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SOUTH DOWNS
BEACHY HEAD TO THE RIVER OUSE
AERIAL INVESTIGATION AND MAPPING

ARCHAEOLOGICAL REPORT

Edward Carpenter, Martyn Barber and Fiona Small

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Cover Photograph: Cuckmere Haven, the Seven Sisters and Beachy Head.
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SUMMARY

This survey involved the interpretation, transcription and recording of all archaeological features seen on aerial photographs for part of the South Downs within East Sussex. The project area included the coast from Peacehaven to the western edge of Eastbourne, areas of downland and parts of the Ouse and Cuckmere river valleys. This report explores some of the key themes identified during the project.

This survey is one of three projects designed to characterise the historic environment in sample areas of the South Downs National Park (see Carpenter 2008, Young 2011). The results also complemented the South East Rapid Coastal Zone Assessment Survey (Hamel & Lambert 2011; Dickson, Janik, Priest & Royall 2012).The project contributed to National Heritage Protection Plan (NHPP) Measure 3 Activity 3A4 Identification of terrestrial assets via non-intrusive survey (RASMIS Project Number 5868 NMP S Downs). The project recorded 655 previously unknown archaeological features and amended details for 265 in the English Heritage National Record of the Historic Environment

Archaeological features were recorded with potential dates ranging from the Neolithic through to the modern period. Extensive areas of lyncheted field systems highlight the possibility of, as yet undiscovered, associated enclosed settlements and the need to carefully consider the relationships of the fields to Bronze Age round barrows and other features on the Downs. Perhaps one of the most iconic features of this part of the Downs is the Long Man of Wilmington. This hill figure is discussed and its relationship to the nearby earthworks whose perceived antiquity influenced the dating of the Long Man. Dewponds and a livestock enclosure are testament to the sheep kept on the downs. Numerous works were undertaken to improve both the drainage of the Ouse valley and the navigation of the river itself and evidence of earlier episodes of these works were identified. There is good evidence of the First World War army camps at Seaford, and extensive military remains dating to the Second World War. These reflect both the threat of attack from the air or invasion as well as the widespread military training undertaken across much of the downs. Representations of wartime Newhaven on aerial photographs and in war art are discussed.

CONTRIBUTORS

The interpretation, transcription and recording were carried out by Edward Carpenter, Fiona Small, Martyn Barber, Robert Skinner, and Cathy Stoertz. Edward Carpenter, Martyn Barber and Fiona Small wrote the report. Helen Winton compiled and edited the report and produced some of the illustrations.

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DATE OF SURVEY

2009-10 & 2012

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INTRODUCTION

This report describes the results of *The South Downs NMP: Beachy Head to River Ouse Project.* This forms part of a suite of English Heritage research to enhance our understanding of the archaeological remains within the area covered by the newly created South Downs National Park (McOmish 2005). It is the third project in the park to use National Mapping Programme (NMP) standards following-on from *Hampshire South Downs* (Young 2011), and The *South Downs NMP Pilot Area 1: Worthing to the Weald* (Carpenter 2008). These projects were carried out to characterise the archaeology on the Downs and immediate environs and to inform future archaeological work and conservation management plans for the National Park.

The project contributed to National Heritage Protection Plan (NHPP) Measure 3 Activity 3A4 Identification of terrestrial assets via non-intrusive survey (RASMIS Project Number 5868 NMP S Downs).

All archaeological features visible on aerial photographs were surveyed and recorded. This included buried features visible as cropmarks or soilmarks, earthworks and structures with a potential date range from the Neolithic period to the mid-20th century, the latter mainly military sites.

The project area originally comprised chalk downland between Lewes and Eastbourne, the Ouse and Cuckmere river valleys, and part of the Weald (Carpenter 2009). It included the eroding 'heritage coastline' at Beachy Head and an area for proposed managed retreat along the lower Cuckmere river (EA 2007).

The coastal strip was completed in 2010 to contribute to the South East Rapid Coastal Zone Assessment Survey EH Projects No. 5698, 6102-3 (Hamel and Lambert 2011, Dickson et al 2012). The World War I camps at Seaford were subject to further analysis as part of this phase (Skinner 2011). The interim results contributed to a website on the South Downs http://www.english-heritage.org.uk/discover/south-downs/

Due to a reduction in the team, the project was revised to target key areas of archaeological and geographic significance (Small and Winton 2012). The revised project area comprised 118 square kilometres. The reduced area, chosen by the project team and stakeholders, included Bullock Down, part of Friston Forest, the Ouse and Cuckmere valleys, and the areas of chalk downland east of Lewes and between Beachy Head and the Long Man of Wilmington. The remaining parts of the revised project area were completed in Late 2012.

The project recorded 655 previously unknown archaeological features and amended details for 265 in the English Heritage National Record of the Historic Environment (NRHE AMIE database).

Project Area

The project area is in East Sussex and includes downland to the east of Lewes, the Ouse Valley below Lewes, a coastal strip between Newhaven and Eastbourne, the Cuckmere Valley up to Berwick, and downland stretching north-west from Beachy Head to Wilmington (Fig 1). The area is within the eastern end of the South Downs National Park except the coastal towns of Seaford, Newhaven and Peacehaven.

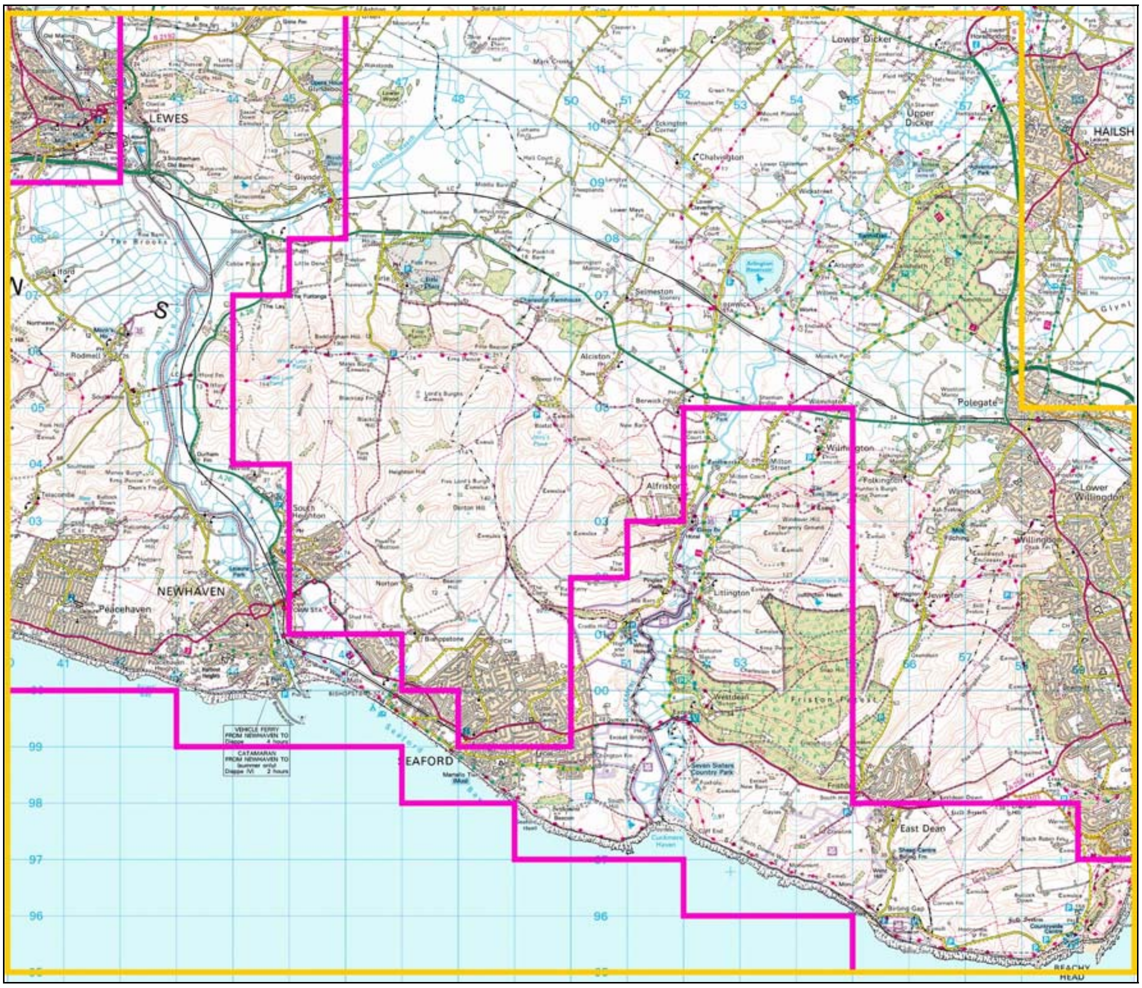

Figure 1 Revised project area outlined in pink, original area in yellow. *Background mapping © Crown copyright and database right 2013, all rights reserved. Ordnance Survey Licence number 100024900.*

The coast between Seaford and Beachy Head is defined, by Natural England, as a 'Heritage Coast'. These are areas of coastline managed to conserve and enhance the natural beauty and public enjoyment, understanding and appreciation. The area also falls within the Natural England Joint Character Area 125 – South Downs. This area is similar in extent to the National Park and covers the chalk downland between Winchester and Eastbourne. Natural England describe it as 'a chalk landscape of high exposed rolling hills, steep scarps, rounded open ridges and dry valleys (combes)' where 'rivers from the Low

Weald cut through the Downs forming river valleys and broad floodplains' (source: Natural England website).

The underlying geology in most of the survey area is chalk. Most of the project area therefore has shallow well drained calcareous silty soils over chalk of the Andover 1 Soil Association. There are pockets of well drained fine loamy over clayey, and clayey, soils of the Marlow Soil Association. These soils extend along the higher ridges on the chalk downs, to the south of Friston Forest, for example. The soils in the river valleys mainly comprise marine alluvium of the Newchurch 1 and 2 Soil Associations with river alluvium in the upper reaches beyond Litlington in the Cuckmere valley and above Beddingham and Lewes in the Ouse valley.

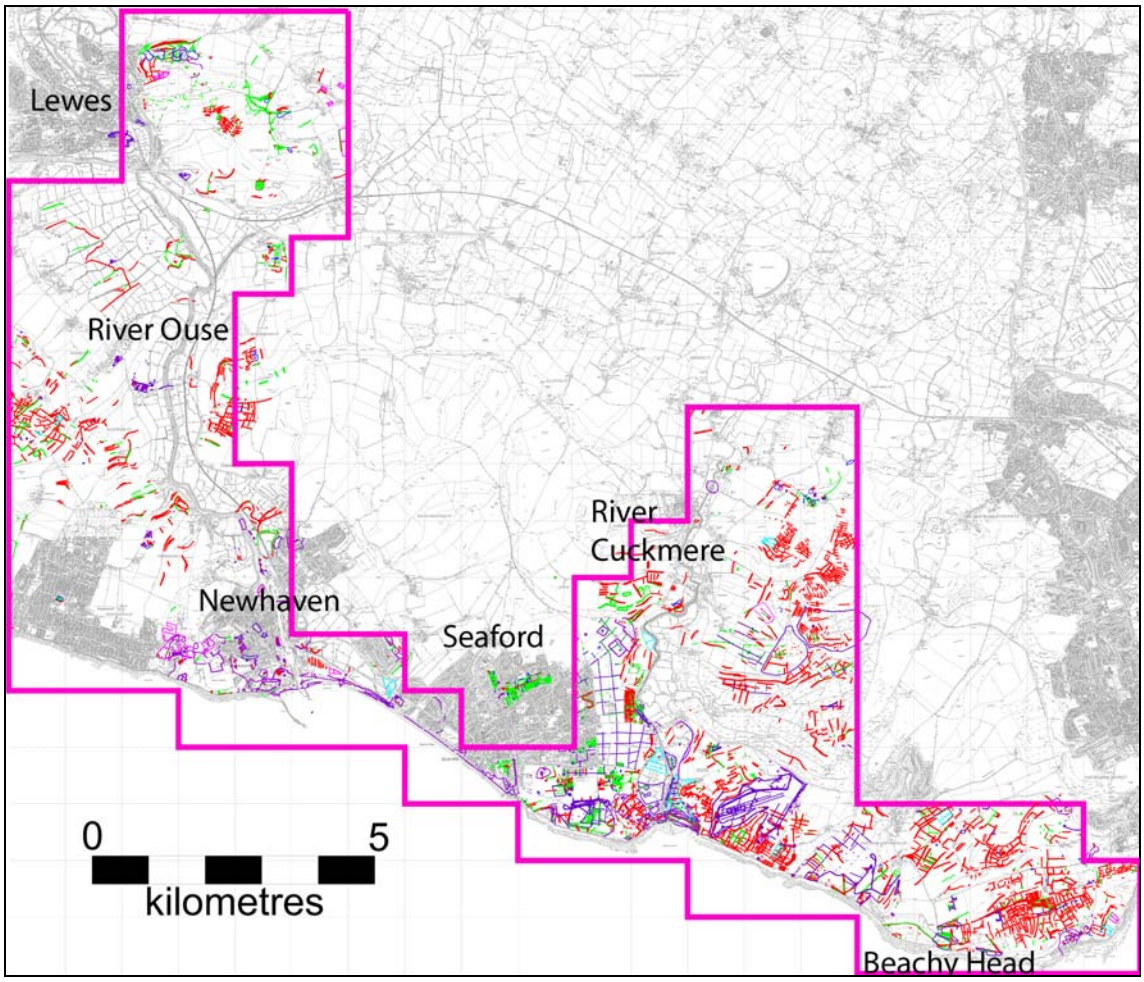

Figure 2 Archaeological features mapped from aerial photographs. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

There appears to be no correlation between geology or soil type and the distribution of archaeological features recorded. Archaeological features were recorded on all soil types although the distribution of types of archaeology varied (Fig 2).

During the 19th and first half of the 20th century, the South Downs were noted for their unenclosed rolling landscape and abundant flora, characteristics dependent on the grazing of sheep. Archaeological earthwork preservation was relatively good up until the late 1940s and some of these archaeological sites contributed to the popular image of the South Downs as an unspoilt, unchanging landscape that offered a haven from modern life. The expansion of ploughing across the Downs since the Second World War has changed the landscape and levelled many archaeological earthworks. Between the wars, the growing desirability of the Downs as a place to live resulted in house building in some parts and some areas such as Peacehaven were developed. Conservation bodies, including the National Trust, purchased land to protect this apparently threatened landscape. Although the initial proposal for a South Downs National Park was rejected immediately after the Second World War, it was designated in 2009.

Methods

The project scope included all archaeological features visible on aerial photographs. These ranged in date from the Neolithic period to the 20th century and included sites visible as cropmarks and/or earthworks but also structures, in particular those relating to early twentieth century military activities. All aerial photographs from the English Heritage Archive (formerly the National Monuments Record (NMR)), Cambridge University, and East Sussex Historic Environment Record (HER) were consulted. All vertical photographic prints were viewed using a stereoscope. Readily available documentary sources (historic maps etc) and synthesised background information on the area (published material, NRHE and HER monument records) were also consulted.

Rectified and georeferenced digital images were produced by transforming scans of oblique and vertical photographs using the University of Bradford AERIAL5 programme. Control information was taken from digital 1:2500 scale Ordnance Survey Mastermap data. The relevant scanned photograph(s) were usually rectified to an average level of accuracy of 2m or less to the base map. This gives an overall accuracy of plotted features, to true ground position, dependent on the accuracy of the map base, usually guaranteed by the OS to be within ±5-15m. A digital terrain model function, using OS 5m interval contour data, was used to compensate for undulating terrain.

Archaeological features were traced from georeferenced and rectified photographs using AutoCAD Map (Fig 3). Archaeological features were depicted on different layers based on the form of remains (For example bank, ditch etc). A monument polygon was created for each site. Basic indexing information (For example period, monument type, photo reference) was attached to groups of objects, in AutoCAD, to aid analysis of the mapping. A unique identifier number was attached to each group of objects corresponding to the monument description in the English Heritage AMIE database.

Monument records in the NRHE AMIE database were created or amended where appropriate. The project recorded 655 previously unknown archaeological features and amended details for 265 records.

The monument record consisted of a textual description of the site linked to indexed location, period, type and form of evidence. The record also included digital cross references to other monuments and datasets (usually the HER or scheduling information) as well as a list of the main aerial photographs and other sources for the site. An Event record in the NRHE AMIE database was created to provide data on project scope and procedures. Archive records were created for each quarter sheet. The Event and archive records are linked to each monument record.

All data and documentation relating to the project was archived at the English Heritage Archive (formerly the National Monuments Record). Full monument records are available via Pastscape (www.pastscape.org.uk). Mapping and monument records are available on request from the English Heritage Archive Services. All data was supplied to the East Sussex HER.

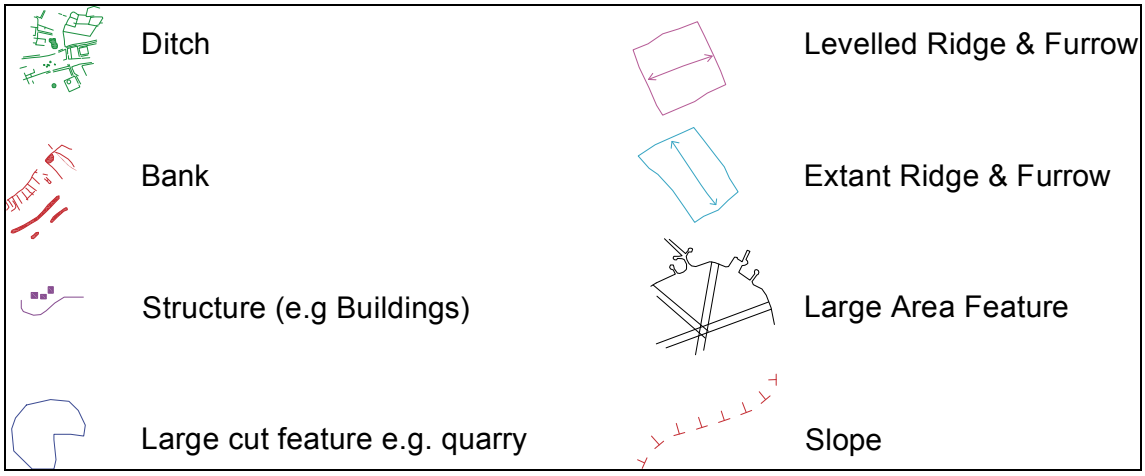

Figure 3 Mapping conventions.

NEOLITHIC LONG BARROWS

In the absence of either causewayed enclosures or flint mines from the project area, the earliest monuments encountered are a series of probable or possible Neolithic long barrows: Money Burgh (AMIE: 406246), Camel's Humps (406570), Windover Hill (408708), Hunter's Burgh (408732), Litlington (408791), and Exceat (470226). A possible new discovery was seen as cropmarks at Rathfinny Farm (1568872). Further long barrows lie just outside the project area, for example: Long Burgh (408646); Alfriston (408685); and Firle Beacon (405738).

Although the Sussex long barrows featured prominently in explanatory models for the development of the Neolithic across the South Downs (For example Drewett 1978, 2003; Russell 2001, 2002), there has been surprisingly little fieldwork undertaken on them. Sussex's causewayed enclosures and flint mines, many of which were discovered during the inter-war years, have seen many episodes of investigation during the 20th century. However, the only East Sussex long barrow to be excavated was the mound at Alfriston (Drewett 1975), located just outside the project area.

The first publication dealing specifically with Sussex long barrows was by Herbert Toms, curator of Brighton Museum and, in the 1890s, assistant to Pitt Rivers during some of his key excavations on his Cranborne Chase estate. Toms' 1922 paper on the Sussex mounds featured measured surveys of all 5 long barrows known at the time, 3 of them – Money Burgh, Camel's Humps, and Windover Hill (which he discovered shortly after surveying the other 4) – located within the project area. Another, Hunter's Burgh, was noted soon after on aerial photographs. The number has risen gradually since then, of course, but one principal feature of long barrow distribution on the Sussex Downs has remained relatively constant – most lie in the area of downland between Brighton and Eastbourne.

Perhaps the key development of recent decades was Drewett's (1975, 1978, 1986 etc) efforts to distinguish a class of 'oval barrow' in the wake of his excavations at Alfriston. These, he argued, were shorter than long barrows generally, their mounds – as the name suggests – more oval than long (or trapezoidal), and – on the basis of his excavations at the Alfriston example and, subsequently, North Marden in West Sussex – later in date than the larger long barrows. Consequently they could be seen as an intermediate stage between the long mounds of the earlier Neolithic and the round mounds of the Bronze Age. The idea of a distinct class of oval barrows within Sussex has come in for severe criticism (For example Kinnes 1992; Russell 2001, 2002; Field 2006 etc) – barrows of similar dimensions and morphology are quite widespread across southern Britain (For example the so-called 'Cranborne Chase Type'), and there is no evidence for them being markedly later, either individually or as a class, than any other kind of long barrow.

The recent project focusing primarily on the dating of causewayed enclosures, using Bayesian analysis (Whittle et al 2011), noted of long and oval barrows in Sussex that

'Although there are up to 20…, little is known of them' (ibid, 243-4), with the lack of any dating evidence meaning that 'Sussex long and oval barrows [are] at present in chronological limbo' (ibid., 246). Generally speaking it seems that the Sussex flint mines were potentially the earliest Neolithic monument across the South Downs (perhaps beginning before 4000BC), with the practice of building long barrows beginning during the first half of the fourth millennium BC, probably before the first causewayed enclosures. However, with no dates available, and evidence from elsewhere indicating that although individual barrows may have had a use-life of just two or three generations, barrow construction was itself quite long-lived, it is impossible to be sure where to place any of the Sussex mounds. An added problem is that in the absence of fieldwork and, in particular, excavation, question marks can even be placed against the identification of some of the mounds as long barrows.

The probable and possible Neolithic long barrows within the project area are described in turn below, with details from analysis of aerial photographs compared with earlier descriptions of the various mounds:

Money Burgh

Toms' 1920 survey showed a mound 118 feet (35.9 metres) long, orientated east-northeast to west-southwest, with a 'pronounced eastern end', i.e. it was higher and wider than the other end (Fig 4). Later investigation by the Ordnance Survey Archaeology Division recorded the mound length as 38 metres, with the eastern end 15.5 metres wide and 2 metres high, compared to the western end's 9.5 metres by 1.75 metres. Toms had stated (1922, 159) that 'All trace of lateral ditches has been obliterated by trackways and former cultivations, but the present conformation of the ground shows that these ditches did not run around the ends'.

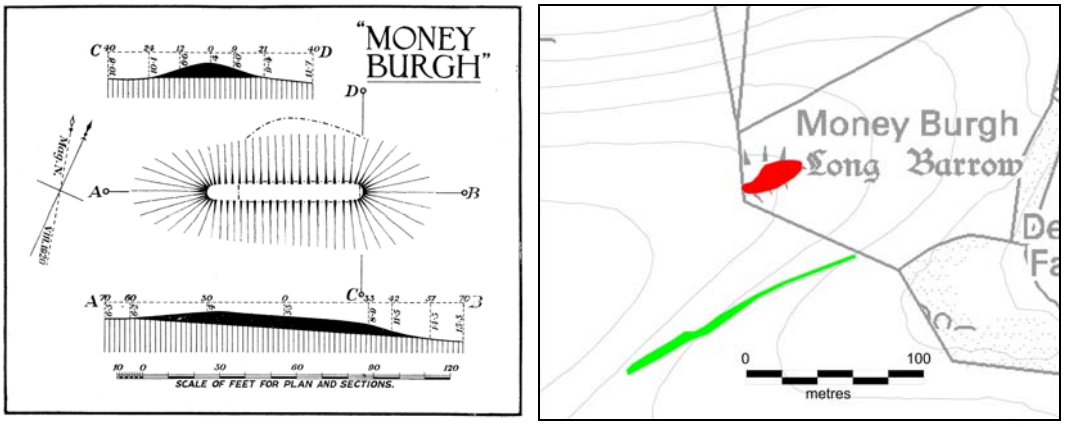

Figure 4 Toms' 1920 'corrected' survey (left, from Toms 1922); trace from aerial photography (right)

The OS confirmed that there were no traces of ditches visible on the surface. Examination of recent and historic aerial photographs also confirms this – all that could be mapped was an elongated mound circa 36 metres by 15 metres, with a marked indentation on the northern side of the western end (Fig 4).

In 1922 Toms wrote that 'this barrow has been badly excavated in quite recent years', featuring 'a modern-looking trench, which runs nearly the whole length of the crest', while 'material from an earlier excavation of the mound has been thrown to the north forming a talus…which, combined with the results of former ploughing, gives the mound a bulging appearance to the north-east'. This description certainly tallies with the recent aerial photograph investigation – the apparent discrepancy between the appearance of the mound on the latter and on Toms' survey is the result of Toms 'correcting' the barrow outline on his survey (Toms 1922, 159-160).

One of the excavations was apparently carried out by a Mr Joseph Tompsett who, according to Toms, 'died many years ago'. Tompsett's granddaughter told Toms in 1910 that 'a skeleton and other antiquities were found in the upper portion of the mound', but 'she was of the opinion that the excavation did not reach the level of a primary interment' (Toms 1922, 160). Although Miss Tompsett seemed certain the finds were sent to the Sussex Archaeological Society's museum at Lewes, the museum does not appear to have them (AS Phillips, OS field investigator, 19th May 1972 in AMIE record 406246).

Camel's Humps (or Warrior's Grave, or Cliffe Hill Long Barrow)

Toms (1922, 157) referred to this as the Cliffe Hill long barrow, but noted that 'according to Mr JHA Jenner, the tumulus has been named 'The Camel's Humps'.' The name 'Warrior's Grave' was reported by Grinsell (1934, 220). Toms' measured the mound length as 116 feet (c 35 metres), noting that 'it has all the characteristics of a long barrow (Fig 5)'. The name 'Camel's Humps' derives from its appearance – as Toms noted, 'From the top of School Hill, Lewes, this mound looks like two adjacent tumuli, for the reason that a large hole…excavated east of its centre, has left the two ends standing in the form of a camel's humps' (ibid). Spoil from this excavation had been thrown outwards, particularly to the south, partly obscuring the line of the southern ditch. Toms reported that the north-east and south-west ditch terminals were 'distinctly visible in suitable lights', while the south-east terminal had 'been destroyed by some kind of excavation, possibly for flints'. The north-west corner of the barrow was occupied by a golf green.

Toms' survey showed a mound orientated east-southeast by west-northwest, with a flanking ditch on either side. The ditches are gently curved, and neither show signs of continuing around either end of the mound. Ordnance Survey field investigation in 1972 confirmed the existence of a mound measuring circa 34m in length and 18m wide, and standing up to 3.2m high, which accords well with Toms' survey half a century earlier. However, while a ditch – extant up to 0.8m deep – was visible on the north side, 'on the south side it has been destroyed by a golf fairway'.

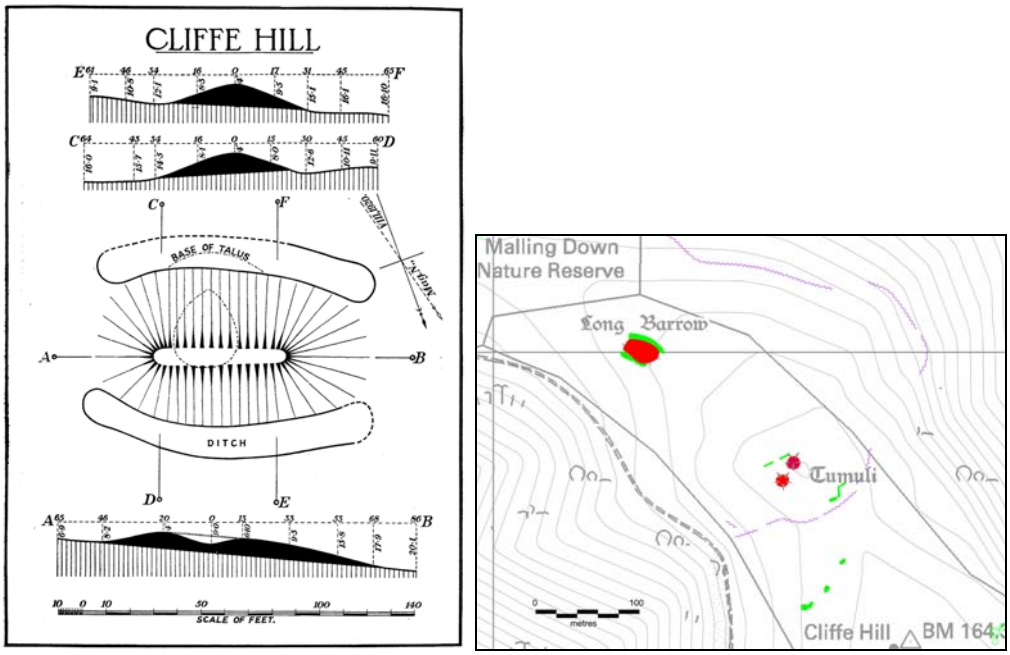

Figure 5 Toms' 1920 survey (left), from Toms 1922; plot from aerial photographs including the long barrow, round barrows and twentieth century military defences (right) Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

Mapping in 2012, from aerial photographs taken in 1968, did identify the course of at least part of the southern ditch, although the mound appears markedly more irregular than in Toms' survey, with a flattened western end (Fig 5). The south-eastern end, where the mound appears truncated and the ditch terminal missing, fits well with Toms' account of this area having been destroyed by digging.

Windover Hill

This mound was first identified by Herbert Toms in August 1920 after completing the surveys of the other four long barrows that featured in his 1922 paper. Toms had discovered the mound (although in fact it was depicted on Ordnance Survey maps – see below) whilst walking up Windover Hill from the west, the parallel 'ditches' of an alleged 'cambered road' (see below) having caught his eye (Toms 1922, 161-3).

Toms admitted to being 'puzzled' by the long mound, these initial doubts being prompted by its proximity to the large chalk-pit on the summit of the hill – he does not mention the shallower earthworks of hollows and spoil around the mound and, indeed, all over the hill. He noted the presence of a ditch – 'filled up nearly level' – visible on the surface on the downhill (northwest) side, which on his survey he showed complete but for a short stretch towards the south-western terminal. He does not mention the other ditch, but it is shown on his plan, albeit lacking a terminal at its north-eastern end (Fig 6). Toms' survey showed a circular mound a short distance north-east of the long mound – he seems to

have regarded this as a separate feature, although his account is a little ambiguous. He certainly did not regard it as a round barrow, however.

