THE SEARCHLIGHT BATTERY, FELL LANE, CRACOE, NORTH YORKSHIRE

ARCHAEOLOGICAL AND HISTORICAL SURVEY

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EXECUTIVE SUMMARY

In December 2009, Shaun Richardson of Ed Dennison Archaeological Services Ltd (EDAS) undertook an archaeological and historical survey of a former World War Two searchlight battery at Fell Lane, Cracoe, North Yorkshire (NGR SD 9820 5990 centred). The genesis of the survey came as a result of a talk given at the Yorkshire Dales National Park Authority's (YDNPA) 2008 Archaeology Dayschool at Grassington on 20th century military remains within the Park, after which Shaun Richardson was contacted by Mr Patrick Sunderland of Keighley, who had memories of the Cracoe searchlights and other World War Two military sites in the area.

A combination of field survey and oral evidence has established that at Cracoe, the searchlight battery comprised both projectors and prediction equipment, that as many as nine huts or other structures were placed adjacent to Fell Lane, and that other structures, including a possible Light Anti-Aircraft position, were present. It should be borne in mind that the structures recorded by the survey will only represent a part of those that were once present, as tented or above-ground sandbagged structures will have left only very slight or no traces on the surface of the ground.

The battery is believed to have been constructed in 1941 and was associated with a camp near Threapland Farm. The surviving earthworks do not closely resemble the three-light cluster system introduced in November 1940 and so, on balance, the form of the complex, together with the distance between Cracoe and its configuration with other searchlight batteries in the area, suggests that it is most likely to belong to the three-part arrangement of defensive belts initiated in the autumn of 1941, and that it was associated with the Leeds Gun Defended Area. It is possible that the Cracoe battery was placed within a Killer Belt, and was equipped with a pair of predictors and a single 150cm diameter light projector, but further documentary research would be needed to confirm this.

The recording of such World War Two sites, and the presentation of the results of this recording at public venues such as Archaeology Dayschools, stimulates those with such memories to come forward. Often these memories relate to structures or activities which have left little or no physical trace, and whose presence would otherwise remain unknown, thus providing an important adjunct to archaeological survey. In addition, an awareness of the presence and form of often numerous Second World War earthworks is vital in the wider recording and understanding of military landscapes, because features such as denuded projector or predictor pits could be mistaken for evidence of much earlier activity.

1 INTRODUCTION

Reasons and Circumstances for the Project

1.1 In December 2009, Shaun Richardson of Ed Dennison Archaeological Services Ltd (EDAS) undertook an archaeological and historical survey of a former World War Two searchlight battery at Fell Lane, Cracoe, North Yorkshire (NGR SD 9820 5990 centred). The genesis of the survey came as a result of a talk given by Shaun Richardson at the Yorkshire Dales National Park Authority's (YDNPA) 2008 Archaeology Dayschool at Grassington on 20th century military remains within the Park. After the talk, Shaun Richardson was contacted by Mr Patrick Sunderland of Keighley. Mr Sunderland had visited the Cracoe searchlights and other military sites in the area during the war, and was keen to share his memories.

1.2 The opportunity to draw on the memories of someone regarding a specific World War Two site during archaeological fieldwork is becoming increasingly rare, and the invaluable nature of oral testimony to help with the interpretation of 20th century archaeological remains, where it is available, has been well demonstrated elsewhere (e.g. Richardson 1995; Richardson 2005; Richardson 2008). The owner of the land, Mr J W Stockdale, was approached, and very kindly gave his permission for the survey to take place. The survey work was carried out with encouragement and support from the YDNPA.

Site Location and Description

1.3 The searchlight battery is located to the east of the centre of Cracoe, in a field on the north side of Fell Lane opposite Hill Top Laithe. Access is currently by foot or vehicle along Fell Lane (see figure 1). The survey area covered a sub-rectangular pasture field measuring c.250m north-south by a maximum of 300m east-west, and located at an elevation of c.230m AOD (see figure 2). The ground surface within the survey area sloped markedly down from north to south, towards Fell Lane, and all sides of the survey area were bounded by drystone field walls. The survey area lies wholly within the Yorkshire Dales National Park but is not subject to any statutory protection; the site is also listed on the Yorkshire Dales Historical Environment Record (Site MYD36568).

Aims and Objectives

1.4 The aims of the project were to produce a detailed archaeological and historical survey of the former searchlight battery, and to record a type of archaeological monument rarely recorded by earthwork survey at both a regional and national level. A further objective was to produce information that would assist with any future management strategies for similar monuments.

Survey Methodology

Detailed measured survey

1.5 A detailed archaeological earthwork survey of the whole field within which the searchlight battery was located was undertaken to record the position and form of all features considered to be of archaeological and/or historic interest. The survey was carried out at a scale of 1:500 using EDM total station equipment, and equates to a Level 3 analytical record as defined by English Heritage (2007, 23-26).

1.6 The survey recorded the ground level position of all structures, wall remnants and revetments, earthworks, water courses, paths, stone and rubble scatters, ironwork, fences, hedges and other boundary features, and any other features considered to be of archaeological or historic interest. Sufficient information was also gathered to allow the survey area to be readily located through the use of surviving structures, fences, walls, water courses and other topographical features. Survey points were taken from fixed survey stations on a closed traverse around and through the site, and the survey was integrated into the Ordnance Survey national grid by resection to points of known co-ordinates. On completion of the EDM survey, the field data was plotted and re-checked on site in a separate operation; any amendments or additions were surveyed by hand. The resulting survey plan has been produced at a scale of 1:500 and is presented as an interpretative hachure plan using conventions analogous to those used by English Heritage (1999; 2007, 31-35); a larger plan and section, at a scale of 1:100 was produced of one of the circular earthworks within the survey area. The EDM survey work took place on 6th November 2009, and the hand-enhancement was done on 1st December 2009.

1.7 Each identified individual component within the survey area was given a unique identifier number, and detailed written descriptions were prepared on notes taken in the field. Each identified component that responded well to photography was also photographed using a digital camera with 10 megapixel resolution. English Heritage photographic guidelines were followed (English Heritage 2007, 14) and each photograph was normally provided with a scale. More general digital photographs were also taken showing the landscape context of the site. All photographs have been clearly numbered and labelled with the subject, orientation, date taken and photographer's name, and cross referenced to digital files etc.

Field interpretation

1.8 Once the field survey was completed, Mr Patrick Sunderland visited the survey area on 17th December 2009 with Shaun Richardson to walk over the recorded features, offering his interpretation and his more general memories of World War Two activity within this part of Wharfedale. These memories were noted by Shaun Richardson and are reproduced here as Appendix 1.

1.9 In addition to Mr Sunderland's oral testimony, this report also draws on the important work undertaken by the Bordley-Cracoe-Hetton-Rylstone Local History Group (BCHR LHG 2005) to record World War Two memories, on relevant contextual information gathered, for example, as part of English Heritage's *Monuments of War* series (Dobinson 2000a; Dobinson 2001) or the RCHME's Defence of Britain project, and finally searchlight battery sites recorded in other areas of England (e.g. Cadman 2007). A summary of the results of the survey were given by Shaun Richardson at a talk presented at the 2011 YDNPA Archaeology Dayschool, and this prompted further contributions from several audience members, which have also been incorporated into the survey report.

Report and Archive

1.10 This archive survey report is based on the detailed field survey and information gathered on site and through research. It assembles and summarises the available evidence for the survey area in an ordered form, synthesises the data, comments on the quality and reliability of the evidence, and how it might need to be supplemented by further site work or desk-based research.

