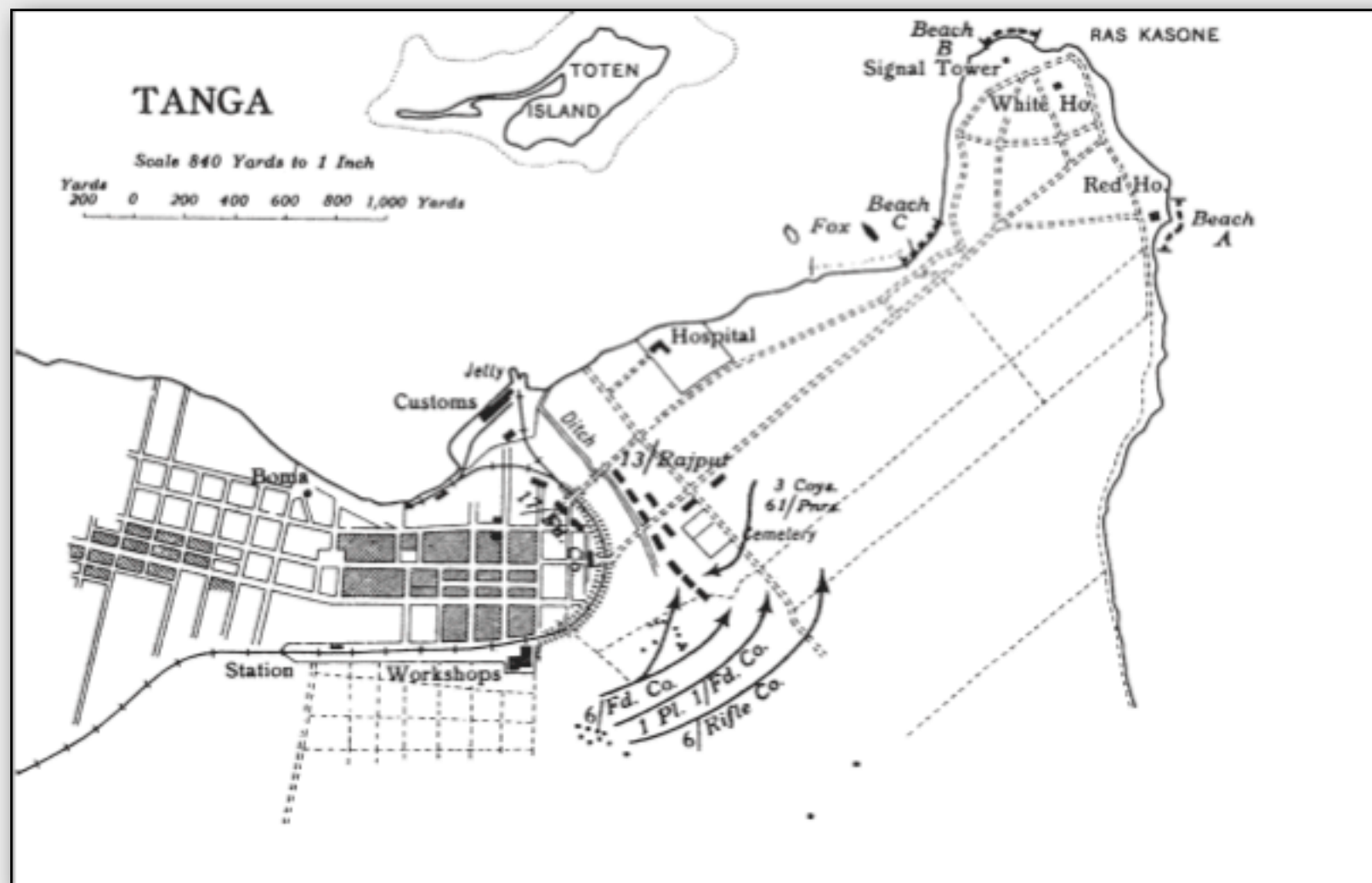
“Someone’s put ‘rubber’ down here. I assume that means rubber plantations.”



## ***Tanga 3 November 1914***

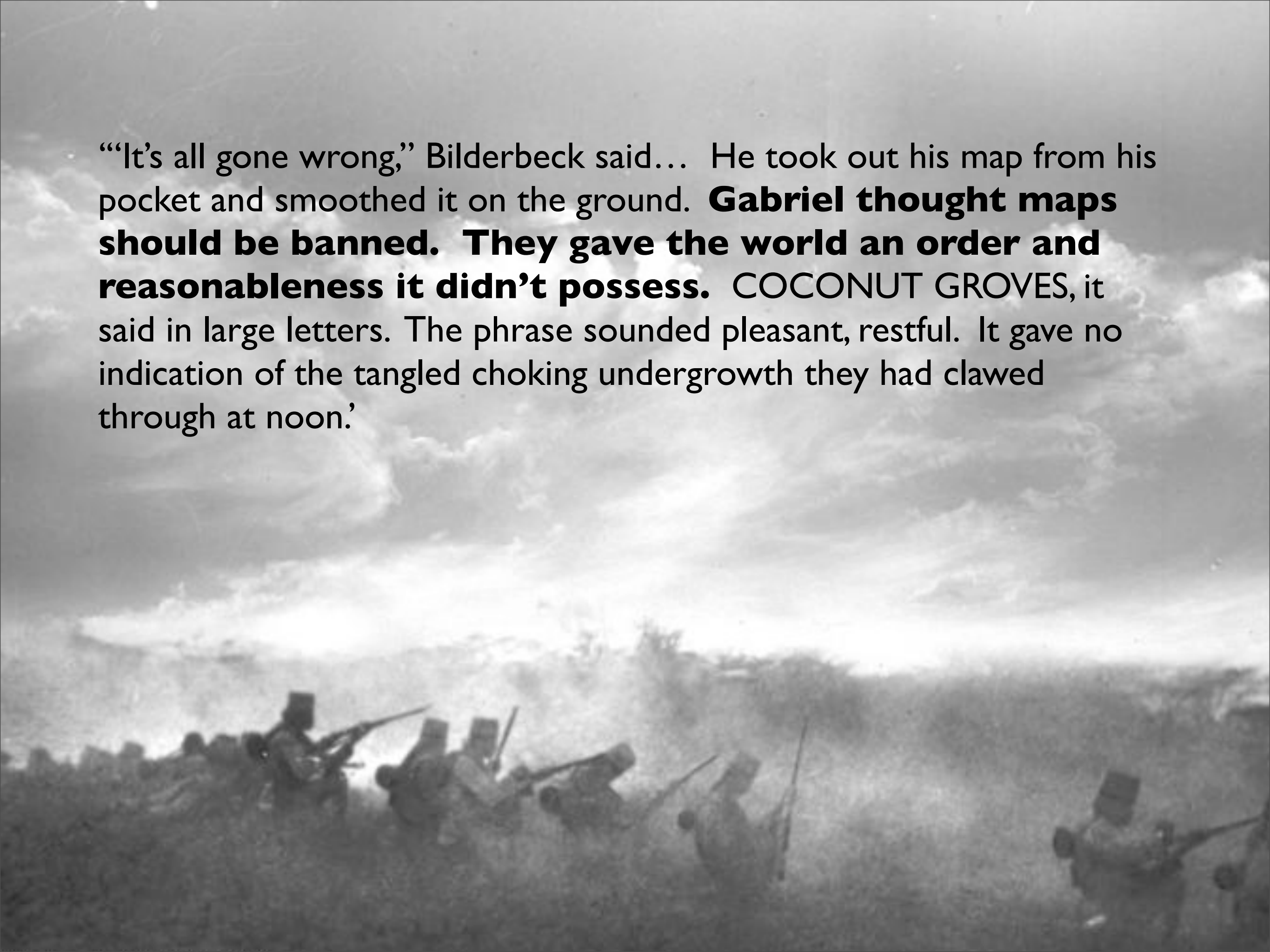
**‘Gabriel tried to visualise the advance as if from a bird’s-eye view – three thousand men moving on Tanga – but found it impossible.** By now he was dripping with sweat. His leggings and trousers were thick with dust and torn from the many thorn-bearing plants he’d had to push his way through.’

‘He wondered if they’d wandered off course in the coconut plantation. But what lay beyond the maize field? **Gabriel waved his men down into a crouch and got out his map. It made no sense at all....**

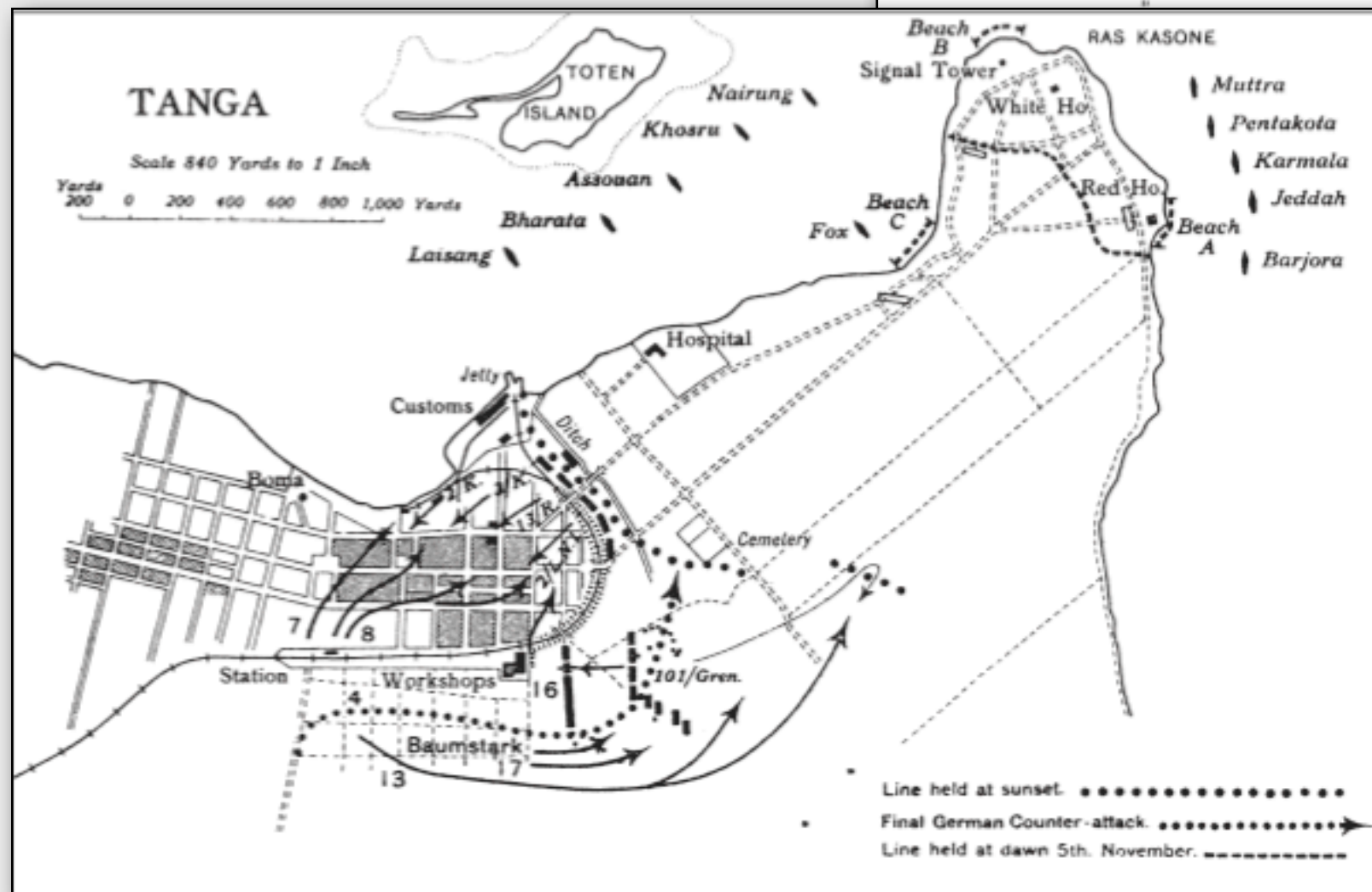
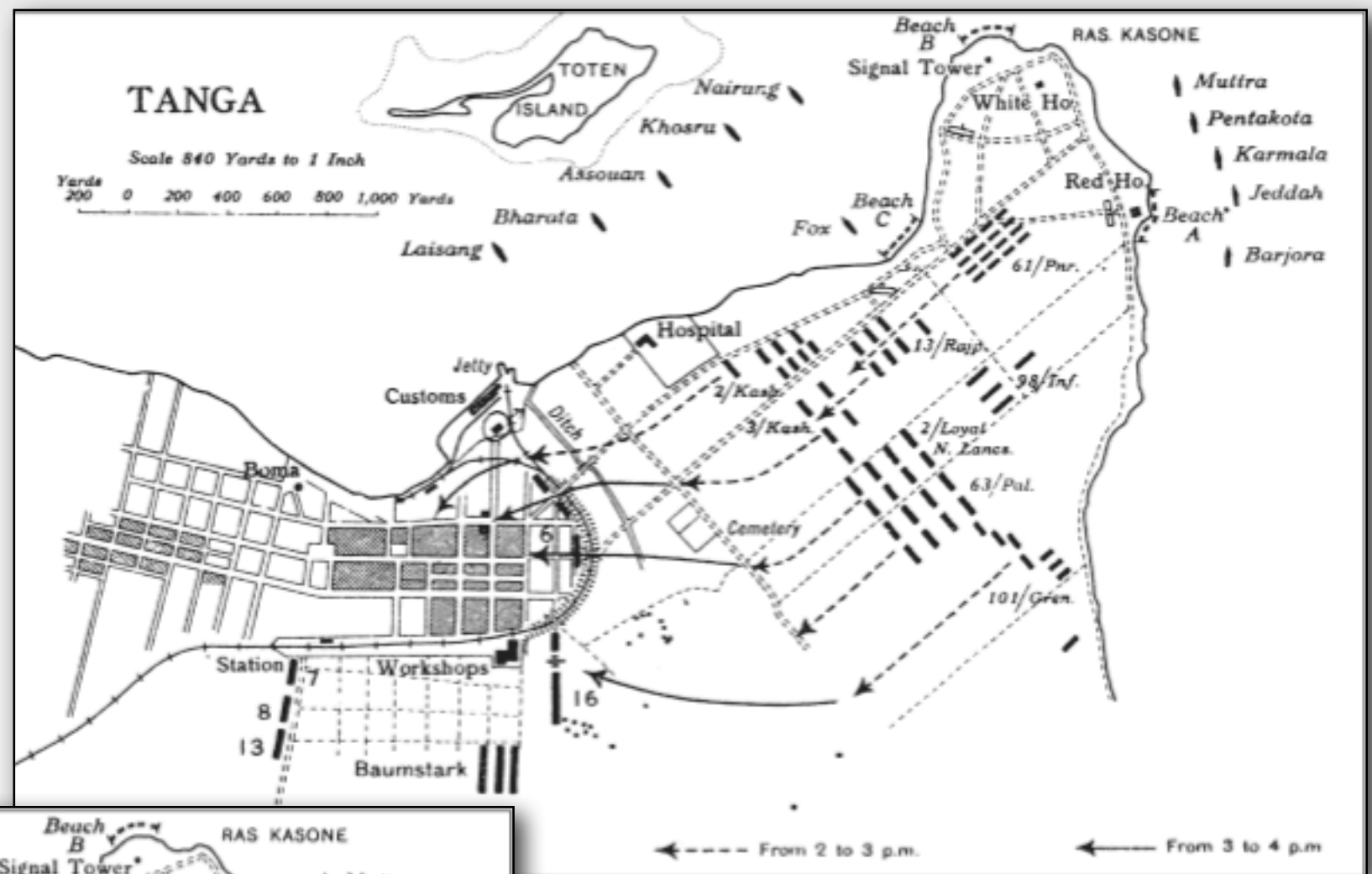




“It’s all gone wrong,” Bilderbeck said... He took out his map from his pocket and smoothed it on the ground. **Gabriel thought maps should be banned. They gave the world an order and reasonableness it didn’t possess.** COCONUT GROVES, it said in large letters. The phrase sounded pleasant, restful. It gave no indication of the tangled choking undergrowth they had clawed through at noon.’







Ross Anderson, 'The Battle of  
Tanga, 2-5 November 1914',  
*War in History* 8 (3) (2001)  
294-332



# A campaign of extraordinary brutality

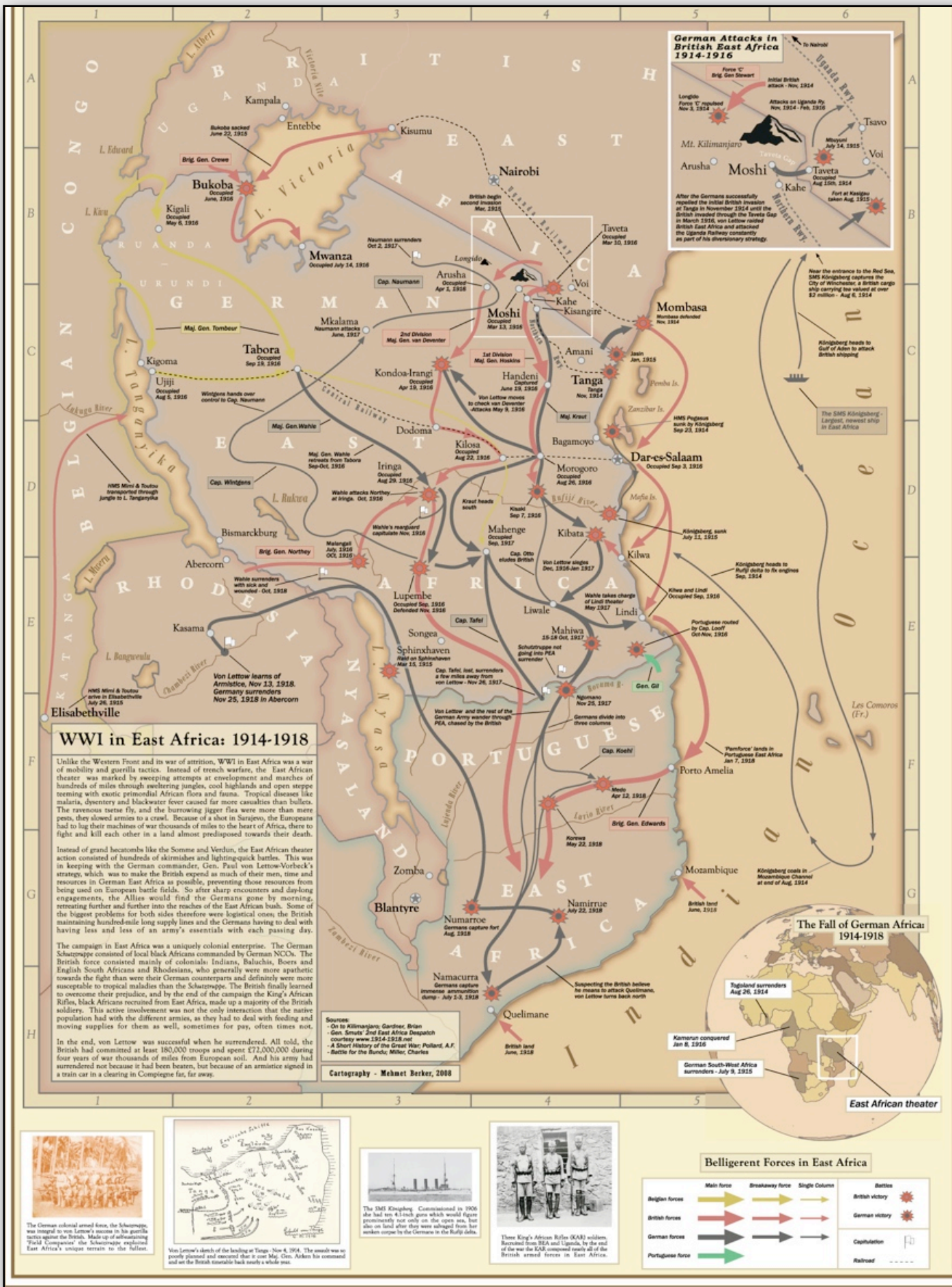
“The death toll among African soldiers and military carriers recruited from British East Africa alone exceeded 45,000 - or one in eight of the country’s adult male population; and among all British imperial combatant and support units who took to the field in the East Africa theatre of war the official death toll exceeded 100,000 men. This equated to the number of British soldiers killed in the carnage on the Somme between July and November 1916, or to America’s total war dead in the Great War; and the true figure may have been as much as double the official tally. Such was the astonishing cost in human life of a campaign which one official historian described as ‘a war of ... extermination which [was] without parallel in modern times’.”

**Edward Paice**



**“In 1914 Lieutenant Lewis had witnessed the slaughter of every single man in his half-battalion on the Western Front and had experienced all the horrors of trench warfare. Yet sixteen months later, in a letter sent to his mother from the East African ‘front’, Lewis wrote ‘I would rather be in France than here’.”**





The war in East Africa lasted two weeks longer than the war in Europe: the *Schutztruppe* surrendered on 25 November 1918.

Unlike the war in Europe, this was primarily a war of **movement and manoeuvre**.

Unlike the war in Europe, this was a war fought with the **most meagre of military intelligence**.

‘British and German memoirs describe the appalling lack of maps and the general inability of the commanders to visualize the terrain. Maps that did exist were generally inaccurate and outdated, and at too small a scale to be effectively useful for planning tactical operations. As Lettow-Vorbeck noted in his memoirs of the campaign, **“It is of course always difficult to make plans for an action in country so totally unknown to one without the aid of a map”.**’

**Andrew Lohman**



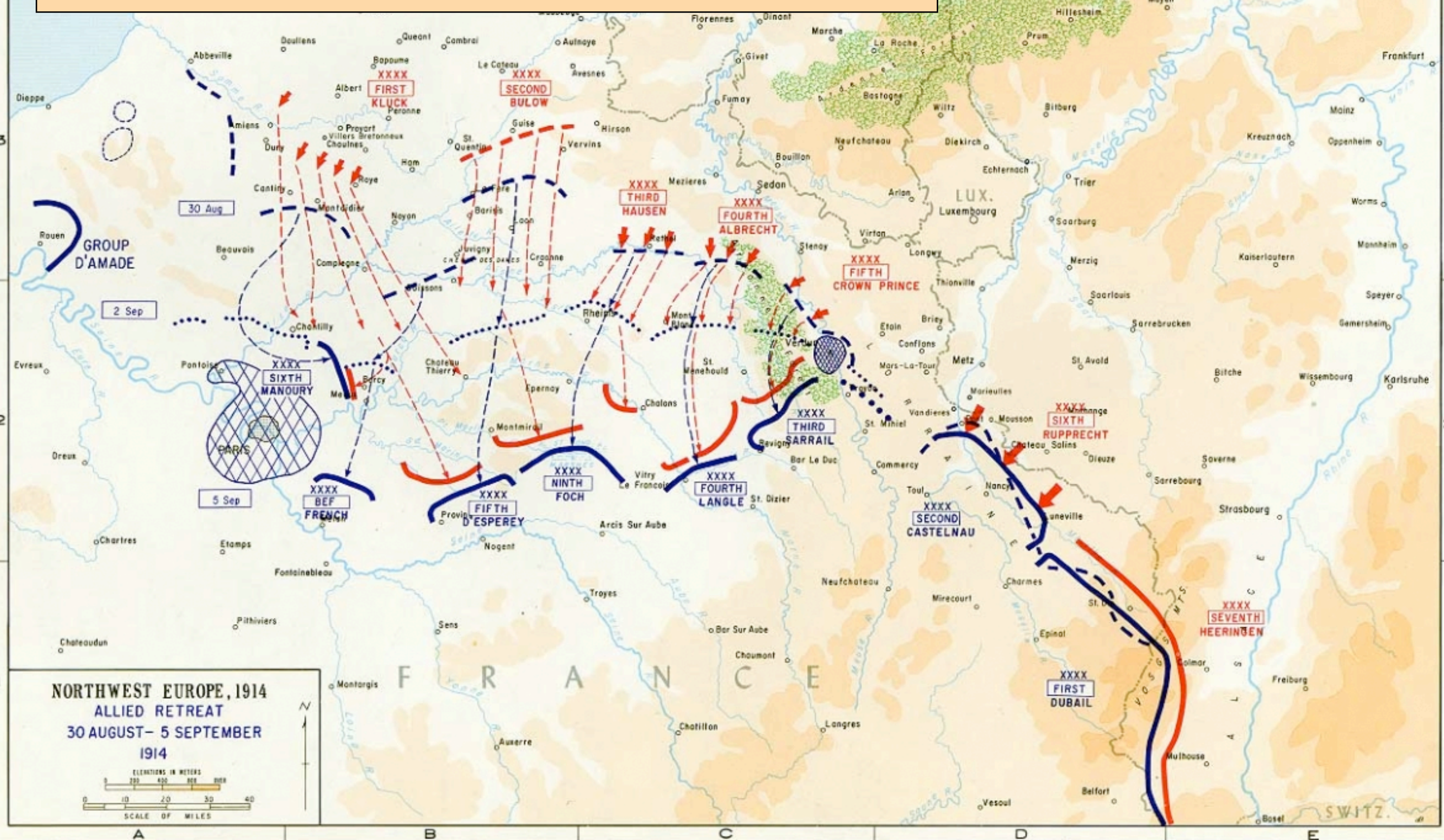
## 2: The optical war and cartographic vision



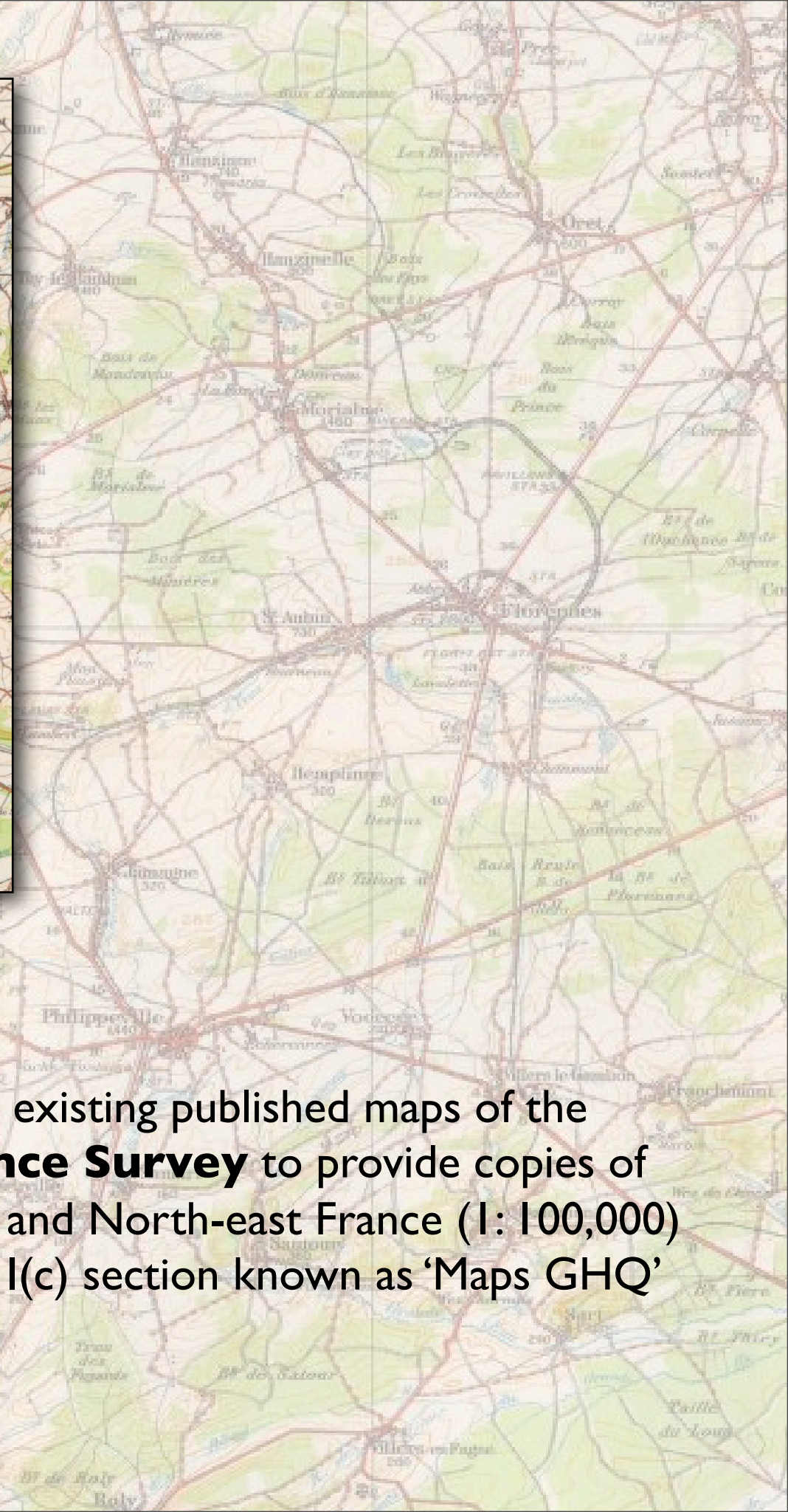
*‘World War I was ... the most optical war yet’: Paul Saint-Amour*



The first phase of the war on the Western Front (August-September 1914) seemed to herald a war of movement too

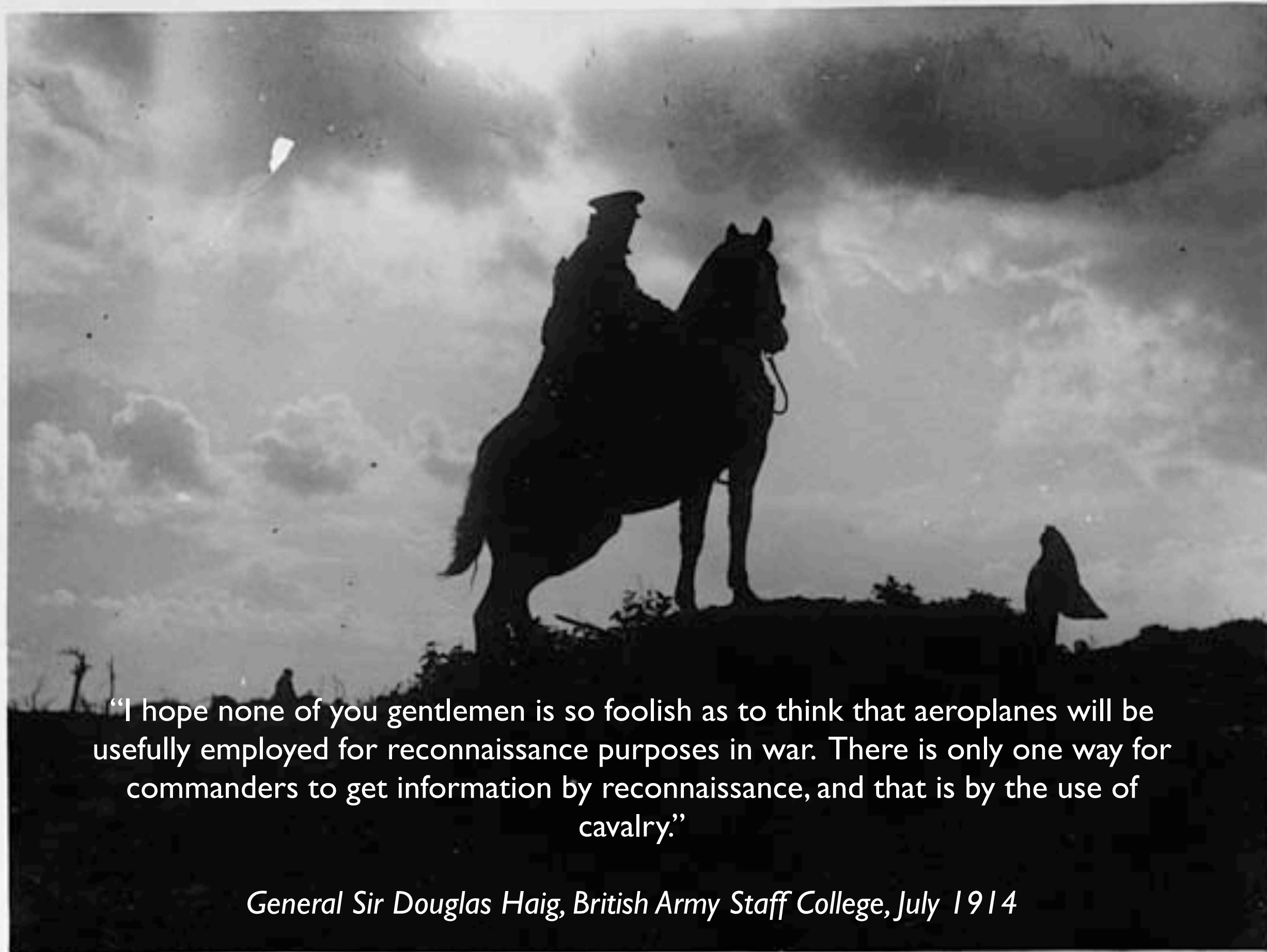






In August 1914 the War Office in London had decided that existing published maps of the combat zone would be sufficient and ordered the **Ordnance Survey** to provide copies of two **medium-scale** topographic series maps of Belgium and North-east France (1:100,000) and France (1:80,000) to the British Expeditionary Force's I(c) section known as 'Maps GHQ'





“I hope none of you gentlemen is so foolish as to think that aeroplanes will be usefully employed for reconnaissance purposes in war. There is only one way for commanders to get information by reconnaissance, and that is by the use of cavalry.”

