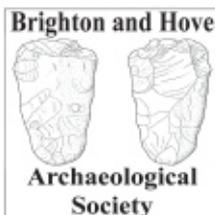


A REPORT ON THE OUTCOMES OF THE WHITEHAWK COMMUNITY
ARCHAEOLOGY PROJECT, INCLUDING A POST-EXCAVATION ASSESSMENT
AND UPDATED PROJECT DESIGN



**WHITEHAWK CAMP, MANOR HILL,
BRIGHTON, EAST SUSSEX**

**NGR: 532938 104787
(TQ 32938 04787)**

Scheduled Ancient Monument: 1010929

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COMMUNITY ARCHAEOLOGY PROJECT, INCLUDING A
POST-EXCAVATION ASSESSMENT AND UPDATED PROJECT
DESIGN**

**ASE Project No: P106
Site Code: WHC14**

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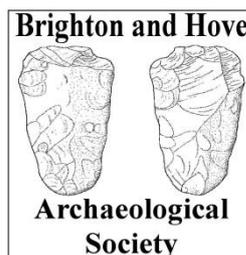
By Jon Sygrave

With contributions by Luke Barber, Trista Clifford, Anna Doherty, Hayley Forsyth, Karine Le Hégarat, Andy Maxted, Dawn Elise Mooney, Hilary Orange, Dr Paola Ponce, Don Richardson

Illustrations by Justin Russell

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**Centre for Applied
Archaeology**



Abstract

This report presents the results of the Whitehawk Camp Community Archaeology Project carried out by the Whitehawk Camp Partnership between April 2014 and July 2015. The work was generously funded by the Heritage Lottery Fund. This report details the background to the project, the methodology by which it was undertaken, the results of the archaeological fieldwork, the reassessment of the archive material, the potential and significance of the archaeological results, presents a new research agenda for the site and outlines the scope of potential future projects. This report does not detail all the project outcomes and the reader is directed to Appendix 5: An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project (Orange et al 2015) for a summary of the main results of the Project including how successful it was in engaging with target audiences, what changes to heritage, community and people the project has brought about, project legacy and future work.

The 2014-5 excavations, targeted on anomalies identified in the preceding geophysical survey (ASE 2014b), encountered a small number of features and a large unstratified finds assemblage associated with allotment gardens, the dumping of refuse and activity probably related to Brighton Racecourse dating to the 19th- 21st centuries. A small assemblage of unstratified late medieval and early post-medieval pottery may relate to limited agricultural activity on the site during these periods. A small assemblage of highly abraded unstratified prehistoric flintwork was also recovered, although no features of a prehistoric date were encountered.

The reassessment of the existing archive has allowed us to better quantify what remains from the original excavations and re-examine it to modern standards. This has provided a new 'baseline' for future research at the site and on the archive and allowed the creation of a research agenda to direct future potential projects. The report is written and structured so as to conform to the standards required of post-excavation analysis work as set out in Management of Research Projects in the Historic Environment (MoRPHE), Project Planning Notes 3 (PPN3): Archaeological Excavation (English Heritage 2008). Interim analysis of the stratigraphic, finds and environmental material has indicated a provisional chronology, and assessed the potential of the site archive to address the original research agenda, as well as assessing the significance of those findings. The research agenda and potential future project sections provide a guideline for future work but as further funding beyond the scope of this report is yet to be secured a detailed breakdown for further analysis work has not been produced at this time.

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1.0 INTRODUCTION

1.1 Scope of the Project

- 1.1.1 The Whitehawk Camp partnership, formed of the Centre for Applied Archaeology, University College London (CAA/UCL), Royal Pavilion & Museums (RPM) (part of Brighton & Hove City Council, BHCC) and Brighton and Hove Archaeological Society (BHAS), successfully applied to the Heritage Lottery Fund's (HLF) Our Heritage scheme and was awarded £99,300 to run a community archaeology project in Brighton focused on the Whitehawk Camp Scheduled Ancient Monument (Fig. 1). The project was carried out under the name, "The Whitehawk Community Archaeology Project", hereafter referred to as 'the project'.
- 1.1.2 Once informed a grant would be awarded, the partnership agreed the Terms of Reference under which it would operate and a formal contract was signed by signatories from each organization to ensure that the approved project aims would be carried out.
- 1.1.3 The project received permission to start from the HLF on 31st March 2014 and ran for c. 12 months finishing in April 2015.

1.2 Project Background

- 1.2.1 Since the early 1990s BHAS and UCL staff have worked at Whitehawk Camp and volunteered their time to raise awareness of its importance with the local community, government and business. This included commercial work monitoring impacts from development, free talks on the site, communication with Brighton Racecourse and the voluntary monitoring of the site for damage. Since 2008, tours of the site by CAA/UCL have formed a regular part of Brighton and Hove's annual 'Open Door' heritage events.
- 1.2.2 In 2009 CAA/UCL staff applied to an internal UCL fund in order to undertake a partial topographic and impact survey of the site (ASE 2009). Following this, CAA/UCL staff applied to the Beacon Bursary and received £1,500 to hold an outreach event on the site called 'Stone Age Day', in 2009. The event was staffed by volunteers from CAA/UCL, BHAS, BHCC and many others and attracted c. 700 visitors. Following the success of the event BHCC funded the completion of the topographic survey (ASE 2009) and reached agreement with English Heritage as to the installation of steel bollards along Manor Hill to prevent incursions by vehicles, a regular issue. Through the open day the project met Paul Gorringer, Park Ranger (CityParks, BHCC) responsible for the improvement of the site. The project also began to develop a plan with RPM for the reassessment of the existing archive, receiving funding from UCL for a member of CAA/UCL staff to assist RPM with an initial assessment of its condition.
- 1.2.3 In 2013 the project made contact with the BHCC team putting together the bid for UNESCO Biosphere status, which was awarded to the city in 2014. UCL became a formal Partner in the Biosphere Project and worked with BHCC to explore ways to reconnect the urban population with their surrounding downland landscape and its history. As part of

this process UCL Research Associate, Hilary Orange and the project team began a consultation process with local community groups, culminating in two workshops in March 2013 attended by c. 50 representatives from c. 20 groups. Following the consultation process the HLF bid partnership (Section 1.1.1) was formed, with CityParks, BHCC as a key delivery partner and Red Earth Environmental Arts Group delivering the Sensory Experiment (Section 3.3).

1.3 Project and Site Location

1.3.1 The project was managed from the offices of Archaeology South-East, with volunteer activities focused around two locations: Brighton Museum and Art Gallery (part of the Royal Pavilion and Museums) (hereafter referred to as RPM) and the Whitehawk Camp Scheduled Ancient Monument (No. 1010929), situated on land adjacent to Manor Hill, Brighton, East Sussex, hereafter 'the site' (centred at NGR 532938 104787) (Fig. 1).

1.3.2 RPM hosted volunteer activities associated with the re-cataloguing and packaging of the archives, the creation of a digital archive and digital game and the seminars given by the finds specialists. RPM also hosted a project run Family Archaeology Day in January 2015 at Brighton Museum and Art Gallery and a lecture on the project outcomes in March 2015. For further information, please refer to Appendix 5: *An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project* (Orange et al 2015).

1.3.3 Whitehawk Camp site is bisected by Manor Hill and the pulling up track of Brighton Racecourse and covers land owned by Brighton and Hove City Council (BHCC) and land leased by the council to Brighton Racecourse. The site was the focus for volunteer activities associated with: geophysical survey, archaeological excavation, site improvement works, allotment finds collecting, and sensory workshops. An open day was held on the site in August 2015, and throughout the project, numerous site tours were undertaken for local schools and colleges, voluntary groups and as part of the Heritage Open Days scheme. For further information, please refer to Appendix 5: *An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project* (Orange et al 2015).

1.4 Geology and Topography

1.4.1 The British Geological Survey (BGS Geology of Britain viewer <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> accessed 23/07/15) records the underlying solid geology at Whitehawk Camp as Newhaven Chalk Formation, with no superficial deposits (Fig. 2).

1.4.2 Whitehawk Camp is situated on Whitehawk Hill, the last chalk downland promontory hill before the Sussex Coastal Plain ends at Black Rock, c. 1km to the south east of the site. The site lies in the 'saddle' of the hill between the 105-120m contours and the main chalk downland block to the north and the peak of Whitehawk Hill to the south, covering an area of c. 6ha. The centre of the monument is largely flat with the land rising to the north and south and falling away to the east and west to become the steep near vertical sides of

Whitehawk Bottom and Bakers Bottom respectively. The site has commanding views of the downland dip slope hills, Brighton and Hove City Centre and the Sussex Coastal Plain to the west and Whitehawk Bottom (Whitehawk Housing Estate), Sheepcote Valley and Red Hill to the east, with oblique sea views to the south east and west.

1.5 Permissions

- 1.5.1 Prior to the submission of the grant application to HLF, permission was sought from Brighton and Hove City Council to conduct the project on their land. This was kindly granted on 27th August 2013 by the head of BHCC CityParks, Robert Walker. The project also applied for permission from English Heritage to conduct a non-invasive survey of the monument, which was kindly granted by Paul Roberts Inspector of Ancient Monuments on 28th August 2013 under reference AA/50859.
- 1.5.2 The majority of the surviving archive of finds and paper records associated with the excavations carried out in 1929, 1932-3, 1935 and 1991-3 are held by RPM. However, it was known that the archive of the Sussex Archaeological Society (SAS) also held finds, paper and photographic records relating to the site, due to its association with E. C. Curwen, who directed the 1932-3 and 1935 excavations. The project contacted the SAS and sought their permission to loan the surviving Whitehawk finds archive to RPM for the duration of the project. Permission was kindly given by the SAS Museums Officer, Emma O'Connor in April 2014. It is hoped that this loan can eventually become a permanent transfer in order that all surviving finds relating to the site can be held by a single repository, but this will be subject to further discussion between SAS and RPM. Work on the archive was carried out under the authority of RPM and SAS, who are the official repositories of the Whitehawk Camp archive.
- 1.5.3 Following the awarding of the grant, the project sought permission from Brighton Racecourse to conduct fieldwork on land they lease from BHCC, which was kindly granted in April 2014.
- 1.5.4 Prior to intrusive archaeological investigation and site improvement works a Written Scheme of Investigation (WSI) was produced (ASE 2014c) detailing the proposed works and submitted to BHCC's archaeological advisor Greg Chuter, East Sussex County Council (ESCC) and English Heritage's Inspector of Ancient Monuments, Paul Roberts. The Brighton and Hove Ranger responsible for Whitehawk Hill, Paul Gorringer, then submitted a Scheduled Ancient Monument Consent form for the site improvements works to EH and, as part of the site is under the Higher Level Stewardship Scheme, sought derogation from Natural England to allow the works to take place. Following the above communications, Greg Chuter and Paul Roberts approved the WSI on 10th July 2014, the BHCC Estates team gave permission of 15th July 2014, the Natural England Land Management Advisor, Elaine Webster gave permission on 4th August 2014 and BHCC CityParks received Scheduled Monument Consent for the site improvement works from EH on 30th July 2014 under reference S00089762.
- 1.5.5 The paucity of archaeological finds or features uncovered during the excavation meant that the original excavation areas were completed far

quicker than first envisaged. This led to the project requesting two further excavation areas be included during the second week of excavation.

1.6 Circumstances and Dates of Work

1.6.1 Table 1 details the type of work undertaken by the project, its location, the dates when it took place the lead organisation and the type of volunteer involved.

Role	Location	Dates of work	Professional or lead organisation	Volunteers/ contributors
Archaeological excavation	Whitehawk Hill	Aug 2014	CAA/UCL	BHAS, Public, CAA/UCL
Geophysical survey	Whitehawk Hill	May 2014	CAA/UCL	BHAS (Training)
Site Improvement works	Whitehawk Hill	Aug 2014	CityParks (BHCC)	Public & Brighton Racecourse
Data processing	RPM	May-Aug 2014	RPM	BHAS & Public
Packing	RPM	May-Aug 2014	RPM	BHAS & Public
Scanning	RPM	May-Dec 2014	RPM	BHAS & Public
Photography	RPM	May-Aug 2014	RPM	Public
Social history research	Various locations	May-Dec 2014	BHAS	BHAS
Allotment finds collecting	Allotments on and near to Whitehawk Hill	Apr-Oct 2014	CAA/UCL	Public & BHCC (Allotments Officer)
Digital Game	RPM	Jul 2014-Feb 2015	RPM	Public
Storydrop	RPM	Jul 2014-Feb 2015	RPM	Public
Specialist Assessment of the archive	RPM & CAA/UCL	Sept 2014- Feb 2015	CAA/UCL	CAA/UCL
Specialist Seminars to volunteers	RPM	29 th July 2014 and 13 th January 2015	CAA/UCL	CAA/UCL & RPM
Public events	Various	Jun 2014-Mar 2015	CAA/UCL & RPM	BHAS, Public, BHCC, CAA/UCL, Other Professional Archaeologists
School and Community Group Visits	Various	June 2014-June 2015	BHAS & CAA/UCL	BHAS & CAA/UCL
Interpretation Board	Various	May 2015- July 2015	BHCC & UCL	BHAS, UCL

Table 1: Circumstances and Dates of work

1.7 Stakeholders and Volunteers by Dr Hilary Orange

1.7.1 The key stakeholders of the site comprise:

- Residents - who live in estates and residential areas around Whitehawk Hill including residents of the Bristol Estate, Craven Vale, Manor Hill area and the Whitehawk Estate. The Camp is a popular place for dog walkers;
- Historic England (formerly English Heritage) - who manage the National Heritage List for England and oversee the statutory protection of the Camp;
- East Sussex County Council - who curate archaeological sites and implement government planning guidance (National Planning Policy Framework) (Department for Communities and Local Government 2012);
- Brighton and Hove City Council (BHCC) - as landowner and local council. The site is managed by the Cityparks Department and a substantial part of the archive of excavated material from the site is held by the Royal Pavilion and Museums. The Park Ranger regularly leads on guided walks around the site;
- Brighton Racecourse and visitors – Brighton Racecourse lease land from BHCC and have played a key role in promoting and assisting the project, for example during management of the site open day and site improvement works;
- Brighton and Hove Allotments Federation - who lease land from BHCC and manage allotments located on and near to Whitehawk Hill, for instance, the Walpole Road, Whitehawk Hill and Craven Vale allotments;
- Sussex Police - through their role in crime prevention and investigation, including heritage crime (wildlife and physical heritage);
- Friends of Craven Wood - a local voluntary organization who work with BHCC Cityparks to conserve woodland on the western flank of the hill;
- UCL Centre for Applied Archaeology (incorporating Archaeology South-East) and Brighton and Hove Archaeological Society – who have long-standing interests in the archaeology of the site. UCL and BHAS conducted archaeological investigations at Whitehawk Camp in 1991 and 1997. In 2001 BHAS and UCL formed a working group which resulted in the eventual emplacement of bollards to prevent vehicular access. Both organisations carry out regular public tours of the site and in 2009 carried out a large-scale public engagement event (with BHCC and other groups), funded by a UCL Beacons Public Engagement Award.

1.7.2 In developing the HLF bid a programme of public consultation was carried out by the Partnership. Two consultation workshops, held in March 2013 at Brighton Museum and Art Gallery, were attended by around 50 representatives of Brighton and Hove public and private sector organisations. Key points from the consultation exercise included: importance of access to green space; Whitehawk Estate perceived as an 'at risk' community; Whitehawk Hill's rich natural and

cultural heritage is undervalued; food projects are important to residents; the teaching of new skills and volunteering can increase well-being; and the importance of developing digital apps / technology to engage young people. Following the development of an outline plan, an online consultation was conducted in June 2013, following which, 20 groups confirmed their support for the project. The consultation programme was managed by Hilary Orange.

- 1.7.3 Residents of East Brighton formed the primary target audience (BN2 postcodes). Secondary target audiences comprised a) Brighton and Hove residents (beyond BN2 postcodes) b) temporary residents including students c) visitors / tourists d) visitors to the Royal Pavilion and Museums e) digital audiences f) existing users / stakeholders of the site and g) members of the Brighton and Hove Archaeological Society.
- 1.7.4 During project activities, public volunteers on the project (with no prior archaeological experience) were supported by volunteers with prior archaeological experience (BHAS members and professional archaeologists) through a buddying system. The project also provided BHAS members with training in geophysical survey. Volunteer activities, locations and dates of work are shown in Appendix 5: *An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project* (Orange et al 2015, Table 1). Members of the project team in HLF funded posts (Delivery team) also volunteered time outside their contracted hours.
- 1.7.5 Volunteers registered through an online registration form. Depending on the volunteer role and location public volunteers, professional archaeologists and BHAS members were managed by: Jon Sygrave (archaeological excavation and geophysical survey); Andrew Maxted (archive and digital development); Paul Gorringe (site improvement works); and Hilary Orange (outreach and events).

1.8 Organisation of the Project and Report

- 1.8.1 CAA/UCL was the lead partner organisation owing to its greater capacity to develop an application and manage financial aspects. Brighton and Hove City Council (BHCC), as majority landowner, and Brighton and Hove Archaeological Society (BHAS) co-delivered collections, fieldwork and public engagement elements of the project.
- 1.8.2 The overall project was managed by Dr Hilary Orange and Jon Sygrave, with activities at RPM run by Andrew Maxted, Curator and managed by Richard Le Saux, Senior Keeper. The involvement of the Brighton and Hove Archaeological Society was managed by their President, Don Richardson and their fieldwork coordinators John Funnell and John Skelton. The involvement of BHCC CityParks and Rangers departments was managed by Paul Gorringe, CityPark Ranger. The above mentioned individuals formed the executive committee of the project, with other individuals (see Appendix 1 - list of organisations involved in the project) helping with the organisation of specific activities.
- 1.8.3 Thematic working groups were established e.g. 'Site Improvement', 'Fieldwork' to oversee particular aspects of the Project. These working

groups were populated by the delivery team and members of the Project Partnership, stakeholders (for instance Brighton Racecourse) and volunteers.

- 1.8.4 Specialist staff at UCL-ASE and RPM supported the project and were managed by the Delivery Team and line managers at UCL-ASE and BHCC-RPM, as required. Dr Dominic Perring (Director of UCL CAA-ASE) took overall responsibility for the project. The Partnership was a non-political group composed of officers of different bodies.
- 1.8.5 This post-excavation assessment (PXA) and updated project design (UPD) has been prepared in accordance with the guidelines laid out in Management of Research Projects in the Historic Environment (MoRPHE), Project Planning Notes 3 (PPN3): Archaeological Excavation (English Heritage 2008).
- 1.8.6 The report summarises the overall results of the community engagement programme including, how successful the project has been in engaging with target audiences, what changes to heritage, community and people the project has brought about and project legacy (Appendix 5 Orange et al 2015). The report seeks to: place the results from the site within the local archaeological and historical setting; to quantify and summarise the results; specify their significance and potential, including any capacity to address the original research aims, list any new research criteria; and to lay out what further analysis work is required to enable their final dissemination, and what form the latter should take.
- 1.8.7 The report includes a summary of works undertaken by volunteers at RPM, an assessment of the survey, excavation and resulting finds and environmental samples from the current works and a reassessment of the surviving finds from the 1929, 1932-3 and 1935 excavations. The project did not reassess material from the 1991-93 archaeological investigations as this work was undertaken relatively recently and published (Russell & Rudling 1996).
- 1.8.8 Where possible the results from the current excavation have been integrated and assessed with the results from the other phases of excavation.

2.0 HISTORICAL AND ARCHAEOLOGICAL BACKGROUND by Don Richardson and Jon Sygrave

2.1 Introduction

2.1.1 This section of the report sets out the background to the general understanding of Causewayed Enclosures and the specific history of survey and investigation which has taken place at Whitehawk Camp. This report does not attempt to provide a detailed discussion as to the nature of Causewayed Enclosure sites across the British Isles. Should the reader wish to enquire further they are directed to 'Gathering Time: Dating the Early Neolithic Enclosures of Southern Britain and Ireland' (Whittle, Healy & Bayliss 2011) and 'Creating Monuments: Causewayed Enclosures in the British Isles' (Oswald, Dyer & Barber 2001).

2.1.2 Whitehawk Camp is a Neolithic Causewayed Enclosure, one of c. 80 such monuments across the British Isles (English Heritage 2011, 2), which are thought to trace their lineage back to the enclosures of the LBK (from the German: Linear Band Keramik) Neolithic communities of central and western Europe, constructed in the sixth millennium BC (Whittle et al 2011, 878). Causewayed enclosures in the British Isles appear to have a geographic focus in the southern half of present day England, although examples are noted from Ireland, Wales, Scotland and Northern England (English Heritage 2011, 2). The conclusions of a recent extensive programme of radiocarbon dating and modelling undertaken for Causewayed Enclosures and other Early British Neolithic sites (Whittle et al 2011), suggest that they also have an apparent temporal focus for their construction and use, probably commencing in the 38th millennium BC, peaking during the 37th and 36th and going out of primary use during the 33rd (Whittle et al 2011, 683). The four circuits at Whitehawk Camp are thought to have been constructed between the mid-37th and mid-36th millennium BC and remained in use between 75-260 years (ibid 226).

2.1.3 Whitehawk Camp is one of the largest and more complex Causewayed Enclosure sites. It has four definite, possibly six, circuits of ditches and banks covering a minimum 6ha area, evidence of remodelling, potential associated contemporary features, the potential to contain a rich environmental record and a large and varied assemblage of finds (RCHME 1995).

2.2 The discovery of Causewayed Enclosures and History of Archaeological Investigation at Whitehawk Camp

2.2.1 The first survey of the monument was undertaken by the Rev John Skinner, an antiquarian and archaeologist who specialised in digging barrows in Somerset, where his parish was based. However, in the early nineteenth century he started touring the South of England, recording various earthworks, including Whitehawk Camp. Skinner's sketch of Whitehawk camp is thought to show the outer two circuits of ditch and bank (Ditches 3 and 4) with causeways, but offers no detailed explanation of what they may represent (Oswald et al 2001, 12).

- 2.2.2 Further survey of the site in 1910 by Herbert Toms, curator of archaeology at Brighton Museum and founder of the Brighton and Hove Archaeology Club, is thought to have revealed a third inner circuit of ditch and bank (Ditch 2) (Whittle et al 2011, 208). However, the nature of the site and others like it was still unclear and there remained confusion as to the date and purpose of the monuments.
- 2.2.3 In November 1923 the monument was designated as a Scheduled Ancient Monument (ref: 1010929). This does not appear to have afforded as much protection for the site as was hoped and Ross Williamson comments that it was still under threat from additional allotments and construction projects in the late 1920s (Ross Williamson 1930, 59).
- 2.2.4 In 1924 Alexander Keiller commenced survey and excavations at Windmill Hill, Wiltshire (Smith 1965). Windmill Hill was to become the first detailed excavation of a causewayed enclosure and led the way in understanding the nature of these monuments (Oswald et al 2001, 15).
- 2.2.5 Site Survey and Excavation 1928/29 (Ross-Williamson, 1930) by Don Richardson (Figs 3-5)

Further to threats to the site, including its proposed levelling for football pitches, Brighton & Hove Archaeological Club (now Society) (BHAC), along with others, mounted a protest campaign and at the Autumn meeting of BHAC, held in October 1928, it was decided that the 'club' would support a limited excavation on the monument with a view to ascertain its date, physical features, and to impress upon the public the importance of the need to preserve it. It was agreed that the excavation should be supervised by E Cecil Curwen and RP Ross Williamson, who at the time was studying archaeology at Emmanuel College, Cambridge. The work was scheduled for December and January 1928-29. During the first two weeks of December, Curwen carried out a land surface survey, to be followed by a sub-surface survey. This was well before the time of geophysical methods, and he used a procedure known as 'bosing', first used by Gen. Pitt Rivers at Oakley Down, Cranborne Chase, Dorset. This involved hammering the ground with a weight and noting the sound produced. The booming sound produced from broken fill in a pit, differed from the dead note from natural ground (Curwen 1930). The procedure had been used by Curwen on the Trundle, and proved to be very successful on chalk land. The resulting plan (Fig. 4) showed that the monument was made up of four, more or less complete concentric rings, plus a possible fifth. This plan was to become the basis for all subsequent excavations, and it was not until the RCHME made a comprehensive earthwork survey in 1993 (RCHME 1995), that it was replaced. No complete geophysical survey had been carried out until one was undertaken as part of the current project.

During the first three weeks of January 1929 excavations were carried out on land to north of the monument and adjacent to the racecourse, taking in the inner and second rings, and to a less extent the third ring (Figs 3-5). The ditches proved not to be continuous but were interrupted by sections of natural chalk known as 'causeways'. The ditches were not of uniform size and varied considerably in width and

depth. Similarly, the causeways varied in width. It was the team's opinion that the ditches had not been deliberately back-filled, but had naturally silted-up with material mainly from the walls of the ditches, and the banks. Considerable amounts of pottery and struck flint were recovered and used as a basis for dating the monument. A wide range of other artefacts were collected, including human and animal bones, charcoal, and mollusc, both marine and non-marine. All were submitted to specialists, whose individual reports are incorporated in the final published excavation report. All these artefacts, together with those from the later excavations, have been subjected to re-evaluation as part of the current project.

The conclusions outlined in Curwen's report are limited. The pottery and flint confirm that the monument is Neolithic, and the author suggested a date no later than 2000BC. As to its use, the author is not forthcoming. A search was made for post-holes in the causeways which might have suggested a palisade or gateway; but none were found. The quantity of domestic pottery, animal bone and other domestic waste implied inhabitation by a large population for a comparatively short time. There was no evidence of occupation of a later period.

2.2.6 Excavation 1932-3 (Curwen, 1934) by Don Richardson (Figs 3, 6, 7, 8)

In 1932 the lessees of the racecourse applied for permission to extend the existing 'pull-up ground': this was granted subject to an archaeological excavation being carried by the Sussex Archaeological Society. The lessees' agreed to make a donation of £150 to offset costs. Cecil Curwen agreed to supervise the work with help of other local amateur archaeologists and local hired labour. The team included BC Hamilton, who was responsible for the measuring and recording, and GP Burstow, and G Holleyman; all of these were to become famous amateur field workers in Sussex, both before and after the Second World War. James Stuart was employed to carry out the excavation work.

Work commenced on the 12th December and was completed by the 21st of January and included clearing out the entire fill of the third and fourth ditches and the stripping off all the topsoil down to the bare chalk within the excavated sections (Figs 3, 6, 7, 8). The 1932-3 excavation was notable for the discovery of articulated human remains (Fig. 7), whereas only disarticulate human bone had been recovered during the previous excavation. The first skeleton was found within the third ditch close to Whitehawk Hill Road in a dark band of 'occupation' deposit, immediately below a water pipe. From the arrangement of the body it was thought to have been dumped rather than carefully being placed in the ditch. There were no grave goods other than one fossilised sea urchin. The condition of the skeleton restricted a full evaluation; however, it was thought to be a female, between 25 and 30 years old, short and lightly built. The second skeleton was also female, slightly younger, 20 to 25 years, and of similar build. This woman had been placed in a grave made from a ring of chalk blocks. The woman was closely associated with an infant, either newly born or possibly a still born baby. In this case we have 'grave goods'; two pieces of chalk pierced to take a cord, two fossils and a piece of ox bone.

In the same ditch above the burial of the woman and child were, "traces of a hearth, surrounded by a wide scatter of ashes. In close relation to the hearth were found (1) a quantity of Neolithic pottery sherds; (2) parts of two human brain-pans and three small charred fragments of human skull ...", (Curwen 1934, 111). Curwen interpreted this as evidence of cannibalism (Curwen 1934, 112) and of the squalid manner in which the people of Whitehawk lived (Curwen 1954, 75). This interpretation was reflected in headline, 'When cannibals lived in Brighton. Curious discoveries at Whitehawk', of the Brighton Herald, 16th December 1933. Given that the remains must have only just been discovered a matter of days before this headline it appears that Curwen was quick to come to this conclusion. This view is reiterated in Curwen's later book, *The Archaeology of Sussex*, with a rather visceral interpretation of life at Whitehawk

"What were these children's skulls doing around a domestic hearth unless the occupant of this piece of ditch was a cannibal? Not content, however, with living amid this filthy litter he must needs bury his young wife and her infant at the end of his little ditch, within 20 feet of his hearth." (Curwen 1954, 76).

2.2.7 Excavations 1935 (Curwen 1936) by Don Richardson (Fig.'s 3, 9, 10, 11, 12)

In 1934 a proposal was put forward to construct a new road to connect the newly built Manor Farm estate with Freshfield Road. This would cut across the centre of the monument, and therefore, as with the previous projects, permission was sought to proceed. This was duly given on condition that an excavation should be conducted by the Sussex Archaeological Society. The costs were to be borne by the Brighton Corporation. It was logical that Curwen should be appointed to carry out the work.

It is around this time that the Institute of Archaeology was being founded, with Dr (later Sir) Mortimer Wheeler playing a leading role. Wheeler advocated a more scientific and methodical approach to excavation and the need for stratigraphic recording of artefacts; this was to become known as the 'Wheeler Method'. Curwen was fortunate to obtain the services of some of Wheeler's students who brought this method to the Whitehawk excavation. The excavation report mentions specifically Miss Leslie Scott, who oversaw the day-to-day fieldwork, Miss V Seton-Williams, Mr B Sturdy and Miss CM Preston, all of whom had special responsibilities for sections of the work. Little is known of the later careers of these people except Veronica Seton-Williams, who worked alongside Wheeler on Maiden Castle, and progressed to become a leading worker in the fields of Egyptian and Mesopotamian archaeology. Wheeler maintained a keen interest in the Whitehawk excavations and visited the site on two occasions.

The work was started in October 1935 and continued for five weeks, and at its peak engaged forty people, many of whom were volunteers from the BHAC. A strip was opened across the monument, cutting all four banks and ditches twice (Figs 9, 10, 11, 12). Along the way the excavators encountered water pipes which probably supplied water from a local water cistern to the nearby housing. As was found on

previous excavations the ditches were of variable width and depth, whilst in places the eroded banks displayed holes, possibly post-holes associated with palisades. The excavations produced an assemblage of finds similar in character to the earlier excavations including two more articulated skeletons, the first a male thought to be of middle age. The skeleton was far from complete, and lacked the necessary long bones to enable an estimate to be made of his stature. All that could be said was that he was neither tall nor heavily built. The second was of a child, and based on dental evidence, was probably about seven years old. It was buried half way between the top and bottom of the ditch and had alongside a few pieces of pottery and an interesting piece of chalk covered with incised lines.

Curwen gained the impression during the work that the inner ditch had been used as a midden, and that 'occupation layers', in places, were divided by a layer of silt. This raised the question; were there two phases of occupation? Also Curwen suggested that parts of the banks were strengthened by 'concreting', this was a procedure whereby chalk-mud was included as a binder. It was noted that this method had been used on other monuments of this period, although this has yet to be proven by modern excavation techniques to be intentional and could still be caused by post-depositional processes.

2.2.8 Archaeological investigations since 1991 (Fig. 13)

Following the 1935 excavation there appears to be no recorded archaeological investigations on the site until those undertaken in 1991 (Russell and Rudling 1996). A list of archaeological investigations undertaken at Whitehawk Camp since 1991 is presented below:

- 1991a Rescue excavation of the south west tangential ditch by South-Eastern Archaeological Services (SEAS, later to become ASE) with assistance from BHAS (Rudling and Russell 1996)
- 1991b Archaeological watching brief by SEAS (1991; Rudling and Russell 1996) to record a series of six trenches opened by contractors on the site. A c. 19th bottle dump was recorded along with a series of possible undated deposits of 'chalk loam' which may relate to a prehistoric bank. No other archaeological features or finds were recovered.
- 1993a Two archaeological watching briefs by SEAS (1993) in January and July 1993 during the removal of c. 20th century chalk bunding on the north and south of the site and installation of bollards along Manor Hill. No Archaeological features or finds were recovered.
- 1993b RCHME Survey of Whitehawk Camp undertaken (RCHME 1995).
- 1993c Gradiometer and Resistivity surveys of selected areas undertaken by Geophysical Surveys Bradford (GSB) (Whittle et al 2011, 212; GSB 1993; whereabouts of digital data unknown)
- 1994 Archaeological Watching Brief by ASE during site improvement works including the removal of a recent chalk bund and installation of 84 wooden bollards. No archaeological features or finds encountered.