1.11 The full archive, comprising paper, magnetic and plastic media, relating to the project has been ordered and indexed according to the standards set by English Heritage's National Archaeological Record (EDAS site code FLC 11). It was deposited with the YDNPA Historic Environment Record on completion of the project.

2 HISTORICAL BACKGROUND

Introduction

2.1 The searchlight battery forms part of a complex, multi-period landscape in this area of Wharfedale, parts of which have been subject to detailed recording (for example, see Moorhouse 2003, 299-300). However, for the purposes of this report, the historical background concentrates on that material which is relevant to the battery itself.

Military Context

2.2 The battery is, of course, only one component of a landscape of defence, spread across the area to the north and north-east of Leeds and Bradford, and its position only makes any sense when it is read as part of this wider landscape. It is also a part of a landscape of offence, and for a fuller comprehension of this one needs an understanding of the tactics of the Luftwaffe. The reconstruction of such landscapes is not straightforward. Primary sources listing the position of every searchlight site in Britain do survive in the National Archives, but substantial time and effort is needed to retrieve the information.

2.3 Dobinson, in his excellent national survey of the physical remains of Anti-Aircraft or AA Command, summarises the difficulties as follows. Searchlight batteries were one of the most numerous of AA Command sites; in January 1941 there were just over 4,000 searchlights nationally. Their records are often scattered, searchlight batteries being logged in the archives of their occupying units, rather than in some over-arching national list. These records are not always logged in a consistent format and are not always easy to use; where grid references are given, they are to the projection and grid used by the Ordnance Survey in wartime, which differs from their modern equivalents, and so have to be manually converted (Dobinson 2001, 289, 467; Dobinson 2000b). It is quite likely therefore that the history of the Cracoe battery given below could be augmented by the examination of relevant material in the National Archives, and may be enhanced by research on searchlight batteries nationally which is currently being undertaken by English Heritage.

2.4 The Cracoe battery appears to have formed part of a network of air defences designed to protect the industrial conurbations around Bradford and Leeds from German bombers coming in from the north-east. An evacuee at Bewerley Park camp, near Pateley Bridge, remembered regularly hearing Luftwaffe planes overhead, using local reservoirs as a rendezvous point for bombing raids against regional targets and also those further afield in Liverpool, Belfast or Barrow in Furness (Cook 2002).

2.5 The battery at Cracoe was only one of a number of searchlights located in this area. For example, there were searchlights at High Bradley, to the south-east of Skipton, where one large and two smaller circular earthworks still survive, together with at least three or four hut platforms (National Monuments Record site SE04NW143; Pastscape 1364144). Another battery apparently existed at Gargrave (BCHR LHG 2005), although it has not been possible to discover any further information about this. Further afield, there were searchlights at Denton, north-east of Ilkley, where aerial photographs suggest that two incomplete semi-circular earthworks survive (NMR SR14NW129; Pastscape 1364040), and north-east of Baildon, where there are three large embanked circular earthworks, a smaller similar feature, hardstanding for generators, and an associated trackway (NMR SE14SE75; Pastscape 1369455). Finally, there were two battery sites at

Otley (NMR SE24NW71; Pastscape 1371310 and NMR SE24SW64; Pastscape 1374201). Without further research, it cannot be certain that all of these batteries were active at the same time although it is probably unlikely as searchlight batteries were relatively easy to move or remodel, so that a site might only be occupied for a short time.

2.6 Early on in the war, responsibility for manning the searchlights was transferred from the Royal Engineers to the Royal Artillery, and together with AA guns, searchlights came under the overall charge of Anti-Aircraft (AA) Command. Under this system, searchlight troops were organised into 'searchlight batteries RA' and in turn into 'searchlight regiments', who answered to anti-aircraft brigades forming part of AA Command's organisational hierarchy. A searchlight regiment might typically contain four batteries, whilst an anti-aircraft brigade would be responsible for all the guns and lights in a Gun Defended Area (GDA) around a specific town (Dobinson 2000b, 2). Furthermore, the way in which lights were deployed changed during the course of the war, with a great upheaval taking place in the design of searchlight layout in the winter of 1940-41. There had been a suspicion, based on operating experience, that single searchlights located within gun zones did more to light up the target for the enemy than drive them away. From approximately the autumn of 1940 therefore, lights began to be clustered, with up to half a dozen projectors on one site (Dobinson 2000b, 2). However, in November 1940, a new practice utilised the three-light cluster, drawing three projectors together on sites ideally 10,400 yards (six miles) apart, rather than the previous 6,000 yards (three and a half miles). Within the cluster system, where possible, the three projectors comprised one larger 150cm diameter type and two smaller 120cm or more usually 90cm types, often arranged in a triangle with about 50m between them (Dobinson 2001, 280-284).

2.7 But by the autumn of 1941, continuing experimentation had led to the decision to decluster searchlights once more. At the same time, sites were grouped into a series of belts on the approaches to major target cities. Conventionally, these were formed by a three-part arrangement; an Indicator Belt, 12 miles deep with lights deployed singly at spacings of about 10,000 yards to provide early indications of approaching bombers; a Killer Belt, 16 miles deep with single lights at 6,000 yard spacings, equipped with searchlight radars or sound locators, sometimes using 150cm projectors rather than 90cm projectors to aid night fighter aircraft to intercept bombers; lights in existing GDA's which incorporated positions up to 12,000 yards outside the outer line of existing guns, with single lights at a spacing of 6,000 yards or less, both to illuminate targets for AA guns and to dazzle the airborne bomb-aimers (Dobinson 2000b, 2; Dobinson 2001, 345).

2.8 The nearest Gun Defended Area to Cracoe was the Leeds GDA, where the highest total number of operational heavy Anti-Aircraft guns deployed was 39 in March 1944 (Dobinson 2001, 173 & 548). The nearest AA gun battery of the Leeds GDA to Cracoe appears to have been H21, located just to the north of what was then an Avro factory but which now forms Leeds-Bradford airport. It is believed that several German bombers were either shot down or crashed in the area to the north and north-east of Leeds during the war, including one which crashed near Ilkley after being damaged over Bradford (Patrick Sunderland, *pers. comm.*). There were undoubtedly other military sites near to Cracoe associated with air defence, which have now either passed from living memory or which have left little physical trace. For example, an Observation Post at Norton Tower was manned by No. 6 Platoon 'A' Company 32nd West Riding Battalion of the Home Guard, who were based at Scale House in Hetton (BCHR LHG 2005), and it is believed that until, recently ancillary buildings at Scale House preserved evidence

of Home Guard use, including a rack with pegs on which to hang tin hats; there was also a .22 rifle range located there during the war (audience member, YDNPA Archaeology Dayschool 2011).

History of the Cracoe Battery

2.9 Prior to the construction of the battery, historic map coverage shows the field in which it stands to be unoccupied, with the building on the opposite (south) side of Fell Lane named as 'Hill Top Laithe'. It has not been possible to establish exactly when the Cracoe searchlight battery was constructed, but it is believed to have been some time in 1941 (Patrick Sunderland, *pers. comm.*). The battery would have been built by the Royal Engineers, possibly the Pioneer Corps, and the day to day running of the construction works would have been the responsibility of the Clerk of Works, a Jack Mettrick of Otley. Once it was finished, it would have been manned initially by the Royal Artillery, but would have remained the responsibility of Captain Fred Sunderland, Royal Engineers, who was the garrison engineer for the area, and who was billeted at Burley-in-Wharfedale (Patrick Sunderland, *pers. comm.*).