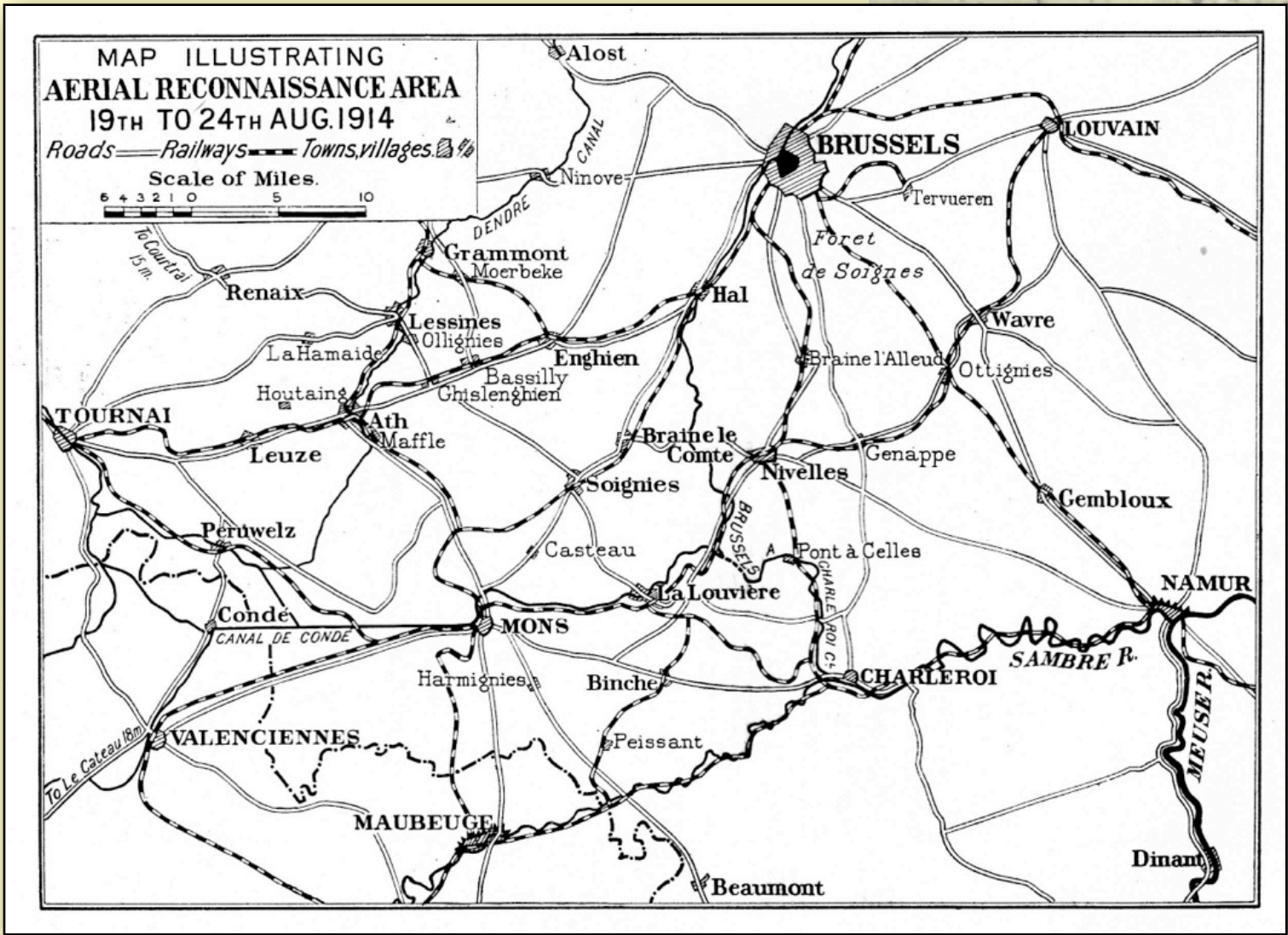
*General Sir Douglas Haig, British Army Staff College, July 1914*



The first aerial reconnaissance by the RFC was on **19 August 1914**. They flew without observers:  
*'The machines lost their way and lost each other.'*

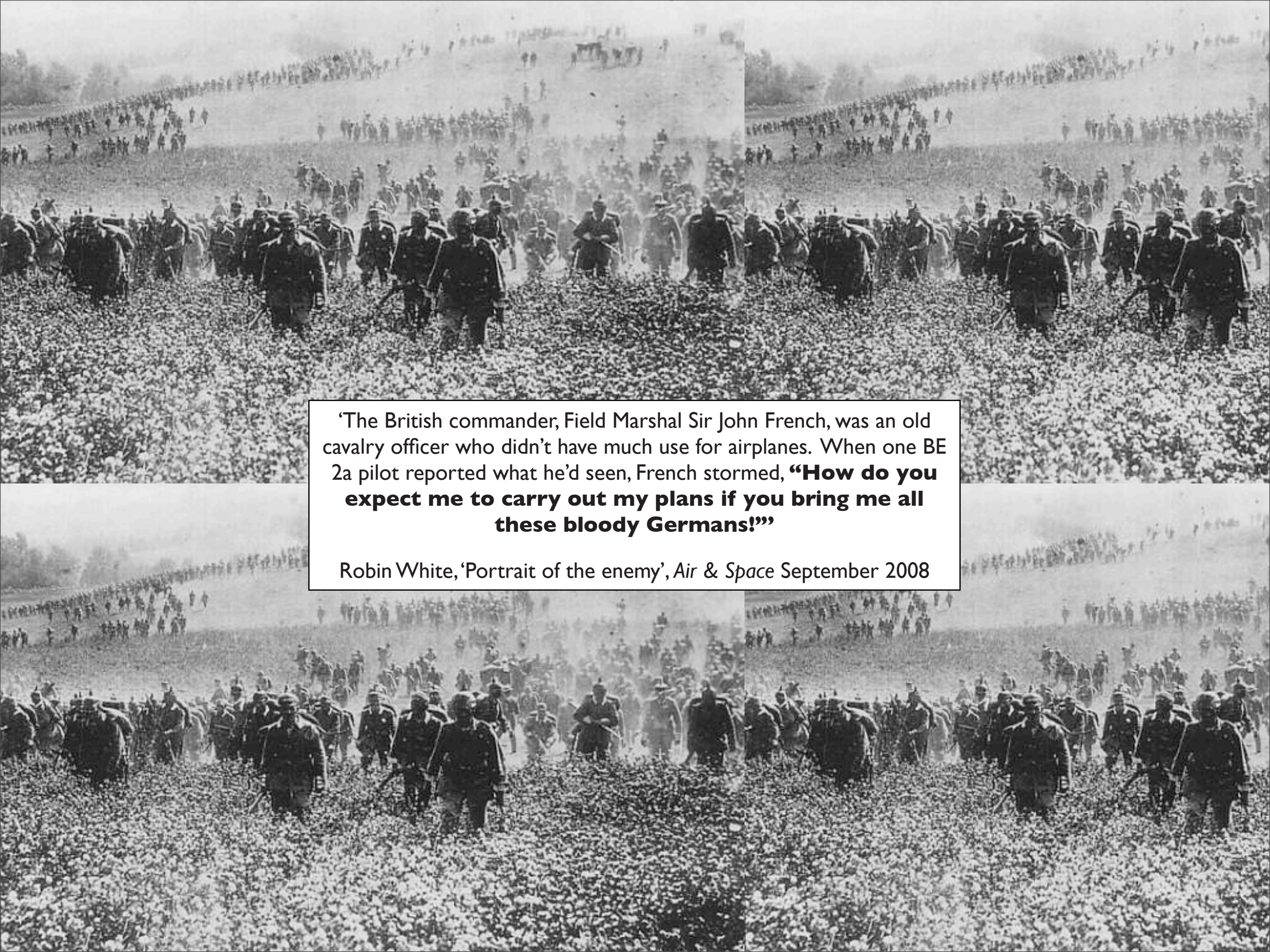
There were twelve reconnaissance flights on **22 August 1914**, which was the first day on which an aircraft 'failed to return from over enemy territory' (observer's report salvaged, right)

No. of Reconnaissance		Hour Started 10.16 am
Date August 22		Hour Ended
Aeroplane No.		Pilot 1 <sup>st</sup> C.M. Waterfall Observer 1 <sup>st</sup> G.H. Bayly
Time	Place	OBSERVATION
10.50	MONS - SOIGNIES road.	600 <sup>+</sup> baggage wagon on road moving from THILLYS direction N.E.
11.0	ENGHEN SOIGNIES	Can: for 200 <sup>+</sup> in file 4 coy: inf: in four apparently 6 four horse team 2 coy inf 4 four horse team Column turning to left to SILEY, with 4 coys march



**A report that same day provided the crucial intelligence that a German Army Corps was moving west on the Brussels-Ninove road in an enveloping movement.**





‘The British commander, Field Marshal Sir John French, was an old cavalry officer who didn’t have much use for airplanes. When one BE 2a pilot reported what he’d seen, French stormed, **“How do you expect me to carry out my plans if you bring me all these bloody Germans!”**’

Robin White, ‘Portrait of the enemy’, *Air & Space* September 2008



# Reconnaissance conceived as the primary function of military aircraft

## But the officers had no training in reconnaissance

‘At the time of the battles of Ypres, 1914, observers of No. 6 Squadron, which had prepared itself in hot haste for foreign service, mistook long patches of tar on macadamized roads for troops on the move, and the shadows cast by the gravestones in a churchyard for a military bivouac.’

Walter Raleigh, *The war in the air* (volume I)

## The first reports were in narrative-tabular form

‘The system adopted from the first was for the pilot or observer, or both, immediately on their return to bring their report to R.F.C. Headquarters, whence the Commander, or his staff officer, accompanied them to G.H.Q., where the map was filled in in accordance with the report. G.H.Q. could then ask questions and obtain any further information which the observer could give, while R.F.C. Headquarters could ascertain what further reports were most urgently required....

‘The maps thus compiled at G.H.Q. from air reconnaissance reports between August 31st and September 3rd were of vital interest, though it was sometimes very difficult to get the information put on the map for prompt consideration. For instance, at Dammartin on the evening of September 1st, when it was thought that German cavalry were within a few miles, G.H.Q. made a very hurried departure, and I was unable to find anyone to whom to give very important reports.’

Sir Frederick Hugh Sykes, *Aviation in peace and war*

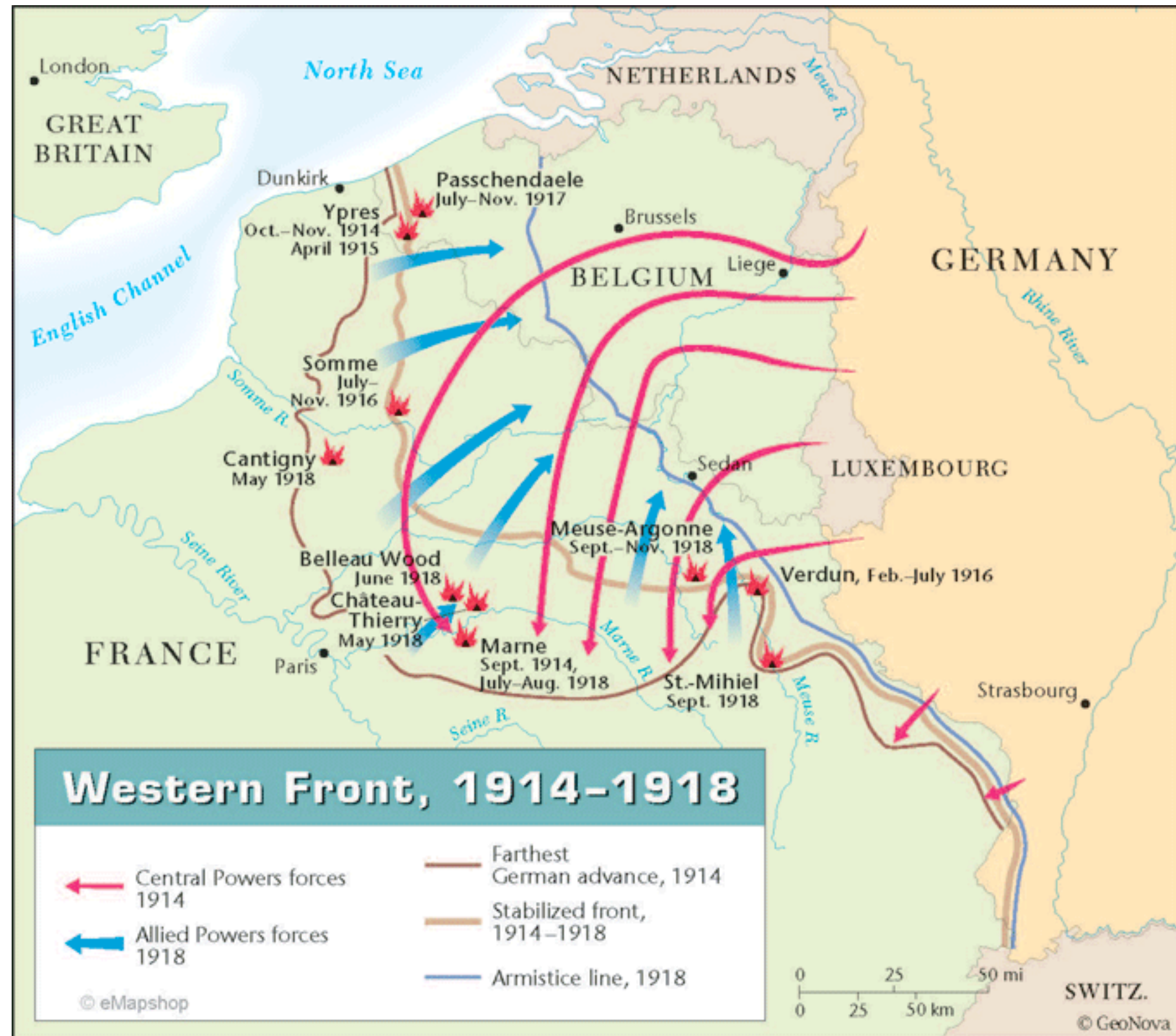
A RECONNAISSANCE			311
No. of Reconnaissance : 57. Hour Started : 11.10 a.m.			
Date : 26.8.1914. Hour Ended : 1.40 p.m.			
Aeroplane No. : 387. Pilot : Lieutenant G. F. Pretyman.			
			Observer : Major L. B. Boyd-Moss.
Time.	Place.	Observation.	
11.50	Honnechy.	Gun-fire and shells bursting all along the line from Honnechy towards Cambrai. Caudry partly in flames.	
11.52	Le Cateau.	Burning. Howitzers open fire on us. Artillery moving through village of Ors. Several motor-cars moving south through Croix.	
11.55	Forêt de Mormal.	Big column of troops moving along the road running along western edge of the forest. Head at Englefontaine—Rear at point where the branch road leads off to Gommegnies. Artillery moving through centre of forest towards Landrecies.	
12.0	Le Quesnoy.	Full of troops.	
12.5	Bavai.	Scattered parties of troops and wagons on all roads leading N. No big columns.	
12.15	Blaugies.	Blocked with transport. Dropped bomb into transport parked $\frac{1}{2}$ mile S. of village. Transport stretching along the road from Dour to Houdain (not closed up—big intervals).	
12.40	Wargnies.	Can make very little progress against wind.	
12.50	Saultain.	Transport from Saultain to Preseau moving south.	
12.59	Valenciennes.	All roads leading E.-N.E. and S.E. clear.	
1.5	Valenciennes.	No troops visible in town.	
1.6		Landing-cross and two aeroplanes close to Valenciennes—Cambrai road $1\frac{1}{2}$ miles from Valenciennes. Aircraft gun fires on us from landing-place. Mechanical transport	



# The stabilized front

After the battles in Flanders in October 1914 the front more or less stabilized, and the conflict turned into a **war of attrition** with the armies on the Western Front 'scratching behind the skirting boards of France and Belgium.'

**Large-scale maps** were required more or less immediately.







By September 1914 the Ordnance Survey had started to enlarge existing French maps to 1:20,000 for the artillery but the distortions and inaccuracies were too great and the OS moved to producing new maps.

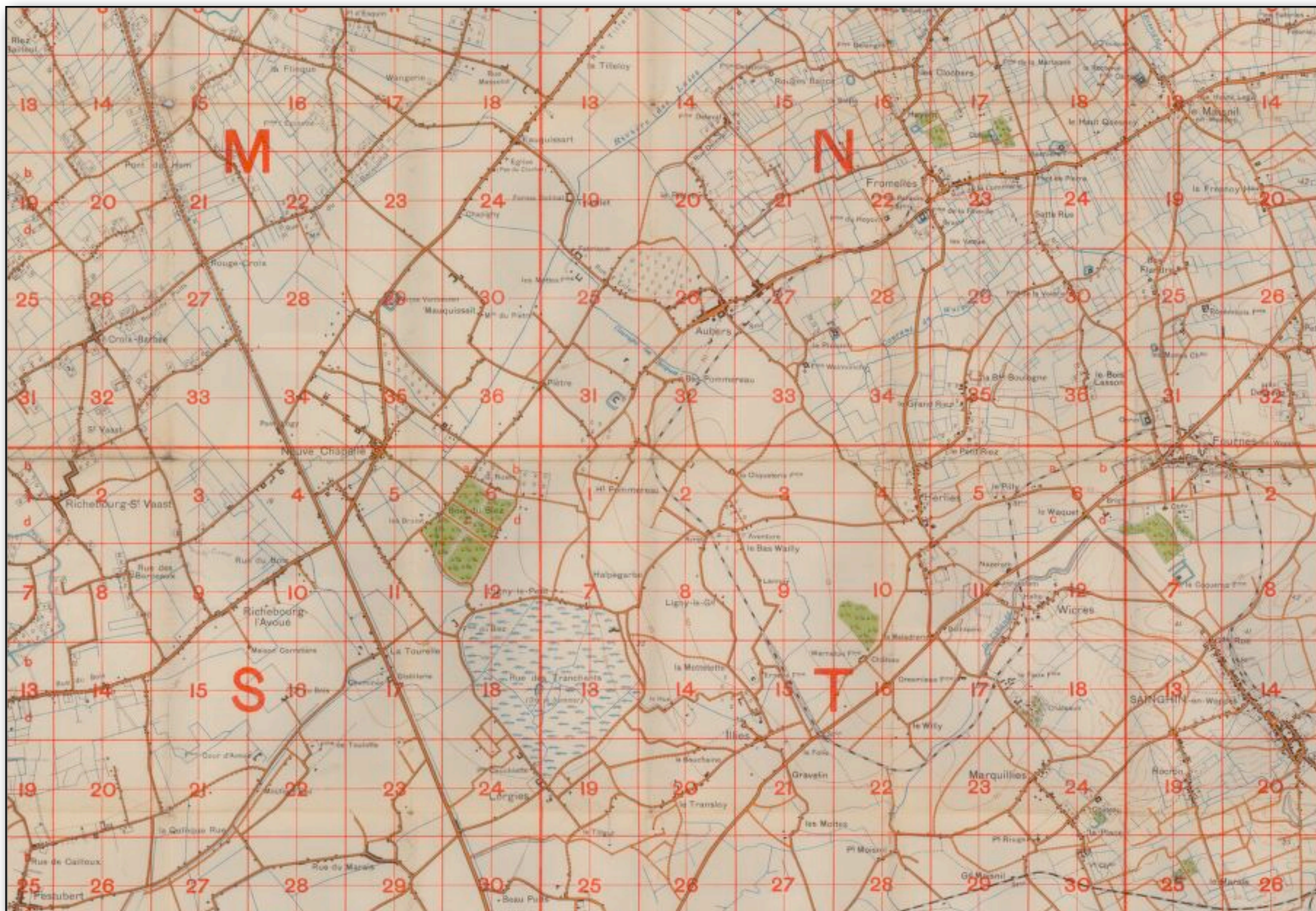
The **first trench maps** had been provided in great haste for the battle of the Aisne in the middle of September at a scale of **1:50,000**, but it was now clear to all the belligerents that they would need accurate, large-scale base maps, regularly updated and overprinted with the latest tactical intelligence.

*Ordnance Survey workers boxing up maps to be sent to the Front*

The Royal Engineers started **large-scale mapping (1:20,000)** on **25 January 1915**, and within a month the field sheets had been delivered to the Ordnance Survey for reproduction. The maps so improved the accuracy of the British artillery that the demand increased for even more detailed maps of the German front lines.



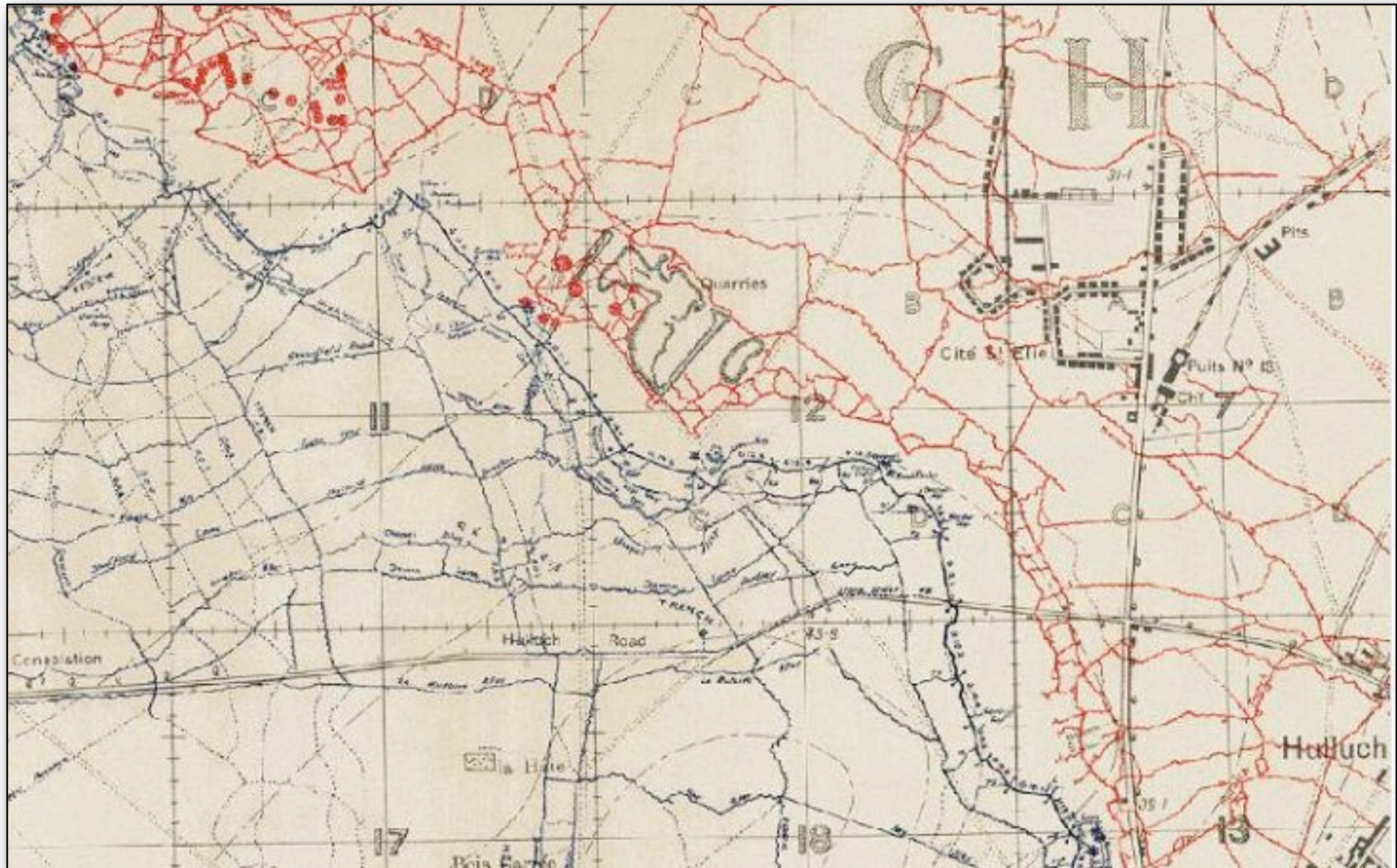




**Ordnance Survey B Series map (1915), 1: 20,000 (Neuve Chapelle)**

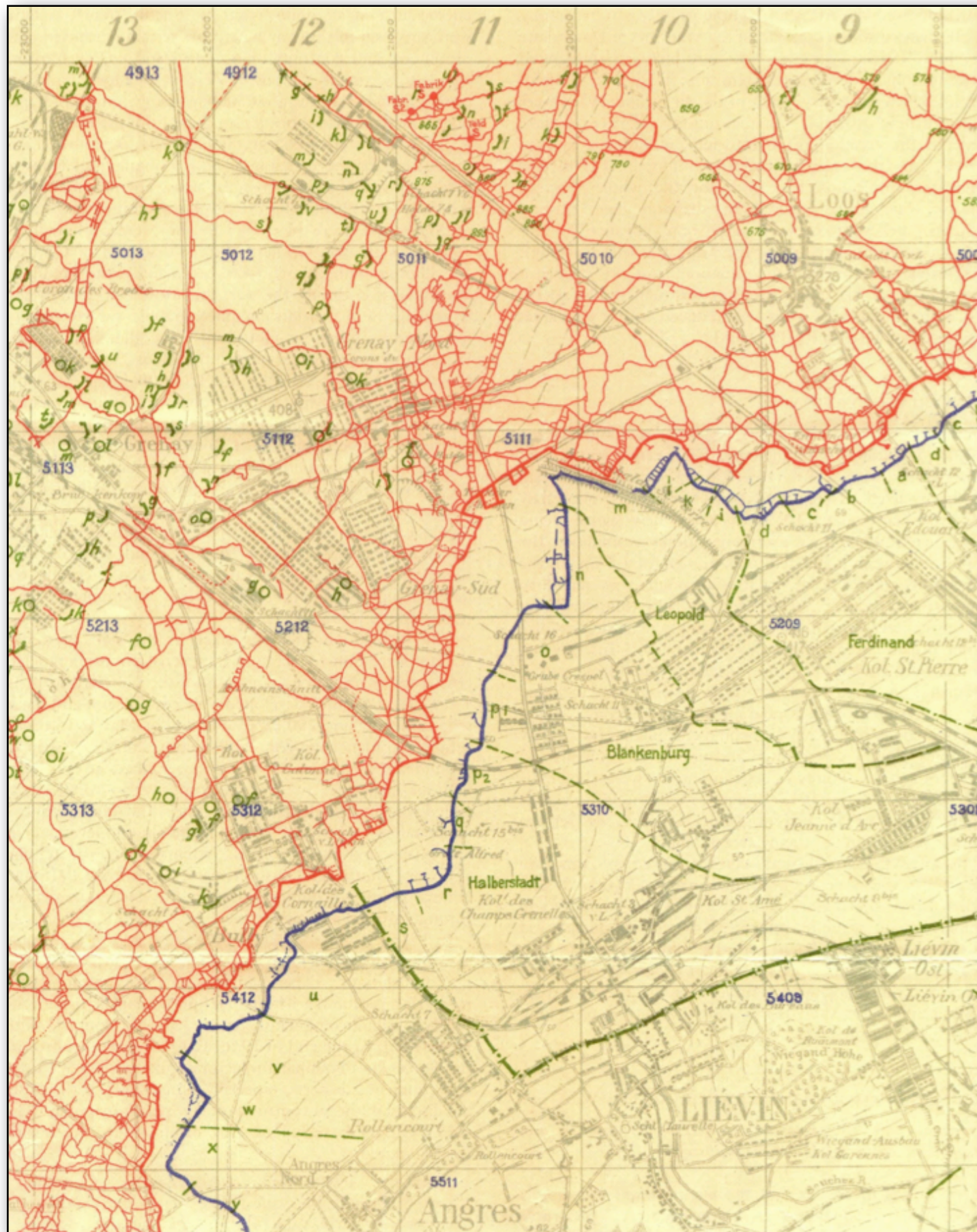


By the summer of 1914 a new series of **1:10,000 trench maps** was in preparation, and by November these had been printed and distributed by the Ordnance Survey in Southampton, and shipped across to Le Havre and on to GHQ at Montreuil.



Eventually the Ordnance Survey's 'map cars' were distributing maps to Corps and Divisional Headquarters every day, and by the end of the war **34 million printed sheets** had been supplied to Britain's armed forces.

