‘Calculating the future’
panoramic sketching, reconnaissance drawing and the material trace of war

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Part One – the academies

Since the establishment of the training academies in the 18th century, the military have taught drawing as a navigation and exploratory tool. At Woolwich, Dartmouth and Great Marlow, gentlemen cadets and sailors were trained to analyse and record landscape and coastline as a means of neutralizing and controlling enemy space. Perhaps surprisingly, the practice is maintained today; the quality of drawing made by field gunners and reconnaissance scouts may lack the artistry of their 18th century forebears, but it has in common the desire to schematize the act of looking, and to reduce drawing and note-taking to the essentials, using basic but tested methods of measuring and calibration by eye and hand.

Military drawing was an element of the curriculum at the first military academy set up at Woolwich in 1741. The Rules and Orders required the Drawing Master to 'teach the method of Sketching Ground, the taking of Views, the drawing of Civil Architecture and the Practice of Perspective.′ (Buchanan 1892:33) Probably the most eminent artist associated with Woolwich was the watercolourist Paul Sandby, who served as Drawing Master from 1768 until 1796. Sandby was then at the height of his fame, and his appointment at a military academy reflects the importance of drawing in the training of the artillery and engineer cadets. Under his guidance the quality of observation and draughtsmanship was consistently high, and a number of his pupils went on to prove themselves as expert front-line draughtsmen, often making crucially important reconnaissance drawings and finely illustrated reports (Hardie 1966: 216)

During the Napoleonic Wars it was recognized that a skill in drawing could be of immediate benefit in unmapped and unknown terrain. With the establishment of new Staff and Junior military colleges in 1801, drawing became firmly established as an essential element in the training of infantry and cavalry officers. At the height of the war period, the country was scoured for capable landscape draughtsmen to employ as drawing tutors. Even John Constable was interviewed in 1802 for the post of Drawing Master at the Junior Department in Great Marlow, but he later rejected the offer, arguing that had he accepted 'it would have been a death blow to all my prospects of perfection in the Art I love'[i].

On mainland Europe, trained army officers were soon at work in the battlefield, exploring unfamiliar ground, making detailed sketches of its topographical features, and reporting back to their superior officers. The value of an accurate drawing, however hastily made, was often more useful than a verbal or written description, and the officer-draughtsman cadre played a significant part in Wellington's Peninsular campaign.

Constable's relief at turning down the military appointment is an important reminder of the disdain that many artists felt for topographic art. Whether for artillery or infantry use, military drawing puts a premium on producing an accurate report shorn of artistic and aesthetic trappings. For all its remunerative attraction, military sketching was regarded with some disdain, a process of 'tame delineation', of reducing the aesthetics of nature to something ordinary or (to borrow Thomas Gainsborough's dismissive phrase) something 'mappy'. For others, the task of 'breaking ground' and issuing a neutral report was [like the very term 'military intelligence'] a contradiction in terms. Gainsborough wrote of the opprobrium cast upon artists who regarded themselves as 'topographers', rather than 'interpreters' of the landscape. Naturally, however, the military requires a factual, accurate drawing, however clumsy, rather than an idealized landscape picture.

Drawing for such purposes can be separated into two distinct fields of vision. These correspond approximately to the different arms of the military: on the one hand are those drawings made during mobile reconnaissance - usually by light cavalry patrols or units of advanced infantry – that are used to record intelligence about enemy positions and key terrain. On the other hand, there are drawings known as panoramas that are made from a static position, usually an elevated vantage point that commands an uninterrupted view of the enemy front. These are normally drawn by specially trained artillery or engineer officers and are vital for indicating targets and determining range and arc of fire.

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[ii].