The outline of the long mound was already depicted on the 1874 25' Ordnance Survey map but, unlike the round barrows a short distance to the east, it was not labelled 'tumulus', which might imply that the OS surveyors considered it to be associated with the adjacent chalk quarry. Toms noted that the OS plan of the mound showed it to be circa 250 feet (c 76 metres) long instead of the 180 feet (c 54 metres) that he had measured. The discrepancy, he suggested, was caused by the OS surveyors including 'the rise with the flat top, which my plan shows adjacent to the north-east end of the mound'. Either the OS surveyors 'reconstructed' the mound on their survey, ignoring the gap, or the gap did not exist in 1874. The latter explanation would require quarrying to still be going on at this late date, which seems unlikely on present evidence, especially as the 1874 OS map labels the adjacent quarry 'old chalk pit'.

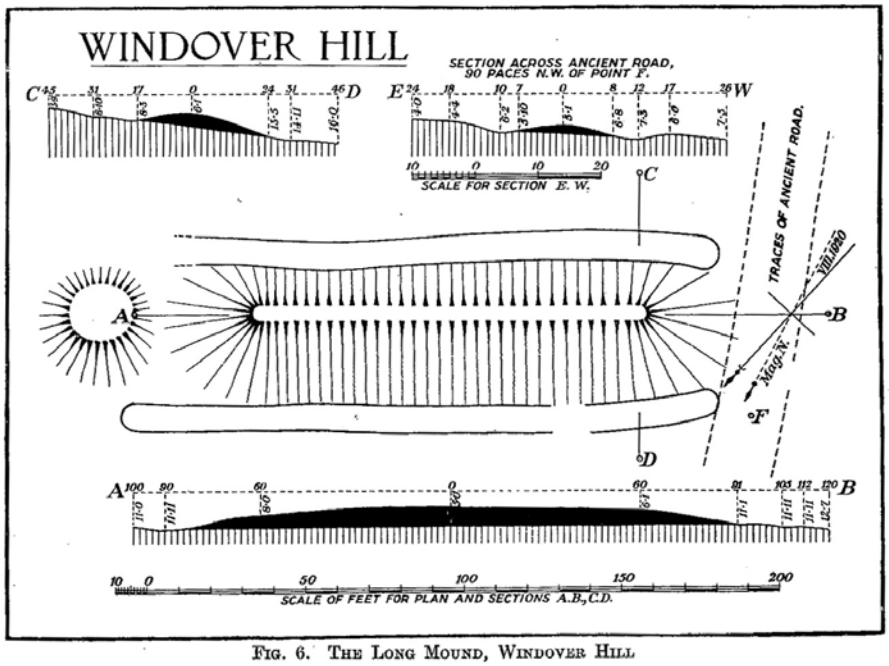

FIG. 6. THE LONG MOUND, WINDOVER HILL

Figure 6 Toms' 1920 survey of the mound he 'discovered' on Windover Hill (from Toms 1922).

Noting that he had traced the course of the ditch on the north-western side beyond the end of the long mound, to a point roughly level with the 'rise', Toms did speculate whether 'the big mound was not originally as long as this side of the ditch, the rise having been formed subsequently by traffic or a way cut across the north-east end' (ibid, 65). He was, at best, unsure – unlike on some of his other long barrow surveys, he did not 'restore' the outline on the plan to include this 'rise', nor did he include it in any of his profiles and sections. As noted above, he referred to it as a 'rise with a flat top', and his survey plan shows a roughly circular mound, its flat top some 20 feet (c 6 metres) in diameter. He noted that when 'standing on this rise, one looks down the very steep escarpment on to the 'Long Man'…' (ibid).

Subsequent survey by the Ordnance Survey Archaeology Division seems to have continued the OS tradition of regarding both features as part of a single mound. In 1972, Keith Blood recorded a mound 68 metres long, circa 13 metres wide and up to 2 metres high, 'with flanking ditches visible as vegetation marks'. He added that 'The barrow is mutilated towards its NE end by an old track crossing it, giving the erroneous impression of two mounds'.

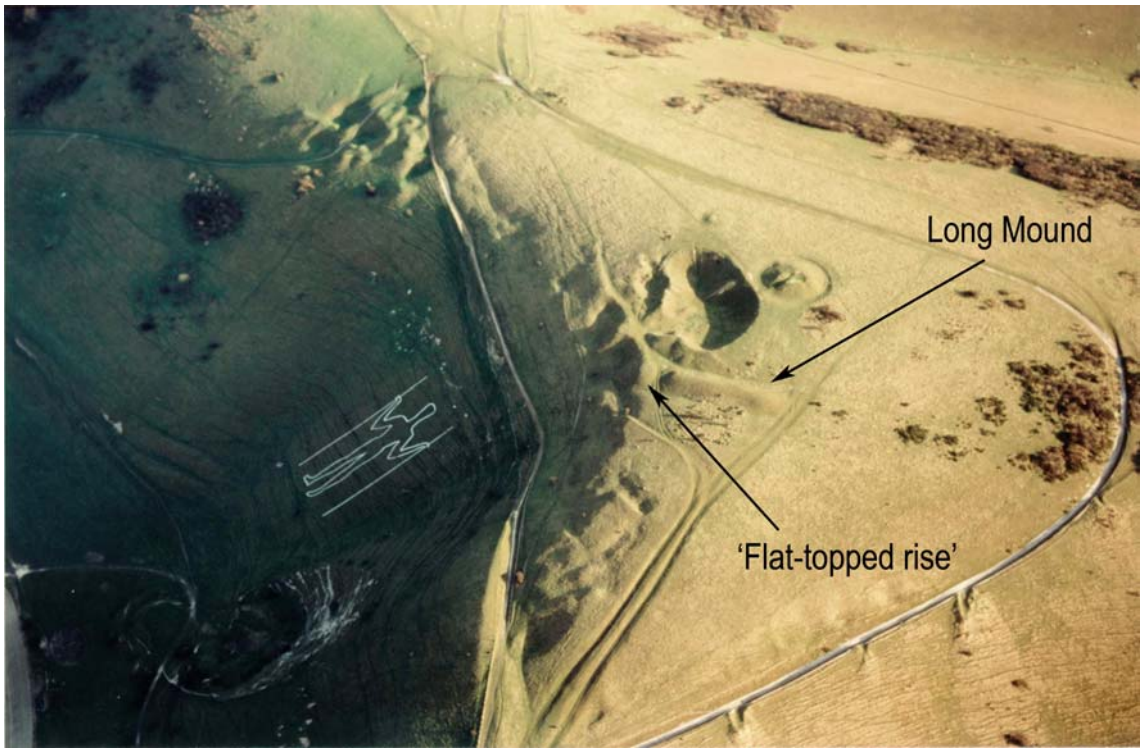

Figure 7 1995 oblique aerial view showing the relationship of the long mound to the quarry earthworks. Note how the suggested round mound or 'flat-topped rise' is actually integral to the latter. NMR 15211/23, 30 January 1995 © Crown Copyright. English Heritage.

The earthworks on Windover Hill were re-examined by Royal Commission on the Historical Monuments of England (RCHME) staff in 1995 in the course of a project focused on Neolithic flint mine sites. Some of the earthworks on Windover Hill had been identified in the mid-1920s as being flint mines. The RCHME visits confirmed that the supposed Neolithic flint mines were actually quarries of much more recent date (see also the chpater below on the Long Man). The RCHME team recognised the implications for the date of the long mound. In his book *Earthen Long Barrows*, Dave Field, one of the RCHME staff who had visited the area in 1995, wrote as follows:

> 'The large mound on Windover Hill in Sussex reaches 68m in length with a level summit at a height of 2m… It is surrounded by an area of chalk quarries and a cambered feature once thought to be a Roman Road leads upslope directly towards it. Inspected in greater detail by the

[RCHME] in recent years, the road is undoubtedly a tramway associated with the quarry and the long barrow a terminal associated with it. It remains possible that the quarry workers modified and utilised an existing mound, but they could easily have constructed a brand new one. Unfortunately, there is little direct evidence that this should be so and extreme caution is now required regarding its true classification. Only excavation to test the nature of the mound will confirm the point' (Field 2006, 24).'

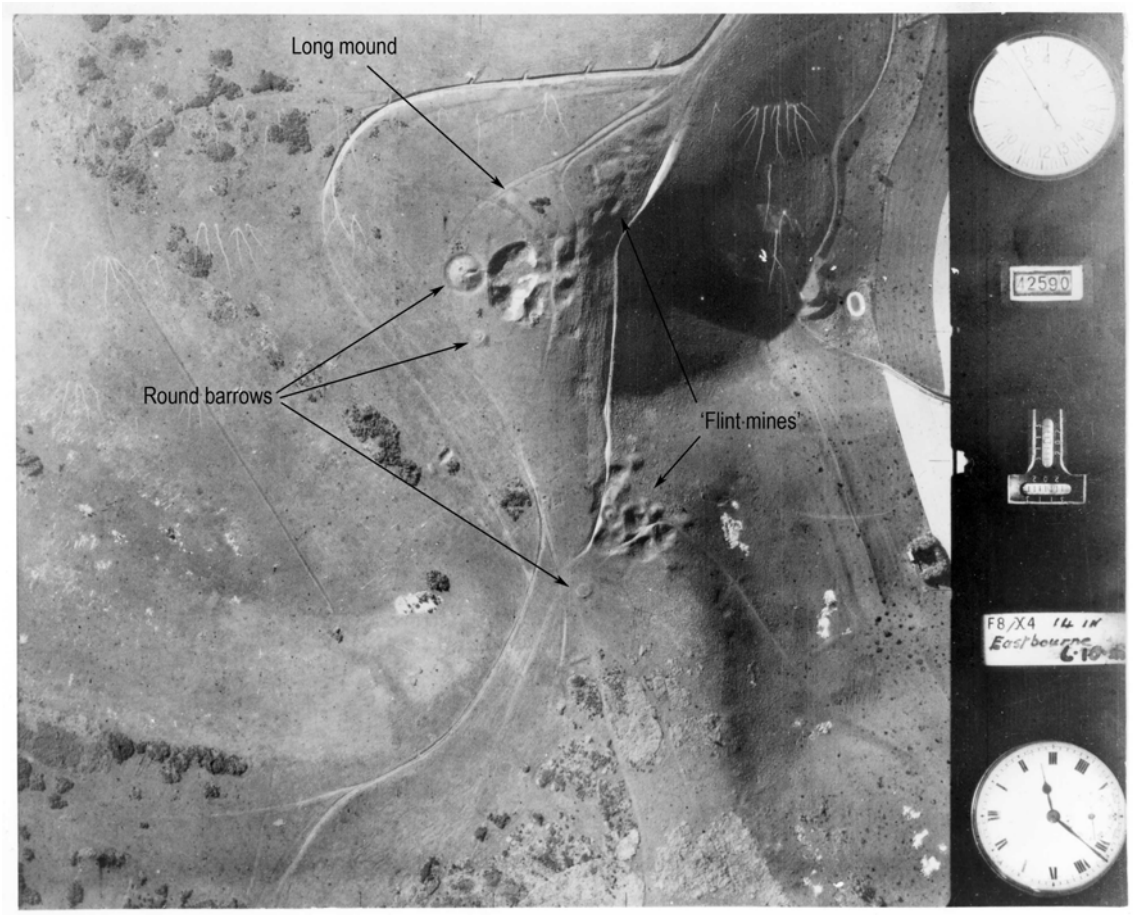

Figure 8 1925 vertical of the Windover Hill area. North to right. TQ 5403/5 OSV 11241/42590 6th October 1925 English Heritage. Ordnance Survey Collection.

Miles Russell (2001, 65) had already questioned the RCHME view, insisting that 'There is no reason to doubt the primary interpretation of the Windover mound…especially concerning its position, form, and presence of flanking ditches, even if it had been modified or reused at some later point during the extraction of subsurface flint. Unfortunately no detailed archaeological investigation into the mound has yet been conducted.'

The evidence from aerial photographs equally raises questions about the mound without offering any clear-cut answers. On a vertical aerial photograph taken for the OS in October 1925, the angle of sunlight means that the long mound is relatively indistinct, with just a small area of shadow visible at its north-eastern end (Fig 8). The possible extension – Toms' flat-topped rise – is easier to pick out. The long mound seems a little less regular than depicted by Toms – his plan showed a very straight mound with a slightly off-centre narrow, flat summit and straight, parallel flanking ditches with no sign of a berm separating them from the mound. On the aerial photograph, the south-eastern flank of the mound has a path or track running alongside it. This track comes in from the south, curving as it heads towards the mound, and eventually joins the track separating the long mound from its possible extension just east of the latter. The course of the other 'ditch' is less distinct in 1925, but on more recent photographs, for example the RCHME 1995 colour obliques (such as Fig 7 above), there is again the possibility of a path or track running alongside the mound into the area of quarrying. Of course, the presence of tracks does not rule out the prior existence of ditches either side of the mound but they do offer an alternative reason for a slightly hollowed area alongside it.

Other aerial photographs also suggest that the long mound itself is not quite as straight or as flat-topped as on Toms' survey. Shadows present on the 1925 and 1995 aerial photographs mentioned above plus, for example, RCHME obliques from 1977 suggest that the south-western end may be a sub-circular feature on a slightly different alignment from the rest of the mound, with a slight fall in height between it and the continued line of the long mound to the northeast. Meanwhile, the 'flat-topped rise', rather than being a north-eastern extension of the long mound, separated from the rest of the latter by a trackway, appears more closely integrated with the hollows and spoil of the quarries that extend eastwards from the so-called western group of mines, across the top of the scarp. It is noticeably wider than the long mound, and is also markedly off-centre in relation to the long axis of the latter. In fact, on the verticals especially, the long mound and the 'rise' look to be two separate constructions rather than a single feature cut through by a path. While there is a possibility that a path heading along the terrace, past the entrance to the large quarry, has been cut through an existing long mound, going round it – along one of the other paths or tracks, perhaps – might have presented a simpler option. Finally, given the impact of chalk quarrying on chalk-built long barrows elsewhere, For example Winterbourne Stoke, Wiltshire; Dampney Barrow, Damerham, Hampshire (Barber & Wickstead in press), the possible survival – relatively unscathed – of a long barrow amidst chalk quarrying on Windover Hill is worth noting.

Hunter's Burgh

This mound was first noted on a set of 1925 verticals taken by the Aircraft Operating Company for the Ordnance Survey as part of an experiment in mapping from aerial photographs over more varied terrain than had been attempted previously (Barber 2011, 143; 2013). Some of the photographs contained detail that the Ordnance Survey's Archaeological Officer, OGS Crawford, felt warranted further attention, and he passed a

set of prints on to Sussex-based field archaeologist Cecil Curwen. The mound wasn't entirely a new discovery – the name Hunter's Burgh is attested at least as early as 1579 (Mawer and Stenton 1930, 414), and the barrow is depicted on Ordnance Survey maps, but as a round barrow.

Figure 9 Hunter's Burgh seen on an enlarged extract from RAF/58/2321/0044 2nd December 1957 English Heritage RAF Photography.

Curwen was the first to publish a note of the discovery, in his 1928 paper on *The Antiquities of Windover Hill*. A little over 800 metres east-northeast of the Windover Hill mound, Curwen (1928, 93-5) described it as 'situated on falling ground and [it] measures 190 ft [c 58 metres] by 75 ft [c 22.9 metres], the long axis pointing a little east of north, and the south end being the wider. This south end has been dug into at some period subsequent to its construction, and the upcast soil, having been scattered radially round the excavation, has given the whole mound something of the appearance of a cupped round barrow with a long tail pointing northwards. There are wide hollows, rather than ditches, along the two flanks of the mound and also round the south end, but not at the north end.' Ordnance Survey field investigation in 1972 confirmed Curwen's description, although differing on size – 64 metres north-south, by 18 metres east-west, and 2 metres high at the higher southern end. The ditch was 'discernible as a vegetation mark on the W and S side but nothing remains of the E ditch'.

On recent aerial photographs (For example PGA TQ5403 28th June 2004) it has the appearance of a circular mound c 15 metres in diameter with a long tapering tail heading off from its northern side. The hollow in the top of the southern end only serves to underline this resemblance to an excavated round barrow. Its total length, as mapped from aerial photographs, is around 61 metres – this is only approximate, as although the southern end seems quite well defined, at the northern end it seems to fade out somewhat. Its width is also difficult to determine (Fig 9). As Curwen noted, a ditch, visible

on aerial photographs as differential grass growth, does seem to run along the western (uphill) side and curve around the southern end, but the situation on the eastern, downhill side is less clear, and is not helped by the presence of a path.

The mound looks most convincing as a long barrow on the 1925 vertical used by Curwen – it appears as a roughly wedge-shaped mound, perhaps slightly wider in the middle than at the southern end, and tapering away to the north. Later verticals (Fig 9), with low sun shining from the south, underlines the distinction between the higher, more or less circular end, and the long, lower mound on its northern side. Clearly further work on the ground is necessary to determine whether this is a long barrow, a round barrow, or both.

Litlington

The Ordnance Survey recorded two mounds at Litlington – one (AMIE: 408794) at TQ 53550060, the other (AMIE: 408791) at TQ 53560065. Russell (2001, 59) suggested that both records may refer to the same mound. However, the two records are based on two distinct, albeit doubtful, features recorded by Leslie Grinsell but clearly, some confusion has arisen at some stage over the two. One – 408791 – was recorded by Grinsell as 'a long mound which has the appearance of a long-barrow' (1930, 69); the other – 408794 – as a doubtful bowl barrow (Grinsell 1934, 273). Somewhere along the line, for reasons that are unclear, the latter became re-classified in the OS (or RCHME) records as an oval barrow.

Grinsell recorded the long mound at a location described as 'about 600 yards south of Manure Barn, Litlington Parish' – his siting is only approximate as at this stage Grinsell was not providing grid references – the OS sheets he was using at this stage lacked a grid. He noted it as being 'overgrown with trees, gorse and shrubs, of various kinds, and measurements are consequently difficult' (Grinsell 1930, 69). Four years later, he described it – in his list of Sussex long barrows – as measuring 28 paces long, 16 paces wide and up to 4 feet high. He could see no surface trace of any ditch, and suggested that it may be orientated SW-NE, but could not be sure. He described the mound as 'oval, possibly doubtful' (Grinsell 1934, 220). Later Ordnance Survey field investigation met with mixed results – in 1972 Keith Blood noted 'Traces of a mound up to 1.0m high, so overgrown with scrub, brambles, nettles, etc, that neither its size, nor shape can be ascertained. More precise classification impossible'.

The monument was scheduled in January 1979 (List Entry Number 1014385). The entry describes it as a low earthen mound, oval in shape and up to 0.5m in height, orientated south-west – north-east, and measuring some 24m long by 16mwide, although the width was said to be partly due to the spread nature of the mound through erosion. No surface sign of the ditches could be seen. Inspection of aerial photographs in 2012 was less fortunate – the site of the mound could not be identified at all. On early photographs, the location was generally obscured by clumps of gorse or bushes; aerial photographs taken in

1982 show the area ploughed, with no obvious trace of a mound (for further details see monument 4087911).

Exceat

It is not clear when the mound at Exceat (Fig 10) was first identified. For example, it was not mentioned in Drewett's (1978) account of Neolithic Sussex, but was present in his report on the excavation of the North Marden oval barrow (Drewett 1986) though with little detail. It was Scheduled in March 1980, which suggests a date in the late 1970s for its discovery.

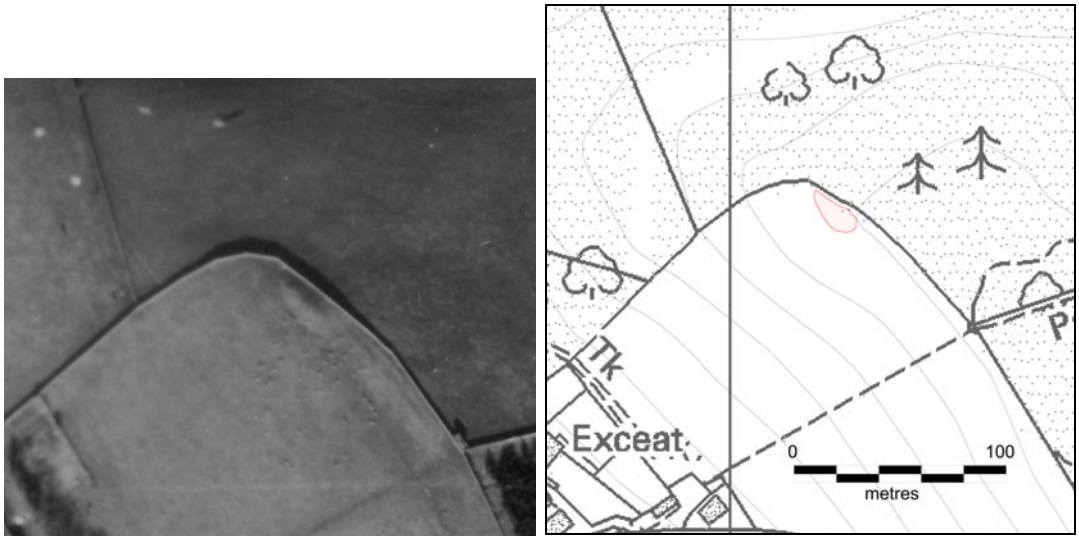

Figure 10 Long mound at Exceat. Enlarged extract from RAF CPE/UK/1947/3007 22-Jan-1947 English Heritage RAF Photography (left); right – mapping from aerial photographs. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

It is described in the Schedule entry (List Entry Number 1014386) as a spread earthen mound, oval in plan, and measuring up to 28m long and up to 14m wide, standing up to 1.2m high, with no ditch visible on the surface (though the presence of one is assumed). The Schedule entry describes the mound as being crossed on its north side by a flint estate wall. Subsequently, Ordnance Survey staff noted that the mound was clearly visible on RAF verticals taken in 1947 (Fig 10) (DP Houston, 25 Jan 1982: AMIE 470226). Drewett (1986, 46) provided little detail, beyond including the site in his 'oval barrow' class, and offering measurements of 25m x 13m for the mound. A decade later, Castleden (1992, 181) offered slightly different measurements – 28m x 18m, and up to 1.5m high, and added that the north-east edge of the mound (and any presumed ditch on that side) lay in woodland, which presumably means on the other side of the aforementioned flint wall. Russell (2001, 57) added that 'possible traces of a quarry ditch, apparently surrounding the mound, have been noted', although no source is offered for this, which may represent a misunderstanding of the schedule entry.

The mound is clearly visible on the 1947 RAF verticals. It is orientated approximately northwest-southeast, and is located just below the crest of a chalk spur, overlooking the Cuckmere valley to the northwest, west and south. It is close to the corner of a field, a wall passing close by on its northeast-facing long side before curving round to the southwest. The shadow cast by the wall make it impossible to determine whether the mound is indeed cut by the wall on its north eastern side, or if the mound has spread up to and against the wall. In 1947, the land the other side of the wall is pasture, but on more recent photography it comprises woodland right up to the wall.

The mound is extremely difficult to identify in later photography – the low sunlight evident on the RAF photographs is generally lacking. However, a low mound of broadly similar shape and size can just be made out on Google Earth imagery dating between 2004 and 2009. Again, the relationship between mound and wall is difficult to resolve, but if the wall does cross the mound, very little of the latter could be on the woodland side. It is also worth highlighting that both the 1947 verticals and the 2005 Google Earth photography show a much slighter linear rise – perhaps a low bank or series of banks – sharing the orientation of the mound and running roughly parallel to the field wall to the southeast of the mound.

Rathfinny Farm

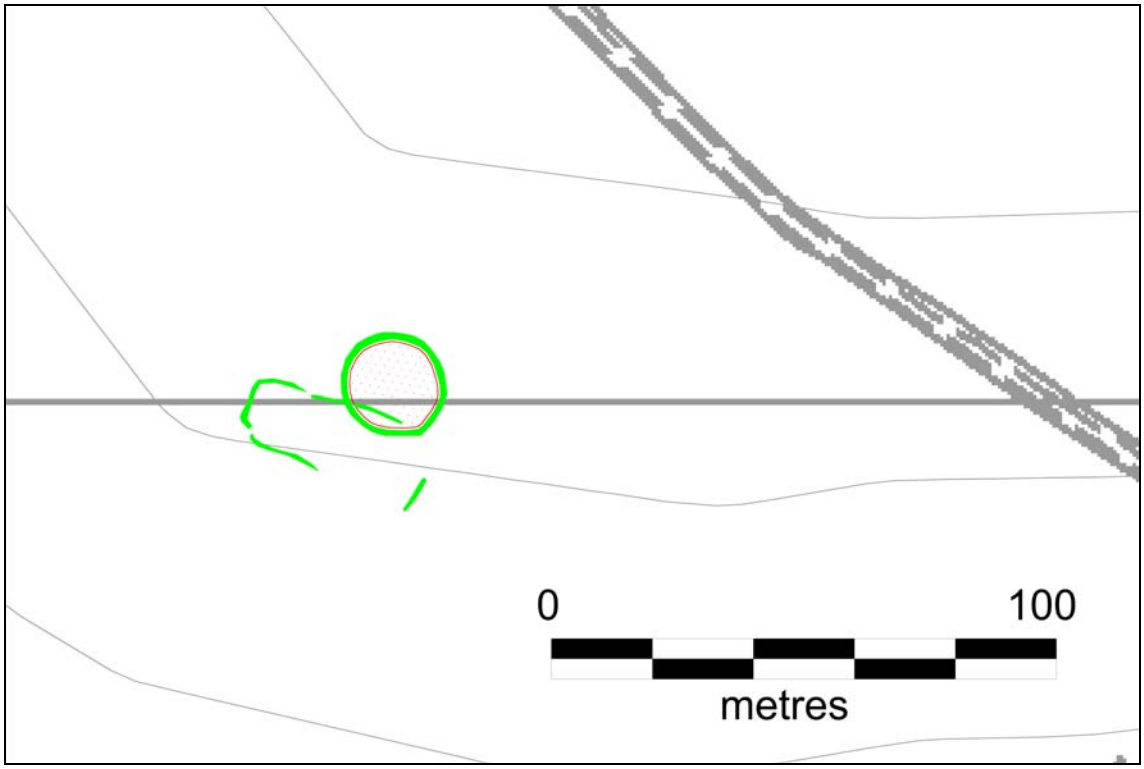

Figure 11 Cropmarks near Rathfinny Farm mapped from aerial photographs. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

Although just outside the project area, this feature was mapped because of its potential significance (Fig 11). Identified on aerial photographs taken in 1977, it comprises an incomplete sub-rectangular ditched enclosure which appears to be partly overlain by a ring ditch, the latter presumably representing a plough-levelled Bronze Age round barrow.

The enclosure presents a much fainter cropmark than the ring ditch, the lines of the ditches also being incomplete on the available photographs, and is aligned WNW-ESE, measuring approximately 39 metres long, and tapering in width from 15.7 metres across its south-east end to 12 metres across its north-western end. Presuming it is earlier than the ring ditch, then a Neolithic date is possible. The rectilinear arrangement would be unusual but not unknown for a long barrow; alternatively it may represent a monument of the form usually referred to as 'mortuary enclosures' or 'mortuary structures'.

Long barrows - discussion

There is very little known about the long barrows in the project area and the few that were subject to early excavation lack any meaningful record of what was found. Consequently, identification must be based on morphological considerations. On this basis, both Money Burgh and the Camel's humps look the most convincing cases. Hunter's Burgh may be a round barrow, a long barrow, or both. The mound on Windover Hill may be no more than a few centuries old. The sites at Litlington and Exceat are clearly in need of further investigation to confirm that they are archaeological features – geophysical survey aimed at identifying ditches would be a useful starting point. Similarly the new discovery at Rathfinny Farm requires further investigation to confirm, first of all, that it is indeed earlier than the ring ditch.

There are other aspects of Sussex's long barrows that have been much discussed in recent years, including their landscape context and setting. These would probably be best addressed by visiting all the sites on the ground within a study that takes in far more sites than those in the project area. Further work should address issues such as Litlington's location on a relatively gentle slope above a shallow coombe, or Windover Hill's orientation – perpendicular to the scarp edge. Additionally, the matter of oval barrows, despite the doubts expressed in the published literature, might benefit from a wider study.

FIELD SYSTEMS

The Sussex Downs have long been associated with the study of lyncheted field systems. The existence of earthworks representing prehistoric and Roman cultivation was demonstrated by the Curwens in Sussex (Curwen and Curwen 1923) via a good deal of earthwork survey. This was at the same time as, and independently of, OGS Crawford (1923; 1924), who arrived at broadly the same conclusions using aerial photographs ('checked and supplemented by a good deal of fieldwork' – Crawford 1924, 10) of sites on the chalk downland of Hampshire, Wiltshire and Dorset (see also Bradley 1989 for the contribution of Herbert Toms, and Blaker 1902 for an example of earlier work on 'ancient cultivations' in Sussex). It was Crawford who introduced the term 'Celtic fields', which despite the problematic reasoning behind the choice (Wickstead 2008), has proved quite durable.

Such field systems are now thought to have been created and used over a much longer time period than either Crawford or the Curwens originally envisaged, spanning at least from the Early Bronze Age through to the Romano-British period. However, the dating of individual lynchets, fields or even entire field systems remains difficult, as Drewett noted in the report on the Bullock Down survey (Drewett 1982, 208-9). On the basis of trenches across several lynchets in the course of that particular project, dating either the origins or abandonment of such systems proved difficult. This led to rather generalised conclusions such as 'it would appear that the lynchet developed during the Late Bronze Age to early Roman period at least' (ibid, 999), but given the proven Middle Bronze Age origins of lyncheted field systems elsewhere on the Downs, an earlier origin would be impossible to rule out. Of course, this is not a problem unique to the South Downs.

Identifying settlement associated with field systems is equally tricky. A number of well-known sites elsewhere on the Sussex downs – Black Patch, Itford Hill, and so on – featured house sites that survived as slight earthworks, terraced into the hillside. Enclosed settlements are, of course, a little easier to spot, but do not necessarily date the fields – perhaps the best-known case is South Lodge, Wiltshire, excavated by Pitt Rivers in the late 19th century. There, the sub-rectangular enclosure sat within a lyncheted field system, but the enclosure earthworks proved to be enhancements of existing lynchets – the field system had already been in existence when the enclosure earthworks were constructed. It is difficult to point to any clear cases of enclosed settlements among the fields plotted during this project.

Unenclosed settlements are also difficult to identify, although as was suggested for Salisbury Plain, 'unusually shaped fields, such as those with curved lynchets or others that define small trapezoidal or triangular areas, might point to the presence of former settlements set within the fields' (McOmish et all 2002, 56).