- 1996 Resistivity Survey undertaken by BHAS over a c. 0.1ha area. Survey identified some potential anomalies (Healy et al 2011, 212).
- 1998a Watching brief during construction of a new building and installation of services at the Whitehawk Transmitter by ASE (1998). No archaeological features or finds encountered.
- 1998b Archaeological Watching Brief by ASE (1998b) during excavation of service trench for new telecommunications cables. The trench ran along Manor Hill and then south towards the transmitter mast on Whitehawk Hill along the route of the former Whitehawk Hill road. The tops of the ditches for the first and third circuits were observed, but no indication of the second ditch or any upstanding banks associated with the ditches. Other discrete features were observed but these were interpreted as c. 19th/20th century in origin. The ditch only cut the top of the ditch fills and no archaeological finds were recovered.
- 1999a Watching brief during construction of new buildings, extension of existing buildings and installation of new services at Brighton Racecourse by ASE (1999a). Concluded in 2000, see ASE 2000 below for summary.
- 1999b Watching brief during installation of new fence around members lawn Brighton Racecourse by ASE (1999b). No archaeological features or finds encountered.
- 1999c Archaeological Watching Brief by ASE (1999c) during excavation of a pit to locate a water pipe. No archaeological features or finds recovered.
- 2000a Watching brief during construction of new buildings, extension of existing buildings and installation of new services at Brighton Racecourse by ASE (2000a and 2000b). The watching brief observed probable archaeological features in the north west of the site within and exterior to the scheduled area. In particular a c. 14.5m long stretch of probable infilled ditch which appears to relate to the proposed location of Ditch 4 in the north west of the monument as located during Curwen's boring survey of 1928 (Ross-Williamson 1930). However, the groundworks only impacted the upper fills of this potential ditch section, which were sterile of finds. Two probable worked flints and undiagnostic sherd of pottery were recovered.
- 2000b Archaeological Watching Brief by ASE (2000) during construction works at Brighton Race Course. No archaeological features or finds recovered.
- 2002a Watching brief during installation of new British Telecom ducts by ASE (ASE 2002), no archaeological features or finds encountered.
- 2002b BHAS watching brief during installation of security gate produced no archaeological features or finds. Field walking survey of immediate allotment plots produced 10 struck flint flakes (BHAS 2002)
- 2004 Watching brief during installation of service trench at Brighton Racecourse within the scheduled area by ASE (2004). No archaeological features or finds encountered.

- 2009a Archaeological Evaluation at Whitehawk Primary School undertaken by TVAS (2009), c. 200 m to the east, downslope of the site uncovered no archaeological features or finds.
- 2009b Topographic and condition survey by ASE (2009a) funded by the CAA and BHCC. Defined damage done to the monument in recent years.
- 2009c Archaeological Watching Brief by ASE (2009b) on emergency water pipe replacement works. Possible archaeological feature encountered but trench too narrow to confirm. No archaeological finds recovered.
- 2010a Archaeological Watching Brief by ASE (2010) during the removal of an unauthorised earth bund, the removal of 57 oak posts, the erection of 107 new bollards and the relocation of a gateway. No archaeological features or finds encountered.
- 2010b A resistivity survey and archaeological evaluation to the immediate north of the monument (CBAS 2010).

The archaeological investigations since 1991 catalogue the amount of minor development and site alterations which have occurred in recent years. Although the site has been protected as a Scheduled Ancient Monument since 1923 it is highly probable that the rise in archaeological work on the site during this period (associated with development) is linked to the advent of Planning Policy Guidance 16: Archaeology and Planning in November 1990 (PPG16). Map evidence and a lack of recorded archaeological work on the site for the period 1935 to 1991 indicate that even development worthy of recording by the Ordnance Survey was occurring within the Scheduled Area without archaeological mitigation. An example of this is the construction of the stable blocks in the north west of the site, see Section 2.4.5.1 for a detailed discussion. It is therefore highly likely that other lesser impacts also occurred to the monument during this period.

The RCHME survey of the site in 1993 (RCHME 1995) noted a number of potential features not previously identified on the site. These included: two potential additional circuits (2a and 3a) which abutted the west side of Ditch's II and III (Fig. 3); an external bank to the south of Ditch II; a possible long barrow to the north of, and respected by Ditch II. The survey also concludes, 'that there are clearly several episodes of deposition and recutting in the ditches' (RCHME 1995), although the recutting is yet to be conclusively proved.

2.3 HER Data (Fig. 14)

2.3.1 Following discussion with the East Sussex County Archaeologist it was agreed that a 10km radius HER search be undertaken, centred on Whitehawk Camp, for contemporary Early Neolithic sites and spot finds. The search returned 220 records, each of which was checked for its validity. The following records were removed:

- Multiple records associated with a single site
- Records which are presently undated and could relate to later periods, including undated crouch burials

- Later Neolithic sites ie Beaker
- Records associated with landscape features (i.e. cross dyke's, lynchets, trackways) which lack accurate dating evidence

2.3.2 This process reduced the total number of records to 120, which broke down into the following categories:

Causewayed Enclosures	2
Possible Causewayed Enclosure	1
Possible Long Barrows	8
Sites with Early Neolithic Pits	7
Other possible Early Neolithic sites	2
Unstratified worked flint spot finds	100

The sites and spot finds are presented in Fig. 14 (number on Fig. 14 given as (#) in text below) and the HER details listed in Appendix 2.

2.3.3 The two definite Causewayed enclosures (1, 2) (Whitehawk - MES174 and Offham - MES1516) were recorded along with a possible third enclosure (3) (Cockroost Hill - MES1112) situated on downland to the north of Mile Oak, Brighton & Hove. The possible enclosure at Cockroost Hill was postulated on the basis of aerial photographic transcription, carried out by the RCHME in 1997 as part of the Industry and Enclosure in the Neolithic Project (http://www.pastscape.org/events.aspx?a=0&hob_id=618570&criteria=sussex%20hampshire&search=any&pnt=y accessed on 07-07-15).

2.3.4 None of the sites or surviving archives of the eight possible Long Barrows within the study area have been investigated to modern standards or have been accurately dated. However, it is known from studies elsewhere (Whittle et al 2011, 13-15) that long barrows were a typical monument type of the Early Neolithic. Of the possible long barrow sites in the study area two were poorly excavated in the 19th century and remain extant but mutilated (7,8) (The Camels Humps - MES1599; Money Burgh MES1841); three were destroyed in the 19th century (4,6,9) (Beacon Hill MES230; Surrenden Road MES301; Preston Drove MES302); two have been ploughed out or much reduced (11,5) (Beacon Hill MES1; Plumpton Plain; MES1873); and one (1) (Whitehawk Camp MES174) is largely speculation on the basis of a bend in the alignment of the second circuit of Whitehawk Camp (RCHME 1995). As has been stated elsewhere (Whittle et al 2011) not much can be said with any certainty as to the presence and nature of Early Neolithic barrows in Sussex due to a dearth of accurately dated sites excavated to modern standards.

2.3.5 Sites recorded as having Neolithic pits are important as they indicate some of the few additional locations where stratified Neolithic deposits have been recorded. These sites range from a single pit containing a fragment of polished axe, such as at Saxonbury (12) (MES1748), to the extensive series of pits recorded at Peacehaven Watewater Treatment Works (15) (MES18927) which contained an extensive assemblage of pottery, worked flint and charred plant remains (Hart 2015).

2.3.6 Two other possible Neolithic sites include the stone circle of pudding stones (19) (MES177) reportedly removed from St Nicholas' Church (although there is no accurate record of this) and the possible Neolithic flint mine shaft at Falmer (20), although lack of finds or secure dating suggest this is more likely to be a natural or later feature (Garland and Anderson-Whymark 2016, 20).

2.3.7 As is to be expected, by far the largest number of records relate to unstratified flint tools, flakes and debitage thought to date from the Neolithic period. It is of note that nearly a third of the records are of axe roughouts or polished axes. Presumably this is because these are easily recognisable Neolithic forms and represent a bias in the data. For a fuller discussion as to issues involved in analysing un-stratified flint work assemblages in Sussex please refer to Gardiner (1988).

2.4 Historic Map Regression

2.4.1 1st Edition Ordnance Survey (1876) (Fig. 15)

The 1st Edition OS shows Whitehawk Camp on the north east periphery of Brighton in the Park Ward. East Park Road (now Freshfield Road) has been constructed from Kemp Town up to the north west boundary of the monument. Whitehawk Hill road also rises from Kemptown and meets the southern boundary of the monument before becoming a footpath. A circular feature present just to the north west of the monument may represent a dew pond given its form and the fact that there appears to be no account of a similar archaeological feature in records from the period. Small unnamed roads are shown in Bakers Bottom and Whitehawk Bottom lined with enclosures and small buildings and probably represent a series of small holdings. The racecourse is shown to extend into the north western quarter of the monument with a Grand Stand and paddock roughly where the present day main stand is situated. To the north of the site, opposite the racecourse, lies the Brighton Workhouse, which occupies the eastern half of the site of the present day County Hospital. The area of Whitehawk Camp, the racecourse and the slope of Whitehawk Bottom carries a symbol for grassland, suggesting that it remained downland in contrast to land given over to farming activities.

2.4.2 1st Revision Ordnance Survey (1898) (Fig. 16)

The 1st Revision shows the rapid expansion of Brighton's suburbs with the construction of residential housing in the southern half of Baker's Bottom, to the north of Queens Park and between Elm Grove and Queens Park Road. The character of the enclosed land between these areas and Whitehawk Camp also appears to have changed with the majority being given over to allotment gardens and the majority of small enclosures (presumed small holdings) disappearing. Allotments border the monument to the south and west but do not encroach past the earthworks. East Park Road has been renamed Freshfield Road and a road appears to have been cut through the monument linking it with Whitehawk Hill Road. Freshfield Road now extends to the north between the Racecourse and the Brighton Workhouse to meet Elm Grove.

2.4.3 2nd Revision (1911) (Fig. 17)

By the 2nd Revision, more residential housing can be seen to the north of Queens Park and the allotment gardens surrounding the site have become more established, with possibly more land being given over to them in the south. No further development has occurred in Bakers Bottom and no development is yet to occur on the southern flanks of Whitehawk Hill leaving the Manor House still in open land.

2.4.4 3rd Revision (1931) (Fig. 18)

By 1931 residential development has infilled the area between Freshfield Road, Queens Park Road and Elm Grove, with further residential properties constructed on the eastern side of Freshfield Road. More detail has been added to Whitehawk Camp in the form of a 3rd bank added to the monuments interior. This probably was due to Curwen's survey of the monument in 1928 (Ross Williamson 1930). Whilst not clear, it would appear that by this period allotment gardens have been extended over the south eastern quarter of the monument and an enclosure established bordering the east of Whitehawk Hill Road as it crosses the monument. The results of the present geophysical survey suggest that water pipes were also probably installed across the south quarter of the monument during this period to provide water to the gardens (ASE 2014b). Residential development can just be seen encroaching to the south of Whitehawk Bottom and to the east of Manor House. The paddock to the south of the main racecourse stand also appears to have been extended south over the monument and an area to the south of the present day Manor Hill in the north west of the monument appears to have been enclosed as allotment gardens and the earthworks in this area flattened.

2.4.5 National Grid (1953) (Fig. 19)

Following the archaeological excavations in 1932-3 and 1935 (Curwen 1934 and 1936) Manor Hill and the race course pulling up track were both constructed through the monument. Manor Hill linked Freshfield Road with the new residential developments on the south eastern flank of Whitehawk Hill and Whitehawk Bottom. The 1930s saw a huge rise in residential development in East Brighton and by 1937 around 1,200 homes had been constructed in the Whitehawk area (Bangs 2004, 103). A series of piggeries can also be seen to have been built in the south eastern quarter of the monument, possibly moved from elsewhere by the increase in residential housing. The map also shows further encroachment into the scheduled area of the monument by the racecourse. In the north western quarter of the monument a series of stable blocks have been constructed and in the north of the monument an area of land to the east of the race track has been enclosed.

2.4.6 National Grid (1961) (Fig 20)

In 1959 the Whitehawk Hill transmitting station was constructed to the south of the monument by the BBC to transmit television signals to the surrounding area. The transmitter is thought to have been constructed on the site of a former WWII radar station, although no evidence is present on available civilian mapping. In the mid1950s the Craven Vale

estate was constructed in the north of Bakers Bottom and further residential development occurred on the southern flanks of Whitehawk Hill. The area of allotments in the north west of the monument to the south of Manor hill appears to have been cleared and levelled by this point, taking on a similar appearance to how it looks today as a compound to the racecourse.

2.4.7 National Grid (1980) (Fig. 21)

Further residential development can be seen to the east of Whitehawk Hill Road.

2.4.8 National Grid (1991) (Fig. 22)

By 1991 the St John the Baptist Catholic Primary School has been constructed to the west of Whitehawk Hill Road and further residential development can also be seen infilling areas to the east. The map also marks the construction of a new denser housing layout in the Whitehawk Estate, following the demolition and redesign of the area.

2.4.9 Present day

The present map shows the construction of The Causeway and Monument Way residential streets to the immediate west of the monument in the mid 1990s following archaeological investigation by South Eastern Archaeological Services (UCL) (Rudling and Russell 1996).

2.4.10 Discussion

The historic map regression charts the gradual spread of Brighton, the development of residential housing and changing landuse. It marks key points when damage occurred to the site and the manner in which it has been divided by various impacts. Key dates, as evidenced by historic mapping, which have affected the monument, are as follows:

Late 18 th - 19 th Century	Development of the racecourse and construction of the pulling up track into the northwest corner of the monument
By 1898	Whitehawk Hill Road is extended through the monument and allotments are developed up to the perimeter of its earthworks
1911-31	Allotments have extended over the south east quarter of the monument and in its northwest. The Racecourse has extended its paddock south into the monument. Water main constructed through the monument as observed during later excavations (Curwen 1935, 61)
1931-53	Construction of Manor Hill and an extension to the racecourse pulling up track through the centre of the monument. A series of stable blocks are

	constructed and an area enclosed in the north of the Scheduled Monument.
1953-61	The allotments in the north west of the monument are levelled and the area terraced, later used by the racecourse as a compound. Construction of the transmitter, to which later services will be run through the monument.
1961-91	Further encroachment by residential housing on the southern flank of Whitehawk Hill.
1991-Present	Construction of The Causeway and Monument Way residential development immediately adjacent to the monument.

3.0 METHODOLOGY

3.1 Outreach and Evaluation by Dr Hilary Orange

3.1.1 Community outreach management and administration

Prior to submission of the bid, community consultation workshops were held at BHCC-RPM in March 2013. The workshops were structured around the 'Nominal Group Technique' (Boddy 2012) which is a decision making process that can be used in groups of different sizes where participants do not know each other and where everyone's opinions need to be taken into account. The workshops were attended by 50 representatives of cross-sector Brighton groups (see Orange 2013). Follow-up consultation with participants was conducted through an online survey in June 2013 (response rate 34%). In addition, BHCC City Parks completed a public consultation on the future management of Whitehawk Hill Local Nature Reserve in 2012 (c. 300 responses, 30% response rate). Through these consultation exercises 17 Brighton groups committed support to the project. Other stakeholder organisations were targeted and engaged with during delivery stages.

Volunteer task descriptions were created for each discrete activity (see Table 1) and volunteer positions were advertised to public volunteers from May to August 2014. Volunteers registered online through a form on the Project website (<http://www.ucl.ac.uk/caa/whitehawk-hlf>). A database of potential volunteers was managed by Hilary Orange.

Personal information collected through the registration process was stored on a safe and secure server at UCL. Other paper based records containing personal information were collected by RPM (insurance, photographic permissions and equalities data) and by UCL (photographic permissions, / medical information relating to conditions that could affect volunteer wellbeing during excavation). As this data contained sensitive data, files were placed on restricted access and all paper based records were kept in secure lockable furniture at RPM and UCL. In addition, personal information on skilled volunteers was held separately by BHAS as part of their membership data. Personal data will be destroyed by RPM and UCL 18 months after Project end. With permission volunteer names and email addresses will be transferred to a mailing list for future event notifications.

Volunteers were required to attend formal induction sessions and health and safety briefings at RPM (for digital / archive tasks) and Whitehawk Hill (for geophysics / fieldwork).

Volunteer and staff hours were collated on a monthly basis by the Delivery Team and information kept on a safe and secure server at UCL.

Email communication between the Project Team and volunteers was managed by the Delivery Team. All emails have been saved on secure servers at BHCC-RPM and UCL as part of the project archive.

Media and publicity including press releases, event news and project updates were managed by the UCL and RPM delivery teams in

conjunction with the BHCC Press Office. Project news was distributed through the Project website and social media, and through Partner and community organisations. Media articles were archived on the Project website.

The Project is curated on the UCL Impact Curation Database (<http://www.ucl.ac.uk/impact/support>). The UCL Research Impact Curation & Support team monitors and supports impacts emerging from excellent research at UCL.

3.1.2 Community outreach programme

An outreach programme to schools and community venues ran from June 2014 to March 2015. The programme was managed by Hilary Orange and delivered by the Project team working with volunteers and members of community groups and organisations. All schools and colleges (private and state), residents and tenant's associations, libraries and community centres in East Brighton were contacted by email and offered talks, handling sessions and workshops. The school outreach programme was tailored to fit the particular age, learning needs and interests of the school group. A prehistoric handling collection and a number of activity sheets were developed.

The Project attended a number of Brighton festivals and public events in June and July 2014 and ran stalls, displays and activities. A site open day was organised in August 2014 and in January 2015 a Family Archaeology Day was held at RPM (managed by Andrew Maxted, Fiona Redford and Hilary Orange).

3.1.3 Digital outreach

Digital outreach was managed by Hilary Orange (UCL) and Andrew Maxted (RPM).

A Project website (<http://www.ucl.ac.uk/caa/whitehawk-hlf>) located on a UCL server was curated during the lifespan of the Project and included pages on a) Project team b) News and Events c) Media Archive d) Recommended Reading e) About Whitehawk Camp. UCL will curate the website as a Project Legacy.

Project specific social media platforms were curated during the project lifetime including Twitter (@DigWhitehawk); Facebook (Whitehawk Camp Community Archaeology Facebook Group) and Tumblr (<http://digwhitehawk.tumblr.com/>). In addition, Project content was written by Andrew Maxted and Bloggers-in-Residence for the RPM Tumblr platform (<http://brightonmuseums.tumblr.com/>).

3.1.4 Project evaluation

Project evaluation and feedback was managed by Hilary Orange. Project evaluation procedures were written by Hilary Orange, set out in an evaluation document - 'Project Team Evaluation Pack' (May 2014) and agreed by the Project team. These procedures adopted formative and summative assessment and followed guidance from the HLF (2012), the New Economics Foundation (2009)

<http://www.proveit.org.uk/>), Museum, Libraries and Archive Council (2008 <http://www.inspiringlearningforall.gov.uk/>) and UCL (2013 <http://www.ucl.ac.uk/public-engagement/evaluation/toolkits/methods>). The aim of the evaluation was to:

- bring together all of the evidence to tell the project's story;
- to compare the project's initial aims with its outcomes
- to look beyond the 'easy-to-count' by showing how the project changed things, communities and people
- to provide recommendations for future work with the community

Evaluation evidence comprised both statistical and qualitative data as shown in Table 2 below:

Statistical evidence
Number of participants in project's approved purposes
Demographic data (age, gender, etc.) of public and skilled volunteers who took part in project activities
Project team hours: paid and volunteer hours
Social media / web statistics & analytics
Numbers of staff who were employed
Increase in number of people involved as ongoing volunteers / members in partner organisations and community groups
Evidence that demonstrates the extent to which the project has reached its target audience, through registration
Volunteer hours on the project (skilled and public volunteers)
Qualitative evidence
Change to the condition of the monument before the site improvement works had commenced
Change to the condition of the archive before works commence
Names of community groups who participate in the project
Evidence of participants' experiences recorded through an online survey, film and digital images (see Appendix 5 Orange et al 2015, 3.1.20)
Selection of comments from social media platforms
Media articles and blog posts on the project
Reviews and uptake of digital game and Storydrop
Formative and summative assessment by Project team (through monthly project evaluation forms)
Email feedback from volunteers, organisations and activity leads who had taken part in outreach events
Comments from visitors to outreach events (in a visitor's book).

Table 2: Types of evaluation evidence collected

Online survey of project volunteers (carried out mid-Project (November 2014) and at Project end (Mar 2015). Survey carried out on Smart Survey platform. Response rate 54%. Survey data (semi anonymised) kept on a safe and secure server at UCL;

Project evaluation outputs are detailed in Appendix 5: An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project (Orange et al 2015).

3.2 RPM based activities

3.2.1 Following the recruitment of volunteers as described in Section 3.1.1 those activities based at RPM were run by Andrew Maxted, Curator and managed by Richard Le Saux, Senior Keeper.

3.2.2 Repackaging and cataloguing the archive

The existing accession data from paper records, records on original packaging and records inked onto finds was examined and then digitally inputted via RPM's MIMSY data management software to create a new database of all objects within the collection. The original packaging was retained and objects were placed in new appropriate containers and bags with new labels. Volunteers were trained in object handling and data entry and supervised by RPM staff.

3.2.3 Digital Archive Development

Photographs, illustrations, plans and reports relating to the original excavations in the 1920's and 1930's were scanned using the Museum's book scanner and then cropped where necessary in Adobe Photoshop. The images were then renamed and saved onto an external hard-drive or on a PC before the final images were uploaded to the Museum's 'Image Bank' so that they can then be made available via the Museum's website. Volunteers were trained in the above processes and supervised by RPM staff.

3.2.4 Story Drop Development

Volunteers were asked to pick up to 8 important objects from across the Whitehawk site to illustrate a digital 'treasure hunt'. The volunteers worked closely together in the selection of the objects and wrote text to explain the importance of those objects in terms of the overall Whitehawk 'story'. The images and text were then used by a digital specialist to create a Whitehawk 'Story Drop' for the Museum: <http://brightonmuseums.org.uk/discover/play/>. The Story Drop Application can be downloaded to a mobile device and can be played as a geolocation game, with the user physically visiting monuments across the city to gain points whilst learning of their significance and history.

3.2.5 Digital Game Development

RPM staff worked with volunteers, local schools and a professional developer to produce an online game using the Whitehawk site and finds to explore the nature of early Neolithic societies. The game is aimed at the 6 years+ age group and can be accessed at <http://brightonmuseums.org.uk/discover/play/>.

3.3 Sensory Experiment

3.3.1 The project provided specific funding to Red Earth arts group as part of their Borderlands project, a site specific film project across the neglected Neolithic landscape of Whitehawk Camp. Funding from the

project allowed Red Earth to provide a series of onsite interdisciplinary workshops and sensory experiments, as detailed below:

- On-site interdisciplinary workshops: flint-knapping, spear making and throwing, temporary installation work constructed from greenwood/found materials, on-site specialist talks and demonstrations.
- Sensory, site-based experimental work including dawn/dusk exercises, soundscape experimentation (voice, instrument, spoken word), film work.

3.3.2 All fieldwork will be recorded as audio/visual raw material for the final BORDERLAND film, a link to which will be provided via the project website in due course.

3.4 Geophysical Survey (Fig. 23)

3.4.1 A fluxgate gradiometer (magnetometry) survey of the site was undertaken between Monday 28th April and Friday 2nd May 2014. BHAS volunteers were trained in the recovery of data from the field and in its processing by ASE staff, and received certificates of attainment on completion. The results of the geophysical survey informed the siting of eight of the ten excavation trenches, which were targeted on geophysical anomalies with the potential to be archaeological features. Please refer to the Geophysical Survey Report (ASE 2014b) for full details on the methodology and results.

3.5 Archaeological Excavation (Fig. 23)

3.5.1 The archaeological excavation comprised of ten trenches: Trench 1 (5m by 30m), Trench 10 (c. 10m by 10m), Trench 9 (1m wide by 28m long), trenches 4 and 5 (1.5m by 8m) and trenches 2, 6, 7 and 8 (2m by 5m) and trench 3 (2m by 4m). All trenches were positioned outside of the scheduled area, with trenches 1 - 8 targeted upon geophysical anomalies recorded during the preceding magnetometer survey.

3.5.2 The trenches 1, 2, 3, 4, 5, 6, 7 and 8 were accurately laid out using a GPS survey system to target geophysical anomalies identified by the preceding Magnetometer Survey. Trenches 9 and 10 were set out by hand. Following excavation each trench was then resurveyed using a GPS survey system and tied in to the National Grid.

3.5.3 The trenches were scanned prior to excavation by a suitably trained member of ASE staff using a CAT. Trenches 1, 10, 4 and 5 were deturfed by machine and trenches 4 and 5 were also mechanically excavated to archaeological horizon, under archaeological supervision. The other trenches were deturfed by hand, with a suitable mechanical excavator (360° excavator) equipped with a toothless ditching bucket employed in the larger areas.

3.5.4 Only undifferentiated topsoil, subsoil and overburden of recent origin were removed by machine, or through hand excavation. The excavation preceded in c. 100mm spits to the top of the first significant

archaeological horizon or the top of the underlying 'natural' deposit. Care was taken throughout the mechanical excavation to observe for in situ flint work scatters.

3.5.5 None of the trenches exceeded c. 0.7m in depth. All machining was undertaken under the supervision of a suitably qualified archaeologist.

3.5.6 On conclusion of the excavation, the spoil was backfilled by machine, in appropriate sequence, spread evenly and compacted to ensure a surface flush or nearly flush with the ground surface. The original surface was not reinstated (i.e. re-turfed).

3.6 Volunteer assistance during the excavation

3.6.1 Up to 22 community volunteers, per day, took part in the archaeological excavation. A minimum of half of these were experienced members of the Brighton and Hove Archaeological Society or professional ASE staff. This meant that at least 50% of the site staff at any time comprised professional archaeologists and experienced amateurs.

3.6.2 All volunteers received a Health and Safety briefing covering the site Risk and Method Statement prior to starting work, were given the opportunity to query what was discussed and then asked to sign the document as understood.

3.6.3 All volunteers then received a talk covering the archaeological background of the site, the reason for the fieldwork and the method by which the excavation would proceed. Unexperienced volunteers were interspersed with professionals and experienced amateurs in a 'buddy' system.

3.6.4 Archaeological features were only excavated by suitably experienced professional or archaeologically experienced volunteers with unexperienced volunteers on a 1:1 basis. This provided a worthwhile training and learning experience for those volunteering, whilst safe guarding archaeological features associated with a nationally important monument.

3.7 Archaeological Watching Brief (Fig. 24)

3.7.1 The watching brief was carried out by a suitably qualified archaeologist on all intrusive site improvement works as detailed in the preceding WSI (ASE 2014c) and Section 3.9 below.

3.7.2 All machines used for removal of material above undisturbed natural geology were fitted with a toothless bucket of appropriate width. All excavations undertaken by groundwork contractors were undertaken with due regard for the potential to encounter archaeological remains.

3.7.3 The spoil from the excavations was inspected by a suitably qualified archaeologist to recover artefacts or ecofacts of archaeological interest and scanned with a metal detector.

3.7.4 The EH and ESCC Archaeologists were kept informed of progress so that they could monitor the archaeological work.

3.8 Excavation and Watching Brief Recording Techniques

- 3.8.1 All exposed archaeological features and deposits were cleaned by hand, planned and recorded. All discrete cut features were half sectioned, drawn, planned and recorded and then 100% excavated. All features were planned at the scale of 1:20 in relation to the trench outline. Further plans at the scale of 1:20 and sections at the scale of 1:10 were drawn as necessary. Plans were be drawn on plastic film. A digital photographic record was kept of all trenches and features. Site levels were recorded for trenches and features by mean of a GPS Survey system in relation to Ordnance datum.
- 3.8.2 All archaeological features and deposits were recorded using the standard context record sheets used by Archaeology South-East. A metal detector was used to scan all excavated material and features in advance of and during their excavation, however the volume of 20th century metalwork on site meant that this became unworkable apart from on individual features.
- 3.8.3 The ESCC Archaeologist and EH Inspector of Ancient Monuments were kept informed of the progress of the excavation.
- 3.8.4 No human remains were uncovered during the work.
- 3.8.5 No finds were encountered which potentially fall within the statutory definition of Treasure, as defined by the Treasure Act 1996 (amended 2003).

3.9 Site Improvement Works

- 3.9.1 The site improvement works comprised of five activities: the collection of litter and fly tipped material; the repair and replacement of existing fences; installation of new fencing and gates; removal of a c. 70m long earth bund from the centre north of the monument, placed there in the late 20th century; and the replanting of native species on trench scars following the end of the excavation. All of these activities were led by Brighton Rangers, Cityparks, BHCC and volunteer groups under their supervision.
- 3.9.2 Litter and fly tipped material was collected by hand along the line of the earth bund in the centre of the monument prior to its removal, to prevent mixing with the spoil or dispersal.
- 3.9.3 The existing rusting fences and wooden stop barricade around the pulling up track were removed and a new wire stock fence was installed.
- 3.9.4 Prior to the removal of the c. 70m long earth bund from the central north of the monument the bund and working area of the machine was fenced off from the public footpath and signage erected, warning the public to stay out of the area. The bund was removed in c. 100mm spits by a 13T tracked machine equipped with 1.8m smooth edged ditching bucket and the material transported via dump truck c. 300m to the north outside the scheduled area to a point agreed with the Brighton

Rangers, acting on behalf of Cityparks, BHCC. Greg Chuter, ESCC and Paul Roberts, EH were also informed. The bund was reduced to present ground level.

- 3.9.5 Following the completion of the excavation trenches and the removal of earth bund from the north of the monument, volunteers, supervised by the Brighton Rangers, replanted the areas with native plants grown from seeds gathered from Whitehawk Hill and the surrounding area.
- 3.9.6 A series of new fence and gate posts were installed to replace the dilapidated wooden barrier at the southern end of the pulling track and to run east west across the green swath to the north east of the monument (Fig. 24). The works all lay outside of the Scheduled Monument Area and involved the emplacement of posts c. 300mm in diameter to depth of c. 600mm. An Archaeological Watching Brief was maintained during the works but no archaeological features or finds were recorded.
- 3.9.7 Four new bollards were also installed to the north and south of Mill Hill to fully secure the monument from vehicular access (Fig. 24). An Archaeological Watching Brief was maintained during the works but no archaeological features or finds were recorded.

4.0 HLF APPROVED PURPOSES AND RESEARCH AIMS

4.1 Introduction

4.1.1 The project aims were set out in the preceding grant application to the HLF as defined as the 'Approved Purposes' in the HLF 'Permission to Start' letter:

HLF Approved Purposes

- Undertake a programme of excavations at the monument, which will involve local volunteers.
- Work to catalogue and reassess the finds from past excavations
- Carry out surveys and conservation work to the monument
- Deliver a series of outreach events on the theme of "Food and People"
- Deliver training sessions for the volunteers in archive, survey and excavation techniques, which will result in certificates of Attainment
- Create Interpretation through a digital app and archive

4.1.2 Specific aims and objectives were developed to address the HLF Approved Purposes and the requirements of the various consultees to the work, namely Brighton and Hove City Council, Historic England and Natural England.

4.2 Specific aims of the outreach programme

- The overall aim of the Project was to promote a 'forgotten' site of national importance and to better manage heritage through greater community involvement. In particular, to provide a springboard for membership of archaeology / ecology groups and generating interest in the wider Biosphere project. In addition, greater community commitment will support BHCC in its challenge to improve management of this SAM, to better manage the Whitehawk Nature Reserve, and develop its continuing role engaging with communities.