2.10 It was common practice for many searchlight batteries to split their accommodation into two groups, one group of huts near the battery for the operating detachment and a more complete domestic site in a retired position near a road, where, for example, dining facilities were laid on (Dobinson 2001, 284). This was also the case at Cracoe, the searchlight battery being associated with an army camp based near Threapland Farm, a short distance to the north. The camp was equipped with separate red brick bath houses for men and for women, and also a canteen; Mr Sunderland remembered seeing the parabola of a searchlight being cleaned at Threapland (Patrick Sunderland, *pers. comm.*) while local people also remembered seeing sentries posted near the camp (local information, *pers. comm.*). The provision of separate bathing facilities at Threapland might suggest that women from the ATS (Auxiliary Territorial Service) could have been present; in the winter of 1941-42, to ease manpower shortages, it was proposed that the ATS operated searchlight sites and this became more common from mid 1942 onwards (Dobinson 2001, 336). It has also been suggested that American soldiers were once present at the Cracoe battery (BCHR LHG 2005), although this might be a mistaken reference to Canadians (Patrick Sunderland, *pers. comm.*).

2.11 As would be expected, the battery was clearly disused by the time that a vertical black and white aerial photograph was taken of Cracoe in May 1946 (see figure 3). This photograph shows two smaller circular earthworks very clearly, together with a similar but larger earthwork some distance to the east. Several smaller structures, some sub-circular and apparently the result of recent disturbance, can be seen to the west of the paired circular earthworks. Seven hut bases can be seen on the north side of Fell Lane, their bright appearance denoting exposed concrete; a line runs north-east from the second hut from the east end towards the paired circular features. At the time the photograph was taken, there was no drystone wall separating Fell Lane from the field in which the battery was located. A more recent oblique colour aerial photograph taken in 1990 (see figure 3) shows the drystone wall to have been rebuilt and the hut bases to be overgrown, but otherwise most of the other features shown in 1946 are still visible.

3 DESCRIPTION OF THE SURVEY AREA

Introduction

3.1 A description of the survey area is given below, based on notes and observations made in the field, and the results of the detailed measured survey. As has been noted above, each of the major individual components has been ascribed a unique identifier number (e.g. **Site 1**), for purely descriptive purposes. Reference should also be made to the reduced survey drawings included in this report (see figures 5 and 6). In the following text, the actual searchlights themselves are referred to as 'projectors', following the example of Dobinson (2001).

The Survey Area

3.2 The survey area covered a sub-rectangular pasture field measuring c.250m east-west by a maximum of 300m north-south. The field is bisected by the route of a buried gas pipeline, clearly visible on modern aerial photographs, which runs on a shallow north-east/south-west alignment to the east of centre of the field. At the time of the survey, there was a marked difference in surface vegetation either side of the pipeline, with the grass to the east being noticeably shorter than that to the west. The ground surface within the survey area sloped markedly down from north to south, towards Fell Lane which runs along the south side of the area. The view north and north-east from the battery is blocked by the steeply rising mass of Cracoe Fell, but there are extensive views to the west of almost 20 miles towards Lancashire.

3.3 At the time of the survey, the only access into the field was through a gateway in the north-west corner, leading off Fell Lane. Fell Lane itself is only roughly metalled, and preserves little evidence for wartime alteration. All sides of the field were bounded by drystone walls, and these preserved a number of items of wall furniture.

3.4 This wall furniture is described in a clockwise direction, starting at the north-west corner of the field. At this point, a straight joint is visible in the wall close to the north-west corner, and also a narrow blocked gateway just to the east, just over 1m wide, with a stone stoop surviving on the eastern side. To the east of the blocked gateway, the wall stands 1.10m high on the survey area side, being 0.80m wide at the base and slightly battered towards the top. It is built of random stone rubble with few or no throughs, and has upright rubble coping. The wall continues in this form as far as a gateway with stone stoops approximately half way along the north side of the survey area, and beyond it in a similar fashion as far as the northern corner of the field. From here, the wall becomes more substantial as it moves south-east, incorporating a straight joint a short distance from the north corner of the field. Beyond a gateway incorporating a re-used stone stoop, the wall rises to 1.40m in height, although its overall construction remains similar along the whole of the east side of the survey area. Running south-west from the east corner of the field, the wall incorporates a 0.50m high sheep creep with a flat stone lintel. The wall then becomes taller and more substantial to the south-west, standing to over 1.50m in height and developing a profile with a more pronounced batter, but still with few through stones. As has been noted above, no wall is shown on the 1946 aerial photograph on the north side of Fell Lane, and so all of the existing drystone wall must have been built after the war, when the field was returned to agricultural use; the number of straight joints it preserves suggests that it was built in a number of phases.

The Surviving Earthworks (see figure 5)

Hut bases and other structures (Sites 1, 2 and 5)

3.5 On entering the field, the most obvious feature is a row of hut bases (**Site 1**) positioned along the northern side of Fell Lane. In 1946, these were open to the lane, the drystone wall here being a post-war addition. Seven concrete hut bases are also visible on the May 1946 aerial photograph, with a line running north-east from the second hut from the east end towards a pair of circular earthworks (see below). Local information suggested that up to eight accommodation huts had once been present (BCHR LHG 2005).

3.6 There are in fact the earthwork remains of nine hut bases surviving within the field. The seven hut bases shown in 1946 are all of similar form, measuring c.12m long by 6m wide (see plate 1). They are closely grouped, with less than 2m between them, and they are stepped slightly downwards from south-east to north-west; most were being used to store manure at the time of the survey. The easternmost three are represented by shallow sub-rectangular depressions, but the other four retain visible surface traces of the concrete base. An angled bank to the south-east of the hut bases may represent a former wall alignment, as it contains a high proportion of stone rubble and it is aligned on a straight joint in the adjacent drystone field wall. It is possible that the wall on the north side of Fell Lane was initially only demolished as far as the east end of the huts, and that the remainder was re-aligned along the route marked by the angled bank. No trace could be seen of the linear feature shown leaving the second hut from the east end in May 1946, but given that this was aligned on a pair of circular features, it may represent the line of a former cable from generators accommodated in or adjacent to the huts - electric power would have been needed for both the projectors and any location equipment that was present, and a Lister generator is the most likely type to have been used (Patrick Sunderland, *pers. comm.*).

3.7 Although they also display evidence for the use of concrete, and both can be seen on the 1946 aerial photograph (albeit less clearly), the two westernmost hut bases are slightly different to the other seven (see plate 2). They are set slightly further to the north-east, and are also slightly narrower than the others. The southern of the pair may preserve evidence for brick footings on the concrete base. The original form of the hut superstructures is unclear. It is likely that some were Nissen derivates but others may have been slightly different, as searchlight crews in some areas were encouraged to camouflage their huts by, for example, mimicking the character of local buildings such as farm buildings (Dobinson 2001, 284).

3.8 To the north of the hut bases there is a group of smaller structures (**Site 2**). Of these, the most prominent is a small sub-circular, almost comma-shaped, earthwork, c.7m across but less than 0.30m high. The earthwork appears to have been open to the north-west, and has a small sub-square depression at the centre. Although it is suggested to be unlikely that such features were present (Patrick Sunderland, *pers. comm.*), the earthwork does bear a strong resemblance to what might be expected to survive if a sandbagged Light Anti Aircraft (LAA) machine gun position had been dismantled (Brown *et al* 1995, 63). These were most commonly formed by a Lewis Gun mounted on a central post and surrounded by an encircling parapet of sandbags (see figure 4). The detailed design of these positions was sometimes left to local commanders to decide, and Dobinson (2001,182) includes an example designed by Sir Mortimer Wheeler, when he was Lieutenant Colonel Wheeler in command of the 42 LAA Regiment.