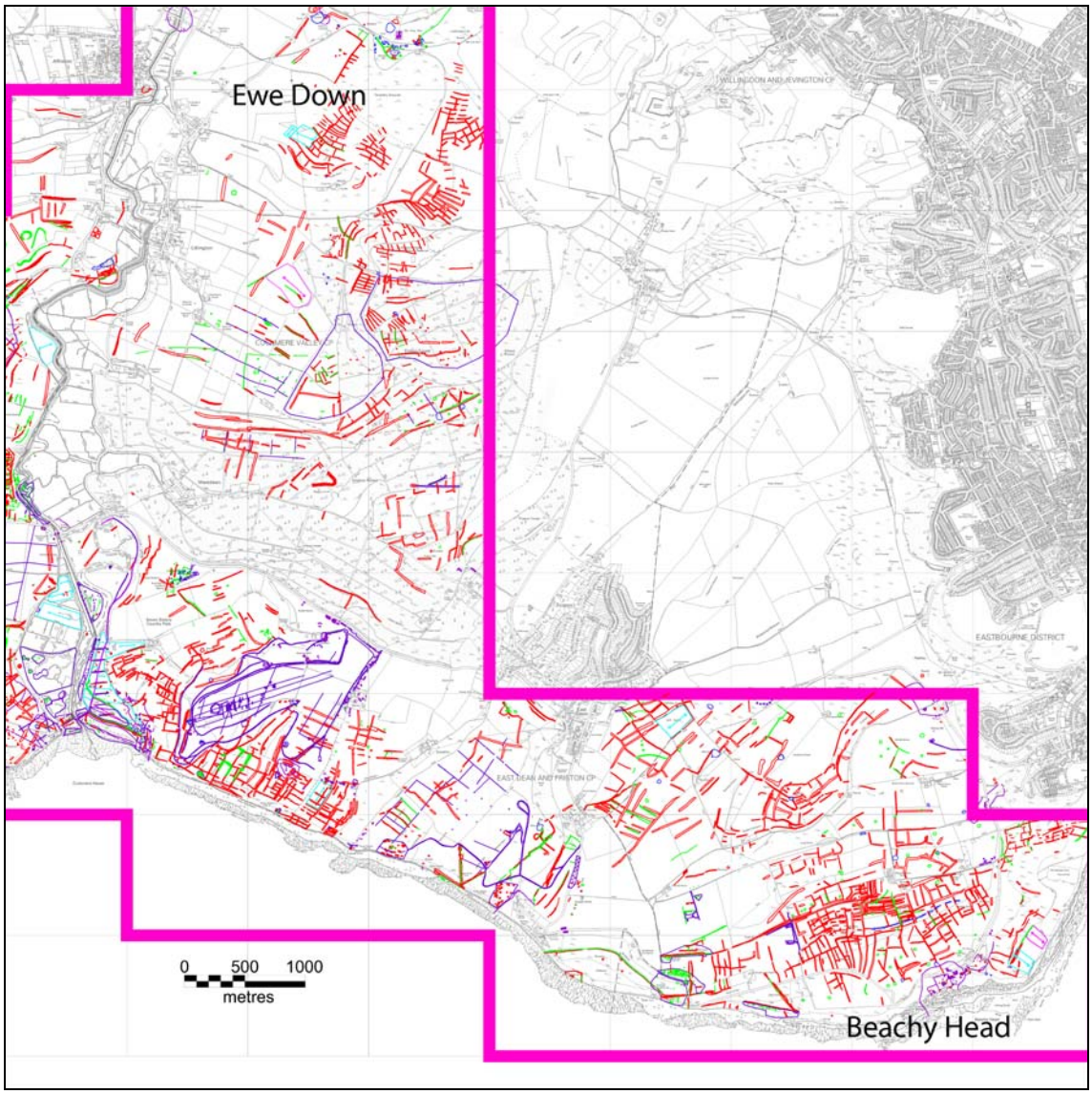

Figure 12 General view of the eastern side of the project area showing the distribution of field systems and other archaeological features mapped from aerial photographs. Note that features in purple relate to 20th century military remains. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

In terms of seeking a relative chronology for either the origins or cessation of use for the lyncheted field systems, there is little clear-cut evidence from the project area. This part of the South Downs seems to lack, for instance, examples of field systems being slighted by the construction of later prehistoric linear boundaries, as is seen on Salisbury Plain. At the other end of the chronological spectrum is the relationship between fields and earlier monuments. Within the project area, the only type of monument definitely earlier than the earliest fields is the long barrow. Only the questionable example at Litlington (see chapter above) is located close to any field boundaries, but the relationship remains

unclear, especially as the long barrow mound cannot be identified on available aerial photographs.

The relationship of early fields with round barrows offers a different set of problems. It has been suggested that field systems may have deliberately incorporated earlier earthworks such as round barrows. However, at the same time there is evidence that round barrows continued to be built well into the Middle Bronze Age, after the establishment of the field systems they were associated with, for example Itford Hill, where Ann Ellison distinguished several phases of settlement within a field system, and demonstrated that a potsherd from one of the later phases of settlement fitted an almost complete vessel recovered from a nearby barrow (Ellison 1978, 36). Further afield, on Cranborne Chase, excavation evidence has linked burial monuments with settlement enclosures, the latter appearing some time after the appearance of field systems (Barrett et al 1991, 224-5). Moreover, as new discoveries continue to push the date of the earliest field systems in southern England further back into the early 2nd millennium BC (For example Martin et al 2012), there is now a considerable chronological overlap between round barrows and field systems in general.

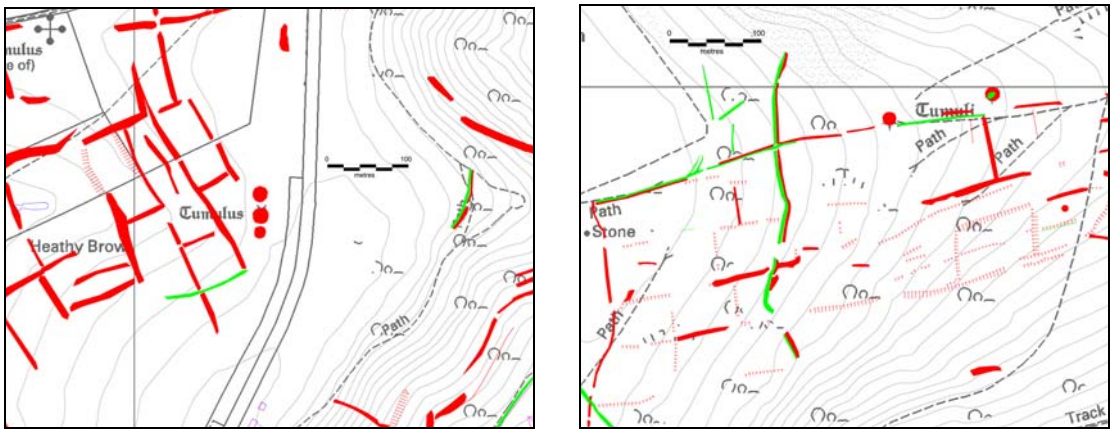

Figure 13 Field systems and round barrows at Heathy Brow (left) and above Holwell both near Beachy Head (right). Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

Despite the difficulties with dating, there are some interesting relationships worth exploring further. For example, at the eastern end of Heathy Brow (TV 591962), a line of three round barrows, the largest around 20 metres in diameter, lie at the eastern end of a sizeable block of fields (Fig 13 left). On the slopes above Holywell (TV 59599696) another round barrow lies close to the northern limit of a different block of fields. It appears to sit beside a gap in the field boundary earthworks, making it unclear if a pre-existing barrow has been used as a marker in defining the limits of the field system (Fig 13 right). At the western end of Heathy Brow (TV 58779609), a ring ditch is located in the corner of an almost square field, with hints that the banks of the field system may partly overlie its ditch (Fig 14 left). Above East Dean (TV 562975), three ring ditches lie within a

large sub-rectangular field that is also partly sub-divided by a curving length of ditch (Fig 14 right).

Within these field systems there are also plenty of examples of unusually shaped fields that may offer clues to the whereabouts of settlement sites. This method was demonstrated during the Bullock Down Project, when excavation uncovered a traces of Romano-British settlement (TV 57709622) where the gap between the two banks of a double-lynchet trackway was noticeably broader (Drewett 1982, 97).

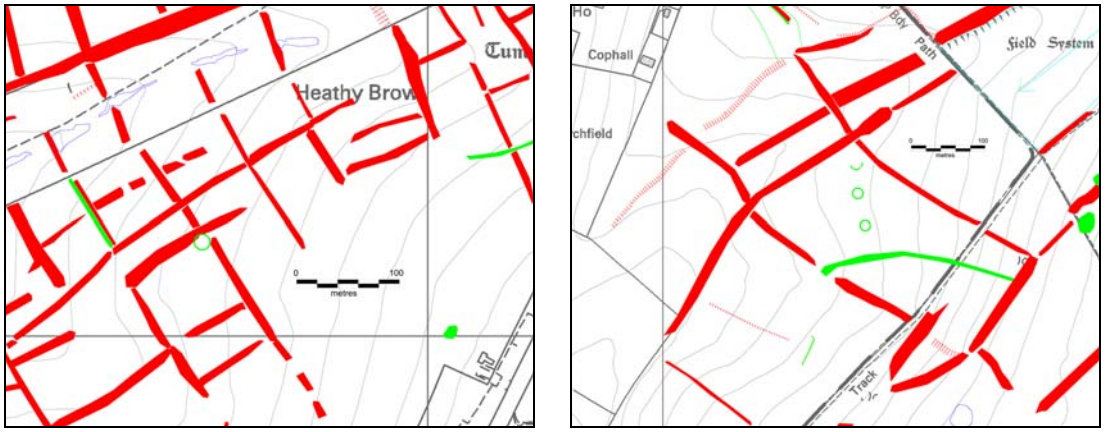

Figure 14 Field systems and round barrows at the western end of Heathy Brow (left) and above East Dean both near Beachy Head. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

Ewe Dene Down

The lynchet-defined fields existing across Tenantry Ground and Deep Dean (an area referred to by Curwen in 1928 as Ewe Dene Down, the name preferred here), located between Litlington and Wilmington, are worth examining in closer detail (Fig 15). The area features a number of the issues described above – the presence of round barrows and of unusually shaped fields, for example – as well as possessing good, early aerial photographic cover (Fig 16).

This field system was an often-used example, during the inter-war years, when study of early fields and prehistoric cultivation practices was very much in vogue following the Curwen's and Crawford's demonstration of the survival of extensive prehistoric agricultural landscapes,– probably because of the quality of the aerial photographs. The photographs concerned were from the previously mentioned batch taken in 1925 by the Aircraft Operating Company, for the Ordnance Survey and used by Curwen as the basis for his 1928 paper *The Antiquities of Windover Hill* (see below).

Unusually, Curwen seems not to have surveyed the field system. On his 1928 published site plan, he mapped the location of the features at the northern end of the spur – the

Long Man, alleged flint mines etc – while at the bottom of the plan he simply drew an arrow, pointing southwest, next to the words 'celtic lynchets'.

His account of the fields ran as follows:

> 'On the south-west spur of the hill, known as Ewe Dene Down, is a very remarkable series of cultivation terraces, or lynchets, of Celtic type. They are scarcely visible on the hill itself, but may be seen best by pedestrians from Fore Down, which lies across the valley to the south; they show up particularly well in the air-photographs recently taken by the Ordnance Survey for the purpose of revising the 25-inch maps. The series is continued into Deep Dene and over Fore Down into Old Kiln Bottom' (Curwen 1928, 98).

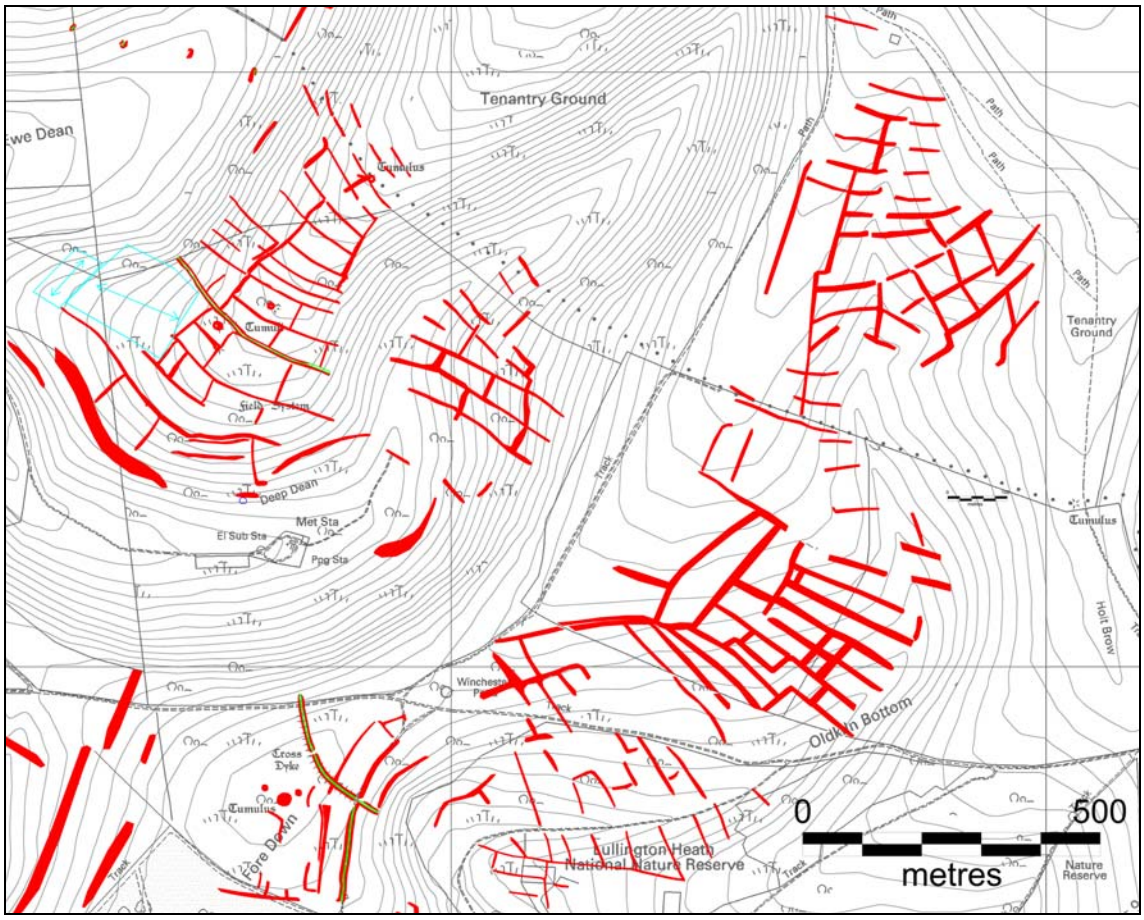

Figure 15 Field systems across Ewe Dean Down (left), Old Kiln Bottom and adjacent areas. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

Coincidentally, the Rev W Budgen in 1926-7 excavated some pits a little to the south, in the Fore Down/Old Kiln Bottom area, which had produced pottery described as 'Hallstatt' i.e. he thought it comparable to early Iron Age examples on the continent. Curwen suggested that the pits examined by Budgen 'appear to have been ploughed over by the

cultivators of these lynchets' (ibid.) - the plan published by Curwen in his 1954 book *The Archaeology of Sussex* (Curwen 1954, 212) seems to suggest that the pits were within fields rather than being cut or crossed by field boundaries. Back in 1928, Curwen stated that 'We have not been able to locate the settlement to which the fields on Ewe Dene Down were attached; some small pits about 500 ft. south of the large round barrow [presumably the one overlooking the Long Man] appear to be too irregular, With the permission of Col Gwynne, the owner, and Mr. Axford, tenant, the writer opened one of these and found it a mere shallow scratching which yielded no evidence whatever of human occupation' (Curwen 1928, 98). The precise location of this 'shallow scratching' is unclear.

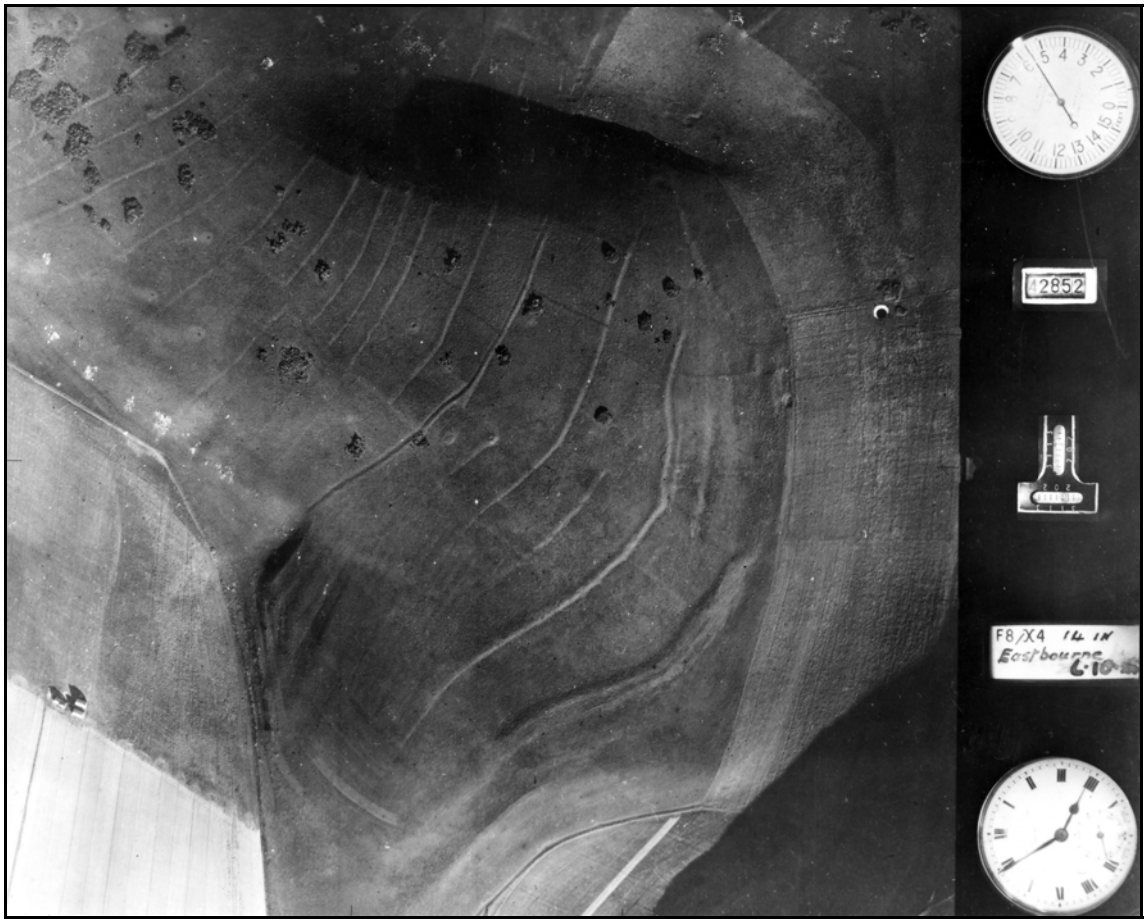

Figure 16 1925 vertical aerial photograph of the field system on Ewe Dean Down (north towards top left) TQ 5302/2 OSV 11241/42858 6th October 1925 English Heritage. Ordnance Survey Collection.

The 1925 aerial photograph of Ewe Dene Down featured in Curwen's article 'Prehistoric Agriculture in Britain', in the first volume of *Antiquity* (Curwen 1927), but without any real description or analysis. The same article also included an aerial photograph, from the same flight, of part of the Fore Down system, and the lynchets at nearby Jevington which had been surveyed by the Curwens a few years previously: Curwen & Curwen 1923. Essentially, the 1925 photographs captured a huge swathe of downland covered in

lyncheted field systems. In addition to Ewe Dean Down, they covered the floor of the neighbouring coombe to the east as well as the next ridge (Fig 15), and also continued south across Lullington Heath and Friston Forest. They seem to represent several well-defined systems all in very close proximity to each other, although much is obscured by vegetation and trees, making any relationship between adjacent systems difficult to identify from the aerial photographs alone.

The 1925 aerial photographs continued to appear in publications dealing with prehistoric agriculture: for instance, Curwen used the Ewe Dene Down aerial photograph (Fig 16) prominently in his 1928 pamphlet '*Air-Photography and Economic History: the Evolution of the Corn-Field*', published by the Economic History Society. He noted that 'air-photography is able to bring out the general plan and arrangement of the fields to which [the lynchets] belong, even when they have been destroyed by ploughing – an advantage which the aeroplane has over the pedestrian' (Curwen 1928b, 8). This implies that he thought the vertical aerial photograph to be as good as, if not better than, a ground-based survey.

Meanwhile, Crawford himself made use of the Ewe Dene Down aerial photographs (though under the heading 'Windover Hill') in his 1929 monograph '*Air Photography for Archaeologists*', where it appeared as an example of aerial photography of earthworks: 'Previous plates have shown the importance of shadows. This one shows that sometimes exactly opposite conditions may produce excellent results. The ridge on which the Celtic fields were laid out slopes directly *towards* the sun, which was low, consequently the steep lower slope of each lynchet reflects a brighter line of light and causes it to stand out with extreme contrast. The field-banks running parallel to the direction of the main slope, though not so steep, are far fainter in proportion, and are less visible the nearer they point to the sun. Some are quite invisible, others are revealed by shadows' (Crawford 1929, 16 & plate V, his emphasis).

Ewe Dene Down appeared (again as 'Windover Hill') in Holleyman's 1935 *Antiquity* paper 'The Celtic Field System in South Britain', and in Curwen's series of articles on 'Sussex from the Air', one of which included a stereo pair of part of the system – described as 'one of the finest sets of prehistoric cultivations in the whole country' – for readers to view through a stereoscope, 'cutting it out for the purpose' (Curwen 1930, 1058). He did offer advice on how to view stereoscopic images 'with the unaided eye' for those who either did not possess a stereoscope or who did not want to 'mutilate the page by cutting out the picture' (ibid).

Despite all this early attention, this particular group of field systems has had a markedly lower profile since the war. No earthwork survey seems to have been undertaken, and while recent aerial photography and lidar cover shows that much still survives as earthworks, none are scheduled, and neither are the round barrows within the Ewe Dene fields. Little fieldwork has been carried out either. Consequently, the limited archaeological work undertaken when a water pipeline was cut through the fields in parts of Friston

Forest and Lullington Heath – 37 lynchets were cut through, but only two sections recorded (Butler 2008) – might be regarded as a missed opportunity.

The recent investigation and mapping from aerial photographs suggests some areas for further investigation. The fields on Ewe Dene Down, at first glance, appear to be subdivided by two linear earthworks (Fig 17) The first is a linear earthwork comprising bank and ditch that runs across the spur nearer its southwestern end – this is the only ditched feature identified in the survey – and a linear bank running northeast-southwest down the centre of the spur. However, the latter appears not as a single earthwork, but follows a slightly irregular course as though composed of a series of roughly aligned field boundaries. When it reaches the aforementioned linear bank and ditch, it appears to terminate against its northern side. The relationship is not clear – it may be that it is cut by the ditch, but does not appear to continue beyond the bank. Instead, the northeast-southwest line is continued on the other side by a series of lynchets slightly offset (to the northwest).

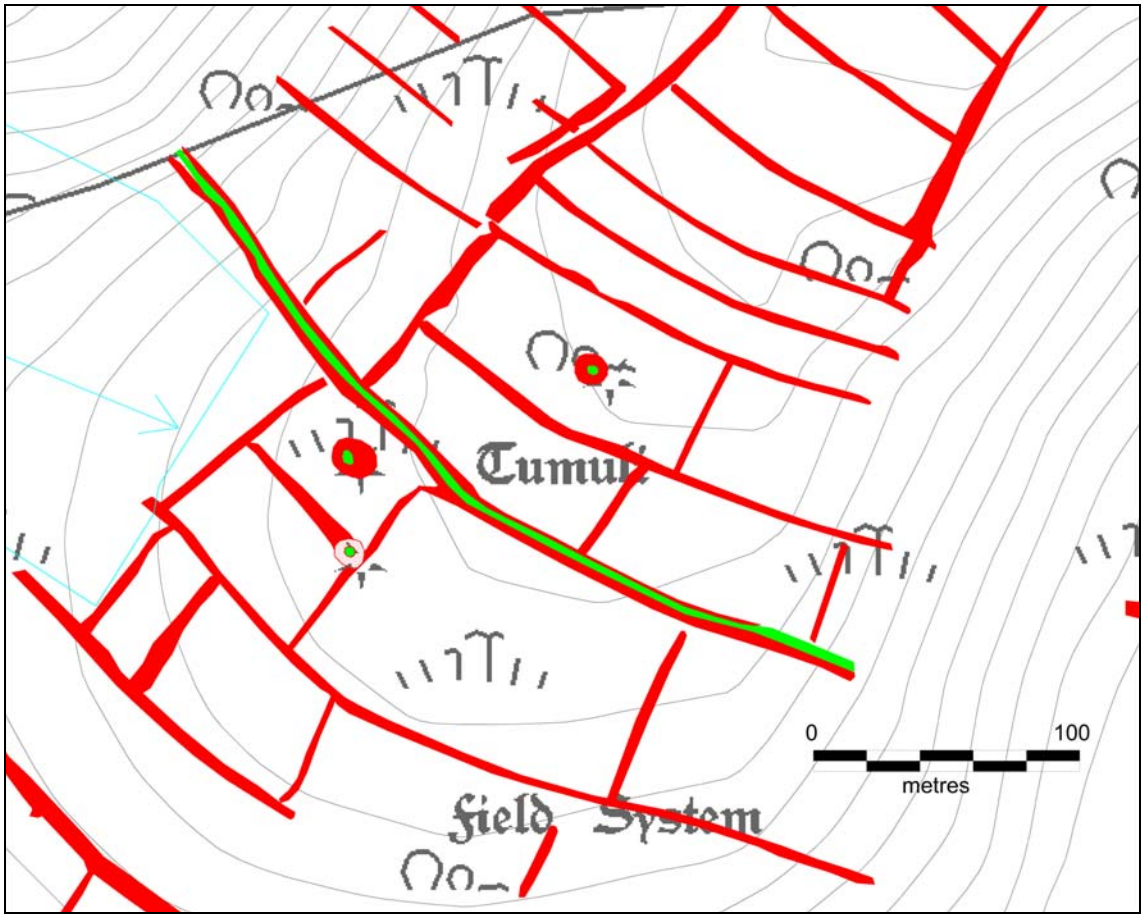

Figure 17 Detail of field system on Ewe Dean Down. Note the barrow (in pink) located at the junction of field boundaries, centre left. Background mapping © Crown copyright and database right 2013, all rights reserved. Licence number 100024900.

This area, where the NE-SW bank meets the linear earthwork, is intriguing for a number of reasons. On the southwestern side of the linear bank and ditch, opposite the point where the NE-SW bank appears to terminate, is a small square field defined on all sides by lynchets. Within this small field is a round barrow. Immediately to the east of the round barrow is a curious fork in the bank of the linear earthwork, which seems to suggest that originally this linear bank may have been aligned on the barrow before changing direction. At the southern corner of this small square field is another round barrow, which seems – from the aerial photographs at least – to sit on top of the junction of lynchets at this corner. It seems curious that this relationship was not remarked on by Crawford, Curwen, or anyone else who published this photograph.

Another round barrow is located towards the northeastern limit of the field system. It sits very close to the other, northeastern, terminal of the linear bank running NE-SW along the spine of the hill. Again, there appears to be a close relationship between this barrow and the adjacent lynchets, but on the aerial photographs it is impossible to suggest a sequence. In fact, on the 1925 verticals, there does appear to be a slight but distinct gap between the barrow and the nearest lynchet.

Exploration of these relationships, through analytical earthwork survey followed up by further targeted work, would provide important information on the dates and development of the field systems on Ewe Dean Down, and more generally on the Sussex chalk downs.

SHEEP AND THE DEVIL'S BOOK

From the fold to the pasture

In the 1780s the agricultural writer Arthur Young (1714-1820) calculated that during the summer the South Downs held 270,000 sheep and had stated that 'I know of no lands in the Kingdom, rich marshes excepted, which are stocked in such a proportion' (Arthur Young 1788 quoted in Youatt 1837, 234). The value of sheep not only lay in their wool and meat but also in the invaluable role they played in manuring the arable fields and on the South Downs, manuring had been the main role of sheep throughout the medieval period (Brandon 1999, 58-78). There is also evidence that the flocks on the eastern downs in particular were also prized for their wool from the 14th century onwards (Brandon 1999, 64-65). Extensive arable fields, and new fodder crops introduced from the 17th century enabled sufficient winter and early spring feed to be produced for the much larger 18th century flocks (Brandon 1999, 108).

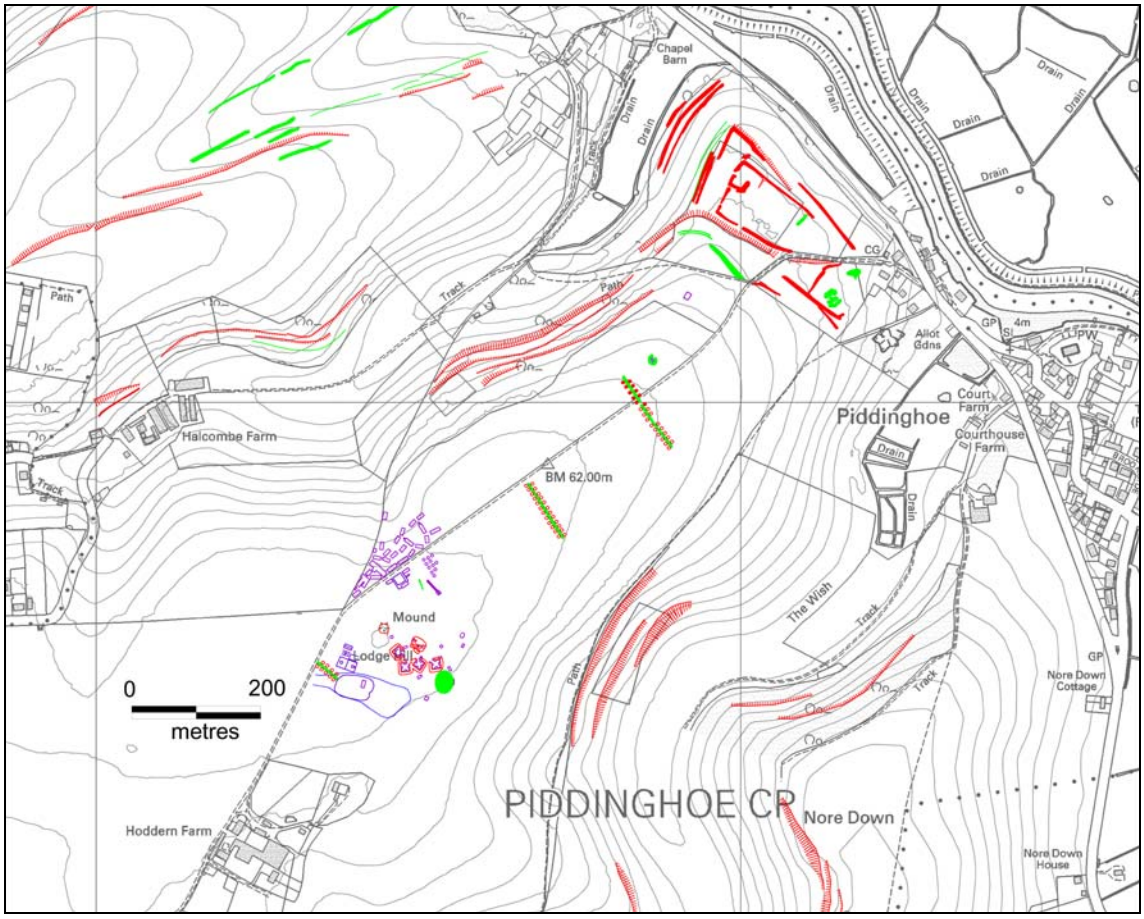

Figure 18 Evidence of medieval or post medieval ploughing, in the form of strip lynchets, on steep slopes in the coombes above Piddinghoe and the Ouse Valley. Background mapping © Crown copyright and database right 2013, all rights reserved. Ordnance Survey Licence number 100024900.