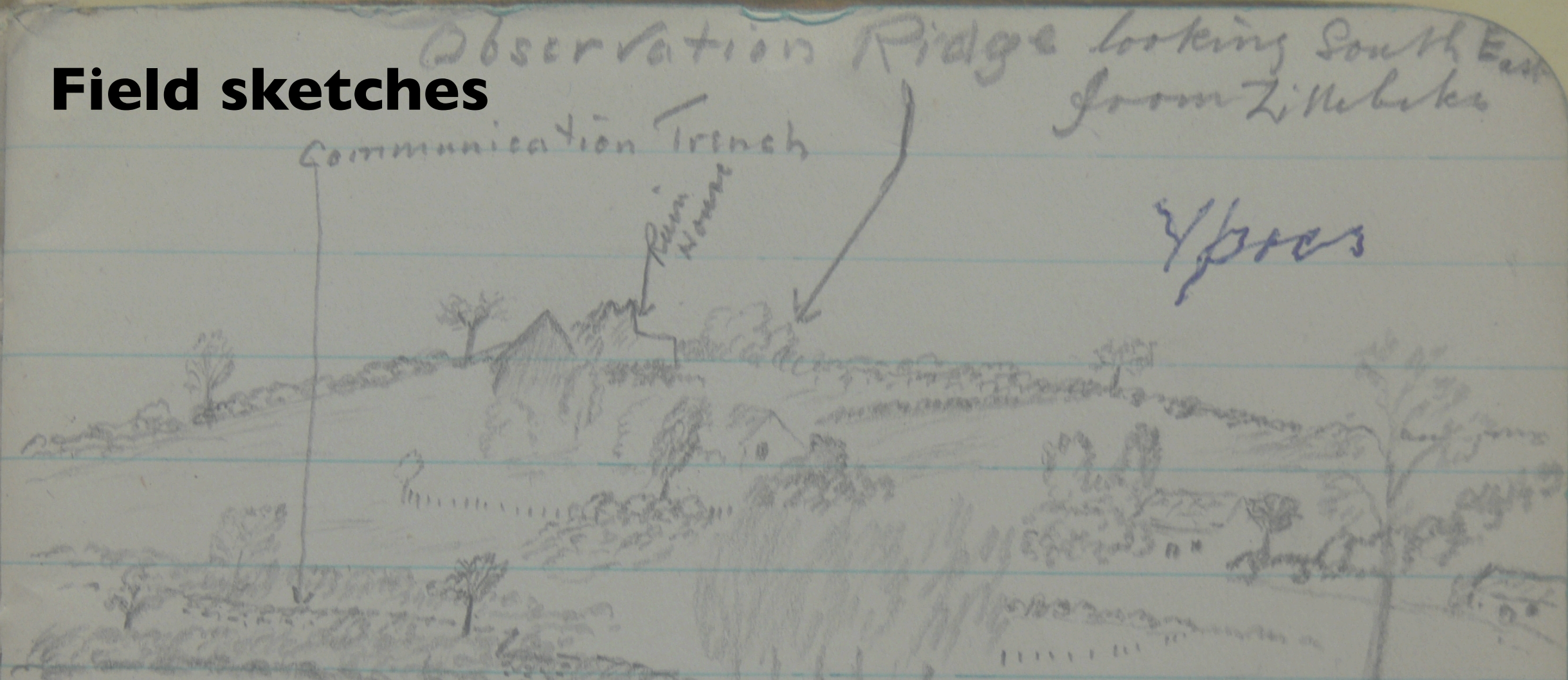




*The Germans were of course doing the same: this is a German map of part of the Allied trench system that was compiled on 7 March 1916.*



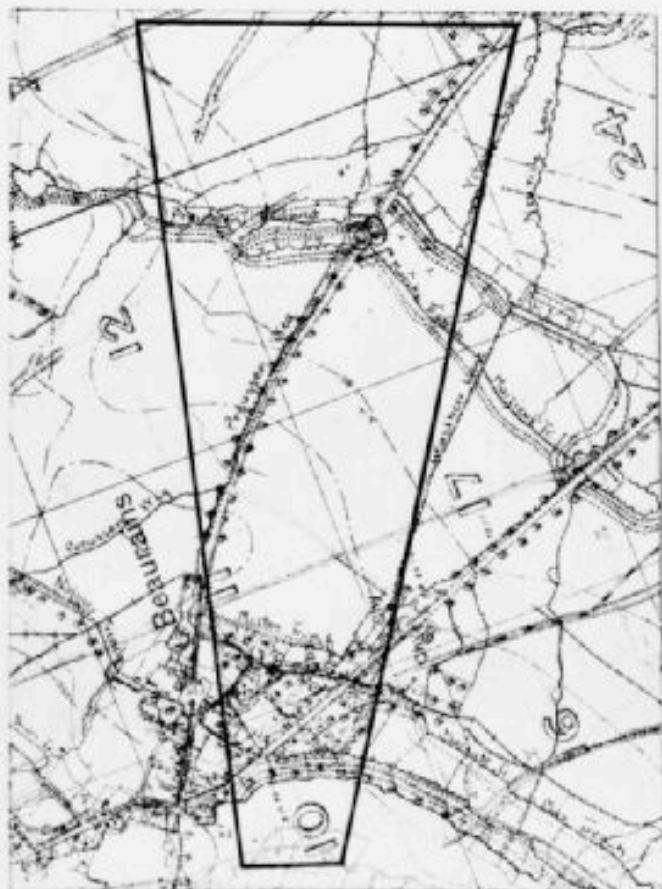
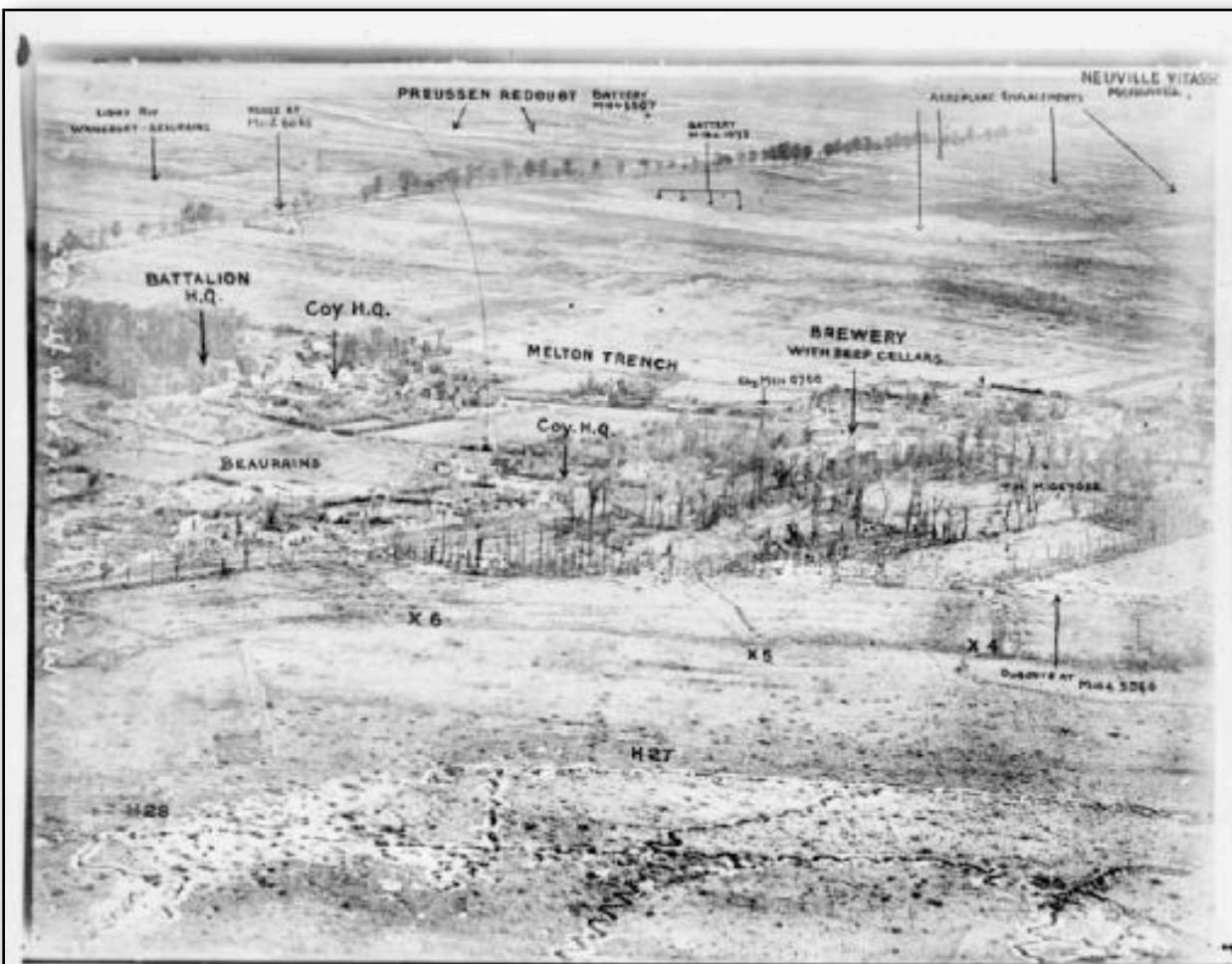
## Field sketches



'The Field Sketch was **the graphic trace of scopic control**. In the trenches of the Western Front the trained military draughtsman shared something of the solitary fixation of the sniper: ceaselessly scrutinising a fixed front, homing in on a hidden enemy and picking out (or off) the target....

'**Drawing for military purposes has two distinct fields of vision**: information-drawings gathered during mobile reconnaissance (by peripatetic patrol) and drawings made from static, elevated positions - customarily the preserve of the artillery spotter. Where the **patrol sketch** is often a collage of hasty impressions later re-arranged to form a spatial narrative, the panorama is primarily concerned with scopic control and spatial dominance. The **artillery panorama** works on the same premise as military mapping; surveillance and graphic survey will eventually neutralise a dangerous terrain and assure mastery over it...'





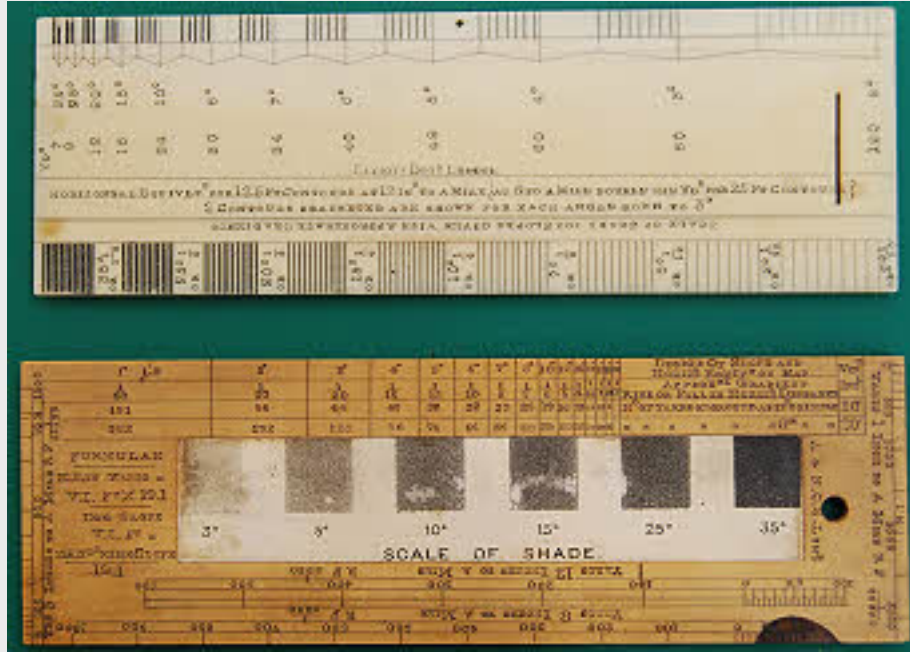
‘The principle of panoramic drawing, when used in an artillery sense, developed from the role of the **Forward Observation Officer (FOO)** who was **directing the fire of guns located much further back from his post on the edge of known and secure ground**. Through close observation the FOO was able to engage targets very rapidly across the whole arc of view. If a number of targets had already been pre-registered, and engaged to an exact point on the ground, that point could be marked on a drawn panorama. **This drawing would also be copied to the gunners in the rear who would then be able to engage the same target number with greater speed and efficiency. In effect, the panorama became a surrogate view for the distant artillery blinded by dead ground or topographic barriers...**

‘The artillery drawing reported a single view from a fixed Observation Post; it need only show a few prominent reference points drawn in a clear and unambiguous manner so as to indicate targets for observed fire; and it was drawn to maintain a record of artillery data on a particular battery front. The artillery panorama **works on the same basis as military mapping – that is, the act of surveying and transcribing a landscape helps neutralize the dangers of uncertain terrain and eventually assure mastery over it. The discipline of panoramic drawing reduced any landscape ... into a series of immutable co-ordinates and fixed datum points.**’

*Paul Gough, ‘Calculating the future’*



# The technoculture of military sketching



*New Service Protractor, 1900  
with scale of shade to indicate slope*



*All Service Protractor, 1915*



*British Army military sketching boards*

*Sketches had to include a scale and  
compass direction to enable the sketch  
to be 'set'*

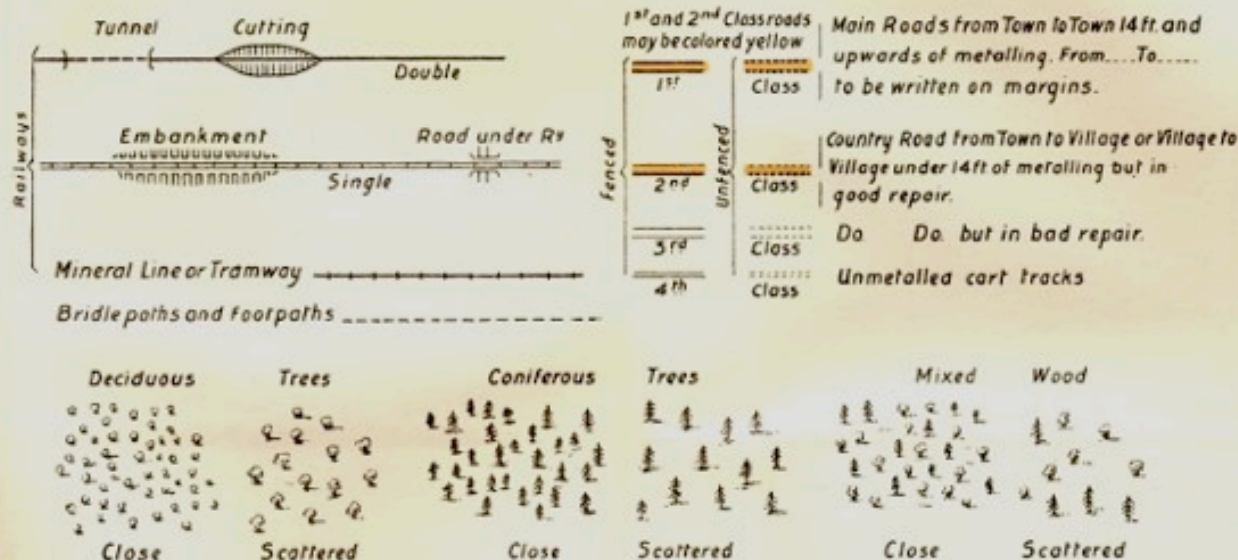




# Military sketching and cartographic vision

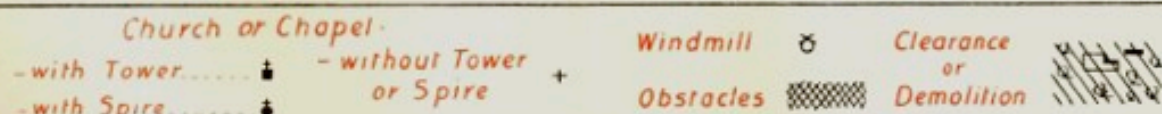
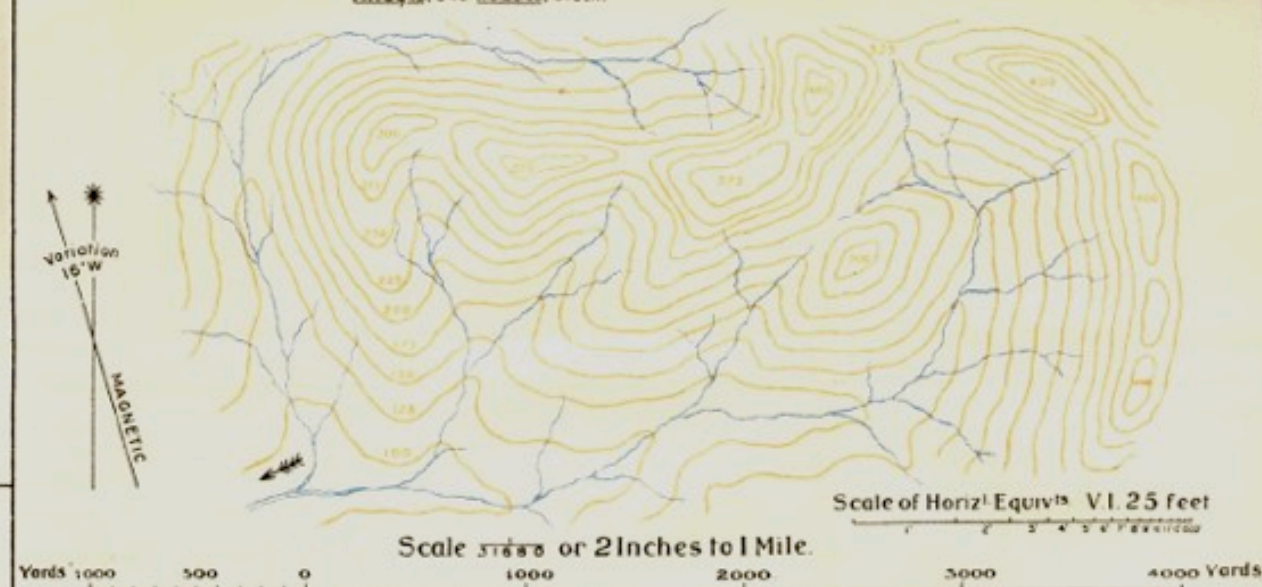
## CONVENTIONAL SIGNS & TERMS USED IN MILITARY TOPOGRAPHY.

### SYMBOLS USED ON ORDNANCE SURVEY MAPS (for information only)



### REPRESENTATION OF HILL-FEATURES AND CONVENTIONAL COLOURS.

**Colours.** Contours and heights: burnt sienna; where this is not available, or time does not allow, contours may be shown by chain-dotted black lines. Streams, blue (or black); double line when over 15 ft wide. Roads, outlined in black; metalled roads may be colored brown. Woods, to be shown by symbols for trees or colored green. Villages and houses, black.



### ABBREVIATIONS

Post Office	P
Telegraph Office	T
Sign Post	S P
Well	W

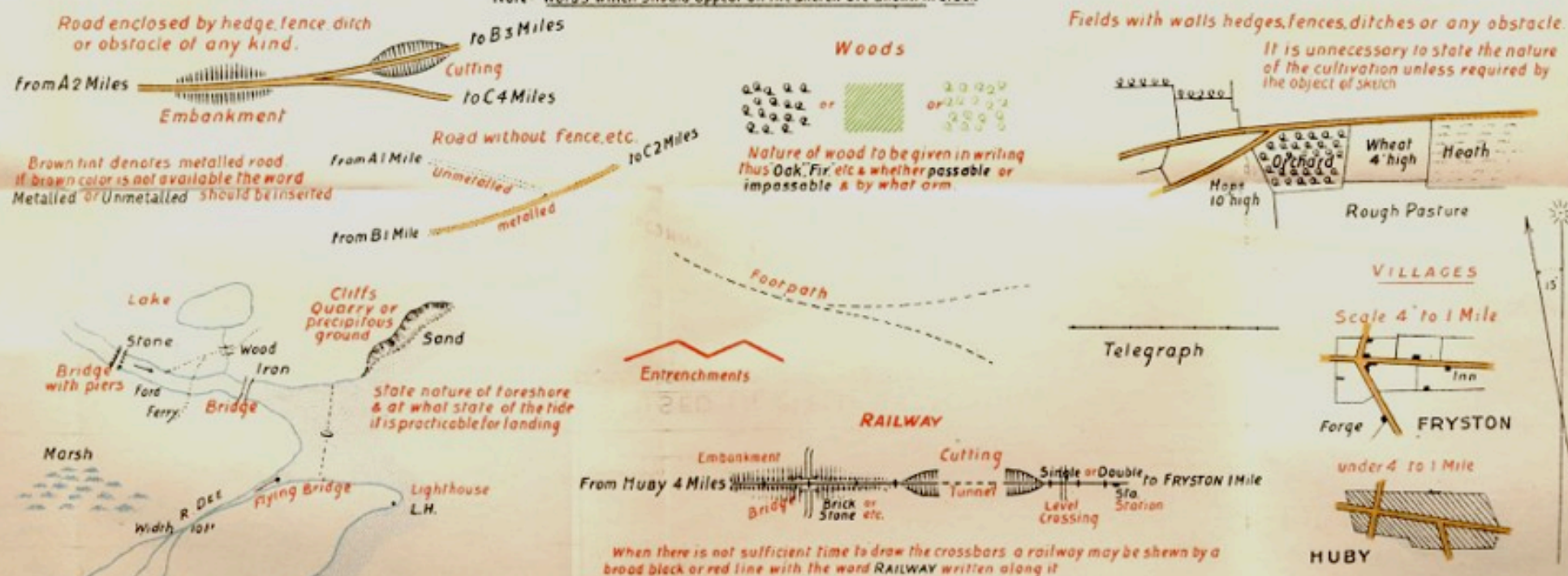
### BRITISH TROOPS

Mounted Troops (add M.I. if Mounted Infantry)	In Line	
	Column of Route	
	Other Formations	
	Vegetation	
Artillery	Guns in Action	
	Guns on March	
Infantry	In Line	
	Column of Route	
	Other Formations	
	Sentry	
Transport	On March	
	Parked	

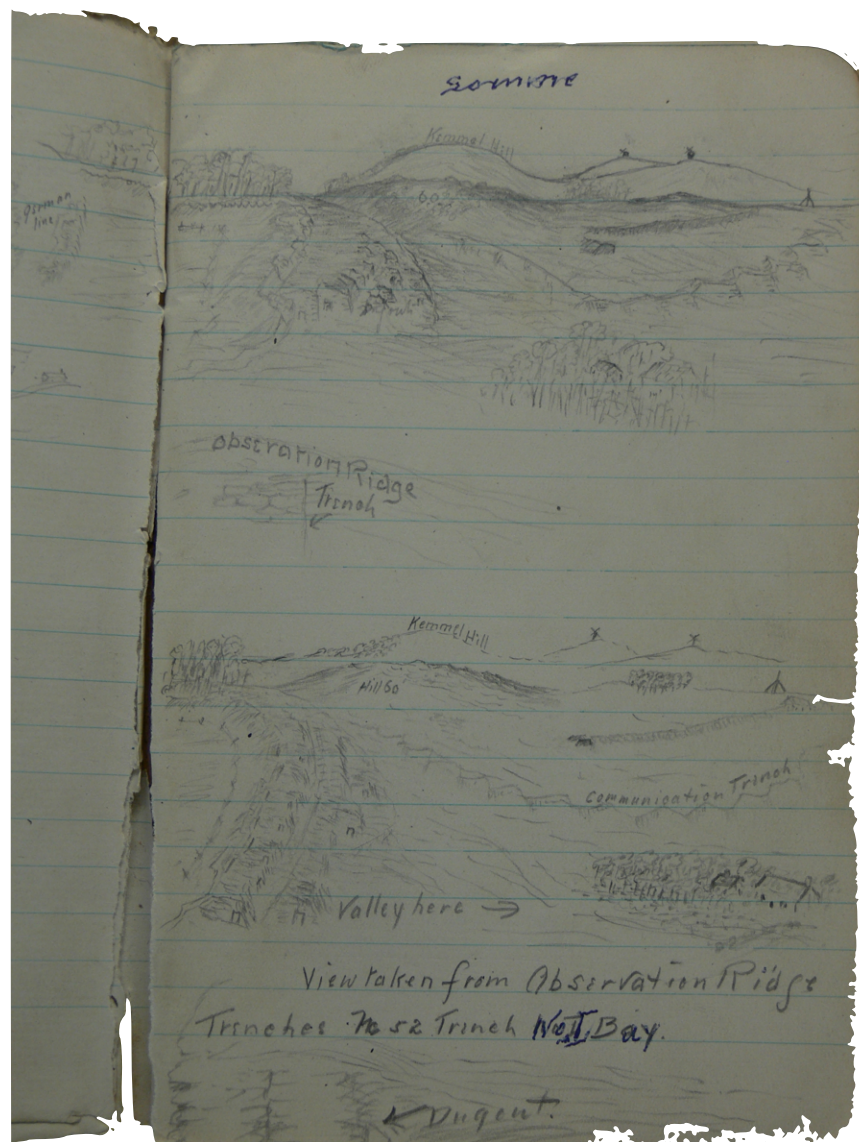
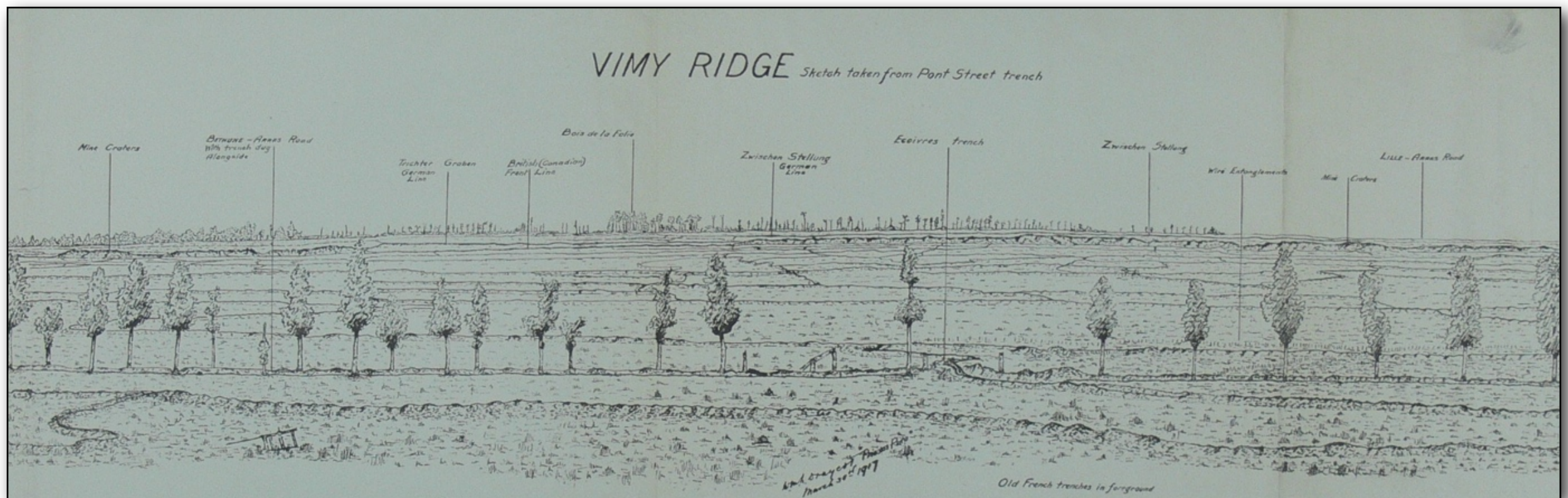
British Troops Red Opposing Forces Blue.

### SYMBOLS USED IN FIELD SKETCHING

Note: Words which should appear on the Sketch are shown in black.







## Walter Draycot

“Draycot produced maps and sketches throughout the war but felt growing frustration as his workload increased: ‘The Canadian Division calls for tracings of maps made by me. Why the devil don’t they send their own polished boots, extra paid, draughtsmen into the trenches to get the information? Why harass a one-man Brigade Office?’ The work was endless because enemy damage necessitated a constant supply of new sketches and maps. As enemy bombardment increased, it was also necessary to produce sketches using different perspectives: ‘[E]very angle of rifle fire taken by the enemy had to be considered, enfilading and such.’”

Jane Mattisson, <http://www.walterdraycot.com>





‘[Paul] Maze **supplemented his trench drawings with information gleaned from aerial photographs**, and he also incorporated imaginary views taken as though from the enemy lines... A large sketch of the Somme battleground, dating from mid-1916, has obviously been drawn from the lip of a trench. The parapet is broadly rendered in charcoal, a copse of trees in the middle distance is established with slabs of yellow paint, and its perimeter edge is clearly defined with a single pencil line. The names of two villages have been hastily scrawled in the sky. **For all his abilities as an artist, the drawing is, in fact, heavily dressed in the idiom of map-making** – the copse is given a clear perimeter line, the conifers are rendered in the conventional language of cartography, and houses are drawn as uniform blocks rather than as individual buildings.’

*Paul Gough, ‘Calculating the future’ – panoramic sketching, reconnaissance drawing and the material trace of war’, in Nicholas Saunders, and Paul Cornish (eds.) Contested Objects: Material Memories of the Great War (2009) pp. 237-251*



# Balloon observation

Unlike its opponents, the British Expeditionary Force arrived without a single observation balloon: the first British Kite Balloon Section did not arrive until **May 1915**.

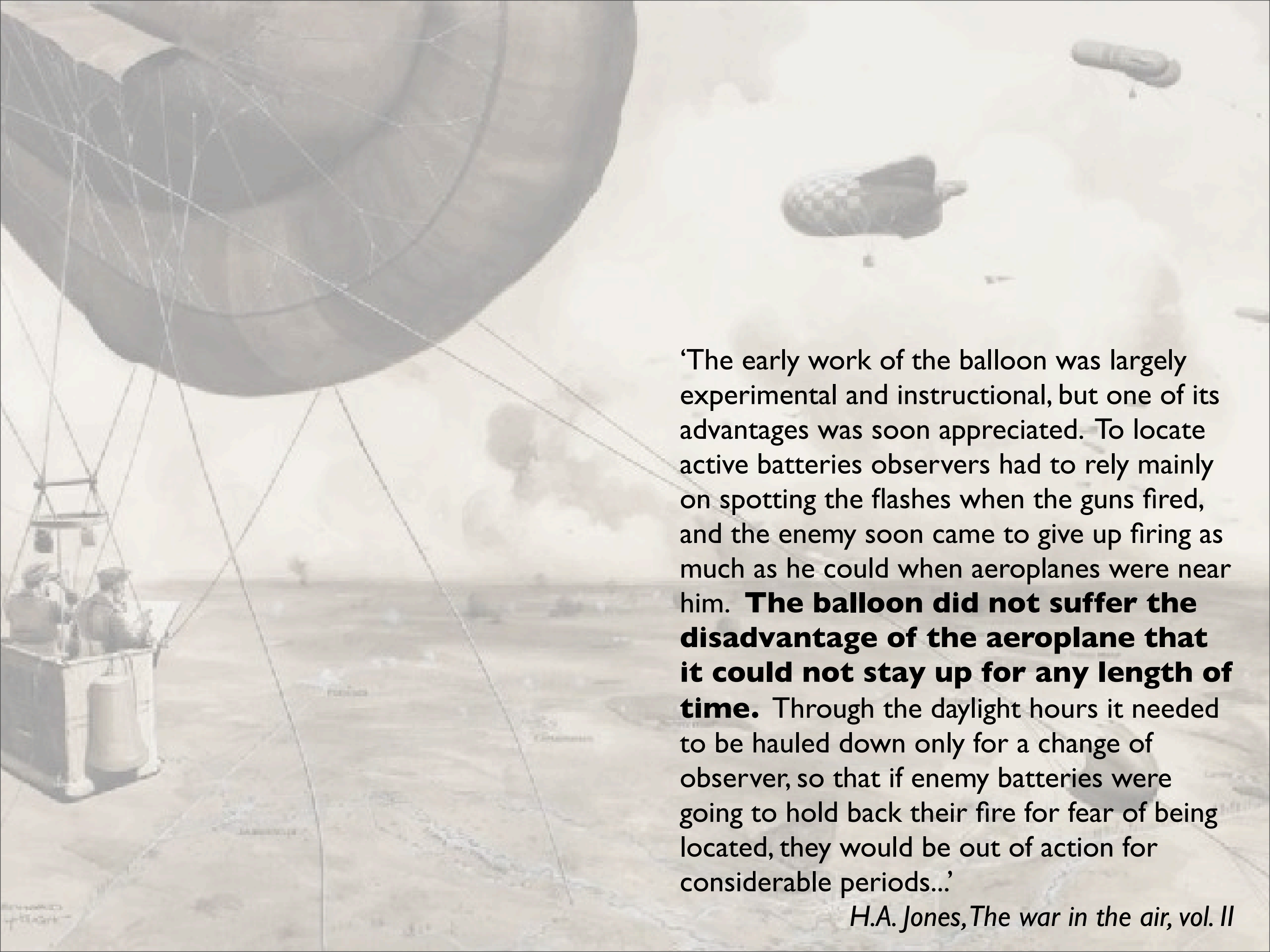
The balloons were deployed 12-15 miles apart and usually tethered three miles behind the front line trenches (beyond the range of small arms and artillery fire).

They were tethered to a winch on a truck and were filled with hydrogen gas that allowed them to rise to 3-4,000 feet, which gave a view (under good conditions) of 15 miles beyond the enemy's front line.

Observers were equipped with maps, field glasses and a camera, a telephone line, and parachutes.







‘The early work of the balloon was largely experimental and instructional, but one of its advantages was soon appreciated. To locate active batteries observers had to rely mainly on spotting the flashes when the guns fired, and the enemy soon came to give up firing as much as he could when aeroplanes were near him. **The balloon did not suffer the disadvantage of the aeroplane that it could not stay up for any length of time.** Through the daylight hours it needed to be hauled down only for a change of observer, so that if enemy batteries were going to hold back their fire for fear of being located, they would be out of action for considerable periods..’