Whereas the patrol sketch is often a collage of hasty impressions later re-arranged to form a tactical 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 neutralize a dangerous terrain and assure mastery over it (Alfrey and Daniels 1990) In similar spirit, Foucault wrote of the system of permanent registration that operated in the plague town in the 17th century (Foucault 1975). On the septic terrain of the First World War battlefield the panoramic drawing was an integral part in segmenting and immobilizing perceived space. The stasis of the battle line, however, meant that the panoptic ideal could never be attained: dead ground (space beyond or concealed from retinal view), camouflage, and concealment were constant frustrations to retinal surveillance. Foucault's concept of a transparent space was constantly frustrated by the fissured and volatile landscape of the battlefield. The military sketch, though, provided the nearest graphic equivalent of Bentham's paradigm: it provided systematic observation 'in which the slightest movements are supervised, in which all events are recorded' (Foucault 1975:197).

Part Two – 'The Drawing Manuals'

The different skills required for each type of drawing can be traced in the many official and commercial manuals that were published in the nineteenth century. During this period, proficiency in drawing was widely acknowledged as offering an advantage to boys competing for places at the military academies. Yet the varying qualities in the teaching of drawing across the 'public' and middle-class schools constantly undermined the calibre of cadet applications to the military colleges. Both the Clarendon Commission of 1864 and the Taunton Commission four years later remarked on the erratic, often poor, quality of art teaching in schools, and the impact this might have on the quality of draughtsmanship in the professions and in the services (Sutton 1967: 88).

The unimaginative style of most military manuals of the late nineteenth century reflects the low status of drawing in the army's thinking. Invariably, freehand sketching was relegated to an item of 'special interest', and regarded as little more than an adjunct to map work. Manual writers leaned heavily on the conventional language and symbols of military cartography, transforming a single lesson in landscape drawing into little more than a matter of contours and geometric symbols.

Two manuals in *'Rapid Field Sketching and Reconnaissance'* of 1889 and 1903, for example, laid heavy emphasis on map and compass work, with only a cursory description of the merits of freehand drawing. Commercial manuals such as Major R.F.Legge's *Military Sketching and Map Reading* ignored observational work completely, concentrating instead on map co-

ordinates, measurement of slopes, magnetic bearings, and using the service compass (Legge 1906). One of the first manuals to actively encourage freehand drawing was *The Active Service Pocket Book* written by 2nd Lt. Bertrand Stewart and published in 1907. Stewart dedicated eight pages to freehand sketching, offering step-by-step advice on drawing in outline, using the pencil as a measuring instrument and mastering the challenging problem of perspective. The manual is clearly aimed at the novice. Stewart, for instance, recommends the construction of an oblong drawing frame attached to a stick with a pointed end. The frame is to be divided at regular six inch intervals by stretched wire, thus forming a drawing grid which will help simplify any landscape seen through it. Drawing on squared paper, the soldier is encouraged to make an exact outline copy of the view through the frame, though conveniently the author skips over the difficult matter of situating the frame, piercing hard ground, and avoiding enemy detection (Stewart 1907).

The hurried re-issue of a number of drawing manuals at the outbreak of war in 1914 was followed, over the next four years, by the publication of training booklets. At least nine commercial and War Office books on topographical and panoramic sketching were made available to soldiers of all ranks. Through such publishing ventures tuition in freehand drawing and map-reading spread from being the preserve of the officer in the Regular Army to a craft capable of being learned by all. The Great War accelerated this development. Not only was the army able to draw upon a better educated and more intelligent workforce, but the static nature of the fighting on the Western Front called for highly accurate intelligence on enemy positions. Observational drawing became an integral element in surveillance work, and was able to complement aerial photography as a method of scrutiny and surveillance.