3.9 A shallow north-facing scarp runs north-east from the possible LAA position towards the other earthworks within the group. To the north of this scarp, there is a small sub-rectangular earthwork, aligned north-west/south-east, c.4m long by 2m wide. It is flanked by low linear mounds, up to 5m long but generally shorter, and on a north-east/south-west alignment. These may have slight parallel depressions on their downslope (north-western) sides, and it is possible that they are the remains of PAD (Passive Air Defence) trenches for shelter during air raids; it was standard practice to provide these at searchlight sites (Dobinson 2000b, 2).

3.10 To their south, a second sub-rectangular structure survives as an earthwork. It measures c.5m long and c.2m wide, and is on the same orientation as the possible PAD trenches noted above. Most of these features can be seen on the 1946 aerial photograph, and the possible LAA position is quite prominent on the 2004 photograph.

3.11 Close to the boundary wall with Fell Lane and opposite Hill Top Laithe, there is another structure (**Site 5**) which may be contemporary with the searchlight battery. It is formed by two shallow sub-rectangular platforms, aligned north-west/south-east, both c.7m long by c.3m wide, and both preserving evidence for either concrete or brick bases. The structures may be visible on the 1946 aerial photograph, but they are not as clear as, for example, the other hut bases, suggesting that they were more ephemerally-built structures or that they fell out of use at an earlier date.

Projectors (Searchlights) (Sites 3 and 4)

3.12 The most prominent features within the survey area are the three circular earthworks, representing the pits which housed either the projectors or a predictor of one form or another, a device used to determine the direction and position of oncoming enemy aircraft (see Discussion and Conclusions below); local information suggests that 'air raid detection equipment' was present at the battery (BCHR LHG 2005). Predictors could work on either sound or visual information. A common type was manufactured by Bar and Stroud. It basically consisted of a horizontally mounted tube about 1m long with a mirror or prism at either end. These produced two images of the plane being tracked on a screen and when these merged it was possible to work out the angle, movement and speed of the plane. This information was then used to predict the plane's future position and guide the projectors (Patrick Sunderland, *pers. comm.*).

3.13 The paired circular pits (**Site 3**) both have an internal diameter of c.8m-10m, and are surrounded by a broad flat-topped earth parapet, up to 1.5m wide and standing just over 1.0m high; they confirm to the standard examples (see figure 4). The earth parapet of the western pit also preserves some evidence of longitudinal division (see figure 6). On its east side, there is a sub-rectangular mound, 5.50m long and 2m wide, which appears to replace the main parapet here, as this fades out. However, it resumes a short distance to the south and, where it curves around to the south and then west, there is evidence for further longitudinal division, principally a 'step' set c.1m back from the top of the inner side of the parapet. It is highly likely that some of these longitudinal divisions are the result of original revetting material, such as corrugated iron or sandbags being removed, as shown by Dobinson (2001, 183) in his reconstruction of a searchlight pit.

3.14 The broad principles of searchlight site design did not alter much over the duration of the war. The official pattern consisted of a broad flat-topped earthwork parapet thrown up to encircle the light projector, which stood at the centre of a revetted

emplacement containing a slightly raised operating platform. Variations on this theme were used, including the excavation of an annular ditch around the parapet (Dobinson 2001, 184). At Cracoe, there may be the denuded remains of a similarly-sized third circular structure close to the other two, positioned immediately to their north, but this is not certain.

3.15 The single circular pit (**Site 4**) is situated some 50m to the south-east of the pair. It is of similar construction, but somewhat larger at c.12m internal diameter (see plates 3 and 4). It too preserves evidence for longitudinal division to the earth parapet, principally a step to the interior, and has the remains of a very shallow annular ditch on the south and south-west side.

Other earthworks (Sites 6, 7, 8 and 9)

3.16 There are further earthworks to the north-east of the larger projector pit. The 2004 aerial photograph suggests that they may be up to three conjoined sub-square enclosures here, and the remains of one are still just discernable as a very faint earthwork. The sub-square enclosures may sit within a larger enclosure (**Site 6**), the sides of which are defined by shallow scarps, with the scarp on the south-west side perhaps having a slight ditch running parallel along its east side. In the north-west corner of the larger enclosure, there is a pair of low linear mounds, which bear some resemblance to the possible LAA position seen to the north-west (see Site 2 above). Although it is unlikely that the battery would have been provided with two such positions, these earthworks are more sharply defined than the others in this area, and so also probably date to the Second World War; it may represent a replacement LAA position.

3.17 The larger enclosure may have been reached by a trackway running towards it from the west (**Site 7**). This is visible to the west of the disturbance caused by the gas pipeline as a shallow linear depression, with a more prominent bank running parallel to the southern side. It fades out to the south of the paired circular pits (Site 3 above), but can be seen again on the 2004 aerial photograph to the north of the possible LAA position (part of Site 2), and may survive here as a slightly deeper depression between two linear banks.

3.18 There are other curvilinear depressions to the east of the larger circular pit, some of which pre-date the drystone walls forming the boundary to the field, and which may represent earlier trackways ascending the higher ground to the east. The probable line of a culvert can also be seen to the south-west of the larger circular pit.

3.19 In the northern corner of the survey area, a raised knoll of ground is crossed by parallel linear earthworks on an east-west alignment (**Site 8**). On the west-facing slope of the knoll, there are two sub-circular depressions which probably represent tree pulls; the southern one has a shallow narrow and curvilinear depression to one side, which runs almost as far westward as the paired circular pits. The southern edge of the knoll is also crossed by a linear gully on a north-west/south-east orientation, and may have the denuded remains of a sub-rectangular structure on its summit, adjacent to a gateway in the drystone field wall here. South-east of this gateway, there is a semi-circular depression to the south side of the wall, caused by cattle or sheep gathering around a water outlet in the base of the wall.

3.20 Further slight linear banks, set at approximate 8m centres and generally running parallel to one another on a north-west/south-east alignment, can be seen running towards the north-west boundary of the survey area (**Site 9**). They are clearly

visible on the 2004 aerial photograph, and may well comprise denuded ridge and furrow which extends into the adjacent field. However, some of these linear furrows are rather straight, and so may in part represent post-war drainage activity.

4 DISCUSSION AND CONCLUSIONS

4.1 Second World War sites such as the Cracoe searchlight battery now form part of a landscape which is as much a remembered one as it is a physical one. Furthermore, it is increasingly one remembered by those who were children at the time, and it is clear that the aerial phenomenon of war, be it searchlights, bombers or escaped barrage balloons drifting up Wharfedale, held a special fascination for children (BCHR LHG 2005; Richardson 2008). A Cracoe boy, recounting his wartime childhood, made special mention of the searchlight battery up Fell Lane, weaving patterns of light across the night sky, with fainter beams from searchlights on more distant sites (BCHR LHG 2005).

4.2 The recording of such sites, and the presentation of the results of this recording at public venues such as Archaeology Dayschools, stimulates those with such memories to come forward. Often these memories relate to structures or activities which have left little or no physical trace, and whose presence would otherwise remain unknown, thus providing an important balance to archaeological survey; the Bordley-Cracoe-Hetton-Rylstone Local History Group are to be particularly commended for the recording of local wartime memories that they undertook prior to 2005. In addition, as Dobinson (2000b, 2) has highlighted, an awareness of the presence and form of often numerous Second World War earthworks is vital in the wider recording and understanding of landscapes, because features such as denuded projector or predictor pits could easily be mistaken for evidence of much earlier activity. In this regard, given that Norton Tower near Rylstone was used as an observation post during the Second World War, one might speculate as to what extent the Home Guard modified any pre-existing medieval or early post-medieval earthworks around the ruins of the tower.