*H.A. Jones, The war in the air, vol. II*



‘[T]he observer suspended in his basket was in constant voice contact with the ground, thanks to the telephone line incorporated into the balloon’s cable.... Often, vibration and the movement of the balloon basket were so slight that its occupant could use high-magnification binoculars of up to 20-power—something the airplane observer could not do. Then, too, the man in the airplane could get only a brief look at an objective as he passed; the man in the balloon could keep it under constant surveillance from dawn to dusk, and by 1918 there was nighttime surveillance as well.’

*Lee Kennett, The first air war*



*The Somme viewed from an observation balloon, 1916*



# Aerial photography

The Royal Flying Corps took only one official camera to France, and the first attempt at aerial photography took place on **15 September 1914**: five plates were exposed 'with very imperfect results'.

The first successful British attempts at aerial photography were made by Lt Charles Curtis Darley, a Royal Artillery officer serving as an observer with No. 3 Squadron, who assembled an annotated photo-mosaic by **January 1915**.

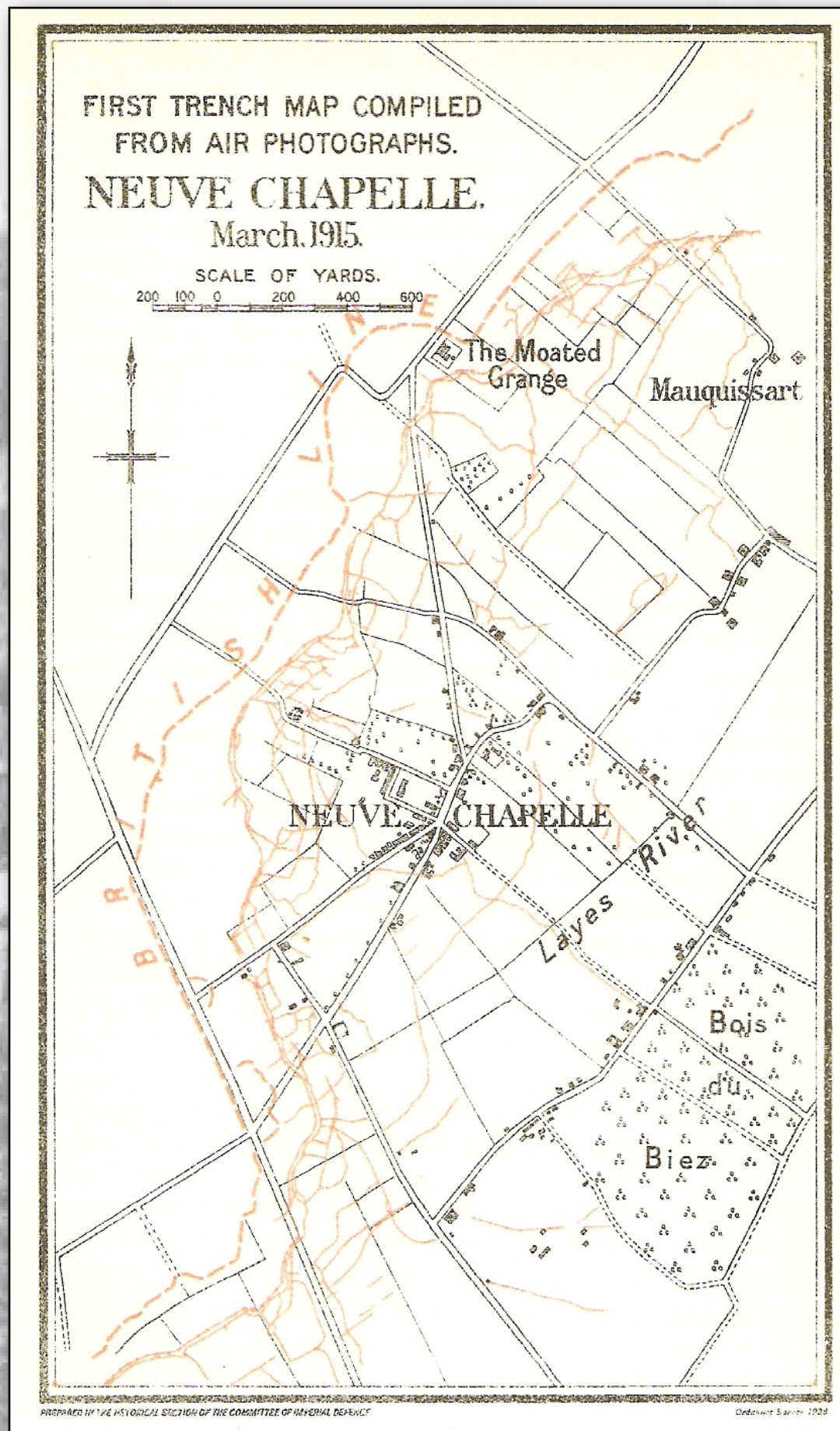
The staff officers at Corps HQ were impressed – 'Here was a picture showing enemy dispositions that a General could relate to and understand' – but the staff officers at the RFC were more impressed by French aerial photography and established a formal liaison with the section responsible.

The RFC established an **experimental photographic section**, which designed a special hand-held 'A' type camera (top right), which involved 11 distinct operations to expose a single plate: it was first used over German lines on **2 March 1915**.

By the summer of 1915 a semi-automated 'C' type camera (bottom right) was fixed to the aircraft.







The first photographic reconnaissance missions covered the German trench system in front of the First Army to a depth of 700–1,500 yards.

Haig used this intelligence to plan the **Battle of Neuve Chapelle** between **10-13 March 1915**, the first large-scale attack by the British Army, for which 1,500 copies of a **1: 5,000** map (left) were overprinted in red with an outline of the German trench system.







Field Marshal Sir John French claimed that the failure of the battle was the result of a shortage of artillery shells, which led to the **“Shell Crisis”** that brought down the Liberal Government.

The crisis also produced more demands for **even more accurate and timely mapping** of the German trench system and artillery positions, which was vital for counter-battery operations against German artillery and, from 1916, for the ‘creeping barrage’ designed to protect and support an infantry advance.

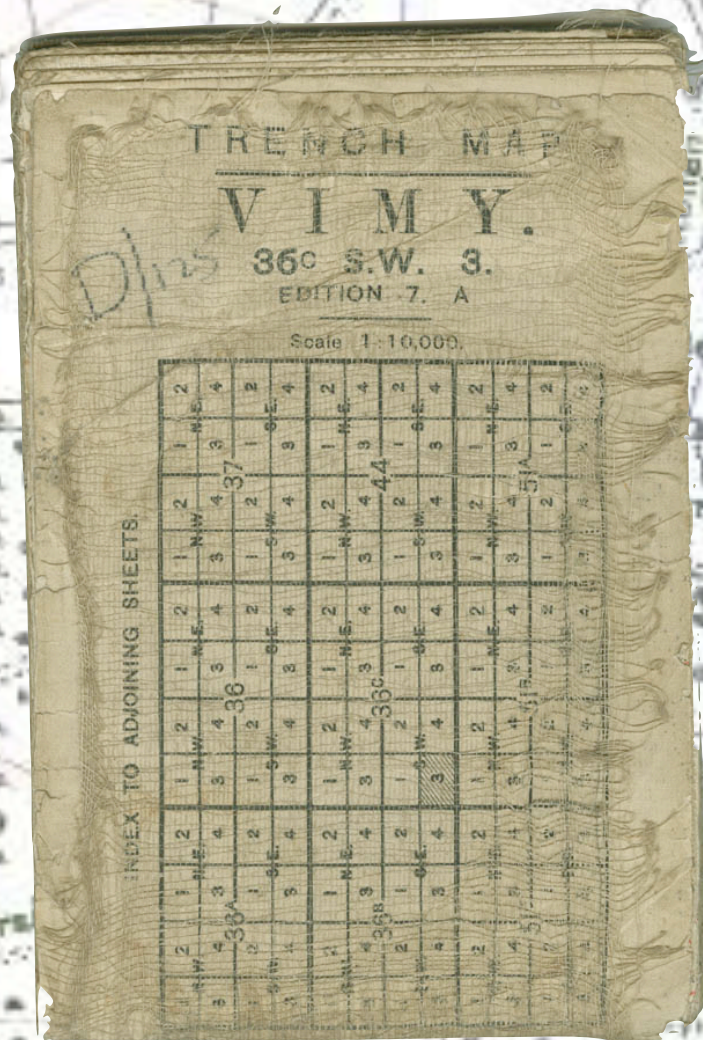


# Trench maps

I: 10,000 trench maps were now being routinely produced and distributed to officers (rarely to other ranks).

During 1915 the interval between map drawing to the delivery of the map ready for use was **two weeks**.

By 1916 the demand had extended the production cycle to **four weeks**.





The RFC planned to photograph the German trench system to a depth of 3,000 yards every **5 days** and the counter-battery area every **10 days**.

The tempo increased during a major offensive: during the preliminary bombardment at Messines in June 1917 the RFC photographed the German trench system **every day** and the counter-battery area every **two days**.



*Oosteverne Wood, Battle of Messines, 7 June 1917*



# Fordist war

‘The making of these reconnaissance prints was one of the **first instances of virtual assembly line image production**. (Henry Ford’s first automobile assembly-line became operative only in 1914.) The establishment of this method of production grew out of demands for resolution, volume, and immediacy. No method of reproduction but direct printing from the original negative would hold the detail necessary for reconnaissance purposes. Large numbers of prints from a single negative had to be made for distribution throughout the hierarchy of command. In addition, the information in prints dated very rapidly. Under these circumstances, efficiency depended on a thorough-going division of labor and a virtually continuous speedup of the work process. Printers worked in unventilated, makeshift darkrooms; 20 workers might produce as many as 1,500 prints in an hour, working 16-hour shifts.’

*Allan Sekula, ‘The instrumental image: Steichen at war’, Artforum 14 (1975) 26-35*

‘With 55 officers and 1,111 men under his command, [Edward] Steichen had relied on a division of labour and intensive production methods to organize a factory-style output of war information. **The photograph thus ceased to be an episodic item, as Steichen turned out a veritable flow of pictures which fitted perfectly with the statistical tendencies of this first great military-industrial conflict.**’

*Paul Virilio, War and cinema, pp. 20-1*



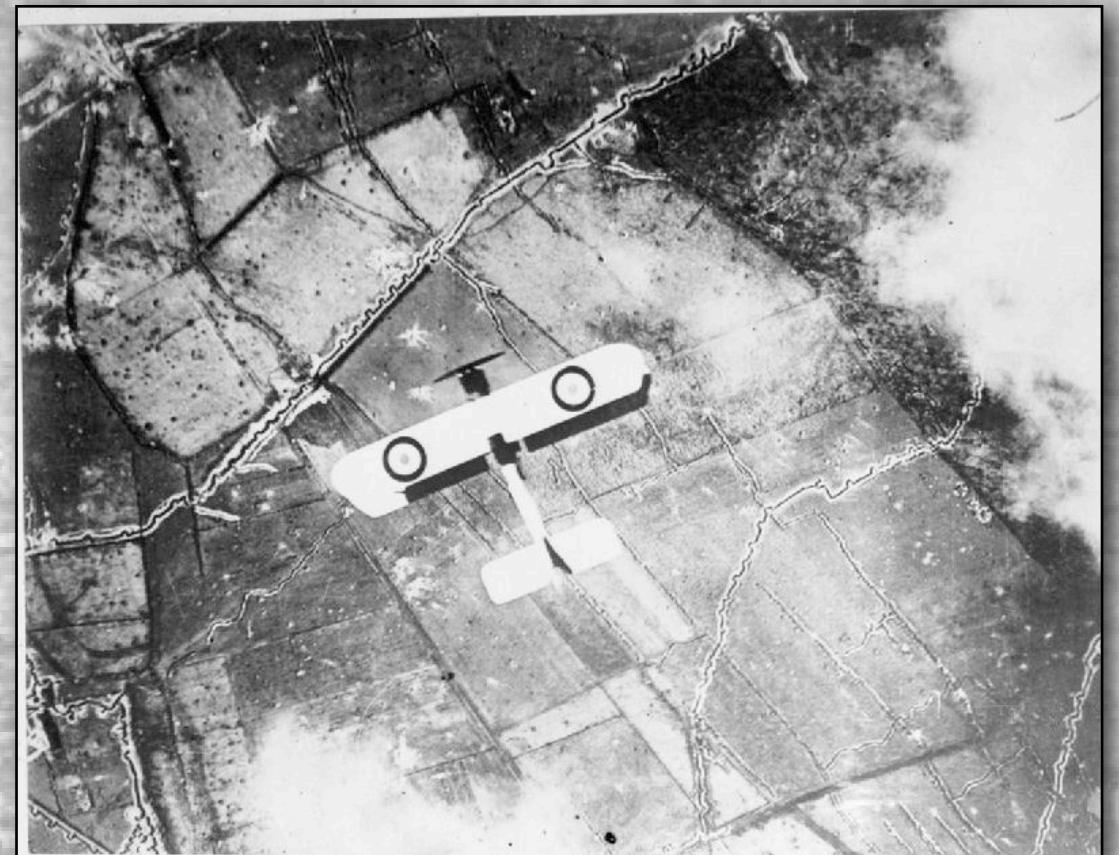
# Speed tests

To determine the production and circulation time of its aerial photographs, in preparation for the Battle of the Somme, the RFC conducted a series of 'speed tests' during the early summer of 1916:

On 10 June a BE2 aircraft took a photograph over the front at 0750, landed at 0810, and the first prints were sent by motorcycle courier to I Corps HQ at 0832, where they arrived at 0839: elapsed time **49 minutes**.

On 16 June an FE2b aircraft took a photograph over the front at 1706, and ten prints were developed by 1727 and arrived at IV Corps HQ at 1804: elapsed time **62 minutes**.

On 18 June a BE2c took a photograph over the front which was delivered to XI Corps HQ **30 minutes** later.



*BE2 aircraft over trenches, 1916*

But these speed tests were conducted under more or less ideal (though still wartime) conditions, and the results take no account of the time involved in **tasking** the reconnaissance mission or in **interpretation, annotation and forward delivery**.



# Stereo imagery

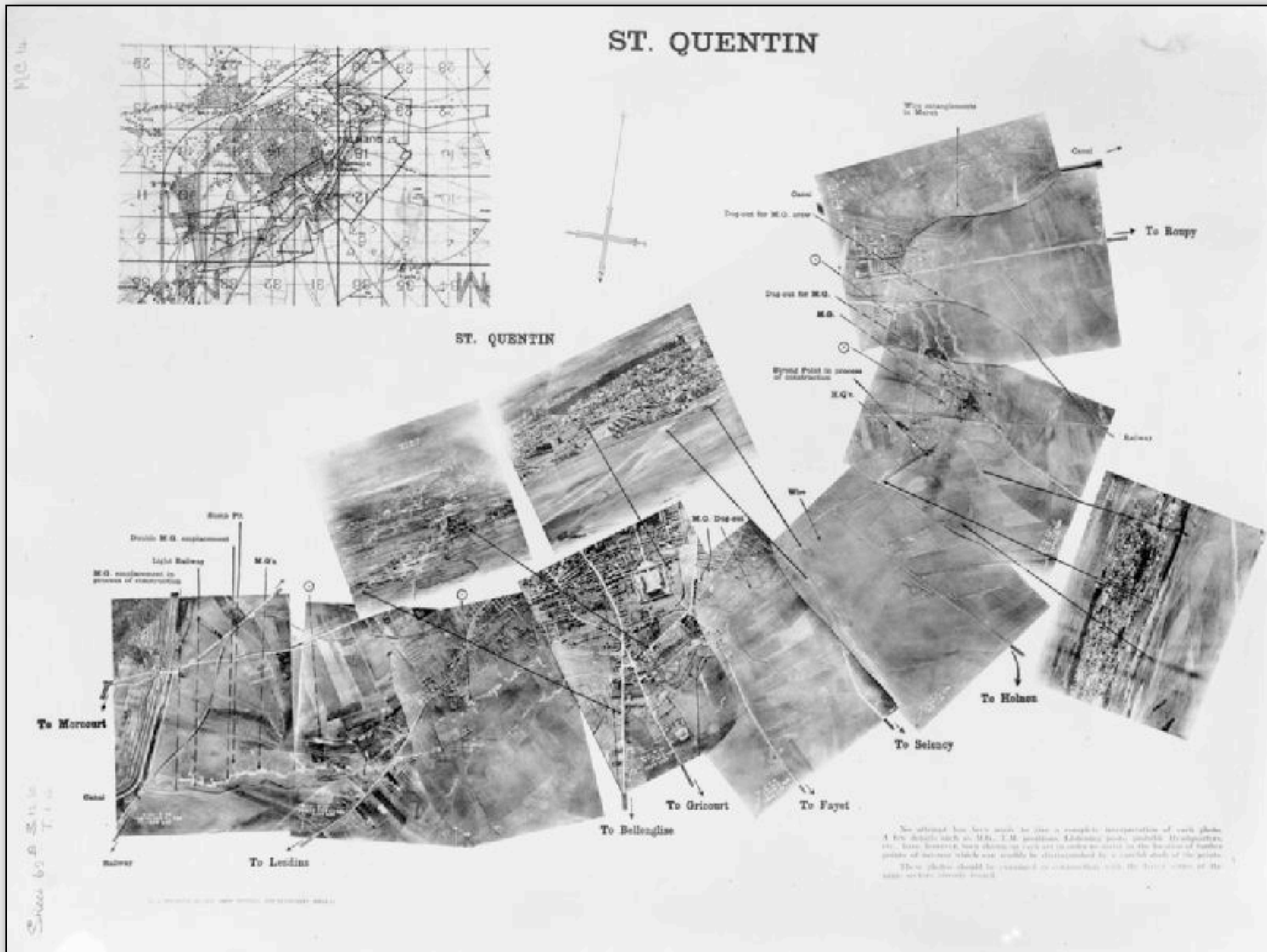
**‘By the summer of 1915** camera semi-automation enabled pilots to take a series of aerial photographs close enough together so that the ground depicted in adjacent photographs on the series overlapped. By putting these overlapping pairs of aerial photographs under the stereoscope, photo-interpreters could use the device’s virtual stereopsis to tell bomb craters from mounds and trenches from embankments. They could distinguish flat decoy bridges from real ones; they could see through some kinds of camouflage and forest covering to the objects hidden beneath. And if the overlapping photo pairs were taken at wide enough spatial intervals, interpreters could even see part of the ground underneath bridges....

**‘[A]erial stereoscopy depended for its effects as much on the viewer’s optical anatomy as on the device’s placement of overlapping photo pairs,** fusing the stereoscope and the photo interpreter into a single viewing apparatus.’

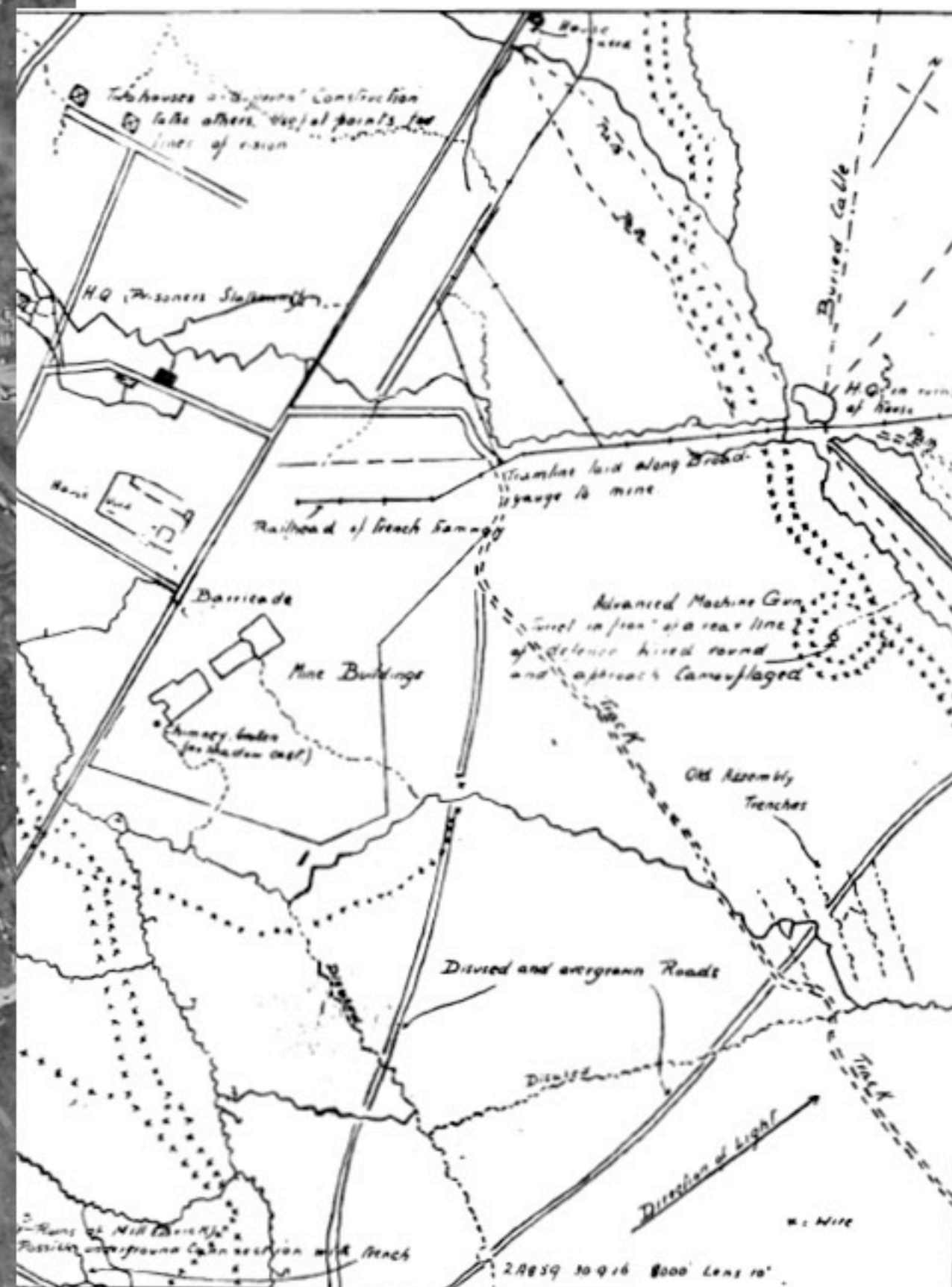
*Paul K. Saint-Amour, ‘Modernist reconnaissance’, Modernism/modernity 10 (2) (2003) 349-80: 358*



# Photo-mosaics

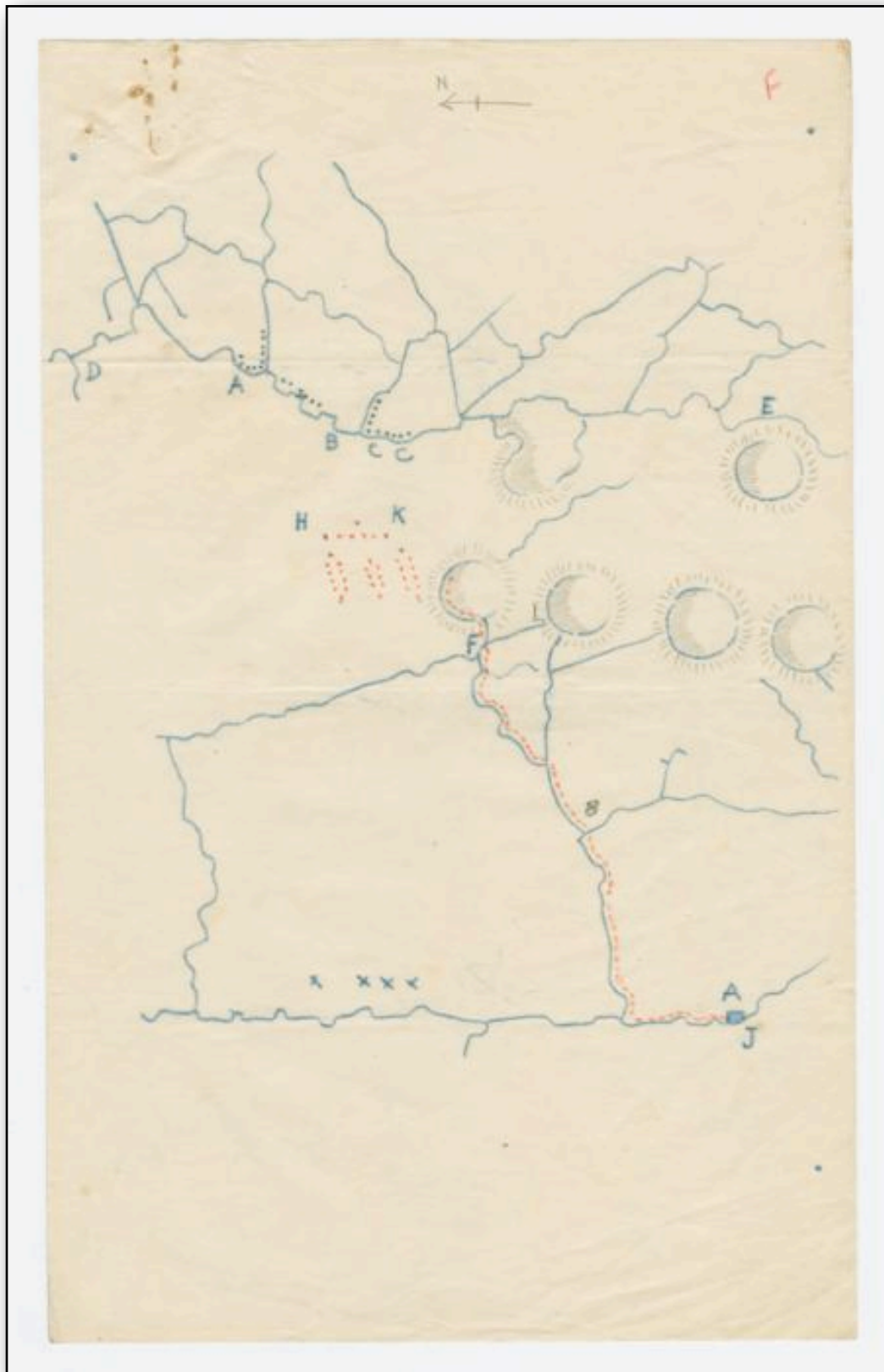






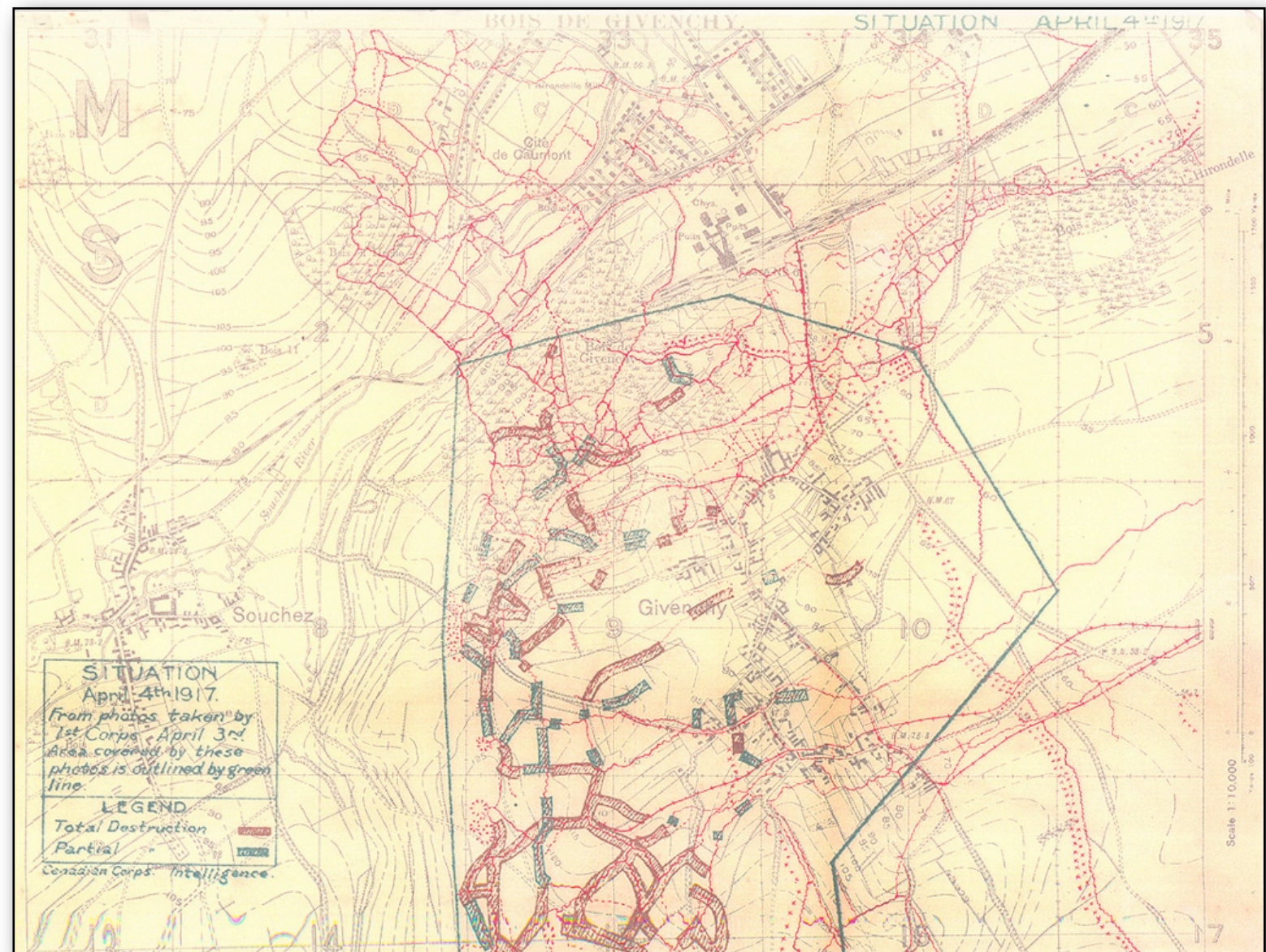


**All the way down the distribution chain aerial photographs were re-examined, annotated and used as the basis for sketch maps**



*Sketch map derived from aerial photograph for a trench raid near Roclincourt on 19 September 1916*

**Trench maps were entangled with aerial photographs in a myriad ways**









SECRET COPY No 17

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31

MAGNETIC GRID N

CAMERON CRATER

Li Hoja

NAMLESS TRENCH

FILLED IN WITH WIRE

ZASH ALLEY

Dynamite Magazine

RUINS

REFERENCE.

M.G. MACHINE GUN.

○ TRENCH MORTAR.

□ DUG OUT.

M.G.O. MACHINE GUN OPEN.

M.G.C. " COVERED.