Artistically talented soldiers of all ranks soon found themselves sought out to work in the Camouflage Corps or for the Field Survey. Not all went willingly. Harry Bateman, having volunteered for service with the Royal Field Artillery, ignored a sergeant's request at their first parade for any artist present to make himself known[iii]. He 'remained silent as he wanted to go and fight' (Brown 1978:185). Others found that their skills were deemed inappropriate: the painter and poet David Jones, serving with the 15th (London Welsh) Battalion, Royal Welch Fusiliers, had five years art school training to his credit when he was recommended to the 2nd Field Survey Company based at Second Army Headquarters at Cassel. But Jones appears to have lacked the requisite technical skills needed for map drawing, and was instead sent to one of the Company's four observation groups as a Survey Post observer. Having already been promoted sideways from 'Maps', Jones did not last much longer as an observer - 'Got the sack from that job because of my

inefficiency in getting the right degrees of enemy gunflashes' (Hague 1980:241; Chasseaud 1993:19). Another artist failed in the simple task of 'breaking ground':

> From the OP (Observation Post) I saw a completely featureless landscape, save here and there a few broken sticks of trees. I made a pencil drawing of this barren piece of ground, but what use my superiors would be able to make of this sketch I could not imagine. (Roberts 1974:27-28)

Thus ended the Vorticist painter William Roberts' first and only foray into reconnaissance drawing. In fact, surprisingly few of the other young 'moderns' serving in the armed forces during the Great War could subvert their artistic tendencies in the pursuit of technical objectivity.

Others advertised their skills quite freely. Adrian Hill – one of the youngest soldier-artists to eventually work for the official government war art schemes - combined his drawing abilities with his work in a Scouting and Sniping Section of the Honorable Artillery Company. After the war, he recalled a typical patrol into No Man's Land:

> I advanced in short rushes, mostly on my hands and knees with my sketching kit dangling round my neck. As I slowly approached, the wood gradually took a more definite shape, and as I crept nearer I saw that what was hidden from our own line, now revealed itself as a cunningly contrived observation post in one of the battered trees. (Hill 1930:p. 16)

Part three – malign space

As 'a palimpsest of overlapping, multi-vocal landscapes' (Saunders 2001:37), the Western Front battlefield was a malign industrialized space where visibility was often a 'trap'. The military sketch was the spring in that mechanism. Concealment was the only antidote to the omni-directional gaze of the trained eye.

Jay Appleton, developing Konrad Lorenz's thesis on the atavistic landscape, has proposed a habitat theory that categorizes any landscape into hierarchies of 'prospect, refuge and hazard' (Appleton 1975). The panoramic viewpoint is the paradigm of Appleton's system; military drawing systematized the graphic language so that trees became datum points, and fixed features of the land became the immutable co-ordinates of a functional terrain, a strategic field. Or, as Henry Reed phrases it in this poetic fragment 'Judging Distances' from *Lessons of the War*, it is a domain where the temporal overlaps with the spatial:

> Not only how far away; but the way that you say it is very important. / Perhaps you may never get/ The knack of judging a distance, but at least you know/ How to report on a landscape: the central sector / The right of the arc and that, which we had last Tuesday / And at least you know / That maps are of time, not place, so far as the army / Happens to be concerned - the reason being / Is one which need not delay us. Again, you know / There are three kinds of tree, three only, the fir and the poplar, And those which have bushy tops to; and lastly / That things only seem to be things[iv]. (Reed, 1943)

As a piece of spatial interpretation, the drawn artillery panorama has clear areas of jurisdiction. The foreground is considered irrelevant. To the gunner, the near is already controlled. The middle distance and the horizon are the focal points. These, to borrow Appleton's phrase, are the prospect-rich domains and the most coveted. Panorama drawings are predicated on trajectories and barrage lines. The horizon is the ultimate goal because it holds the promise of further territory for martial exploitation. During the First World War, the horizon took on special value when seen from the noisome mess of the front-line trench. Secreted in their observation posts, gunners described the green and unspoilt distance as 'The Promised Land' - perfect, but forever locked in an unattainable future.