Further aims included:

- To provide better interpretation and explanation of Whitehawk Camp and its collection including the development of a variety of digital and non-digital outputs for different audiences. These will help East Brighton to develop a better understanding of the significance of Whitehawk Camp within British prehistory;
- To generate a new, and more positive, sense of place;
- To help people to engage with the heritage in fun and exciting ways;
- To develop a more secure future for the Partners through the creation and development of links with the community and the development of staff skills.

4.3 Specific Aims of the Geophysical Survey (ASE 2014a and 2014b):

- The general aim of this programme of field investigation was to obtain a better understanding of the archaeological potential of the site in relation to previous surveys and fieldwork. In particular, the survey hoped to better define the extent and character of the monument to inform an updated assessment of the site and aid its future management.
- The other specific aim of this project was to train members of the BHAS in the operation of a Bartington Grad 601-2 Fluxgate Gradiometer, the processing of the data derived from survey and the archaeological interpretation of said data. The objective of this training was to provide BHAS with additional transferable skills which will aid the survey and management of other archaeological sites.

4.4 Specific Aims of the Archaeological Excavation and Site Improvement Works (ASE 2014c):

- Inform and train community volunteers in how an archaeological excavation is undertaken
- better our understanding of Whitehawk Causewayed Enclosure and its associated features to facilitate its protection and management
- Establish whether geophysical anomalies noted in the geophysical survey were archaeological features and if so their character and date
- Inform community volunteers and the wider population as to the value of Whitehawk Causewayed Enclosure and how its study can lead to a better understanding of our own lives
- Improve the quality of the land and associated furniture (fencing etc) to facilitate the ongoing management of the site and the betterment of the adjacent area for the local population

The excavation aims were also informed by two of the 'Unanswered research questions for the southern British enclosures' section of the Gathering Time publication (Whittle et al 2011, 917), namely:

- Are there yet further circuits, perhaps corresponding to the fifth and sixth ditches observed by Curwen?
- What is the date of the north south row of pits or ditch segments on the race course to the south of the circuits, and does it relate to the complex.

4.5 Specific Aims of the Archive and Assessment Work

- Inform and train community volunteers in how an archaeology archive is conserved and maintained
- Work to catalogue and reassess the finds from past excavations
- Create Interpretation through a digital app and archive

5.0 RESULTS OF THE 2014-5 PROJECT

5.1 Community Outreach

5.1.1 Please refer to Appendix 5: *An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project* (Orange et al 2015) for a detailed quantitative and qualitative breakdown as to how the project engaged with target audiences, brought about changes to heritage, community and people and its legacy and future work. Table 3 below provides a summary of the projects results in these areas. Since the evaluation report has been produced, the project also created and installed a new interpretation board for the site, which was jointly funded by the project and BHCC.

Outcomes for heritage	<ul style="list-style-type: none"> • The Whitehawk archive has been catalogued, made more accessible and is up to modern museum standards • A Geolocation Story Drop App, On-line Digital game and Digital Archive have been developed • Material held in other collections has been identified • The Whitehawk archive has undergone specialist assessment which will greatly benefit future research and scholarship • Significant improvements have been to the condition of the monument and site resulting in the return of sheep grazing to Whitehawk Hill • A technical report has been written which details the results of the geophysical survey, outreach, fieldwork and archival reassessment • Allotment finds have been donated to the Booth Museum of Natural History
Outcomes for people	<ul style="list-style-type: none"> • 136 people volunteered on the Project • They gave 3,578 hours of volunteer time • 70% of volunteers had not been involved in a heritage project before • 88% of volunteers came from the Brighton area • 88% of volunteers enjoyed volunteering • 93% said that they had learnt about their local area / heritage • 56% had more pride in their local area / heritage • 61% had learnt new skills • c. 700 people visited our site open day and 1883 people visited our 'Family Archaeology Day' at Brighton Museum & Art Gallery
Outcomes for communities	<ul style="list-style-type: none"> • An outreach programme toured 8 schools and colleges and 8 community centres, residents' associations and libraries, engaging approximately 770 people. • The Project has motivated Brighton & Hove Archaeological Society to develop its own outreach programme • The Project has supported community initiatives, leading to successful grant outcomes • The Partnership now has new and improved relationships with numerous Brighton-wide community groups and organisations, in particular, Brighton Racecourse, Friends of Craven Wood, Craven Vale Community Association and Wyld Service.

Table 3: Community Outreach Project Results

5.2 Archaeological Stratigraphic Results from WHC14 (Figs 23 and 26-32)

5.2.1 The community excavation on the site carried out in August 2014 recorded a limited number of archaeological features, all of which are likely to relate to the later 19th and 20th century use of the site as allotment gardens and racecourse. For this reason, no post-excavation analysis was necessary beyond the use of spot dates to confirm the date of features. Where necessary individual contexts are referred to by trench and context number i.e. pit [4/7] was recorded in trench 4. The contents of the stratigraphic archive are presented in Table 4 below.

Type	Description	Quantity
Context sheets	Individual context sheets	44
Section sheets	A1 Multi-context permatrace sheets 1:10	1
Plans	Multi-context DWG plans	1
	A1 permatrace sheets 1:20 or 1: 50	1
Photos	Digital images	69
Environmental sample sheets	Individual sample sheets	1
Context register	Context register sheets	2
Environmental sample register	Environmental sample register sheets	1
Photographic register	Photograph register sheets	2
Drawing register	Section register sheets	1
Trench Sheets	Trench record sheets	10

Table 4: Site archive quantification table

5.2.2 A county wide policy of selection and retention of archaeological finds is currently under review by the Sussex Archaeological Museum Group working party. Once the policy is agreed and in place, it will be implemented by Archaeology South East. The finds archive will be revised in accordance with this policy in the event that it is implemented before deposition of the archive occurs.

5.2.3 The location of the archaeological excavation trenches was determined on the basis of geophysical anomalies identified by the preceding geophysical survey (ASE 2014b) as described in the Written Scheme of Investigation for the fieldwork (ASE 2014c). The geophysical survey report (ASE 2014c) should be referred to for a detailed discussion of the survey results.

5.2.4 Natural Deposits

Excavations in all parts of the site revealed a typical stratigraphic sequence of 0.20m - 0.50m of top and subsoil overlying Chalk Bedrock (Newhaven Chalk Formation).

The surface of the chalk had weathered to a varying degree across the hill and at least two of the trenches (Trenches 1 and 6) revealed the presence of erosion channels or fissures in the surface of the chalk where chalk had begun to dissolve or fracture. These channels or

fissures typically ran with the direction of slope and presumably were created or developed by water run-off down slope.

The largest of these channels or fissures was observed in Trench 1 running east west down slope. The majority of this natural feature consisted of a line of dissolved or fractured chalk, with a small percentage of clean subsoil which had been drawn into the feature with the movement of ground water. The southern section of the feature contained a reddish brown clay-with-flints deposit. No clay-with-flints deposits are shown on the BGS survey for Whitehawk Hill, but its presence is not unsurprising given that 'Red Hill' c. 2km to the west is shown on BGS mapping to have a large deposit of clay-with-flints sealing Newhaven Chalk.

The observed channels or fissures appear to directly relate to many of the geophysical anomalies identified in the preceding magnetometer survey, on which many of the excavation trenches were targeted.

5.2.5 Residual Material

Prehistoric

One small piece of abraded pottery and 144 pieces of highly abraded struck flint were recovered from the top and sub soil deposits of the 10 trenches and from within two later post medieval features in Trenches 4 and 5.

There was no apparent spatial pattern to the residual prehistoric material and it all bore the appearance of having been reworked either by activity associated with the allotment gardens, previous agricultural activity or geological processes.

Medieval and early post-medieval

A single abraded sherd of medieval and 12 abraded sherds of early post-medieval pottery recovered from top and sub soil deposits in Trenches 1, 3, 9 and 10 suggest possible manuring of the southern half of the site during these periods. However, this is a meagre assemblage and it suggests there was either a low level of agricultural/horticultural activity during this period or that the material was introduced to the site via later activity associated with the allotment gardens.

Post-medieval

The vast majority of the finds from the recent excavations were recovered from the top and sub soil of trenches in the southern half of the site and dated to the later 19th to 20th century. The finds relate to the use of the southern half of the site for allotment gardens from the 19th century.

5.2.6 Archaeological features

Southern Trenches

A total of 15 cut features were recorded in Trenches 4, 5, 7 and 10, the majority of which (10) were discrete postholes and pits containing 20th century material in the north east of Trench 10. The features in Trench 10 could possibly relate to the former radar station known to have been sited on Whitehawk Hill, but no distinct WWII material was recovered from them and it is more likely that they relate to features within former allotment gardens. A series of possible stakeholes was recorded in Trench 7, but these were undated and in an area of former allotment gardens. It was concluded that all of the features probably relate to the later 19th century and 20th century use of the site as allotment gardens.

Northern Trenches

In the north of the site, three pieces of residual prehistoric struck flint were recovered from a pit [7/4] within Trench 4, dated to the 20th century by later finds, which lay adjacent to a small undated ditch [4/4]. A single piece of struck flint was recovered from a pit [4/5] in Trench 5 adjacent to an undated posthole [6/5]. All of these features lay adjacent to the present racecourse in an area thought to have former structures associated with the racecourse. It was concluded that all of the features probably relate to the later 18th- 21st century, most likely 20th century, use of the site as a racecourse.

5.3 Finds and Environmental Assessments

5.3.1 The community excavation recovered a large assemblage of finds from the site, the vast majority of which do not relate to the Neolithic Enclosure and were 19th- 21st century in date. As a result, the whole assemblage was rapidly scanned. Finds derived from stratified contexts are quantified in Table 5 below and other notable finds from the top and subsoil are quantified or referenced in the specialist reports (Sections 5.4 - 5.12). For a full list of the contexts described below please refer to Appendix 3.

Context	Material	No	Weight	Comments and Date
4/005	Clay Pipe	7	11	1750-1900+ Stems inc. developed mouthpiece
4/005	LPM pot	4	40	1890-1930
4/005	PM tile	1	20	Peg. Late
4/005	Mortar	1	39	Coarse buff sandy concrete
4/005	Metal	1		Beer bottle cap; 21st century
4/005	Lead	1		Fishing weight; 21st century
4/006	PM brick	1	4	Late
4/006	Mortar	2	4	Sandy
4/006	Stone	3	9	All Welsh slate
4/006	Clay Pipe	1	1	1750-1900+ Stem
4/006	Worked flint	3	40	One flake with proximal end absent, one plain platform, one with platform preparation. moderate to heavy damage
5/005	Worked flint	1	8	Plain platform with heavy damage
10/007	Iron	1		20th century nail - not kept
10/013	PM brick	1	570	Late C18th - 19th

10/013	Slag	5	44	Clinker
10/015	PM brick	2	579	C19th Paver
10/015	Mortar	1	73	Grey cement with coarse pebbles
10/022	Glass	Multiple		20th century glass fragments
10/024	Iron	1		Corroded iron

Table 5: Finds from features excavated as part of WHC14

The following sections present a brief summary of the different types of material recovered.

5.4 Prehistoric Pottery by Luke Barber

- 5.4.1 A single abraded bodysherd of flint tempered pottery (9g) was recovered from the subsoil in Trench 10.

5.5 Post-Roman Pottery by Luke Barber

- 5.5.1 With the exception of the single prehistoric sherd, all of the pottery is of post-Roman date and as such is separated from the Neolithic activity by a considerable period of time. Three periods are represented.
- 5.5.2 The earliest pottery consists of a single 5g sherd from a 13th- to early 14th- century cooking pot with tapering club rim. The fabric, tempered with medium sand and sparse white flint, is of a Ringmer type (context [1/002]). The sherd, which has notable abrasion, suggests a little limited arable cultivation/manuring at this time.
- 5.5.3 There are 12 sherds (100g) of Early Post-medieval pottery amongst the assemblage. Virtually all are heavily abraded and, at 8.3g, have a small average sherd weight. The most common fabrics are the local red earthenwares, usually with a dull green glaze ([3/002] x2, [9/001], [9/002], [1/002] x 3), that are likely to represent mid 16th- to early 18th- century activity. The only other wares are of early/mid 18th- century non-local types – two pieces of tin-glazed ware from London ([3/002] and [1/002]) and two sherds of Staffordshire white salt-glazed stoneware (contexts [10/001] a plate and [1/002] a vessel with scratch blue decoration). Although meagre, the small assemblage of Early post-medieval sherds suggests a manuring during arable cultivation episodes may have been higher during the 17th to mid 18th century than ever before.
- 5.5.4 The vast majority of the pottery from the excavations is of the Late Post-medieval period (1162 sherds weighing 6209g). The assemblage is very fragmented (average sherd weight of just 5.3g) and much is notably abraded. As such it has clearly been subjected to repeated reworking. Although there are one or two sherds of late 18th- to early 19th- century creamware and pearlware these are probably old vessels still in use in the later 19th or early 20th centuries. Certainly the vast majority of the Late Post-medieval assemblage can be placed comfortably between 1890/1900 and 1920/30. The material is generally representative of a fairly typical low-status domestic assemblage and includes kitchen and table wares. However, many sherds are not diagnostic of form due to their small size. Kitchen wares include local

glazed red earthenwares (large bowls in particular), Midlands slipware (bowls), Yellow ware, English stoneware (usually Bristol-glazed transfer-printed ginger beer bottles and ribbed preserve jars). Table and tea wares include Rockingham-type black-glazed wares (teapots), various transfer-printed whitewares (a wide range of plates, bowls, cups and saucers with late-style patterns and floral designs), plain refined whitewares (including plates and preserve jars) and English porcelain (a range of plates, cups and saucers of low quality). Of note are a couple of sherds of late Chinese porcelain with overglaze polychrome decoration that show some of the households contributing to the assemblage had a few exotic pieces (e.g. Trench 12 had a saucer). This is balanced by the presence of a plate fragment from context [10/001] that carries the establishment's name ('Gold..., Brighton' around a yellow cross) from which it was obviously removed. The largest and freshest pieces of Late Post-medieval pottery are the unglazed earthenware flower pots sherds, which are notable also for their quantities (they were found in most contexts). The density of Late post-medieval pottery varies across the investigated area but in areas was notably high (e.g. contexts [10/001] and [10/002] produced 186 and 126 sherds respectively, while [9/001] produced 224 sherds). The quantities involved, the fragmented and abraded nature of the domestic assemblage and the presence of significant numbers of horticultural wares, strongly suggest this material has been deposited during allotment gardening in the early 20th century.

5.6 Flintwork by Karine Le Hégarat

5.6.1 The community excavations produced 144 pieces of struck flint weighing 1554g and 33 fragments (682g) of unworked burnt flint. The pieces of struck flint were quantified by piece count and weight. They were individually examined and classified using standard set of codes and morphological descriptions. Basic technological details as well as further information regarding the condition of the artefacts were recorded. Dating was attempted when possible. All data have been entered onto a Microsoft Excel spreadsheet, and it is summarized by artefact types in Table 6.

Context	Flake	Blade-like flake *	Core	Retouchd form	Totals
1/001 & 1/002	74	6	1	1	82
2/001	1	1	-	-	2
3/002	7	1	-	-	8
4/002	4	1	-	1	6
5/002	1	-	-	-	1
6/002	1	-	-	-	1
7/002	1	-	-	-	1
8/002	2	-	-	-	2
9/001 & 9/002	17	1	-	2	20
10/001	10	-	-	-	10

U/S (Spoil heap)	7	-	-	-	7
4/006	3	-	-	-	3
5/005	1	-	-	-	1
Totals	129	10	1	4	144

Table 6: The flintwork (* includes core preparation blade-like flakes)

5.6.2 The flintwork was principally recovered from topsoil and subsoil contexts and from the spoil heap. A further four pieces came from contexts [4/006] and [5/005] that represent two features likely to be modern. The condition of the flint assemblage was very poor, and this is probably the result of successive re-depositions. Extensive weathering is expected in topsoil and subsoil deposits, especially when the site has been used for allotments. Rust marks associated with agricultural activities were recorded on 35 pieces, and may indicate previous ploughing activities. Fifty one pieces were broken. More flints were recorded in Trench 1, but this might simply be due to the volunteer's capacity to recognise worked flints. Furthermore soil is often imported in gardens/allotments, and the origin the flints remain unclear. The assemblage is likely to represent surface finds reminiscent of prehistoric activities in the area, but some may also have been brought onto the site.

5.6.3 The assemblage of struck flints is largely composed of unmodified pieces of flint débitage, including 129 flakes and 10 blade-like flakes. The flakes are irregular and mostly small. The majority display plain or cortical platforms with very few signs of edge preparation. The clear dominance of flakes indicates a flake-based industry often associated with later Neolithic technology (or post Neolithic technology). The lack of bladelets and blades, and the overall low number of blade-like flakes sets aside this assemblage from the flint assemblage from the archived collection. The assemblage feels different. Nonetheless occasional pieces suggest a careful reduction strategy such as the core / face edge rejuvenation blade-like flake from [4/002]. Retouched pieces were uncommon. Two retouched flakes ([9/001] and [9/002]) and an end scraper ([4/002]) are not closely datable. The flint assemblage may mostly be contemporary with the use of the causewayed enclosure. But it is in fact difficult to compare both assemblages because the archived flint collection (from the early excavations) doesn't comprise the total of flints encountered on site, nor does it represent the total of flints recovered and examined.

5.6.4 Overall, the flint assemblage is likely to be related to the prehistoric occupation of the site. However, no diagnostic tools were recovered, and with no pieces that can be closely dated on technological and typological grounds, the contemporaneity of the material with the use of the causewayed enclosure is uncertain. Several flints could post-date the use of the monument; some may even have recently been imported to the site.

5.7 The Clay Tobacco Pipes by Luke Barber

5.7.1 The excavations recovered 72 fragments of clay pipe, weighing 119g. The material is spread thinly across the whole area investigated, the largest single context group consisting of just nine pieces (15g) from

context [9/001]. Virtually all fragments consist of abraded pieces of stem of c. 1750-1900+ date. Given the few closer datable pieces and the associated ceramics a date right at the end of this range is probable for most of the pipes – as such they would sit comfortably at the end of the 19th and very beginning of the 20th centuries (c. 1880 to 1920 probably). Bowl fragments are few in number, but include part of one in the form of a barrel (context [9/001]) and one moulded stem (like a drain-pipe) from [2/001].

5.8 The Ceramic Building Material by Luke Barber

5.8.1 The excavations recovered some 200 pieces of brick, weighing 4488g, from across the investigated area. The vast majority of this material consists of well-formed medium to well-fired red bricks of mid-18th- to 19th- century type. These are essentially tempered with sparse fine sand and sparse/common iron oxides to 2mm, occasionally with some marl streaking. Very few full dimensions are present – most consist of badly broken amorphous pieces with a notable degree of abrasion. Exceptions include fragments of two pavers: a 46mm thick example from [9/001] and a 110mm wide by 32mm thick example from [10/015] and a 66mm thick building brick from [10/013]. Other brick types include a couple of London-type yellow stock bricks from [9/001] and a scatter of pieces with granular 20th- century fabrics.

5.8.2 The 117 pieces (2143g) of tile from the site are mainly of 19th- to early 20th- century peg tiles. These are often slightly poorly formed and frequently hard/over-fired. Tempering consists of sparse fine sand, often with sparse to common iron oxides to 1mm. In addition there are a few machine-pressed tiles in very fine fabrics of the early 20th century. There is also a scatter of wall and floor tiles in refined whiteware and stoneware, all of which are of late 19th- to mid-20th- century date. There is also part of a black-glazed ridge tile from this latter deposit.

5.9 The Mortar by Luke Barber

5.9.1 The 61 pieces of mortar and concrete from the site (2428g) are all of types that can be placed in a later 19th- to mid-20th- century date range. There are a variety of sandy mortars, most of which appear to use cement as their binding agent. These are mainly from brickwork pointing and internal/external renders. In addition there are a number of coarser concrete fragments from floor/yard surfaces.

5.10 The Slag by Luke Barber

5.10.1 Twenty-eight pieces of slag (432g) were recovered during the excavations. All of this material consists of 19th- to early 20th- century waste generated by burning coal. The assemblage includes coke, clinker and coal-generated fuel ash slag. The material can be seen as domestic waste, discarded alongside the ceramic refuse from the same households.

5.11 The Geological Material by Luke Barber

5.11.1 The excavations recovered 153 pieces of stone, weighing 1632g, from the site. The vast majority of this consists of small pieces of unburnt

coal and fragments of Welsh roofing slates. Context [9/001] also produced two pieces of possible medieval West Country slate, but considering the other 27 pieces from this deposit were all Welsh this is not certain. The coal and Welsh slate would all be in keeping with late 19th- to early 20th- century activity suggested by the pottery. Other stone types include a scatter of pieces of igneous aggregate (e.g. a piece of granite from [2/001]), parts of a 17mm thick white marble table-top (451g) from [2/002] and a fragment from an oval-sectioned Midlands sandstone hone from [10/001]. All of these types are in keeping with the late 19th- to early 20th- century date suggested by the other artefact classes. Interestingly there is a complete absence of Sarsen sandstone, Tertiary ferruginous sandstone and quartzite pebbles – the most common types used at the site during the Neolithic.

5.12 Other Materials by Luke Barber

5.12.1 The excavations recovered a number of other finds that do not comfortably fit into the other material categories. These include three pieces (20g) of asbestos sheeting, both plain and corrugated (the latter in [10/001]), four pieces (5g) from white ceramic gas mantles (e.g. 1/002), the graphite centre from a battery (context [9/001]), a fragment of unglazed earthenware marble ([1/002]) and a 95g piece of asphalt ([1/002]), two pieces of pressed fibre tile/drain (context [7/002]). All relate to the late 19th- to mid-20th- century activity indicated by the ceramics.

5.12.2 The assemblage is not considered to hold any potential for further analysis.

5.13 Environmental Samples

5.13.1 A sample was taken from context [10/005], however, finds recovered from this context showed it to be 20th century in origin and therefore it was not processed.

6.0 REASSESSMENT OF EXISTING ARCHIVE MATERIAL

6.1 The present state of the archive, missing artefacts and location of material

- 6.1.1 The majority of the archives from the three excavations which took place in 1928/9, 1932/3 and 1935 were deposited with the Brighton Museum and Art Gallery (RPM) and the Sussex Archaeological Society (SAS), shortly after the publication of the sites. However, due to the partial nature of both the quantification record presented in the publications and original accession paperwork, it is impossible to say whether all of the finds, environmental samples, paper and photographic archive were deposited with these two institutions, whether some material was discarded prior to deposition and/or whether some material was donated to other institutions.
- 6.1.2 The publication texts state that the material was sent for analysis to a variety of specialists and institutions, but it is unclear as to whether all of the material was returned or whether some was retained. Of the three excavation reports only the 1929 publication refers directly to the institutions to which some of the specialists belonged - flint implements to Mr Reginald Smith at the British Museum, animal bones to Professor D.M.S. Watson, London University and charcoal to Mr J. Cecil Maby, Imperial Forestry Institute.
- 6.1.3 Recent discussions with a member of the HLF funded Chilterns Box Woodland project (<http://www.chilternsaonb.org/box.html> accessed 29th July 2015) who is researching the origins of the Box tree, suggest that the Imperial Forestry Institute retained some charcoal samples from the site.
- 6.1.4 Some key finds are known to be missing, such as the articulated roe deer skeleton recovered during the 1932-3 excavation. The bones of the deer were studied by J. Wilfred Jackson, probably at Manchester Museum where he had a post, but what happened to them next is unclear. Recent discussions suggest that the roe deer may now be kept at the Natural History Museum, although this is yet to be confirmed.
- 6.1.5 The original paper site archive from the 1920s and 30s excavations is largely missing, aside from a partial account of the 1935 excavations in EC Curwen's field notebook (held by Brighton Museum and Art Gallery). It is possible that field notes made by students of Mortimer Wheeler during the 1935 excavation are within the Wheeler archive held by the Institute for Archaeology, UCL, however given this archive is substantial and not fully catalogued this could not be determined as part of the present project.
- 6.1.6 A larger paper and photographic archive of site images and contemporary notes and newspaper articles does survive and is kept by RPM and SAS. This archive includes: the drawings which were produced for the publications (held by RPM and SAS); a typed account of the 1932-3 excavations with photographs by Holleyman (kept by the SAS and available via the RPM digital archive); and EC Curwen's magic lantern slide show of 85 glass plates (kept by the SAS and available via the RPM digital archive).

- 6.1.7 In order to provide an estimate of what has been lost, each of the specialists involved in the reassessment have attempted to state how representative the current archive is of what was originally excavated. Apart from notable exceptions, it would appear that the majority of missing artefacts probably relate to undiagnostic pottery body sherds, flint debitage and animal bone, which may have been discarded at the time or been dispersed to other individuals or institutions through unrecorded gifts.
- 6.1.8 Notable finds described in the original publications, which were accessioned by RPM but are now missing from the archive are shown in Appendix 4.

6.2 Reassessment of the Stratigraphic Archive by Jon Sygrave

6.2.1 Previous excavation recording techniques

As mentioned above, the original paper and plan archive created on site is largely missing. The publications are therefore the only means of assessing the stratigraphic relationships recorded.

As was common in the period, the 1928/9 and 1932/3 excavations were dug by cutting and spit. 'Cutting' describes the area and 'Spit' the depth. Spits were arbitrarily excavated in either 9" or 10" steps down into the ditches and did not respect deposit types/context. It seems to have been common to excavate alternate cuttings in the first instance to provide sections through the ditches, which were then drawn to show the various fills and deposits, sometimes with dotted lines to demarcate spits (Ross Williamson 1930, 62). Specific spits were described, for example, by Ditch IV, Cutting III, Spit 4 and abbreviated to 'DIV, CIII, 4', which was then marked on the majority of finds.

The 1935 excavation was recorded differently. This was partly due to the long thin shape of the excavation covering the impact area of the proposed Manor Hill road and partly due to the assistance of a number of Dr Mortimer Wheeler's students who were using 'Dr Wheeler's Technique'. Rather than open areas in cuttings the site was split into Sites A (the eastern half) and B (the western half) and deposits were recorded and excavated separately, rather than in arbitrary spits. The fills of the ditches were abbreviated similarly as before but prefixed by the area and minus the cutting ie A-DIII 1 or Area A, Ditch 3, Context 1.

Discrete features, such as pits, postholes and stakeholes were recorded as 'Holes' (Curwen 1934, 106), with fills emptied as single contexts in the 1928-9 and 1932-3 excavations and as multiple contexts in the 1935 excavation.

The system of recording by cutting and spit allowed for the preservation of the broad stratigraphic relationship of finds from within the ditch fills, but prevented finds being allocated to a specific context or precisely located within the cutting. All of the reports (Ross Williamson 1930; Curwen 1934; Curwen 1936) state that the majority of Neolithic finds came from a 'Black Mould' deposit within the ditch circuits (Fig.5) (Ross Williamson 1930, 62;).

6.2.2 Specific stratigraphic findings from the previous excavations (Figs 3-12)

The 1920s and 30s excavations concluded that banks appeared to have been constructed on the interior of each ditch (Ross Williamson 1930, 57), formed of chalk rubble excavated from the ditches. This is evidenced from several of the section drawings which show chalk rubble tip lines originating from the centre of the monument (*ibid* 62, Plate III), (Figs 5, 7, 8, 10, 12); Curwen 1935, Fig. C, Site A, Ditch I; Fig. C, Site A, Ditch III; Fig. E, Site B, Ditch IV). However, the 1993 RCHME survey of the site noted a potential external bank to Ditch II in the south and potential semi-circular external banks to Ditches II and III to the west and south west (Fig. 3; RCHME 1995; Whittle et al 2011, 209-10).

Evidence that the banks were constructed inside the ditches and the perceived 'dog leg' in the northern extent of Ditch II, support the notion that the causewayed enclosure is respecting an early earthwork which lies to the immediate north of Ditch II, postulated to be a long mound (Fig. 3; RCHME 1995). However, if there are external banks to the south and west of Ditches II and III (circuits 2A and 3A Fig. 3) this could suggest that this was part of a more complex pattern of bank placement or a later reworking of the site. Interpretation of the earthworks on site is greatly hampered by the general erosion, truncation and placement of material on the site known to have occurred over the last c. 150 years (see Section 2).

During the 1935 excavation Curwen concluded that the few sections of the surviving bank suggested that, in the footprint of the bank at least, the top and sub soil had been stripped prior to construction (Rampart inside Ditches III & IV: Curwen 1936, 66 & 74), although the only section drawing to show this relates to the bank associated with Ditch III excavated in 1929 (Fig. 5; Ross Williamson 1930, 62) and there is no accompanying discussion. This could conceivably have provided a more solid footing for the bank directly on chalk bedrock or represent the wholesale removal of overburden across the monument. Curwen believed that the rubble construction of the internal banks had been concreted by 'grouting the rubble with chalk mud' (Curwen 1936, 66 & 74).

In a few areas there appears to be evidence of a 'pallisade' comprising of postholes through surviving bank material on the inside of the ditches. These include part of the eastern extent of Ditch I (Fig. 10; Curwen 1936, Fig. A, 62; Plate II, 64; & 63), Ditch III (*ibid* 67) and Ditch IV (*ibid* 68). A number of those inside Ditches III and IV are described as 'negative casts' within concreted bank material (Fig. 11; *ibid* 67 & 68). Curwen also concludes that the presence of two postholes inside the western extent of Ditch III also denote a palisade which blocked a causeway (Fig. 12; Curwen 1936, 72). The idea of an associated palisade appears to have been introduced during the 1935 excavation season, as a series of three postholes (Holes 15, 16 and 17) parallel to and inside of Ditch III, excavated in 1932-3 are described as simply belonging to the 'Neolithic system' (Fig 7; Curwen 1934, 106). No evidence of associated timber structures was recorded during the 1928-9 excavation (Ross Williamson 1930, 87). Whilst it seems likely that

there were some timber structures associated with the monument, see discussion on entrance ways in below paragraph, the extent to which the banks had an associated palisade or timber revetment is at present unclear.

Whilst it was thought that not all causeways between ditch sections denoted respective gaps in the bank (Curwen 1934, 102 & 105), there is evidence to suggest that some were definite entrance ways. A relatively narrow entrance, Causeway 1, in the southern extent of Ditch III, which appears to be denoted with two large postholes (Holes 10 and 11) and further postholes (1, 2, 3, 7) which formed a passage through the internal bank had created a hollow through use (Fig. 7; *ibid*). Due to poor sunlight the excavator took a photograph of these features by moonlight with a c. 1hr exposure! (*ibid*). Another entrance way was identified in the north west of Ditch I where a gap of 70' was noted between ditches with no evidence of an internal bank or palisade (Fig 9; Curwen 1936, 70). It may be of note that Skeleton III was recovered directly opposite this entrance way (Fig 9; *ibid*). A further entrance way was postulated through the western extent of Ditch IV, denoted by a line of four postholes on its southern flank (Fig.'s 9 and 12; Curwen 1936, 74). Although, the northern extent of this had been truncated by a water main and the construction of a stable block (*ibid*).

The ditches, and the causeways between them, were highly irregular in width and depth (Ross Williamson 1930, 61; Curwen 1934, 102), although Curwen notes that Ditch II was cut in a more regular fashion than Ditch IV (Curwen 1934, 107). Ditch IV was recorded as being 'surprisingly smaller' in its eastern extent than was observed in the south (Figs 8 and 12; Curwen 1936, 68). This may support the notion that there was an earlier shallower version of some of the ditches (see below Section 6.2.2). Conversely the western extent of Ditch III was c. 8' deep and described as a 'formidable obstacle' (Curwen 1936, 71).