BRITISH TRENCHES

GERMAN

T. 87.

1 CORPS TOPO SECTION.

Yds 100 0 100 200 300 400

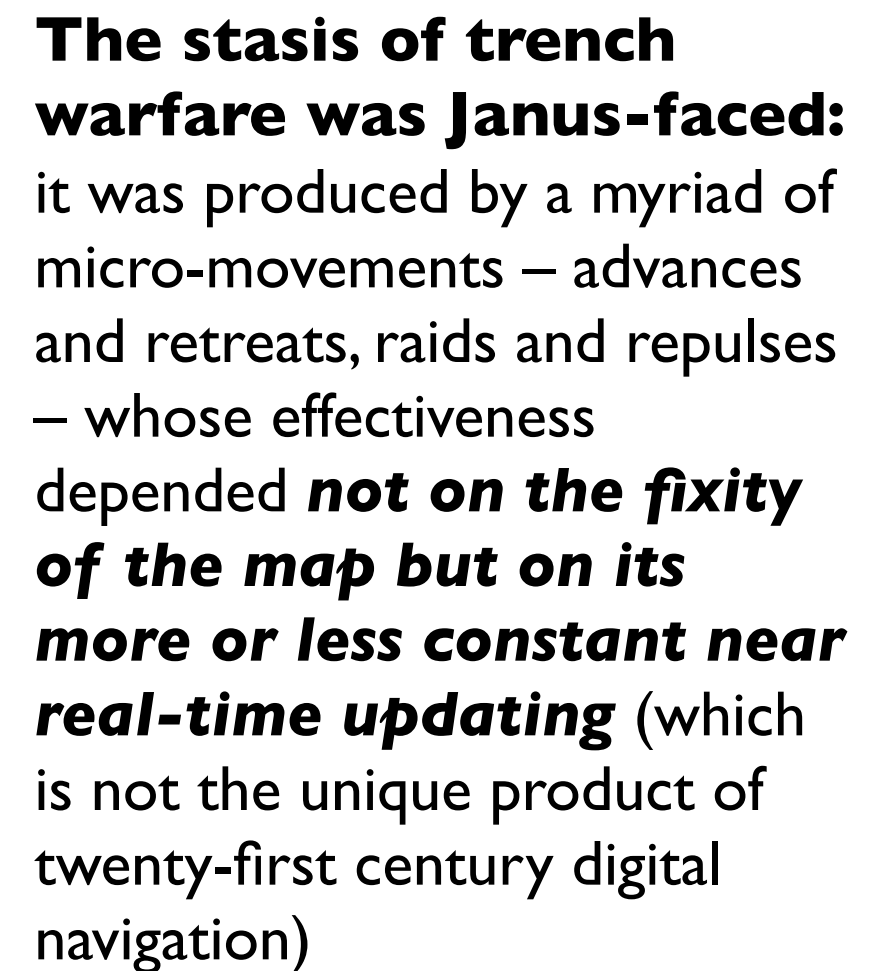
**The artillery stopped at zero plus 30.**



**Dates and times were increasingly precise**





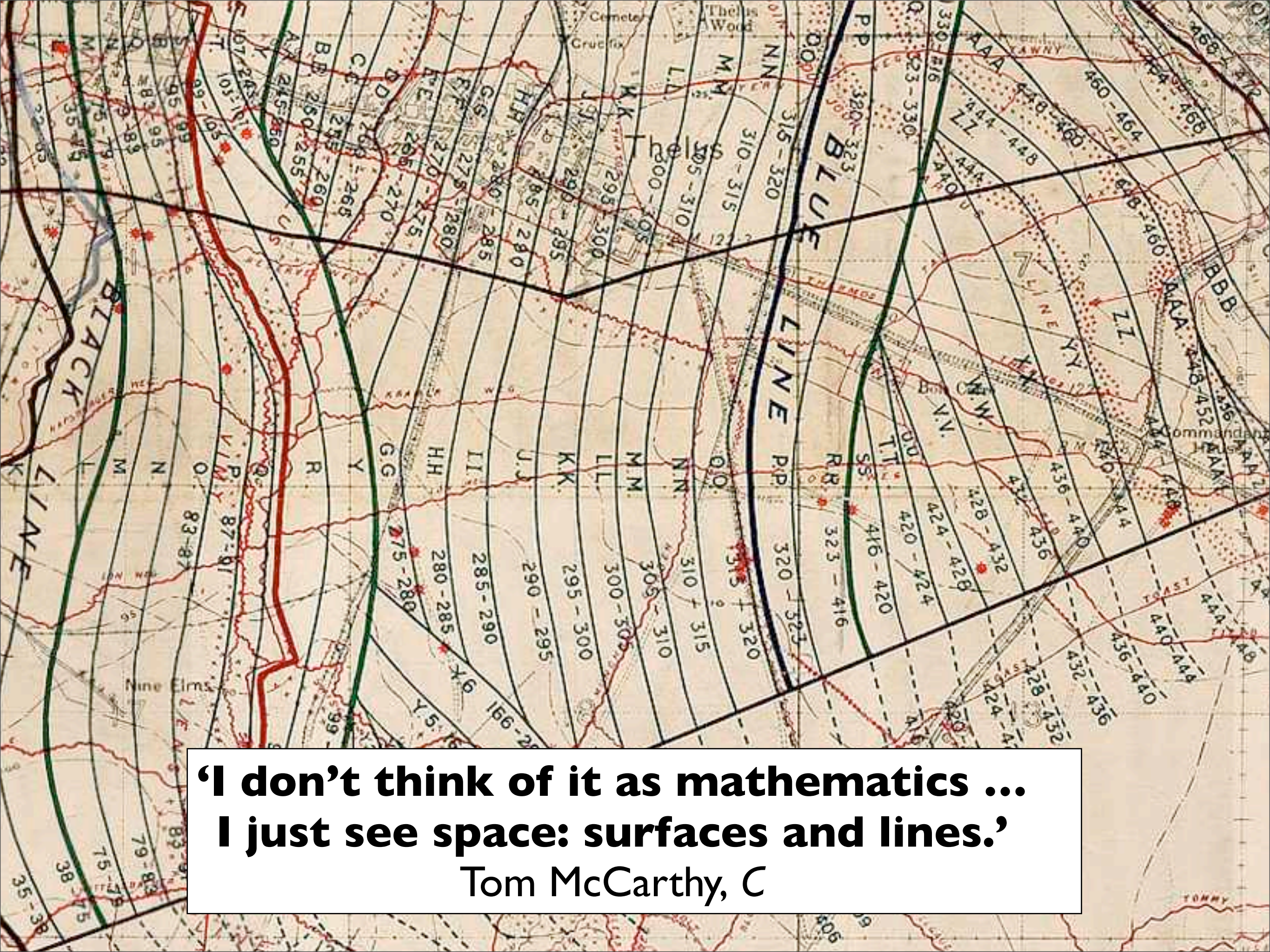


**The stasis of trench warfare was Janus-faced:** it was produced by a myriad of micro-movements – advances and retreats, raids and repulses – whose effectiveness depended ***not on the fixity of the map but on its more or less constant near real-time updating*** (which is not the unique product of twenty-first century digital navigation)



**3: 'Clockwork war' and the mathematics of the battlefield**





**‘I don’t think of it as mathematics ...  
I just see space: surfaces and lines.’**  
Tom McCarthy, C





# **Industrial war**

*Christopher Nevinson, A tank*

*Christopher Nevinson, La mitrailleuse*





# Mechanical war

*Christopher Nevinson, Column on the March (1915)*





*“The modern battlefield is like a huge, sleeping machine with innumerable eyes and ears and arms, lying hidden and inactive, ambushed for the one moment on which all depends. Then from some hole in the ground a single red light ascends in fiery prelude. A thousand guns roar out on the instant, and at a touch, driven by innumerable levers, the work of annihilation goes pounding on its way.”*

*Ernst Jünger*

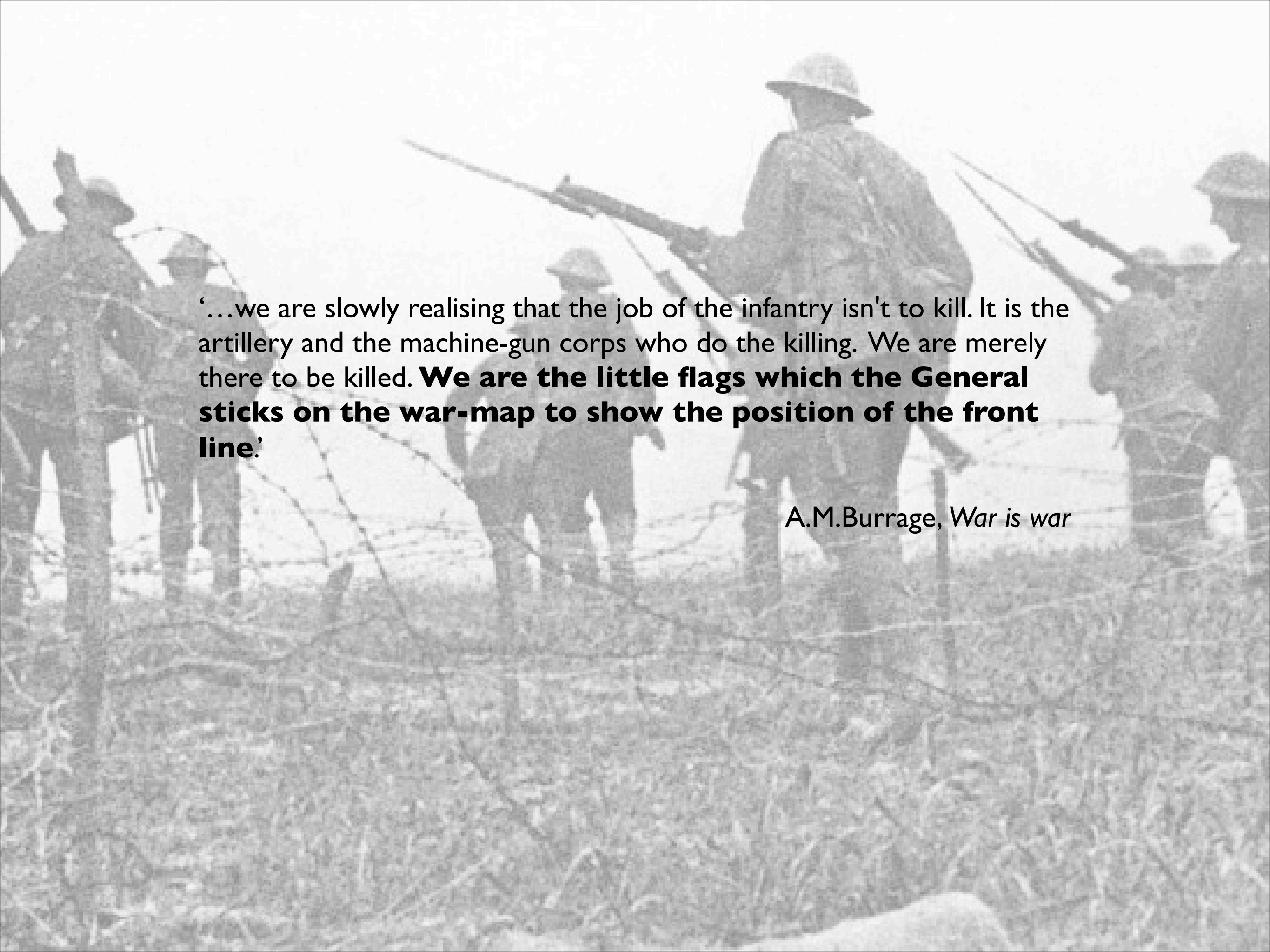




*“The modern battlefield is like a huge, sleeping machine with innumerable eyes and ears and arms, lying hidden and inactive, ambushed for the one moment on which all depends. Then from some hole in the ground a single red light ascends in fiery prelude. A thousand guns roar out on the instant, and at a touch, driven by innumerable levers, the work of annihilation goes pounding on its way.”*

*Ernst Jünger*





‘...we are slowly realising that the job of the infantry isn't to kill. It is the artillery and the machine-gun corps who do the killing. We are merely there to be killed. **We are the little flags which the General sticks on the war-map to show the position of the front line.**’

A.M.Burrage, *War is war*



# Performative spaces

**‘[H]e doesn’t think of what he’s doing as a deadening. Quite the opposite: it’s a quickening, a bringing to life. He feels this viscerally, not just intellectually, every time his tapping finger draws shells up into their arcs, or sends instructions buzzing through the woods to kick-start piano wires for whirring cameras, or causes the ground’s scars and wrinkles to shift and contort from one photo to another: it’s an awakening, a setting into motion.’**

*Tom McCarthy, C*



You hit  
them

We must  
go home  
No petrol

***'You hit them.  
We must go home.  
No petrol.'***



Message dropped from aircraft to artillery  
battery, 20 October 1914



**23 September 1914, telegraph from commander of II Corps to GHQ:**

*'I hope that you will be able to spare the wireless aeroplane and receiving set to Third Division again to-morrow. The results were so good yesterday that it seems a pity not to keep it with the Division, which has got accustomed to its uses and is in a position to benefit even more largely by the experience gained.'*

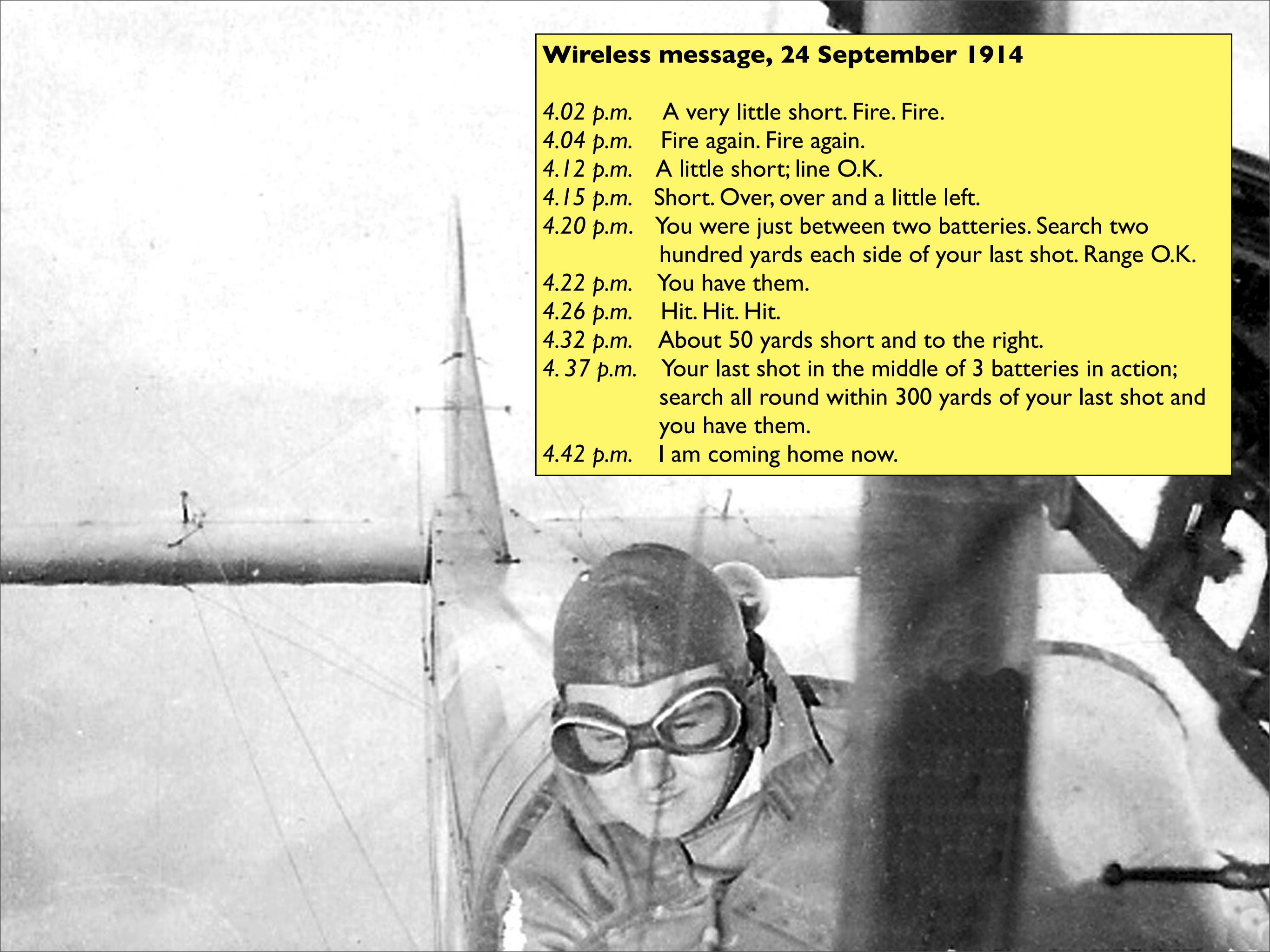
*'The answer was that the machine had been damaged by anti-aircraft fire, but would be ready again shortly. **A wireless aeroplane was as popular as an opera-singer.***

*Walter Raleigh, War in the air*

*Wireless equipment was too heavy to allow aircraft to carry both a transmitter and a receiver, so they carried only a transmitter, which required the pilot to descend below 5,000 feet and unreel a wire antenna*







## Wireless message, 24 September 1914

4.02 p.m. A very little short. Fire. Fire.  
4.04 p.m. Fire again. Fire again.  
4.12 p.m. A little short; line O.K.  
4.15 p.m. Short. Over, over and a little left.  
4.20 p.m. You were just between two batteries. Search two hundred yards each side of your last shot. Range O.K.  
4.22 p.m. You have them.  
4.26 p.m. Hit. Hit. Hit.  
4.32 p.m. About 50 yards short and to the right.  
4.37 p.m. Your last shot in the middle of 3 batteries in action; search all round within 300 yards of your last shot and you have them.  
4.42 p.m. I am coming home now.



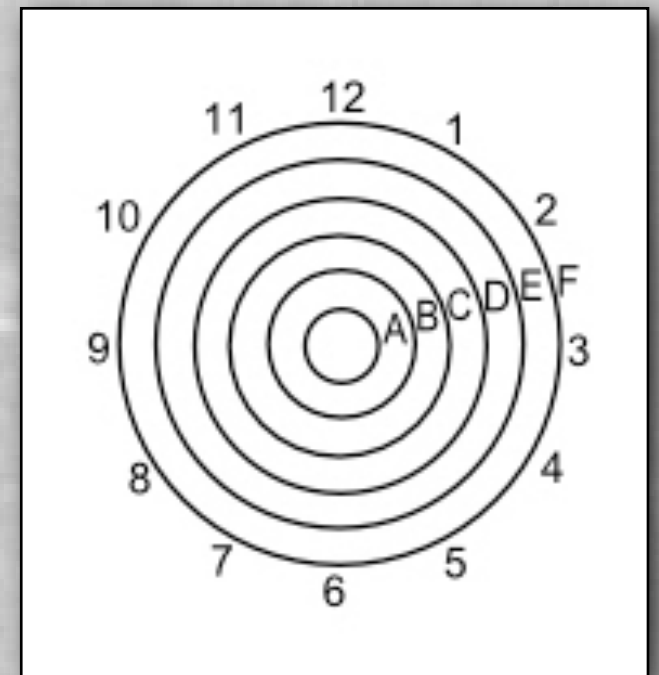
# ‘Clock-code’ introduced in 1915

‘An image in the form of a clock-dial would be superimposed over some of these developed prints, locating the target dead-centre on the clock-dial with the 12 o'clock position pointing true north. **Circles at radial distances representing 10, 25, 50, 100, 200, 300, 400 and 500 yards from the target were lettered Y, Z, A, B, C, D, E and F respectively.** Copies of these "clock code" photographs were then dispatched to nearby Army Artillery Batteries as well as to the RE8 crew assigned to carry out the Artillery ranging.

**After take off, the RE8 would wait for the Battery to lay out a giant white linoleum-formed letter "L" on the ground to signify the Battery was ready to commence firing.** The RE8 would then cruise at about 85 miles per hour towards the target area and, using the RE8's Standard Sterling Transmitter with its 120ft-long trailing aerial, **they'd key (in Morse Code) the letter "G" to let the Battery know they could let "go" with their salvo.**

On the ground, near each Battery location, a 3 Squadron Wireless Operator would receive the RE8's signal on his crystal detector receiver, using a "cat's whisker" tuner, headphones and an aerial pole about 30 feet high. Incidentally, the "cat's whisker" had to be continually re-tuned to the point on the crystal which gave the best signal reception because, as the shoot progressed, the receiver would be constantly jolted by the concussion from the Battery's guns and the enemy's counter-bombardment.

Nevertheless, **the RE8s signals, relayed to the Battery, would start each salvo** and the RE8's job was to note where each salvo fell in relation to the clock-face on the photograph and to then signal the Battery with the clock-code-letter designating the distance the salvo fell short of the target.’







*Artillery officer directing fire based on aerial observation, Montauban, July 1916*





‘The affair is not like shooting at anything. A polished missile is shoved into the gun. A horrid bang – the missile has disappeared, has simply gone. Where it has gone, what it has done, nobody in the hut seems to care. There is a telephone close by, but only numbers and formulae – and perhaps an occasional rebuke – come out of the telephone, in response to which the perspiring men make minute adjustments in the gun or in the next missile.

‘Of the target I am absolutely ignorant, and so are the perspiring men.’

Arnold Bennett, *Over there: war scenes on the Western Front* (1915)



# ‘Zone-calls’ introduced in 1916

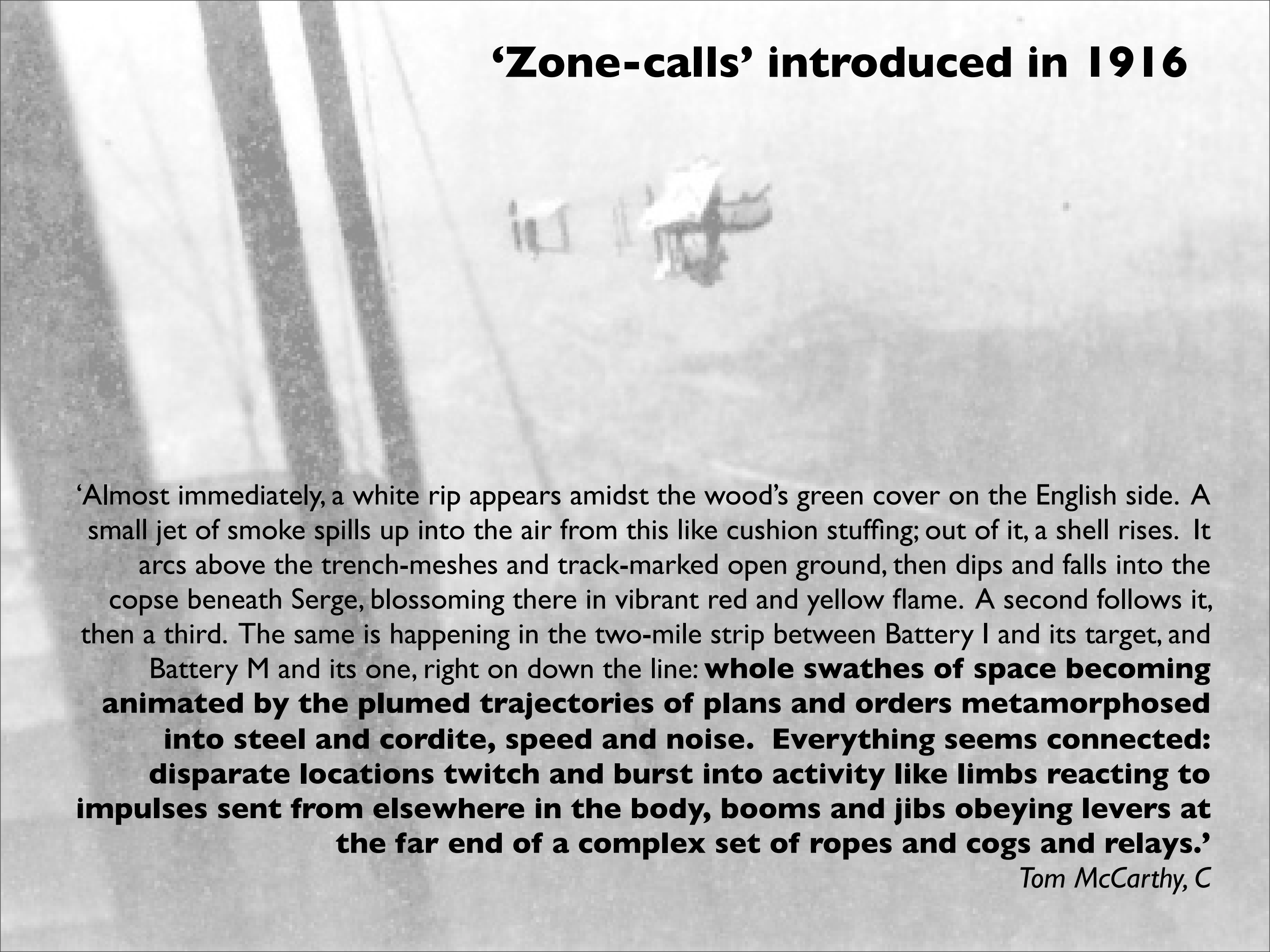
‘Serge feels an almost sacred tingling, as though he himself had become godlike, elevated by machinery and signal code to a higher post within the overall structure of things, **a vantage point from which the vectors and control lines linking earth and heaven, the hermetic language of the invocations, its very lettering and script, have become visible, tangible even, all concentrated at a spot just underneath the index finger of his right hand which is tapping out, right now, the sequence C3E MXI2 G...**

*Tom McCarthy, C*

1	2	3	4	5	6
7	<b>A</b> 8	9	10	<b>B</b> 11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	<b>C</b> 26	27	28	<b>D</b> 29	30
31	32	33	34	35	36



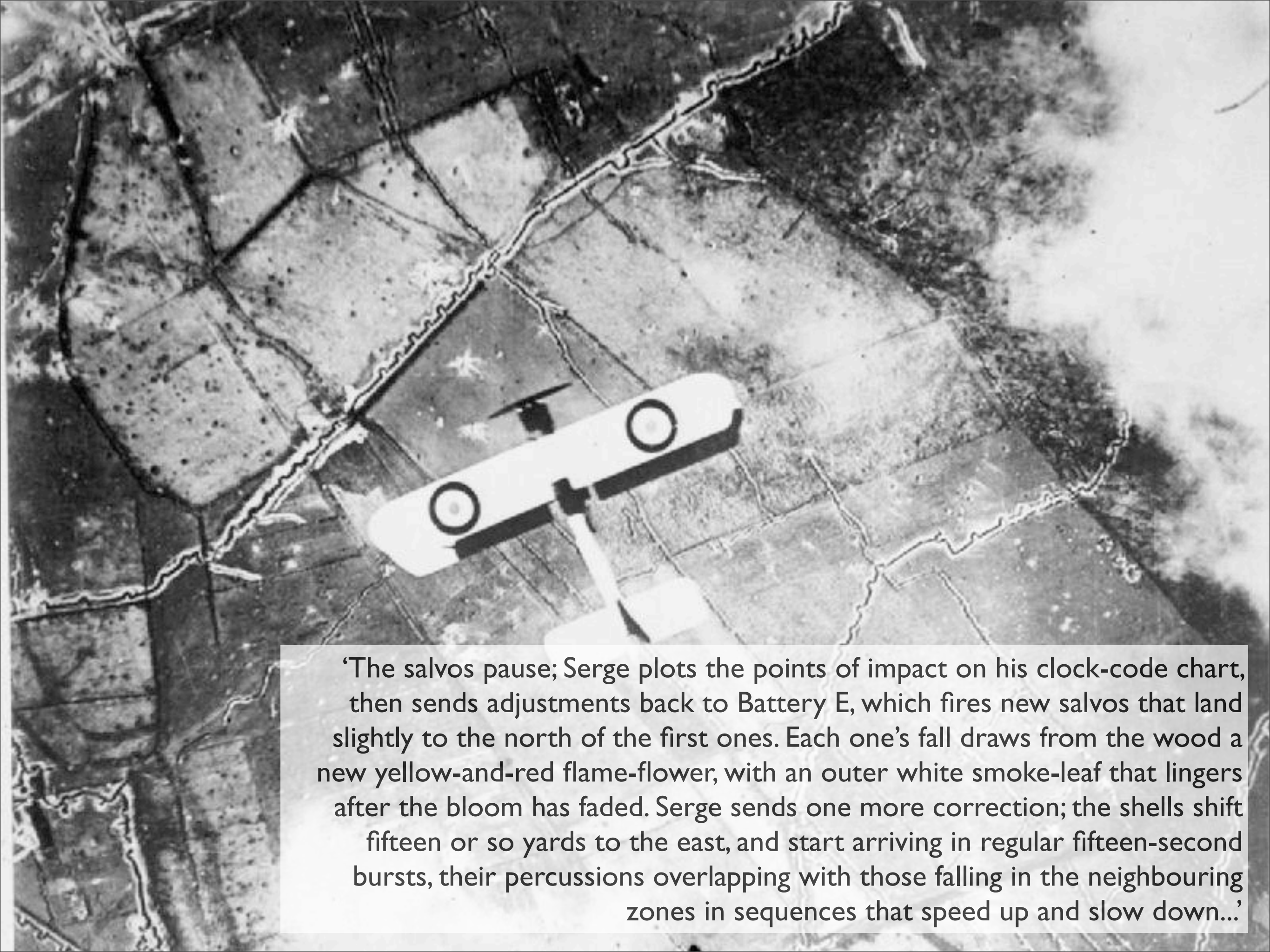
## ‘Zone-calls’ introduced in 1916



‘Almost immediately, a white rip appears amidst the wood’s green cover on the English side. A small jet of smoke spills up into the air from this like cushion stuffing; out of it, a shell rises. It arcs above the trench-meshes and track-marked open ground, then dips and falls into the copse beneath Serge, blossoming there in vibrant red and yellow flame. A second follows it, then a third. The same is happening in the two-mile strip between Battery I and its target, and Battery M and its one, right on down the line: **whole swathes of space becoming animated by the plumed trajectories of plans and orders metamorphosed into steel and cordite, speed and noise. Everything seems connected: disparate locations twitch and burst into activity like limbs reacting to impulses sent from elsewhere in the body, booms and jibs obeying levers at the far end of a complex set of ropes and cogs and relays.**’

*Tom McCarthy, C*





‘The salvos pause; Serge plots the points of impact on his clock-code chart, then sends adjustments back to Battery E, which fires new salvos that land slightly to the north of the first ones. Each one’s fall draws from the wood a new yellow-and-red flame-flower, with an outer white smoke-leaf that lingers after the bloom has faded. Serge sends one more correction; the shells shift fifteen or so yards to the east, and start arriving in regular fifteen-second bursts, their percussions overlapping with those falling in the neighbouring zones in sequences that speed up and slow down..’



# ‘The Manhattan Project of the 1914-18 war’

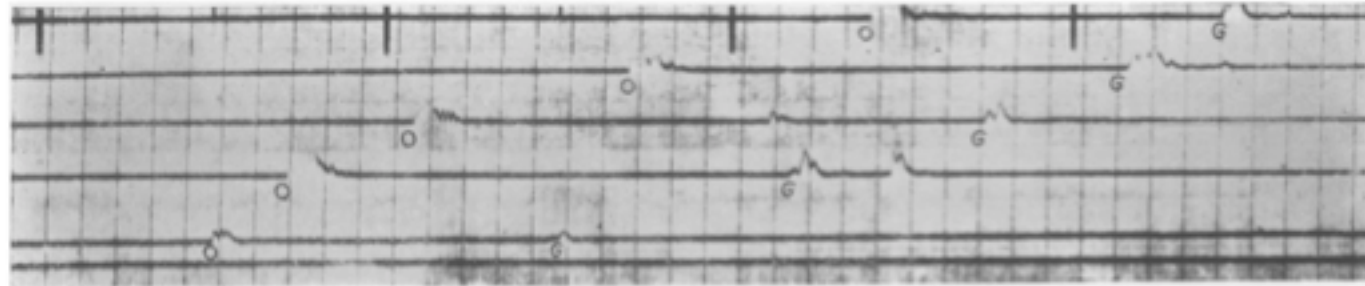


FIG. 18, SLIDE III.

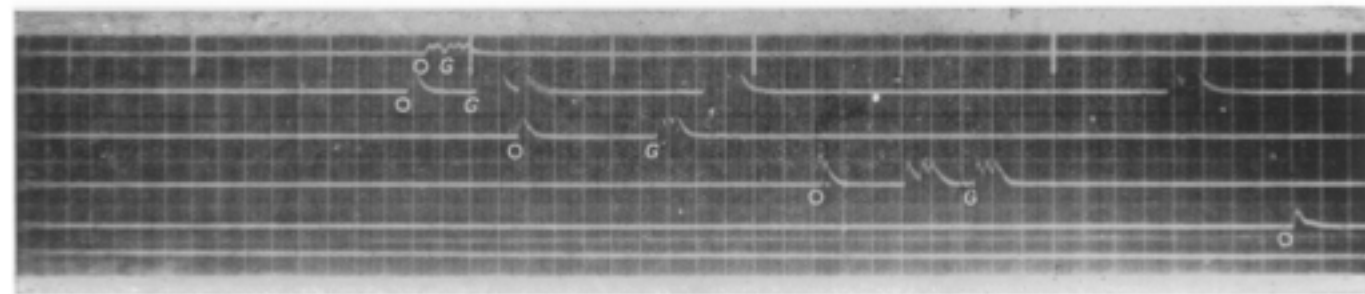


FIG. 19, SLIDE IV A.