These concerns, as W.J.T. Mitchell has observed, are the essential discourses of imperialism. Empires, according to him, move outward in space 'as a way of moving outward in time, the “prospect” that opens up is not just a spatial scene, but a projected future of "development" and exploitation.' (Mitchell 1994:16-17). The promise of control permeates every level of military drawing. In contemporary drawing manuals, the unmodulated pencil line is given the authority of military language:

> A line should be as sharp and precise as a word of command. A wavering line which dies away carries no conviction or information because it is the product of a wavering mind. Every line should be put in to express something. Start sharply and finish sharply. Press on the paper. (Newton 1915:27)

Similarly, by ridding the page of ambiguity or doubt, the drawings aim to pre-ordain the future. This is also true of the written word, which uses the active and instructive tense of military command. It is a language where the passive or conditional tense does not function: 'Brigade <u>will</u> commence at ..., Objectives <u>shall</u> be taken by ..., reinforcements <u>will</u> be moved to ... etc'. (Keegan

1976:266). Maps and charts drawn up before offensives bear a similar code; barrage lines are clearly marked in minutes of advance; in June 1944, the objectives beyond the Normandy beachhead were marked out in time - D Day plus one, plus two, etc - as well as in actual space.

Instruction manuals in military sketching equate clarity of line with clarity of purpose. Ambiguity and doubt are (quite literally) ruled out. The margins of failure (like the estimated casualty rate) are clearly prescribed and then codified. Any blank areas of the paper are not intended to be read as negative space, but the area set aside for instructive wording. The panorama, though, could only make sense in a war where both sides were predominantly static, where a battlescape was shared but where the zones of control were clearly demarcated. The view from the opposing emplacements might be radically different, but the contested ground was rationalized and systematized using a shared vocabulary of grid and line. In his analysis of the 'tourism' of war, Jean Louis Deotte has argued that the beachline of Normandy in 1944 constituted a common world, a shared objectivity for both defender (cooped in a concrete pillbox) and attacker (exposed in a metal landing craft). Both sets of adversaries experienced a 'reversibility of the points of view' because 'enemies share in common the same definition of space, the same geometric plane ... they belong to the same world of techno-scientific confrontation, the substratum of which, here, is sight'. (Diller and Scofidio 1994 :116-177**)**.

From a strictly operational point of view, the artillery panorama differed from a front-line or reconnaissance drawing in three respects. 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, however picturesque, into a series of immutable co-ordinates and fixed datum points.

Drawings made from reconnaissance patrols or from the lip of a trench are often less formalized than the artillery panorama. Seen through a trench periscope or pieced together from night patrols their descriptive language is less codified, they may combine a number of viewpoints and usually serve as visual elaboration for a longer written report. But, they share with the panoramic drawing the same material fate: few images have survived, as they were intended for immediate, tactical use and were soon discarded.

Part four – Maze and Newton

One of the few front-line artists whose work did survive is the painter Paul Maze (IWM n.d.a). A French-speaking, self-confessed adventurer, Maze worked first as an interpreter to the Royal Scots Greys in 1914, and later as a liaison officer for General Sir Hubert Gough, Fifth Army commander. Gough would regularly send Maze on sketching sorties to the front line where the young painter would fearlessly record his impressions of the battlefield. One of his first missions, in May 1915, was to sketch the 7th Division's objectives around Festubert on the Somme, a task which required him to draw from the front line where he 'had to use a periscope and crane (his) neck over the sandbags quickly and peep'. This was Maze's preferred – if somewhat risky - method of drawing. In March 1916, ignoring all regard for his own safety, he drew in the line every day:

> My work was interesting. Bit by bit I dissected the ground with our field glasses, and I made drawings from every possible angle marking every obstacle which could hinder our advance. (Maze 1934: 130)

William Rothenstein, an official war artist working south of the Somme in March 1918, recalled seeing at Fifth Army headquarters 'drawings pieced together, showing a considerable view of the German front', made by Maze 'creeping, day after day, beyond our front lines ... an act of rare courage and devotion' (Rothenstein 1932 :334).