4.3 A combination of field survey and oral evidence has established that at Cracoe, the searchlight battery comprised both projectors and prediction equipment, that as many as nine huts or other structures were placed adjacent to Fell Lane, and that other structures, including a probable LAA position, were present. It should be borne in mind that the structures recorded by the archaeological survey will only represent a part of those that were once present, as tented or above-ground sandbagged structures will have left only very slight or no surface traces.

4.4 The battery is believed to have been constructed in 1941 and was associated with a camp near Threapland Farm; it is possible that the searchlights were operated by the ATS at some point during the war. The surviving earthworks do not closely resemble the three-light cluster system introduced in November 1940, and on balance, the form, together with the distance between Cracoe and the other batteries at Gargrave and High Bradley (each separated by c.10,000 yards), suggests that it is most likely to belong to the three-part arrangement of defensive belts initiated in the autumn of 1941 (although an earlier battery could of course have been remodelled), and that it was associated with the Leeds GDA.

4.5 However, two alternative functions can be suggested. The survey has recovered no evidence for any searchlight batteries positioned further north up Wharfedale other than Cracoe, and therefore the battery may have been placed within the Indicator Belt and equipped within a single projector only. Alternatively, given the presence of the predictor equipment, and the size of circular pit (Site 4), the battery may have been placed within the Killer Belt, perhaps with predictors housed in the paired circular pits (Site 3) and a single 150cm projector in the larger pit (Site 4). It is likely that further documentary research in the National Archives would resolve some of these questions.

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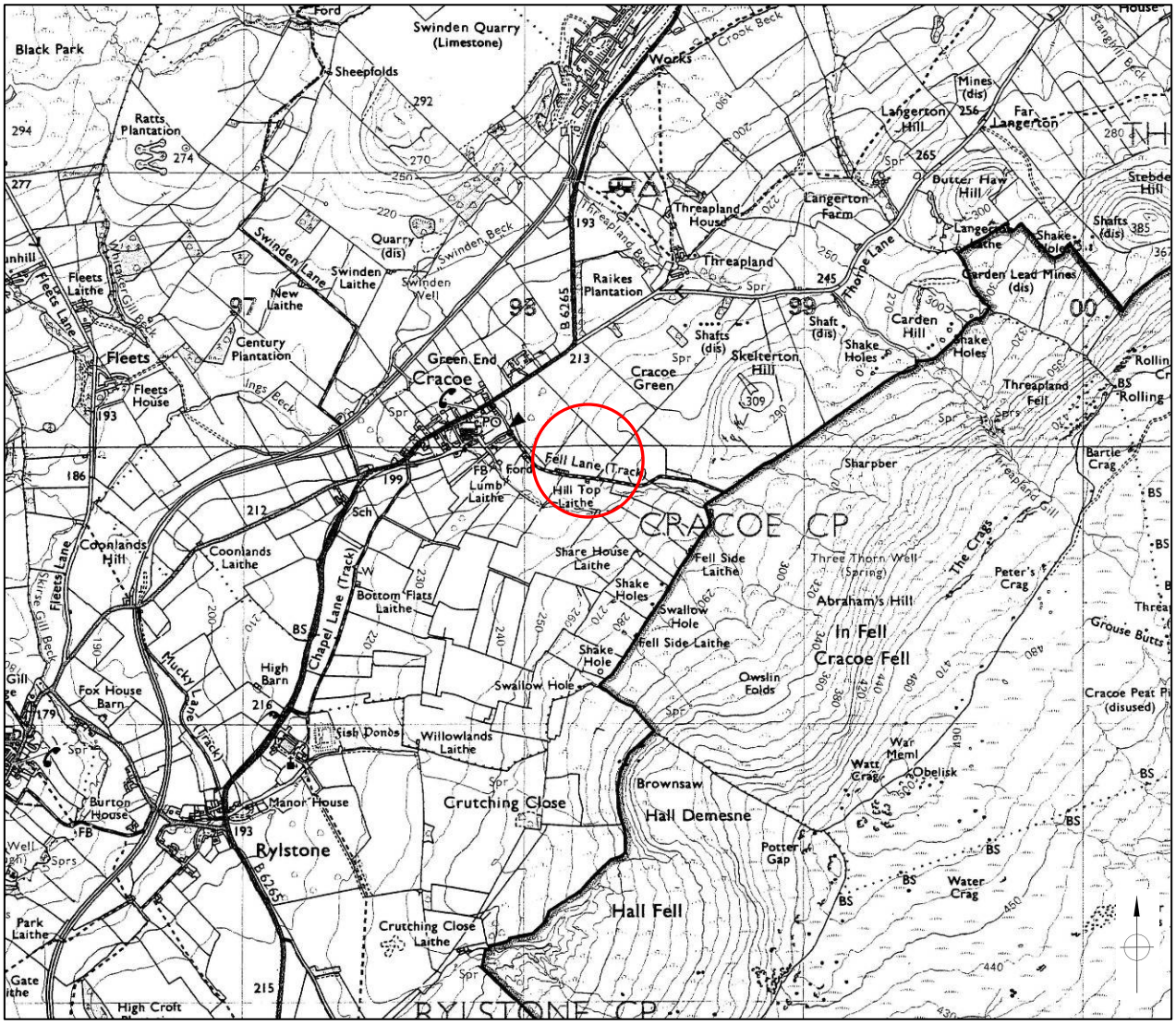
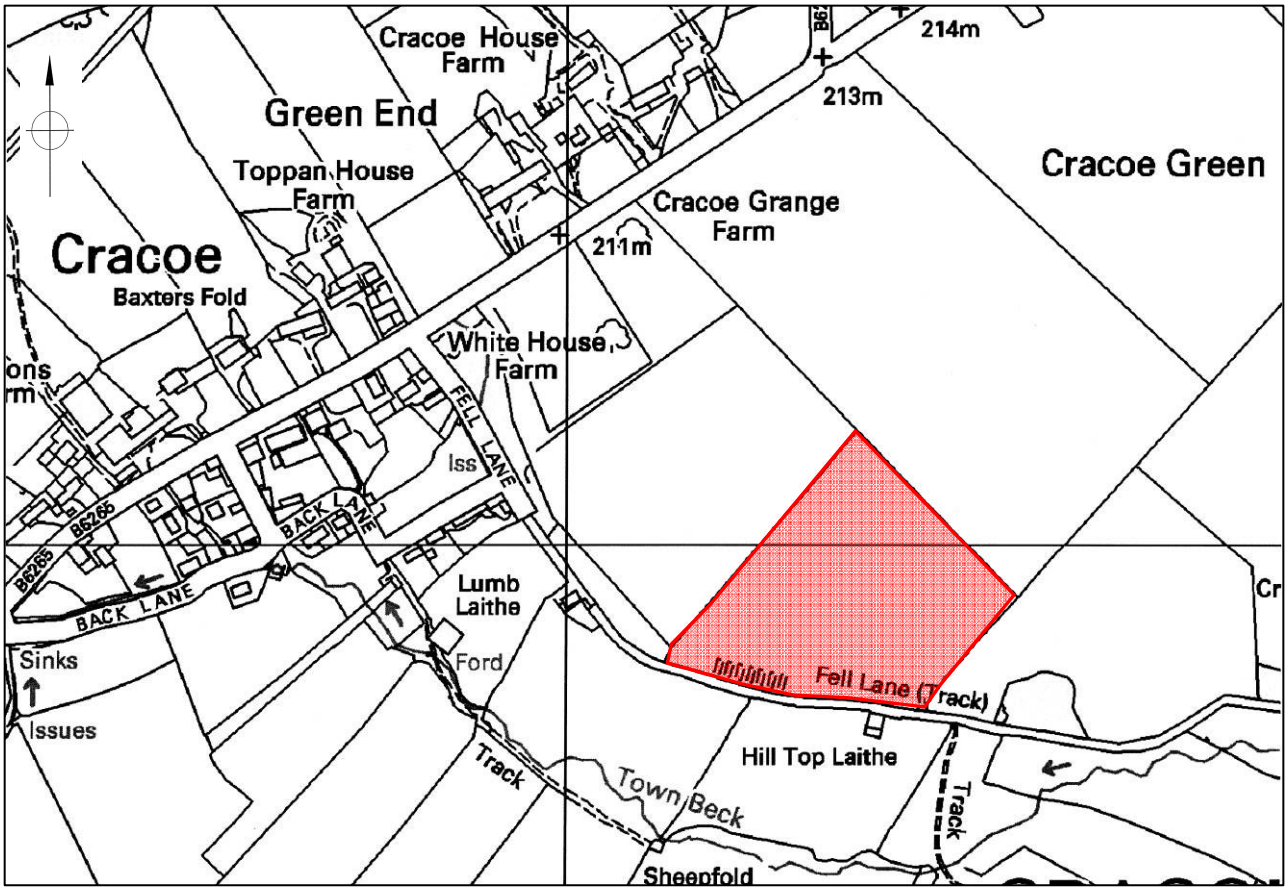
6 ACKNOWLEDGEMENTS