“Each gun-boom, when it’s picked up by a mike, sends a current down the wires you just pissed on,” the man continues, “and the current makes the piano wire inside this room heat up and give a little kick, which gets diffracted through the prisms into the next room, and straight into the camera.” **“So you’re filming sound?” Serge asks. “You could say that, I suppose,” the man concurs.**

*Tom McCarthy, C*

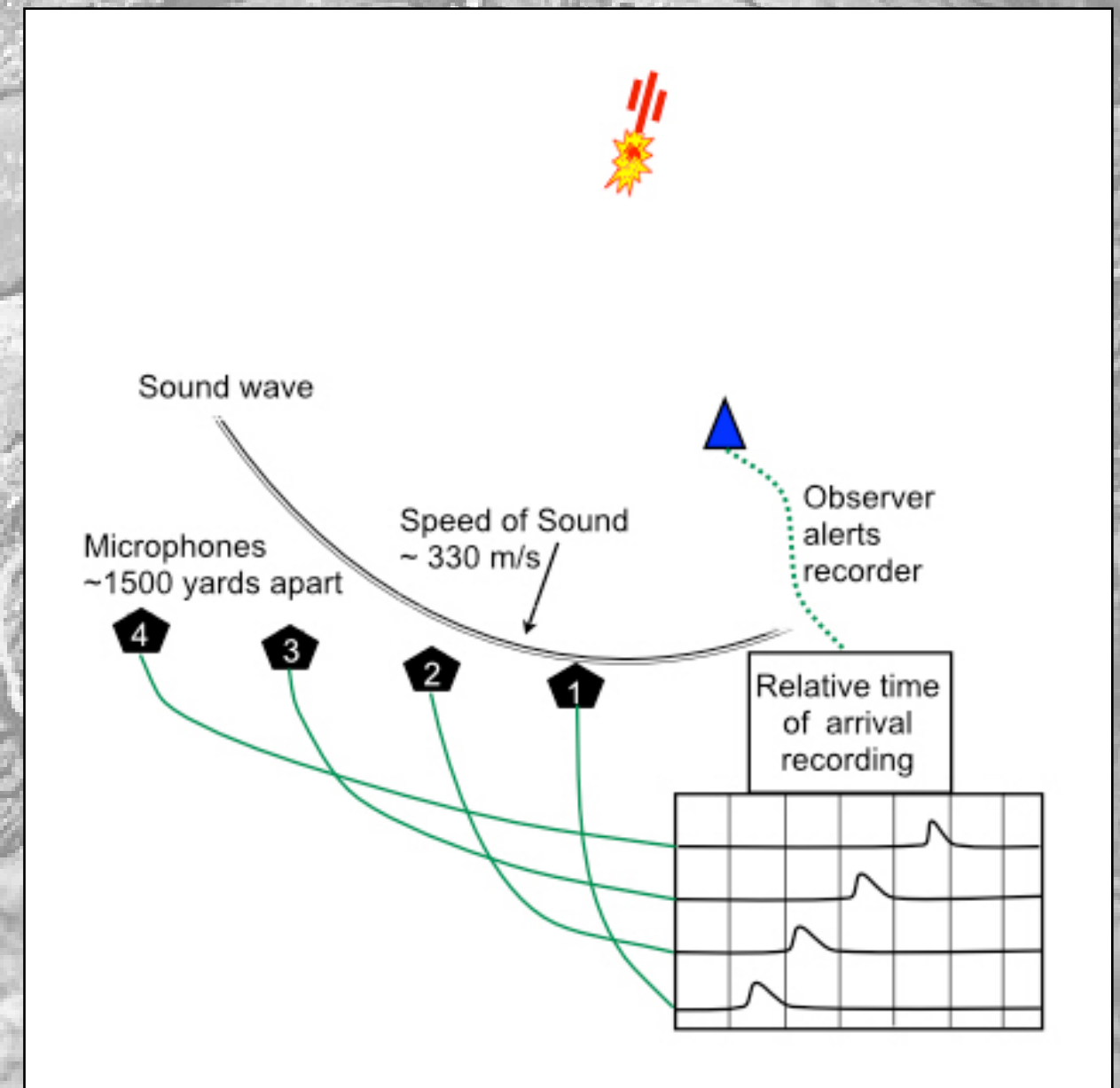


# Sound ranging

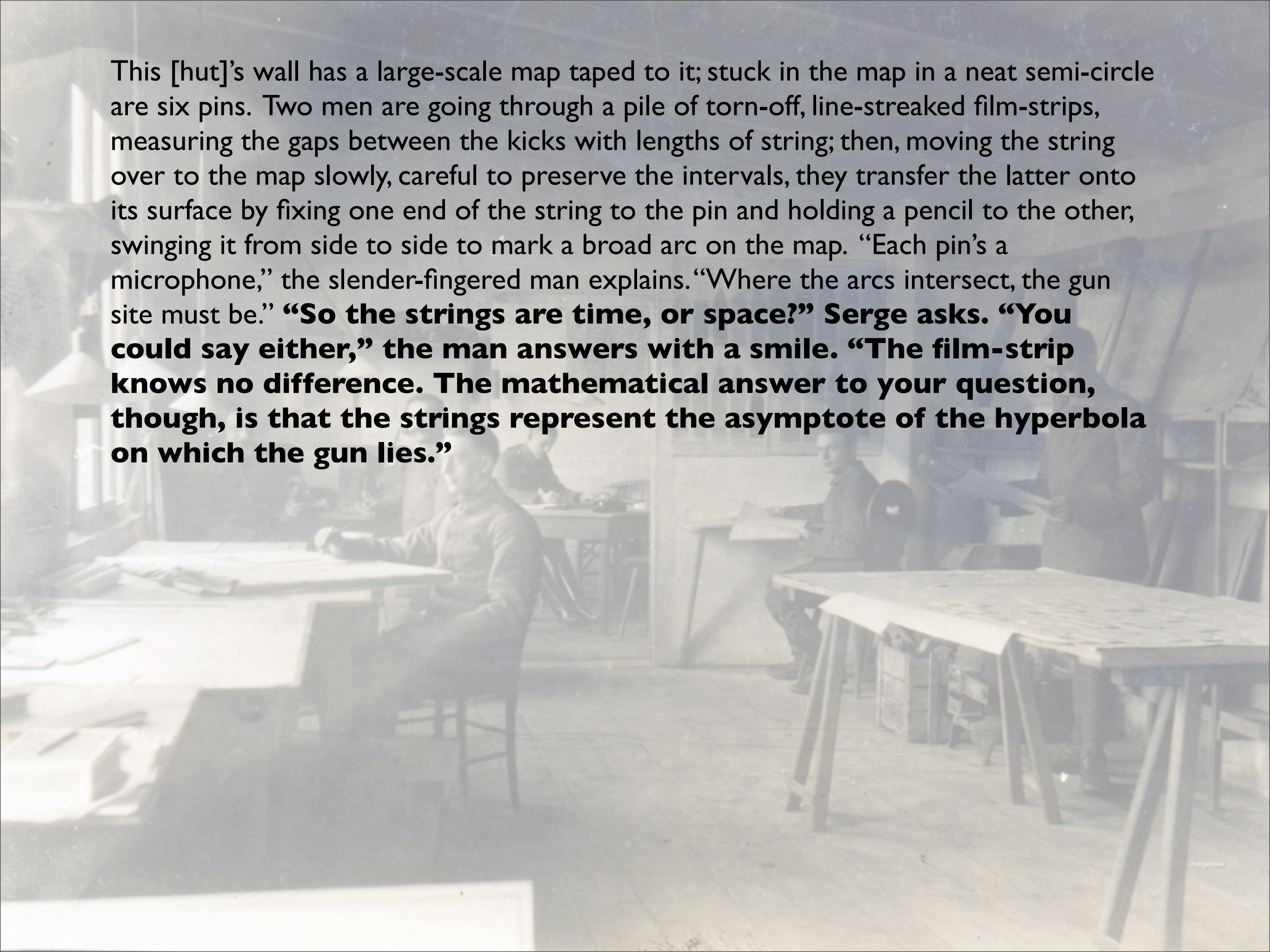


The usual configuration was to have six 'Tucker' microphone stations at carefully surveyed intervals along an arc 4000 yards behind the front line with two observation posts in front of them, all linked to a recording station in the rear by 40 miles of wire.

When the observers saw a gun flash or heard its boom they sent a signal that activated the oscillograph and film recorder.







This [hut]'s wall has a large-scale map taped to it; stuck in the map in a neat semi-circle are six pins. Two men are going through a pile of torn-off, line-streaked film-strips, measuring the gaps between the kicks with lengths of string; then, moving the string over to the map slowly, careful to preserve the intervals, they transfer the latter onto its surface by fixing one end of the string to the pin and holding a pencil to the other, swinging it from side to side to mark a broad arc on the map. "Each pin's a microphone," the slender-fingered man explains. "Where the arcs intersect, the gun site must be." **"So the strings are time, or space?" Serge asks. "You could say either," the man answers with a smile. "The film-strip knows no difference. The mathematical answer to your question, though, is that the strings represent the asymptote of the hyperbola on which the gun lies."**



*Analysis section of German sound ranging station, 1917*





## POSITIONS MAP.

Active between 16-12-17 & 19-1-18, ....

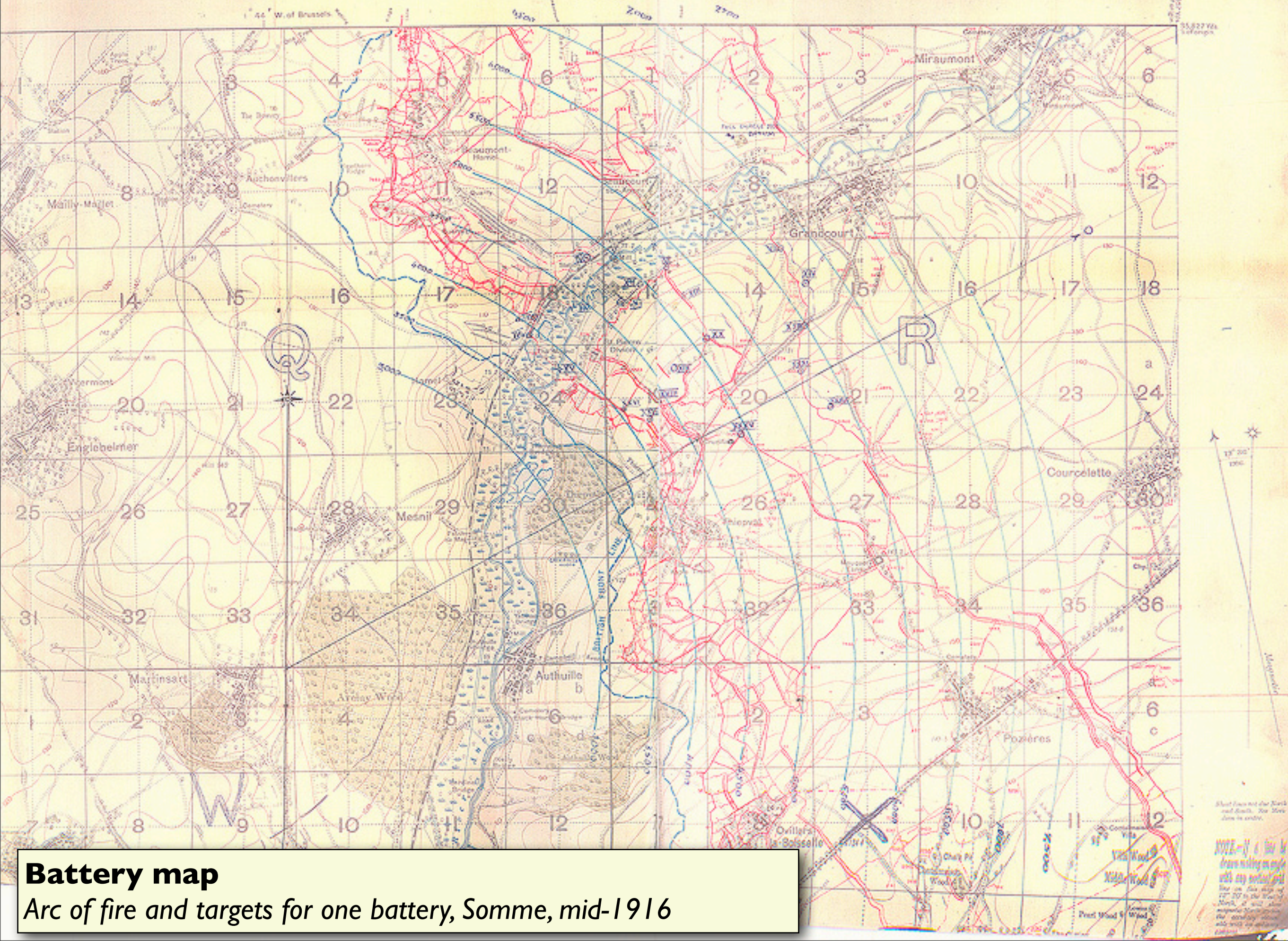
Inactive 29

In the course of 1916 the British established **eight sound-ranging sections**, each plotting battery positions on base maps supplied by 'Maps GHQ'. In ideal conditions (which were rare) the operation could be completed for a single battery within **three minutes** (using graphical rather than computational methods) and with an accuracy of **25-100 yards**.

According to a captured English document the English have a well-developed system of sound-ranging which in theory corresponds to our own. Precautions are accordingly to be taken to camouflage the sound: e.g. registration when the wind is contrary, and when there is considerable artillery activity, many batteries firing at the same time, simultaneous firing from false positions, etc. The English have an objective method (self-recording apparatus). It is important to capture such an apparatus. The same holds good on the French front.

## General Erich von Ludendorff

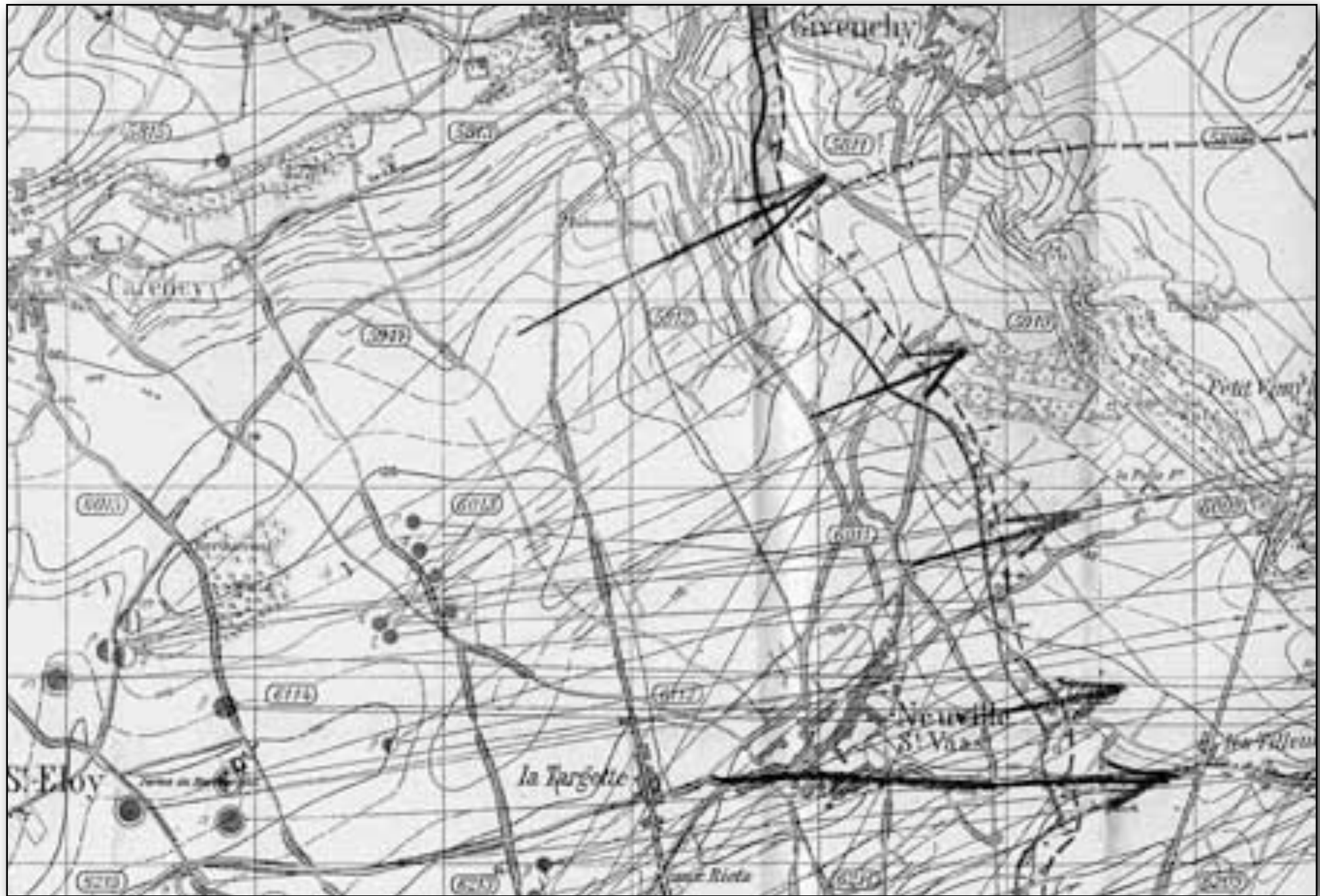




## Battery map

Arc of fire and targets for one battery, Somme, mid-1916





*German artillery intelligence map: Enemy batteries, 15-22 March 1917, Vimy Ridge*



# The mathematics of the barrage

‘We are to go over from tapes laid by the Engineers. The whole thing must be done with mathematical precision, for we are to follow a creeping barrage which is to play for four minutes only a hundred yards in front of the first “ripple” of our first “wave.”’

*A.M. Burrage, War is war*





# The chronology of artillery timing

Major A.F. Becke, 'The coming of the creeping barrage', *Journal of the Royal Artillery* 58 (1) (1931)

## **March 1915 : Battle of Neuve Chapelle: introduction of the artillery time-table**

Three phases: 'the preliminary bombardment'; 'assault of the enemy's first-line trenches'; 'assault of the village of Neuve Chapelle'

## **September 1915: Battle of Loos: introduction of the stepped barrage**

the preliminary bombardment saw the barrage search forward 50 yards at a time, but this was not followed by an infantry advance

## **April 1916: close artillery/infantry co-ordination outlined**

'The lifts of the artillery timetables must conform to the advance of the infantry...The guns must "arrose" each objective just before the infantry assault it. Timing is a matter of most careful consideration' (Commander, Fourth Army)

## **July–November 1916: Battle of the Somme introduction of the creeping barrage**

'The advance of the infantry will be covered by a heavy barrage from all natures of guns and mortars. The heavy artillery barrage will lift direct from one line onto the next. The field artillery barrage will creep back by short lifts. Both will work strictly according to time-table. The lifts have been timed so as to allow the infantry plenty of time for the advance from one objective to the next, on the principle that it is preferable that the infantry should wait for the barrage to lift than that the latter should lift prematurely and thus allow the enemy to man their parapets. The infantry will follow as close behind the barrage as safety admits' (XII Corps Plan of Operations, 15 June)

*Background: Artillery officer directing fire based on aerial observation, Montauban, July 1916*

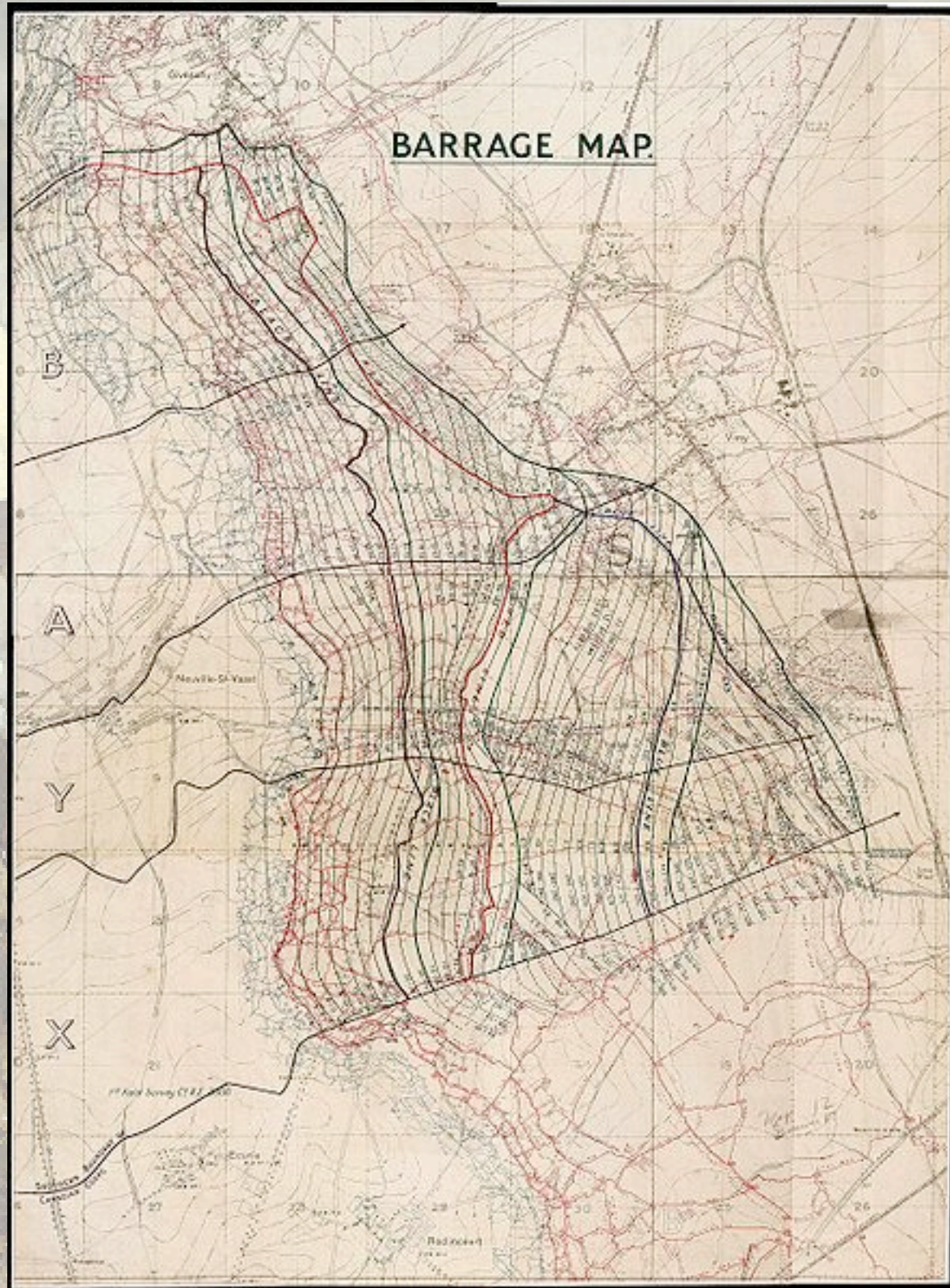




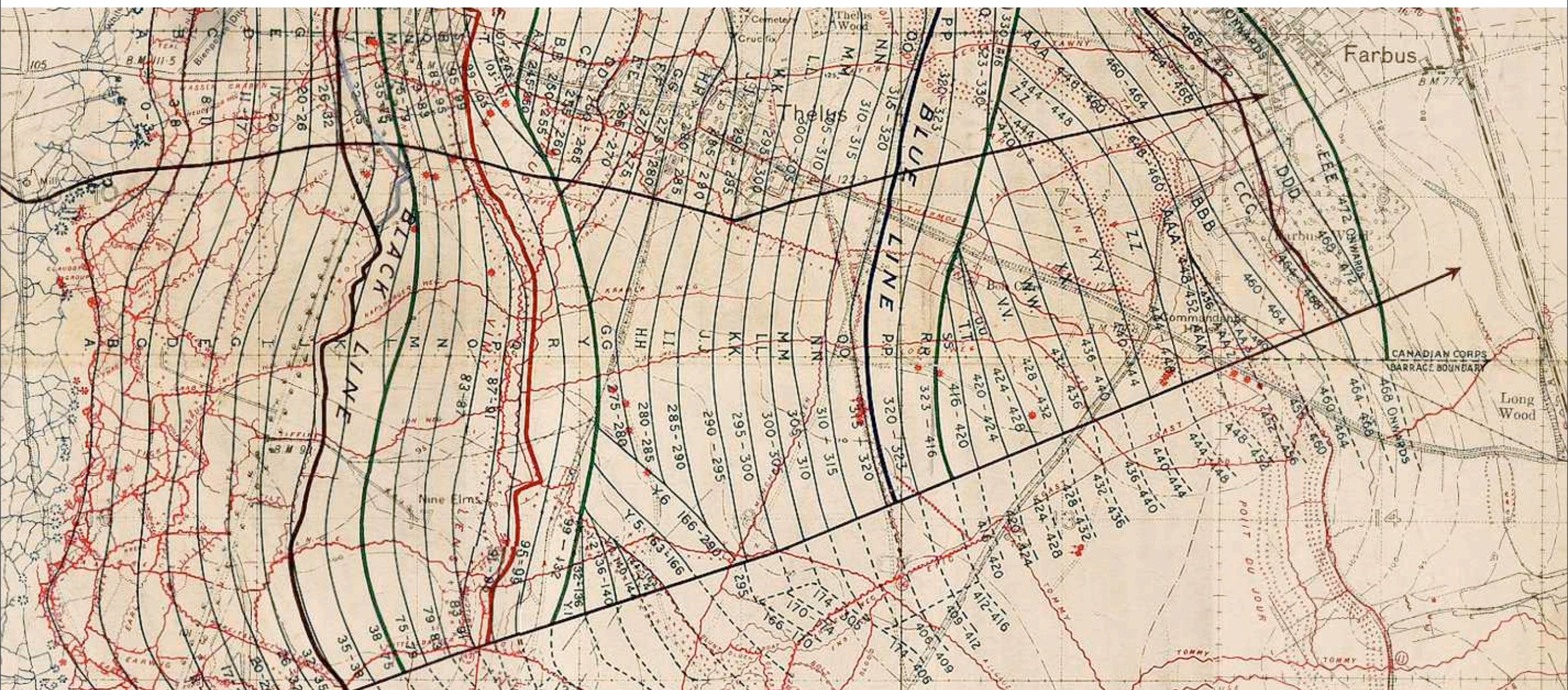
*Bombardment viewed from a balloon, Roclincourt, 23 September 1915*