Maze supplemented his trench drawings with information gleaned from aerial photographs, and he also incorporated imaginary views taken as though from the enemy lines. Few of them have survived. Five held by the Department of Art at the Imperial War Museum must be considered typical of his style. A large sketch of the Somme battleground, dating from mid-1916, (Figure 1?) 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. Maze adopts further map conventions in an even larger drawing of the battlefield around the village of Hamel on the Somme, in which the British front line is drawn in blue and the German line in red. However, on this occasion, Maze

was unable to finish this particular drawing: inscribed in the painter's hand at the bottom is the telling message *'could not go on through heavy shelling'*. Maze was clearly excited by the dangers of drawing near the fighting line, and he relished his role as an explorer and recorder of the battlefield. His work earned him both injuries and decorations, and it gave him an unusual apprenticeship as a painter. Even at the front he occasionally forgot his military duty and became 'engrossed in form and colour' (Maze 1934:138) but he was quite happy to be remembered as an artist who worked 'in shorthand'.

One artist who felt that it was not enough to entrust military drawing to adventurers or bemused avant garde artists was subaltern William Newton of the Artist's Rifles. A trainee architect, Newton contended that it was possible to teach a novice how to draw a battle landscape after just one lecture and two days drawing in the field. This was an ambitious programme. By comparison, front-line infantry scouts took up to six weeks to train (Cameron 1916). Newton laid out his ideas in *Military Landscape Sketching and Target Indication* - a manual published commercially in 1916. In the introduction, Lieutenant Colonel H.A.R. May, commanding officer of the Artist's Rifles, applauded Newton's system.

> The test of each solution is whether a stranger can with ease and rapidity identify the exact place intended; and tested in this manner the results of his teaching have been most successful and many officers in the trenches have benefited by the care and devotion he has given to his work. (Newton 1916: 6)

In his opening definition, Newton clarified the function of a military sketch. It 'is a form of report, without the ambiguity of language. It is graphic information. For information clearness is essential, and clearness is attained by two avenues: a) thought, b) draughtsmanship'. (Newton 1916:8). In making this point, Newton distances himself from previous manual writers who opted for heavily annotated sketches, and for a pictorial language rooted in the conventions of maps. However, the real challenge, continues Newton, is how to simplify the visual chaos of a landscape, especially a landscape damaged by battle.

> It is therefore necessary to analyse, to bring order out of chaos. For this purpose there are three main methods of analysis - separation of planes, encircling or framing in, division of a whole into parts. (Newton 1916: 9)

Possibly the most interesting of these three methods is the first - the separation of planes. Newton suggests that the draughtsman should try to imagine a landscape as a series of horizontal (but not straight) bands that stretch from one side of the paper to the other. It might help, he suggested, to imagine the country as something like the scenery of an outdoor exhibition with each ridge, hill, wood cut out of sheets of wood and laid one behind the other. Having done this, a point can successfully be marked on the drawing, its approximate distance from the viewer clearly indicated by the number and density of horizontal lines representing fields, meadows, tree lines in between the draughtsman and the point.

Newton's manual is full of such pragmatic advice. He emphasized the draughtsman's duty in guiding the eye to salient points in the landscape by using key devices in the terrain - an isolated chimney, a single red roof amongst black roofs, three silhouetted bushes on a crest line - as so many 'labels' that indicate particular targets or tactically vital features. He avoids the tendency of other instructors to construct complex drawing frames, or string and protractor gizmos[v]. (Green 1908: 25) Instead, he argues for clarity of purpose at all times, for always using a sharp pencil and throwing the India rubber away - 'the aim should rather be to do a clear sketch from the first, because in the field opportunities of subsequent polish are limited'. He continues in fine style:

> A line should be as sharp and precise as a word of command. A wavering line which dies away carries no conviction or information because it is the product of a wavering mind. Every line should be put in to express something. Start sharply and finish sharply. Press on the paper. (Newton 1916: 27)