In the early 19th century it was noted that Sussex sheep farms included a considerable area of arable and this equal importance of arable and grazing was demonstrated when it was calculated that for 1000 ewes, a farm would consist of 600 acres of arable and 600 acres of down (Youatt 1837, 234). The project area covered in this report covers little of the low lying land off the downs where most of the arable farming took place. There is evidence of medieval or post medieval arable farming in the form of strip lynchets on parts of the downland with particularly good examples in the parish of Piddinghoe (Fig 18).

Sheep would invariably be herded considerable distances between downland and fields and not all breeds were suitable for this farming regime. South Downs sheep were bred to be light weight with short wool to enable them to be easily moved and folded overnight in fallow fields by the village (Brandon 1999, 62-64). In the 19th century, one reason Leicester sheep 'never succeeded on the downs was, that they would not bear to be driven two or three miles twice every day, from the fold to the pasture, and from the pasture to the fold.' (Youatt 1837, 234).

Despite the importance of sheep on the South Downs from at least the medieval period, relatively few features associated with sheep husbandry were identified within the project area. The most numerous remains are the dewponds on the downs which were dug to collect rainwater for livestock to drink. A number of dewponds are situated on the downs to the east of Lewes, a block of land which has over the last 200 years or so gone by a variety of names including Cliff Hills, Glynde Hills and Caburn massif (Vines & Price 2005, 117).

The Devil's Book or the Bible: A sheep enclosure on the downs

This 'isolated lump of downs' as A Hadrian Allcroft described it (Allcroft 1908, 676) also contains the earthwork of a sheep enclosure known as 'The Bible'. These enclosures were created to collect, or sort the sheep, for lambing and perhaps for milking (Smith 2005, 194). The number of enclosures needed varied but for the larger Wiltshire flocks three permanent sheep folds were kept, for ewes, wethers and, hogasters or yearlings (ibid).

'The Bible' is a rectangular enclosure defined by low banks enclosing an area measuring 95m by 59m. Its position within a dry valley is typical of sheep enclosures, offering shelter and utilising the topography to funnel the flock into the pen. The enclosure is internally divided probably for sorting and separation of the flocks. A longitudinal shallow depression and other slight earthworks hint at this subdivision. Within the enclosure at the south-western corner are the remains of a dewpond (Fig 19).

Most of the Wiltshire enclosures are thought to have been purpose built, but some older earthworks were reused (Smith 2005, 194). Although 'The Bible' is not thought to be a pre-medieval enclosure, its similarity in size and orientation to some prehistoric of Roman

'Celtic' fields immediately to the east indicates that some reuse of already existing banks may have taken place.

It is not clear how long sheep enclosures remained in use, but it is thought that by the late 19th century Wiltshire penning enclosures had been 'disused for a long time' (Smith 2005, 196). In Sussex in the early 19th century some form of shelter for sheep was still provided, 'The Sussex farmers usually set an example of humanity to those in many other districts' in the care of the pregnant ewe which is 'driven home, or there are sheds or sheltered places for her constructed in the field' (Youatt 1837, 235).

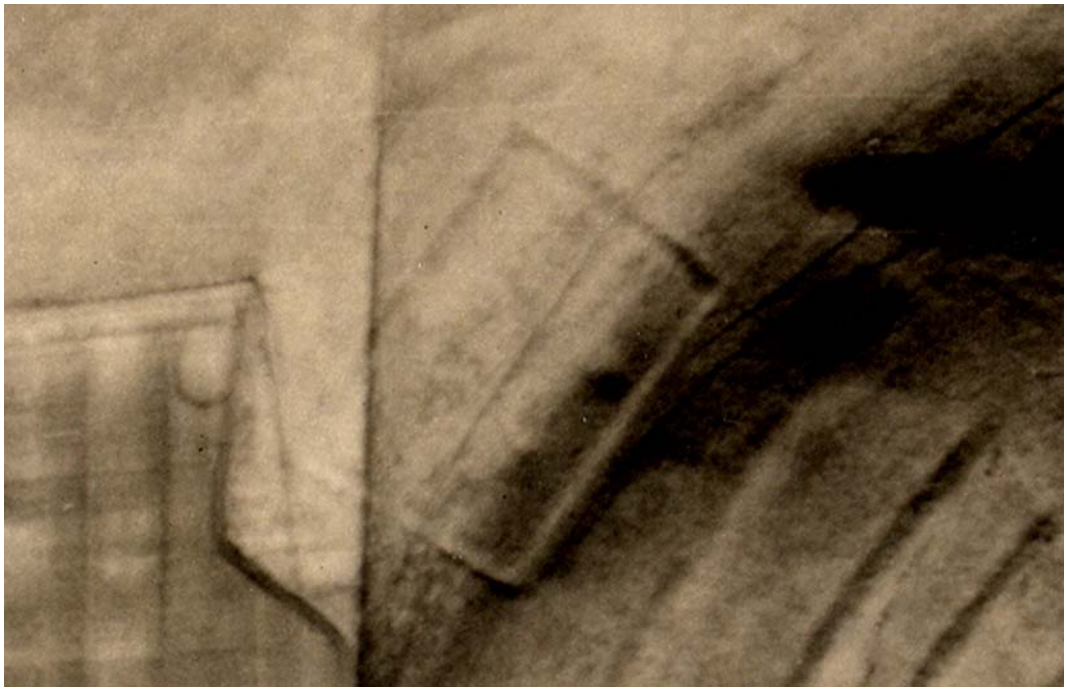

Figure 19 'The Bible' sheep enclosure. Detail of RAF CPE/UK/1947 3043 2-JAN-1947 English Heritage RAF Photography.

'The Bible' enclosure is distinctive in that it was given a name, something that can be contrasted with the Wiltshire examples on the Marlborough Downs, none of which had been distinguished in this way. The giving of a name may relate to its position on a route way onto the higher ground, though as many sheep enclosures were positioned in similar locations this is possibly an unlikely explanation. Alternatively, the need to identify this site may relate to its position on a boundary. Part of this area of downland was divided between two farms in the 18th century and the dividing line passed through this enclosure (Vines & Price 2005, Fig 5, 126).

'The Bible' enclosure was described by A. Hadrian Allcroft in the 1920s as follows: it 'has the outline of a book lying open on the turf – a somewhat old-fashioned book in the shape of a shopkeeper's ledger' (Allcroft 1924, 24). But while the book-like appearance of

this earthwork may have suggested its name, 'The Bible' is a later re-naming and presumably a reaction to its original title 'The Devil's Book'.

In 1835 Thomas Horsfield not only claimed that this earthwork was notable as the 'largest and deepest' example of the 'numerous trenches of a square and right-angled form' found across this part of the South Downs (Horsfield 1835 vol I, 344), but also that it was 'well known' as the Devil's Book - before adding that the 'place is certainly one of solitude and seclusion. Meet for earnest meditation and grave designs' (Horsfield 1835, vol I, 344).

The Devil's Book is typical of the type of names given to archaeological monuments which invoke the supernatural and Sussex (East & West) includes a Devil's Ditch, Devil's Dykes, Devil's Humps and Devils Jumps (Grinsell 1976, 125). Examples of these were collected together by the archaeologist Leslie Grinsell as part of his study of the folklore, myths and legends of prehistoric monuments (Grinsell 1976). These include references to King Arthur, fairies, giants, Grim, Woden and the Devil. Grinsell carried out his survey of place names in the 1930s with the idea (then widely held) that this information could provide some understanding of the original beliefs associated with the archaeological sites, though this concept was eventually rejected (Hutton 2009, 19). Jeremy Harte's paper on the folklore of prehistoric sites (Harte 2009) offers a further example of the disconnection between prehistoric monuments and their folklore in highlighting a number of instances where a monument's name has been changed in the post medieval period. Finally, as the example of The Devil's Book shows, not all supernatural names were given to monuments from the prehistoric period.

The use of the name Devil appears to be a post medieval phenomenon. The Devil's Dyke in Cambridgeshire was first recorded with that name in 1574 (Harte 2009, 26) while the Grim's Ditch between Wiltshire and Berkshire, known as such from the middle ages to at least the 17th century was by the 19th century known to locals as The Devil's Ditch (ibid, 25). Features are not only renamed, but, during this period, the Devil's name was invariably given to 'outstanding landmarks of the countryside' (ibid 27); Devil names, it is argued, were given 'not in an age of faith and superstition, but in the last two or three centuries – a time when devils were found mostly in pantomimes and picture books' (ibid 26).

The Devil has not always been seen as such an unthreatening figure, particularly in the earlier part of the period in question. The medieval concept of a personal Devil who could cause storms or snatch sinners away was strengthened by the Reformation (Thomas 1971, 560). It was also from the late 16th century that the belief was established in Britain that witches owed their power to a pact with the Devil which made witchcraft a form of devil worship (Thomas 1971, 521, 523). This was also a period when witchcraft was made a statutory offence with acts passed in 1542, 1563 and 1604 (finally repealed 1736) (Thomas 1971, 525). Some of these offences carried the death penalty and it has been estimated that around 1000 people may have been executed under witchcraft statutes (ibid 535).

The 1835 reference to the earthwork being called The Devil's Book is, so far, the earliest found. It cannot be said with any certainty whether the name was coined in the context of a belief in the Devil as the personification of evil or during a period when, as Harte puts it, we are not meant to take the Devil name seriously (Harte 2009, 26). The name 'Devil' may have simply been added to this book-shaped feature in the landscape but it is worth noting that the term 'Devil's Book' does exist. William Shakespeare (1564-1616) mentions 'devil's book' in Henry VI part 2; 'By this hand, thou thinkest me as far in the devil's book as thou and Falstaff for obduracy and persistency'. The 1690s witch trials in Salem, America included numerous references to those entering into a pact with the Devil having signed the devil's book (Reis 1997); this makes Allcroft's description of this Sussex earthwork being in the shape of a 'ledger' all the more intriguing (Allcroft 1924, 24). The devil's book also appears to be a catch all term for a variety of things. Used in an 18th century novel it was the ephemera associated with fortune telling (Anon 1756, 126) while in an 18th century sermon it seems to refer to any written work that wasn't the Bible (Anon (ed) 1821, 248). The Protestant Magazine records a number of instances that demonstrate that to some Catholics, the protestant Authorised Version of the Bible was considered 'the Devil's Book' and cases where copies of the Bible were burnt were recorded both in Ireland in 1852 and 1855 and in Birmingham in 1848 (Anon 1855, 358-361).

While these 19th century examples probably have little bearing on the naming of the enclosure after the Devil, they do provide the context for the change of the enclosure's name. Despite, being well known as 'The Devil's Book' in 1835 by 1873 the Ordnance Survey map calls this enclosure 'The Bible'. The accounts of the Bible burning indicate some of the tensions between Protestants and Catholics at this time, a situation particularly pertinent to Lewes. This town has a strong tradition of Protestant dissent and during the 19th century saw a period of anti-catholic agitation and anti-High Church Anglicanism (Goring 2003, 126). It is perhaps in this period of religious tension that the name of the enclosure was changed.

‘THE TIDES WERE SCARCELY SENSIBLE’

DRAINAGE AND NAVIGATION IN THE LOWER OUSE VALLEY

Drainage

When the engineer John Smeaton was asked to consider the drainage of the Lewes and Laughton Levels in 1767, he reported that ‘the level meadows called Brooks, laying upon the river Ouse, were in under water from Land Port above Lewes, to White Wall below Rodmill [Rodmell](Smeaton 1812, 340). This description of an extensively flooded Ouse valley was not exceptional. Winter flooding was common in the 14th century; in the 15th century conditions were so bad that meadow at Southerham was converted to a fishery and in the early 16th century parts of Southover, Kingston and Iford were ‘almost the whole year underwater ’. It was reported in the early 17th century that the Ouse ‘maketh a large mere’ (Brandon 1971, 96-97; Camden 1610, 315 quoted in Brandon 1971, 101).

Despite these descriptions, low lying land had been inned and embanked to protect it from flooding from the early 14th century (Brandon 1971, 96) but these needed continual maintenance, or raising periodically, as water levels rose. These works, as the above quotes make clear, were not always successful.

Earthwork remains of what are thought to be embankments were identified on 1940s aerial photographs in The Brooks within the parishes of Iford and Rodmell (Fig 20). Banks run roughly parallel to the higher ground in each parish and connect to the parish boundary, a line once followed by an earthwork known as the Iford Wall. Combined, these earthworks enclosed approximately 90ha (60ha in Iford, 30ha in Rodmell). At one point the bank returns to the higher ground and immediately to the south a second bank heads back into The Brooks. The remains of a drain can be seen at this point and this arrangement may indicate that the line of the embankments took into account a watercourse that was too wide to be built across. No remains of a channel can be identified at this point despite aerial photographs showing the area in flood in 1960 and which reveal former channels further east in the Brooks which joined the Ouse south of Lower Rise.

Although the problems of flooding were not confined to the Middle Ages the somewhat irregular line followed by these earthworks and their position relatively close to the higher ground may indicate that they are early, and perhaps medieval in date. They may represent an early phase in the inning of the Brooks, with subsequent phases creating new embankments nearer the river. Certainly by the late 18th century John Smeaton described banks as being ‘contiguous to the river’ (Smeaton 1812, 340). This movement of embankments towards rivers or coasts has been identified in Kent (Bowler 1968) and on the Severn Estuary (Allen & Rippon 1995); though the Severn examples have mainly been concerned with the movement of the outfall structures.

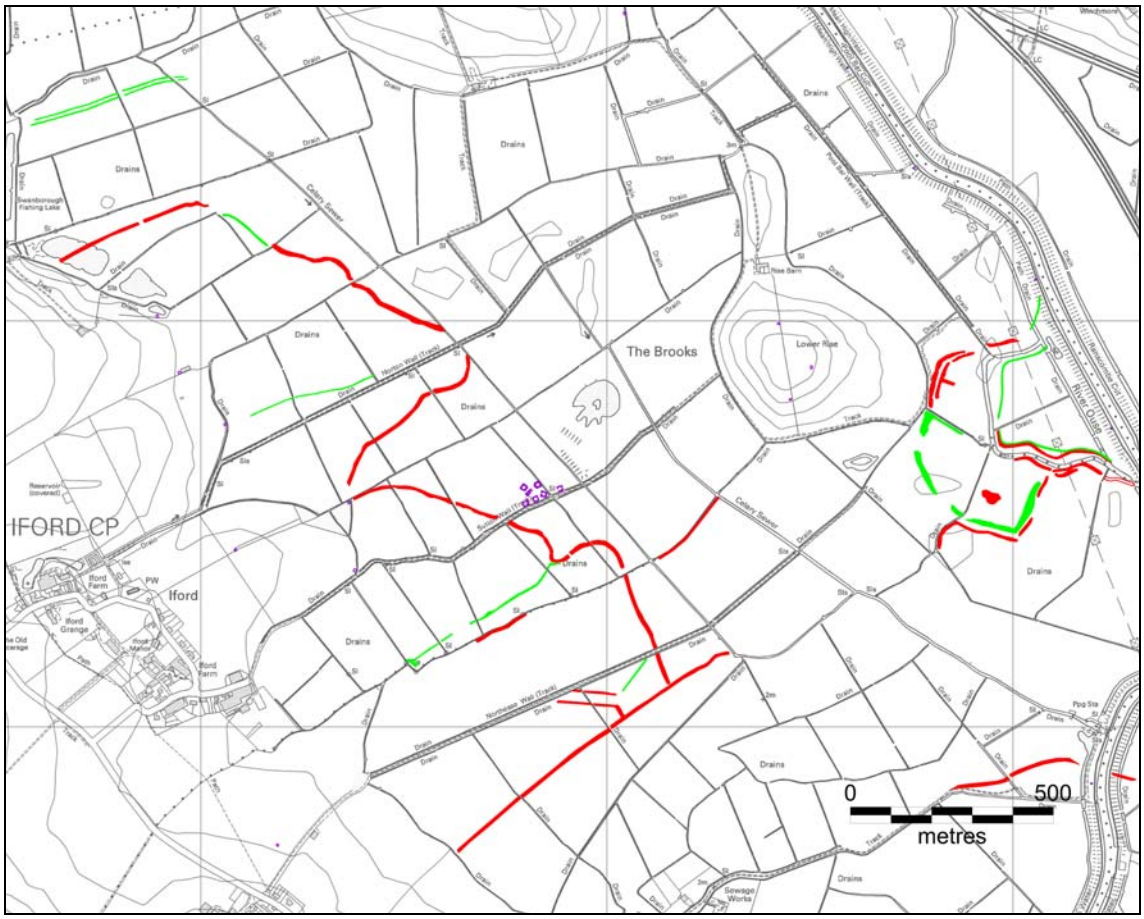

Figure 20 Medieval and post medieval embankments (in red and green) at Iford and Rodmell. Features in purple relate to 20th century military remains. Background mapping © Crown copyright and database right 2013, all rights reserved. Ordnance Survey Licence number 100024900.

The main sewer that runs south-east across The Brooks from Kingston near Lewes was in existence in the 1760s (Smeaton 1812, 348) and appears to cut through the eastern extremity of the embankments. This sewer is now known as Celery sewer and can be seen running top left to bottom right in Fig 20 above. At its southern end it follows a dog-leg before meeting the river. A second channel joins the sewer at this point and is also marked Celery Sewer. It is not clear when this sewer was dug but there is some suggestion that it was depicted on John de Wards 1620 map (Thorburn 2007, 19). The cutting through the embankment by the sewer indicates that they were out of use by this date.

The Iford Wall no longer exists, but three new walls now run south-west, north-east (Norton Wall; Suiton Wall; Northease Wall) all of which appear to have been built around the mid-19th century and their creation seems to coincide with the abandonment of Iford Wall and represents a major change in the arrangement of this part of The Brooks.

Improved navigation

Perhaps some of the most ambitious work undertaken along the course of the Ouse was the straightening of the channel, by-passing many of the meanders. This is evident in comparison of Yeakell & Gardiner's late 18th century map with the early 19th century Ordnance Survey map. Straightening of the Ouse was proposed by John Smeaton in his report of the 1760s and also in William Jessop's report which followed in the 1780s; an act to carry out these improvements was passed in 1791 (Farrant 1972, 50). Evidence of a former course of the Ouse is identifiable at a number of points and some are prominent and still water-filled features such as the double loop south-west of Tarring Neville.

Figure 21 Embankments flanking a former meander in the River Ouse. The line of the river once marked the boundary between Piddinghoe and Tarring Neville. Detail of RAF 541/219 4043 29-DEC-1948 English Heritage RAF Photography.

Aerial photographs taken in the 1940s show the arrangement of river embankments that flank this part of the river and which on the Tarring Neville side consist of a series of conjoined curving earthworks (Fig 21). While this could suggest that it was built in sections by different gangs of workers, the earthworks also seem to be subdividing the land between the bank and the river, though it is not known for what purpose.

Figure 22 An early example of by-passed meander in the River Ouse to the west of South Heighton. Detail of RAF 541/219 4043 29-DEC-1948 English Heritage RAF Photography.

To the west of South Heighton parallel earthworks once flanked a large loop in the river (Fig 22), though this course was not depicted by either Smeaton or Yeakell & Gardiner and so must pre-date the work undertaken in the 1790s. A channel of only 100m in length was required to cut off this meander (which was still followed by a boundary in the mid-19th century). While the removal of this meander would have aided navigation, it also reduced the length of embankment that required maintenance by 1.3km. The reduction of embankment length to reduce maintenance costs has been suggested as the driving force behind the rationalisation of embankments along the Severn (Allen & Rippon 1995, 85).

Previous discussions on the drainage of the levels and the straightening of the Ouse have relied on documentary evidence but this project has shown the potential for further work that takes the physical remains into account to better understand the embanking and draining of the levels and the management of Ouse.

BLUE BOULDERS, POTTERY AND PUMICE: STONE COLLECTION AT NEWHAVEN

The discovery that ground flint could whiten and harden clay was supposedly made by in 1720 by a Staffordshire potter with the surname Astbury. The genesis of this discovery was in the somewhat remarkable story that while travelling, Mr Astbury's horse developed a film over his eye. The ostler at the inn he stopped at treated the eye by grinding up a heated flint, reducing it to powder which he then blew into the infected eye. Astbury (no first name is given) noted the whiteness of the heated flint and experimented successfully with flints to produced improved white ware pottery. It has been suggested that the Astbury in question may have been a Thomas (Baker 1991, 11) or perhaps John (http://www.oxforddnb.com/view/article/813, accessed 19 Dec 2012) – there were certainly several Astbury's in the Staffordshire potteries at that time (ibid).

There is no flint in Staffordshire and it had to be imported from other parts of the country. Newhaven, along with Rye were just two places where flints were sent to the potteries. Thomas Walker Horsfield writing in 1824 describes this trade, which according to his dates began in 1819:

> 'Newhaven has a particular trade attached to it which many ports have not the benefit of, viz., that of boulders, which are collected by the poor, and shipped for the potteries in Staffordshire. Such is the extent of this trade, that the following quantities have been exported during the last five years.
> 1819 – 4376 tons; 1820 – 2605 tons; 1821 – 2757 tons; 1822 – 3810 tons; 1823 -5372 tons.
> From this source of the employment, a very considerable sum is yearly paid to the labourers; thereby giving employment to the poor. The consequence is, that the poor rates are kept down within reasonable bounds'
>
> (Horsfield 1824, 338).

Aerial photographs taken in 1940 show a winch on the cliff edge south of New Barn west of Newhaven. Although it is uncertain what this was for, it may have been used to bring boulders up off the beach. The winch was short-lived, it is not marked on any maps so was presumably constructed after 1928 and aerial photographs indicate that it had been removed by 1942. Two of the stone or concrete settings for this could still be seen on aerial photographs taken in 1996. Immediately to the north of the winch is a small quarry first depicted in 1910 map and achieving its maximum size by 1928. The quarry, which was linked to Newhaven harbour via a track, contained by 1940 a series of internal divisions. Stones drawn up from the beach may have been stored in the quarry and from where they could be transported down to the harbour. If used for blue boulders, the

absence of a winch on earlier maps suggests that they were managed differently and at Rye, boats were beached and then loaded up with these stones.

Evidence of this trade can be found in various editions of Kelly's directory. The 1867 edition lists amongst coastal trade outwards 'flints to Staffordshire potteries' This is also referred to in Kelly's 1887, 1903 and 1915 editions (Anon 1887, 2067; Anon 1903, 499). Boulder merchants are listed in the 1867, 1887 and 1903 editions (Anon 1867, Anon 1887, 2069; Anon 1903, 502). The trade may have ended in the first half of the 20th century and there is no mention of boulders in the 1934 edition of Kelly's – however, there is less detailed information about the town in this volume which may account for its omission. If still in operation, any restrictions in place on access to the beach during the Second World War may have contributed to the end of this trade. The trade at Rye finally ended in the 1950s (M Alford Blue Boulders at Rye Harbour http://www.ryeharbour.net/pdf/9.pdf Accessed 19-Dec-2012).

There are also some references to pebbles from Newhaven's beaches being ground up in the 'pumice factory' on West Quay or sent (it unclear if ground or un-ground) to be used as an ingredient in face powder. 'After leaving the Navy [in 1919] Albert worked in the pumice factory grinding blue pebbles collected from Newhaven West Beach' (The Hill, Winders & Woolgars by Ray Sexton on 'Our Newhaven' web site http://www.ournewhaven.org.uk/page_id__1381_path__0p3p84p.aspx Accessed 19-Dec-2012). Also recorded in the Southern Weekly News 1936: 'From this inn [Hope Inn] a little army of men work on the beach, finding amongst the pebbles a blue stone. Newhaven is one of the few spots where this stone can be found, and it is used for the production of face powder. An amateur would have to search diligently for the stones, but as much as four tons a day have been sent from the town to the perfumery factories.' (Around Sussex: Newhaven – Town of Changing Fortunes on 'Our Newhaven' web site http://ournewhaven.org.uk/page_id__1877_path__0p2p105p.aspx Accessed 19-Dec-2012).

UNTROUBLED AND UNDISTURBED? THE DOWNS DURING WARTIME

During the Second World War, there were two significant and contradictory views of the countryside. One of these was of an untroubled and undisturbed landscape of well maintained farmland, quiet villages and farms. This presented a Britain that was enduring, safe and beautiful; a landscape where modernity had made few marks.

The alternative view was of an intensively farmed land, using increasingly mechanised methods, which was producing record harvests. This intensification was necessary as by the start of the war Britain imported 60% of her foodstuffs and an immediate programme of intensification of farming was introduced (a campaign of ploughing was undertaken in the autumn of 1939) with a particular objective to increase arable yields. A significant part of this intensification was the reclamation of 'wastelands' and the ploughing of land traditionally not used for arable.

The South Downs was used to illustrate both these representations of the countryside at war. It appears in Frank Newbould's poster 'Your Britain Fight for it Now' (1942) which shows an idyllic view across the downs towards Belle Tout with a shepherd and his flock making their way to a farm in the middle distance. The South Downs are also featured in the official story of wartime farming *Land at War* in a chapter entitled 'Return of the Plough'. A photo of grass downland being ploughed-up has the caption 'On the South Downs, unfarmed since the days of the Saxons, the modern plough appeared'. While this caption implies this ploughing was a momentous event, it was a statement that could only be made by ignoring many similar periods of downland conversion, some as recent as the First World War.

Aerial photographs taken during the Second World War provide yet another view of this landscape at war. These show a military landscape concerned with anti-invasion measures and military training on training grounds.

First World War camps and training areas

There were coastal defence barracks at near by East Blechington from 1794, but the start of the First World War, saw a sudden influx of soldiers to Seaford, from across the country, and from British colonies such as Canada. This was the result of the call to arms on the 6th August 1914 requesting 100,000 men (Simkins, 1988, 75). Two training camps (North and South Camp) were established at Seaford between 1914 and 1915 as accommodation, and a training base, for volunteers for Kitchener's Third New Army. The camps were established on two areas of undeveloped land on the outskirts of Seaford. The camps had ready access to a variety of landscapes for training in warfare to prepare troops for the battlefield. Seaford was readily accessible by rail and close to harbour at Newhaven which became the main embarkation point for France.

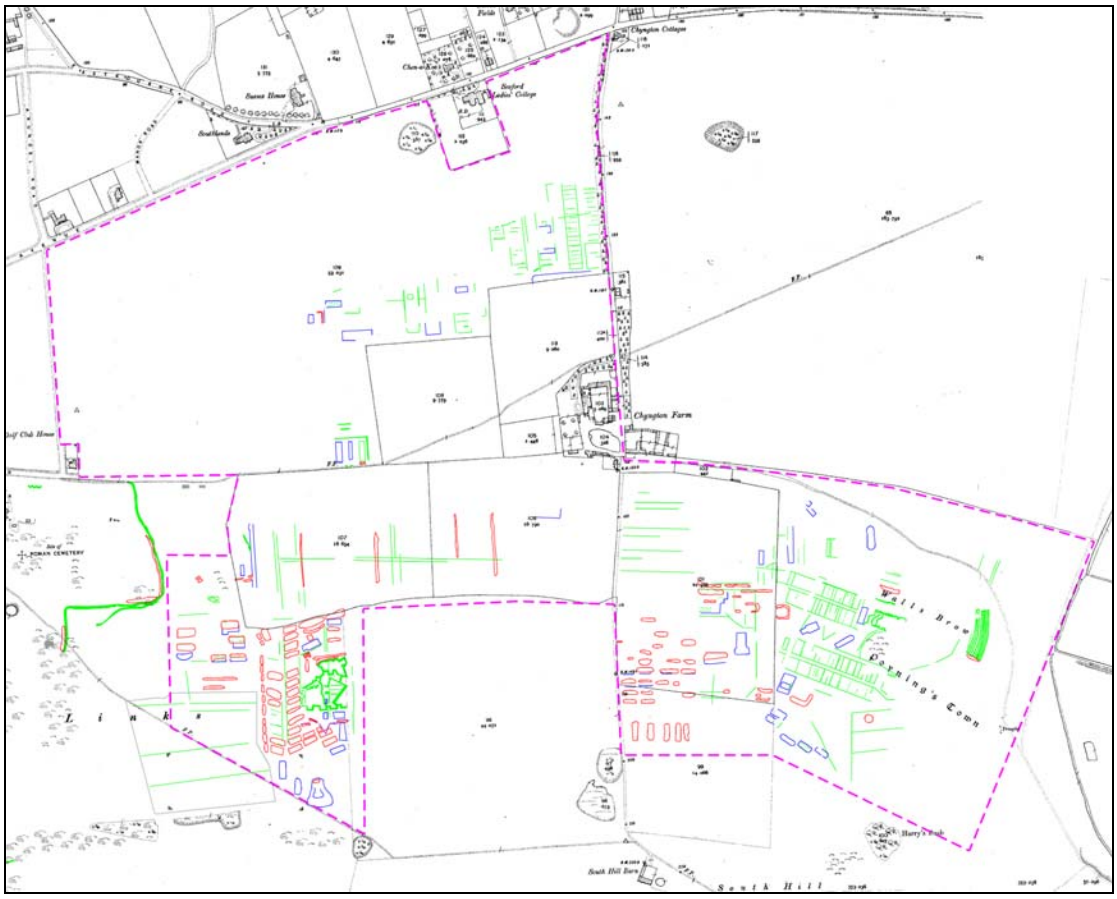

Figure 23 Extents of South Camp, based on the 1916 Royal Engineer's plan, outlined in pink. Mapping from aerial photographs is in colour, the background is an Ordnance Survey 6" map from 1911. © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2010). Licence numbers 000394 and TP0024.