There was no evidence that the ditches were 'artificially infilled' (Ross Williamson 1930, 61). The basal fill consisted of chalk rubble derived from the adjacent bank or weathered from the ditch sides, sealed by a deposit of 'black mould' or midden material, which contained the majority of the finds, in turn sealed by a natural accumulation of silt and a turf layer (Fig. 5; Ross Williamson 1930, 61; Curwen 1934, 102-3) apart from Ditch III where the turf line was apparently absent (Curwen 1934, 107). Finds within the 'black mould' appeared jumbled with portions of the same or similar pots at all levels (Ross Williamson 1930, 61). Curwen seems to have believed that the people of the Camp were living in the ditch cuts, at the same time as depositing midden material and burying their dead (Curwen 1934, 107). He also notes the presence of a number of skull fragments in Ditch III, three of which he describes as charred (although no charred human remains were noted in the present archive see Section 6.7) and suggests that these are indicative of cannibalism (*ibid* 112). Curwen appears to have a jaundiced view of the people who inhabited Whitehawk Camp, exemplified by his subsequent comments in his book on the Archaeology of Sussex (1954) see Section 2.2.6.

Excavations on the Ditch IV in 1932-3 suggested that there could have been an earlier shallower ditch on the same alignment, which was later

re cut as two butt ending ditches forming a causeway (Curwen 1934, 102). This section of Ditch IV also contained Hole 5 and the remains of the roe deer (ibid). However, this area is close to the south western tangential ditch, now thought to be a later Bronze Age addition (Whittle et al 2011) and the shallow ditch may have related to this feature. An earlier shallow ditch was also postulated for Ditch III extending into Causeway II (Curwen 1934, 107). This could denote an early version of the ditch, but the stratigraphic and dating evidence is not clear.

The 1935 excavation recorded evidence of possible fifth and sixth ditches to the south east of the monument but these do not appear to have been planned and were only evidenced as sections within the road cut and appear to have no associated finds (Curwen 1936, 69). Curwen suggests these could relate to another tangential ditch heading off to the south east supposedly drawn by the Rev. Skinner in 1821 (Oswald et al 2001, 12), but they could equally relate to later features not associated with the monument.

Curwen notes that, 'no specific occupation layer', occurred in the southern part of the 4th ditch and only 13 sherds of Neolithic pottery were recovered from the c. 100' which was opened in 1932-3 season (1934, 104). The eastern extent of Ditch IV excavated in 1935 also contained no pottery (Curwen 1936, 68). The 140' of Ditch III which was excavated in 1932-3 contained 'a fair quantity' of pottery, but significantly less than what was recovered during the 1928-9 excavation (ibid 111-2). Curwen describes the difference in terms of pottery generated by man days excavation with the same amount of pottery generated in 1928-9 in 8 man days as was generated during the 1932-3 excavation in 252 (ibid 111), a ratio of c. 1:31. Ditch III also produced little in the way of flintwork with only 64 flakes recovered from the 140' of ditch opened, although it did produce the first Sussex examples of 'antler combs' from C VIII (ibid 112).

6.2.3 Stratigraphic descriptions of the burials (see Section 6.7 for a detailed assessment of the skeletal material):

Sk I Skeleton I (Fig. 7) lay semi prone on its left side with its head facing north west, possibly buried with a fossilised sea urchin. Curwen says that the body was buried within the ditch fill and not within a perceivable cut (Curwen 1934, 108). However it is unclear as to whether it lay on the surface of the primary chalk rubble infill or properly within the 'black mould'. As with the majority of human bones from the site there is no indication of the bones being exposed at the time of burial and no evidence of scavenging marks left by animals (Section 6.7).

Sk II Skeleton II (Fig. 7) was semi prone on its right side with the head facing south, possibly buried with two fossilised sea urchins, two perforated pieces of chalk and an ox radius (Curwen 1934, 110). It was surrounded by chalk blocks and the spits immediately below it produced perforated chalk blocks (Curwen 1934, 108). Curiously the end of the opposing section of Ditch III across Causeway II, also contains a purposively placed line of chalk blocks but no associated burial (ibid Plate XIV & 107). Curwen believes the space between the chalk blocks had been infilled

with material and that the burial was contemporary with the infilling of midden material (ibid). Again it is difficult to tell as to the stratigraphic relationship with the skeleton and the midden material, although there does seem to have been some secondary infilling of the ditch prior to burial. Presumably if the ditch had been open for a few years/seasons prior to the burial then material could have accumulated prior to burial. A lot has been discussed as to the differential treatment of these two women (SK's I and II) and whether Sk II was of a higher status than Sk I, due to the slightly higher number of potential grave goods and presence of the chalk block markers. Status may not necessarily relate to her membership of an elite rather it could be explained by her and her child's possible death in childbirth.

Sk III Skeleton III (Fig. 9) was recovered between the 1st and 2nd ditches opposite the presumed entrance of the 1st circuit (Curwen 1936, 70) during the 1935 excavation. It was recorded in a 'contracted attitude' head to the east facing north with hands in front of his face on the surface of the chalk bedrock and not within any perceived cut. It has been suggested (Healy et al 2011, 222) that this burial could have been buried under an internal bank to Ditch II in this area and that is why it managed to survive articulated without any perceivable grave cut. If this were the case then there is possibility that other burials were placed within or under the associated banks. Could these have eroded out to produce the disarticulated remains recovered from the ditches?

Sk IV Sk IV (Fig. 12) was recovered from the base of Pit 51, beneath a piece of chalk cut with incised lines (Curwen 1936, 73). It was curled up with the head facing south and limbs to the east. Curwen suggests that the hole was particularly deep and narrow and that the burial may have had a greater purpose than simply to inter the body, and could have been associated with an upstanding post in a similar manner to interments at the base of some standing stones (ibid).

6.2.4 Phasing the monument

Shallow and irregular sections of Ditches III and IV (Fig.'s 7 and 8) led Curwen to suggest that these represented the original shallower ditches, which were later recut with deeper ditch sections (1934, 102 & 107). These could have been similar to the shallow section of Ditch IV recorded in Site A during the 1935 excavations (Curwen 1936, 68). If correct the recutting and/or remodelling of the ditches would suggest a more complex history of the site's development. However, the ditches encountered on the site proved to be highly irregular in nature and the stratigraphic evidence available is not of sufficient quality to be able to determine whether these were recuts or simply highly irregular but contemporary ditch cuts. One possible recut is discernible in the published sections (Ditch III, Fig. 12), but this is impossible to verify and is not referred to in the text. Previous speculation (Drewett 1994, 19; Mercer 1990 57-8; Russell and Rudling 1996) over the phasing of the monument has proved to be unsupported by a recent c14 dating programme on the site, which concluded that it would be misleading to

try and infer an order of the construction of circuits at the site due to restrictions on sample availability (Whittle et al 2011, 226).

The RCHME survey undertaken on the site in 1993 (Fig. 3) proposed a number of additional phases to the monument including: a potential long barrow in the north of the monument which was respected during the construction of Ditch II (RCHME 1995); additional banks and/or circuits (2a and 3a) in the south western quarter of the monument which may have partitioned the space between the circuits in this area or be a restructuring of the monument (RCHME 1995; Whittle et al 2011, 209); and that the significant width of Ditch IV to the north west could be due to an amendment of its route by recutting (RCHME 1995; Whittle et al 2011, 209). However, we know (Section 2) that there has been significant disturbance to the site and these features, and the potential chronology they represent, remain untested.

The tangential ditch to the south west of the monument (Rudling and Russell 1996) has been convincingly shown through stratigraphic, c14 dating and environmental data to be a later, probably Bronze Age, addition to the monument (Whittle et al 2011, 226; Oswald et al 2001 142-3).

6.2.5 Determining the percentage of the site excavated

In order to make an estimate as to the percentage of the site which has been excavated, the plan of the ditches, as surveyed by Curwen using the bosing technique in 1928 (Ross Williamson 1930), was imported and rectified within ArcGIS and each of the ditch segments traced and a resultant .shp file created. This was only attempted for the four main ditch circuits proven by excavation. The ditches were projected through the areas of soft or disturbed ground where the bosing survey was not possible. Whilst Curwen's bosing survey may seem archaic to modern standards a comparison between the 1928 survey (Ross Williamson 1930, 58) and the subsequent phases of excavation (Curwen 1934 Plate XII; Curwen 1936, Plate 1) shows it was broadly accurate in determining the line of the ditch and even some of the causeways. Following the creation of .shp files for each of the ditch circuits the potential area of unexcavated ditch could be estimated. Due to the irregular nature of the ditches and that Neolithic deposits only represent the lower fills, an estimate based on ditch fill volume was not attempted.

Ditch Circuit	Total area of ditch in m ²	Area of ditch excavated in m ²	Estimated % of ditch excavated
I	503	61	12%
II	720	97	13.5%
III	1,639	215	13%
IV	2608	185	7%
All Ditches	5,470	558	10%

Table 7: Estimation of excavated to unexcavated ditch area

Whilst the above estimate can only be an educated guess as to the true extent of the ditch circuits, it hopefully provides some context to the volumes of finds reassessed below and the potential for what may still remain.

6.3 The Prehistoric Pottery by Anna Doherty

6.3.1 Introduction

The Whitehawk assemblage (quantified by year of excavation in Table 8) represents one of relatively few very substantial collections of Early Neolithic pottery from Causewayed Enclosure sites nationally. The pottery assemblages from all three seasons were published soon after excavation by Ross Williamson (with additional comments by E.C. Curwen) (1930) and Stuart Piggott (1934; 1936). Although these reports are, for their time, very detailed, the field of archaeological ceramics has developed significantly since the 1930's particularly in terms of fabric analysis and the importance attached to detailed quantification according to depositional context. Almost all of the assemblage can be characterised as belonging to the "Whitehawk style" Plain/Decorated Bowl tradition and, as such, is considered contemporary with the use of the Causewayed Enclosure. Small associated assemblages of Ebbsfleet ware – the earliest incarnation of the Middle Neolithic Peterborough ware tradition – were mostly confined to a few localised areas near the top of the stratigraphic sequence in the 1933 and 1935 excavation areas. Small associated assemblages of Beaker were noted in 1933 Ditch 3, cuttings 7 and 8 and in a few other isolated locations. Finally, a few sherds of Late Iron Age/early Roman pottery were associated together in the 1935 west cutting of Ditch 4.

6.3.2 Methodology

The assemblage was examined using a x20 binocular microscope and recorded on *pro forma* record sheets and in an Excel spreadsheet. Fabrics were recorded according to a site specific type-series formulated in accordance with the guidelines of the Prehistoric Ceramics Research Group (PCRG 2010). Form was recorded in three main fields: rim shape; overall openness of profile and presence/absence of carinations/cordons at the mid body. Decoration and its position on the body were recorded as were features like lug handles or perforations. Recording was designed to distinguish between genuine absence of features like decoration or carinations on fairly complete profiles and absence due to incompleteness. Diameter was determined where possible although, since most rim sherds are small, this was often a broad estimate rather than an accurate measurement.

Most individual bags of pottery had previously been archived according to a unique accession number (although some accession numbers were used on multiple bags). All of the pottery has been returned to original bags and accession numbers have been recorded in the pottery records. The majority of the pottery retains its stratigraphic labelling according to ditch, cutting and spit (or stratigraphic layer in the case of the 1935 archive). All sherds which had some form of locational information were fully quantified by sherd count, weight and Estimated Vessel Number. The latter method of quantification is fairly subjective, especially since individual Neolithic vessels may have quite marked variations in size, frequency and sorting of temper, firing colour and even rim form; however ENV can be a useful way of noting the

completeness and degree of mixing of different vessels within any given spit or context. An additional method of estimating minimum vessel number (MNV) was also employed in order to examine fragmentation of individual vessels across the site. Each feature sherd (showing at least one aspect of form or decoration) was individually numbered but where non-cross-fitting sherds, thought likely to be of the same vessel were identified, these were assigned as 1a, 1b etc. rather than as separately numbered pieces. This in itself is a subjective process; it would have been impractical to lay out the entire assemblage at once, so there is a possibility that some cross-fits or possible 'sherd families' found in different areas of the site may have been missed. However, in most cases an entire cutting and sometime subsequent cuttings could be directly compared. In addition, a complete record of numbered sketches of all feature sherds was compiled during recording so that, when distinctive form or decorative traits were noted, similar sherds from elsewhere on the site could be easily extracted for comparison.

A number of bags lacked any stratigraphic labelling and, owing to time constraints, these were not recorded in detail. These were only briefly scanned as well as being counted and weighed (quantification given in Table 8). Almost all are bodysherds in probable Early Neolithic fabrics. A few diagnostic sherds of inherent interest, identified during this process were however fully recorded.

Excavation season	Sherds	Weight	ENV	MNV (diagnostic vessels)
Whitehawk CE 1929 (with locational information)	1716	22186	1418	345
Whitehawk CE 1929 (completely unstratified)	361	6494	360	
Whitehawk CE 1929/1933 (with locational information)	1	30	1	1
Whitehawk CE 1933 (with locational information)	452	5944	350	148
Whitehawk CE 1933 (completely unstratified)	11	59	11	
Whitehawk CE 1935 (with stratigraphic information)	872	7238	528	84
Whitehawk CE 1935 (completely unstratified)	31	490	30	
Total	3444	42441	2698	578

Table 8: quantification of the surviving pottery archive from the 1929, 1933 and 1935 excavation seasons (including Plain/Decorated Bowl, Peterborough Ware, Beaker and LIA/early Roman pottery)

Site specific fabric definitions:

FLIN1 A slightly silty matrix but with no visible quartz at x20 magnification. Common to abundant well-sorted fine flint (most of 0.2-0.5mm with rare examples up to 2mm).

FLIN2 A slightly silty matrix with sparse flint, mostly of 0.2-0.5mm with rare examples up to 2mm

FLIN3 A slightly silty matrix but with little visible quartz at x20 magnification. Sparse flint mostly of 0.2-1.5mm with rare very large examples up to 6mm. Quite nicely finished surfaces

FLIN4 A slightly silty matrix but with little visible quartz at x20 magnification. Sparse/moderate flint mostly of 0.5-3mm with rarer examples up to 6mm

FLIN5 On a continuum with FLIN4 but with moderate ill-sorted flint between 0.5-8mm and more examples at the coarser end of this range

FLIN6 A slightly silty matrix with common to abundant moderately-sorted flint of 0.5-2mm (occasionally up to 3mm)

FLGL1 Sparse ill-sorted flint 1-6mm with moderate well-sorted glauconite mostly around 0.2mm

FLGR1 A dense matrix with sparse grog of c.0.7-1.5mm and rare/sparse ill-sorted flint of 1-3.5mm

FLQU1 A dense matrix with sparse/moderate rounded quartz grains of c.0.2-0.5mm. Sparse ill-sorted flint, most in the size range 1-3mm with rare examples up to 6mm. Although a relatively coarse fabric surfaces can be quite well-smoothed with little flint showing up.

FLQU2 A dense matrix with sparse/moderate rounded quartz grains of c.0.2-0.5mm. Moderate to common ill-sorted flint, ranging from 0.5-8mm. Often oxidised

FLQU3 Moderate quartz mostly of 0.2-0.3mm. Rare to sparse flint mostly of <0.5mm

FLSH1 Laminar quartz-free matrix with sparse flint and sparse shell mostly 0.5-2.5mm although rare examples may be larger

FLSH2 Laminar quartz-free matrix with sparse flint and sparse shell mostly 1.5-3.5mm rarely up to 6mm

FLSH3 Quartz free matrix with sparse fairly well-sorted flint and shell 0.5-1mm with rare examples up to 3mm

GRFS1 Sparse grog of 2-3mm with sparse flint and sparse shell both of 0.5-2.5mm

GRSH1 Sparse grog of 2-3mm with sparse shell of 0.5-2.5mm

GROG1 Sparse grog of 2-3mm in a silty matrix with few other inclusions

GROG2 Moderate to common grog of 1-2mm with sparse quartz of 0.2-0.3mm

GRQU1 Rare to sparse grog of 2-3mm and moderate quartz of 0.3-0.5mm

QUAR1 Moderate quartz mostly of 0.2-0.3mm with no added flint temper

QUGL1 Silty matrix with moderate larger quartz of 0.2-0.3mm and sparse glauconite of 0.1-0.2mm

ROCK1 Common to abundant calcareous sedimentary rock inclusions with sparse quartz of 0.1-0.3mm

SHQU1 Rare to sparse shell of 0.5-3mm and common quartz of 0.3-0.5mm

SHEL1 Quartz free matrix with sparse fairly well-sorted shell mostly of 0.5-1mm with rare examples up to 3mm

SHEL2 Quartz free matrix with moderate shell of 1-3mm

SHEL3 Common shell mostly of 0.5-2mm (rarely up to 3mm) contains punctate fossil shell of non-local origin

SHEL 4 Common to abundant fine shell mostly of 0.5-1mm (rarely up to 2mm)

6.3.3 Stratigraphic integrity of the assemblage

The final season of excavation employed stratigraphic methods of excavation and recording so all of the labelled pottery from 1935 can probably be interpreted as *in situ* within contemporary deposits.

Because the earlier seasons employed excavation in spits rather than by stratigraphic context, there is some uncertainty about whether any of the material in upper spits can be considered securely stratified within the enclosure ditches. The section illustrations in the report on the 1929 season appear to show at least the upper spit as containing a thin layer of “turf mould” (presumably meaning topsoil). In the report on the 1933 season, the sections specify that, as well as the turf layer, some upper archaeological deposits post-date the Neolithic period. However, as the spits are not marked on the sections, it is unclear whether Spit 1 starts at the ground surface or at the top of the Neolithic horizon. We cannot necessarily equate deposits found at approximately the same level in different ditches but upper spits tended to contain relatively little pottery; however, a quite large quantity was found in the second and third spits (Table 9). Unfortunately, there is a possibility that some of this material is redeposited in post-Neolithic layers and, even lower down the sequence, it is not generally possible to equate whole spits to single stratigraphic units because they were excavated horizontally and are often shown on the section as cutting across several obvious stratigraphic layers. This may, for example, make it difficult to compare material from original fills and recuts or from primary and secondary deposits.

Spit	% of labelled sherds
Spit 1 deposits	4.7%
Spit 2 deposits	27.2%
Spit 3 deposits	31.2%
Spit 4 deposits	15.4%
Spit 5 deposits	12.6%
Spit 6 deposits	1.5%
Spit 7 deposits	0.5%
Spit 8 deposits	0.1%
Spit not recorded	6.7%
Discrete features separate from main enclosure circuits	<0.1%

Table 9: Summary of the relative frequency of sherds in spits from 1929 and 1933 seasons of excavation

6.3.4 Survival of the pottery archive

Pottery was the only material class to be omitted from the ‘relic tables’ in the report on the first excavation season, which detailed all of the other finds present in each cutting and spit of the enclosure ditches. Neither this nor the subsequent reports present any form of quantification so it is impossible to estimate precisely how much may have been lost or discarded. Although the majority of the vessels illustrated in the three reports are present, a significant number of feature sherds were not located. These include: from the 1929 season (Ross Williamson 1930) Figs. 3, 6, 20, 28, 30, 31; from the 1933 season (Piggott 1934) Figs. 8, 15, 18, 23, 24, 69, 70; and from the 1935 season (Piggott 1936) Figs. 1, 7, 23, 24, 25, 26, 27 and 28. Many of these are the more complete profiles and four are probably those currently on display at the Whitehawk micro-museum. Although these

have not been examined as part of this assessment they would be available for recording in the event of further analysis work.

The only other indication of the original size of the assemblage comes from comments by E.C. Curwen, with slightly contradictory statements that 'at least 80 lbs' (c.36kg) or '70 or 80lbs' (32-36kg) of pottery was recovered in the 1929 season (Curwen 1930, 31; 1931, 134). The report on the second season states that 'a fair quantity' of pottery was found in the ditch cuttings in what was termed the 'occupation layer' in Ditch 3, although it was not 'anything like as plentiful as that obtained in the two inner ditches in the 1929 excavations' (Curwen 1934, 111;). The 1929 pottery located in Brighton Museum and elsewhere amounts to 28.68kg and, assuming that Curwen's figures are reasonably accurate, this could suggest that up to 20% of the first season's assemblage is missing, although, a small part of this discrepancy may be accounted for by the four unquantified vessels currently on display. In the second season, Curwen stated that Cuttings 4, 5 and 8 of Ditch 3 produced the most pottery, yet in the current archive, significantly more pottery survives from Cutting 7 than Cutting 4. In the third season, Piggott (1936, 75) described the pottery as 'abundant' but today only three relatively loosely packed, medium-sized boxes survive.

Overall, a suspiciously high proportion of the sherds are rims or decorated pieces but this varies according to year of excavation: 70% of the surviving sherds from 1929 are featureless bodysherds compared with 51% from 1933 and 82% from 1935. A similar picture can be seen in the proportion of surviving Estimated Vessels which are undecorated (87%, 75% and 91% respectively). Since Piggott (*ibid*, 80) noted at the time that decoration was more common in the pottery recovered during 1935 than in the previous seasons, there is good reason to suspect that there may have been at least some selective discard of undiagnostic material (particularly from the 1933 pottery archive, which contains very few undiagnostic bodysherds) or alternatively a significant loss of decorated sherds from 1935. On the other hand, since Piggott never quantified the assemblage in detail, it is possible that he was mistaken and that the 1933 and 1935 archives are relatively intact.

6.3.5 Plain/Decorated Bowl fabrics

The original reports on the pottery from Whitehawk pre-date the advent of detailed fabric analysis so one of the important aspects of revisiting the pottery is the opportunity to characterise and quantify fabric types in a systematic way. As shown in Table 10, the dominant ware type comprises flint-tempered fabrics which lack any other major inclusion type, accounting for just over half of the assemblage. It can be very difficult to define Neolithic fabric categories objectively because of their lack of uniformity, even within a single vessel. Many of these fabrics are on a continuum with one another; however it is clear that the flint-tempered wares include fabric variants which would have been recognised as different by the makers and users of the vessels. The finest fabric, FLIN1, contains well-sorted inclusions and is frequently associated with well burnished surfaces. It also seems to be disproportionately associated with carinated/cordoned bowl forms and with the use of vertical faceted burnish on the upper body and across

the top of the rim. Fabric FLIN2 is also fairly fine in terms of inclusion size but is less well-sorted and less likely to have a 'fine-ware' finish. Amongst the medium coarse wares, FLIN3 represents a similar fabric to FLIN2 but with slightly larger and more ill-sorted inclusions, whereas FLIN6 is as well-sorted as FLIN1, with similarly common inclusions. At the coarser end of the spectrum, fabrics FLIN4 and FLIN5 can clearly be defined as 'coarse wares' and are frequently associated with thick-walled vessels but very rarely with decoration or surface treatments.

Fabric grouping	Sherds	% Sherds	Weight	% Weight	ENV	%
Fine flint-tempered wares	266	9.2%	3103	9.1%	222	9.9%
Medium coarse flint-tempered wares	562	18.2%	6447	16.8%	423	17.7%
Coarse flint-tempered wares	660	20.7%	9072	24.3%	507	20.6%
Fine sandy flint-tempered wares	160	5.4%	1892	5.5%	133	5.7%
Medium coarse sandy flint-tempered wares	294	10.1%	2997	8.8%	247	11.0%
Coarse sandy flint-tempered wares	245	7.4%	3313	9.7%	167	6.5%
Fine sandy flint-tempered wares	160	5.5%	1892	5.5%	133	5.8%
Flint and shell wares	445	14.3%	4748	12.9%	357	14.8%
Shelly wares	189	6.4%	1271	3.7%	120	5.4%
Non flint-tempered sandy wares	4	0.1%	25	0.1%	3	0.1%
Flint and glauconite wares	81	2.7%	1229	3.6%	61	2.5%
Total	2906	100%	34097	100%	2240	100%

Table 10: Quantification of Plain/Decorated Bowl fabrics from all excavation seasons

Another group of flint-tempered wares are comparable to those outlined above but also contain moderate quantities of quartz sand in their matrixes. They make up about a quarter of the assemblage. The quartz in these fabrics may well be naturally occurring rather than representing added temper. These could therefore suggest a different source of raw clay rather than a tempering choice. They range from fine wares (FLQU3), to medium coarse (FLQU1) and coarse wares (FLQU2). There are also a very few examples of non-flint-tempered wares with similar quartz-rich matrixes but no added flint temper (QUAR1). Interestingly, the sandier coarse wares have a tendency to be oxidised, suggesting slightly different firing techniques and strengthening the impression that they come from different sources to the majority of the pottery.

Flint-and-shell wares (FLSH1; FLSH2; FLSH3) comprise another major fabric group, accounting for c.15% of the assemblage; non-flint-tempered shelly wares (SHEL1; SHEL2; SHEL4) account for roughly 5%. Again it seems likely that these fabrics represent different fossiliferous clay sources, most likely in coastal/estuarine locations, although it is not impossible that some of the inclusions derive from added fresh shell temper. The original report on the pottery from the first season of excavation noted that one sherd contained a visible piece of mussel shell, although this was not noted during the current

recording process (Williamson 1930, 69). A single shelly bodysherd, found in 1933 D3 C7 S3, included punctate fossil shell which is probably not from south-east England (SHEL3). This type of shell is very commonly observed in Roman shelly wares traded from the East Midlands (although other sources are possible). Long distance trade or exchange of ceramics has been demonstrated in south-west England and it is possible that this was occasionally also the case in Sussex, for example in the case of a limestone tempered fabric from Bishopstone (Bell 1977). However, this spit also contains Beaker pottery and given the potential problems with the stratigraphic integrity of the assemblage, it is impossible to be certain that this sherd is even of earlier prehistoric date.

A fourth shelly fabric (SHEL4), with very common, fine, well-sorted inclusions was only associated with one vessel, which Piggott saw as of unusual, non-local type (Piggott 1936, Fig. 5). It is very unlikely that this vessel has any association with Scottish Neolithic traditions as suggested by Piggott (*ibid*, 79); however the nature of the tooled decoration and its position on the interior of the vessel does stand out. Although the shell in this fabric is too finely crushed to be identifiable at the macroscopic level it is possible that the vessel is of non-local origin.

Aside from these examples, the only fabric types which are demonstrably from a source which is not very local to the site are the glauconitic wares (FLGL1; QUGL1), accounting for about 3% of the assemblage. It is likely that these originate from Greensand/Gault geology, of which the nearest source is located c.8km to north of the site. Significantly this is slightly beyond the typical maximum resource procurement zone of 7km for potters working at a low-level of specialisation (Arnold 1985), thought to typify most prehistoric production in Britain. Although these wares are not particularly prevalent, they do demonstrate some consistent movement of vessels from north to south. To a limited extent, this contradicts Drewett's (1980, 26-27) view that the Downs were a significant barrier to the physical movement of vessels themselves and to the transfer of stylistic traits in ceramic manufacture.

It is also worth noting that the fabrics in the Whitehawk assemblage have some very marked differences with those recently recorded in a broadly contemporary assemblage recovered from a large group pits at Lower Hoddern Farm, Peacehaven located c.8km to the south-east (Doherty 2015). This may demonstrate that pottery from the two sites originates from different sources. Differing fabrics may also suggest varying tempering choices which could represent a different range of functional types or be linked to style and the visual qualities of the pottery. For example, at Peacehaven, only five estimated vessels, making up 1% of the assemblage, contained shell inclusions and shell was never observed in flint-tempered fabrics. Only a single glauconitic sherd was noted in that assemblage, although Peacehaven is actually marginally nearer to sources of glauconite-bearing geology. The greater variation in sources of pottery at Whitehawk may therefore represent tangible evidence that the highly visible nature of Causewayed Enclosures drew people and objects from a relatively wider hinterland.

It also appears that the proportions of fabrics vary significantly between different areas of the site, for example, glauconitic wares are more prevalent in the 1929 excavation as are sandier flint-tempered wares. By contrast flint-with-shell fabrics appear more common in the 1933 excavations and non-flint-tempered shelly wares are more frequent in the material from the 1935 season. Unlike, for example, variations in the levels of decoration, this trend is unlikely to be affected by selective discard and might therefore represent a chronological trend or a distinction in the functional or stylistic types of vessels being deposited in different areas of the site.

6.3.6 Plain/Decorated Bowl: form and decoration

Although the terminology used to describe Neolithic pottery has changed since the 1930's, many of the general observations on form and decoration made by Williamson, Curwen and Piggott in the original publications still stand. Almost without exception the original illustrations were found to be entirely accurate. Most of the more substantial vessel profiles were illustrated and, even though quite a large proportion of feature sherds were not drawn, the original figures are probably representative of the assemblage of a whole. However, as with fabric, a key problem for modern pottery specialists trying to interpret the assemblage is a lack of detailed quantification of different types and of their stratigraphic associations and spatial distribution.

Rim forms are very simple, over half are completely plain; most of these are rounded in section but others are very squared. Over a third of rims feature a beaded rim, usually on the exterior but occasionally on the interior, or both (giving a T-shaped section). Finally about 10% of vessels have simple flat or everted rims, although these tend to lack the well-defined necks which are a feature, for example, of Mildenhall Plain Bowl pottery in the East of England. Where some estimation of body profile is possible, about half of vessels appear to be completely neutral. Vessels with closed, slightly closed, slightly open or open profiles are all present in similar frequencies, each accounting for slightly over 10% of the diagnostic assemblage.

Lugs were noted on 8% of diagnostic vessels, although since many of the feature sherds are small individual rims, this may be an underestimation of the total number of lugged vessels. The majority are solid lugs although vertically pierced examples are also present. Almost all lugs occur on the mid body, frequently merging with a raised cordon. Perforation is also a fairly common feature, noted on about 5% of minimum diagnostic vessels. In most cases the perforations were made prior to firing although a small number of drilled holes were also noted. In a number of examples, a row of holes were recorded just below the rim, which could indicate that they were used for suspension or attaching coverings. However, some of the *pre-cocturam* holes do not fully perforate the vessel wall, suggesting that they may have been decorative rather than serving any utilitarian purpose.

Carination is very common; of the diagnostic vessels, nearly 20% feature some form of cordon or simple carination and, of the remaining 80%, very few are complete enough to demonstrate that carinations are definitely absent. Interestingly the prevalence of carination was said to

be one of the key differences between the assemblages from Whitehawk and the Trundle (Curwen 1931, 134). It is tempting to think that this may be a chronological difference, since Carinated Bowl pottery is the earliest ceramic tradition in Britain, pre-dating the Causewayed Enclosures. Where these features are found in Plain/Decorated Bowl assemblages they may therefore represent continuity with earlier pottery styles. However it is also possible that this difference is purely stylistic or functional. A more detailed consideration of the prevalence of carination in different parts of the stratigraphic sequence and/or its distribution within different ditch circuits may help resolve this question.

Overall about a third of the individually numbered Early Neolithic feature sherds are decorated. This figure may exaggerate the true proportion of decorated vessels because bodysherds with decoration are easily recognised as elements of unique vessels, whereas equivalent bodysherds from plain vessels are not and, as noted above, it appears that some plain bodysherds may have been discarded. If for example, we look only at rimsherds (where this bias is less pronounced) about a quarter are decorated; however this method of quantification is not perfect either since some undecorated rimsherds probably come from vessels which originally had decoration lower on the body.

There is a fairly narrow decorative repertoire. By far the most common form of decoration is linear faceted burnishing or tooling which typically appears on the top of simple rim forms, and vertically on the upper external surface as well as across cordons/carinations (Table 11). Other decoration appears to be almost entirely made using simple stick-like tools to make impressions, incised and shallow tooled lines, dots and dashes. Usually these occur in simple rows or columns on the external upper body and there is little evidence for elaborate motifs which might have required more planning and skill. Decoration on the interior is much rarer, presumably because open vessel profiles are not especially prevalent. In most cases only one form of decoration is present, with only a small minority of vessels featuring more than one type of tooling or impression. Overall the simplicity of the decoration adds to the impression that pottery production was not a highly specialised activity.