## Vimy Ridge Barrage Map, April 1917





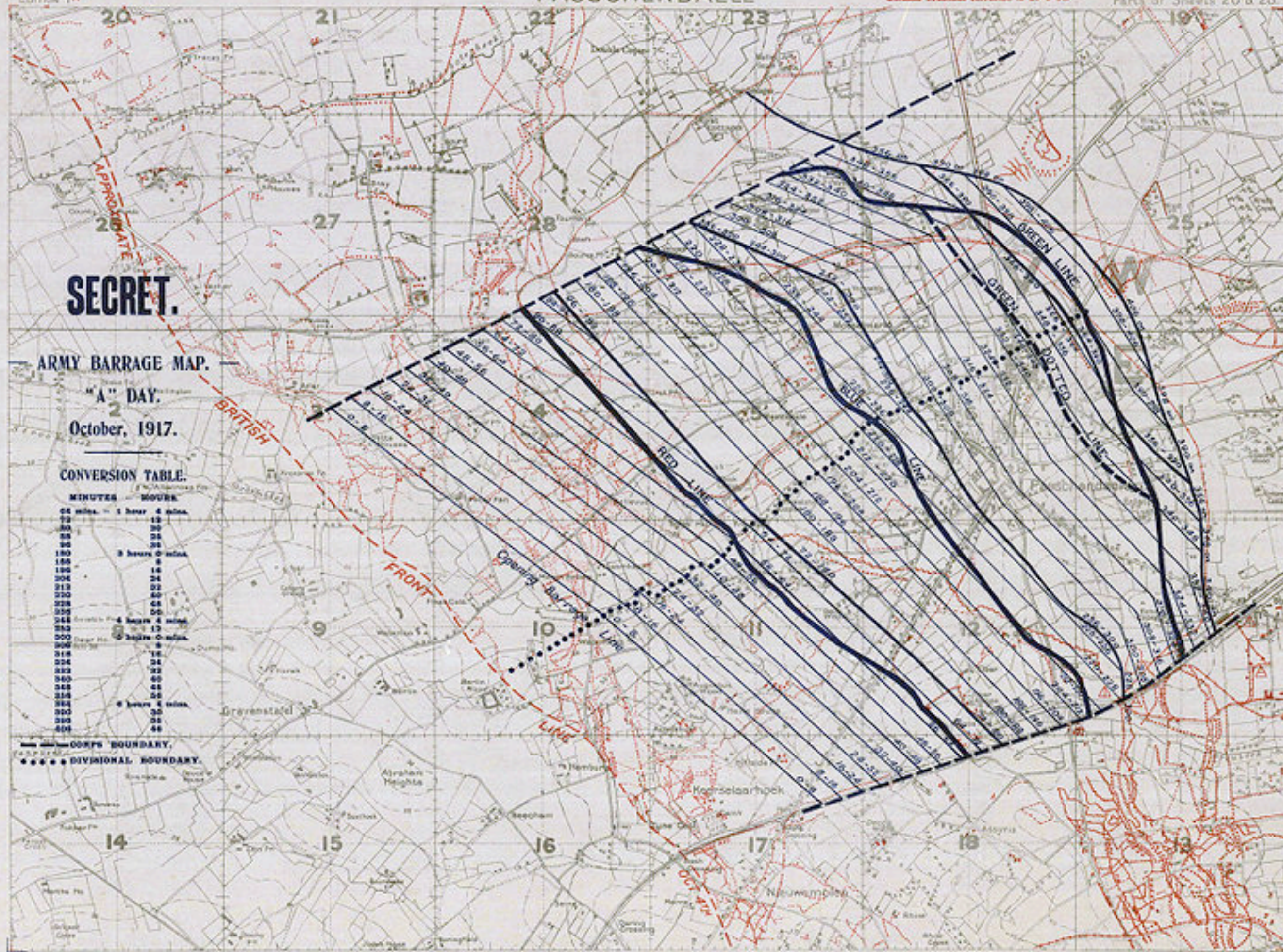




**SECRET.****ARMY BARRAGE MAP.****"A" DAY.****October, 1917.****CONVERSION TABLE.**

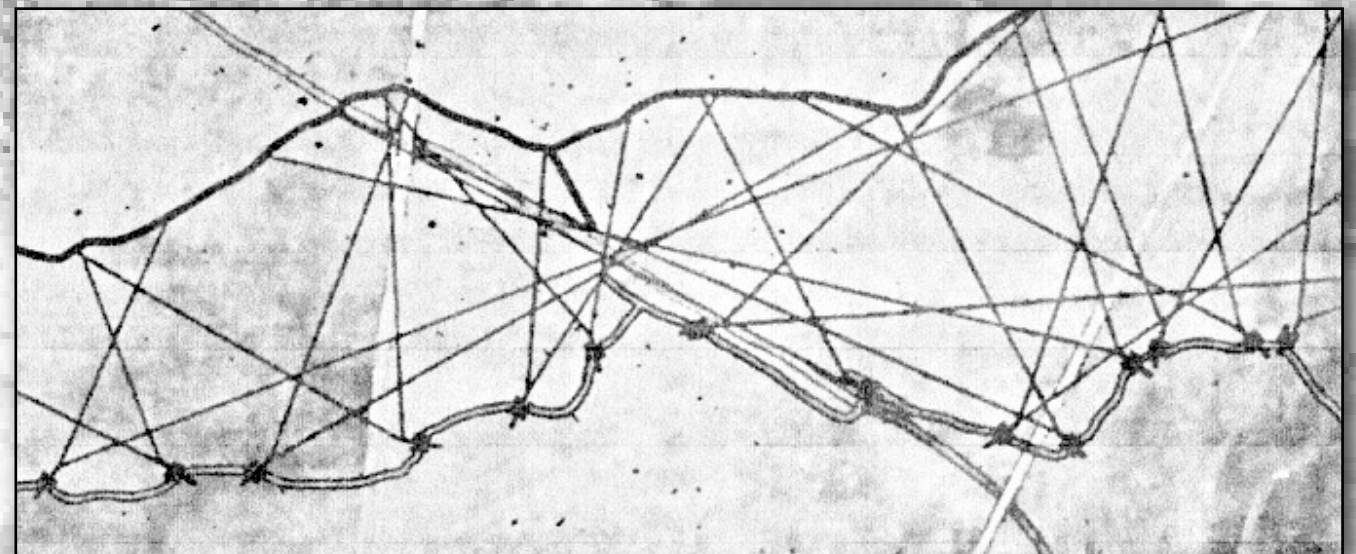
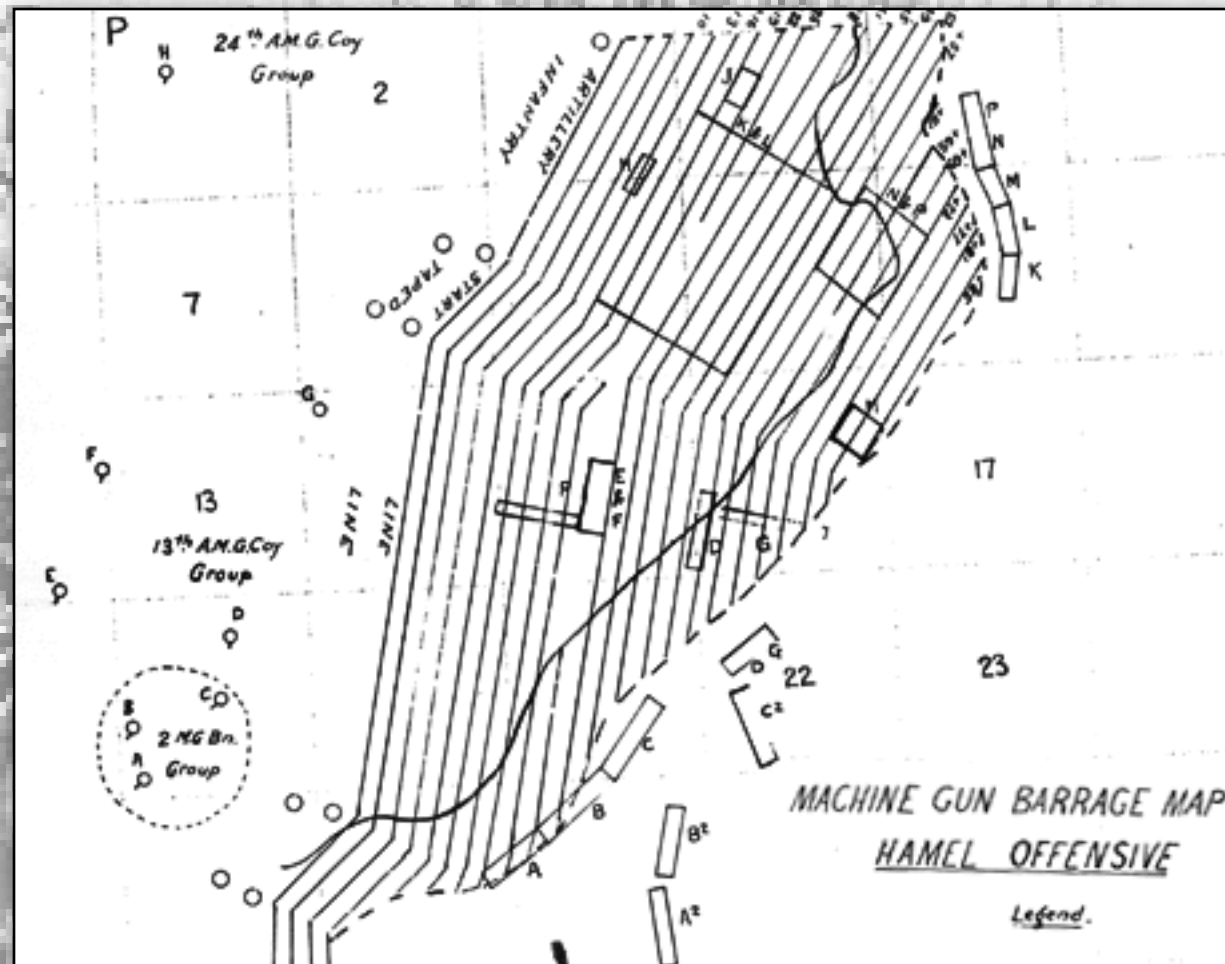
MINUTES	HOURS
00 miles. = 1 hour	0 miles.
15	15
30	30
45	45
60	1 hour
75	1 hour 15
90	1 hour 30
105	1 hour 45
120	2 hours
135	2 hours 15
150	2 hours 30
165	2 hours 45
180	3 hours
195	3 hours 15
210	3 hours 30
225	3 hours 45
240	4 hours
255	4 hours 15
270	4 hours 30
285	4 hours 45
300	5 hours
315	5 hours 15
330	5 hours 30
345	5 hours 45
360	6 hours

--- CORPS BOUNDARY.  
 .... DIVISIONAL BOUNDARY.





# The geometry of the machine-gun





'The plan for the attack has now come out – about 100 pages of typed foolscap which had to be read through, digested and from which the battery programme had to be extracted and the calculations made.'

*Major Roderick Macleod, Royal Field  
Artillery  
[in Nigel Steel and Peter Hart, Passchendaele:  
the sacrificial ground]*

#### 4. TANKS.

- (1) No. 9 Section of the Tanks will deal with our own Brigade frontage, and No. 10 Section with that of the Northern Section (13th Brigade).
- (ii) The Tanks will move from BOIS DE MARQUEIL to their starting point in ELBE Trench about A.9.a.2.4. on X/Y night.

Route will be - F.20.b.8.9. - across country to F.17.d.7.1. - along North side of road to F.18.c.6.8. - cross road at this point - along South side of road to A.13.b.2.3. - along road thence to A.13.b.5.8. - thence South of road to A.14.a.3.6. Thence straight across country to starting point.

Approximate time table for the move is as follows:-

Leave	F.20.b.8.9.	8.15 p.m.
Arrive	F.17.d.7.1.	11.15 p.m.
Cross Road	F.18.c.6.8.	12 mid-night.
Follow road	A.13.b.2.3. } A.13.b.5.8. }	12.30 - 1.30 a.m.
Cross BETHUNE Road	(S. of AUX RIETZ Corner)	2.00 a.m.
Arrive ELBE.		3.15 a.m.
Swinging & Lying up.		3.15 - 4.14 a.m.

- (iii) In order to cover the noise of this movement, Field Artillery and Machine Guns will arrange to keep up a steady fire from mid-night X/Y till dawn on "Y" day.
- (iv) The two Tanks of No. 9 Section moving round the South Side of THELUS will continue along TAPE Trench as far as the road at A.12.d.6.8. before returning to the rendezvous behind THELUS WOOD.
- (v) No code of Signals will be required between the Tanks and the Infantry, other than Observers. Infantry Observers in O.Pa. must be prepared to receive messages sent by ALDIS Lamp from the Tanks, codes for which are attached hereto.

#### 5. EMPLOYMENT OF FIELD COMPANIES ON STRONG POINTS.

The two Sections of Field Company detailed to work on 31st Battalion Strong Point "U" and 28th Battalion Strong Point "V", will remain in their billets on Y/Z night, and will report to the G.O.C., at approximate ZERO plus 4 hours. The G.O.C., will then decide whether the situation permits of them going forward to commence work.

#### 6. LIGHT SIGNALS TO DENOTE CAPTURE OF OBJECTIVES.

As soon as the BLACK, RED, BLUE and BROWN Lines respectively have been captured, three WHITE Very Lights will be fired by the assaulting troops as a signal to show that they have reached their objectives.

These signals are only to be fired by order of the Oa.C. Assaulting Companies; the necessary pistols and ammunition being carried by Company Headquarters.

In addition a special signal to denote the capture of THELUS or HILL 140 consisting of three GOLD and SILVER Rain Rockets will be fired by assaulting troops of 8th and 13th Brigades. These rockets will only be fired by orders of an O.C., Assaulting Company.

All Observers will be warned to keep a special look-out for these signals.



# Modelling the trenches

‘...an enormous model of the German systems now considered due to Britain was open for inspection, whether from the ground or from step-ladders raised beside, and this was popular, though whether from its charm as a model or value as a military aid is uncertain.’

Edmund Blunden, *Undertones of war*









# Modelling the trenches

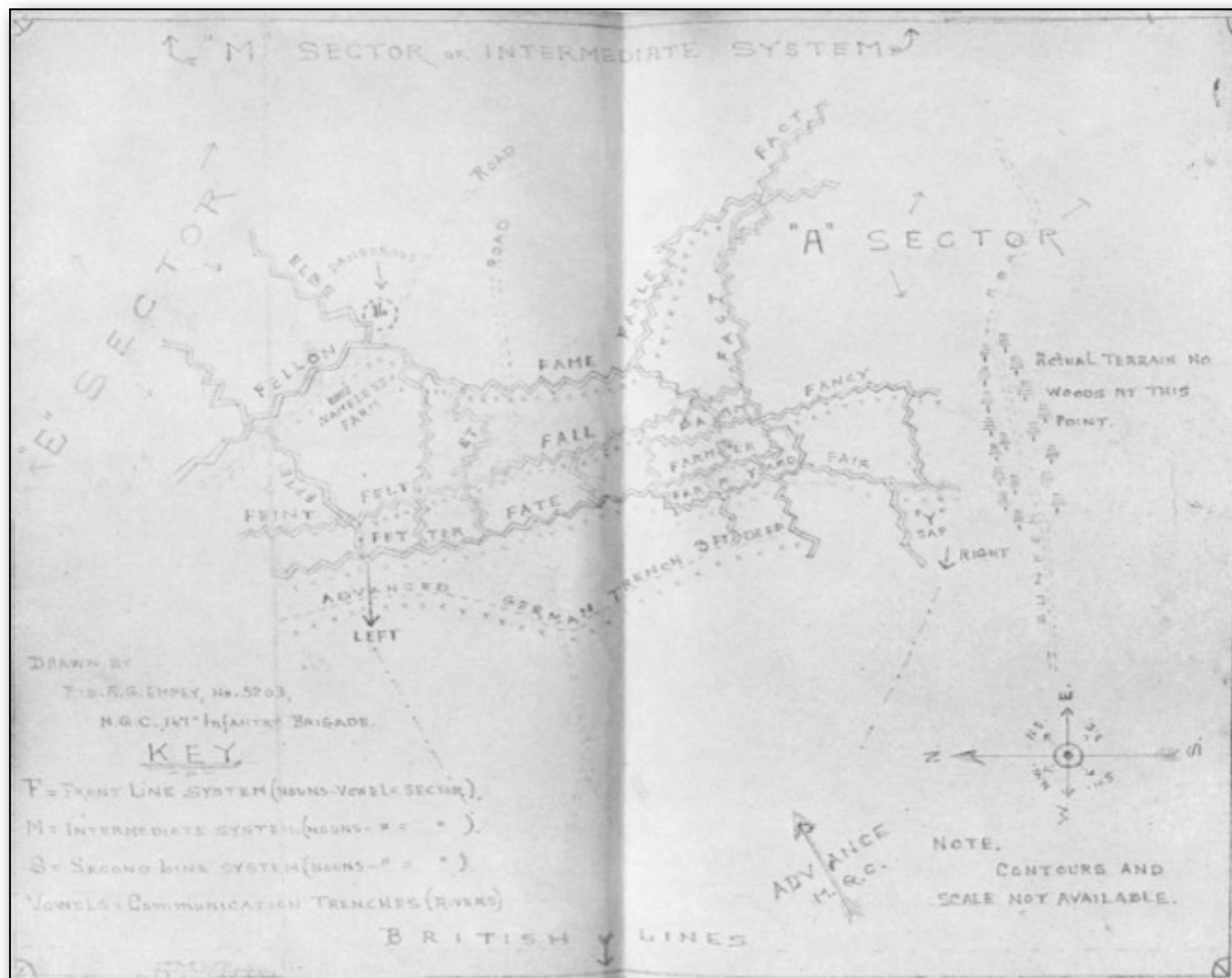
‘Three weeks before the Big Push of July 1st [1916] – as the Battle of the Somme has been called – started, exact duplicates of the German trenches were dug about thirty kilos behind our lines. The layout of the trenches were taken from aeroplane photographs submitted by the Royal Flying Corps. The trenches were correct to the foot; they showed dugouts, saps, barbed wire defences, and danger spots.

‘Battalions that were to go over in the first waves were sent back for three days to study these trenches, engage in practice attacks, and have night maneuvers. Each man was required to make a map of the trenches and familiarize himself with the names and location of the parts his battalion was to attack...

‘These imitation trenches, or trench models, were well guarded from observation by numerous allied planes which constantly circled above them. No German aeroplane could approach within observing distance. A restricted area was maintained and no civilian was allowed within three miles...’

*Arthur Empey, Over the top*

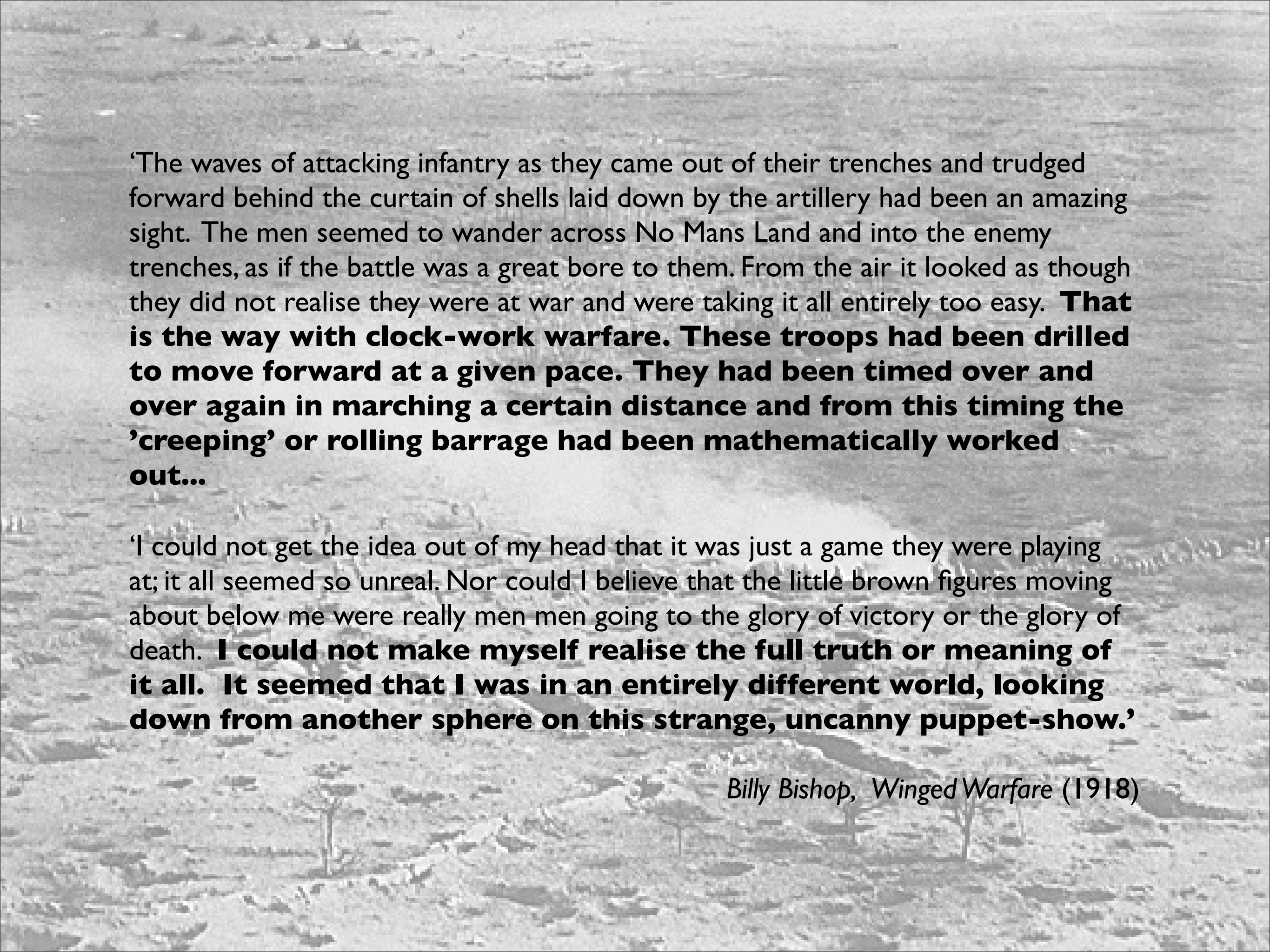




“When we took over the front line we received an awful shock. The Germans displayed signboards over the top of their trench showing the names that we had called their trenches. The signs read "Fair," "Fact," "Fate," and "Fancy" and so on, according to the code names on our map. Then to rub it in, they hoisted some more signs which read, "When are you coming over?" or "Come on, we are ready, stupid English.”

*Arthur Empey, Over the top*





‘The waves of attacking infantry as they came out of their trenches and trudged forward behind the curtain of shells laid down by the artillery had been an amazing sight. The men seemed to wander across No Mans Land and into the enemy trenches, as if the battle was a great bore to them. From the air it looked as though they did not realise they were at war and were taking it all entirely too easy. **That is the way with clock-work warfare. These troops had been drilled to move forward at a given pace. They had been timed over and over again in marching a certain distance and from this timing the ‘creeping’ or rolling barrage had been mathematically worked out...**

‘I could not get the idea out of my head that it was just a game they were playing at; it all seemed so unreal. Nor could I believe that the little brown figures moving about below me were really men men going to the glory of victory or the glory of death. **I could not make myself realise the full truth or meaning of it all. It seemed that I was in an entirely different world, looking down from another sphere on this strange, uncanny puppet-show.**’

*Billy Bishop, Winged Warfare (1918)*





Christopher Nevinson, *Nerves of the Army* (1918)

**‘The communication system in Fourth Army, resembling in essentials that installed up and down the Western Front and on both sides of no-man’s-land, was a comprehensive one.** It was based on the telephone and the telegraph, the latter replacing the former where amplification was difficult to ensure, and ran through an extremely elaborate network of ‘land line’ and ‘air line’. Airlines from the major headquarters – G.H.Q. at Montreuil and Fourth Army H.Q. at Querrieux, fifteen miles from the front – to Corps, and Division, with as much lateral branching as was necessary to make communication to a flank possible. Forward of Division, to Brigade and Battalion, the lines left their poles to descend earthward, becoming ‘land lines’...The nearer it approached the front trench, the deeper was it buried, until in the forward zone it reached a depth of six feet.

‘It had, however, one disabling shortcoming: it stopped at the edge of no-man’s-land. Once the troops left their trenches, as at 7.30 a.m. on July 1st [1916, on the Somme], they passed beyond the carry of their signals system into the unknown.

‘The army had provided them with some makeshifts to indicate their position: rockets, tin triangles sewn to the backs of their packs as air recognition symbols, lamps and flags, and some one-way signalling expedients, Morse shutters, semaphore flags and carrier pigeons...’

John Keegan, *The Face of Battle*



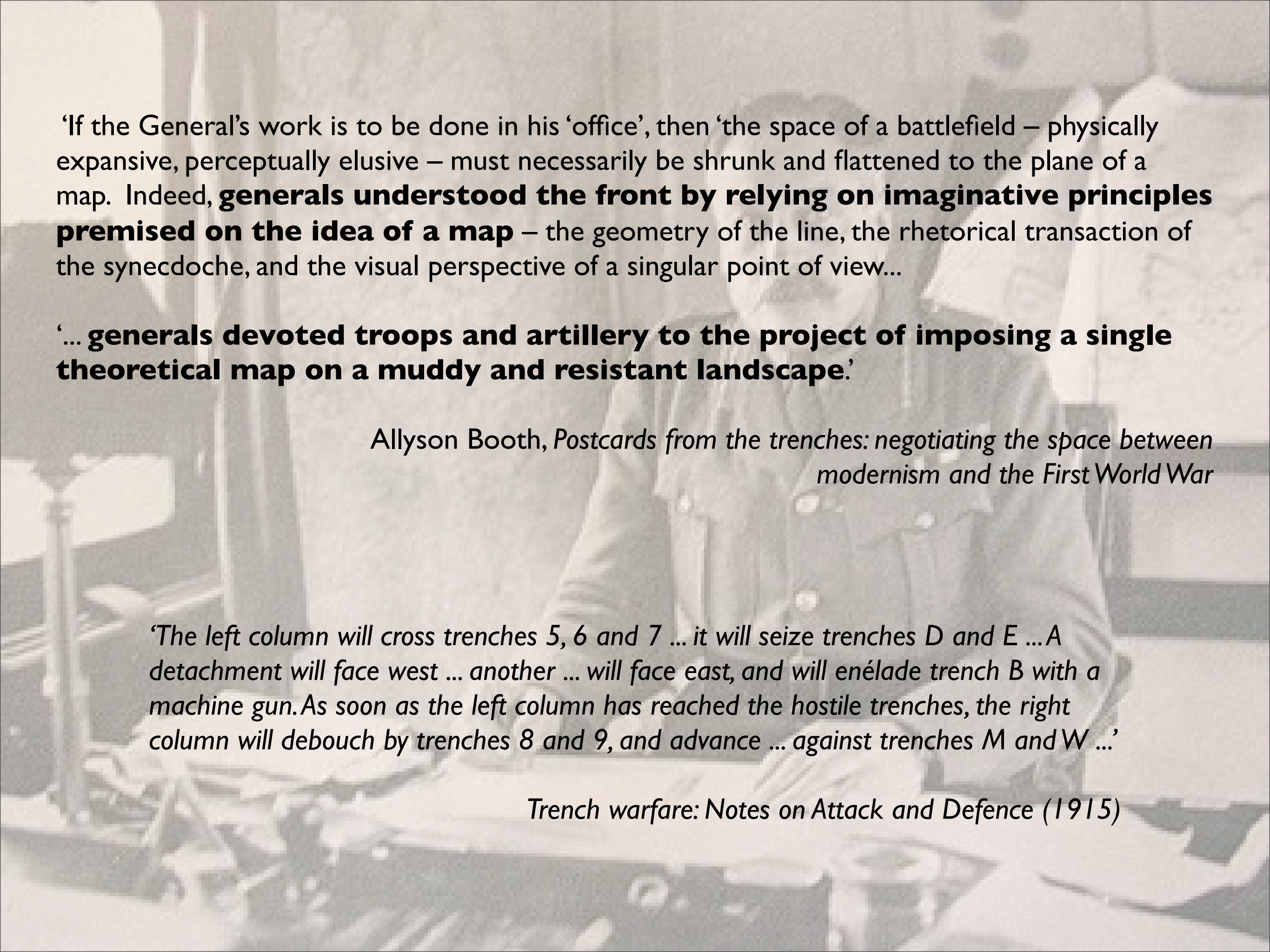
# The fog-horn of war

‘We had all our contact patrol technique perfected and we went right down to 3,000 feet to see what was happening. We had a klaxon horn on the undercarriage of the Morane – a great big 12 volt klaxon, and I had a button which I used to press out a letter to tell the infantry we wanted to know where they were. When they heard us hawking them from above, they had little red Bengal flares, they carried them in their pockets, they would put a match to their flares. All along the line wherever there was a chap there would be a flare, and we would note those flares down on the map and Bob’s your uncle!’

‘It was one thing to practice this but quite another for them to really do it when they were under fire, and particularly when things began to go a bit badly. Then they jolly well wouldn’t light anything and small blame to them because it drew the fire of the enemy on to them at once.’

*2nd Lt Cecil Lewis Royal Flying Corps  
(Peter Hart, Somme success)*





‘If the General’s work is to be done in his ‘office’, then ‘the space of a battlefield – physically expansive, perceptually elusive – must necessarily be shrunk and flattened to the plane of a map. Indeed, **generals understood the front by relying on imaginative principles premised on the idea of a map** – the geometry of the line, the rhetorical transaction of the synecdoche, and the visual perspective of a singular point of view...

‘... **generals devoted troops and artillery to the project of imposing a single theoretical map on a muddy and resistant landscape.**’

Allyson Booth, *Postcards from the trenches: negotiating the space between modernism and the First World War*

*‘The left column will cross trenches 5, 6 and 7 ... it will seize trenches D and E ... A detachment will face west ... another ... will face east, and will enélade trench B with a machine gun. As soon as the left column has reached the hostile trenches, the right column will debouch by trenches 8 and 9, and advance ... against trenches M and W ...’*

*Trench warfare: Notes on Attack and Defence (1915)*



‘It is a spirit not of providing for eventualities, but rather of **attempting to preordain the future; a spirit borne out by the language of the orders:** *‘infantry and machine-guns will be pushed forward at once ...’; ‘the siege and heavy artillery will be advanced ...’ ‘After the capture of their final objective the 30th Division will be relieved by the 9th Division ...’* ... [A]ttempts at preordination are always risky and require as a minimum precondition for success the co-operation of all concerned. Upon that of the Germans the British could not of course count.

‘Consequently, **at every point where the future threatened to resist preordination, Haig and Rawlinson had reinsured themselves** – by lengthening the duration of the bombardment, adding to the targets to be destroyed, increasing the ratio of troops to space.

‘**The effect of these reinsurances was to complicate the plan.** And the complication of a plan which would depend for its success on the smooth interaction of a very large number of mutually dependent elements invited its frustration.

John Keegan, *The Face of Battle*



**Not only an abstract space but also a mechanical,  
automated space**

*‘... space has no social existence independently of an intensive,  
aggressive and repressive visualization. It is thus – not  
symbolically but in fact – a purely visual space. The rise of the  
visual realm entails a series of substitutions and displacements by  
means of which it **overwhelms the whole body** and usurps  
its role.’*

*Henri Lefebvre, The production of space*



# The production of this abstract, visual space may have been automated but it was not autonomic

In particular Paul Saint-Amour notes that the production of aerial photographs and the practice of photogrammetry required the **bodily investment** of the observer-interpreter:

*‘In respect to relief displacement, shadow orientation and hemisphere, aerial stereoscopy insisted...[on] **an incarnated observer**, one who had to be properly oriented toward light, image, and perceptual habits, while being lowered, so to speak, into the virtual cockpit of the stereo image... Far from delivering a disembodied but immediately legible overview of its objects, aerial stereoscopy did as much to expose the spatial and **biological contingency of its observers** as it did to lay bare the terrain it depicted.’*

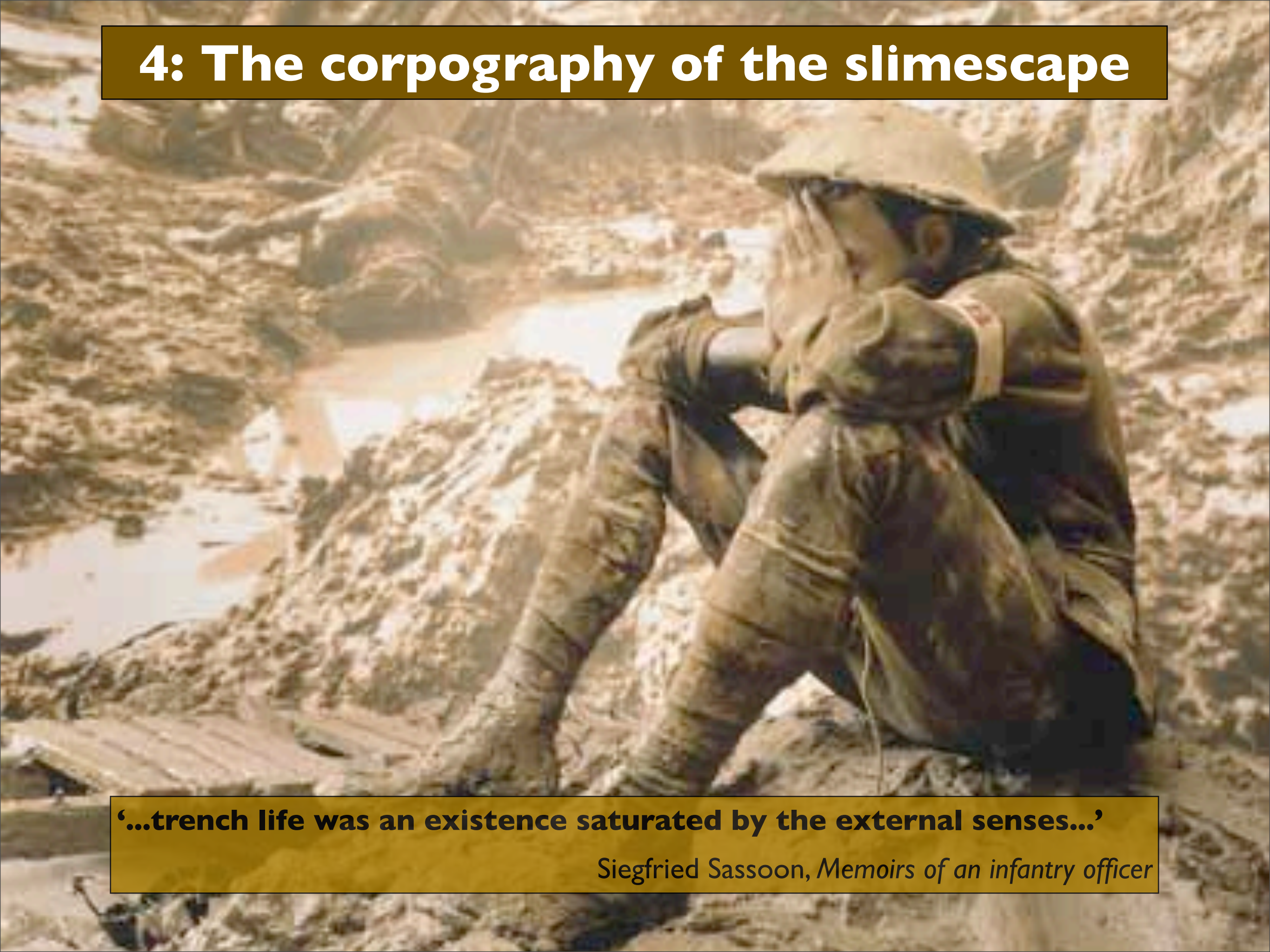




Christopher Nevinson, *The underground war*



## 4: The corpography of the slimescape



**‘...trench life was an existence saturated by the external senses...’**

Siegfried Sassoon, *Memoirs of an infantry officer*



# **‘Tommification’: familiarisation and the surreal**



*Frank Hurley*



Muirhead Bone, A view in Flanders behind the lines (1916)



Muirhead Bone



*Muirhead Bone, Spring in Rollencourt (1918)*





*Christopher Nevinson, A front line near Saint Quentin*





*Christopher Nevinston, The strafing (1916)*





# Dialectical images

**Paul Saint-Amour** regards photo-reconnaissance and photogrammetry not as 'applied realism' (Sekula's term) but as '**applied modernism**' with structural affinities to the optical geometries of Cubism and Futurism: '**distortion was the only route to revelation**'.

*Paul K. Saint-Amour, 'Applied modernism: military and civilian uses of the aerial photomosaic',  
Theory, culture and society 28 (7-8) (2011) 241-269*

**When Nevinson turned to Futurist tropes and techniques to reproduce the violence of the Western Front he was thus also recovering and reinscribing the scopic regime that was instrumental in the production of that violence.**





# Soundscape

‘The mechanised nature of the First World War severed the link between sight, space and danger, a connection that had traditionally been used to structure perception in wartime. This disjunction resulted in **an exaggerated investment in sound**.’