The First World War camps at Seaford were the subject of a separate study and details can be found in Skinner 2011. A summary is included below. South camp was the larger of the two camps, (also known as Chyngton Camp after Chyngton Farm) and extended 1.5km east-west between Seaford Head Golf Course the edge of the Cuckmere Valley. The south side extended to the base of Seaford Head and the Eastbourne Road marked the northern extent North Camp was located approximately 1.3km to the north-west on an area of farmland to east of East Blatchington, a village suburb of the town. The remains of the Seaford camps were recorded on aerial photographs taken from the 1940s up until 1960. The outlines of individual huts and the double row of foundation post holes were clearly recorded on aerial photographs enabling large areas of the camps to be identified and mapped. The resulting plans corresponded almost exactly with the surviving wartime plans of the camps (Figs 23-4). After 1960 the remains of the camps were levelled, or built over, apart from one area at Seaford Head where the earthworks still survive in scrub covered land.

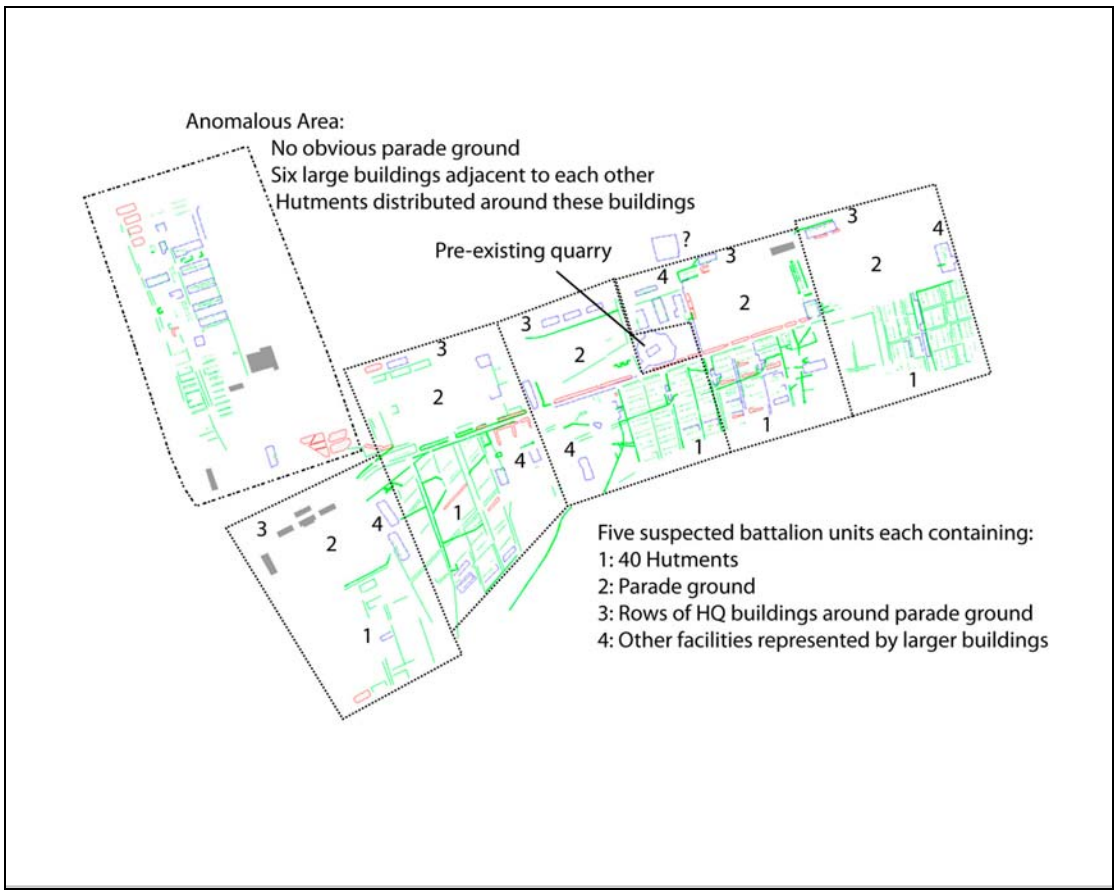

Figure 24 Suggested layout of North Camp. Mapping from aerial photographs in colour, information from the 1916 plan in black. (Skinner, 2011).

Both camps were sub-divided into units of 40 huts (units 1-5 in North Camp and 6-15 in South Camp) with battalion HQ buildings, each with its own parade ground (Fig 25). Each row of barrack huts had an ablution, latrines and urinals block for washing and toiletry needs. The battalion also had access to a bathhouse and drying room and a trio of buildings consisting of a cookhouse and two wash-ups, located beside or amongst the barrack huts. Coal yards for storing fuel were located within reach of the cookhouses (Simkins, 1988, 242).

Each battalion also had access to a cluster of buildings concerned with storage and transport. Transport consisted of horse drawn carts and wagons for carrying heavy weapons such as machine guns, ammunition and stores. A battalion maintained 13 riding and 43 draught and packhorses (http://www.1914-1918.net/whatbatt) all of which were kept in stables attached to the battalion's camp unit.

The layout of the camps reflected the organisation of the troops. The designs of Major BHO Armstrong proposed a standard hut that would accommodate thirty men (Simkins,

1988, 234). The grouping of 40 huts with each parade ground provided accommodation for a battalion of up to 1200 men. A First World War British infantry battalion consisted of around 1000 men and about 35 officers (Schofield, 2006, 5). Seaford could accommodate 15 battalions, approximately 18,000 men spread across both sites (Schofield, 2006, 5).

Figure 25 Aerial photograph of part of North Camp showing an original Armstrong hut and the post holes outlining the foundations of other huts surrounding a parade ground. Extract of RAF/58/613 4237 05-APR-1951 English Heritage RAF Photography.

After the First World War the army continued to use land at Seaford for training. In 1921 Seaford had 99 officers and 2309 other ranks in residence and continued in use into the 1930s with improved barrack blocks (Schofield, 2006, 9-12). Most of the original huts were probably removed at the end of the war, broken down and sold off (illustrated by sale adverts in The Times - *The Times* 1 May 1920; pg. 10 & 12 Aug 1920; pg. 6). The local scout group bought a hut and re-erected it on Chichester road nearer to the centre of Seaford (*Sussex Express,* Mar 29, 2007).

A handful of the original Armstrong huts and remnants of the camp roadways remained in North Camp, until 1960 when a new estate was built on the site. Some of the routes within the camps are fossilized in the roads within the post-war estates (Foot, 2005, 9). For example, North Way, North Camp Lane and Northfield Drive. South Camp's layout was partially preserved in Chyngton Road, Fairways Road and Rodmel Road. In the 1930s one of the larger huts of North Camp was transformed into the Caroline Barling Holiday Home, a holiday home and school for impoverished Jewish girls (Greenberg, 1948, 143).

Other huts were bought and converted to private dwellings. One such hut from North Camp remained in use as a house surrounded by the 1960s estate until at least 2005

Many of the troops passing through the camps at Seaford were raw recruits who were there to be rapidly turned into soldiers ready for deployment in France. They would have been drilled and disciplined on the parade grounds within the camps. In the surrounding Downs and river valleys, they were schooled in other aspects of warfare, including combat, trench digging, gas training and artillery practice. The military presence was far reaching with large areas of requisitioned land taken over for intensive troop training.

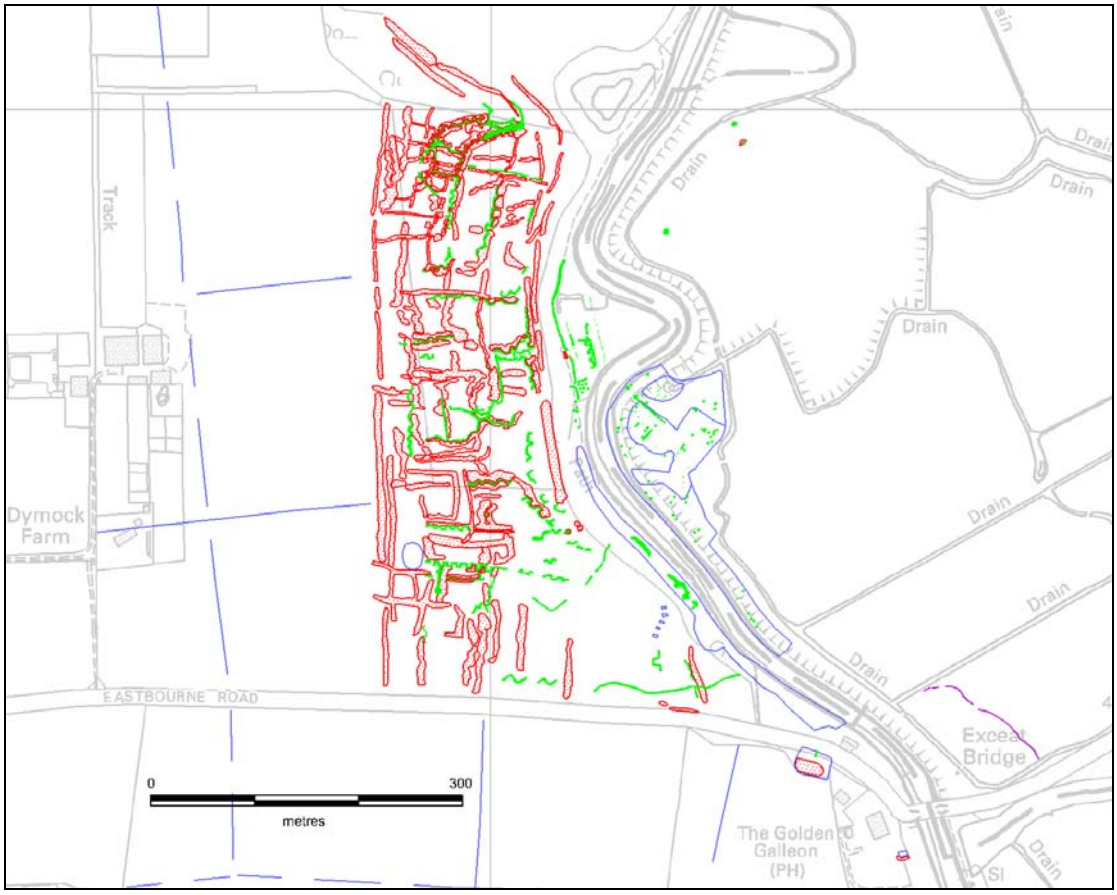

Figure 26 Earthwork remains of First World War training trenches on Ewe Down in the Cuckmere Valley – mapped from RAF aerial photographs taken between 1947 and 1958. Background mapping © Crown copyright and database right 2013, all rights reserved. Ordnance Survey Licence number 100024900.

Practice trenches were identified from aerial photographs, adjacent to South Camp and on Ewe Down in the Cuckmere Valley (Monument Number: 1528015). Crenellated trenches covered an area of 13.5 hectares on raised ground overlooking the Cuckmere River (Fig 26). They were probably associated with the camps at Seaford. Aerial photographs record these trenches in 1940 apparently out of use. Subsequent photographs (May 1942, May 1944) showed the northern parts cleared of vegetation,

indicating probable re-use for military training or perhaps as part of a nearby bombing decoy (Monument Number: 1470076).

The First World War saw the advent of aircraft (planes and airships) which changed the face of warfare, with the conflict no longer confined to the battlefield and directly threatening civilians on their home ground.

In a letter home, Garn Dobbs, a recruit from Canada gave an account of his first few days at Seaford Camp in 1917 noting the presence of numerous airships and experiencing his first zeppelin raid:

> Seaford Camp, June 13, 1917
> We reached Seaford about 8:30 p.m. …finally reached camp about 9 o'clock in a drizzling rain. …We were assigned to tents in a quarantine camp … after which we will go to the main camp about a mile from here. The first night was very dark and rainy and the sky was pierced in all directions with searchlights looking for zeppelins.
> About noon today a heavy mist rolled up and the alarm was sounded upon which we all ran out and got away from the camp. We learned later…there had been a zep raid over the country but didn't learn of any damage done. There are lots of airships and dirigibles flying around here and we are getting quite used to them. (*Canadian War Museum 2012).*

The first airfields appeared across the southern areas of England. Of those near the project area, Wilmington Airfield was established as a Home Defence landing ground in 1916 (Butler 2007, 156), and a seaplane base, RNAS Newhaven, was established at Tide Mills between Newhaven and Seaford providing anti-submarine patrols and escorting Naval convoys (Butler 2007, 39). It was closed at the end of the war, but the concrete hard standings for the wooden hangar and foundations of the slipway are still visible on the beach today (Monument Number: 1488232).

The Second World War and tank training

After just two decades of peace the outbreak of the Second World War once again saw a return of the army to the Downs to prepare troops for battle and to test new weapons and techniques. However, this time operations were on a much larger scale. Aerial photographs taken during, and immediately after the war show large areas of Southern England employed as military training grounds. From Newhaven and Seaford across to Eastbourne land between the coast and the northern edge of the Downs was requisitioned. For example, the area that is now Friston Forest was devoid of trees at the time and was heavily used for troop and tank training. This is reflected in the remains of numerous tank tracks, practice gun emplacements, and fox holes.

A number of tank training ranges were situated along the coast to the west of Beachy Head (Fig 27). These ranges comprised a winch house to pull a moving target (a trolley mounted covered frame) along rails set within a recessed and embanked target run. Tanks or mobile guns were located at prepared firing points, usually inland from the range, with shells fired out to sea. One range with three target runs (each offset by 45° from its neighbour) was located on the cliff at Michel Dean. Other ranges were located close to the lighthouse at Belle Tout, which was severely damaged by repeated strikes by tank shells (Source: Sussex History forum).

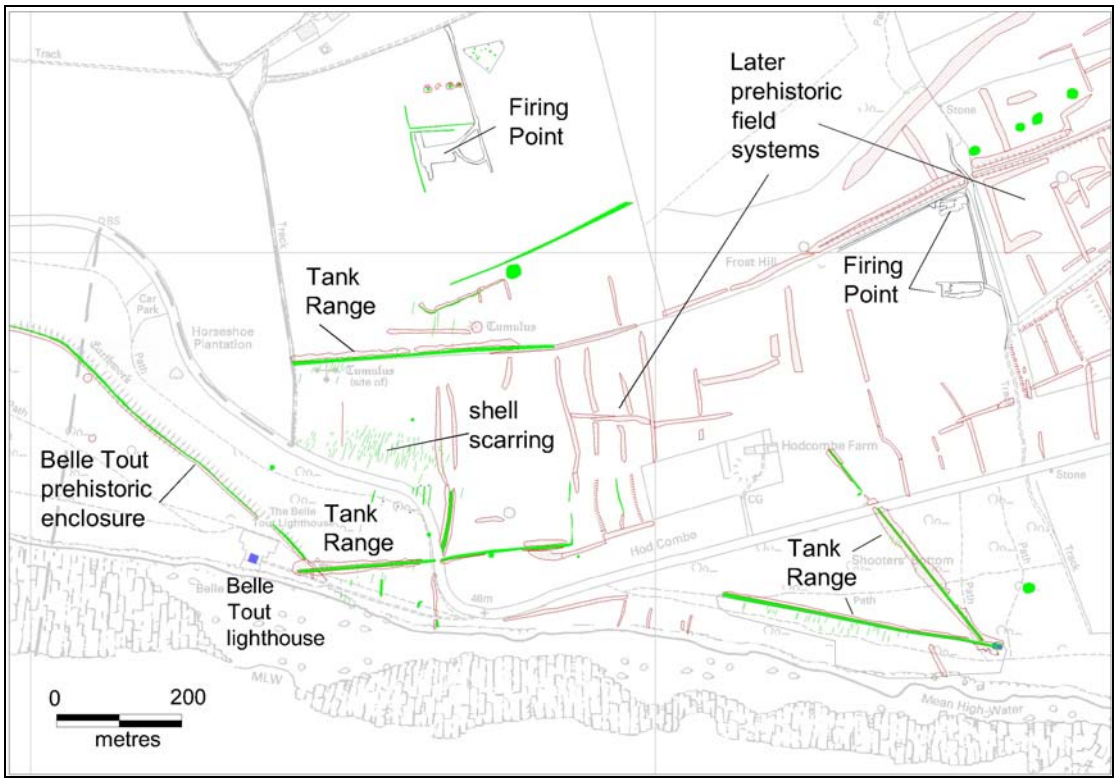

Figure 27 Extract of mapping showing the Belle Tout and Shooter's Bottom tank training ranges and firing points amongst the prehistoric field systems, barrows and enclosures. Background mapping © Crown copyright and database right 2013, all rights reserved. Ordnance Survey Licence number 100024900.

Extracts from the wartime range diaries for Michel Dean, Belle Tout and Shooter's Bottom give an insight into the day-to-day operations of the different regiments from home and abroad, illustrating how range operations were dependent on the weather, the presence of passing traffic in the air and at sea, air raids and dog fights.

> 24th January 1943, Light rain to help increase the muddy condition of the ranges. The 12th Fld Regt. fired today not so good making only 30%. Slight enemy air activity directly over head but no need to close down. Two more right angle hits on the Belle Toute Lighthouse. The 3rd A.Tk. Regiment finished firing on the 6 Pdr. Range

30th January 1943. The wind velocity about 59m.p.h. No firing done today. The 7th Fld were down and we tried to zero some guns. We wired the target trolleys to tracks to keep them from blowing over, but the wind tore the trolley apart. There were three mines put ashore in front on H.Q.'s and we had to vacate for 2 hours (0800-1000) when high tide washed them offshore to disappear.

12th February 1943. Firing went ahead as planned and the 13th Fld Regt. had a fair day. The Canadian School of Artillery also fired on the 6 Pdr. Range. … Belle Toute is scarred to the tune of 18 hits to date. All of them accidental of course (Source: Sussex History forum).

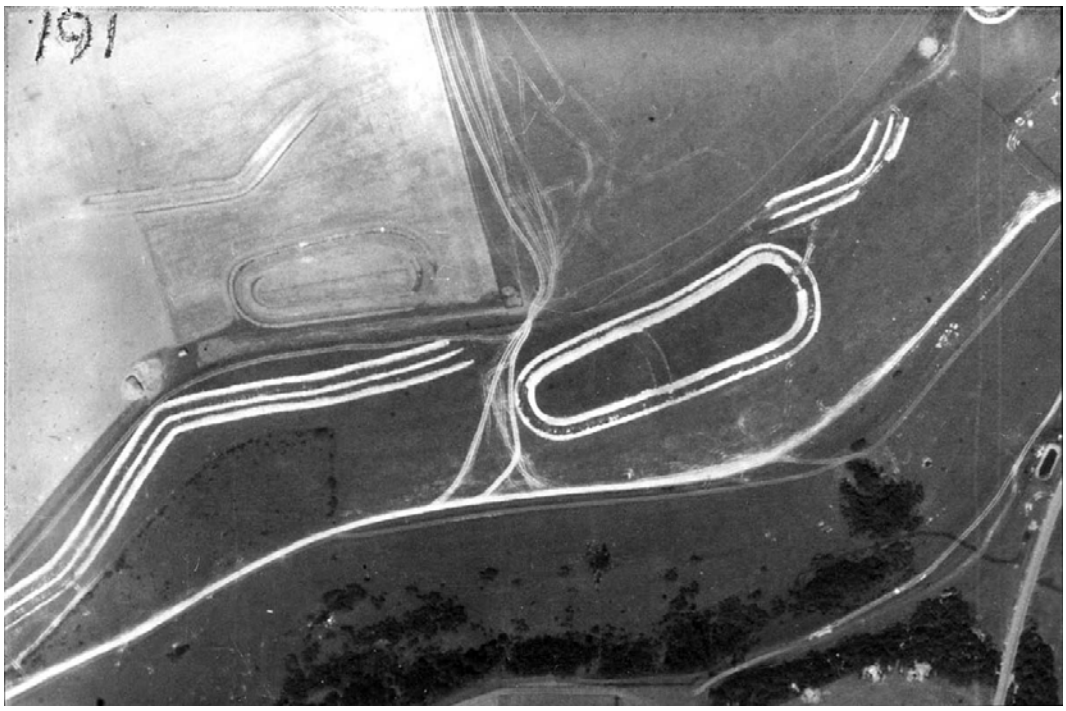

Figure 28 Evidence of possible military training in the Cuckmere Valley. Multiple tank tracks branch off the chalky tank road to the south. Extract of aerial photograph HLA/538/1PRU/6 01 08-MAY-1942 English Heritage RAF Photography.

In a narrow dry valley off the main Cuckmere valley, north of Cradle Hill, aerial photographs taken in 1942 revealed further traces of military activity. Tank tracks and a number of geometric excavated chalky areas appeared as double and triple lines, chevrons and loops, and were visible on photographs taken throughout the war (Fig 28). These features extend along the bottom and up the northern side of the valley. Their location, some distance from the coast within a narrow combe, suggests it is unlikely that these structures are part of the complex anti-invasion defences seen within the main valley. They are more likely to be the result of wartime practice works experimenting

with methods of anti-tank or anti-glider ditch construction, possibly using tanks with bulldozer attachments. When the area was photographed in 1950 the fields appear to have been patched and re-turfed where they had been scarred by the war-time activity and traces of one loop manifested as a cropmark when photographed by the RCHME in 1995.

The Downs above Newhaven also saw heavy wartime tank manoeuvres. Tanks frequently passed through the village of Rodmell from the downland to the south, and the wooden swing bridge over the River Ouse, east of Southease, had to be supplemented for the duration of the war with an adjacent Bailey bridge able to withstand the regular tank convoys (BBC WW2 People's War, 2005).

Second World War anti-invasion defences

Invasion was seen as a serious threat following the invasion of France and the Low Countries, and the coastline of southern and eastern England became the frontline between the Continent and inland targets. From May 1940, steps were taken to secure the vulnerable sections of Britain's coastline against enemy landing from sea and air. The cliffs of Southern Britain offered natural barriers to invasion. Much of the coastline from Eastbourne to the Seaford Head, including the Seven Sisters and Beachy Head comprised vertical chalk cliffs, which required little or no additional anti-invasion defences. The more vulnerable stretches of coast in the survey area included the expanse of sandy beach at Seaford between the western end of Seaford Head and Newhaven where the River Ouse reaches the Sea.

Steps were taken to cut off the beaches and prevent enemy landing. Anti-invasion measures included lines of anti-tank cubes, beach scaffolding and multiple barbed wire entanglements laid along the entire length of the beach, supported by pillboxes and gun emplacements. These formed the first line of the coastal defences. Behind the beach, roads were blocked and defended. The railway station at Bishopstone, at the western end of Seaford, had two pillboxes built over the 1938 art deco station buildings. These still remain with their gun slits (Butler 2007, 42). Opposite the entrance to the station on Marine Parade is a small brick building thought to be the pump house for a Second World War Sea Flame Barrage (Butler 2007, 43). This was recorded on wartime aerial photographs and appeared on recent aerial photographs. The intention of a Flame Barrage was to pump a mixture of volatile fuels onto the sea and ignite it during an invasion attempt.

Newhaven harbour and the entrance to the River Ouse were defended against attack from the sea. The beach defences of Seaford Bay protected the eastern side of the harbour from invasion, whilst the western side was protected by the defences and the strong points established in the Fort Newhaven and on Castle Hill, both strengthened and enclosed with double and triple barbed wire entanglements. Much of the southern side of

the town appeared to be rendered inaccessible from the coast by further barbed wire obstructions and gun emplacements

Cuckmere Haven, with its small flat flood plain, shingle beach opening onto a broad bay, would have been one of better invasion routes into southern England (Fig 29). Annotated Luftwaffe aerial photographs and German wartime maps highlighted the proposed invasion routes through Kent and Sussex (Operation Sealion) with Cuckmere Haven as one of the major a points of entry for the 6th Division of the German 9th Army (Foot 2006b, 41).

RAF Aerial photographs, taken between July 1940 and 1947, show the extent and complexity of the defences built across the mouth of the river and up the Cuckmere valley. An anti-tank ditch and bank effectively cut off the beach from the rest of the valley. This extended from the edge of the valley to the river on the west and was supplemented by anti-tank cubes up to the river bank on the eastern side. On the beach in front of this there was a zone (120m wide) protected by barbed wire, anti-tank beach scaffolding and minefields. Behind the ditch were further barbed wire entanglements and a subsidiary watercourse was enlarged to form a further anti-tank ditch on the eastern side of the flood plain. Pillboxes and machine gun emplacements were placed along the sides of the valley at the base of the slope and on commanding higher ground overlooking the beach.

Numerous weapons pits, gun emplacements and a small arms firing range were situated on the south-eastern flank of South Hill overlooking the western end of the beach. Amongst these, there are the fragmented remains of a later prehistoric field system. These military features appear to be associated with training rather than defence. Lines and enclosed cells of barbed wire extended up the hillside from the valley offering a further line of obstacles and protection of entrenched defences.

Inland were further layers of defences - pillboxes and gun emplacements- were placed at regular intervals across the fields, along rivers, at junctions and railway and river crossings. Road blocks and mined bridges and sections of road were prepared and a number of defended stop lines constructed to prevent advancement of any invasion force that had penetrated the coastal defences. Cuckmere Haven and the lower 3km of the river were heavily defended with gun emplacements, minefields and anti-tank ditches. North of Ewe Down there appear to have been very few defences, presumably as the heavy defences blocking the lower reaches of the valley were thought to be adequate.

The Ouse and Cuckmere rivers, and floodplains, would have hindered any east-west movement across the valleys. Bridges were strengthened to form defended localities. For example, the river crossing at Exceat Bridge was strengthened with barbed wire and gun emplacements, and road blocks put in place on the bridge and the tracks along the river banks. Likewise, the crossing of the river at Long Bridge (north of Alfriston) was completely encircled with barbed wire from the road to the waters' edge and defended by at least one pillbox.

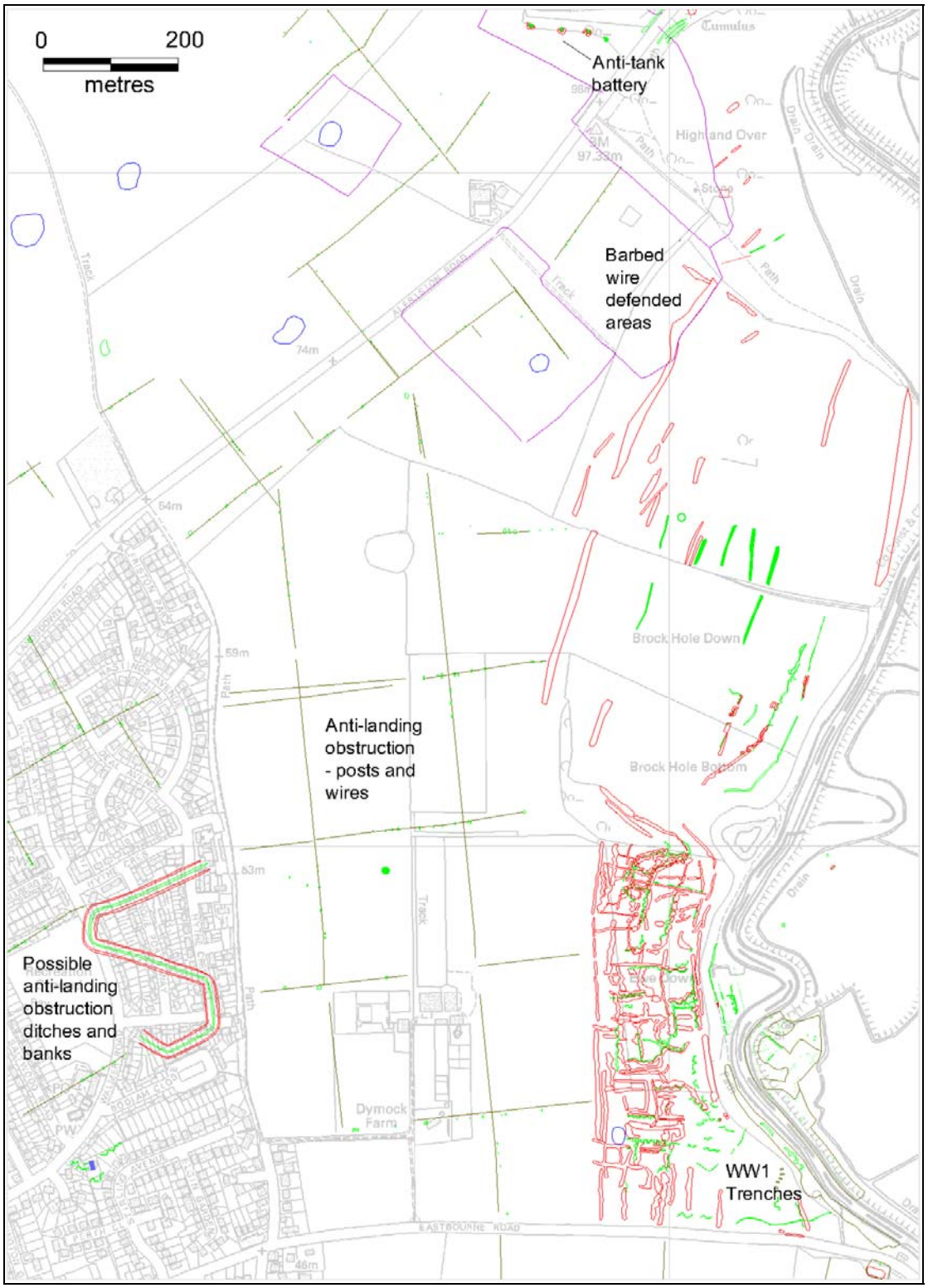

Figure 29 Extract of mapping depicting the extent of Second World War anti-landing obstructions between Seaford and the Cuckmere River against the modern map base. First World War practice trenches extend up the western side of the river bank. Background mapping © Crown copyright and database right 2013, all rights reserved. Ordnance Survey Licence number 100024900.

Movement upriver was hindered by pillboxes placed at intervals of between 300m and 450m along the western bank of the River Ouse from Newhaven and Lewes. Inland from the river pillboxes and gun emplacements placed at road junctions, edges of fields and at entrances to the villages formed a secondary line of defence. The crossing point over the Ouse at Southease was fortified with a road block and at least two pillboxes and gun emplacements. Most were still present in the decade following the war, but recent photographs show only a handful, though others have been noted, hidden in hedge lines and under trees.

Any invasion attempt was expected to be a combined beach and aerial assault. To counter aerial invasion, obstructions were required in all open areas with a length of 500ft (457m) or more, within 5 miles of the coast or in close proximity to airfields or sensitive positions and installations (Foot 2006, 11). Designed to be simple, but effective these obstructions aimed to prevent landing or take-off of gliders or powered planes. A variety of types of obstacle were used, the most common being rows or grids of obstructions comprising ditches and banks or mounds of earth, or rows of posts across fields and along wider roads. In some places, miscellaneous objects such as tree trunks were utilised (Foot 2006, 21). For example, at Wilmington airfield, cars were parked across the run-way during the Second World War to prevent enemy planes landing (Butler 2007, 157).