There are a few examples of slightly more complex impressions although unfortunately the high levels of abrasion often make it difficult to identify them with certainty. A few possible examples of twisted cord or bird-bone were identified. Fingernail impressions, seemingly made over a wide area of the body were also noted on a number of examples. Whilst these traits are not necessarily out of place in a Decorated Bowl assemblage they are decorative types which continue into the succeeding Peterborough Ware tradition. Another characteristic which distinguishes Early and Middle Neolithic pottery styles is the extensiveness of decoration. Clearly the main assemblage from the Causewayed Enclosure ditches contains occasional examples with decoration all over the upper body and sometime even below the mid body; these could feasibly indicate later Decorated Bowl elements.

Decoration type	MNV	MNV%
Impressed: simple tool	21	4.2%
Impressed: fingernail	8	1.6%
Impressed: ?finger	1	0.2%
Impressed: ?twisted cord	2	0.4%
Impressed: ?leaf	1	0.2%
Impressed: ?grain	3	0.6%
Impressed: ?bird bone	2	0.4%
Shallow tooled dashes/lines as part of decorative motif	13	2.6%
Incised lines/dashes as part of decorative motif	7	1.4%
Simple linear faceted burnish/tooling	70	13.9%
Indented decoration	1	0.2%
Mixed: shallow tooled dashes; simple faceted burnish	2	0.4%
Mixed: incised lines/dashes; simple faceted burnish	1	0.2%
Mixed: impressed, simple tool and incised lines/dashes	2	0.4%
Mixed: impressed: simple tool and simple faceted burnish	8	1.6%
Mixed: Impressed: simple tool and fingernail	1	0.2%
Mixed: shallow tooled dashes/lines; faceted burnish	2	0.4%
Mixed: Horizontal scoring; single or sparse fingernail	1	0.2%
Horizontal scoring/wiping	4	0.8%
Incised lines/dashes random	7	1.4%
Single or sparse fingernail impressions	8	1.6%
Undecorated	338	67.2%
Total	503	100.0%

Table 11: Quantification of decoration by Minimum Vessel Number in the Plain/Decorated Bowl assemblage

It is also worth noting some examples of surface impressions/tooling which appear to be singular rather than making up part of a wider motif. These include individual or small groups of fingernail impressions and seemingly random small impressions or incised linear marks on otherwise undecorated vessels/larger sherds. Some of these may well have been made accidentally prior to firing although they are fairly prevalent overall, perhaps suggesting that some are deliberate. Most of the possible individual impressions are quite simple in shape but are often quite indistinct due to surface abrasion. In three cases, these were considered possibly from impressed grains. One very clear-cut example was noted: a set of three grains representing the broken top of an intact spikelet, probably of wheat or barley. Unfortunately this was completely lacking in any locational information and was marked as from either the 1929 or 1933 excavations. Another two non-fitting sherds, likely of the same vessel, both marked as from 1929 Ditch 1 – but without a cutting or spit – feature fern-like leaf impressions.

6.3.7 Date and duration of monument use

Our understanding of the chronology of the Whitehawk Causewayed Enclosure has recently been improved by an extensive programme of radiocarbon dating (Whittle et al 2011, 208-226) which was able to demonstrate with a high degree of confidence (95%) that all four of the excavated ditch circuits were constructed within 75-260 years of one another and likely within 155-230 years (68%). Overall it was felt that construction was most likely to have occurred between mid 37th century and the end of the 36th century BC. However, the main focus of the dating programme was on construction as opposed to use and the authors expressed some disappointment with the quality of material available for scientific dating. This meant, for example, that the programme was not able to fully resolve questions over the contemporaneity of the ditch circuits – particularly whether Ditches 1 and 2 (the inner circuits) pre-date the original cuts of Ditches 3 and 4 and whether recuts in the latter two were made whilst the inner ditches were still open.

The pottery suffers from some of the same problems as the radiocarbon dating samples (particularly a possible lack of stratigraphic integrity in the first two seasons, where pottery was only recorded by horizontal spit). However the assemblage does have the advantage of providing thousands of individual pieces of dating evidence rather than a few dozen. It has already been noted that there is some apparent differentiation in various aspects of the assemblage, including the relative proportions of different fabrics and decorative styles. Whilst it may be wrong to assume that these are chronological patterns, this is certainly an avenue of research which would be worth exploring. One of the most important pieces of further work will be to investigate whether assemblage variation has any apparent correlation with vertical stratigraphy or whether particular ditch circuits or recuts appear to display different characteristics which may be the result of chronological development. It is certainly the case that some individual bodysherds within groups that were otherwise unambiguously attributable to the Plain/Decorated Bowl tradition display characteristics like more extensive decoration over a wider area of the body and occasional use of more complex impressions like bird-bone and twisted cord. These could arguably represent later traits in a Plain/Decorated Bowl assemblage, prefiguring the emergence of the Ebbsfleet Peterborough ware tradition at c.3500BC. It has also been noted below that all of the more certainly assigned Ebbsfleet Peterborough ware was recovered from Ditch 3, including a few sherds from lower spits and this seems to provide some indication that this feature was open for longer than Ditches 1 and 2.

6.3.8. Patterns of deposition

The original site reports were clear in stating that pottery was quite unevenly distributed amongst the different ditch circuits despite the fact that, by the final season, a similar sample length of each had been excavated. Pottery was stated to have been very abundant in Ditch 1 (Curwen 1934, 111-112) and virtually absent in Ditch 4 (ibid, 104). Accepting that quantification could be slightly skewed by loss or discard or pottery, the current quantification exercise provides more detailed

data on this point. Table 12 shows that about half of the Plain/Decorated Bowl assemblage attributable to a specific location was found in Ditch 1 and less than 1% in Ditch 4. Something which was less clearly documented in the published reports is the fact that fairly similar quantities of pottery come from Ditches 2 and 3. A small total was also attributable to other features or locations including discrete pits and post-holes; however the total shown in Table 4 also includes a number of bags with locational information which is now obscure, e.g. “between pegs 30 and 32”.

Ditch	Sherd Count	Weight	ENV
D1	49.3%	51.2%	54.2%
D2	17.3%	20.6%	15.0%
D3	24.1%	23.0%	23.4%
D4	0.6%	0.7%	0.6%
Other (discrete features etc.)	8.7%	4.4%	6.8%
Total	100.0%	100.0%	100.0%

Table 12: Percentage of Plain/Decorated Bowl pottery found in each ditch circuit (quantified by sherd count, weight and Estimated Vessel Number)

Williamson’s (1930, 16) assertion that ‘portions of the same or similar pots were found at all levels’ can now also be qualified. It seems likely that he simply meant that all levels of the ditches contained stylistically similar and therefore broadly contemporary pottery (i.e. what we would now be referred to as Plain/Decorated Bowl). There are actually relatively few diagnostic vessels represented by more than one sherd and, where these occur, they are overwhelmingly found within the same cutting and spit. Having said this, there are a dozen or so instances of possible sherd links found in different spits/contexts, including some non-adjacent ones. Only one of these was conjoining; the rest were non-fitting sherds thought distinctive and similar enough to be probably of the same vessel. These patterns may provide some indications of the filling processes of the ditches. For example, several were found at roughly similar levels in non-adjacent cuttings of Ditch 2, perhaps suggesting that long stretches may have been filled at the same time with mixed material from a common source. Possible sherd links were found across Cuttings 1 and 3, 2 and 4, 3 and 6 and 4 and 6. Other groups of sherds possibly originating from two individual vessels were also noted across Cuttings 1, 4 and 6 and Cuttings 2 and 6 of Ditch 1. In addition, there is considerable evidence of vertical mixing within Spits 1-4 of Ditch 1, Cutting 6, with multiple sherds of seven different vessels found in different, sometimes non-adjacent spits, potentially hinting that most of the material in Spit 4 and above was laid down in a single event or that layers were deposited in quick succession (although there is no published section of this cutting so we do not know how spits relate to stratigraphic contexts). In one case, a distinctive pattern of double tool-stabbed lines associated with identical fabric and firing colour was noted in very widely dispersed locations in Ditch 2, Cutting 1, Spits 2 and 3 from the 1929 excavations, Ditch 3 Cutting 7, Spit 3 from the 1933 excavation and in Layer 3 of the western intervention through

Ditch 3 from 1935, potentially suggesting that sherds from one vessel had been redistributed in many different areas of the site.

One of the clearest patterns to emerge from the rerecording of the assemblage is that most sherds appear to have been thoroughly fragmented and mixed prior to deposition. For example, considering that a relatively high proportion of the assemblage consists of thick-walled vessels, the average sherd weight of c.12g is not especially high and most examples could be described as moderately to heavily abraded. There are also surprisingly few examples where multiple sherds of the same vessel were found together. Even the substantial illustrated profiles (e.g. Williamson 1930 Plates IX and X) only tend to make up c.5-10% of a complete vessel. Just two recorded vessels were represented by more than 200g of pottery (at a rough estimate, most vessels would probably have weighed in the region of 1-2kg when complete). The original reports refer to 'occupation layers' within the ditch circuits but it seems much more likely that this material derives from middens that had undergone repeated reworking. There is almost no evidence that the pottery was deposited soon after its initial point of use and discard. A similar pattern was generally noted at Hambledon Hill and Windmill Hill (Healy 2006, 15; Smith 2008, 594; Zienkiewicz 1999, 270). It is worth noting however, that this does not seem to be universally the case at Causewayed Enclosures: pottery in the eastern arc of the enclosure ditch at Etton, for example, was said to be largely made up by structured deposits with little background redeposited material (Pryor 1998, 352-353).

Having said this, even at Causewayed Enclosures where most pottery appears to have been redeposited, there has often been at least some evidence of structured deposits, although not necessarily involving wholly-complete vessels. For example, at Hambledon Hill, a fragmented partially-complete cup, associated with a stone axehead, was found in a pit near the crown of the hill (Healy 2006, 16). As a general rule, Early Neolithic pits, both within Causewayed Enclosures and in the wider landscape, are thought to have been dug for the placement of objects and material rather than as a simple means of refuse disposal (e.g. Oswald et al 2001, 126). Relatively few pits were excavated at Whitehawk and most produced negligible quantities of pottery. However, one example, Pit 2 (western site, 1935) contained a large group and, although mixed fragments from many different pots are represented, there appear to be more numerous sherds from one or two individual vessels, something which was not often noted in ditch groups. This seems to confirm the idea that there were some differences in processes of deposition in pits and ditches.

It would also be interesting to investigate further any possible stratigraphic and spatial associations between more complete vessel profiles and human bone, and other artefact types like potentially prestigious flint tools or chalk objects. This could include illustrated partially-complete vessels which are now missing but which have their ditch, cutting and spit number recorded in the original site reports. More generally it would be interesting to look in more detail at the spatial distribution of pottery using GIS. As well as plotting simple frequency of sherds, minimum/estimated vessels and sherd weights, it may also be helpful to examine how overall average sherd weight and/or average

weight of numbered diagnostic vessels varies spatially in order to examine whether there are any tangible differences in fragmentation across the site. At Hambledon Hill, semi-complete vessels were said to be preferentially associated with butts of ditch segments (Healy 2006, 18). Several of the cuttings made in the first two seasons at Whitehawk are at the termini of segmented ditches (e.g. 1929 Ditch 1 CIII and CV and Ditch 2 CI and CIV, 1933 Ditch CII, CIII, CV and CVI) and it would be interesting to compare data about completeness/fragmentation with cuttings elsewhere. Unfortunately this would be less easy with the 1935 archive because longer stretches of the ditches were excavated under a single ditch number.

The overviews of fabric, form and decoration have already touched on some evident spatial differences in the types of pottery being deposited in different parts of the site. As already noted, there remains some uncertainty as to whether all of the ditch circuits were open and in contemporary use throughout the whole life of the monument and it is feasible that some of this patterning is because of chronological factors. However, it is also possible that pottery distribution will have real implications for our understanding of the organisation and use of the space within the monument. At Hambledon Hill, for example, Smith (2008, 597) suggested that differentiation in the pottery fabrics represented real variations in the nature of activities occurring in inner and outer parts of the site.

6.3.9 Vessels and population/site function

The MNV of 503 vessels (representing unique Plain/Decorated Bowl feature sherds) and ENV of over 2000 vessels (including undiagnostic bodysherds), recovered during somewhere in the region of 10% (Section 6.2.5) excavation of the monument, provide one of the most tangible indicators that the site was visited or occupied by large groups of people. As already noted, the pottery tends to be highly fragmented, most individual diagnostic vessels only being represented by small individual sherds rather than large parts of vessel profiles. This may suggest that a significant proportion of the pottery used at the site would not have been preserved by deposition in cut features. Loss or discard also seems to have slightly reduced the size of the assemblage now retained in the archive.

Of course, it is very difficult to use populations of vessels to determine the size of human communities and duration of occupation, although this approach has been attempted on other Neolithic sites (e.g. Garrow 2005). The monument may have been used over reasonably long periods by small groups or just for a few days each year for very large communal events. It may have been occupied very intensively at certain points in its history but less so at others – this might, for example, be a plausible explanation for the varying frequency of pottery found within different ditch circuits. It is also possible that Williamson's original excavations in Ditches 1 and 2 happened to target an area which was atypically rich in pottery. Nevertheless, it seems reasonable to estimate that the total number of vessels used over the c.150 year life-span of the monument would probably have reached at least the low tens of thousands. Even at a fairly conservative estimate, it seems likely that pots were consumed at an average rate of more than a

hundred per year and the figure could conceivably be many times higher.

The type of vessels being used is also clearly relevant both to estimating human population and to the consideration of site function. Small bowl/cup like forms (which could be interpreted as relating to individual consumption) were present in small quantities but it seems likely that most vessels were used in storage, food preparation, cooking and serving for more than one person. This suggests that the number of people visiting/occupying the monument over its whole lifespan would probably have been considerably more than the number of pots deposited. Having said this, it appears that very large heavy-duty vessels are slightly less prevalent at Whitehawk than at the nearby pit site at Lower Hodder Farm, Peacehaven (Doherty 2015). One possible explanation for the preference for very large vessels put forward at that site was the use of pottery in communal cooking, perhaps of starchy grain-based foods which may have required long periods of heating at low temperatures. A detailed quantified comparison of the assemblages from these two sites, particularly using characteristics such as diameter and prevalence of very coarse fabric types (which tend to be directly correlated with large-heavy duty vessels) may help bring out evidence about functional differences on the two sites. Indeed a significant question about the Whitehawk pottery is the extent to which such a large assemblage, apparently displaying quite a significant element of fairly utilitarian vessels can be understood purely in terms of short-lived events like feasts and how far the ceramic evidence implies at least some degree of semi-permanent occupation.

6.3.10 Ebbsfleet style Peterborough ware

It has already been noted that Early Neolithic Decorated Bowl pottery probably evolved into Peterborough ware through a gradual increase in the use of decoration over a wider area of the body and through adoption of more complex styles of decoration. Current radiocarbon dating suggests that the Ebbsfleet style developed around c.3500BC at a time when many Causewayed Enclosures were still in use. Occasional sherds quantified above within the Decorated Bowl assemblages arguably show some possible trends towards the later tradition without constituting fully developed Peterborough ware. However a small assemblage totalling 37 sherds, weighing 355g from c.8 estimated vessels probably should be classified as the earliest Ebbsfleet variant of the Peterborough ware tradition. These were quite widely distributed within the 1933 and 1935 interventions through Ditch 3, including in 1933 Cuttings 2, 5 and 7 and in the 1935 eastern and western interventions. Two other illustrated examples which were not located during the current recording process but which were illustrated in the original 1934 report also probably fall into this category, including Fig 15 (D3 CV S3) and Fig. 18 (D3 C2 S2). The largest concentration of Peterborough ware was found in the upper spit of the 1935 eastern Ditch 3 intervention and comprises 23 large, mostly non-fitting, sherds from 2 vessels.

The Peterborough ware assemblage is so small that it is difficult to be sure that any trends in fabric and form can be considered representative; however a few general points can be made. Five of the

eight estimated vessels were made in a very similar medium-coarse non-sandy flint-tempered fabric (FLIN 3) and one was in a similar but slightly coarser ware (FLIN4). Other fabrics include a sandy flint-tempered ware (FLQU1) and a flint-with-shell-ware (FLSH1). Overall then the Peterborough ware seems to occur in a similar but perhaps marginally narrower range of fabrics than the Early Neolithic assemblage.

Almost all of the Peterborough ware pottery was illustrated (see Piggott 1934 Figs. 15-21 and 1936 Figs. 20-22). In the few cases where body profile is apparent these are all vessels with restricted necks and out-turning/everted rims but clearly lack the heavier rims and recessed necks of later Peterborough ware styles. As is typical of this tradition, the range of decorative techniques is slightly more complex than in the Decorated Bowl assemblage. Five of the vessels include twisted cord or whipped cord impressed decoration. However, the remaining vessels employ techniques which are seen in the earlier assemblage, such as simple tooled lines and dots or fingernail impressions but these occur more closely and intricately spaced over a wider body area.

It may be significant that some of these were found in lower spits including one sherd in D3 C2 S5 and three sherds in D3 C5 S4. Current dating evidence suggests that Peterborough ware developed around c.3500BC and although the recent radiocarbon dating programme suggested that the main use of the monument was probably coming to an end by the end of the 36th century, it did allow for the possibility of later activity (Whittle *et al* 2011, 226). The analysis was also purely based on the radiocarbon evidence and its scope did not involve any consideration of the published finds. Accepting the limitations of relying on dating evidence recovered from spits rather than sealed stratigraphic contexts, the presence of a few Peterborough Ware sherds several feet down in the ditches does provide reasonably strong argument for Ditch 3 remaining open somewhat later than Ditches 1 and 2 (though not necessarily Ditch 4 which contained very little pottery).

6.3.11 Beaker

A total of 93 sherds, weighing 937g from an estimated 64 Beaker vessels was recovered mostly from Cuttings 7 and 8 through Ditch 3. The stratigraphic description of this area in the original reports is slightly confusing and makes the provenance of these sherds uncertain (Curwen 1934, 106-107). Although much of the pottery is marked as coming from D3 C8 S2 it appears that some of it actually originates from a discrete pit (Pit 1) which was described as having a hearth occupying its mouth; it is uncertain whether this is interpreted as a pit cut by a later hearth feature or just a single pit containing a secondary burnt layer. The labelling on the sherds themselves does not differentiate them from the ditch but some of the published illustrations specify that the sherds come from the 'hearth above Pit 1'. However the report suggests that some of the pottery was found in a stratigraphically late layer within the ditch in Cuttings 7 and 8 'separated from the Neolithic pottery in the occupation layer of the ditch by a sterile band of fine silt'.

Individual sherds of probable/possible Beaker were found in a number of other locations, including 1929 D1 C1 S3 and 1933 Pit 4 (presumably meaning Post-hole 4 as no Pit 4 appears in the report) and D3 C2 S2, D3 C5 S2, D4 C6 S4 – the latter appears to contradict the description of pottery from Ditch 4 given in the published report and could possibly represent a transcription error (Curwen 1934, 104). Some of these were only identified as Beaker on the basis of fabric, since grog-temper never occurred in the Plain/Decorated bowl assemblage but is common amongst the Beaker. It is hard to draw any firm conclusions about the presence of small individual fragments of possible later pottery in these locations.

The Beaker pottery is notable for a very diverse and different range of fabric to those employed in the Early/Middle Neolithic assemblages, mostly containing some grog-tempering. By far the most common of these, is a grog-tempered ware containing sparse shell (GRSH1). This accounts for nearly half of the assemblage – more than half if we include a slight variant of the fabric containing some flint (GRFS1) Also relatively common are non-shelly grog-tempered wares (GROG1; GROG2) and their sparsely flint-tempered variant FLGR1. Most of the Beaker pottery appears to have been made from non-sandy clays although one example of a very sandy grog-tempered ware was recorded (GRQU1). There are a few examples of probable Beaker form/decoration associated with similar fabrics to those employed in the Early Neolithic assemblage. For example, a flat based vessel was recorded in association with a non-grog-tempered shelly ware (SHEL1). Several other comb-stabbed examples were noted in association with a shelly fabric which was significantly sandier than most of the Early Neolithic sandy wares (SHQU1).

Fabric	Sherds	Weight (g)	ENV
FLGR1	4	29	4
FLSH3	1	4	1
GRFS1	15	210	8
GROG1	2	33	2
GROG2	18	110	11
GRQU1	3	16	3
GRSH1	45	479	30
ROCK1	1	5	1
SHEL1	1	18	1
SHQU1	3	33	3
Total	93	937	64

Table 13: Quantification of Beaker fabrics

As with the Peterborough ware assemblage, almost all of the Beaker feature sherds were illustrated in the published report (Piggott 1934 Figs 41-62). Few rim sherds are represented and those that are present are too small to be certain of the overall vessel form. Two examples (Figs 41 and 42) have plain slightly flaring upper profiles possibly from longer necked forms and one has a collared rim (Fig. 55). One vessel has an S-shaped profile (Fig. 63) whilst another has a simple beaded rim (Fig. 64). Another rim from a much larger Food Vessel is also

present (Fig. 54). Decoration can be split into three principle types: comb-stabbed, fingernail impressed and incised line. Generally speaking, decoration occurs in simple rows or columns although in some cases vessels include both vertical linear decoration and lattices or zig-zags (e.g. Figs 58-60).

The precise chronology of prehistoric pottery styles was poorly understood when the original reports were written although it was known that Beaker was likely significantly later than the main use of the monument. We now know that the earliest occurrence of Beaker in Britain was approximately a thousand years after the Whitehawk Causewayed Enclosure went out of use. In all likelihood this assemblage, which is more in keeping with middle and late Beaker styles, dates to beyond c.2250-2150BC when Beaker culture became more widespread (Needham 2005). Whereas the Ebbsfleet style Peterborough Ware could feasibly represent the end of a continuous period of activity at the monument, the absence of later Peterborough ware styles or of early Beaker traits such as all-over-corded decoration indicates that there was probably a very prolonged hiatus in activity in the later 4th and 3rd millennia. It is of course possible that the earthworks continued to be a factor in drawing people from later periods to the hill. In fact the relatively large quantities found in upper layers of Ditch 3 suggest that it was still visible as a significant depression at this time.

6.3.12 Late Iron Age/early Roman pottery

Four sherds of Late Iron Age/Roman grog-tempered pottery, including the rim from a simple undecorated necked jar were recovered from the 1935 western intervention through Ditch 4. These presumably correspond to those described as 'Early Iron Age' pottery by Curwen (1936, 73). This may be an error or a peculiarity of the contemporary terminology but he was not referring to what we now know as the Early Iron Age as he qualifies this term as meaning 'La Tene III, 50BC-AD50'. The report also states the pottery came from Layer 1, though it is labelled as from Layer 2; however since Layer 2 was also said to contain tile, it seems likely that both layers post-date the prehistoric period.

6.4 The Flintwork – Re-assessment of the archived material Karine Le Hégarat

6.4.1 Introduction

In the late 1920s and 1930s three consecutive excavations were carried out at the Whitehawk causewayed enclosure. Pieces of struck flint were reported on soon after the three archaeological investigations (Ross Williamson 1930, Curwen 1934 & 1936). Since their recovery, more sophisticated analytical tools are available to study lithics, more causewayed enclosures have been investigated, and a dating program featuring Whitehawk has started (Healy *et al.* 2011). However the exact nature and function of causewayed enclosures is still unresolved. Almost 80 years after their recovery, the lithic assemblage from Whitehawk was re-examined with two main motives. The first one was to outline the composition and state of the current assemblage, and the

second was to determine whether more work should be carried out on the amalgamated collection.

It was quickly confirmed that the flint collection was biased towards tools and waste flakes / blades. Furthermore, for the first two seasons, recording relied on spits as a measurement of depth. Obviously a biased assemblage is difficult to interpret, especially when this is further complicated by a lack of regard to the archaeological stratigraphy. Despite the limitations, the collection has some potential to shed light on the activities undertaken at the camp. This assessment characterises the flint assemblage, considers the integrity of the current collection and provides recommendations for further work.

6.4.2 Methodology

The three publications (Ross Williamson 1930, Curwen 1934 & 1936) provide limited information regarding the original recording methodologies. For the first excavation only 14 artefacts were examined by Mr R. Smith from the British Museum. In the publication Ross Williamson pastes the comments made by Mr Smith on the "Flint Implements", then reports briefly on the "Flint Flakes". For the second excavation, G. Clark examined what appears to be the full assemblage although this is not clearly stated. His report is also brief. It lists "the most important flint objects from the excavation" (Clark 1934) and describes the flakes and cores. It is not clear from the publication who examined the flintwork from the third season. The flint report written by Curwen is again brief and concentrates on listing the flint implements.

Recently, the Brighton Royal Pavillon & Museums has traced the flints from the three excavations, and volunteers have re-bagged the material. They have written the following information on each bag: "Whitehawk CE", the accession number, the context number, the year of deposition and their description of the flint artefacts. A card with the same information was included in each bag.

The flints were then submitted to Archaeology South East where the pieces of struck flint were individually examined. They were classified using standard set of codes and morphological descriptions (Butler 2005, Ford 1987 and Inizan *et al.* 1999). Basic technological details as well as further information regarding the condition of the artefacts (evidence of burning or breakage, degree of cortication and degree of edge damage) were recorded. A x10 magnifier glass, and on occasion a stereozoom microscope at x7-45 magnification were used to examine the surfaces and edges for traces of minute retouch, damage and utilisation. A conservative approach to the identification of utilised and edge-retouch was taken because of the high degree of cortication obstructing evidence and because a number of other factors can produce similar edge damage (see below). The flint assemblage comprised four bags for which the "Whitehawk" provenance was unconfirmed, and only the material without issues of provenance was examined. A further 23 pieces originating from Whitehawk but not from the three excavations were also examined.

The assemblage was catalogued directly onto a Microsoft Excel spreadsheet. Accession numbers taken from the bags were entered on

the table, although some numbers were re-used on different bags. A number was assigned to each flint category, which might help to manipulate the data if further studies are conducted. The burnt unworked flint was quantified by number and weight. A copy of the catalogue has been printed for the archive; and, as requested by the Brighton Royal Pavillon & Museums, none of the descriptions made on the bags by the volunteers have been changed.

6.4.3 Results: quantification of the assemblage

The surviving flint collection from Whitehawk causewayed enclosure comprises 1035 pieces of struck flint weighing 32 866g (Table 14) and 157 fragments of unworked burnt flint weighing 7 117g (Table 15). This consists of the material recovered during the 1929 and 1930s excavations. In addition to the flints from these three excavations, 23 pieces with recovery dates ranging from 1874 to 1931 are likely to represent surface finds.

Year	Known contexts*		Unknown contexts**		Total
	On original museum register	Not on original museum register	On original museum register	Not on original museum register	
1929	53	257	7	27	344
1933	187	-	4	-	191
1935	77	187	-	213	477
Additional***	-	2	-	21	23
Total	317	446	11	261	1035

Table 14: summary of the struck flint by year (* with some contextual information (type of feature with sometimes cut / spit or context) ** with no contextual information; *** flints with year different from 1929, 1933 and 1935)

Year	Known contexts *		Unknown contexts **		Total
	On original museum register	Not on original museum register	On original museum register	Not on original museum register	
1929	1	2	16	-	19
1933	98	-	26	-	124
1935	10	-	-	4	14
Total	109	2	42	4	157

Table 15: summary of the unworked burnt flint by year (*with some contextual information (type of feature with sometimes cut / spit or context) ** with no contextual information)

It is clear that the current collection does not represent the total of flints encountered on site during the three excavations, nor does it represent the total of flints recovered and examined. Saville explained (2002, 92)

how lithic collections from causewayed enclosures have mostly been characterised by a low resolution recovery approach. This is valid for the Whitehawk assemblage which is certainly biased towards the collection of large, more visible, more recognisable or simply "nicer" pieces. The presence of cores and hammerstones suggest that flint knapping was carried out at Whitehawk. However, the flints in the current collection consist principally of tools and unmodified flakes, blade-like flakes and blades. Pieces of irregular waste and chips are limited to twenty two items. It is unlikely that the chips and pieces of irregular waste associated with knapping were buried elsewhere; and, although no bulk samples were extracted, it seems more probable that the excavators simply kept only a percentage of the flints they found on site.

In addition to the likely selective recovery approach applied on site, it seems that a proportion of the collected flints is also absent from the archive. Unfortunately none of the flint publication reports provide clear quantifications, but the three main texts and accompanying illustrations as well as the relic tables (present for the first season of excavation) highlight several discrepancies.

For instance, relic tables, present for the 1929 excavation, list and describe the flints found in each ditch using the following headings: implements, pot boilers, serrated flakes, worked flakes, used flakes, hammerstones, cores and remarks. Taken into consideration that the first column in the tables called "implements" may also include a few implements manufactured from bone and antler, the totals are still inconsistent (Table 16). If the figures in the relic tables indicate the correct amount of flints retrieved and quantified during the 1929 excavation then almost 30% of this assemblage has since been either lost or discarded. The original museum register is rather unhelpful in understanding the initial retention of flints as it lists only 60 pieces (Table 14). Comparing the lithics described in the relic tables and the lithics in the current archive, it seems that various flint categories are missing such as scrapers, axes, arrowheads, serrated flakes, cores and worked flakes.

	Struck flints in current collection for 1929	Struck flints on relic tables in the publication report* (Ross Williamson 1930, 88-96)
DI	247	365
DII	59	103
DIII	4	13
Unspecified origin	34	-
Total	344	481

Table 16: Discrepancy between the total of flints recovered during the first season and number present in current collection (* may include a few implements made from raw material other than flint)

In the 1933 flint publication report Curwen notes that the "flint flakes" from Ditch IV numbered 322 (*ibid* 1934, 104), but for 1933 the current collection contains only 84 pieces labelled Ditch IV. This suggests that

just for Ditch IV, 73.9% of the total flint assemblage has been either lost or discarded. Several tools illustrated in the publication reports are also missing: "part of a polished flint axe" plate XII, fig. 1, a "leaf-shaped flint arrowhead" plate XIV, fig. 13, a "flint arrowhead, petit tranchet" plate XIV, fig. 14 (Ross Williamson 1930), "portion of a polished flint axe" fig. 85 (Curwen 1934), "hinder end of reshipped polished flint axe" fig. 32 (Curwen 1936). Two of them (figs 1 and 85) may be exhibited at the Whitehawk micro museum. The surviving collection is definitely partial. The quantity of missing pieces is unclear because no original flint quantifications are present to compare with. This under-representation of the pieces of struck flint hinders specific studying methods (see below).

The current collection does not represent the total of flints encountered on site during the three excavations, nor does it represent the total of flints recovered and examined. It is clear that the collection is biased towards retouched tools and regular flakes and blades. No clear quantifications are present in the publication reports, so the amount of discarded flints will remain unknown. Nonetheless, the current assemblage confirms that a moderate amount of flints (1035 pieces) survived. The collection provides a glimpse of the material recovered from each seasons.

6.4.5 Raw material

In total, 97.19% of the assemblage (n=1006) displays varying degrees of surface cortication. The majority of the pieces are wholly re-corticated off-white, and a smaller amount of pieces are partly re-coloured milky blue or off-white. A large proportion of the assemblage displays small areas with concretions of very light brown minerals or sediment. These concretions and the overall strong cortication of the artefacts make it more difficult to observe characteristics of the raw material. All the pieces appear to consist of flint which is abundant locally. Only a very small amount of frost-shattered pieces was present. Where present the cortex was often thin (1 or 2 mm thick), but several pieces exhibit thicker cortical surface (between 4 and 8mm). It is principally weathered and abraded to varying degree. The raw material could have been collected locally from superficial deposits covering the chalk, for example from head deposits in the vicinity of the site or from clay-with-flints at a distance of just over 1km south east of the site. The nodules encountered as superficial deposits would have been of varying flaking quality.