Such instruction may sound a little severe but it was born from a belief in the superiority of careful observational drawing as a method of study and analysis. Without the rigorous discipline advocated by Newton, military drawing can easily descend into a parody of itself - dull, repetitive diagrams in which trees have been reduced to a formula, producing a rather contrived landscape image that resembles 'nursery wall paper'. This was due in part to the consequence of drawing trees in outline which tends to make them resemble their cartographic equivalent - either bushy topped deciduous or 'Christmas tree' firs. It is also the consequence of drawing in outline alone and so accentuating the top line of trees and buildings with a minimum of shading and colour. The end results, however, had a curious aesthetic appeal and many military drawings began to resemble the arts and crafts style woodcut illustrations that were popular in the first decades of the century. *The Studio* magazine was quick to note the similarity. In February 1916 an illustrated

article applauded the army's work in broadening the education of the common soldier, noting with pleasure that 'instruction has been extended to the rank and file because the authorities recognize the immense value on active service of men who can use a pencil in making topographical sketches' (R.F.C. 1916:44-45). The writer marveled at the short period of instruction, proof that 'one can just as easily be taught to draw the formation of objects in nature as to trace the design of the letters of the alphabet' but is most impressed by the unsophisticated aesthetic appeal of the drawings:

> These sketches are, of course, not intended to be artistic in their handling, but at the same time there is a certain charm in their simplicity, and the conventional method does not detract from their interest. (R.F.C. 1916:45)

The accompanying line drawings show a verdant landscape of rolling pastures and tidy villages - in truth, not dissimilar from the images on offer in the magazine each month. Similar pastoral scenery was uniformly used for target practice. One subaltern wryly noted the popularity of the rural idyll.

> Two fingers right, four o'clock from the haystack, at five hundred yards at the bushy-topped tree - fire!'I don't think that a tree that was not bushy-topped existed in the picture, which at least saved any strain on the School of Musketry's vocabulary or inventiveness. (Mellersh 1978:52)

To the military mind, though, such aestheticism was anathema. Though Major Pearson's manual of 1906 offered a wider range of tree types - pine, poplar, scots fir, the banana - to wean his students from the tyranny of the 'bushy topped' formula, every drawing instructor warned the draughtsman to guard against 'artistic effect'. 'Indeed', argued the author of the 1912 manual, 'it is almost better that the artistic sense should be absent, and that instead of idealising a landscape it should be looked at with a cold matter-of-fact military eye'. (War Office 1912: 75). A soldier-sketcher had to concentrate on the potential of the countryside for military purposes and not be distracted by 'its beauties of colouring or the artistic effects of light and shade.'

To certain military artists, though, the call of landscape art would always overwhelm purely tactical considerations. Perhaps the least exacting type of military sketch is the conventional landscape painting that has been simply ruled off with vertical pencil lines to mark out the degrees of artillery fire. Wilfred de Glehn chose this method (IWM n.d.a.). A professional

artist, de Glehn served with the Royal Garrison Artillery on the Italian theatre of operations in 1917. From observation posts on the hills above the Isonzo Valley he painted a number of striking watercolour landscapes of the battlefield and the distant Austrian lines**. (Figure 2??)** Exquisitely painted and beautifully luminous, they are, however, rather limited as images of tactical information - important contour lines are lost in the refined brushwork, keypoints in the enemy line are sacrificed to the principles of aerial perspective, vaporous watercolour technique obscures hard military fact. Only the unwavering vertical lines remind us that this is a dangerous killing zone. Similarly, the sculptor Gilbert Ledward, who was stationed with the Royal Garrison Artillery on the Italian Front during 1917-1918, made a panorama from a high vantage point above the village of Camporovere. His elegant watercolour captures something of the charm of the wide valley, but it relies almost entirely on dotted lines and numerical code to indicate the 'approximate location of hostile batteries'[vi].

Part five - legacy

Few of the innovations in battlefield drawing advocated by Newton seem to have survived the Great War. A sample panorama provided with the 1921 manual of Map Reading shows a wide tract of country either side of the Etaples-Verton railway in Northern France. It was drawn on 3 July 1918 at 0900 hours by a Lieut. J Smith Royal Artillery from an observation post some 15 metres high. It is a classic panorama - an endless vista of land described in a neutral outline. But as a piece of graphic information it relies almost entirely on annotations and graphic directions – arrows, icons, symbols, etc. It premises literal description at the expense of pictorial invention.