6.1 EDAS would like to thank Mr J W Stockdale for giving permission for the survey to take place on his land, and Robert White of the YDNPA for offering support and enthusiasm for the project. Thanks are also extended to Mrs Rhymer of the Bordley-Cracoe-Hetton-Rylstone Local History Group who supplied a copy of their recording work on World War Two memories in the area. Finally, special thanks are given to Mr Patrick Sunderland, without whose contribution this report would be much the poorer, and who re-visited Cracoe during heavy snow in early December 2009.

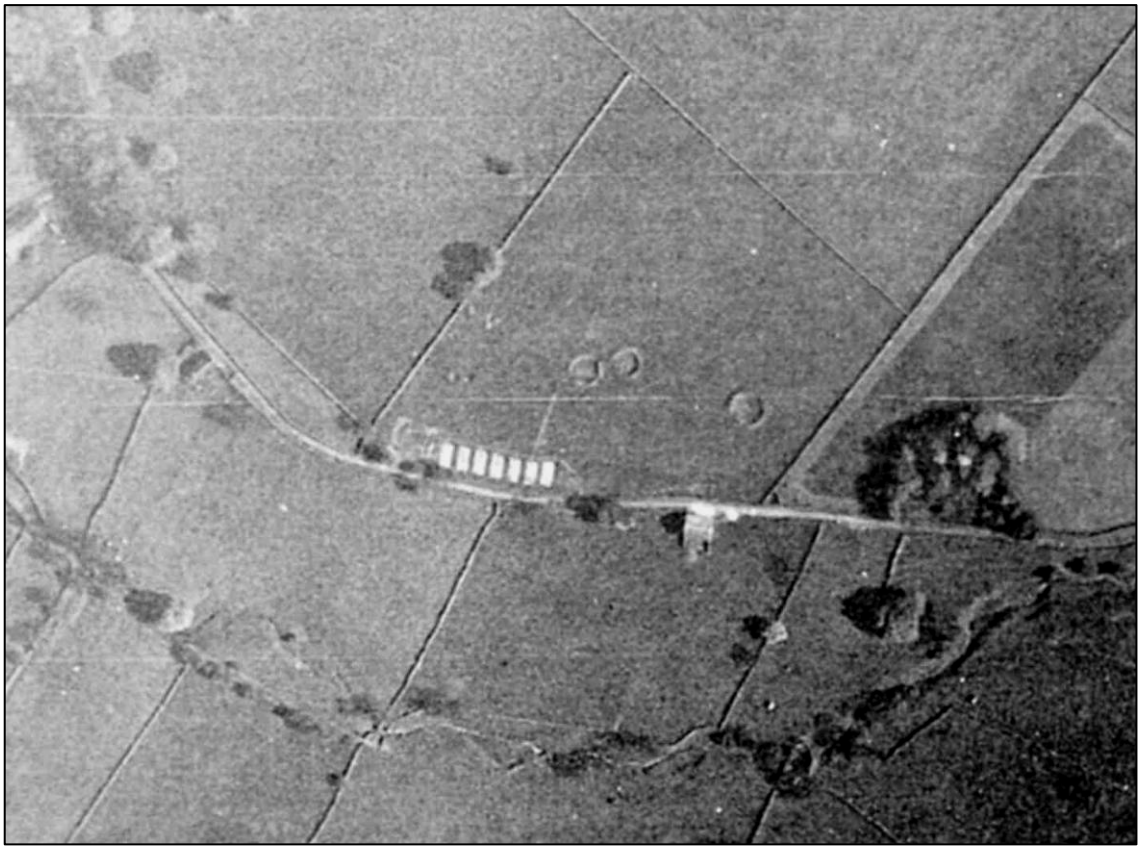
6.2 The on-site survey work was carried out by Shaun Richardson who also took the photographs and produced a draft report and site archive. The final report was produced by Ed Dennison, with whom the responsibility for any errors or inconsistencies remains.



PROJECT: CRACOE SEARCHLIGHT BATTERY	
TITLE: GENERAL LOCATION	
SCALE: NTS	DATE: JULY 2011
EDAS	FIGURE: 1



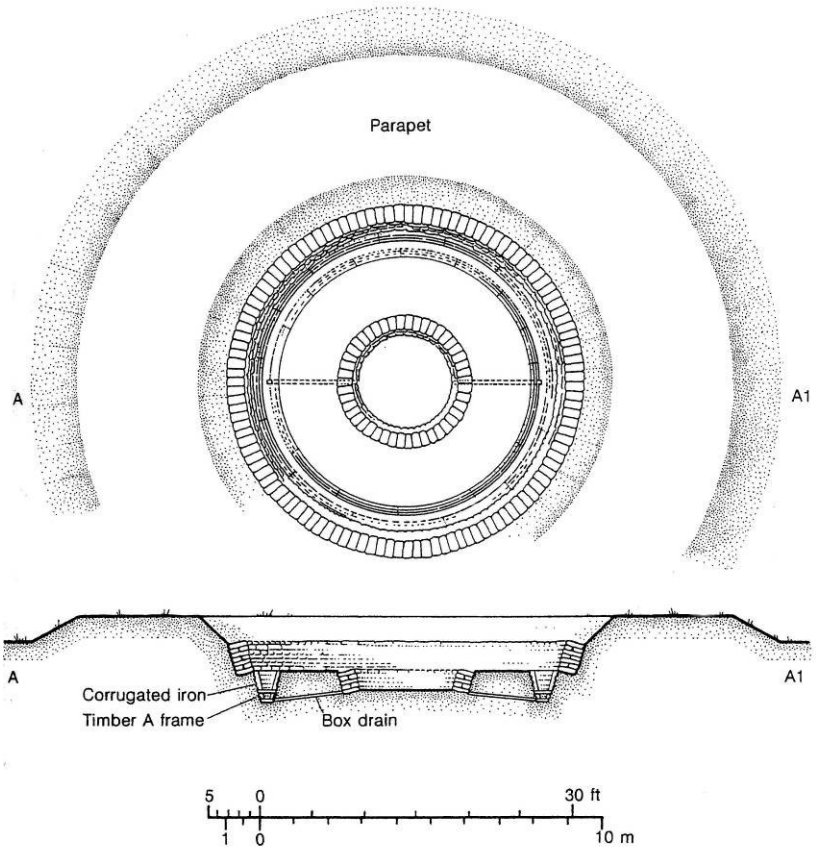
PROJECT: CRACOE SEARCHLIGHT BATTERY	
TITLE: AREA OF SURVEY	
SCALE: NTS	DATE: JULY 2011
EDAS	FIGURE: 2