Another source could have been the Upper Chalk itself. It comprises large un-weathered flint nodules. These could have been encountered and dug up while digging the ditches. Such sources were exploited through quarrying or shallow mining at Maiden Castle and Hambledon Hill (Gardiner 1988, 215). The relic table for DIII C1 mentions that "a seam of loose nodule flints in the centre of section" (Ross Williamson 1930, 96) was encountered while excavating spit 3 (20-30" depth). For the lower spit (spit 4, 30-40") the table mentions "large quantity of flints in section". No struck flints were recorded for this spit. It is therefore likely that flint nodules, encountered during the excavation of the ditches, were used as raw material.

Mined flint could have also been exploited. Possible sources of mined flint comprise Cissbury, at a distance of about 20km west of the site, as well as Church Hill, Blackpatch and Harrow Hill further west. Flint axes in the assemblage contain some impurities, and it is unclear if they originate from the exploitation of these mines. Gardiner explains that axes including polished ones are not necessarily manufactured using mined flint, (ibid, 350). At Maiden Castle un-weathered flint nodules from in the Upper Chalk were used to manufacture flint axes (ibid, 215).

On a very few occasions pieces exhibited a darker outer surface with an underlying light orange band, a characteristic of Bullhead flint. In total 13 pieces were made using this raw material that can offer good flaking properties. It seems that it was principally used for the manufacture of small thin blades. The pieces came from DI (2 blades, a serrated blade, a blade-like and a flake), DII (an exhausted blade core, a blade and a serrated bladelet), DIII (a blade), PII (a blade, a blade-like and a flake) and from an unspecified origin (a blade). Additional non cortical pieces of Bullhead flint are likely to be present. This raw material can be obtained from the base of the Reading Beds (Shepherd 1972, 114). Nodules would have available at a distance of some 20km from the site (Seaford). Nearer sources may include Hove and Peacehaven (Matt Pope pers. comment).

It should also be noted that an association between flint working and causewayed enclosures should not be unconsciously observed. The two Causewayed Enclosures (K1 and K2) discovered at Kingsborough, Isle of Sheppey showed a disparity in the amount of material present with a marked higher frequency at K1 than at K2. This was explained by the proposal that the enclosures may have served different purpose or were used by different groups (Butler & Leivers 2008, Leivers 2008).

Ross Williamson (1930, 80) mentioned that a hammerstone found in Ditch 2 (DII_CIV_2) was made of quartzite pebble. It is therefore possible that other local raw material such as beach cobbles or river pebbles were used. However, none were found in the current collection and the hammerstone mentioned by Ross Williamson is missing.

6.4.6 Condition

The condition of the flintwork is varied. Edge damage is common on a small proportion of the archived pieces that correspond to the material unrelated to the main three excavations labelled as 'additional' on Table 14. These pieces were possibly mainly collected from the surface, and their poor condition reflects their likely provenance from repeatedly reworked deposits. The condition of the remaining flintwork (the majority of the archived collection) is fresher. However, none of the pieces are in a very fresh condition, indicating that they have undergone minimal post depositional disturbance. They may have been primarily deposited in a midden-like deposit, and then either intentionally deposited in the features or simply inadvertently caught up in the fills. The period during which the material was left exposed was possibly short because no heavy damage associated with trampling and successive movement was recorded. However, the condition could simply be caused by some slight soil movements in the features or activities such as re-cutting of the ditches.

As noted above, in addition to the high level of re-cortication, areas with concretions were frequently recorded. Ross Williamson (1930, 79) differentiates the flints from the black mould (moderate patination and no encrustation) from the flints from the chalk (blue and dark grey colouring and thick lime encrustation). Several factors can play a role in the formation of re-cortication such as ground water conditions, soil mineral composition and the type of flint; and the differences noted by Ross Williamson should not be taken as a dating indicator. In total, 97.19% of the flints from the archive display varying degrees of surface cortication, and signs of concretion were common but mainly discrete. Based on technological grounds, the flintwork forms a coherent assemblage, and the slight difference in level of cortication is likely to have simply been influenced by the depositional conditions, with some fills being chalkier than others for instance.

Almost a quarter of the struck flints (23.38% of the entire assemblage, n=242) are broken. The broken areas are re-corticated indicating that the breaks took place in antiquity. A small amount of the struck flints (2.51% of the total assemblage, n=26) are burnt, but most of these pieces are only partially burnt.

6.4.7 Provenance

Flints of unknown origin account for 25.99% of the total archived flint assemblage (n=269). The remaining pieces originate from four ditches, five pits, a posthole, as well as from unstratified deposits. The results give the impression that flints were more common in DI than in the other three ditches (Table 17). However, unless the four ditches were excavated following the same standards, interpretation regarding the quantity of flints is in fact unhelpful. Totals in Table 17 should be interpreted with care because of the collection and retention biases highlighted above. Flint recovery methodologies and retention strategies were different for the three excavations, and for none of them the full amount of flints encountered is present. Furthermore, amongst the retained flints, the origin of 269 pieces is unknown (Table 17). It is unlikely that they represent surface finds because their condition is comparable to the rest of the assemblage recovered from the features. Also strip zones excavated during the last season are reported as being unproductive (Curwen 1936). Maybe these pieces came from the features but were never labelled or the labels got lost.

Provenance	Quantity	Total
DI - 1929, 1935	364	669
DII - 1929, 1935	95	
DIII - 1929, 1933, 1935 (+1931?)	121	
DIV - 1933 - 1935	89	
PII - 1935	53	91
PIII - 1935	26	
PIV - 1935	4	
PX - 1935	1	

Provenance	Quantity	Total
PXVII - 1935	6	275
SP7 - 1935	1	
U/S - 1935	1	
surface - 1913, 1930, 1935	5	
unspecified - 1929, 1933, 1935 & various dates	269	
Total		1035

Table 17: Provenance of the pieces of struck flint and hammerstone in the current collection (information from the bags)

Overall, the archived flintwork forms a coherent assemblage. Based on the presence of diagnostic tools and technological traits and based on the association with the "Whitehawk style" Plain/Decorated Bowl tradition pottery recovered from the features, the bulk of the lithic assemblage is likely to be Early Neolithic in date. Nonetheless, flint material associated with visits to the site before the construction of the causewayed enclosure or related to activities carried out once the ditches were out of use, could have easily accumulated in the ditch fills. During its occupational stage, re-cuttings could have also favoured some mixture of the flints. A few sherds of Ebbsfleet-style Peterborough and Beaker ware traditions were recorded, and it is likely that some of the flintwork belongs to these periods. The missing "flint arrowhead, petit tranchet" plate XIV, fig. 14 (Ross Williamson 1930) certainly indicates a middle Neolithic date. Some of the flintwork in DIII CVII and CVIII could also be contemporary with the Beaker pottery found in that location. No flints were recovered from the west cutting of DIV that produced some Late Iron Age/early Roman pottery. Overall the surviving flintwork is coherent; it is likely to be contemporary with the use of the enclosure but some mixture inherent with ditches, a minimal level of residuality and the presence of flints from later activities are more than likely.

The posthole and three of the five pits produced only small number of flints, but PII (east) and PIII (west) contained larger quantities of material (53 pieces and 26 pieces respectively). Assemblages from pits are interesting because they can offer greater integrity than assemblages from ditches. No diagnostic tools were present, but the flint is comparable to the majority of the flintwork from the ditches and it is likely to be Early Neolithic in date. No pottery was recovered from PIII, and PII contained only one sherd of Plain/Decorated Bowl tradition pottery.

6.4.8 The lithic assemblage

For the assessment, no systematic measurements were taken, but considering the entire flint assemblage, it is clear that the collection relates to a blade-based industry. Blades, blade-like flakes and bladelets are well-represented adding to 313 pieces (Table 18). These represent 37.75% of the débitage component (and 30.24% of the total assemblage). This percentage fits just outside the range suggested for Early Neolithic assemblages where between 13% and 36% is more typical (Ford 1987, 79, Table 2). The result could indicate a low level of

residuality. Evidence of Mesolithic presence is occasionally recorded on causewayed enclosure sites (Saville 2002). For Whitehawk, although a pre-causewayed use of the site is well conceivable, no evidence in the form of diagnostic microliths or microburins were present in the flint collection. This of course may be due to collection bias. Nonetheless, three small exhausted blade cores and several bladelets (blades less than 8mm in width) strongly suggest a Mesolithic presence. Furthermore several core tools would not be out of place in a Mesolithic assemblage.

	Flake*	Blade, Blade-like flake, Bladelet**	Chip	Irregular waste	Core, Core fragment, tested nodules	Retouched form	Hammerstone	Total
DI	162	143	-	6	6	43	4	364
DII	29	32	-	-	2	30	2	95
DIII	45	22	-	-	9	37	9	122
DIV	54	9	-	1	18	1	5	88
Pits and posthole	41	37	-	-	2	11	-	91
Remaining assemblage	163	70	1	14	3	21	3	275
Total	494	313	1	21	40	143	23	1035

Table 18: summary of the struck flint by feature (* includes core preparation flakes, ** includes core preparation blades)

Technical attributes were recorded. Although the hammer mode was principally indeterminate, the use of a soft hammer, witnessed by the presence of lipped and diffused bulbs of percussion (Onhuma and Bergman 1982, 163) was regularly noted. No systematic recording of every platform was undertaken, but it seems that plain and narrow platforms predominate over linear, punctiform and winged platforms that were present in smaller numbers. Platforms were not systematically prepared, nonetheless platform edges were routinely abraded for the controlled and predictable removal of blades and flakes. The presence of a core face / edge rejuvenation flake (DII CVI 3) and a core / face edge rejuvenation blade (DI CVI 2) confirms the concern with good core preparation and maintenance. These characteristics are shared by Mesolithic and Early Neolithic flint industries, and the majority of the flintwork is therefore likely to be contemporary with the use of the causewayed enclosure.

In total 38 cores (excluding tested nodules) were present. The cores were varied including three small blade cores, seven single platform flake cores, 15 multiplatform flake cores, three discoidal cores, two cores on a flake and eight unclassifiable or fragmentary cores. One of the three blade cores was made using a Bullhead flint nodule. It was

used to remove very fine bladelets, with the final length measuring 31mm. In fact, apart from the other two exhausted blade cores, the remaining cores were all aimed at the production of flakes. Several cores were well maintained and aimed at the production of small thin and narrow flakes, but large proportions were actually unsystematically worked and the scars suggest that they were used expediently to remove larger flakes. The average weight of the cores is 176g. Two tested nodules (weighing 226g and 384g) were also recovered from DIV.

In fact, more cores were present in the archived assemblage: several cores were re-used as hammerstones (and recorded as such). In total ten of the 23 hammerstones consisted of re-used cores or re-used tested nodules.

The current assemblage containing numerous cores and hammerstones indicates that knapping activities were carried out. However, no further interpretations (activity areas, different knapping stages...) can be confidently made because the assemblage is incomplete. Chips are almost absent. Pieces of irregular waste, primary flakes and trimming flakes from the primary stage of core reduction are uncommon. It is possible that most of the primary knapping stages took place elsewhere, with the cores brought partly prepared. In this case the tested nodules and bashed lumps may simply relate to accidental knapping while digging the ditches and encountering concentrations of nodules (see "raw material" above). It could also be that the primary flakes were deposited elsewhere. Some may have been utilised. In fact, primary flakes were sometimes selected as support for the manufacture of implements, particularly scrapers. Furthermore, although totals from different ditches should be compared cautiously, it seems that DIV contained more cores than the other ditches: 16 cores and two tested nodules (Table19). This could indicate that knapping was carried out in or around the ditch, or it means that the cores were deposited in this location.

Although a large quantity of hammerstones (23 in total) were recovered, it is obvious that some of them were used for other activities than flint knapping. They could have been used: to break nodules while digging the ditches (especially true for some of the hammerstones in DIV), to prepare food (as pestles, or to break bones), or to build structures. The heaviest hammerstone comes from a ditch terminal (DII CI 3) and weighs 1,300g; it consists of a large extensively used, round flint nodule, with facets covering a large surface area.

	DI	DII	DIII	DIV	Pits and posthole	Remaining assemblage	Total

	DI	DII	DIII	DIV	Pits and posthole	Remaining assemblage	Total
Flake	160	27	44	54	40	163	488
Blade-like flake	47	14	9	3	6	42	121
Blade	87	17	12	4	28	27	175
Bladelet	8	1	1	1	3	1	15
Core face/edge rejuvenation flake	-	1	-	-	-	-	1
Core face/edge rejuvenation blade	1	-	-	-	-	-	1
Thinning flake	2	-	1	-	1	-	4
Flake from ground implement	-	1	-	-	-	-	1
Blade from ground implement	-	-	-	1	-	-	1
Irregular waste	6	-	-	1	-	14	21
Chip	-	-	-	-	-	1	1
Tested nodule/bashed lump	-	-	-	2	-	-	2
Other blade core	-	1	1	1	-	-	3
Single platform flake core	2	-	1	1	2	1	7
Multiplatform flake core	2	1	4	7	-	1	15
Levallois/ other discoïdal flake core	2	-	-	1	-	-	3
Core on a flake	-	-	-	2	-	-	2
Unclassifiable/fragmentary core	-	-	3	4	-	1	8
End scraper	1	3	7	1	4	8	24
Side scraper	2	2	7	-	-	-	11
End-and-side scraper	2	2	4	-	-	4	12
Disc scraper	-	-	1	-	-	-	1
Denticulated scraper	1	-	1	-	-	-	2
Unclassifiable scraper	1	-	-	-	-	-	1
Piercer / borer	1	-	-	-	-	1	2
Notched piece	1	-	-	-	-	-	1
Denticulate	-	-	-	-	-	-	0
Serrated flake	7	2	5	-	3	2	19
Serrated blade-like	5	5	1	-	2	-	13
Serrated blade	16	9	4	-	1	1	31
Serrated bladelet	-	1	1	-	-	-	2
Backed knife	1	-	-	-	-	-	1
Single-piece sickle	-	1	-	-	-	-	1
Leaf arrowhead	-	2	1	-	1	-	4
Flaked axe	1	1	-	-	-	-	2
Polished axe	1	-	1	-	-	-	2
Miniature axe	-	-	-	-	-	2	2

	DI	DII	DIII	DIV	Pits and posthole	Remaining assemblage	Total
Other core tool	2	1	1	-	-	-	4
Retouched flake	1	1	1	-	-	3	6
Retouched blade-like	-	-	1	-	-	-	1
Retouched blade	-	-	1	-	-	-	1
Hammerstone	4	2	9	5	-	3	23
Total	364	95	122	88	91	275	1035

Table 19: the flint assemblage

A large number of unretouched flakes, blade-like flakes and blades appear to have been utilised (c. 156). However, a conservative approach to this identification should be taken because the majority of the artefacts were examined only macroscopically, and this approach is less precise than with a microscopic analysis (Young and Bamforth 2000). Therefore the amount of utilised pieces might be slightly fewer than 156. Surface wear and fracture scars can be caused by other factors such as trampling or even natural processes. However, it is interesting that causewayed enclosure flint assemblages seem to exhibit a high incidence of utilisation (Saville 2002, 96). The use-wear recorded on the pieces from Whitehawk could be related to various day-to-day domestic activities, or it may be related to more ceremonial preparations. In fact they could be used for a variety of tasks.

The surviving archived assemblage contains a large number of retouched pieces. They are listed in Table 19, described in more detail in the Microsoft Excel spreadsheet, and a selection is presented below.

6.4.9 Scrapers (51)

Fifty-one scrapers were present: 24 end scrapers, 11 side scrapers, 12 end-and-side scrapers, a disc scraper, two denticulated scrapers and one unclassifiable scraper. The majority were manufactured on flakes often, including primary flakes. The majority are simply retouched by minimal flaking, but a few examples display finer invasive retouch.

6.4.10 Serrated pieces (65)

In total 65 serrated pieces were recovered (twenty eight came from DI, 17 from DII, two from DIII, six from PII and three from unspecified origin). This represents only a quarter (n=267) of the total of pieces previously classified as serrated pieces with the relic tables for the first excavation totalling 205 serrated flakes, the second report 10 and the last one 52. Two reasons are likely for this difference; as noted above the current archive contains only some of the excavated finds. An example is from 1929_DI_CV_2 for which the relic table shows 53

serrated flakes. Only six examples were positively identified in the current archive. The second reason is in the set of codes used as reference to classify a serrated piece. A serrated piece (or microdenticulate) is a piece that displays a series of serrations along one or both edges. These are made using the edge of another flake by creating a fine incision at regular intervals. For many pieces the marks left on the edges were not convincing enough for the artefacts to be called serrated pieces. While some could have been worn serrated pieces, others were not retouched at all but simply utilised pieces. From the 65 serrated pieces recovered, 19 were made on flakes, 13 on blade-like flakes, two on bladelets and the majority (31 pieces) on blades. In most cases retouching was made only on one edge, and the retouch was mostly partial. Twenty two pieces were broken. The break could have occurred during use and relates to post use. Twenty four pieces displayed some gloss along the edge. Gloss was often limited to less than two millimetres.

6.4.11 Leaf-shaped arrowheads (4)

Four leaf arrowheads were present. They are all complete apart for one for which the tip is absent. Two came from DII, one from DIII and one from PIII. Originally DII produced three leaf arrowheads, but one of them is now missing (plate XIV, fig. 13, Williamson 1930). The four arrowheads in the current archive measure between 40.8mm and 62.6mm long. Two are very large and of Green's (1980, 1984) classes 1A and 1C, one is large and belongs to Green's 2B type and one is medium (3C Green's type). All four arrowheads exhibit retouch over both faces. Two (1929_DII_CIV_2 and 1929_DII_CII_2) display only partial short and long retouch. The retouches are mostly fine, stepped and scaled. One from PIII displays short continuous trimming along the edge on one face and only partial edge retouch on the other surface. The finest example came from 1933_DIII_CV_2. Its maximum thickness is 5.2mm, and displays bifacial invasive sub parallel and scaled retouch created by pressure flaking.

The exact function of leaf arrowheads is unclear and possibly encompasses warfare and hunting weapons as well as emblems of gender, or age status (Saville 2002, 96). Two sites - a defended hilltop settlement (Carn Brea, in Cornwall) and an entranced enclosure (Crickley Hill, in Gloucestershire) produced large quantities of leaf arrowheads that confirm intense fighting. In comparison causewayed enclosures produce relatively low numbers of leaf arrowheads (ibid, 98). The low quantity of arrowheads at Whitehawk suggests that no major conflicts took place there. The finest arrowhead came from 1933_DIII_CV_2. A grave with an adult and a neonate were found in 1933_DIII_CV_3. Two large blocks were also present, but the lack of clear contextual data makes it difficult to interpret the exact relation between the arrowhead and the skeletons. It seems that the arrowhead was not found with the skeletons, but instead just overlying the grave; just a coincidence or an offering?

6.4.12 Polished axes (2)

The archived collection contains two polished axes. The first one came from DI_CVI_3 and the second one from DIII (West). Circumstances

under which the later axe was recovered are unclear. The note "1931 Under Whitehawk Road" on the artefact suggests that it was found in the soil rather than on the surface, but it is not described in any of the three publication reports. The broken axe, the blade end of which is absent measures 122mm+ in length, with a maximum width of 57.7mm and a maximum thickness of 32mm. Slight pecking on the break and part of one edge suggests possible re-use as a hammer. The axe is finely polished on both sides although deep flake scar removals are visible. No clear indication of hafting was noted. The overall morphology with a narrow butt, lenticular section and faceted edges suggests a Type 1b (Gardiner 1988, 79) - Type C (Field, D. & Woolley 1984) axe. Gardiner (*ibid.*) explains that Type 1b faceted axes are very common. Two of the three polished flint axes found at Combe Hill are faceted (Drewett 1994, fig. 12). The second polished axe has been extensively reworked. The polished surface is more prominent on one surface than on the other. It could have been hafted and re-used as crude scraper.

6.4.13 Flake and blade from polished implement (2)

The flake with a polished surface from DII_CI_3 is likely to originate from a faceted ground axe. The blade (DIV_CIV_3) struck from the edge of a ground implement, could also come from a faceted ground axe, but the distal end is chalky so maybe not.

6.4.14 Flaked axes (2)

Two flaked axes were present, one from DI and one from DII. The flaked axe from DII_CI_3 is sub-triangular in section. It displays a narrow butt. The blade end exhibits a scar reminiscent of a tranchet axe sharpening flake scar removal. The other side of the blade end displays pecking and the tool seems to have been re-used as a core. The second flaked axe from DI_CIII_3 is broken. It is sub-rectangular in section. Both are very narrow.

6.4.15 Miniature axes (2)

Two miniature axes collected as surface finds were also present in the archive. They measure 83mm and 71mm in length respectively. One of them seems to be a fragment from a larger core tool, but the chalky surface with striations on the potential break refutes this interpretation. Gardiner (1988, 104) explains that miniature axes are commonly found in surface scatters all across the South Downs. Their function is unclear.

6.4.16 Single-piece flint sickle (1)

This artefact recovered from DII_CI_3 exhibits a plano convex outline characteristic of a single-piece flint sickle. It measures 83mm in length. One end is more pointed than the other. It is bifacially worked with low and semi-abrupt retouch. But it seems unfinished (maybe due to a flaw). An area of cortex was present on one side and no gloss was observed. Gardiner (1988, 94) mentioned that they are uncommon in south east England.

6.4.17 Dating and affinities

Based on technological and typological grounds, on the association with ceramic and other types of material, and given the overall contextual data, the bulk of the flint assemblage is considered contemporary with the use of the causewayed enclosure. The presence of three blade cores and several bladelets suggests an earlier occupation (or at least visits) of the site, although this was not confirmed by diagnostic pieces such as microliths or microburins. Mesolithic industry is based on the manufacture of blades, and both Mesolithic and Early Neolithic assemblages share many technological traits. It is therefore possible that some of the blades from the assemblage are actually Mesolithic. Surface finds pre-dating the enclosure could easily have become incorporated in the ditches and other features. Two miniature axes (likely to represent surface finds) could also belong to that period. The presence of a few residual pieces indicates a pre-causewayed use of the site, although it was possibly only low key. It is conceivable that a few pieces including some scrapers could equally be Late Neolithic or Early Bronze Age in date, although once more, no definitive diagnostic material was found in the current archive. (A "flint arrowhead, petit tranchet" was recovered from DI CIII 3 during the first season is now missing). Overall, the greatest part of the flint assemblage is considered contemporary with the main use of the monument during the Early Neolithic period.

The surviving flint assemblage comprises a mixture of unretouched flakes, cores and retouched material. It seems to differ from the flintwork from other causewayed enclosures in Sussex such as Offham (James, 1977), Barkhale (Clipson 1983), Combe Hill (Musson 1950, Drewett 1994), Burry Hill (Bedwin 1981), and Halnaker Hill (Drewett 1992) that produced a more restricted range of retouched pieces. But in fact, it fits well within the flint assemblages from many other causewayed enclosures in terms of its overall composition. The proportion of cores, unretouched flakes and retouched material from Whitehawk is actually consistent with most causewayed enclosures: The Trundel (Curwen 1929, 1931), Hambledon Hill (Saville 2008), Windmill Hill (Smith 1965), Etton (Middleton 1999), Abingdon (Leeds 1928), Briar Hill (Bamford 1985), and Springfield Lyons (Healey 2013) for example. The restricted range of retouched material from other causewayed enclosures in Sussex may be due to the size of the excavations or the level of post-enclosure use and destruction of the sites (by quarrying or farming for instance).

The assemblage compares particularly well with results from other causewayed enclosures in terms of the tools represented and in terms of the concentration of each tool represented. Scrapers, serrated pieces and utilised pieces (in some reports sometimes referred to as edge-trimmed or edge retouched pieces) usually dominate lithic collections, followed by piercers and smaller numbers of leaf arrowheads, axe-heads, and laurel leaves and other knives (Saville 2002, 93). The flint collection from Whitehawk follows this trend with 65 serrated pieces, 51 scrapers and a large number of utilised pieces, but only two piercers, four leaf arrowheads, four axe-heads, and two knives.

6.4.18 Activities

The presence of numerous cores and hammerstones provides evidence for knapping activities. This is commonplace at causewayed enclosures (Saville 2002, 93). The cores vary greatly in morphology. Some were well maintained and aimed at the production of small thin and narrow flakes, others were actually unsystematically worked and the scars suggest that they were used expediently to remove larger flakes. The latter category predominates, but drawing satisfying conclusions regarding the selected reduction techniques would be difficult for different reasons. With only a sample of the flints collected and subsequently retained, the current assemblage provides low refitting value. Chips and pieces of irregular waste are virtually absent. Secondly, it seems that a considerable amount of cores were re-used as hammerstones. So, further detailed analytical work on the cores will be inaccurate. Nonetheless the recycling of the cores is interesting. At other causewayed enclosures such as Offham, flint knapping was carried out in the ditches (James 1977). At Whitehawk the data is too incomplete to make similar observations.

The large number of retouched pieces and unretouched flakes and blades displaying usewear demonstrates that tool using activities were carried out on site. This practice seems widespread given the quantity of material. Nonetheless, Saville (2002, 92) explains that assemblages from causewayed enclosures are "normally in themselves rather unremarkable" and carry in fact similarities with assemblages from other site types. In the region, for example, flint assemblages from the un-enclosed settlement at Bishopstone near Seaford (Bell 1977), or from the "pits site" at Peacehaven (Anderson-Whymark, 2015) are quite similar to the Whitehawk assemblage. The condition of the implements suggests that the material is unlikely to represent caches of ready-to-use tools. The majority is actually well used, and the assemblage is more likely to represent deposits of utilised material including toolkits of flakes/blades and other tools. The serrated pieces, for example, are well used.

Implements were used on site (most likely), and they were possibly manufactured on site too. Nonetheless, the main tools represented (utilised pieces, serrated pieces and scrapers) produce very few or no evidence in terms of by-products. Otherwise, thinning flakes were uncommon. Causewayed enclosures are often pictured as monuments with what can be described as mainly "domestic activities". However, the ways in which tools have been utilised have often been incorrectly interpreted due to the lack of concrete evidence, leading to unfounded interpretations. For example, groupings of flint tools were used by Drewett (1994) to categorise the causewayed enclosures from Sussex. This is now disapproved (Saville 2002).

The interpretation of the activities carried out at the monument would benefit from a programme of use-wear analysis. Although the final interpretation may remain imprecise because as Jensen explains (1994, 166) during the Neolithic period "flint tools functioned primarily in the manufacturing and maintaining of other artefacts rather than in the subsistence sphere of activities". So when they were used to hunt, fish, gather or harvest, evidence may be direct and easy to interpret.

However, when flint implements acted as tools to create items made of either clay, chalk, wood, antler or bones..., the interpretation may become less satisfying. Nonetheless, use-wear analysis would considerably narrow down the ways in which tools were used at Whitehawk. The results could provide a valuable point of reference for other causewayed enclosures given that their function remains unclear. It would be particularly useful to confirm whether the latest analytical methods can help in interpreting the presence of gloss on numerous pieces of flint from Whitehawk. While Curwen's experimental work concluded that the artefacts displaying some gloss were used for cutting wood and corn (Curwen 1930) various other substances such as silicious plants and even meat have since been proposed (Saville 2002, Fullagar 2006). A fair amount of serrated pieces and utilised pieces are broken. It may be possible to determine whether the breaks are deliberate or accidental. However the high re-cortication may hide the necessary indicators described by Anderson-Whymark (2011).

6.4.19 Deposition

The difference between natural weathering caused by slight soil movement and weathering caused by utilisation is not always easily determined. Nonetheless, the flintwork was generally in a fair condition, but some slight edge damage was frequently noted. The overall preservation could indicate that the material was left exposed (maybe in midden-like deposits) before burial. But the location for these accumulations would not have been intensively used (trampled on). On the other hand, the condition could simply be caused by slight soil movement within the ditches themselves. It is simply difficult to infer on depositional practices, and at present the ways in which the flints were deposited and the reason why they were deposited remains unclear. Some of the flints may simply have been caught up in the features, but the majority were possibly deliberately deposited. If they were left in midden-like deposits, they could then have been deposited in a simple domestic fashion or if the "refuse" meant more than ordinary refuse, then, they could have been deposited in a more meaningful way. Some specific retouched pieces could have also been placed in association with other types of material.

The flint assemblages from the pits and the posthole are similar in terms of composition and condition to the assemblage from the ditches and, at present, it is difficult to know whether the flintwork was deliberately deposited or not, and why. Overall, does the flint assemblage represent straightforward disposal of domestic waste or some less mundane disposition or a mixture of both? The archived flintwork provides some potential to examine depositional practices. Further work on the condition of the flints alone (edges and types of breakage) could shed some light on this, although the intense recortication of the material may hinder any further analysis. It would also be helpful to consider the other types of artefacts here. Do they share the same conditions? Could some worked flints be deposited in association with other material - associated with human remains, or in ditch terminals for example?

In terms of deposition, the flints appear to be spread in all the ditches and other features, but it is interesting to note that very few retouched

tools were found in Ditch IV (Table 19). DIV stands out as well because it contains the highest number of cores and tested nodules. The low quantity of tools (one scraper r3688/97, an axe fragment and missing axe) and the best representation of cores in DIV might simply be a coincidence given that only a small part of DIV was excavated and that only a sample of the flints encountered are now in the collection. It could also indicate the presence of distinct activity areas or changes in the site function. At Abingdon, the change in artefacts in terms of composition and quantity has been interpreted as a change in site function (Bradley 1986). It could be interesting to check whether the same broad patterning has been recorded on other causewayed enclosures

6.5 The Registered Finds by Trista Clifford

6.5.1 Introduction

A total of 33 Registered Finds were examined for the purposes of this assessment. As well as these objects, at least a further seven are either catalogued in the records of Brighton Museum, or published in the 1929-1935 excavation reports, but were not available for assessment.

The bone and chalk objects from Whitehawk Camp causewayed enclosure represent part of a nationally important site archive. Since the excavations, contemporary monuments such as Windmill Hill have been subject to reassessment (Whittle *et al*). The aim of this report is to describe and briefly reassess the material in light of advances in artefact studies, the growing number of recorded Neolithic sites and assemblages in Britain and Europe and to suggest potential areas of future research.

Objects were recorded in full on pro forma archive sheets and a database created which is also linked to the GIS site plan. Each individual object was assigned a unique Registered Find number for ease of reference in reporting. A concordance of all museum accession numbers, figure numbers and textual references is provided in Table 20. For the purposes of this report objects are discussed according to material type; since the functionality of many objects is often not discernible they are best considered in terms of material first and foremost.