In artillery and infantry training manuals between the wars, freehand sketching took a poor second place to the technical demands of map work. Panoramic work was regarded as an adjunct to map drawing and was afforded modest coverage in training texts. This trend continued after the Second World War. It seemed that the panoramic sketch as the material trace of war was now defunct.

In our era of photographic surveillance and computerized simulation, it would appear that we have achieved a perfection and totalisation of surveillance technologies. Global Positioning System (GPS) satellites and digital technology can triangulate geographical location to within one metre, allowing a degree of precise digital time and space co-ordination that would have been unthinkable to the armed forces of even thirty years ago (Graham 1999:133). However, it may come as some surprise that freehand drawing is still practiced in the British armed forces today. Light forward units of the British Royal Artillery rely on powerful binoculars, night sights and

thermal imaging devices, but the skill of field sketching is still a part of their work, requiring little more than a pencil, paper and a keen eye. In concealed positions far ahead of their guns, operating from a known grid, Forward Observation Officers, normally captains, observe the ground to the front of their battery, determine targets and order fire.

One such officer explained the value of drawing in this role:

> Drawing is very important to the artillery, and to the observers particularly. We produce a panorama on a flat piece of paper, so that if we have to hand the position onto another party they have to be able to instantly pick up and identify features to the front. When we're drawing we look for key reference points - a prominent contour line, lone trees, buildings and so on[vii].

Carefully avoiding 'artistic effect', one of the observation party uses a felt-tipped pen to make a diagrammatic picture of the enemy terrain. But, unlike his predecessors' work, few of these images will be committed to history. As the Observation Post prepared to move position, the soldier took a damp cloth and, in one movement, wiped the drawing clean off the sheet of acetate. Material trace rendered immaterial.

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[i] John Constable to John Dunthorne, 29th May 1802. For a full account of Paul Sandby's tenure at Woolwich see Hardie 1966:16 – 222.

[ii] This is a fundamentally 20th century development. Indirect fire was only developed from the turn of the century onward, having been made practicable by the advent of quick-firing artillery. In British terms, serious developments of the techniques took place only after the outbreak of the First World War. (Bidwell and Graham 1982).

[iii] Bateman's drawings are held in the Imperial War Museum (IWM) London, Department of Art nos. 6319 – 6338

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[iv] Henry Reed. 'Judging distances' *New Statesman and Nation* 25, no. 628, 6 March 1943, p.155.

[v] See for example the string and ruler contraptions suggested in the War Office Manual of Map Reading and Sketching, (1912) and in Green 1908: 25.

In summer 1994 a replica of a drawing frame was built according to the specifications laid out in a 1907 drawing manual. It was used during the making of an ITV documentary *Drawing Fire* to help train artillery officers in the rudiments of freehand sketching. Although useful as a drawing device it proved a large, rather unwieldy piece of equipment, difficult to camouflage and even more difficult to stick into the ground.

[vi] Ledward's only surviving panorama was made on 27th April 1918 from 94th Brigade Observation Post, at square H20. It is now housed in the Ledward Archive at the Henry Moore Institute, Leeds.

[vii]Quote from Captain Tim Henry, Forward Observation Officer with 266 (GVA) Battery, 7 Royal Horse Artillery, a recently converted parachute light gun battery. Henry described this method [to the author] as little more than 'fag packet gunnery'.

Figures

Figure One
Paul L. Maze
Western Front panorama
Charcoal and wash on paper

1916
Imperial War Museum, Department of Art , No.6070

Figure Two
Wilfred Gabriel de Glehn RA
The Valley of the Osonzo
1917
Watercolour
10 x 21 inches
Imperial War Museum, Department of Art, No. 278

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