At Cuckmere Haven numerous minefields and aircraft anti-landing obstructions were located immediately behind the beach defences. A grid of posts and wires occupied all the large fields between the outskirts of Seaford and the western bank of the river and extended for over 3.7km to the first major bend in the river. Amongst these posts and wires, an unusual S-shaped ditch flanked by thin banks was recorded on a 1942 aerial photograph. It is thought to be an alternative form of obstruction. The eastern side of the Cuckmere Valley was narrower and already broken by frequent drainage ditches and the old river course so required no additional artificial obstructions. Beyond the bend in the river, the valley opens out again to the east of Litlington. Here further lines of posts and wires were used to obstruct the larger level fields between the river and the edge of Friston Forest.

Between the western end of the beach at Cuckmere and Seaford Head there were other anti-glider obstructions in the form of a linear ditch flanked by regularly spaced mounds of upcast spoil, and one possible obstruction in the form of three parallel banks describing the shape of a 'V'. Some of these may have been for training purposes, but most appear to have been functional. Elsewhere, exposed ridges on the Downs above the Ouse Valley were seen to be obstructed with yet another form of anti-glider ditch – three parallel ditches.

Air Defence

Air raids were a constant threat throughout the war. The towns on the southern and eastern coasts saw constant air activity either by passing raiding parties or as targets themselves. Major towns, ports, industrial and military sites, infrastructure and transportation links were all targeted.

Passive defences comprised tethered barrage balloons to hinder low flying aircraft and decoys to draw enemy bombing away from the intended target. One such decoy (a QL night decoy site) was located in the Cuckmere Valley north of the river mouth. This was a complex of electric lights simulating the factories, railway yards and harbour installations of Newhaven (Butler, 2007, 55). The control post building survives (Roger Thomas pers comm), but no trace of the actual decoy (lights) could be located from aerial photographs. It is possible that the earthwork remains of the First World War practice trenches on Ewe Down beside the river were re-used for this purpose.

Light and heavy anti aircraft gun emplacements (LAA & HAA) and searchlight batteries were constructed across the country to intercept and actively engage with incoming enemy aircraft. Both LAAs and HAAS were temporary installations at the start of the war (a few established before the outbreak of war), with HAAs being replaced with more permanent sites with static guns. These more substantial batteries with 4-5 large calibre (3-5.25 inch) guns were designed to combat high-flying aircraft. The gun pits were typically set in a distinctive clover-leaf formation. They often had a gun laying radar, accommodation, control post, generator, magazine and additional gun emplacements. Many HAAs were upgraded and modified throughout the war. LAAs were equipped with a variety of lighter faster firing machine guns used to engage fast low-flying aircraft, frequently located at coastal locations simply protected with sandbags or a low blockwork wall or incorporated into a pillbox. (Lowry (eds) 2001, 59 & 61).

Three heavy anti-aircraft batteries were located between the coast (on SW side of Newhaven) and Lewes, defending the route up the Ouse Valley. The most northerly of these (at Southease) had a sizeable adjacent camp and evidence of a possible gun laying radar platform (Monument Number: 1473043). Another five gun HAA was located on the Golf Links close to the site of the old First World War South Camp on the southern edge of Seaford.

Following D-Day (6 June 1944), Anti-Aircraft Command rapidly redistributed the air defences of Britain in a programme known as Operation Diver. All available mobile HAA and LAA guns were redistributed to form a belt of anti-aircraft guns across the area between the coast and London to counter the threat of the V1 flying bombs (English Heritage 2000). LAA Diver sites were typically armed with 20mm and 40mm guns in lines facing the expected direction of attack. Many of these were temporary mobile emplacements leaving little or no trace except a distinctive pattern of marks on the

ground surface. A Diver site was located immediately south of the East Dean Road on Crapham. An arc of eight pale rectilinear marks facing south-east towards the coast (Fig 30) indicated the location of the battery. These show the location of where each gun emplacement had compressed the ground sufficiently to affect the vegetation growth three years later.

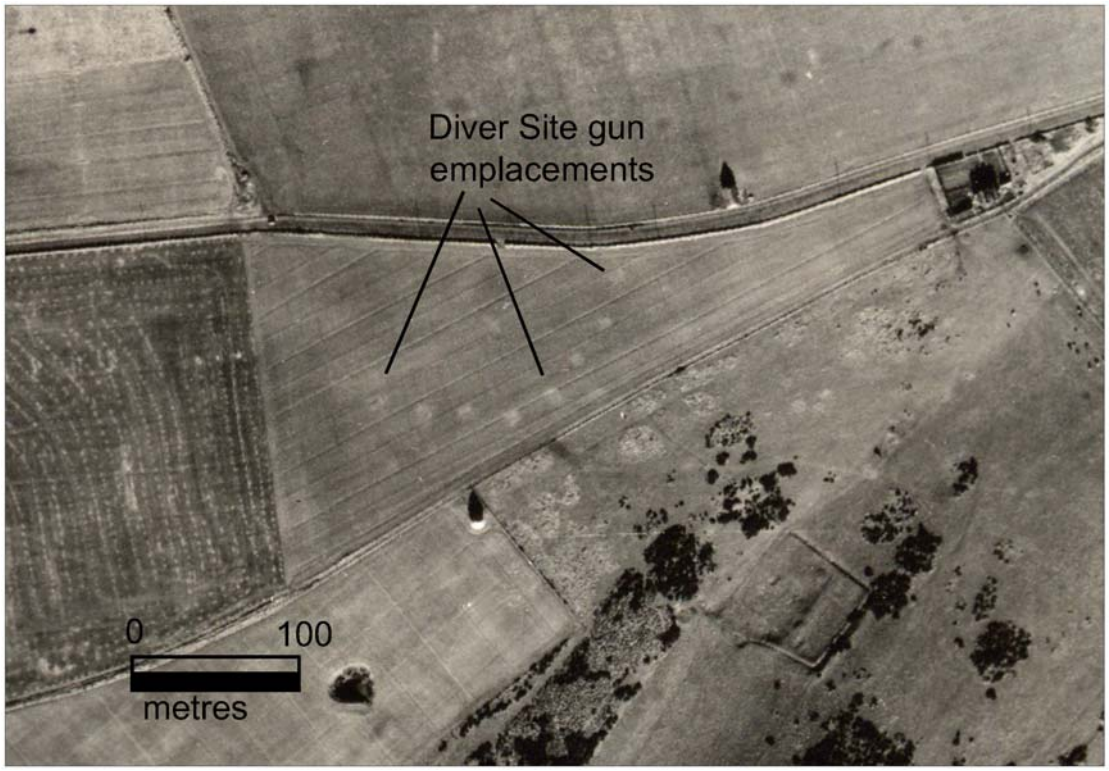

Figure 30 Faint traces of Diver anti-aircraft gun emplacement on Crapham Down visible as pale marks where each gun has compressed the ground. Extract of RAF 564 CPE/UK/1947 2016 22-JAN-1947 English Heritage RAF Photography.

The high cliffs at Beachy Head had long been used for coastal observation and signalling posts. With the development in the 1930s of Radar systems to detect incoming enemy aircraft, Beachy Head was used to site an Observer Corps post and a Royal Naval Signal Station, and one of two Chain Home stations located along this section of coast, the second sited at Newhaven. Beachy Head Chain Home (CD/CHL) station was constructed in spring 1941 by the British Army to detect approaching ships and aircraft. In the early 1950s, the station developed into an R1 underground Rotor early warning system for use in the Cold War. The station was, finally put on standby in 1957 and closed in 1960. In the 1960s the bunker was stripped of its equipment and the guardhouse was occupied by the police and the remaining surface features were removed. The guardhouse was demolished in 1996, and by 2001 the bunker had been sealed and is the only surviving feature at the site.

Friston Airfield

On the rolling downland above the cliffs of the Seven Sisters, an emergency landing ground with a grass landing strip was established early on in the Second World War (Fig 31). This served returning planes, damaged or short of fuel, unable to reach their home bases. The airfield was improved from 1942 onwards. It was also used by resident fighters, No. 253 Squadron with Hurricanes, joined by No. 32 Squadron, but remained as an emergency landing for bombers limping home from the Continent. It was closed in April 1945 and all evidence of the grass runway has now gone (Birtles 1999, 58). All that remains of this airfield are pillboxes adjacent to the road and two semi-sunken air raid shelters in trees to the rear of Gales Farm.

Figure 31 Friston Airfield – a Second World War emergency landing ground with a grass landing strip surrounded by perimeter roads, hangars and support buildings. US/7GR/LOC353 3025 29-MAY-1944 English Heritage USAAF Photography.

Embarkation points

In 1942 Churchill ordered the construction of landing-craft embarkation points along the southern and eastern coast of England (Hegarty and Newsome 2007, 65). The port at Newhaven and the adjacent beaches along Seaford Bay were developed as major embarkation points. Within Newhaven harbour a substantial sloping concrete hard and support yard was established from which landing craft could be loaded with troops and supplies (Fig 32). Concrete hards were built on the beach to the east of the harbour

mouth with lines of pontoons and 'dolphin' tethers extending out to sea enabling ships to be moored at different times in the tide cycle. The concrete hards above the beach are still in place.

Figure 32 Landing craft at Sleeper's Hole, Newhaven 1943. RAF TQ4400/15 15-SEP-194 English Heritage RAF Photography.

BRITANNIA NEEDS NO BULWARKS: DEFENCES AT NEWHAVEN DURING THE SECOND WORLD WAR

In her unfinished poem *Beachy Head*, published posthumously in 1807, Charlotte Smith (1749-1806) describes Beachy Head as a 'stupendous summit, rock sublime' (Smith 1807, 1). From this vantage point she reflects upon, among other subjects, previous invasions (Norman and Scandinavian) and the 1690 British naval defeat in a sea battle with the French off Beachy Head. Her poem was written during the Napoleonic war and although it is tempting to see Beachy Head which 'rears its rugged brow above the channel wave' (Smith 1807, 11) as a defensive entity Smith makes clear that it is the channel that is responsible for 'parting the hostile nations' with England secure as 'Imperial mistress of the obedient sea (ibid). During the Second World War the popular poem *The White Cliffs* written by Alice Duer Miller (1874-1942), presents a slightly different view of England's coastline (in this case at Dover). 'The white cliffs of Dover I saw rising steeply Out of the sea that *once* made her secure' (Miller 1941, 1; my emphasis). Here, perhaps reflecting the advent of air power, the channel no longer offers security and the cliffs become the frontline.

Defending Newhaven

Despite the advent of air power and the acceptance that a future European war would mean attack from the air, an invasion of Britain was not seriously considered a possibility by strategic planners before or even after the declaration of war (Dobinson 1996, 14). However the invasion of Norway in April 1940 forced a re-evaluation of Germany's intentions and the German invasion of France, Belgium and Holland the following month meant that a full-scale invasion became a possibility. The coastline of Sussex within this project area is predominantly cliff and as such is a natural obstacle that required no additional defences against invasion. It is only at Newhaven and Cuckmere Haven, where there are no cliffs, that a landing by invading troops would be possible. Of these, it was the port facilities at Newhaven that were thought to be particularly vulnerable. Britain's earliest defensive measures put in place by the then Commander-in-Chief Home Forces General Kirke were concerned with preventing an invading force from utilising existing ports or airfields. Although the implementation of anti-invasion measures was initially on the east coast (Dobinson 1996, 16) the south coast was soon included. Newhaven marked the western extremity of ports which were to be defended. After the allied defeat at Dunkirk, the coast between the Wash and Newhaven was considered one of two areas most likely to see an invasion (ibid, 24). Emergency defence of Sussex ports (Newhaven and Shoreham) began on 11th May and this work entailed the digging of infantry fieldworks, and preparing bridges for demolition (ibid, 58).

The focus of Newhaven's defence was the Victorian fort built at the mouth of the harbour. RAF reconnaissance photographs taken in July 1940 also show newly dug fieldworks, which consisted of a series of trenches aligned north-south protected with barbed wire, on the high ground to the west of Newhaven (Fig 33).

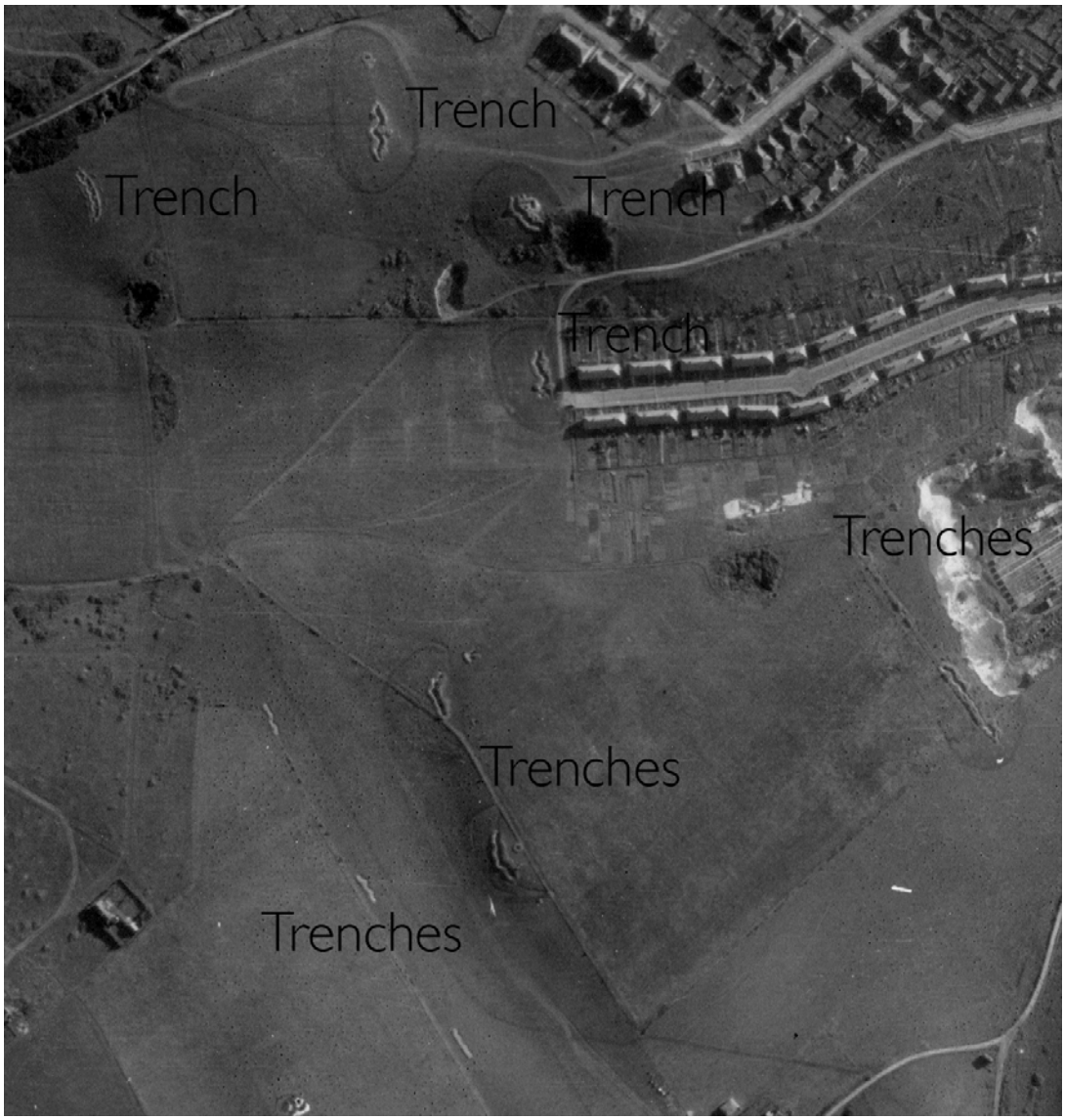

Figure 33 Trenches aligned approximately north-south and enclosing barbed wire defending the westward approach to Newhaven put in place in spring 1940. © English Heritage RAF Photography.

An annotated wartime German map of this area (Foot, 2006, Fig 9, 30) includes symbols representing the various defences identified. A series of triangles to the west of Newhaven correspond with some of these fieldworks. Although Foot states that these represent pillboxes, the triangle symbol is a less specific representation of a defended position. On map key of a German wartime map for part of Kent a triangle represented a Klein-Kamfanlage; this translates as Small Combat System, a definition that does not, as the example of Newhaven shows, necessarily represent hardened defences.

Landings on the shore east of the harbour were to be contained by a double and in places triple line of anti-tank cubes running along the rear of the beach. These extended from the western edge of Seaford to the edge of Newhaven Harbour. A double line of concrete blocks was also positioned in a line between Newhaven's western breakwater

and the base of the cliff to the north. The harbour mouth appears to have been partially obstructed by a small partially submerged vessel positioned at right-angles to the East Pier. Complete obstruction of the harbour mouth would have been possible with a much larger vessel and in 1940 the passenger and cargo ship, SS Davaar was requisitioned and sent to Newhaven to carry out this role. Anchored at the harbour mouth it would have been sunk in the event of invasion preventing the use of the port by the enemy (Fig 34). Aerial photographs also record a partially sunken vessel, Just beyond the harbour mouth, which is probably HMS Steady, a naval mooring vessel sunk by a mine in July 1940.

Figure 34 SS Davaar blockship moored at the mouth of Newhaven Harbour in 1942. Detail of RAF TQ4500/9 24-JAN-1942. English Heritage RAF Photography.

Recording what was there

> 'What did it look like? they will ask in 1981, and no amount of description or documentation will answer them. Nor will big, formal compositions like the battle pictures which hang in palaces; and even photographs which tell us so much, will leave out the colour and the peculiar feeling of events in these extraordinary years. Only the artist with his heightened powers of perception can recognise which elements in a scene can be pickled for posterity in the magical essence of style. And as new subjects begin to saturate his imagination, they create a new style, so that from the destruction of war something of lasting value emerges' (Anon 1942)

The aerial photographs taken by the RAF in 1940 - despite the misgivings of the author of the previous quote - provide a picture of the initial phase of coastal defences rapidly put in place that spring. Newhaven in 1940 was also pickled for posterity by the then official war artists Eric Ravilious (1903-1942). Ravilious knew Sussex well and produced paintings of Sussex subjects, including of Newhaven, before the Second World War. Commissioned as a war artist in 1939 (and attached to the Royal Marines) he was sent to Newhaven to paint the coastal defences in September 1940 and stayed until the following month completing six paintings, most of which featured the fort.

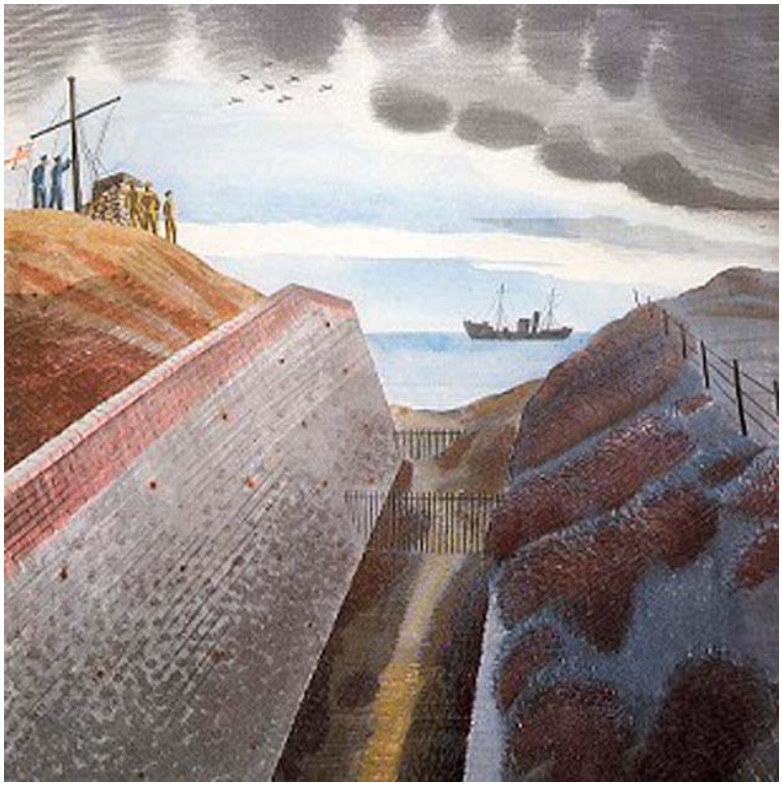

Figure 35 Britannia needs no bulwarks, later renamed Coastal Defences 1. Newhaven, painted 1940. By Permission of IWM (Imperial War Museums).

The paintings do serve a practical role in helping to understand what was there. For example, Ravilious's *Coastal Defences 3* clarifies that the faint marks seen on an aerial photograph taken in July 1940 is a line of barbed wire. The paintings can also offer contrasting impressions of Newhaven. Ravilious's original title for one of his paintings was *Britannia needs no bulwarks* – which seems an odd name for a painting of coastal defences (Fig 35).

The viewer looks along the dry moat which provides a view out to sea. The fort is to the left but despite the servicemen and sandbags, the absence of coastal guns or anti-tank blocks in this view taken together with the painting's title means that Ravilious produced a composition, which appears to downplay the presence and need for coastal defences.

In their place it is perhaps the Royal Navy, invoked by the word Britannia in the title and the RAF, which is represented by his depiction of a formation of aircraft. These planes fly from the left in a clearing sky towards the darker and stormier right hand side, which could be interpreted as representing the threat of the enemy. This has parallels with the historical division of paintings, between peaceful and stormy weather, to indicate opposite states, usually war and peace (Warnke 1994, 115-119). In Ravilious's painting, the threat has been safely negotiated by the merchant ship, an encouraging image for an island nation. As a journalist reporting from East Anglia wrote in 1940, 'By day there is the reassuring sight of merchant convoys – reassuring in the regularity with which they passed unscathed (Anon 1940, 9).

Ravilious's painting can be seen as optimistic; coastal defences are not needed because the Royal Air Force and the Royal Navy will keep the enemy at bay (an idea which chimes with Charlotte Smith's sentiment of an 'Imperial mistress of an obedient sea'). If this interpretation is correct, it may also help to explain Ravilious's description of this work as 'a rather sentimental drawing' (letter in Ullmann 2002, 126). It perhaps what he was working on when he wrote 'There is so little navy to worry me and all the troops inside the fort. I draw in perfect peace of mind on this side of the moat – it is simply wonderful' (Letter September 1940 in Ullmann 2002, 121).

Figure 36 Coastal Defences. Newhaven, painted autumn 1940. By Permission of IWM (Imperial War Museums).

However, for his painting *Coastal Defences* (Fig 36), Ravilious was also working 'on this side of the moat' though at the north-eastern end rather than the north-western corner. From here he produces a very different and less optimistic picture. An uninterrupted view out to sea is denied to the viewer and much of the picture is taken up by the fort. Elements of this are camouflaged and this includes a dead branch. Just off-centre is a red flag (which is never a good sign) and can be contrasted with the previous painting *Britannia Needs No Bulwarks* in which the flag flying is the White Ensign. The exact meaning of the red flag is unknown but perhaps indicates that the harbour is closed as the faint line that is marked across the harbour mouth probably represents a defensive boom. Conflict is also represented by the coastal gun on the fort and what appears to be the mast and wires of the partially sunk HMS Steady seen beyond the harbour mouth behind the lighthouse. The ship at the left of the picture completes the interruption of the view out to sea. Dark and sombre it is clear from the numerous mooring ropes and chains that this ship is not steaming out of Newhaven. This is of course SS Davaar, the blockship (and former passenger and cargo vessel) waiting to be sunk and in which role forms part of the coastal defence Ravilious was commissioned to paint (see also Fig 34 above).

Before the war, Ravilious painted many abandoned vehicles often marked by the incongruity of their location. While the location of this ship is not unusual it may have something in common with the abandoned vehicles Ravilious found in the countryside. Alan Powers suggests that these pre-war paintings of old cars and busses are intended as memento mori (Powers 2003, 38). The SS Davaar in the painting could also be seen as a memento mori. Its only purpose then to be sunk in the event of an invasion it could have also been a reminder of the cessation of the pre-war boats that used to come in and out of Newhaven which Ravilious had also painted. In one of his first letters after arriving at Newhaven he wrote 'It is queer to see this place under war conditions and no steamers (letter reproduced in Ullmann 2002, 116) and in another letter a few days later he explained that Newhaven had changed in wartime and that he 'missed the packet boats' (ibid, 117). But these quotes also hint at the wider changes to have affected the places he knew. Voluntary evacuation of coastal resorts was encouraged and many resorts 'lost from half to two-thirds of their residents (Anon 1940, 9) The evacuation of people from threatened coastal towns had left Eastbourne 'like the ruins of Pompeii…almost no one left in the town…it is the most melancholy, harrowing thing to happen' (letter reproduced in Ullmann 2002, 116).

With all these elements, Ravilious produced a less than optimistic picture that seems to reflect the desperate situation of 1940. The threat from the enemy can be seen in his off-hand comment he made about the German planes which 'fly as they like' (ibid, 118) and the inevitability of a German invasion in this repeated reference to the work he was undertaking as 'pre invasion' drawings (ibid 117 & 119).

While the aerial photographs and paintings produced early in the war can help answer the question posed in the opening quotation 'what did it look like', the wartime landscape continued to evolve after 1940 and Ravilious's departure from the town. Aerial

photographs taken in 1942 may show Newhaven's beach defences at their most developed (Dobinson 1942, 47). The most noticeable addition at Newhaven was three defence lines, constructed from scaffolding, along the beach to the east of the harbour mouth. The forward line roughly follows the low water mark, the second the high water mark while the third runs close to the rear of the beach, in front of a line of anti-tank cubes put in place in 1940.

Snapshots of the increasing and changing defences at Newhaven and along the coast are recorded on the aerial photographs taken at intervals through the war and after. By 1942 there had also been a significant amount of building to the west of Newhaven with the construction of a Heavy Anti-Aircraft battery on Peacehaven Heights and a Coastal Defence/Chain Home Low radar station to the south on the cliff edge overlooking Friar's Bay. The radar station at Newhaven provided target and range information for the coastal batteries at Newhaven and Brighton and 1942 also saw the start of construction of additional coastal guns immediately to the west of Newhaven's Victorian fort. Both the fort and the new battery were protected by extensive lines of barbed wire, particularly on the landward side. A group of buildings to the north of the HAA battery are likely to be domestic quarters, possibly serving both the battery and the radar station. Barbed wire defence was extended across this area protecting both these installations and possibly also enhancing the 1940 defences on the western edge of Newhaven.

Deceiving the enemy: concealment from the air

By 1943 numerous installations had been built in and around Newhaven reflecting its importance as a wartime port. Aerial photographs taken that year also indicate that the threat of invasion had receded, but that air attack was still considered a threat. In 1944, the directorate of Camouflage issued a memorandum in the form of a booklet called *Concealment of New Buildings*. This outlined important points to be followed when considering the siting and construction of new buildings to 'achieve concealment from the air by day or night' (Anon 1944).

Increased naval use of Newhaven is reflected by the provision of fuel oil storage tanks and concerns about concealment from the air may explain why these tanks were not grouped together but instead distributed around the town in smaller groups. Some storage tanks were partly concealed by the disused quarries in which they were built (four tanks in Meeching Quarry and two in disused working on the hill above Gibbon Road - a site now occupied by the western end of Hill Crest Road). At least one storage tank had its sides painted with a disruptive pattern but storage tanks at Meeching Quarry were also concealed with camouflaged netting used to break up their circular plan when viewed from above (Fig 37).

A slightly different technique was applied to the fuel oil storage tank near West Quay. This was entirely covered by netting which was tethered well away from the base giving the appearance of a flat-topped mound (Fig 38). At a storage depot at West Quay, post-

war aerial photographs show a group of regularly arranged earth-covered structures linked by pathways. During the war, this site was entirely covered with camouflage netting.

Figure 37 Fuel oil storage tanks in Meeching Quarry. The outline of the tanks when viewed from above was disrupted by the camouflaged netting, which was stretched down to the ground or up to the quarry's edge. RAF TQ4400/9 5-Sep-1943 English Heritage RAF Photography.

Figure 38 Camouflage netting concealing a storage tank (right) and a group storage buildings, possibly magazines near West Quay. RAF TQ4400/2 5-Sep-1943 English Heritage RAF Photography.

Camouflage netting was also used on the wartime coastal battery, placed over the gun emplacements to conceal the extensive concrete structures that made up the landward side of each emplacement (Fig 39). The post-war view of these exposed emplacements provides a stark contrast to the battery's operational appearance.

The camouflage netting was used to conceal temporary structures. To the north of Newhaven, it covered 185m by 70m of the River Ouse as far upriver as Tarring Neville (Fig 40). This presumably provided a stretch or river where vessels could be moored and concealed from enemy aircraft. The netting is first seen on aerial photographs taken on

17th June 1942 and fresh tracks from Piddinghoe and disturbed ground to either side suggest that it had been recently constructed. This may indicate a link to preparations for the Dieppe Raid of August 1942, although it was retained throughout the war and is therefore likely to have been used for other operations.

Figure 39 Newhaven's wartime battery camouflaged with netting. RAF TQ4400/7 5-Sep-1943 English Heritage RAF Photography.

At HMS Forward, a Naval Intelligence centre at Heighton Hill, most facilities were in a series of tunnels beneath the hill. The military presence was indicated by the barbed wire and earthen fieldworks around the hilltop including the former Guinness Holiday Home via which the tunnels were entered. This station had a number of responsibilities including the chain of ten radar stations from Fairlight, near Hastings to Bognor Regis and maritime defence, including blockships such as SS Davaar at Newhaven.

1943 aerial photographs record a further modified landscape at Newhaven, reflecting the changing priorities of the war. The continued threat of air attack in 1943 is not only apparent in care taken to conceal military buildings but also by the presence of barrage balloons and over 20 balloons can be seen moored in and around Newhaven that September (Fig 41). This reduced threat of ground invasion resulted in the gradual removal of coastal defences. Removal of a number of anti-tank blocks gave access to the beach at the foot of the cliffs beneath the coastal battery. The blockship SS Davaar, after being damaged in an air raid was removed and not replaced. A length of defensive beach scaffolding was also removed to allow the ship to be beached and dismantled. Further east, additional lengths of beach defences were removed, to allow the construction of an embarkation hard, one of many built in the south of England in preparation for D-Day.

Figure 40 Camouflage netting over the River Ouse north of Newhaven. RAF HLA/600 6054 17-Jun-1942 English Heritage RAF Photography.