RF no.	Accession no.	Accession no.2	Context	Object	Material	Wt (g)	Refs
1	R4100/132		1935_E_DIII_4	Plaque	Chalk	648	
2	R4100/133		1935_W?_DIII_6	Plaque	Chalk	437	
3	R4100/130	HA221778	1935_E_DI_2	?Cup	Chalk	478	
4	R4100/126		1935_E_DIII_3	Worked antler 'comb'	Antler	178	
5	R4100/127		1935_E_DIII_3	Worked bone	Bone	183	
6	R4100/128		1935_E_DI_2	Awl	Bone	2	
7	R4100/129		1935_W_DIII_5	Worked antler point	Antler	3	

8	R4100/131		1935_E_DIII_4	Perforated cup	Chalk	124	
9	R4100/244		1935_DIII_4	Cup	Chalk	122	
10	R3162/148		1929_DI_CII_6	perforated cup	Chalk	89	1929 PI XVI Fig 4
11	R3162/149		1929_DI_CVI_3	(perforated) block fragment	Chalk	1900	
12	R3162/150		1929_DII_CI_3	perforated block	Chalk	384	1929 p80 no 4
13	R3162/151		1929_DII_CII_3	Cup	Chalk	103	1929 p79 no 1
14	R3162/152		1929_DIII_CI_1	perforated block	Chalk	94	1929 p80 no 7 Fig 3
15	R3162/153		1929_DII_CI_3	Awl	Bone	4	1929 PI XIV. 18
16	R3162/154		1929_DII_CII_3	Awl	Bone	1	1929 PI XIV. 15
17	R3162/155		1929_DII_CIV_3	Awl	Bone	1	1929 PI XIV. 16
18	SAS1929.8 5/2a		1929_DIII_CI_6	Cup	Chalk	272	1929 p80 no 8
19	SAS1929.8 5/2b		1929_DIII_CI_6	plaque?	Chalk	318	1929 p80 no 9
20	SAS1929.8 6/1		1929_DII_CI_3	perforated block	Chalk	1275	1929 p80 no 10
21	SAS1929.8 7/1		Unstratified- possibly 1929_DII_CII_3	?Cup	Chalk	68	Possibly 1929 p79 no2
22	R3688/113 a		1933_DIII_CVIII_6	Worked antler 'comb'	Antler	31	1933, Fig 89-90
23	R3688/113 b		1933_DIII_CVIII_6	Worked antler 'comb'	Antler	12	1933, Fig 89-90
24	R3688/116		1933_DIII_CIII_7	inscribed block	Chalk	1945	not illustrated or mentioned in text
25	R3688/118 a		1933_DIII_CV_7	incised block, part of b	Chalk	817	not illustrated or mentioned in text
26	R3688/118 b		1933_DIII_CV_7	incised block, part of a	Chalk	1604	not illustrated or mentioned in text
27	R3688/118 c		1933_DIII_CV_7	incised block	Chalk	479	not illustrated or mentioned in text
28	R3688/118 d		1933_DIII_CV_7	perforated and incised block	Chalk	963	not illustrated or mentioned in text
29	R3688/117 b		1933_DIII_CV_6	perforated block	Chalk	1287	1933 p131
30	R3688/117 a		1933_DIII_CVII_6	perforated and incised block	Chalk	595	not illustrated but mentioned in text
31	R3688/114		1933_DIII_CV_7	Cup	Chalk		1933 Fig 86
32	R3688/176		1933_DIII	perforated block	Chalk	3305	not illustrated
33	R3162/166		1929_DII_CIV_2	Awl- missing	Bone		1929 PI XIV.17

Table 20: Concordance of all available museum accession numbers, figure numbers and textual references for Registered Finds

6.5.2 The bone and antler objects

A total of ten bone and antler objects were recovered during the three excavations, however only nine of these were available to study.

Preservation is generally extremely good, particularly the objects from the first and last excavations. The two fragments of 'comb' from the 1933 excavations are less well preserved, the pH of the soil having had a detrimental effect on the condition of the bone. Objects were examined using a x20 magnification binocular microscope in order to identify tool and wear marks. Preservation of the original surface of the

bone was observed to be variable across the assemblage, probably resulting from localised soil conditions.

6.5.3 Antler and bone working evidence

Three objects which exhibit incised longitudinal grooves producing the effect of teeth were described as 'combs' within the original publications, the most complete of which is formed from a reused red deer antler pick (RF<4>). This object is a naturally shed right antler with evident signs of wear on the brow tine tip consistent with use as a pick. Its function as a comb was ascribed due to the 'toothed' appearance produced by the method of manufacture. This method appears to be consistent with the Mesolithic groove and splinter technique described by Clark and Thompson (1953) which was used to work antler at Star Carr. It is scored around the circumference of the beam with seven longitudinal grooves following the natural gutters in the surface of the antler, using a flint tool, to produce six splinter blanks. These splinters would usually then be removed and worked into finer tools such as points (Clark 1954). Five of the breaks are consistently worn indicating that the splinters were removed in antiquity, the sixth is a fresher break. Comparison of the object with the publication illustration (Curwen 1936, Fig 42) suggests that there was originally one remaining complete splinter which has broken off post excavation and is now missing. Consequently, technological evidence for reduction of the beam is now lost. Reduction of the beam length may have occurred during the object's previous use as a pick expediting its reuse, or it may have been deliberately ring cut, as at Hambledon Hill (Mercer and Healey 2008, 578). Two examples of red deer antler picks reutilised in this way were recorded at Hambledon Hill where it was remarked that the implement was 'of unusual form for the period' (*ibid.*, 583).

Similar objects recovered from contemporaneously excavated causewayed enclosures (e.g. Abingdon (n=5), Windmill Hill n=13) are also referred to as 'combs' with the assumption that they represent 'finished' 'complete' or 'broken' functional objects rather than 'transitional' objects deposited at a stage in the production process. The wear pattern on a number of these objects is considered suggestive of use in processing hides or wool (Leeds 1928, 449). Smith (1965, 127) notes that the tips of the teeth on the Windmill Hill combs are circular in section and that wear-polish extends up the handle of one example. Another 'comb' with similar wear polish on the tines was recorded at Etton (Pryor 1998). Wear polish is evident to some extent along the inner surfaces of the grooves on the Whitehawk example but since this is not consistent on all surfaces it is perhaps more likely to result from the abrasion of the grooving tool rather than use-wear. Unfortunately the absence of the terminus of the object means that without a full use wear analysis the definitive function of the object is ambivalent.

Two further red deer antler fragments, RF<22> and <23> came from Ditch 3 and were referred to as comb fragments in the report (Curwen 1934). These fragments are noticeably less well preserved than the others. RF<22> is a piece from the base of a naturally shed antler with three longitudinal grooves forming four splinters. The splinters have been broken off rather than cut, and the grooves are noticeably polished compared with the abraded surface. Two semi-circular

notches in the side of the object could be damage to the edge or may be the remains of circular perforations. The perforations, if deliberate, are smaller than the single holes made on socketed antler tools. No Neolithic parallels have been found and although antler beam tools with two or more perforations are known from Mesolithic sites in Romania (Beldiman 2005, Fig 8.1/2) the perforations are placed much closer to the base of the beam than in this example. RF<23> is smaller; only two splinters are apparent which are ?broken off. Similar polishing within the grooves is evident. The two fragments do not conjoin and are unlikely to derive from the same object. Only one utilised antler splinter, RF<7>, was recovered, from west Ditch 3. The splinter has been broken off roughly from the antler at one end and fashioned into an asymmetric point at the other. The pointed end exhibits two transverse incisions just below the tip which are most probably the result of the transverse grooves incised during the removal process. The surface is smooth and glossy.

Lastly, a juvenile right cattle tibia, RF<5>, from east Ditch 3 was utilised in a similar way. The proxima has been removed by ring cutting, the break polished smooth and the shaft incised with 10 grooves forming 9 splinters. The grooves do not extend to the distal end which is unworked. Two splinters have been removed using a transverse chopping action; the adjacent splinter bears shallow transverse cuts at the same point as the splinters were removed. The breaks are worn and slightly glossy consistent with the surface of the object which suggests the object remained in use in some way after the splinters' removal. So far, this object is without parallel; no other cattle bones of Neolithic date utilised in this way have been published. The function of the object is not known- perhaps it purely represents bone working in progress, or possibly it held some other significance which is now lost.

6.5.4 Tools

A further five bone tools were recovered, four of which were available for study. All are pointed, modified long bones and can be broadly classified as awls. The unassessed object is a small longbone point fragment from Ditch II Cutting IV Spit 2 illustrated in the 1929 excavation report (Ross Williamson 1930, PI XIV.17), apparently similar in shape to RF<17>.

Two other bone points from this excavation were examined. RF<17> is a small fragment from an unidentified medium sized long bone worked to a flat sectioned point, the very tip of which has broken off. Use wear is not particularly apparent on this object due to poor preservation of the surface, and it is broken across the diaphysis at a length of 45.7mm. A single longitudinal groove on one edge is visible under magnification.

RF<16> is another point formed from a quarter -section from the longbone of a pig or sheep. This one is fashioned to a fairly sharp point which has a flattened oval section and again broken across the diaphysis, where the section is crescent shaped, length 56.7mm. The surface of the bone is glossy, and longitudinal and transversely angled tool marks are clear along the edges where the blank splinter has been removed.

RF<6>, recovered from layer 2 of east ditch 1 is similar in form and also made from a medium mammal longbone. It is 72.6mm in length with a crescent shaped section at the broken end and a flat oval section at the pointed end. The object is broken across the shaft. The pointed end is glossy on the exterior surface and shows clear longitudinal tool marks on the interior surface extending approximately 20mm from the tip into the medullary cavity. These grooves may be the result of formation of the point but could have been produced by use of the tool.

RF<15> recovered from Cutting 1 spit 3 of Ditch 2, is the only complete tool within the assemblage, made from the metatarsal of a sheep. The awl is 69mm in length, consisting of the proximal end split in half with the shaft modified to form a point. Again, the surface of the point is slightly glossy. The length of the tool possibly suggests that the metatarsal was utilised to make two tools from one bone by ring cutting at the centre of the diapysis, or that it has been recycled from a broken longer tool; similar complete examples at Hambledon Hill have much longer shafts .

The technology used to produce these points or awls involves splitting the longbone into halves, quarters or possibly even smaller fractions to produce a blank, combined with abrasion to form the desired shape. The width of RF<17> suggests that groove and splinter was the method employed (Hayley Forsyth pers comm) since it would be difficult to produce such a thin fraction in any other way; a single groove is visible in the section on one edge of the tool which may have resulted from this process. The tool marks along the edges of RF<16> are also suggestive of this method; analysis of the tool marks may be able to confirm this. The manufacturing process of RF<15> follows those of the Hambledon Hill (Legge 2008, 584). These awl or point types are ubiquitous finds on a variety of sites of the period. Locally, pointed tools comparable with RFs<15>, <16> and <17> have been found on the Trundle (Curwen 1930, nos 162-3); seventeen metapodial awls were recovered at Windmill Hill (Smith 1965,129), and six from Hambledon Hill where the low numbers allude to specialisation rather than domestic settlement (Legge 2008, 584).

6.5.5 The chalk objects

Twenty three chalk objects were examined for this assessment. In addition to these, a further six objects were unavailable for study at the time of writing. This excludes the material from graves and other large chalk blocks mentioned in the three reports but evidently not deposited with a museum.

Despite their ubiquity, systematic study of early Neolithic chalk artefacts has been limited. Varndell (1991) provides a useful typology of chalk artefacts of the later Neolithic and early Bronze Age from Grimes Graves. Teather (2008) refines and adapts Varndell's typology to incorporate the concepts of portability and non -portability amongst other features. However the range of objects included is wider since it incorporates more than one site and her chronology is confined to the Neolithic, she omits some of the Whitehawk objects altogether and her thesis is as yet unpublished.

With this in mind, Varndell's typology has been used as the basis for this report, primarily for ease of reference and comparison with other assemblages although it should be borne in mind that the objects from Whitehawk predate those from Grimes Graves by almost a millennium. Therefore whilst a continuity of form and/or motif may be clearly evident, continuity of meaning or purpose cannot not necessarily be assumed (Varndell 1999). In particular, Varndell's group (f) miscellaneous is necessarily broad and includes much of the Whitehawk material which otherwise defies categorisation elsewhere.

Cups (well-made and fairly well-made objects)

RF<13> is a small sub-squared block of chalk, measuring 65mm x 58mm x 39mm with a shallow central circular hollow. The object is strikingly similar to a cup from the Trundle (Curwen 1930, Plate XIII.38) and two examples from Windmill Hill (Smith 1965, Fig 56 C6, C7); the latter are described as being from 'primary levels'. Complete circular cups of similar form have been recorded from late Neolithic and Bronze Age deposits at Grimes Graves, where they were interpreted as lamps although a recent lipid analysis seems to rule out this possibility (Tanimoto et al 2011).

Large chalk blocks: unfinished cups?

RF<31> is a wedge-shaped fragment from a cup which is carved to produce a 90 degree angle with deep straight grooves incised into the inner surface; the outer surface is fairly rough and unfinished but follows the same 90 degree angle. It has maximum dimensions of 93mm x 59.5mm x 54mm. One side has been cut straight. A very close parallel was recovered from the Trundle (Curwen 1930, Plate XVI.177). Although the cups look broken and/or unfinished it is difficult to imagine that these objects were not deliberately produced in this form given their similarities. Similarly 'unfinished' or fragmentary cups with circular pits on the inner surfaces rather than straight incisions were also recovered from Windmill Hill (Smith 1965, Fig 56 C1, C2).

RF<9>, from Ditch 3, context 4 consists of a similar quarter -circle cupped hollow carved into top of a squared chalk block (80.5mm x 53mm x 29mm), again with one straight and one unfinished edge; this unfinished circle motif is reminiscent of RF<31> and the Trundle cup.

RF<18> from Ditch 3, cutting 1 spit 6 is a large block measuring 140mm x 87mm with squared sides and incised striations within the hollowed upper surface. Again, this is a 'slice' from a cup which may not have ever been a completely circular object. The thickness ranges from 39mm at the outer edge to 9.6mm at the inner section.

Perforated objects

Perforated objects at Whitehawk are variable in their morphology and therefore probably in their function. Two broad categories are present: small pieces with regular 'hour-glass' perforations and larger pieces in which the perforations may have been formed by boring from both

sides (hour-glass) or those where the perforation is smaller and roughly the same in diameter all the way through.

Small perforated pieces

RF<8> (East ditch 3, layer 4) is a roughly triangular block 63 x 58 x 42mm with an hourglass perforation drilled from either side with a maximum diameter of 27mm at the outer edge and c7mm in the centre. A similar piece from the Trundle excavations (Curwen 1930 Pl.XIII.38) has a more developed perforation; an unstratified parallel also exists from Windmill Hill (Smith 1965, 132). RF<14> consists of half of a sub-circular block broken across the central perforation (diameter c.31mm/centre 13.7mm). The block measures 94.5mm across and is 25mm thick at its thickest point. The upper and lower surfaces and sides have been smoothed and flattened. This object has no direct parallels and seems to be unique in its regularity.

Larger perforated blocks

The 1929 excavation report describes four large 'well smoothed lumps' which might have been used as loom weights (Williamson 1929, 80). Two of these objects are now missing. Ditch 2, cutting 1 spit 3 contained two semi-circular perforated blocks, RF<20> and <12>, both broken across the perforation. The largest of these, RF<20>, measures 86 x 103 x 94.5mm and has holes pecked through from either side resulting in an X shaped perforation, diameter 34.5mm. The smaller RF<12>, measuring 126 x 70 x 58mm, is comparable to a complete 'loom weight' from Maiden Castle (Wheeler 1943, 184).

Two more blocks also attributed this function were recovered in 1930. RF<29>, came from ditch 3 cutting 5 spit 6. The block measures 186 x 95 x 129mm. It is U shaped and has a flat base with tool marks visible. The perforation has been formed by drilling into the base in a square formation; at least 9 drill marks are visible. The resulting perforation is cone shaped and measures 56mm in diameter at the base. This is also described as a probable weight (Curwen 1933, 131) and does exhibit a worn linear area on the thinnest point although the placement of this is not obviously the result of suspension and it could easily represent a drilled perforation similar to those on the surface of RF<25/26>. RF<32> is a polygonal block measuring 230 x 190 x 85mm with a perforation (max. diameter 31mm) at the apex recovered during work on a water main and RF<28> a rounded block with a broken perforation (max. diameter 23.5mm) also at the apex. This example is also incised on the surface with fine lines and stabbed dots; although catalogued as part of the archive these objects were omitted from the 1933 report. Direct evidence for textile production during the Neolithic is particularly scarce in Britain and although interpreted as loom weights there is no wear evidence for suspension on any of these objects to suggest such a function.

Objects with incomplete perforations

Again this category includes artefacts disparate in size and, therefore almost certainly function. Three objects with incomplete hourglass

perforations were recovered. RF<3> is a sub-circular piece of chalk measuring 118 x 102 x 52.5mm with a shallow circular depression scraped out of the middle on one side (diameter 72mm); on the other side is a steeper sided hollow which has been made by 'pecking' out the chalk (diameter 32mm). The two hollows are placed directly opposite each other in the manner of the fully perforated examples described above. Two similar objects, RF<21> and <10> also have paired circular hollows however in both instances the hollows are adjacent rather than directly opposite each other, therefore not intended to produce a single perforation.

'Work surfaces'

Only one object falls into this category. RF<24> is an irregularly shaped block with a single worn and slightly concave surface scored with multiple lines, all of which follow the same direction. Varndell suggests that at Grimes Graves these were used as preparation surfaces or polissoirs (1991, 103) but notes the absence of commensurate polished objects on site.

Miscellaneous objects

Varndell defines this category as including blocks which bear deliberate deeply grooved abstract motifs, oddities and other categories which do not belong elsewhere. Consequently, four objects are included here. The most enigmatic of these are two chalk 'plaques' bearing incised linear motifs, RFs<31> and <32>. The most striking of these, RF<32>, is described as a 'chessboard' (Curwen 1935, 85). The piece measures 136x137mm, is irregularly pentagonal in plan and has a thickness of 42.5mm. The surface bears a geometric motif of intersecting lines producing a grid-like design. In the lower half of the surface, a number of triangular motifs are also visible. The reverse exhibits three widely spaced horizontal lines bordered by two vertical lines. The regularity and purposefulness of the incisions certainly appear to confer intentionality if not meaning.

RF<33> (dimensions 130x98.5x30mm) is also pentagonal although the top of the object has been deliberately rounded. It is less regularly decorated, bearing seemingly random intersecting linear 'scratches' and stab marks on the primary face. These are described by Curwen as 'nonedescript' however the reverse bears a more regular grid like pattern similar to RF<32> and one side is also incised with single linear marks which again suggest intention. This shares similarity with a plaque from Butterworth Down Amesbury (Lawson 1993) which is also decorated on both the faces and sides. A third 'plaque', RF<19>, measuring 82x100x47mm exhibits incised striations which radiate towards a rounded edge. The thickness increases from 27mm at this edge and 47mm at the opposite edge which gives a dished appearance to the profile which might indicate that the object was intended to be a cup rather than a plaque.

Varndell discusses several chalk plaques in her 1999 paper on the Kilham plaque which, sharing decorative similarities with grooved ware pottery motifs, has been stylistically dated to the Later Neolithic. None are as potentially early as the Whitehawk examples, and whilst it could

be suggested that the decoration on the Whitehawk plaques bears some resemblance to contemporary pottery, the definite grid-like pattern is definitively absent from the decorated pottery assemblage. The method of incision into the surface of the chalk is not one generally employed by potters of this period; only 8.4% of the decorated bowl assemblage exhibits incised decoration (Doherty, this report). Furthermore, the motif doesn't appear on pottery of the later Neolithic either and while examples of stabbing decoration are found on a tiny percentage of the pottery, given that this is one of the simplest methods of decoration available this is not surprising. Overall it is considered unlikely that the decoration of the Whitehawk plaques reflects that of the pottery assemblage.

Lastly, a large, rounded block from ditch 3 cutting 5 spit 7, RF<25/26>, weighing 2421g exhibits three small cup marks or incomplete perforations on the upper surface which appear to have been drilled into the surface. Two are linear, having been drilled at an angle. On the flattened underside is a linear mark with a V shaped profile 52mm long. A block measuring 116.5x 103 x 81mm with a shallow linear impression c.20mm wide along the widest edge was also, which was derived from the same context but was omitted from the original report (RF<27>). This shallow impression is very ephemeral and could be a natural feature.

6.6 The Geological Material by Luke Barber

6.6.1 The museum accession registers list some 46 pieces of stone, weighing in excess of 29.3kg, from the site, four of which were not available for viewing during the current assessment. Of these four, one was inaccessible in the basement store (a large lower stone from a quern), one was elsewhere in the 'micro museum' (a possible grinding pestle) and two were simply unaccounted for (one quern and one miscellaneous piece). Although these missing pieces precluded the establishment of the exact weight of the accessioned assemblages the descriptions in the accession registers is usually of enough detail to establish the type and use of the missing stones. As such the accessioned stone from the three main excavations (1929, 1933 and 1935), together with a few stray finds from other years, is characterised in Table 21. This assemblage has been fully recorded on Registered Finds pro forma for archive, with the information being used to create an Excel database. No fresh breaks were made on any of the material during this process, with stone identifications having to be made from weathered surfaces. Having said this, with the exception of a few discrepancies with the published report identifications, it was found the type identifications in the museum accession registers were quite accurate.

Stone type/Year	Misc	1929	1933	1935
Sarsen	?Polishing stone 1/314g Quern 1/589g	Quern 7/10,524g	Quern 3/2768g+	Quern 3/2917g
Tertiary ferruginous sandstone	Misc. 1/527g	Quern 4/3251g	-	Misc 1/? Quern 2/5272g+

Quartzite pebble	Polishing stone 3/865g	Polishing stone 3/395g Hammer stone 1/236g	Polishing stone 11/1232g Hammer stone 1/55g	Polishing stone 1/44g
?Greensand	-	?Quern 1/211g	-	?Grinding stone 1/?*
Welsh slate	-	-	-	Furniture? 1/139g
Totals	6/2295g	16/14,617g	15/4055g+	9/8372g+

Table 21: Summary of combined stone assemblage in archives/listed in museum accession registers. (*Excludes material mentioned in published reports but apparently never accessioned. NB. A weight with + or ? means not all the stone listed in the archive was available for weighing. * indicates stone not seen*).

6.6.2 Study of the published reports of the 1929, 1933 and 1935 excavations (Ross Williamson 1930; Curwen 1934 & 1936) makes it quite clear that not all the excavated stone found its way to the museums and/or stone is present in the museums that was not mentioned in the publication. Although the latter situation can easily be remedied by the current assessment, the apparently discarded stones are slightly problematic. However, these appear to only relate to the 1929 excavations. For example, Williamson mentions 52 fragments of quern were recovered (Ross Williamson 1930, 80) though only 11 are listed in the accession registers. Study of Williamson's report suggests that the missing pieces consist of one fragment of Tertiary ferruginous sandstone and 40 Sarsen quern stone fragments, presumably discarded or lost prior to accessioning. What cannot be quantified are the types and quantities of probably unworked stone that were not collected during the excavations – it is unlikely this material would have been retained during excavation as a general rule.

6.6.3 Querns are the most common artefact type represented, particularly if one takes into account the 40 pieces discarded from the 1929 excavations. All are of the earliest form, described as grain rubbers by the excavators, but classified as Type 1 saddle querns by Peacock (2013). Certainly the term 'grain rubber' is quite apt at describing the rounded or stubby sub-rectangular lower stones with dished grinding surfaces – only the most minimal shaping has been applied to the natural boulders and there are certainly no shaped elongated saddles querns. Having said this, many of the fragments are too small to be able to ascertain the full size/form of the stone in question. Certainly deliberately shaped Sarsen saddle querns were being used later in the Neolithic, though are admittedly more common in the Bronze Age (Barber forthcoming).

6.6.4 The Whitehawk assemblage is essentially dominated by two stone types, both of which would have been locally available as weathered boulders on the downs. The most common type is Sarsen sandstone, usually as light to mid-grey pieces (sometimes with dark grey gritty inclusions), though often with a pinkish/purple tinge. Sarsen querns were recovered from all excavation seasons and consist of both lower (x6 examples) and upper (x6 examples) stone fragments as well as two of indeterminate type. Most pieces are very fragmentary but two complete/near complete upper stones are present, both with

characteristic convex grinding faces: a 1437g stone measuring 167 x 119 x 67mm (1929, D2, C4, S4) and near complete 1287g D-sectioned stone measuring 155 x 113 x 49mm (1935 W Ditch 3). The lower stones are more fragmentary, the largest example measuring 12.5 by 9 by 7 inches and weighing some 33lbs (according to the register: unseen – in basement store).

- 6.6.5 The other stone type consists of medium-grained brown ferruginous Tertiary sandstone. Three upper and three lower stones are represented together with a couple of probably unworked pieces and a missing quern mentioned in the 1929 excavation report. All three upper stones were from the 1929 excavations, the best of which consists of a 460g plano-convex-sectioned example measuring 115 x 104 x 29mm (D2, C5, S1). The lower stones (1929 x2 and 1935 x1) are all fragmentary with the exception of a 5272g example from the 1935 excavations (260 x 140 x 80mm). This example, which appears to be erroneously referred to as Lower Greensand in the published report, has clear wear from grinding in one axis and really marks the start of the typical elongated saddle quern so common in the area. Lower Greensand accounted for all Neolithic querns at The Trundle (Curwen 1929) though no definite querns of this type have been recovered from Whitehawk to date. However, the presence of a 'possible' Lower Greensand quern fragment from the 1929 excavations (D2, C6, S1) shows the stone type was making it to the area at this date.
- 6.6.6 The other major functional category group of stone consists of polishing, or more rarely, hammer stones. These are virtually all represented by circular or oval flattened quartzite pebbles. Although not of local origin such stones would have been available on the beach due to Longshore Drift, and were clearly sought out for their useful properties. Such quartzite pebbles are a common find on prehistoric sites along the coastal fringe of Sussex, particularly during the Neolithic and Bronze Age periods (e.g. Barber 2015). Although all interventions at the site have produced some of these stones, the 1933 excavations produced most (Table 21) even though they are not mentioned in the published report (Curwen 1934). The stones, which frequently exhibit a slight polish wear on their larger faces, could have been put to a number of uses including flint polishing, grinding up foodstuffs and pottery production. The two examples of hammer stones have clear signs of repeated impact damage on their ends (1929 D2, C6, S2 and 1933 D3, C7, S5).
- 6.6.7 With the exception of a few apparently unworked pieces, including unaccessioned fragments of Lower Greensand (x2) and Wealden sandstone from the 1929 excavations (Williamson 1930, 80) there are very few other pieces. These include a grey pear-shaped pebble for use for polishing or as a grinding pestle, listed as Greensand from the 1935 excavations (East D3, Level 1) and a roughed out cylindrical object in Sarsen, perhaps a polishing/grinding stone in the making (Acc. No. R3156 but no details). The only other stone consists of a fragment from the end of a 19th- century furniture slab top of 19th- century Welsh slate (1935 south side of surface soil).
- 6.6.8 The majority of the stone, like many of the other artefact categories, was from the inner enclosure area investigated by Williamson. This

could either suggest this area was the focus of domestic/craft activity or that this section of the ditch was in use longer and therefore generated a correspondingly higher number of artefacts. Certainly the most recent excavations at the site recovered relatively little material culture and no stone is mentioned in the published report (Russell and Rudling 1996). The causewayed enclosure at Offham also failed to produce any querns or polishing stones (Drewett 1977). The excavations of the 1920s and 1930s have therefore provided a significant assemblage of stone and, despite the loss/discard of some parts of it, it is still largely reconstructable. However, despite the fact that all of the published early reports mention stone, none illustrate any pieces, though a single item is illustrated in Curwen's study of querns (Curwen 1937, Plate II, No. 1). This is perhaps not surprising, given the little that can be gleaned from illustrating essentially naturally-formed pebbles and utilised sandstone boulders. However, there are a few complete/near complete pieces of quern within the assemblage that could be illustrated to show the general morphology of these early pieces.

6.7 The Human Remains by Dr Paola Ponce

6.7.1 Introduction

The Whitehawk human skeletal collection comprises of articulated and disarticulated remains. The former group included five individuals: three adults [SKI 1933/128], [SKII 1933/129], [SKIII 1935/139], one juvenile [SKIV 1935/140], and one neonate [SKII 1933/129a]. According to the original records (Curwen 1934, 1935) these were found in a crouched position and buried in deliberate graves inside ditches, sometimes accompanied with grave goods.

Their state of preservation was fair to good although the periostium (outer layer of bone) was abraded by the chalky soil conditions. The degree of completeness was relatively good although the plaster used to reconstruct fragmented elements obstructed the observation of specific diagnostic features.

The disarticulated group constituted the bulk of the skeletal collection and included both adult and non-adult individuals with various degrees of completeness and preservation. Most of the disarticulated remains resulted from three consecutive field excavations (Curwen 1929, 1934, 1935) and appear to have been found scattered either among the animal bone, casually lost or deliberately thrown in ditches.

As observed at a number of Neolithic sites, including causewayed enclosures such as Whitehawk Camp, the frequent occurrence of non-articulated human remains has been considered as resulting from a special treatment of the dead. Thus, disarticulated remains are often interpreted as bodies subjected to certain "ritual" or "ceremonial" practices. For instance, the manipulation of human remains by means of body exposure to post-depositional scavenging either in a "sealed" monument or in an "open" monument, the collection and deposition of remains following their exposure (secondary and tertiary burial practices) are all examples of Neolithic mortuary practices (Fowler, 2010). Within this context, body exposure to scavenger animals with subsequent evidence of pitting, punctures, furrowing, gnawing marks,

and spiral fractures has been suggested as evidence of excarnation (Smith, 2006).

Other body modifications such as decapitation, cranial trauma in the form of healed (pre-mortem) or unhealed (peri-mortem) injuries may not necessarily represent special mortuary practices according to Schulting (2012) but a context of inter-personal violence. However, Roberts and Cox (2003) emphasised that whether trauma represents interpersonal violence or an accidental injury is debatable. Furthermore, signs of butchery, defleshing and dismemberment in the form of cut marks, scrape marks, chewing marks, percussion and anvil striae, and peeling have been interpreted as examples of cannibalism (Boulestin et al 2009). Finally, cremated bones, scorched or charred bones are also present in numerous Neolithic sites representing the special treatment given to human remains within this period (Fowler 2010).

In the light of the contrasting opinions and conflicting interpretations regarding the treatment of the dead during the Neolithic period, this report will attempt to explore the reason/s behind the differential treatment of both articulated and disarticulated human remains from the Whitehawk Camp skeletal collection.

6.7.2 Material and methods

The articulated and disarticulated skeletal material comprising the Whitehawk Camp collection was analysed in the Finds Laboratory at Portslade (Brighton, East Sussex). The initial analysis consisted of preparing an inventory of all the remains recovered in the three digging seasons (1929, 1933, and 1935). Disarticulated fragments were identified to skeletal element (which part or parts of the bone are present, left or right if relevant) and the minimal number of individuals was calculated.

Standard sex and age assessment were carried out on both articulated and, whenever possible, disarticulated human remains.

Patterns of bone modifications were identified and recorded following Boulestin et al (2009) and Binford (1981) according to whether they were produced by humans or non-human agents.

6.7.3 Minimum number of individuals

The minimum number of individuals (MNI) refers to the fewest possible number of individuals in a skeletal assemblage and is used to estimate how many individuals are represented in the sample (Roberts 2009). In the Whitehawk disarticulated assemblage the MNI was calculated on the basis of the skull which represented the bone with the highest frequency among the disarticulated material.

6.7.4 Sex estimation

A set of multifactorial methods were used to estimate sex because they provide the most accurate results possible (Krogman and İşcan, 1986). Thus, a combination of osteometric analysis and the observation of dimorphic traits of the pelvis, sacrum and skull were employed.

The osteometric analysis was based on discriminant functions and taken on measurements of the humeral, radial and femoral heads, the bicondilar width, the maximum length of the clavicle and the width of the glenoid cavity of the scapula. These were carried out following Stewart (1979).

The dimorphic bones analysed were the pelvis, the sacrum and the skull. In the former, the ventral arch, the sciatic notch, the sub-pubic angle, the ischio-pubic ramus, the pre-auricular sulcus, the obturator foramen, the acetabulum, and the pelvic inlet were used according to Buikstra and Ubelaker (1994) and Bass (2005). In the sacrum, the sacral ala and the sacrum shape were used according to Bass (2005). In the skull, the supraorbital ridges, the glabellar profile, the mastoid process, the frontal slope, the posterior zygomatic, the nuchal crest, the mental eminence and the gonial flaring of the mandible were used according to Buikstra and Ubelaker (1994) and Bass (2005).

The skeletons of non-adult individuals (new born, infants and juveniles) that did not show up distinctive dimorphic traits or that did not present fused epiphyses necessary to perform the osteometric analysis, were not assigned to any sex category.

The sex categories assigned to the skeletons were male (M), possible male (M?), female (F), possible female (F?) or unknown (?) when the degree of incompleteness, poor preservation or ambiguous results did not allow definitive assignments to either sex.