Santanu Das, *Touch and intimacy in World War I literature*

**‘Talk gets on to the sounds made by shells, and the minenwerfers that we can run from if our luck’s in, and about the spiteful little whizz-bang that it’s generally too late to run from when it’s heard... More digging and the [machine-]gun fires again. Jacko makes to get down, but has a nasty shock when he sees that none of us has even bobbed. We explain that we knew by the sound of the gun that it was not firing in our direction.... Gas shells are sometimes hard to distinguish from duds. They land with a little putt-tt sort of sound. Just enough explosive in them to burst the case and release the gas without scattering it...’**

**‘The shells are missing us by a matter of yards. Noise is everywhere. We lie on the shuddering ground, rocking to the vibrations, under a shower of solid noise we feel we could reach out and touch. The shells come, burst and are gone, but that invisible noise keeps on – now near, now far, now near, now far again. Flat, unceasing noise.’**

**Edward Lynch, *Somme Mud***



**‘We know by the singing of a shell when it is going to drop near us, when it is politic to duck and when one may treat the sound with contempt.** We are becoming soldiers. We know the calibres of the shells which are sent over in search of us. The brute that explodes with a crash like that of much crockery being broken, and afterwards makes a “cheering” noise like the distant echoes of a football match, is a five-point-nine. The very sudden brute that you don't hear until it has passed you, and rushes with the hiss of escaping steam, is a whizz-bang... The funny little chap who goes tonk-phew-bong is a little high-velocity shell which doesn't do much harm... The thing which, without warning, suddenly utters a hissing sneeze behind us is one of our own trench-mortars. The dull bump which follows, and comes from the middle distance out in front, tells us that the ammunition is “dud.” The German shell which arrives with the sound of a woman with a hare-lip trying to whistle, and makes very little sound when it bursts, almost certainly contains gas.

‘We know when to ignore machine-gun and rifle bullets and when to take an interest in them. A steady phew-phew-phew means that they are not dangerously near. When on the other hand we get a sensation of whips being slashed in our ears we know that it is time to seek the embrace of Mother Earth.’

**A.M. Burrage, *War is war***



# Slimescape

**‘War turns landscape into anti-landscape, and everything in that landscape into grotesque, broken, useless rubbish – including human limbs.’**

**Samuel Hynes, *The soldiers’ tale***

**‘...trench mud was not only mud but was also compounded of organic wastes, industrial debris, iron scraps and even rotting flesh, all dissolving into what Sassoon calls “plastering slime”.’**

**Santanu Das, *Touch and intimacy in World War I literature***







**'... that mud which we cursed and in which we stuck and staggered, slipped and slid,** tugging our boots out of it each time we made a fresh step. Jerry's shells showered us with filth, they disturbed the riddled and broken corpses, they re-shredded the putrid flesh into scraps. It was easy to go "missing": if you got hit, the chances were you slipped into some yawning shell-hole full of greyly opaque water concealing unmentionable things and you drowned there.

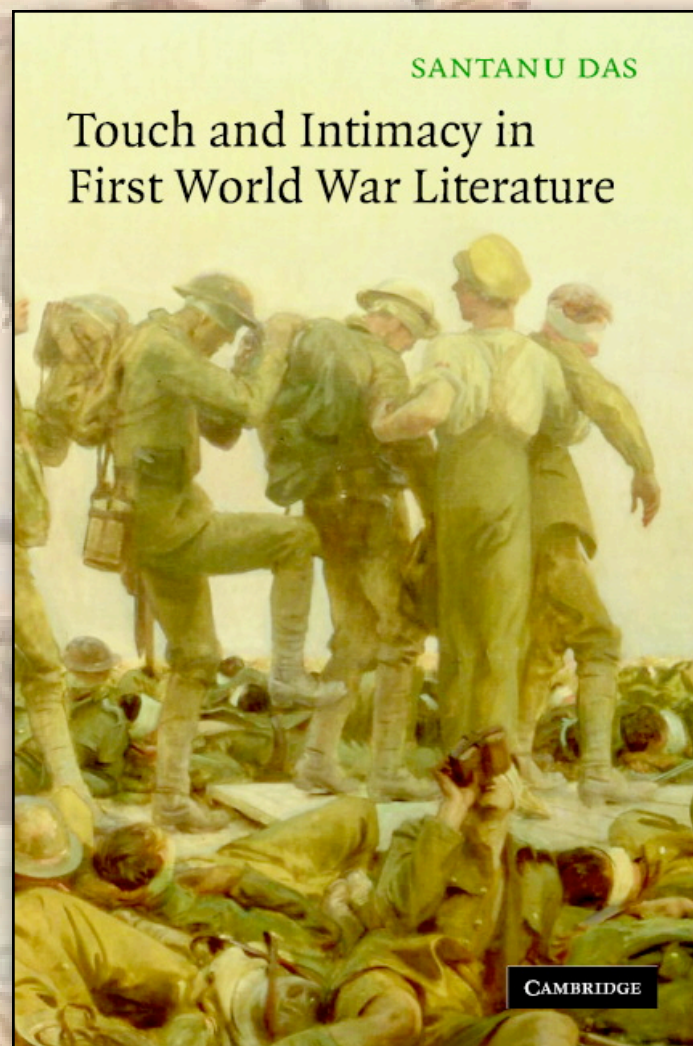
**'Wherever you went in this nightmare country you saw obscene things protruding from the mud. All around us lay the dead, both friend and foe, half in, half out of the water-logged shell holes. Their hands and boots stuck out at us from the mud. Their rotting faces stared blindly at us from coverlets of mud; their decaying buttocks heaved themselves obscenely from the filth with which the shell bursts had smothered them...** They had lain, many of them, for weeks and months; they would lie and rot and disintegrate foully into the muck until they were an inescapable part of it...

**'I never grew accustomed to the all-pervading stench of decayed and decaying flesh, mingled with that of high explosive fumes that hung over miles and miles of what had been sweet countryside and now was one vast much heap of murder.'**

*Lt R.G. Dixon, Royal Garrison Artillery  
[in Nigel Steel and Peter Hart, Passchendaele: the sacrificial ground]*



# Haptic geographies

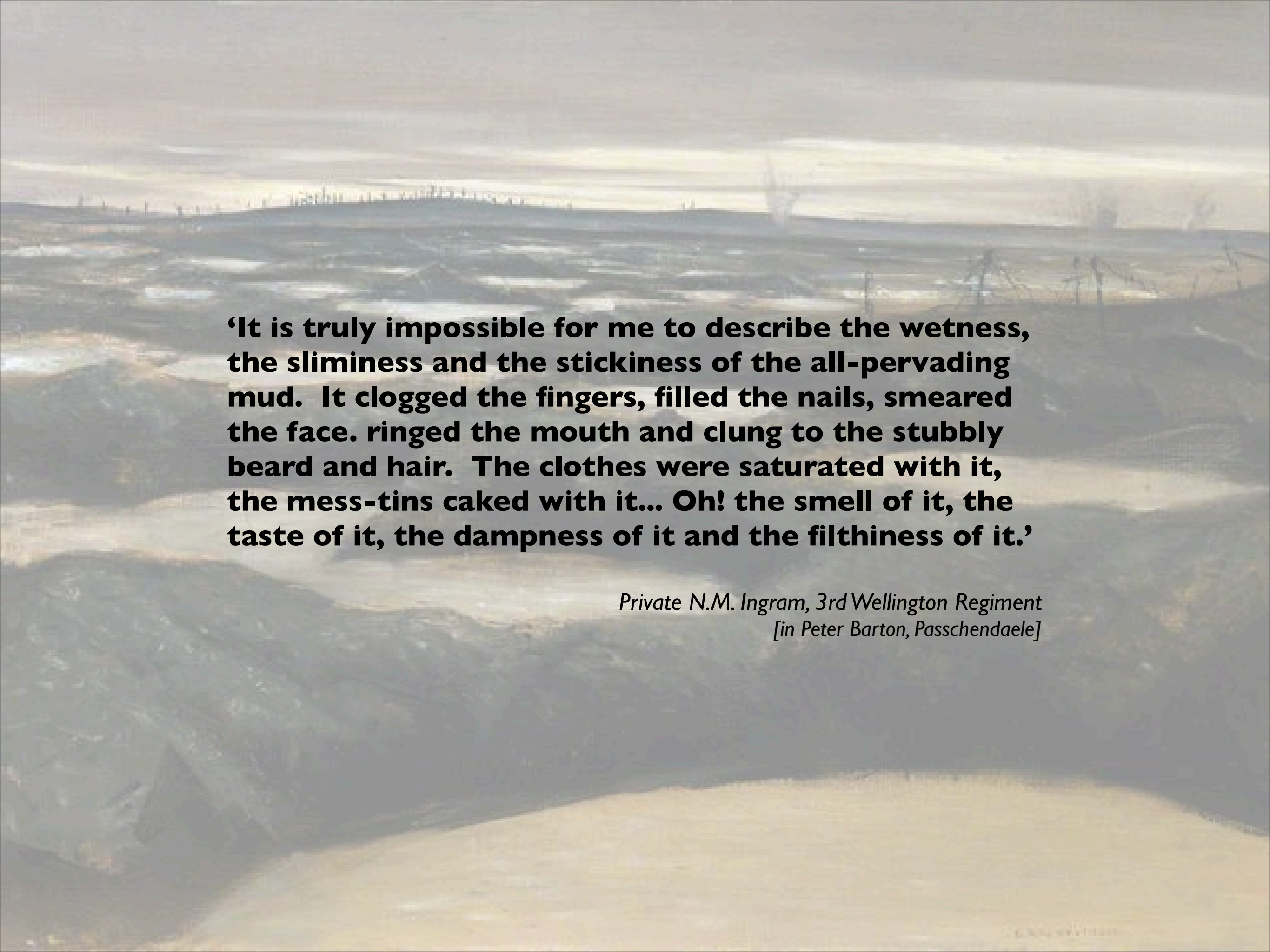


‘phenomenological geography of the trenches – a landscape not understood in terms of maps, places and names, but geography as processes of cognition, as subjective and sensuous states of experience...’

‘Amidst the dark, muddy, subterranean world of the trenches, **the soldiers navigated space ... not through the safe distance of the gaze but rather through the clumsy immediacy of their bodies**: “crawl” is a recurring verb in trench narratives, showing the shift from the visual to the tactile...

**‘[T]he visual topography of the everyday world ... was replaced by the haptic geography of the trenches and mud was a prime agent in this change.** In an atmosphere of darkness, danger and uncertainty, sights, sounds and even smells are encountered as material presences against the flesh.’



The background is a painting of a desolate, muddy battlefield. In the foreground, there are dark, uneven mounds of earth and mud. In the middle ground, a line of barbed wire stretches across the landscape. In the far distance, a city skyline with various buildings and structures is visible under a hazy, overcast sky. The overall tone is somber and historical.

**‘It is truly impossible for me to describe the wetness, the sliminess and the stickiness of the all-pervading mud. It clogged the fingers, filled the nails, smeared the face. ringed the mouth and clung to the stubbly beard and hair. The clothes were saturated with it, the mess-tins caked with it... Oh! the smell of it, the taste of it, the dampness of it and the filthiness of it.’**

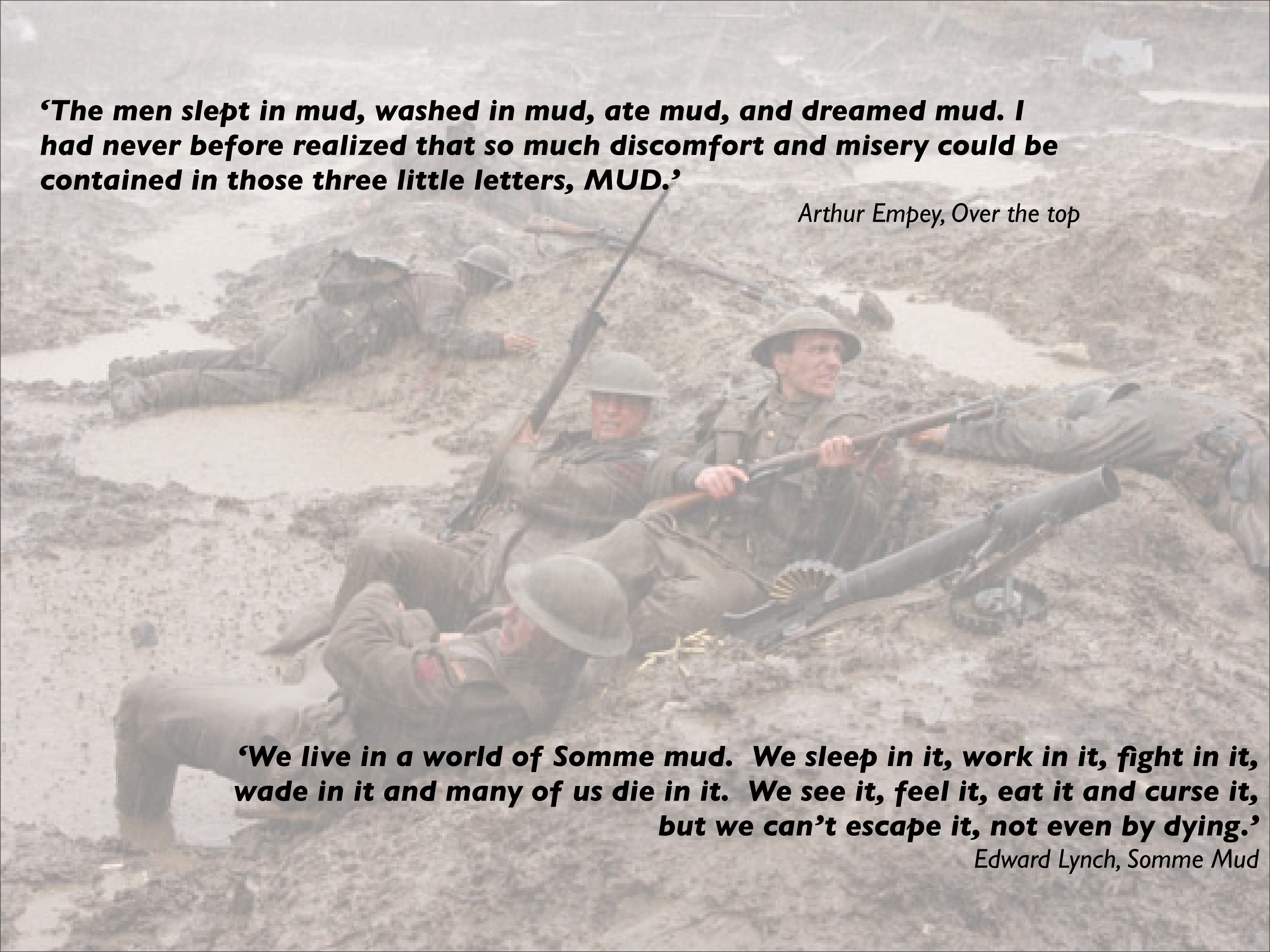
*Private N.M. Ingram, 3rd Wellington Regiment  
[in Peter Barton, Passchendaele]*





*Christopher Nevinson, After a push (1917)*





***‘The men slept in mud, washed in mud, ate mud, and dreamed mud. I had never before realized that so much discomfort and misery could be contained in those three little letters, MUD.’***

*Arthur Empey, Over the top*

***‘We live in a world of Somme mud. We sleep in it, work in it, fight in it, wade in it and many of us die in it. We see it, feel it, eat it and curse it, but we can’t escape it, not even by dying.’***

*Edward Lynch, Somme Mud*



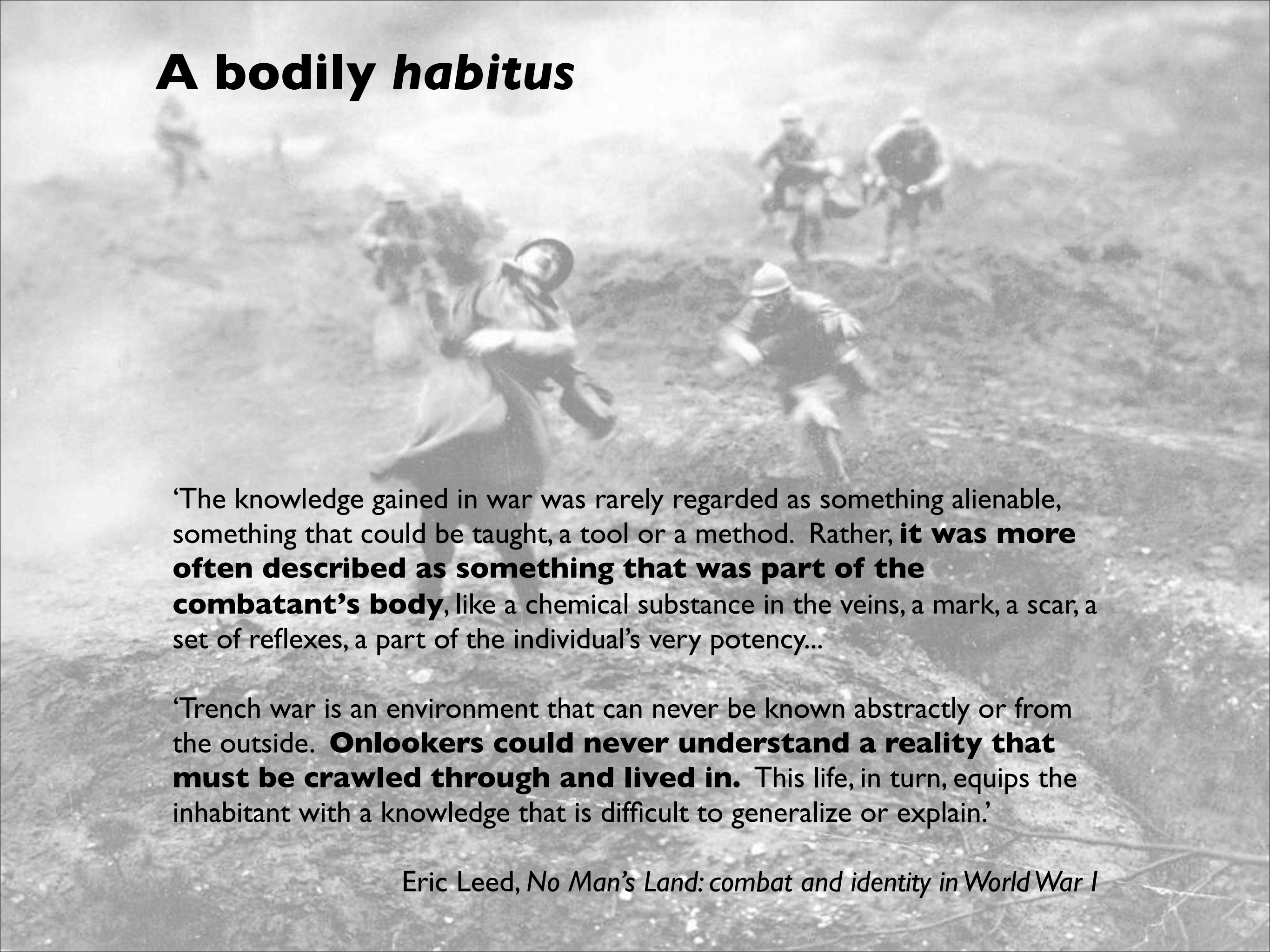


**‘... though we had studied the map so thoroughly beforehand, it was impossible to recognize anything in this chaos...’**

*2nd Lt Thomas Hope Floyd, 2/5 Lancashire Fusiliers, 31 July 1917  
[in Peter Barton, Passchendaele]*



# A bodily *habitus*

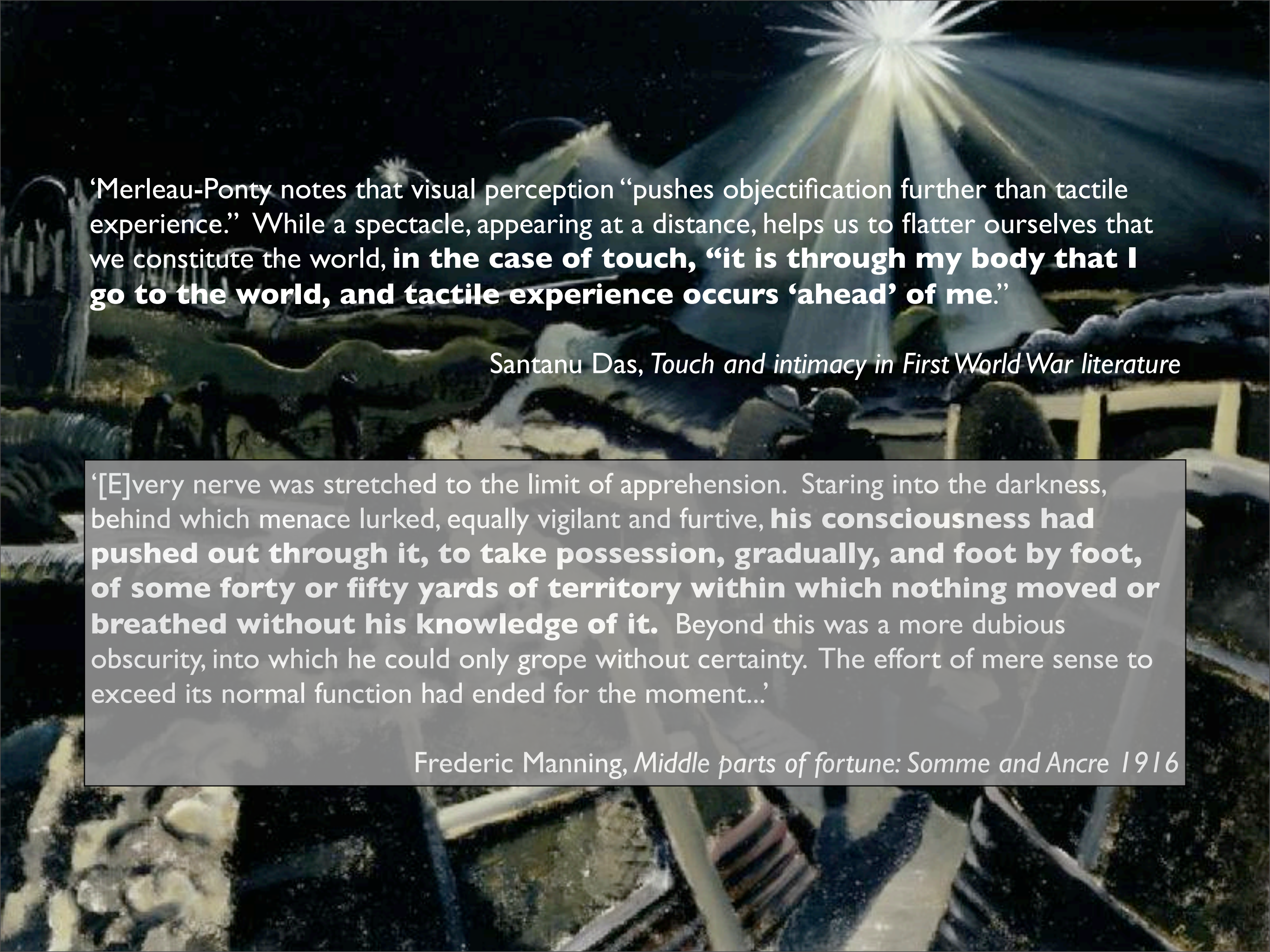


‘The knowledge gained in war was rarely regarded as something alienable, something that could be taught, a tool or a method. Rather, **it was more often described as something that was part of the combatant’s body**, like a chemical substance in the veins, a mark, a scar, a set of reflexes, a part of the individual’s very potency...

‘Trench war is an environment that can never be known abstractly or from the outside. **Onlookers could never understand a reality that must be crawled through and lived in.** This life, in turn, equips the inhabitant with a knowledge that is difficult to generalize or explain.’

Eric Leed, *No Man’s Land: combat and identity in World War I*





‘Merleau-Ponty notes that visual perception “pushes objectification further than tactile experience.” While a spectacle, appearing at a distance, helps us to flatter ourselves that we constitute the world, **in the case of touch, “it is through my body that I go to the world, and tactile experience occurs ‘ahead’ of me.”**

Santanu Das, *Touch and intimacy in First World War literature*

‘[E]very nerve was stretched to the limit of apprehension. Staring into the darkness, behind which menace lurked, equally vigilant and furtive, **his consciousness had pushed out through it, to take possession, gradually, and foot by foot, of some forty or fifty yards of territory within which nothing moved or breathed without his knowledge of it.** Beyond this was a more dubious obscurity, into which he could only grope without certainty. The effort of mere sense to exceed its normal function had ended for the moment...’

Frederic Manning, *Middle parts of fortune: Somme and Ancre 1916*



# Local knowledge



‘The soldiers who held this front line of ours saw this grass and wire day after day, perhaps, for many months. It was the limit of their world, the horizon of their landscape, the boundary.

*John Masefield, The old front line (1917)*



# A corporeal re-mapping

‘I do a reverse journey by a quicker but more exposed route & I look for objects to help guide me. I see a foot and it keeps me for the next time but it is not there long.’

*Private Aston, Ypres Salient, 1917*

‘New weapons technology catalysed a crisis in scale and redefined flesh and earth. But individuals reorganised the spaces they had to negotiate...; it was both impossible and essential to delimit the smooth space of the battlefield....’

**‘Wrinkles in the texture of destruction become coordinates which allow the striation of smooth space....** Industrial weaponry obliterated one landscape: destruction was the starting-point for a new re-gridding.’

*Becca Weir, “Degrees in nothingness”: battlefield topography in the First World War’, Critical Quarterly 49 (4) (2007) 40-55*



‘The land of rotting men...’  
*Edward Lynch, Somme Mud*

# Corpography

‘The whole zone was a corpse, and the mud itself mortified.’  
*Edmund Blunden, Undertones of war*







## **5: The topography of Golgotha**

***‘For 14 hours yesterday, I was at work – teaching Christ to lift his cross by numbers ... and with maps I make him familiar with the topography of Golgotha.’***

***Wilfred Owen, letter to Osbert Sitwell, 4 July 1918***

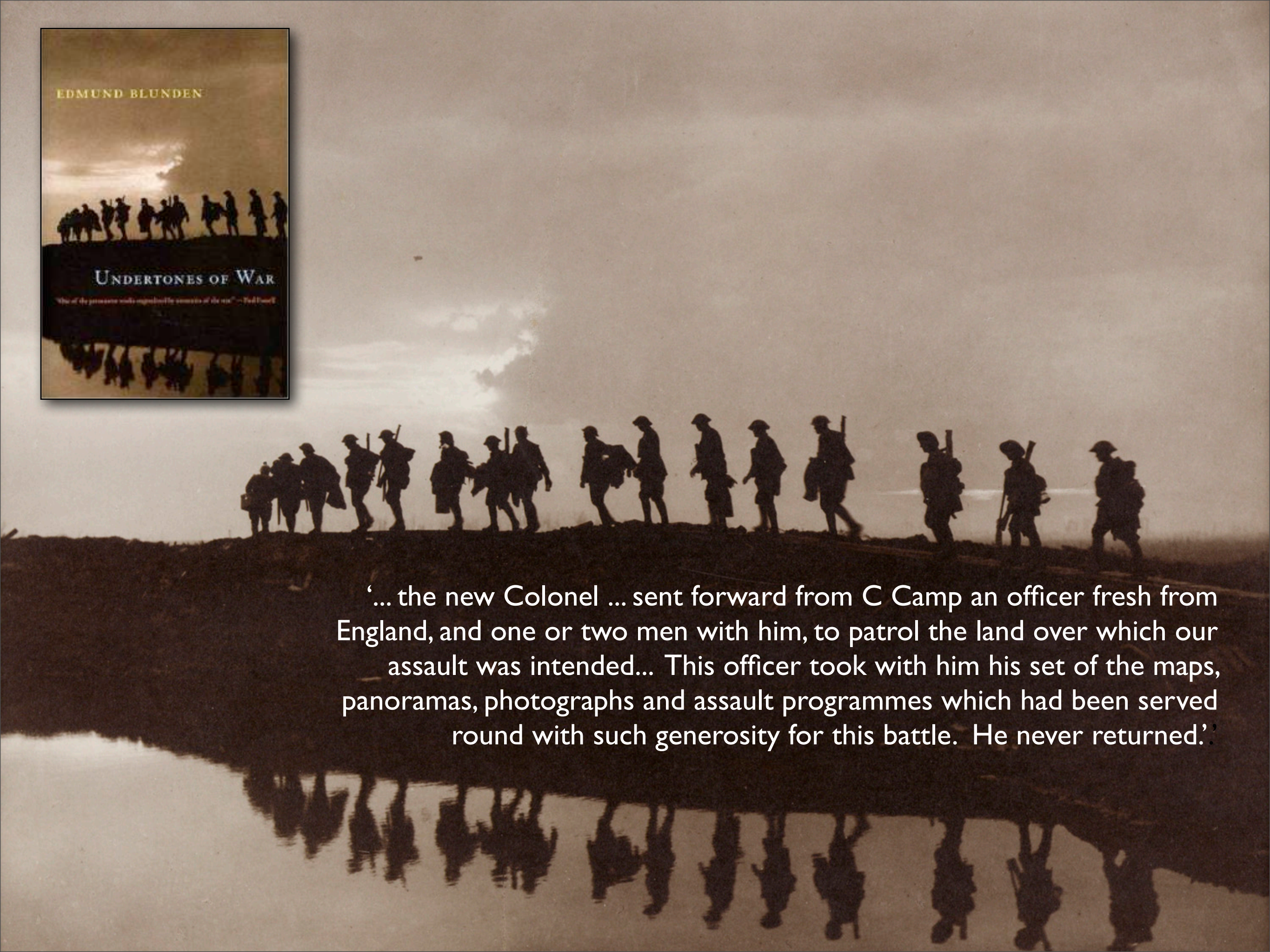
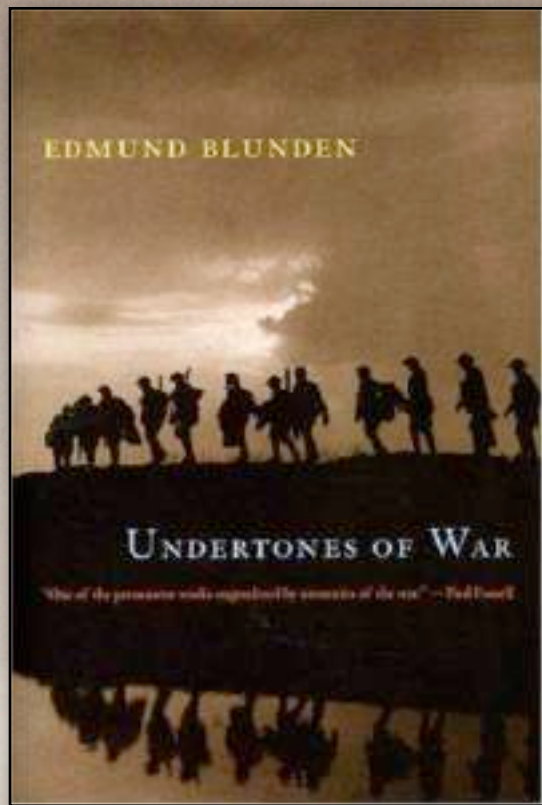




‘Was it nearer the soul of war to adjust armies in coloured inks on vast maps at Montreuil [G.H.Q.] or Whitehall, to hear of or to project colossal shocks in a sort of mathematical symbol, than to rub knees with some poor jaw-dropping resting sentry, under the dripping rubber sheet, balancing on the greasy fire-step...?’

*Edmund Blunden, Undertones of war*



A large, sepia-toned photograph of soldiers silhouetted against a bright, hazy sky. The soldiers are walking in a line across a dark, flat landscape. Their reflections are clearly visible in the calm water in the foreground. The overall mood is somber and reflective.

‘... the new Colonel ... sent forward from C Camp an officer fresh from England, and one or two men with him, to patrol the land over which our assault was intended... This officer took with him his set of the maps, panoramas, photographs and assault programmes which had been served round with such generosity for this battle. He never returned.’