Figure 41 Moored barrage balloons at Newhaven indicate continued threat from air attack but the reduced threat of ground is seen where beach defences were breached. RAF TQ 4500/4 5-Sep-1943 English Heritage RAF Photography.

THE LONG MAN OF WILMINGTON

The Long Man of Wilmington – occasionally referred to as the Wilmington Giant – is undoubtedly the most familiar monument on this part of the Downs. The outline on view today dates from 1969, and comprises 770 two-feet long concrete blocks, pre-cast with white cement and sand, which were made by C.T. Concrete Mouldings Ltd of Uckfield. They were hauled up the hillside in a trolley made from parts of an old electric milk-float, the frame of an iron bedstead, part of an old stable door, and wheels from a motor lawnmower (Holden 1971, 54). The 770 concrete blocks replaced c 7000 yellow bricks which had originally been laid out in 1874, and repaired c 1890-91 and on several subsequent occasions, acquiring both mortar and whitewash along the way. During the Second World War, the bricks were painted green in an attempt to conceal the Long Man from enemy aircraft seeking navigational aids, but he was returned to his pre-war whiteness once hostilities had ended.

Figure 42 The Long Man amidst the earthworks of chalk and flint extraction. NMR 15211/20 30th January 1995 © Crown Copyright. English Heritage.

Aerial photography usefully records the changing appearance of the Long Man throughout the 20th century and into the 21st, as well as offering an opportunity to contribute to the ongoing debate about the 'accuracy' of the various restorations. Although aerial photographs cannot provide a date for the birth of the Long Man, it is possible to comment on some of the evidence that has been put forward by those who argue for a prehistoric, and particularly Neolithic, origin.

Description of the current Long Man

The Long Man consists of the outline of a figure, presumed to be male, marked out on the north-facing scarp of the Downs immediately south of the village of Wilmington. Both arms are raised and he appears to be holding a pole or staff in each hand (or, in some interpretations, he is opening a gateway or doorway). In 1918, Flinders Petrie calculated the slope on the hill figure itself to be 28° 10', though this angle rose to 33° above his head (Petrie 1926). The Long Man's personal dimensions himself have varied according to author. Petrie measured him with tapes on the ground, arriving at a distance of 226.5 ft (c 70m) from head to foot, the eastern staff measuring 230.66 ft (70.30m) and the western one 235.66 ft (71.83m). The distances between staves were 114.17ft (34.80m) at the base and 116.83ft (35.61m) at the top. Petrie estimated that a plan view, i.e. if rendered as a two-dimensional figure on a map, would be around 11.8% shorter.

The current outline, as constructed in 1969, is unlikely to differ greatly, following as it did the brick outline that Petrie was measuring. Using a rectified and georeferenced vertical aerial photograph taken in 2004, the following measurements were obtained: head to foot - 62.40m (a little less of a difference than Petrie's 11.8%); eastern staff – 62.20m; western staff – 62.75m; distance between staves – top: 35.20m, and bottom: 34.40m. This method is dependent on the accuracy of rectification of the aerial photograph to the OS 1:2500 scale base map (within 2m accuracy to the map, within circa 5m to true ground position) and more precise measurements would be obtained by ground-based measurement directly on the figure himself.

Figure 43 The Green Man of Wilmington, as photographed during the war. Note how extensive the evidence for quarrying is along the scarp edge. RAF/HLA/536/6005 06-May-1942 English Heritage RAF Photography.

Seeing the Long Man

There has been debate and disagreement over the restored outline of the figure since 1874, while questions have also been raised over the 1969 repair (Rodney Castleden is the most persistent critic: see, for example, Castleden 1983, 2002, 2003). The main concerns post-1874 have focused on the positioning of the legs and, particularly, the feet. More recently, some have argued that there are some discrepancies between the current concrete outline and the brick one that it replaced. In addition, there has also been discussion about additional details – including facial features – that some claim to have seen, or which were featured in pre-1874 sketches and written accounts. Those pre-1874 sources are limited in both quantity and quality but a particular problem concerns exactly what people were seeing before that first restoration – before the bricks were laid out, what was visible?

Although the Long Man is familiar today as a solid white outline on an otherwise green hillside, he did not become so until the whitewashing of the yellow bricks laid out in 1874. Prior to that 1874 restoration, the presence of the Long Man was indicated by differential grass growth. Consequently he was difficult, if not impossible, to see at certain times of year, or from particular viewpoints. The earliest known written description, dating from c 1780, although referring to him as 'a rude figure cut out in the Chalk', added that 'the Spot being covered with grass may be plainly discovered in Summer by the colour of the Grass' (Farrant 1993, 129) A guidebook published a few years later, in c 1790, informed prospective tourists that 'On the side of the hill is the figure of a man in the different tincture of the grass… It is formed by a pavement of bricks underneath the turf, which gives it this difference of colour. In time of snow it is more visible' (ibid., 130).

The idea of a pavement of bricks beneath the turf received short shrift from others. The Rev DT Powell, probably writing in 1831, commented that 'Though we frequently made observation on this extraordinary monument I have never heard an item about this brick pavement. I fancy it is [an] utterly fanciful account' (Farrant 1995, 284). In 1835, meanwhile, Horsfield observed that 'the figure of a man 240 feet in height may occasionally be seen by a remarkable difference in the verdure… Various are the opinions respecting the origin of this figure; some have asserted that it was paved, but the most probable conjecture is that it was merely shaped in the turf so as to let the chalk appear through. It is only seen under peculiar circumstances and to the best advantage when there is a small quantity of snow on the ground. The indentation is so very slight as not to be visible on the spot, although it may occasionally be seen at a considerable distance of several miles' (cited in St Croix 1881, 107-8). Finally, in 1874, John Phené, whose research and speculations over his origins brought the Long Man to antiquarian and archaeological attention, and essentially led to the idea of restoration, referred to 'slight but beautiful intaglio and cameo effects' (ibid., 101).

Consequently there are two not necessarily mutually exclusive explanations for the pre-1874 outline – an 'indentation' in the turf, i.e. an outline formed by a shallow depression,

which would certainly fit with suggestions that it was easier to see under snow; and a brick pavement beneath the turf, the latter receiving some support during the 1874 restoration work. The Eastbourne Gazette reported on 29 April 1874, for instance, that 'It was necessary to remove the turf in some places, and in doing so fragments of Roman brick were discovered' (cited in Holden 1971, 41-2). Fragments of brick or tile were also encountered in excavations associated with the 1969 repair, and were also tentatively ascribed a Roman date (ibid). More recent excavations in 2002 and 2004 uncovered further pieces, which are now regarded as 16th century AD at the earliest (Bell 2004; Butler & Bell 2005). It is not clear how someone writing in the late 18th century would know about the presence of bricks, unless some were visible on the surface at the time. However, tolerably accurate measurements of around 240 feet suggest something more than sketching and casual observation had occurred.

The recent excavations included, in 2004, six trenches cut across the Long Man's outline at various points. The key conclusions were that the figure was never cut down to, let alone into, the solid chalk (something that had been demonstrated as early as 1889 (Farrant 1993, 134)); and there were no indications either of chalk-filled trenches as at Cerne Abbas or Uffington. In other words, from the start his outline was shallow, and judging by the fragments of post-medieval brick present, may have been marked (or 'paved') with a line or lines of brick.

Legs, feet and photographs

The principal question mark over the 1874 restoration concerned the positioning of the Long Man's legs and, in particular, his feet (the 'debate' is covered in a number of sources, but all the main points are covered by Castleden 1983, 2002, and Holden 1971). The lower part of the figure was clearly difficult to determine by this stage – illustrations from the mid-19th century onwards do not show his lower legs or feet at all, suggesting that they had become obscured over time – and accounts from those who remembered the figure pre-restoration are not consistent. However, there are clear differences between the earliest drawn depictions of the Long Man that do show his feet and the restored outline. At present, both feet face broadly east. Some who criticised the 1874 restoration suggested that both feet had previously pointed down the hill, as though the Giant were descending the slope, although the fact that there were clearly difficulties in seeing the lower half of the figure by the mid-19th century raises questions here. The earliest depictions, all 18th century in date, show the right foot facing east, the left foot facing west, and both legs bent slightly outwards at the knee.

Attempts to determine the original position of legs and feet on the ground have relied on two main sources of evidence – some photographs of the Long Man taken in early 1874, just after the restoration work had been completed, and geophysical survey work by Rodney Castleden in the 1990s. Some of the trenches dug in 2004 were specifically located to test the results of Castleden's survey (Castleden 2002; Bell 2004; Butler & Bell 2005).

The 1874 photographs were taken by a firm of professional photographers, G & R Lavis, of Eastbourne. Their existence came to light in the wake of the 1969 work (Holden 1971, 43), and one in particular proved of interest. Taken from the ground below, and directly in front of, the restored outline, Holden (1971, 49) noted 'faint markings in the turf' which, he suggested, 'can be interpreted as an alternative outline of the Long Man's left leg'. He wasn't overly confident, suggesting 'rabbit runs or the traces of footpaths formed by the workmen who laid the bricks' as alternative explanations. 'Nevertheless,' he continued, 'the resemblances to a leg and a foot are there and they should be recorded', before going on to note that these markings were no longer visible on the ground, nor could they be seen on 'modern aerial photography'.

Rodney Castleden has taken a more positive view of the 1874 photograph. In his 1983 book *The Wilmington Giant*, he noted how on the photograph 'The crisp white outline of the Giant's left leg overlaps a faint image in the turf of an alternative position for the entire left leg, not just the left foot…'. So clear did the outline seem to Castleden that he expressed difficulty understanding how the restorers, on seeing the photograph, 'either did not notice the correct outline of the left leg in the turf or, if they did, chose not to rectify their mistake' (Castleden 1983, 34). Twenty years later, he went further, questioning the failure to rectify the 'mistake" during the 1890-1 re-bricking as well, before querying Holden's reluctance to accept the evidence of the photograph. This time, using high-contrast enlargements, Castleden noted that 'the entire left leg shows up well. The phantom foot appears long and tapered, continuing the diagonal thrust of the leg… Viewed as a whole, the ghost outline forms a consistent alternative leg, the earlier leg that was entirely overlooked during the 1873-74 restoration. The aerial photographs show slight indications of an earlier position for the lower right leg too, making the image more symmetrical'. He was also able to discern 'an earlier position for the fork of the legs about a metre higher up the hill and to the right (east) of the present position, which I had not previously suspected. It also shows an earlier position of the right foot. Its toe was below the sole of the present foot, reaching roughly the same contour as the toe of the original left foot. *Both* feet pointed diagonally down the slope before 1873' (Castleden 2003, 44-5, his emphasis), although this clearly contradicts the earliest known sketches.

Castleden undertook resistivity survey in 1996-97 across large areas of the Long Man, partly in order to test these observations (Castleden 2002). Interpreting the results proved difficult – 'the terracettes crossing the image as lines of lows made the faint and ambiguous resistivity variations behind them difficult to decipher' (ibid., 92). Even identifying the modern body outline proved difficult. However, for the lower legs and feet, despite continuing problems with the data, Castleden felt able to offer a 'paper restoration' of the original position of both legs and feet:

'It is not possible to extract the shape of the [left] foot from the resistivity readings on their own; but when they are compared with the foot outline on the Lavis photograph it is possible to see that the indistinct patch of lows coincides with it. The diagonal form of the foot is visible. The original foot was well clear of the present foot and entirely

separate from it. The toes of the two left feet point in opposite directions 11m apart – which is a large error even on an image as large as the Giant.

'There are indistinct lines of lows crossing the present right foot diagonally, and extending 3 – 4m further down the slope, indicating the pre-1873 location of the Giant's right foot. It points diagonally downwards and to the east, which would make it approximately symmetrical with the left foot on the Lavis photograph. The original right foot – if that is what we are seeing – appears to have been tapering, triangular in form and roughly 6m long by 2 – 3m wide, comparable with the original left foot. It must be emphasized that the resistivity indications for both left and right feet are very slight' (ibid, 93).

The 2004 excavations found 'no evidence for any alternative positions of legs or feet', although the excavators added that 'if the figure was only marked with bricks and there was no deep cut in the ground, then it is unlikely that this could have been determined in the excavation' (Butler & Bell 2005). At the same time, of course, it is unclear how such an outline would be expected to appear on a resistivity survey – as noted above, Castleden found the results difficult to interpret and seems more reliant on his interpretation of the 1874 photograph. Indeed, he was effectively using the photograph to aid the interpretation of a geophysical survey undertaken to test the evidence of the photograph.

The photograph – or reprints of it – were reproduced by Holden (1971, Plate II) and Castleden (2003, fig 7). The latter was an enlargement of the central area of the photo only – the area containing the Long Man. Numerous lines, some clearer than others, can be seen on the image. Those representing the claimed alternative outline of the left leg are particularly evident, but do not seem to represent clear, single lines. Instead, they seem more likely to represent traces of paths worn by walking up and down the hillside, across the Long Man. In fact, the clearest line, which presumably represents the western side of the 'alternative left leg', forms part of a longer line that runs from above the right (or eastern) side of the Giant's head, across his right shoulder, and then diagonally across his body and down his left leg, crossing the outer line of the latter at mid-calf before fading out (or possibly merging with a more diffuse worn area) to the west of the left heel. A similar dark line, not noted by Castleden, runs a roughly parallel course to the east and is particularly noticeable between the back of the Giant's right knee and the top of the left foot. At a point halfway between the knee and ankle of the left leg, a dark line can also be seen to run along one of the many terracettes on the steep slope, apparently joining the two lines. Meanwhile, the line depicting the supposed earlier position of the right leg can also be discerned. Again, it seems to merge with the lines that continue uphill beyond the Giant's right shoulder.

The most likely explanation for these lines is that they represent paths up and down the hill caused by the passage of feet and, perhaps, the trolleys used to haul the bricks up the hill during the 1874 restoration. These lines are not visible on a 1918 aerial photograph (Farrant 1993, fig 1), by which time access to the Long Man seems to have been more

controlled, resulting in very different patterns of pathways through the grass around and across the figure. No traces of any lines resembling those on the 1874 photographs, or on Castleden's 'paper restoration' are visible on any subsequent aerial photographs.

Rake, scythe, crown, cock and face

Although long familiar as an outline, albeit lacking the sort of detail that led to the Cerne Abbas Giant becoming the subject of a Home Office Obscene Publications file (Daniel 1976, 93-4), the Wilmington Giant has always been regarded as male. There have, however, been claims for additional details. A 1781 sketch (reproduced in Farrant 1993, 131)suggests that the two staves in fact represented a rake (on the Giant's right) and a scythe (on his left), while some written accounts also suggested this was the case. However, other earlier, contemporary and later sources make no mention of these features. Again, nothing was evident in any of the 2004 trenches, and nothing is apparent on any extant aerial photographs. The same goes for suggestions of some form of headgear. Obviously, though, the same caveats apply to these as to the feet – the superficial nature of the original outline makes it difficult to completely reject these features. Perhaps easier to dismiss is the 1873 claim by one James Levett that he had seen the outline of a cock (i.e. a male chicken) cut into the hillside to the right (east) of the Long Man (Farrant 1993, 132).

The two earliest extant sketches – dating from 1710 and 1781 – each show the presence of some facial features (both in Farrant 1993, 131). The former has eyes, nose and mouth as simple lines, while the latter offers a little more detail – open eyes with eyeballs, a full nose and a distinct pair of lips. This is the same drawing that depicts the staves as rake and scythe. Farrant (1993, 132) points to the potential for the terracettes on the hillside to mislead, especially from a distance. Presumably no such facial features were visible, even from a distance, in 1874. However, when Flinders Petrie turned up in 1918 to undertake a measured survey of the Giant, he did see something – 'The eyes are marked by plain hollows; the nose is a boss, possibly with recesses for nostrils; the lips are a long boss of turf' (Petrie 1925, 7 and Plate II). The 1918 aerial view published by Farrant (1993, fig 1), taken the same year as Petrie undertook his survey, appears to show these facial features, although they do not seem to quite match either Petrie's survey or the one published by Marples (1949, 282). Marples claimed that these features were visible in 1936 'much as Flinders Petrie describes them, though trampled and blurred' (Marples 1949, 181), but notes that other visitors in 1926 and 1939 saw nothing. However, he argued that 'These discrepancies are probably due to the fact that the features are invisible from a distance: the writers who deny their existence seem never to have set foot on the Long Man's face' (ibid). No facial features in the places marked by Petrie or Marples can be seen on mid-1930s photographs held by English Heritage Archive (TQ5403/1, c 1935; and a Major Allen oblique, TQ5403/6, June 1936, original held by the Ashmolean Museum). Likewise, no such features are visible on any later photographs although occasional small darker or lighter patches can be seen on many aerial photographs both in and around the face, on

other parts of the body, and indeed anywhere within the rectangular enclosure surrounding the figure and beyond.

Shifting outlines

Given the superficial nature of the original outline, and the difficulty of observing it, it is perhaps unsurprising that some were unhappy with the 'restored' Long Man. Perhaps a little more surprising is the fact that the 1969 Long Man appears in places not to follow the precise line of his Victorian predecessor. Rodney Castleden, reporting on a 1990 survey by Jane Bellam, noted the 'disconcerting evidence that the concrete block outline does not even reliably mark the course of the earlier brick outlines' (2003, 86). This evidence included the presence of three yellow bricks apparently marking the 'original' crook of the right arm some 60cm upslope from the nearest concrete block, and a similar situation above the crook of the left arm. Bellam's suggested explanation was that in 1969 the concrete blocks had been laid within the brick outline, and the bricks removed afterwards, though some clearly remained behind.

Looking at aerial views of the Long Man from the 1918 photo published by Farrant (1993) up to the most recent images, it is possible to identify very slight changes in outline – the rather more pointed right elbow; the lines of the hands, especially the parts outside the line of the staves; the shape of the right foot (especially the heel); and so on. However, such minor discrepancies need to be considered against the apparent impossibility of recovering the original outline, and the impossibility of knowing how close the concrete outline in 1969 was to the brick one established in 1874. Castleden's objections were based around the idea that an original (i.e. Neolithic, in his case) outline was archaeologically recoverable, and that it might be comparable in construction to the hill figures at Cerne Abbas or Uffington – 'The bricks and blocks represent an unintentional and inauthentic narrowing and refining of the image…Today the Long Man is a delicate spidery figure that is quite hard to make out more than a mile away – a giant Daddy Long-Legs. The original outline, a ditch two or four times wider and packed with dazzling white chalk rubble, would have been far bolder… Widening the Wilmington Giant's outlines to 30cm or 60cm would make him…stronger, more conspicuous' (Castleden 2003, 44). This was of course written just prior to the recent excavations at the Long Man, and was largely inspired by Castleden's own observations at Cerne Abbas. The 2004 excavations have demonstrated that a wide ditch crammed with dazzling chalk never existed at Wilmington.

Old by association

Since Phené's 1872 lecture on the subject, many ideas as to the identity of the figure and the date of his original creation have been put forward. As Marples (1949, 188) observed, 'the theorists have had full scope to exercise their fancies, unhampered by evidence, and conjecture has run riot'. The recent excavations have offered a plausible case for a date

no earlier than the 16th century, although the matter is by no means settled and definitive answers to the questions 'who?', 'when?' and 'why?' are still awaited.

As with the Cerne Abbas Giant, just about all periods of the past from the Neolithic to the post-medieval have been offered as solutions to the problem of his age, although in recent decades the Roman and later phases have been more popular, due at least in part to the existence of images that resembled the figure (For example the Anglo-Saxon belt buckle decoration known as the Finglesham Man – Hawkes et al 1965). The idea that the Long Man might be prehistoric, perhaps Neolithic, seems to have gained a foothold by the mid-1920s. For example, in his book *The Old Straight Track*, first published in 1925, Alfred Watkins claimed that despite uncertainty as to his meaning, 'there is general agreement as to his age – that he was here before the Romans landed' (Watkins 1948, 84).

Watkins, of course, identified the Long Man as a 'dod-man' – a prehistoric surveyor armed with a pair of sighting staves, essential equipment for 'the primitive surveyor of the ley' (ibid.), calling on all manner of supporting evidence from snails to Hilaire Belloc. Flinders Petrie's contemporary identification of the Long Man as a deity of the Bronze Age or earlier, possibly the Vedic Varuna (Petrie 1926, 16) – 'there would be no impossibility in such gods being the origin of hill figures' – today seems equally implausible, and as Stout (2008, Ch. 13) makes clear, Watkins' work was as firmly grounded in field observation and literary precedent as was Professor Petrie's. The boundaries between a modern 'scientific' archaeology and what today might be construed as the 'fringe' were at best paper-thin. As Petrie concluded, 'Half the difficulty of research is to know what to recognize, and how it can be applied' (Petrie 1926, 16).

In the case of Cerne Abbas, Petrie felt this early dating received support from the presence of some nearby pits which he identified as flint mines (Petrie 1926, 11), leading him to conclude that 'The Giant must…be at least as old as the beginning of the Bronze Age' (ibid). The identification of these pits as flint mines, and as a consequence Petrie's dating of the Giant, was dismissed soon after by OGS Crawford: 'Nothing could be less like the shafts of flint-mines; the eastern pit is a shallow depression of irregular shape and plainly of no great age; the western is an old pond, not more than about 3 feet deep and…obviously still used as such! Thus the whole of [Petrie's] main argument for the age of the Giant collapses' (Crawford 1929, 278). In the meantime, Cecil Curwen had become interested in the area around Wilmington Hill and the neighbouring Windover Hill because of OGS Crawford passing him copies of the vertical aerial photographs taken in 1925 by the Aircraft Operating Company (see above), prompting Curwen to undertake fieldwork in the area.

The slopes around and above the Long Man, and the hilltop itself, are home to a variety of earthworks, including some substantial quarry pits dug for the extraction of chalk. One, on the slope immediately to the west of the Long Man, contains the remnants of a lime kiln. Also present are (alleged) long and round barrows. The largest round barrow, on the

lip of a large chalk quarry, was, according to Curwen (1928, 95) 'evidently…plundered by treasure seekers'. In fact, the damage was largely due to the surgeon, geologist, palaeontologist and occasional antiquarian Gideon Mantell, who in 1833 had recovered flints, ashes and urns from it (Evans 1897, 308; Grinsell 1934, 271). Immediately to its west, however, is a sizeable elongated mound regarded since the 1920s as a probable Neolithic long barrow (see above). Scattered around are numerous lumps and hollows, some of which were interpreted by Curwen as Neolithic flint mines, while two trackways approaching the hilltop, one from the northeast, the other from the northwest, both regarded by Curwen as Roman, and both apparently post-dating the 'flint mines', provided supporting evidence for the latter's claimed prehistoric date.

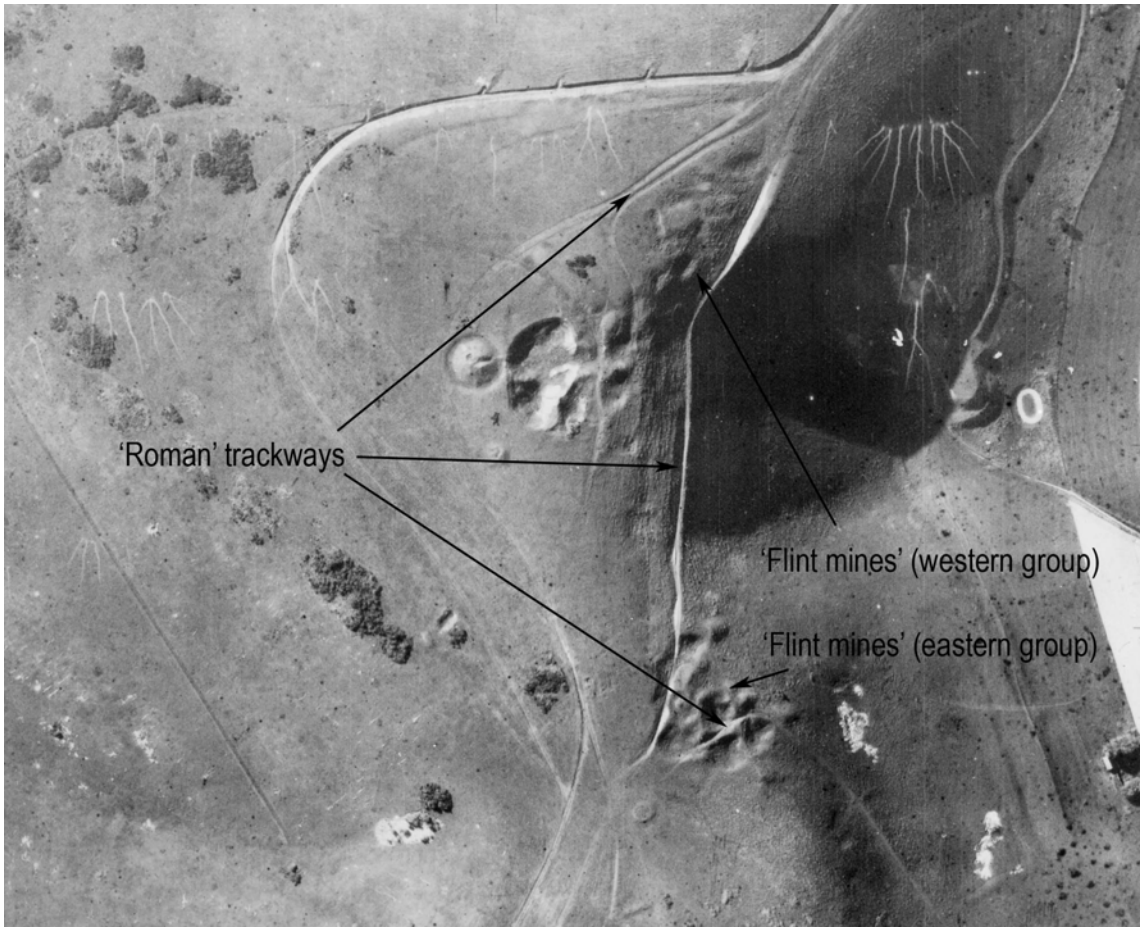

Figure 44 Annotated extract from 1925 vertical showing locations of alleged flint mines and 'Roman' trackways. TQ 5403/5 OSV 1124/42950 6th October 1925 English Heritage. Ordnance Survey Collection.

The presence of Neolithic monuments close to the Long Man has occasionally been offered as supporting evidence for an early date for the Long Man himself. In 1949, Morris Marples wrote that 'Like the Cerne Giant, the Wilmington Long Man is in an area full of Neolithic, Bronze Age and Early Iron Age remains. On the Downs above are the barrows, round and long; ancient trackways pass both below and above the figure; and the hillside,

within a few hundred yards, is pock-marked with what are generally regarded as flint-mines. It was almost inevitable that the Long Man should sometimes be put down as contemporary with the relics of the past which surround it, all of them vaguely known as prehistoric' (Marples 1949, 191). Certainly this is implicit, and occasionally explicit, in the articles Curwen and other leading archaeologists wrote about the Windover Hill earthworks. In his original 1928 paper on 'The Antiquities of Windover Hill', Curwen initially observed that 'so far there is very little evidence as to the period or purpose of its construction', before running through a selection of the theories put forward to date. Among them were OGS Crawford's suggestion of 'a connection between the Giant and the long barrow situated just above his head, especially as long barrows are sometimes popularly known as 'Giant's Graves', an idea to which Curwen added, in possible support, a piece of folklore 'supplied by an anonymous correspondent' (Curwen 1928, 100). The folklore surrounding the Long Man is not discussed here, but it is perhaps worth noting Curwen's conclusion – 'If this legend has the least grain of truth in it, it would point in the direction of the Wilmington Giant being a representation of the Neolithic chief who was buried in the Windover long barrow' (ibid). After a digression to consider a connection with 'the medieval survival of the primitive cult of fertility' – a theory offered by Toms – Curwen concluded that 'As, however, there is evidence that this cult formed at any rate part of the religion of the Neolithic people of Britain, one cannot be certain that the figures do not go back to that period, and a medieval date is by many considered practically inconceivable for the Cerne Giant and most unlikely for the Long Man' (ibid, 101).

Two years later, in his book *Prehistoric Sussex*, Curwen was a little more cautious. Among other theories, he restated the long barrow/Giant's Grave idea and the 'local tradition', but this time suggested that while it was 'at least a possible theory,…like the others [it] lacks sufficient evidence for its support' (Curwen 1929, 135). In conclusion, he argued that 'The most probable solution, therefore, of the mystery of the Long Man, is that he was an idol, made at any period between the Neolithic and the middle ages, and propitiated by offerings and degrading observance by which men hoped to increase the fertility of their fields, their flocks, and of themselves' (ibid, 136). By the time of his later book *The Archaeology of Sussex* (Curwen 1954), the account of the Long Man was placed in a chapter called 'Limbo', a long way from the discussions of either the long barrow or the flint mines. The entry – now entirely lacking the folklore element – was brief, and ended 'What has been said represents the sum of our knowledge regarding this intriguing enigma. For the rest is all guesswork, of which there has been no lack. But in every direction ingenious theories are rendered valueless by lack of evidence, and as this book is concerned only with facts and reasonable inferences therefrom, we must not spend time on what is at best groundless guesswork. It is doubtful if this problem will ever be satisfactorily settled, but in the meantime it is not safe to assume that the Giant is very ancient'.

Nonetheless, as Marples showed in 1949, the proximity of prehistoric monuments was still taken by some as supporting evidence for a prehistoric origin for the Long Man,

something for which the likes of Petrie, Crawford and Curwen have to take some credit, however unwillingly. The most extensive re-stating of this case occurs in Rodney Castleden's 1983 book *The Wilmington Giant*, an extended argument for a Neolithic origin and a book which has proved both popular and influential outside what might be called mainstream archaeology. It is not intended to summarise Castleden's case here.

Doubts about the Neolithic dating of the 'long barrow' have already been summarised (above). The mound itself clearly sits within an area occupied by the earthwork remains of former extraction – either flint, chalk or both, and without further investigation, the possibility that the mound comprises medieval or post-medieval quarry spoil cannot be dismissed. Below, the 'Neolithic flint mines' and 'Roman trackways' are described as components of a medieval or post-medieval landscape focused on the extraction of chalk and flint, a landscape to which the 'long barrow', as noted earlier, almost certainly belongs.

Windover Hill 'Flint Mines'

During the 1920s, Neolithic flint mines had something of a high profile within Sussex archaeology (and, indeed, beyond: Barber et al 1999; Russell 2000). The shafts at Cissbury had first been explored by Canon Greenwell in the late 1860s, and their 'stone age' date established by Lane Fox (later Pitt-Rivers) during the following decade. However, in the 1920s Worthing-based and largely self-taught archaeologist John Pull had discovered the flint mine site at Blackpatch, West Sussex and begun a long programme of excavation, before turning his attention to other flint mine sites including the nearby site at Church Hill, Findon. Meanwhile Cecil Curwen and his father Elliot, after 'assisting' Pull at Blackpatch and then falling out with him, had turned their attention to the nearby Harrow Hill site, which they began excavating in 1925. On seeing the aerial photograph of the Windover Hill area, Cecil Curwen observed a resemblance between two groups of earthworks visible on it and those he had recently been excavating.