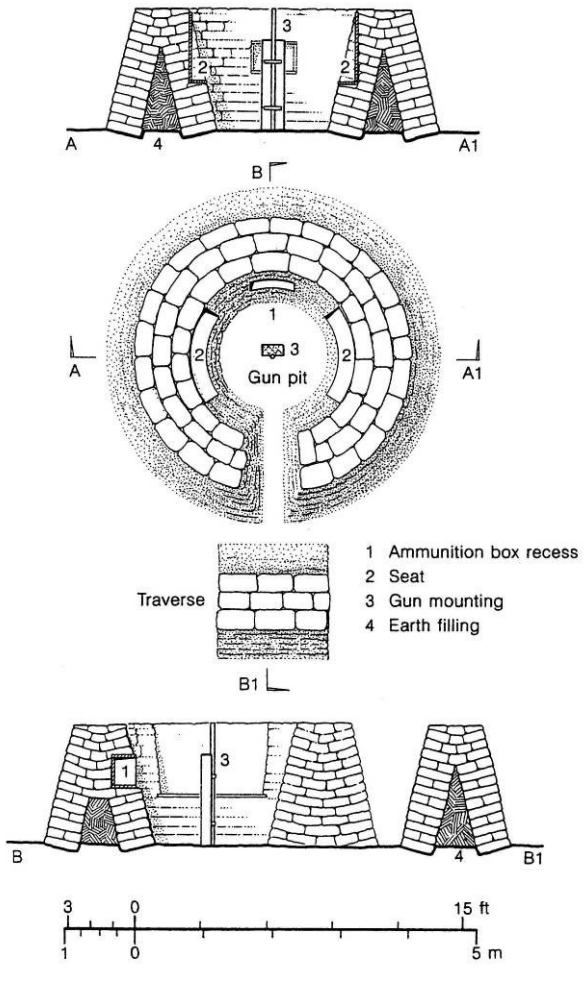


Top: RAF aerial photograph taken 16th May 1946.

Bottom: YDNPA aerial photograph taken 5th December 1990.

PROJECT	
CRACOE SEARCHLIGHT BATTERY	
TITLE	
AERIAL PHOTOGRAPHS	
SCALE	DATE
NTS	JULY 2011
EDAS	FIGURE 3

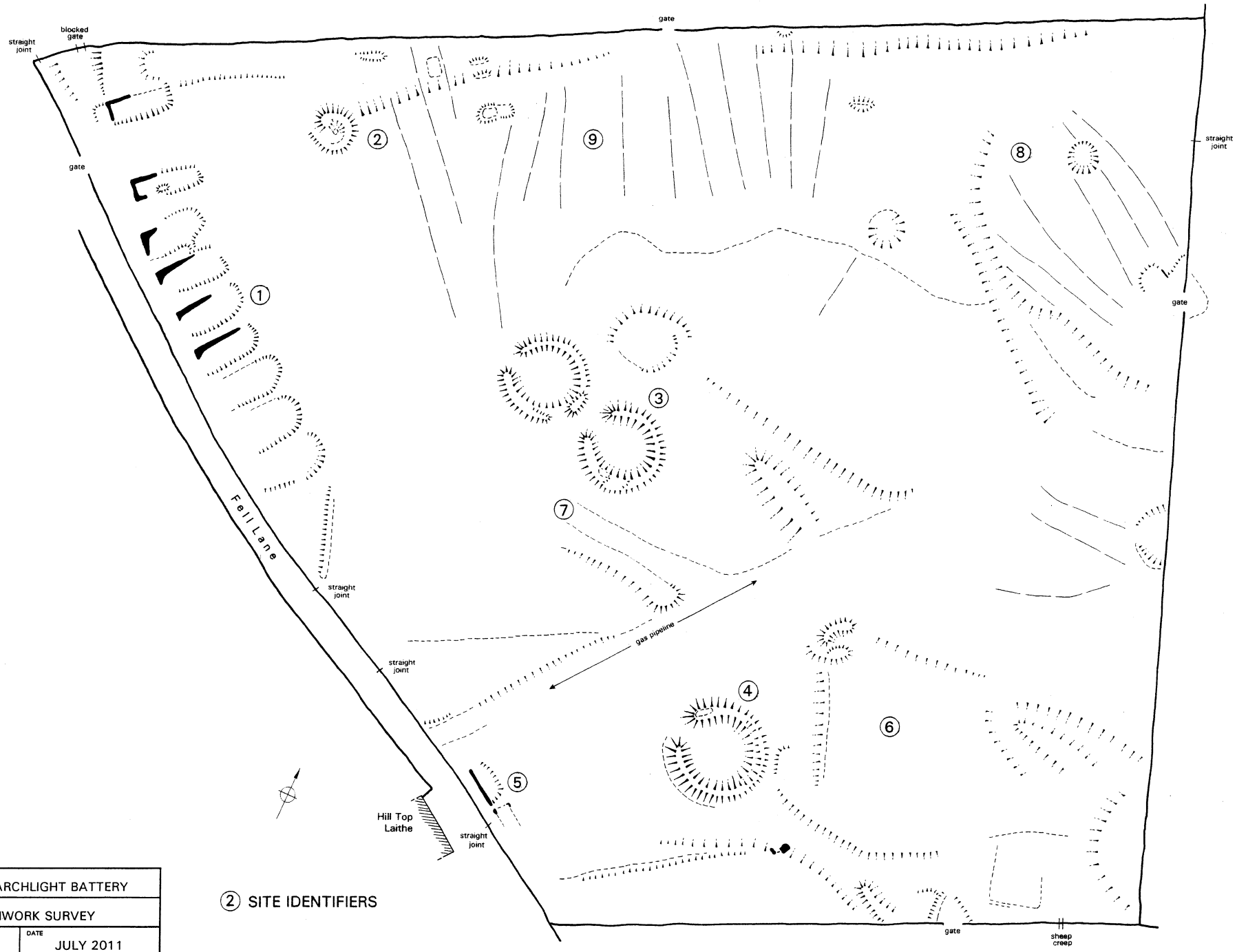




Top: Typical immediate pre-war searchlight site emplacement (Dobinson 2001, 183).

Left: One example of a Lewis gun emplacement, designed by Mortimor Wheeler in 1939 (Dobinson 2001, 182).

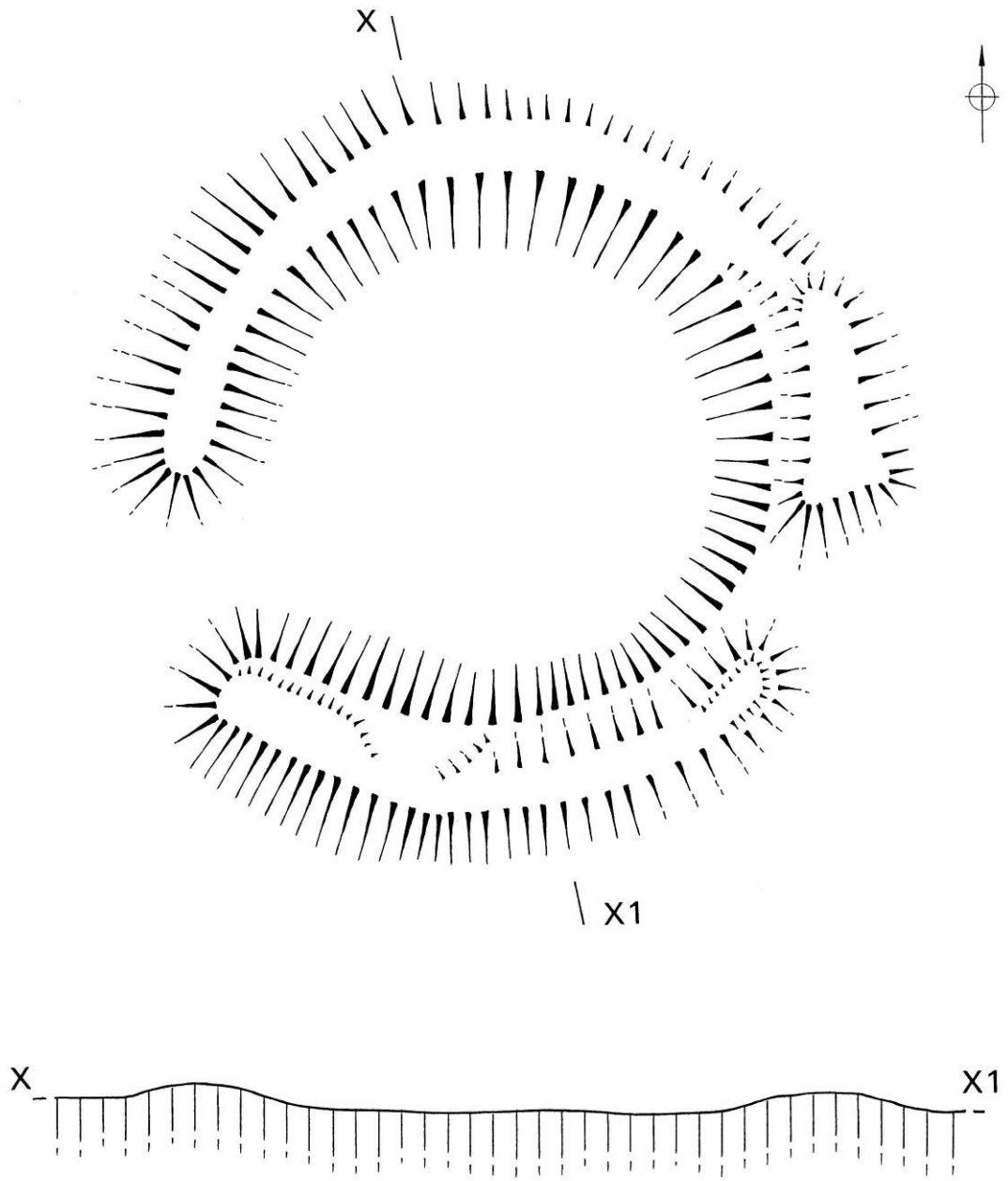
PROJECT: CRACOE SEARCHLIGHT BATTERY	
TITLE: EXAMPLES OF STRUCTURES	
SCALE: NTS	DATE: JULY 2011
EDAS	FIGURE: 4



PROJECT: CRACOE SEARCHLIGHT BATTERY	
TITLE: EARTHWORK SURVEY	
SCALE: AS SHOWN	DATE: JULY 2011
EDAS	FIGURE: 5

② SITE IDENTIFIERS

0 50m



PROJECT: CRACOE SEARCHLIGHT BATTERY	
TITLE: WESTERN EARTHWORK OF SITE 3	
SCALE: AS SHOWN	DATE: JULY 2010
EDAS	FIGURE: 6

Plate 1: View of hut bases (Site 1), looking SE (photo 3/928).

Plate 2: Westernmost hut base (Site 1), looking NW (photo 1/645).

Plate 3: Circular earthwork (Site 4), looking W (photo 2/650).

Plate 4: Circular earthwork (Site 4) looking south towards High Top Laithe (photo 2/653).

APPENDIX 1

APPENDIX 1

Memories related by Mr Patrick Sunderland (age 84) on a site visit to Cracoe searchlight battery on the 17th December 2009

Background

Mr Patrick Sunderland's father, Captain Fred Sunderland of the Royal Engineers, was the garrison engineer for the area. He was billeted at Burley-in-Wharfedale, which was fortuitous as this was where the family home was. Prior to, and after the war, Mr Fred Sunderland was an architect with a small local practice. Mr Patrick Sunderland, as a 14 year old in 1940-41, used to accompany his father during school holidays in their car on his inspections of the various sites which were his responsibility. They sometimes used an Austin Hillman pick-up. Mr Sunderland also visited other sites in the area, including the searchlight battery at Bradley and another near Elsack or Sutton. At the latter site, in the period immediately following Dunkirk, he was talking to some of the battery garrison and a German plane, possibly a Dornier, flew over taking photographs. The battery crew had 300mm P14 rifles using rimfire cartridges, as were issued to the Home Guard, but they had no ammunition, so all they could do was wave their rifles at the plane! Later on, when he was a Sergeant in the Army Cadet Force, he visited some of the sites himself, without his father.

Mr Sunderland started his career in the infantry, training at Newark. He went for a commission in the Royal Engineers and after some initial problems became an officer. He was sent to Routham for pre-officer training and was supposed to be sent to India for three months but one man in their hut was thought to have scarlet fever, and so they were all quarantined. He was eventually sent to West Africa as a Royal Engineer (81st West African Division 36th First Company) and was preparing to take part in the invasion of Japan, but was ultimately never sent.

The construction of the site

The Cracoe site and others in the vicinity would have been constructed by the Royal Engineers, possibly the Pioneer Corps. There was a Corps of Tradesmen that sometimes also did work, and also the Rangers at Burley in Wharfedale. Sometimes 'Taking of Leave Men' were used; these were convicts who were released into the army. They built the road up to the rifle range at Burley in Wharfedale. The day-to-day running of the construction would have been the responsibility of the Clerk of Works, Jack Mettrick, of Otley. Once it had been constructed, the searchlight battery would have been manned by the Royal Artillery. The battery was almost certainly constructed in 1941.

The operation of the site

The numbers of people present at the site would have varied, but one would expect a battery of two searchlights for ranging to have had a team of four/five people per light, plus a crew of one or two for the predictor. There may also have been ATS present, cooks etc and so one might end up with 30 people present. The predictors would most likely have been manufactured by Bar and Stroud. These basically consisted of a horizontally mounted tube about 1m long with a mirror or prism at either end. These produced two images on a screen and, when these merged, one could work out angle, movement and speed of the plane. This information was then used to predict the plane's future position and guide the lights. The planes here would presumably have come in from the north-east; the Germans used lots of air bases in Norway as well as France, Holland and Belgium. The battery would have had a Lister generator to power any searchlights that were present.

The site may not have been ideal for a searchlight battery, and it could have been sited higher up the hillside, with a clearer long-distance view to the north. Two searchlights should be set farther apart than the pair of smaller circular pits at Cracoe. It is possible that there were two predictors and a single searchlight working in conjunction with another light in the area. Alternatively, the larger pit may have housed the predictor. It may be that the ATS were quartered in huts at Cracoe or the Royal Artillery. The predictor crew may have been quartered in the main camp at Threapland. The huts may have been used as 'shift' accommodation for those working up at the searchlight site.

Threapland Camp

The RAMC did a water test at the farm near where the camp was based and condemned the available water supply, and so they had to put a new main in. There were red brick bath houses at Threapland, with separate baths for men and women. There was also a canteen at Threaplands, and Mr Sunderland remembered seeing the parabola of a searchlight being cleaned there; this was done with great care as these were expensive items, costing £30 each.

There was a great deal of other wartime activity in the area. For example, Bolton Abbey station was used for moving ammunition for D-Day and in the lanes round and about, there were huge stockpiles of ammunition. A German bomber may have crashed near Ilkley during the war, after having been shot up over Bradford.