In his 1928 paper on '*The Antiquities of Windover Hill*', he wrote:

> 'Besides the large and fairly modern quarry…there are sundry vague pits, hollows and mounds along the crest of the escarpment, some to the north-west of the quarry and some to the north-east…The latter group is the more clearly pronounced and exactly resembles in appearance the well-known groups of flint-mines at Harrow Hill and elsewhere, and there is very little doubt in the writer's mind that these pits also represent the shafts of similar mines. A study of them on the air-photograph and on the ground shows clearly that they are quite unrelated to the quarry, and that they are earlier than the two terrace-ways…' (Curwen 1928, 95).

These two terrace-ways Curwen (and others – see below) believed to be Roman. If the pits, hollows and mounds were earlier than Roman earthworks, then they must be

prehistoric, and if, as Curwen believed, they represented flint extraction, then they must be Neolithic. However, in the absence of excavated evidence, Curwen was careful to qualify this dating with words like 'probable' and 'supposed'.

The following year, in his *Prehistoric Sussex*, Curwen again restated the evidence relating to the physical relationship between the terrace-ways and the 'irregular grassy humps and hollows' of the suggested flint mines, adding that the latter 'must therefore be older than the Roman terrace-way, and in fact they resemble in appearance the well-known flint mines of Cissbury, Harrow Hill and elsewhere. There is, therefore, very little doubt that these irregularities of the ground represent the filled-in mouths of shafts where flint was mined…and that the humps and mounds are the heaps of refuse material thrown out from the shafts in the working of the mines. These pits can also be traced westwards along the brow of the hill…but they must be carefully distinguished from the more modern chalk quarry situated on the top of the hill close to the large round barrow' (Curwen 1929, 133).

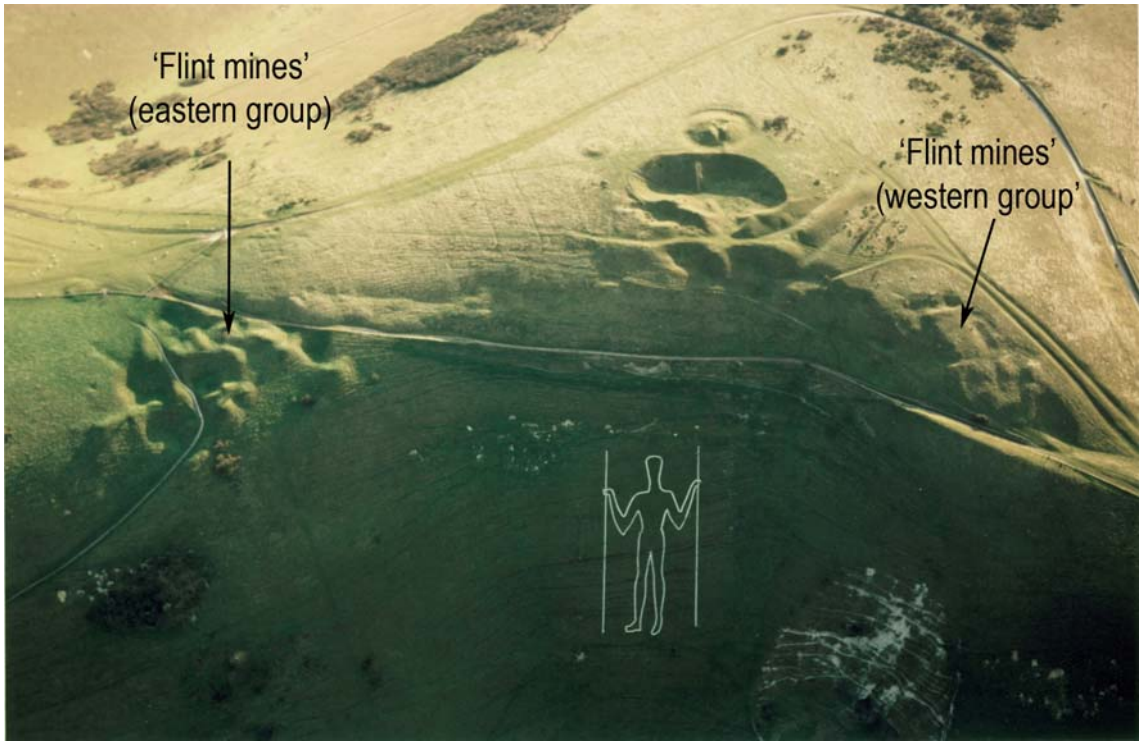

Figure 45 Location of alleged flint mines either side of the Long Man. Curwen regarded the track seen crossing the eastern group as Roman. Therefore, the extraction had to be pre-Roman. As he believed the hollows to represent flint extraction, they had to pre-date widespread use of metal. NMR 15211/20 30th January 1995 © Crown Copyright. English Heritage.

By the time of his 1954 book *The Archaeology of Sussex*, Curwen was again a little more cautious. This time the Windover Hill sites were included in a section dealing with 'sites which await corroboration', i.e. those lacking excavated evidence. The other three, Bow

Hill and the Lavant Caves, both near Chichester, and Tolmere Pond near Findon, not far from the aforementioned Blackpatch, have all since been disproved (Barber et al 1999). As for Windover Hill, Curwen simply stated that 'A small group of pits and mounds, similar to those of the proved flint-mines, lies on the north crest of Windover Hill, five miles north-west of Eastbourne, about 600 feet east of the colossal figure of the Long Man…The site is crossed by two engineered roads of Roman or pre-Roman type, and must not be confused with some modern chalk quarries in the neighbourhood' (Curwen 1954, 121-2). Interestingly, Curwen now only regarded the eastern group as possible neolithic flint mines. The western group is not mentioned in the text, and is ignored in the accompanying annotated photograph (Curwen 1954, plate XXXII).

The area was visited in 1972 by Keith Blood of the Ordnance Survey's Archaeology Division. Based on his careful inspection of the earthworks, Blood was dismissive of the Neolithic dating. The pits 'resemble surface quarries for flint or chalk rather than silted-up flint mines', his argument based around the irregular shapes of the hollows, the quantity and spread of spoil, and the spacing of the pits – basically, what he saw looked nothing like any known Neolithic flint mine (Blood 1972). However, Blood's assessment broadly coincided with higher-profile work at the site which took place around the same time. A programme of trace-element analysis of flint axes being carried out by the British Museum (Craddock et al 1983) was seeking, among other things, to test the possibility of linking flint axes to their sources. This required a small-scale excavation at Windover Hill in order to recover samples, which in turn resulted in a very brief published report of just 3 paragraphs (Holden 1974).

Undertaken in 1971 by Eric Holden and Mr NES Norris, a single trench measuring 18 feet by 2 feet was dug 'in the hollow in the S.E. corner of the group near the confluence of the two trackways, the southern edge of the trench being about 25ft. from the fence'. This was, of course, the eastern group. Holden's account makes no mention of the western group, so it may be that Curwen's doubts about the latter had been noted. Below the topsoil the excavators encountered 'a single layer of smallish natural flints', which they regarded as 'the normal accumulation of flints that occur in hollows on the chalk'. The southern half of the trench was then excavated down for a further 3 feet, within which they found ' loose large and small angular chalk blocks with some flints, mainly unstruck, but there were a few flakes, but not much soil in the lower part of the section. Voids between the chalk blocks were so great that at one time a trowel vanished from sight.' To Holden and Norris, this chalk fill 'resembled excavated material and not undisturbed weathered or frost-fractured chalk'. On the basis of their experiences 'in flint-mine excavations in the past at Findon or Cissbury', they felt that 'the filling could be that of a flint mine'. Supporting evidence apparently comprised a flint hammerstone found 3 feet down, and two large chalk blocks which 'bore holes resembling those formed by antler picks'. In addition, they recovered 'about 20lb. of flint nodules…, mostly of poor quality, which had probably been discarded by the miners'.

It is not clear why the trench stopped at a depth of 3 feet, or whether any attempt was made to ascertain the depth of the hollow. Nonetheless, the report concluded that 'It may be claimed confidently that the Windover Hill groups of shafts represent flint mines of Neolithic or Bronze Age date' (ibid.). In fact, the shallowness of the trench meant that at best, the excavators had failed to find anything to disprove the flint mine theory. By the time Holden's report was published, the eastern group had been scheduled as an Ancient Monument (the western group was scheduled in 1996). The flint sent by Holden to the British Museum offered little support for the flint mine hypothesis. Among 500 axes examined, none were assigned to Windover Hill as first choice, and only 10 as the next most likely source (Craddock et al 1983). Nonetheless, as the Scheduling showed, Holden's excavation seems to have been regarded as confirming the identification of the earthworks as Neolithic flint mines. Drewett (1978, 24) included a sketch plan of the hollows, which appears to depict the eastern group as a cluster of 7 hollows, with two more c 150-200 metres further to the west, which would place them at best on the fringes of Curwen's western group. Later, Robin Holgate wrote in his 1991 book *Neolithic Flint Mines*, that the 'group of about nine hollows and associated upcast dumps have been proved by excavation to be neolithic flint mines' (Holgate 1991, 40).

The site was visited in April and November 1995 by RCHME staff during work on a national survey of Neolithic flint mine sites. Windover Hill was one of 44 rejected sites listed in the resulting publication (Barber et al 1999). Although the rejection and a brief summary of reasons were stated on a number of occasions (Barber et al 1999, 2, 15, 18, 80), because the site clearly wasn't Neolithic, no full survey was undertaken and no detailed report prepared. This may go some way towards explaining why awareness of this confirmation of Keith Blood's 1972 re-interpretation of the earthworks isn't as widely recognised as it perhaps should be. The following report is compiled from field notes made by former RCHME staff Al Oswald (April 1995) and Dave Field (November 1995) with additional comments arising from the recent aerial survey:

The depressions and spoil heaps are located mostly on the upper slopes of Windover Hill, but also extend to lower levels especially on the north-western slopes. Aerial photographs, particularly verticals taken under low lighting conditions, demonstrate how widespread the sometimes quite subtle earthwork remains are across the whole area, rather than the two relatively discrete areas initially identified by Curwen. Around the north-western slopes are a number of quarry scoops of widely differing sizes and spacing. Some of these are connected to the area around the lime kiln (AMIE 1570041) at the foot of the slope to the west of the Long Man by a ramp wide enough to take a vehicle. Many of the hollows are quite shallow, where the steep slopes have contributed to silting, but others remain sharper especially as the slope evens out. In this respect, the large sharply defined quarry on the summit, now c 8 metres deep, is partly surrounded by smaller quarries that are similarly weathered. Most of the quarries are widely spaced and while many have spoil heaps alongside, these appear to have no apparent order. Some of the quarries have entrance ways, and in at least two cases trackways wide enough for vehicles lead into them. Between this area and the eastern group, and running parallel to

the escarpment, are two terraces which may represent open cast quarrying of a flint seam (flint digging on Windover Hill was attested in 1851 following the discovery 'above the Long Man' of an enamelled bronze terret of Iron Age date: Figg 1853). The upper of these two terraces is in turn cut by subsequent quarrying. Although flint exists in considerable quantities in the chalk, there is no struck flint visible on the surface or in eroded patches in the vicinity of the pits.

The eastern group – the one in which Holden placed his trench – consists of at least eight depressions with adjacent spoil heaps. Their form is very variable, but they are generally circular or adit-like, with spoil on the downhill side. The dimensions vary – the majority are between 8 and 12 metres in diameter and up to 2 metres deep, but a few are up to 20 metres across and 4 metres deep. The majority, including those in the main concentration, are steep-sided, well-defined and in many cases appear to have linear hollows entering them, suggesting cart access. Spoil heaps are invariably linear and are not arranged strictly around depressions. The 'Roman terraceway (see below) described by Curwen terminates adjacent to one of the lower quarries in the group and does not overlie spoil heaps as had been suggested – in fact in places it is itself overlain by spoil. A modern footpath does, however, extend from it and winds between the heaps towards the summit. Since the terraceway leads at a difficult incline directly to the quarry group and stops alongside one of them, it appears to be an integral part of the quarrying operation, and may have been constructed as a ramp to get materials safely to the foot of the scarp. In fact, rather than form an integral part of the existing network of tracks and road on and below the scarp, this particular terrace way initially heads in a north-easterly direction down slope away from the quarries before, at the foot of the slope, turning north-westwards, crossing the line of the track running at the foot of the scarp and disappearing into arable. However, it can be traced for a short distance as a cropmark heading in the direction of Wilmington Priory. Other linear cropmarks can be seen in the same field aligned broadly in the same direction, possibly connecting with an alternative route up the scarp.

As Keith Blood recognised forty years ago, the quarries appear to represent surface digging for chalk and flint, and are similar in character to other areas of quarrying dotted along the scarp edge in either direction. None of the other sites have ever been regarded as anything other than relatively recent extraction. Providing more precise dating for the quarrying – rather than just a general 'medieval or post-medieval' time-frame would require additional, probably documentary, research. Suggestions of a connection in at least some phases with Wilmington Priory have been made, particularly as some of the tracks leading from the quarries head in that direction, though not all of them do. In their 2002 trench dug at the foot of the slope, Bell and Butler identified among the soil profile evidence for a long period of stability lasting from at least the Iron Age until the medieval period. This buried soil contained some of the aforementioned fragments of brick as well as pieces of medieval pot. Four samples of brick produced a mean thermoluminescence date of 1545±30 AD. This buried soil was in turn 'sealed by a period of slope instability in which some larger pieces of chalk sealed the surface. Erosion of chalk and soil continued

to the present day…' (Butler & Bell 2005); 'chalk lumps rolled down and [the] soil surface was buried by a series of small-scale erosion episodes' (Bell 2004). Although the excavators have suggested that the onset of this instability 'may relate to the disturbance of the slope above, possibly due to the cutting out of the figure' (Bell & Butler 2003), the presence of lumps of chalk may instead indicate that quarrying at the top of the slope was at least partially responsible.

The 'Roman' terrace-ways

As already noted above, the Roman dating of these has been rejected based on field observation in 1972 and again in 1995 (AMIE 408735). The reason for the original suggestion of a Roman date stems largely from contemporary understandings of the purpose and morphology of various downland trackways in the 1920s, coupled with a relative lack of recognition and understanding of earthworks of more recent date. This isn't the appropriate place to discuss this issue in any detail – instead the specific history of the (mis)interpretation of the terraceways on Windover Hill will be summarised.

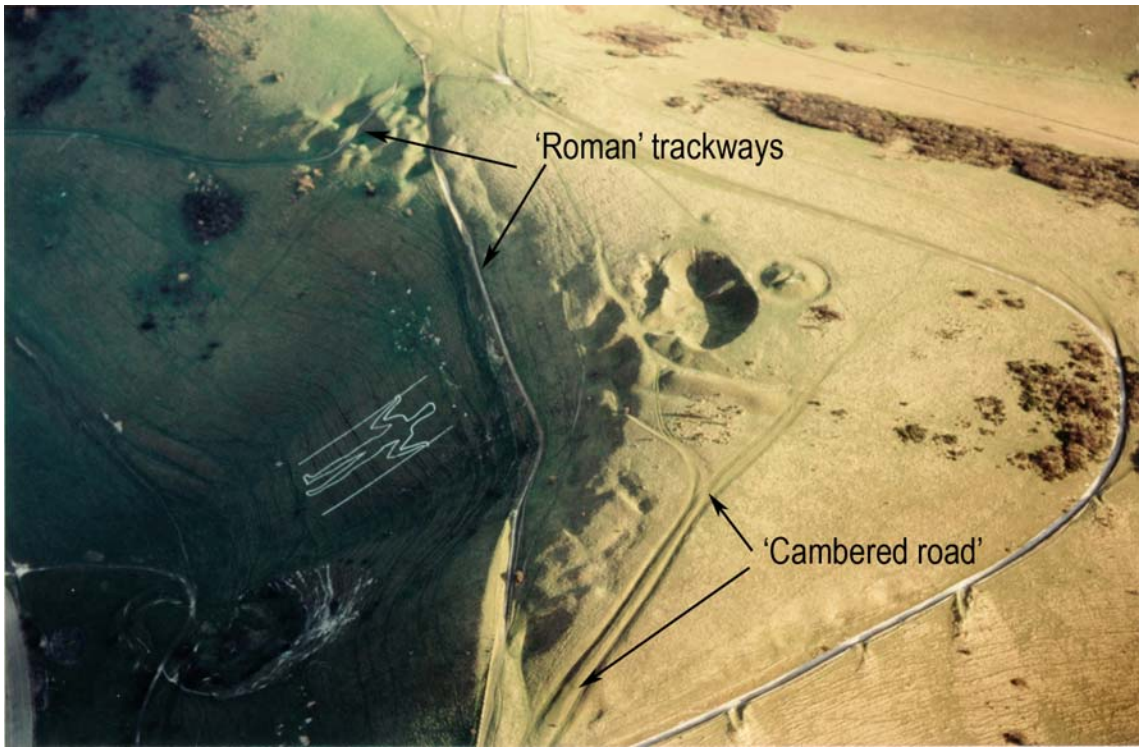

Figure 46 Tracks initially identified by Toms, Curwen and others as Roman. NMR 15211/23 30th January 1995 © Crown Copyright. English Heritage.

In 1922, within his paper discussing Sussex long barrows, Herbert Toms described his visit to Windover Hill with his wife in August 1920 (this was the occasion when he discovered the Windover Hill long barrow – see above). He wrote how he 'ascended the hill in the direction of Windover Mill…When well past the mill site, and nearing the ascent of

Windover Hill, I observed what appeared to be two parallel ditches running up the hill. Closer inspection showed that between these ditches ran a beautifully cambered road…about 17 feet wide. For about 100 yards this ancient road runs up the hill in a state of absolute perfection, rising three feet in every eleven of its steepest course'. He claimed to be able to trace it back along the ridge in the direction of the former Mill, and uphill, where 'the cambered road is found to cease before it reaches the crest of Windover Hill. But there is sufficient indication to show that it went on, just grazing another long mound [the Windover Hill long barrow] in its ascent, and that it must have turned eastwards after passing the very fine round barrow in the top of Windover Hill' (Toms 1922, 161-3).

Toms persuaded classicist and archaeologist A. Hadrian Allcroft, as well as local antiquarian the Rev W Budgen, to have a look, both stating themselves 'in agreement that it forms the continuation of the Roman road which ran from Eastbourne, through Jevington, and connected up with other Roman roads in the neighbourhood of Firle Beacon' (ibid, 163). Allcroft dedicated a chapter to Wilmington Hill in his book *Downland Pathways*, first published in 1922. Although he discusses the terraceway that descends the scarp from the eastern group of quarries and the road that runs along the scarp edge above the Long Man, regarding both as Roman in origin, he does not mention Toms' cambered trackway (Allcroft 1924, 68-71).

Toms' terraceway made a re-appearance in 1928 in Curwen's paper on Windover Hill, the parallel ditches showing clearly on the 1925 aerial photograph – 'a beautifully cambered, turf-covered road between ditches', a form which Curwen argued was 'very suggestive of Roman construction' (Curwen 1928, 97). Curwen suggested it represented an attempt by the Romans to circumvent 'the narrow and precipitous terrace above the 'Long Man'.' Curwen did note that 'The air-photo makes it appear as if this cambered road might be, in part at least, due to the carting of chalk from the quarry. Examination on the ground, however, shows that this is not so, the line bending round towards the quarry being an old boundary bank of some sort. The actual egress for carts from the quarry was on its north side, some carts doubling sharply round south-westwards along the south-east ditch of the long barrow, while others passed through what looks like a breach in that barrow, perhaps to join the cambered road, and yet others doubled sharply round to the east towards Jevington' (ibid, 97-8). This argument was restated by him in *Prehistoric Sussex* (Curwen 1929, 132-3), though again there is far more caution evident by the time of his *Archaeology of Sussex* (Curwen 1954). In that book, here merely mentions that the flint mine site 'is crossed by two engineered roads of Roman or pre-Roman type' (ibid, 122), while his annotated oblique aerial photograph of the area (1954, plate XXXII) identifies the track along the scarp edge and the terraceway leading down from the eastern group of quarries as his two Roman roads. The cambered trackway is ignored.

Keith Blood, in 1972, described the network of tracks on Windover Hill as 'terrace-ways of indeterminate age with no definite evidence of Roman work'. Curwen aside, little note seems to have been made of the Roman attribution outside Sussex (or, indeed, inside the county). This may be, in part at least, because the Roman dating wasn't accepted, or at

least was unsupported by evidence from excavation. The various terraceways and the cambered track were, of course, inspected by RCHME in 1995. Comments on the track associated with the eastern group of quarries has already been noted above, but before dealing more fully with the results of that fieldwork and the analysis of aerial photographs, it may be worth noting in passing one relatively recent attempt at reinterpreting the cambered trackway.

In his book *The Wilmington Giant*, Rodney Castleden dismissed the Roman attribution as lacking any evidence to support it. In any case, 'there is no reason why the Romans should have forced a road up to the summit, if they merely wanted to reach Eastbourne…' (Castleden 1983, 132). Instead, he argues that 'The short cambered way on Windover Hill that seems to lead nowhere is instead related to the neolithic burial rites that accompanied the building of the Windover Long Mound' – it is a cursus (ibid, 132-3).

On the ground, it is apparent that the trackway is not, in fact, cambered, the central portion being no higher than the surrounding downland. The impression of cambering is actually caused by two parallel hollow ways – not ditches – each of which is wide enough for a vehicle. The feature can therefore be seen as a ramp providing access to the quarries, perhaps operating on a pulley system, with one wagon ascending as another was descending (a similar process was used on the Long Man in 1874 to haul the bricks up the slope. On that occasion, children were used as a counter-weight). Castleden (1983, 134-5) actually recognised that the two 'sunken tracks are consistent with usage by a cart or some other vehicle', but his Neolithic dating leads him to propose that 'the Windover cursus [was] a dual slide-car route to the Windover Long Mound', its purpose to haul corpses up the hill to the barrow.

In fact, as already noted, the various tracks including the 'cambered way' seem integral with the far more recent quarrying activity. The parallel hollow-ways end a short distance west of the large quarry, at which point shallower tracks head off in various directions. One curves round to the south of the large round barrow on the summit, curving round the end of the long barrow in the process, while another branch heads east into the quarried area before itself dividing into at least two tracks, both of which appear to follow terraces through the quarry earthworks, one of them cutting across the long barrow towards its north-eastern end before meeting up with the ramp leading into the large chalk quarry. On its down slope side, the cambered trackway eventually disappears amongst a series of trackways. Its course is not so clear from the air, but on the ground it is possible to trace it for some 400 metres or so.

The Long Man and the quarries: discussion

The predominantly prehistoric landscape of the 1920s – a fragmented landscape of assorted features of Neolithic to Roman date – can be replaced with a more coherent post-medieval one, focused around rural industries that are somewhat under-represented in the archaeological record in general. Obviously, further work on the ground and in the

archives is necessary, particularly for Windover Hill – the origins, duration and cessation of the extraction are all unknown, for example. The extraction at Windover Hill fits the pattern of both large- and small-scale quarrying along the scarp of the Downs (Holt 1971), an industry that – in commercial terms – probably peaked in the 19th century, but whose origins and duration, on both a local (agricultural) and industrial scale are more difficult to pin down. The extracted chalk could, of course, be put to numerous uses – a fertilizer to add to the soil on arable fields; for a variety of building purposes (including mortar, cement, and plaster) – all of which are documented by the end of the medieval period. Flint too could be put to a variety of uses, including building and metalling, and there is at least documentary evidence for localised flint digging still occurring on Windover Hill in 1851 (Figg 1853), although we do not know what the flint was being used for.

The arrangement of hollows and spoil, and the various trackways suggest a coherent and integrated collection of earthworks related to the post-medieval – and perhaps medieval – extraction of chalk and flint for a variety of purposes from the hilltop and hillsides, at a range of scales from local agricultural use through to larger-scale, perhaps commercial exploitation, as indicated by the larger pits and the lime kiln. The various trackways point to connections with local farms, villages, Wilmington Priory and, perhaps, the River Cuckmere. It is also likely that the earthworks represent several centuries of activity.

Placing the Long Man in time relative to this activity remains problematic as well. The recent excavations have pointed to a medieval or post-medieval date, although as noted above some of the evidence is open to other interpretations, i.e. the presence of chalk rubble in a soil horizon at the foot of the hill associated with a mid-16th century TL date could actually relate to the onset or expansion of quarrying at the top of the hill rather than the cutting of the Long Man, who as those same excavations showed wasn't a chalk cut figure to begin with. However, the dates did derive from brick fragments which may have formed part of the original outline.

The earliest documentary references to the Long Man date to the 18th century, and it is noteworthy that, discrepancies between the various sketches and accounts notwithstanding, there is a marked decline in the visible detail by the mid-19th century. Given the slight nature of his construction – turf cut at best, possibly marked with bricks – it would be difficult to argue for him being older than a few centuries, let alone millennia. The recent excavations suggest that the original outline – and consequently more finely-tuned chronological information – may no longer be archaeologically recoverable. As with the quarries, documentary research is likely to be key, with Ronald Hutton particularly pointing to a lack of knowledge about the Wilmington landscape in the 16th and 17th centuries – 'a detailed study is…urgently needed of the people who owned the hillside at Wilmington between the reigns of Henry VIII and of Anne, and of their political and social attitudes and the available range of motifs that may be related to the figure's form' (Hutton 2004). This applies, of course, to Wilmington Priory too.

CONCLUSION AND RECOMMENDATIONS FOR FURTHER WORK

The results discussed above provide an overview of the most noteworthy themes emerging from the project. The reduction in physical scope meant the project focussed on a smaller, but representative, sample of each landscape type covering the coast, river valleys and some downland.

The results from this project, and the Hampshire South Downs and Worthing-Weald projects, highlighted the potential of interpretation and mapping from aerial photographs, to National Mapping Programme standards, in recording and understanding archaeological sites and landscapes (Young 2011, Carpenter 2008). The mapping and monument records will feed directly into research and local planning in this part of East Sussex. The results should also inform strategic planning, such as the Management Plan for the South Downs National Park.

The results from the downland covered by the project demonstrated the high potential of survey using NMP standards, in the remaining areas between Beachy Head and Lewes. Completion of an NMP survey of this area would provide a transect from coast, through downland, to Weald as a comparison to the landscape analysis carried out for the Worthing-Weald project in West Sussex (Carpenter 2008). This would also provide accurate depictions and up to date interpretations of archaeological features, to aid research and local planning, and provide an opportunity for a review of known monuments, including designated sites.

The inception of the project prior to the instigation of the National Heritage Protection Plan meant there was less emphasis on review of scheduled monuments at project start-up. However, observations were made on the general preservation of all archaeological features using historic and recent aerial photographs. These details were incorporated into the monument records created for each archaeological site.

A review of Neolithic flint mines, long barrows and other associated features in the project area, as discussed above, is recommended to ensure that any scheduling descriptions reflect the results of current research and fieldwork. The long barrows within the project area highlight a wider problem with these monuments in Sussex and beyond – the lack of recent fieldwork. Analytical earthwork survey and geophysics would be a useful starting point in confirming whether they are all, in fact, Neolithic long barrows. As for the 'flint mines', while there is little support for a Neolithic origin, there is still considerable uncertainty over their date and duration, something that holds for much of the more recent extraction along the scarp of the Downs. Post-medieval remains have received little attention or protection (Barber 2003), and the Windover Hill complex offers an opportunity to analyse a coherent and long-lived 'industrial' landscape within its wider, rural, setting.

There are large areas of well preserved prehistoric or Roman field systems in the survey area. The survival of these 'Celtic fields' is increasingly rare on the South Downs, and on

the chalk downs of southern England generally. A review should examine the existing scheduled areas of field systems, for example those on Sweet Brow/Bullock Down and at East Dean, to ensure that the current extent of scheduling remains a representative sample. A further review should consider other areas of fields for potential further heritage protection outcomes, including scheduling. These include field systems at West Brow, Bullock Down, Malling Down, Saxon Down and on Windover Hill/Ewe Dean Down. Further work on the fields should target areas where there is high potential to identify settlements and to explore potential dating, such as the coincidence of round barrows and fields, as described in more detail in the main report text.

The South Downs have a strong association with medieval and post medieval sheep grazing and arable farming. Physical evidence of this is relatively scarce and is best represented in the medieval strip lynchets. Historic aerial photographs indicate a concentration of lynchets in the parish of Piddinghoe, near Newhaven. Modern aerial photographs indicate some survival of these earthworks though many are covered in trees and the exact state of survival is difficult to determine. Further work should include documentary research, condition assessment and a review of their regional and national significance. This ties in with the need for further work on chalk extraction, a fair amount of which would have been localised and small-scale and intended to go on the fields.

Further work could provide a better understanding of the flood defences in the Ouse valley. It is difficult to determine the degree of earthwork survival of embankments in The Brooks from aerial photographs alone, although the majority of those identified on 1940s aerial photographs do appear to have been levelled. Much of the Ouse was straightened in the ten years from 1791 but bypassed loops of the river remain, flanked by their embankments that may be at least 200 years old. To the south-west of Tarring Neville the old embankments do not just follow the river and appear to have subdivided the land between the bank and the water – though it is not known for what purpose. This variety in form may in part reflect the possibility that different communities may have been responsible for the embankments on either side of the river. The majority of work done to date on the drainage of this area and the improvement of the navigation of the Ouse has been documentary. There is further scope for documentary research including comparing detailed post medieval maps and plans with the physical evidence in an attempt to provide some chronology. However it is clear that the earthworks themselves are under-researched and may benefit from further work.

The study of First World War camps at Seaford (Skinner 2011 and in the report above) demonstrated the value of aerial photographs for the study of the physical remains from the Great War. They supplemented existing documentary research and provide the basis for further research and ground based work.

In the specialist literature, aerial photographs have long been appreciated as an important component of the range of resources available to the student or surveyor of 20th century military defences. However they are often overlooked or dismissed in favour of

documentary sources or fieldwork. Numerous remains were mapped in the project area dating from the Second World War and the overview in this report illustrates the potential of aerial photographs in recording ephemeral and lost remains, but also in providing a contemporary record, and contextual information for surviving remains. The mapping, interpretations and signposts to wartime photographs in the monument records form an essential resource for further study of the Second World War along this key piece of coastline.

The methods used, in each of the three NMP projects in the Park, are of relevance to planning for future historic environment management in other National Parks where NMP survey has not already taken place (Carpenter 2008, Young 2011). In future, the remaining areas of the South Downs National Park, and a contextual area, should be subject to a survey to National Mapping Programme Standards.

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