6.7.5 Age Estimation

Age-at-death was established using a combination of standard osteological techniques. These included the morphological changes observed in the pelvis such as the pubic symphysis (Brooks and Suchey 1990), and the auricular surface (Lovejoy et al 1985). Other methods included the development of the epiphyseal union of long bones (Scheuer and Black 2004), the eruption of teeth and dental development (Ubelaker 1989), dental attrition (Brothwell, 1981), and the measurements of long bone lengths (Maresh, 1970 and Scheuer et al 1980).

The age categories employed for human skeletal material are summarised in Table 22.

Age category	Description	Years
0	Foetus and neonate	Before birth- 11 months
1	Infant 1	12 months – 6 years
2	Infant 2	7 – 12 years
3	Juvenile	13 – 17 years
4	Young Adult	18 – 30 years
5	Prime Adult	31 – 45 years
6	Mature Adult	45 + years
7	Adult	18 – 45 + years

Table 22: Age categories

6.7.6 Stature Estimation

In preparation for the calculation of stature estimates, the length of complete long bones was also recorded because this is believed to indicate the nutritional status of a population (Roberts and Cox 2003). Whenever possible, a left femur or tibia was used to estimate stature. When these were broken, pathological or not present, the opposite side was used instead. In cases where no femora or tibiae from either side were present, the humerus, radius, ulna or fibula were measured.

6.7.7 Pathology

The post-excavation analysis included the provisional assessment and diagnosis of basic nature of gross pathology on all skeletons and bones present. This analysis was carried out following the diagnostic criteria described in Aufderheide and Rodriguez-Martin (1998) and Ortner (2003).

6.7.8 Minimum number of individuals

The minimum number of individuals (MNI) was calculated for the disarticulated human remains. The skeletal assemblage comprised at least 6 individuals.

6.7.9 Sex Estimation

The assessment of the biological sex was possible in the group of articulated adult skeletons. The human remains from the disarticulated group were assessed for sex whenever possible; in other words providing there was sufficient dimorphic traits of the pelvis and the skull preserved to carry out this study. In total, there were two females, one possible female, one male and two possible males.

6.7.10 Age Estimation

The age assessment of articulated individuals and disarticulated remains ranged from foetus/neonate (before birth- 11 months) to prime adult (31 – 45 years). However, the age group most highly represented in the assemblage was young adult.

6.7.11 Stature Estimation

With regards to the calculation of stature, there were two skeletons with well-preserved long bones from the articulated sample [SKI 1933/128] and skeleton [SKII 1933/129]. These can be used to calculate stature.

6.7.12 Pathology

In terms of pathology, the conditions observed were degenerative, congenital, trauma, occupational and dental disease.

Degenerative

Degenerative conditions such as osteoarthritis, which is more prevalent among old adult individuals; was present affecting the spine of two Whitehawk individuals despite their young age.

Congenital

Congenital anomalies included a case of sacralisation (5th lumbar vertebra fused to the sacrum).

6.7.13 Trauma

Traumatic conditions were represented by Schmorl's nodes (grooves on the vertebral bodies resulting from disc herniation). Also observed were possible peri-mortem fractures, cut marks and gnaw marks. Examples of the former were found in skulls and in long bones of both articulated and disarticulated remains however, none of them belong to a "high probability" category as described by Schulting (2012). Two skulls (one from an articulated skeleton and one disarticulated) exhibited concentric or radiating fracture lines suggestive of peri-mortem injuries but the lack of sufficient diagnostic criteria resulting from poor preservation or from excessive plastering for reconstructing the broken pieces prevented the confirmation of this premise. One of these individuals also showed a possible penetrating injury in the occipital bone and two of his/her ribs showed possible gnawing marks. Other cranial injuries of "low probability" were found in two skulls from the disarticulated group. Long bones (three examples from the disarticulated assemblage) also showed "low probability" peri-mortem trauma. Finally, one cut-mark, of a "high probability" was found on the mid diaphysis of a humerus from the disarticulated assemblage.

6.7.14 Occupational

Evidence of activity-related conditions such as the so-called "squatting facets" was noted on a number of tibiae. Furthermore, the presence of a possible example of palatine torus from one articulated skeleton could not rule out evidence of mechanical stress being exerted on the masticatory system.

6.7.15 Dental

Finally, with regards to dental health, the most common pathological conditions present among all teeth observed were dental caries, dental attrition (or dental wear), and calculus (mineralised plaque). Dental attrition is not considered a pathological condition *per se* (Ortner 2003); however excessive dental wear can destroy the enamel of the teeth thus, exposing the dentine to bacterial infection and other dental complications including caries and periodontal disease. The last two listed were also present within the Whitehawk assemblage along with dental calculus.

6.7.16 Miscellaneous

Two small fragments of burnt skull (a possible fragment of occipital bone and an unidentified skull fragment) were also present within the disarticulated group.

6.8 Animal bone by Hayley Forsyth

6.8.1 Introduction

The previous excavations (1929, 1932-3 and 1935) produced a large quantity of animal bone and re-analysis produced an animal bone assemblage containing 909 fragments. Unfortunately, the complete assemblage was not available for study; the near complete articulated skeleton of a roe deer from the 1933 excavations is absent, believed to be in the Natural History Museum, London. It is not clear how many disarticulated bones are absent, if indeed any are.

6.8.2 Methodology

The assemblage has been recorded onto an Excel spreadsheet in accordance with the zoning system outlined by Serjeantson (1996). Wherever possible the fragments have been identified to species and the skeletal element represented. Elements that could not be confidently identified to species, such as long-bone and vertebrae fragments, have been recorded according to their size and identified as large, medium or small mammal.

In order to distinguish between the bones and teeth of sheep and goats a number of criteria were used including those outlined by Boessneck (1969), Boessneck et al (1964), Halstead et al (2002), Hillson (1995), Kratochvil (1969), Payne (1969, 1985), Prummel and Frisch (1986) and Schmid (1972). Goats that have been tentatively identified due to bone fragmentation have been included within the main sheep/goat assemblage. Tooth eruption and wear has been recorded according to Grant (1982) and only recorded for mandibles with two or more teeth in-situ. All mammalian metrical data has been taken in accordance with Von den Driesch (1976). Withers heights for sheep were calculated using Teichert (1975). The state of fusion has been noted and each fragment has then been studied for signs of butchery, burning, gnawing and pathology. Red deer bones and antler were identified with reference to Lister (1997) and Hillson (1996). Some of the deer specimens were either too small or in too poor a condition to be confidently distinguished further and were recorded as deer.

6.8.3 The Assemblage

The assemblage contains 909 fragments of which 902 fragments have been identified to taxa (Table 23). The assemblage has been hand-collected, retrieved from ditch fills from all three excavation years; 1929, 1933 and 1935. The majority of the specimens from all contexts are in good condition with minimal surface erosion present; although very few complete long bone fragments are contained in the assemblage.

Excavation Year	No. Fragments	NISP	Preservation		
			Good	Moderate	Poor
1- 1929	275	271	65.3%	21.8%	12.9%
2- 1933	299	299	53.8%	39.5%	6.7%
3- 1935	335	332	42.5%	57.2%	0.3%

Total	909	902	
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Table 23: The total number of animal bone fragments, NISP (Number of Identifiable Specimens) count and percentage preservation based on the NISP.

A variety of mammalian taxa have been identified (Table 24) including cattle, pig, red deer, sheep/goat, badger, roe deer, goat, sheep, dog, vole, deer, horse. The assemblage is dominated by cattle as shown by the NISP (Table 24) and MNI (Table 25) figures, pigs are also well represented followed by sheep/goat. The red deer NISP count is also high; this is due to the inclusion of antler fragments. The count for the large and medium mammal groups are moderately sized due to the high proportion of fragmented bones that could not be identified further to species.

Taxa	Excavation Year			Total
	1929	1933	1935	
Cattle	94	115	162	371
Pig	79	46	80	205
Sheep/goat	18	24	4	46
Goat	13	3		16
Sheep		8		8
Horse			1	1
Dog		1	3	4
Large Mammal	18	33	14	65
Medium Mammal	41	7	5	53
Deer		2	1	3
Deer Red	5	33	17	55
Deer Roe	3	27	5	35
Badger			36	36
Vole			4	4
Total	271	299	332	902

Table 24: NISP (Number of Identified Specimens) by Excavation Year.

TAXA	MNI
Cattle	13
Pig	7
Sheep/goat	6
Goat	2
Sheep	2
Horse	1
Dog	3
Deer	1
Deer Red	2
Deer Roe	2
Badger	1
Vole	2

Table 25: MNI (Minimum Number of Individuals) count.

The MNI (Minimum Number of Individuals) counts (Table 25) have been calculated by sizing bones and using the zoning system outlined by Serjeantson (1996). The most abundant elements (Table 26) represented by the three main domesticates included meat and non-

meat bearing bones. Cattle are dominated by cranium and horn core fragments, radii, humerii, metatarsals, scapulae, metacarpals and first phalanges. Pigs are dominated by mandible and maxilla fragments, humerii, radii and tibiae whereas tibiae and humerii dominated the sheep/goat assemblage. In comparison the wild animal collection specifically the deer assemblage, including red, roe and general deer, is dominated by shed and hunted antler fragments and radii.

Element	Taxa			
	Cattle	Pig	Sheep/goat*	Deer**
Horn core/Antler	50		5	65
Cranium	28			1
Mandible	8	36	2	3
Maxilla	1	22		
Atlas	6	7		
Axis	4			
Scapula	13	7	2	
Humerus	21	10	12	3
Radius	25	10	5	6
Ulna	4	6	2	
Metacarpal	13	2	6	2
Pelvis	2	3	1	
Femur	4			
Tibia	16	11	13	2
Metatarsal	14	1	5	1
Astragalus	19	2	1	
Calcaneus	8	5		2
1 st Phalanx	13			
2 nd Phalanx	8			
3 rd Phalanx	4			
Total	261	122	54	85

Table 26: Number of Fragments by Element. Sheep/goat* is represented by elements identified as sheep/goat, sheep and goat. Deer** is represented by elements identified by deer, red deer and roe deer.

6.8.4 Domestic Animals

Cattle

Cattle bones are present in abundance at Whitehawk and dominate the assemblage comprising 371 identifiable fragments producing an MNI of 13 (Table 25). Cattle are the main domesticates of the early-middle Neolithic and are found in abundance at several other sites including at The Trundle, Windmill Hill and Hambledon Hill.

Most elements from the cattle carcass are represented within the assemblage, the fore limbs are well represented particularly the radii and humerii, in comparison bones from the hind limb appear under-represented. Cranial fragments and horn core fragments are also present in abundance. The majority of these remains are fragmentary mostly due to butchery. The horn cores have also been damaged.

Analysis of the cattle remains has highlighted a variation in the size of these animals, large and medium sized animals are present within the assemblage. Jackson (1934) suggests in his analysis that the

difference in size can be attributed to there being two types of 'Bos' present, a taller more robust animal and the 'Celtic Ox', smaller in size (Serjeantson, 2011). This has since changed, with all European domestic cattle now regarded as being '*Bos taurus*' (ibid). The size differences observed at Whitehawk most likely relate to the presence of males and females within the assemblage. There was no evidence of aurochs '*Bos primigenius*' at Whitehawk.

Due to the fragmentation of the long bones, in particular the metapodials, metrical analysis to determine the presence of castrates cannot be undertaken. Macroscopic analysis of the metapodials and cranial elements suggests that both cows and bulls are present within the assemblage. Horn cores and long bones cannot be measured to determine the sex ratio of the cattle present within the assemblage as the remains are too fragmentary.

Where observable the majority of the fragmented bones were fused suggesting that they were used for milking, meat, breeding and traction. A number of the adult cattle were killed for consumption. A small quantity of specimens including tibiae, radii, humerii, metatarsi, femur and ulna were recorded as unfused, or fusing in some cases. Fusion rates (Silver 1969) for these bones suggest that some young animals were killed for meat.

Five mandibles provided tooth eruption and wear data, two of which were estimated due to an absent molar. The data suggests that the majority of the animals assessed were mature adults at death. No complete long bones were present to collect metrical data, although twenty bones were measured which included astragali, calcanei and a distal humerus fragment.

Butchery was observed in ninety-two cattle bones affecting radii, humerii, tibiae, metatarsals, metacarpals, scapulae, femora, ulnae, astragalus, pelvis, axis vertebrae fragments. The majority of the remains, sixty-three in total, were chopped and included twelve radii, twelve humerii, eleven metatarsals, ten tibiae, eight metacarpals, four metapodials, two femora, two scapulae, an axis vertebrae and a pelvis fragment. Fourteen elements exhibited signs of cut marks including four radii, three humerii, two scapulae and one astragalus, tibia, axis vertebrae, metacarpal and an ulna fragment. Twelve elements had been split including four metatarsals, three metapodials, two humerii, two tibiae and a radius fragment. Eleven elements showed signs of being smashed and included six radii, three humerii and two tibiae. Both meat and non-meat bearing bones exhibited butchery marks. The presence of these marks suggests that several stages of butchery were undertaken at the site including carcass dismemberment, portioning and processing for consumption. Elements that have been chopped, smashed and split are likely to have been dismembered from the carcass, reduced in size for cooking and utilised for marrow extraction. Some of the larger elements may have been butchered and utilised for bone working.

Carnivore gnawing was observed in two bones, a metacarpal and tibia fragment. Two pathological specimens have been recorded and include two metatarsals. One of the metatarsals exhibited deposits of periosteal

new bone growth on the medial shaft of the bone. There are several aetiologies that can affect the periosteal layer causing new bone deposits to form including trauma, infection and over-use. A swelling was observed in the mid-shaft of the second metatarsal, possibly an ossified haematoma. Pathologies in the metapodials are common in animals used as working stock.

Pig

Pigs are the second most abundant taxa present within the assemblage at Whitehawk comprising 205 identifiable fragments, producing an MNI figure of 7 (Table 25). Pigs are one of the three main domesticates that are common within the early-middle Neolithic and have been recovered from several sites including Hambledon Hill and Windmill Hill causewayed enclosures. Towards the late Neolithic pig numbers increased, with large quantities being recovered from enclosure and henge sites such as Durrington Walls (Serjeantson, 2011).

The majority of the bones were fragmented; no complete long bones were present within the assemblage. Mandible and maxilla fragments were the most abundant elements recorded, followed by tibiae, humeri and radii fragments. Metrical analysis was restricted to three calcanei, an astragalus and a third metacarpal bone as the only complete measurable bones. Comparisons were made with the metrical data collected from the pigs at Durrington Walls by Albarella and Payne (2004).

Although only small amount of metrical data was recorded from the pig bones at Whitehawk, the majority of results sit within the range collected from Durrington and suggest that the animals were of a similar size. Measurements collected from one calcaneus in particular produced data that exceeded the Durrington Walls range considerably; this could suggest the presence of wild boar, or an unusually large domestic animal at Whitehawk.

Pig canines are sexually dimorphic, analysis of the canines alone can be misleading as loose teeth may have been removed for working into adornments and tools (Serjeantson, 2011). Twenty-two male canine fragments and eleven female canine fragments were recorded as present from the maxilla and mandible. Canine alveoli were counted to determine the ratio of males to females and were found to be comparable to the Durrington Walls data, albeit on a reduced scale; four males and three females were present.

The majority of the bones within the assemblage were fused, suggesting that a high percentage of pigs were killed after their first and second years. A small number were killed before their second and third years. Fifteen mandibles were analysed to record age-at-death data, twelve of these mandibular wear stages were estimated due to a missing molar. The majority of the mandibular wear stages suggest a preference in the slaughtering of animals between the ages of 1-2 (subadult) and 2-3 (adult) years old. A young subadult and four older adults were also recorded. These kill-offs may have occurred in the winter months due to the limited food resources at this time of year (Albarella & Payne, 2004).

Butchery was observed in twenty-three pig bones affecting radii, tibiae, mandible, humerii, ulnae fragments. Fragments from three humerii, two mandibles, six radii, six tibiae, two ulnae were chopped, a mandible and a tibia fragment were sliced, another mandible appears smashed and a radius shows evidence of cut marks. Very few non-meat bearing bones are present within the pig assemblage suggesting that the carcasses may have gone through a primary butchery stage elsewhere onsite. The butchery marks suggest that the carcasses were dismembered and also smashed to extract marrow. The majority of the butchered bones are those of adults around the ages of 2-3 years at death.

Carnivore gnawing was observed in three pig bones including radius, humerus and pelvis fragments. Periosteal new bone growth deposits were observed in a single mandible, the aetiology of this pathology is unknown.

Sheep/Goat

Caprines are the third main domesticate species present within the assemblage at Whitehawk comprising 70 identifiable fragments, producing an MNI figure of 6 (Table 25). Both sheep and goats are present in Britain during the Neolithic, although they are found in greater numbers at occupation sites than at enclosures (Serjeantson, 2011). The popularity of sheep in particular increases into the Bronze Age where their numbers dramatically increase. Serjeantson (2011) suggests that goats were kept with the sheep flock to guide and lead the animals based on ethnographic observations.

Where possible, identifications of sheep or goat were made, sixteen goat and eight sheep bones were recorded producing an MNI of two goats and two sheep (Table 25). Fragmented specimens that could not be identified as either sheep or goat were recorded as sheep/goat.

Elements from the sheep/goat carcasses were dominated by tibiae and humerii fragments. The majority of the bones within the sheep/goat assemblage were fragmented, just three bones were recorded as complete and included a single sheep radius, a goat astragalus and horn core. Metrical data was recorded from the goat astragalus and sheep radius with the radius producing a withers height of 60.58cm (Teichert, 1975) comparable to the data recorded from Pamphill Lodge Farm and Windmill Hill (Serjeantson, 2011).

Where observable the majority of the fragmented bones were fused, this data was recorded for twenty-five sheep/goat, five goat and five sheep. Eleven bones, two from sheep/goat, seven from goat and two from sheep, were unfused at time of death and ages range from less than 10 months to less than 3 years. One sheep mandible was analysed to record age-at-death data, which was estimated due to a missing molar. This particular individual falls into the adult category, approximately 4-6 years old at time of death (Greenfield and Arnold, 2008). Killing sheep/goats at this age may indicate the utilisation of these animals was not predominantly a meat focus. Sheep at this time were hairy rather than woolly (Serjeantson, 2011), it is also suggested

that sheep and goats were milked, although there is no direct evidence for milking of sheep at Whitehawk.

Butchery was observed in thirteen bone fragments; twelve from sheep/goat and one from goat. This data is likely to be skewed as the differences in sheep and goats are observed in certain bones, relying on specific characteristics being present for observation and not in a fragmentary state. Fragments of seven tibiae, four humeri, one radius and one metapodial exhibited signs of chopping. The bones that exhibited signs of butchery were all fused, as were the majority of the sheep/goat assemblage suggesting a preference for mutton rather than lamb.

The majority of the assemblage contains meat-bearing elements; this suggests that primary butchery may have occurred elsewhere onsite. There are no phalanges present within the assemblage and limited numbers of metapodials, this could suggest that sheep/goats may have been utilised for their skin to make clothing (Serjeantson, 2011). The butchery chop marks indicate that the carcasses were dismembered, possibly to portion the animals for cooking. Marrow may also have been extracted.

There is no evidence of gnawing, burning or pathology within the sheep/goat assemblage.

Horse

A single fully fused first phalange represents the only horse bone recovered during the Whitehawk 1935 excavations. The preservation of this bone is poor in relation to the remainder of the assemblage. There are very few horse remains from this period in Britain, bones discovered at Neolithic long barrow and enclosure sites have since been carbon dated to the 2nd and 1st millennium BC, as at Durrington Walls (Serjeantson, 2011). Horse bones previously discovered at Windmill Hill are believed to have now been misidentified and the presence of horses within the early-middle Neolithic is currently unproven, the earliest example has been dated between 2860-1630 cal BC from Grimes Graves in Norfolk (Serjeantson, 2011).

Dog

Small quantities of dog bones were recovered during the 1933 and 1935 excavations, retrieved from the ditch fills. Dogs at Whitehawk are represented by four mandible fragments producing an MNI of three individuals (Table 25). A small number of Neolithic sites, including causewayed enclosures have produced dog bones; a complete animal was recovered from the Windmill Hill excavations (Harcourt, 1974).

The shape and robustness of the mandibular bones suggests that they could all derive from a similar sized animal. The lack of variation in the size of Neolithic dogs may have originated from deliberate breeding for a specific purpose, or interbreeding within an uncontrolled population (Harcourt, 1974).

The surviving dentition indicates that these animals had reached maturity at the time of death. Analysis of the bones revealed no signs of butchery or processing to remove the pelt and de-flesh the animals.

Pathology was observed in two of the four mandibles. Ante-mortem tooth loss was recorded in two mandibles, possibly from the same individual, affecting the first and second premolars. Analysis of coprolites from Windmill Hill suggests that the diet of these dogs consisted mainly of bones (Serjeantson, 2011). Although the aetiology of the ante-mortem tooth loss affecting the dogs at Whitehawk is unknown, if the diet was similar to that of Windmill Hill it may have contributed to the loss of the dentition.

6.8.4 Wild Animals

Red Deer

Red deer are one of the most abundant wild taxa present within the assemblage at Whitehawk comprising of 55 identifiable fragments, producing an MNI of two individuals based upon the bone counts alone (Table 25). Evidence of red deer has been recovered from a number of Neolithic sites in Britain including Windmill Hill, Durrington Walls, Hambledon Hill and Offham Hill.

The majority of the assemblage contained antler fragments, forty-eight in total and this comprised mainly of tine fragments, many of them being unidentifiable. Four of these tines exhibited signs of processing, having been cut and chopped to remove them from the beam. Both naturally cast and processed antlers were present within the assemblage and included five shed antlers and one processed through butchery. The processed antler had been chopped or sliced near to the base, below that of the burr and only the brow tine was present.

Red deer antlers are naturally cast around March-April and start to re-grow almost immediately. Five antlers were cast, although the shedding season cannot be used to determine when these resources were collected during the year after this point. Where observable the majority of the antlers with brow and bez tines present suggested the individuals were mature, between stages 4 and 5 (Schmid, 1972). This could indicate that mature animals were preferred to allow the antlers to develop fully so they could be utilised as a resource.

The majority of the red deer bones were fragmented, only two complete calcanei were present within the assemblage. The remainder of the assemblage contained two humeri and two radii fragments as well as two calcanei and one metatarsal fragment. Metrical analysis was restricted to a single calcaneus as the only complete measurable bone. All of the bones within this assemblage were fused, suggesting that adult red deer were favoured.

Butchery was observed in four red deer bones affecting radii, humerus and a metatarsal fragment. All of these bones exhibited chop marks, with one of the radii also being split along the shaft possibly for marrow extraction. A large proportion of the red deer elements are absent from the assemblage, this suggests that the carcasses may have been

processed elsewhere onsite. The butchery marks suggest that the carcasses were dismembered and may also have been chopped midshaft to extract marrow or for bone working.

Pathology was observed in one of the shed antlers from a mature deer, recorded as stage 5 (Schmid, 1972), the bez tine had suffered damage whilst the antlers were still in velvet and at the cartilaginous stage of development (Jin and Shipman, 2010). This had led to a large bulbous bump visible in the bez tine tip.

One antler fragment had been burnt, charred brown black in colour. No evidence of gnawing has been observed.

Roe Deer

Roe deer were second in abundance as wild taxa at Whitehawk comprising of 35 identifiable fragments, producing an MNI of two individuals, excluding antler fragments (Table 25). Evidence of roe deer has been recovered from several sites in the early-middle Neolithic in Britain including at The Trundle, Hambledon Hill and Offham Hill.

The majority of the assemblage contained antler fragments, fifteen in total, from this number only one cast antler fragment exhibited signs of processing. The processed cast antler had been chopped; cutting through the beam, only a small coronet fragment was present. Four unprocessed naturally cast antlers were also present within the assemblage. Roe deer shed their antlers in the autumn-winter months, from October-December and start to re-grow almost immediately. The shedding season cannot be used to determine when these resources were collected during the year after this point.

The majority of the roe deer bones were fragmented; only one complete metacarpal was present within the assemblage. The remainder of the assemblage contained nine loose teeth, three mandible fragments, three radii, two tibiae, a metacarpal and humerus fragments. Metrical analysis was restricted to a single metacarpal as the only complete measurable bone. All of the bones within this assemblage were fused; this suggests that adult roe deer were favoured, most likely for their antlers and meat as well as their skin.

Butchery was observed in three roe deer bones affecting a humerus, metacarpal and cranial fragment. The metacarpal and cranial fragment exhibited chop marks, whilst the humerus had been split along the bone shaft possibly for marrow extraction or bone working. A large proportion of the roe deer elements are absent from the assemblage, this suggests that the carcasses may have been processed elsewhere onsite. The butchery marks suggest that the carcasses were dismembered; the humerus may also have been chopped midshaft to extract marrow.

Pathology was observed in one antler fragment, a deformed beam spindly and thin in appearance with no tines present. This could be a pathological growth pattern from a juvenile, or a deer that has suffered trauma to the skull before or whilst this antler was forming.

Excavations at Whitehawk in 1933 produced an almost entire skeleton of a female roe deer (Jackson, 1934), unfortunately this articulated animal burial also classed as an associated bone group (ABG), was not available for study. It is believed, at some point, to have been re-articulated and may reside in the Natural History Museum or the British Museum in London. According to Jackson (1934) the articulated roe deer skeleton was buried in a small pit, it had been dismembered and suffered damage to the skull and mandible.

Associated bone groups (ABGs) are deposits of articulated skeletal remains from the same animal (Morris, 2010). A number of ABGs have been recovered from Neolithic sites in Britain, although in comparison to later periods these are quite rare (Morris, 2008). Causewayed enclosures are one of the most common sites for ABGs in the Neolithic. Morris (2008) notes that six ABGs were recovered from causewayed enclosures and comprised of complete articulated deposits. In comparison to ABGs from other Neolithic sites these complete deposits are unusual (Morris, 2008). ABGs from the early Neolithic are dominated by cattle remains; wild taxa such as roe deer are first encountered in the mid Neolithic with five roe deer ABGs recovered from the Coneybury Anomaly pit in Wiltshire (Morris, 2008). ABGs are thought to have a symbolic meaning, often although not always the case they are associated with human remains. At Whitehawk an inhumation was found close to the roe deer ABG. It is believed that there may be a connection between these two burials. Morris (2008) also mentions that deposits of antler at sites with ABGs are 'special' offerings; the antler from Whitehawk was not recovered in a single deposit during the excavations although it may still have a symbolic meaning.

No evidence of burning or gnawing was observed.

Deer

Two fragments of antler and a single radius fragment could not be identified further to either red or roe deer species. The antler fragments exhibited signs of being worked.

Badger

Small amounts of badger remains have been recovered from a small number of Neolithic sites in Southern Britain (Serjeantson, 2011). A part skeleton from a juvenile badger was recovered from a post-hole deposit during the 1935 excavations. This young wild animal may have been killed by a larger predator. No butchery marks were observed on the bones that would suggest skinning to utilise the fur.

Vole

A small number of vole remains were recovered from the same post-hole as the badger bones. These remains are fragmentary and disarticulated and may represent the prey of a larger animal.

6.9.1 Introduction

The environmental remains from Whitehawk are somewhat limited. The excavations conducted between 1929 and 1935 were carried out before flotation was widely employed in archaeology, and as such bulk soil samples were not generally taken from the site. The exception to this was a single 0.5 litre sample taken from the eastern part of the innermost ditch during the 1935 excavations, which was processed by flotation in order to retrieve environmental remains such as charred plant macrofossils, wood charcoal, fauna and mollusca. However, the majority of the remains comprised hand-collected charcoal fragments and land snail shells. In the course of the present assessment, the material present in the Brighton Museum collection was examined and recorded, and additional identifications of charred remains (from the soil sample in addition to hand-collected material) were undertaken. Cataloguing of the mollusca assemblage was also conducted, although no identifications or assessment have been undertaken. This report summarises the material present in the collection, its significance for the interpretation of the site and its surrounding landscape, and the potential of the assemblage for further investigations.

6.9.2 Methodology

Material from the Brighton Museum collection was recorded, and is summarised in Tables 27, 28 and 29. The botanical remains present were compared with material listed in the original site reports (Ross Williamson 1930, Curwen 1934, 1936), in order to assess the completeness of the archive. For each of the charcoal assemblages present, the remains were passed through a 4mm sieve, and up to 20 fragments (or the total number present if less than 10) >4mm were examined for taxonomic identification.

Charcoal fragments were fractured along three planes (transverse, radial and tangential) according to standardised procedures (Gale & Cutler 2000). Specimens were viewed under a stereozoom microscope for initial grouping, and an incident light microscope at magnifications up to 400x to facilitate identification of the woody taxa present. Taxonomic identifications were assigned by comparing suites of anatomical characteristics visible with those documented in reference atlases (Hather 2000, Schoch *et al.* 2004). Identifications have been given to species where possible, however genera, family or group names have been given where anatomical differences between taxa are not significant enough to permit satisfactory identification. Taxonomic identifications of charcoal are recorded in Table 26, and nomenclature used follows Stace (1997).

The single soil sample was processed by bucket flotation. The flot and residue were retained on 250µm and 500µm meshes respectively, and were air dried. The dried residue was passed through graded sieves of 8mm, 4mm and 2mm and each fraction sorted for environmental and artefactual remains (Table 28). The dry flot was scanned under a stereozoom microscope at 7-45x magnifications and their contents recorded (Table 28). Identifications of macrobotanical remains have been made through comparison with published reference atlases

(Cappers *et al.* 2006, NIAB 2004), and nomenclature used follows Stace (1997).

6.9.3 Results

Survey of accessioned material

The accessioned botanical remains from the site comprised material from the 1932-33 and 1935 excavations only (Table 27). No material from the 1929 excavations was present. Both land snail shells and hand-collected charcoal fragments were present from both excavations, as well as a number of hand-collected hazelnut (*Corylus avellana*) shell fragments and a single 0.5 litre soil sample from the 1935 excavation. Taxonomic identifications of charcoal were published in the reports from the 1929 (Ross Williamson 1930) and 1932-33 (Curwen 1934) excavations, and two new identifications of probable oak sapwood were conducted for the *Gathering Time* monograph (Healy *et al.* 2011, 223). As five charcoal samples were present with the same context and accession number for 1933_DIII_CV_5 an additional number has been assigned under the 'Qualifier' column to identify specific samples on Table 27. Mollusca remains were present from all three excavations, and comprise a mixture of marine and terrestrial mollusc shells. Some identifications have been conducted (Table 28), but most are unidentified.

New taxonomic identifications

The single small soil sample taken from Ditch 1 in the 1935 excavations produced only a small quantity of charred macrobotanical remains, including a single goosefoot (*Chenopodium* sp.) seed and a small assemblage of charred wood fragments comprising hazel, beech (*Fagus sylvatica*) and wood of the Maloideae subfamily, which includes hawthorn (*Crataegus monogyna*), rowan, service and whitebeam (*Sorbus* sp.), pear (*Pyrus* sp.) and apple (*Malus* sp.). A small number of land snail shells was also present in the flot. Amongst the hand-collected charcoal samples, hazel wood was also present, along with small quantities of cherry/blackthorn (*Prunus* sp.) and yew (*Taxus baccata*), however oak (*Quercus* sp.) was by far the most common taxon identified.

6.9.4 Discussion

Previous work

The only previous work on macrobotanical remains from the site comprised the identification of hazelnut shell fragments from Pit 2 of the 1935 excavations (Curwen 1936). No charcoal identifications were conducted during these excavations, however identifications were published in both the 1929 (Ross Williamson 1930) and 1932-33 (Curwen 1934) reports, undertaken by a Mr C.J. Maby. The following taxa were identified in these publications:

Aesculus sp. (horse chestnut) (1929)
Alnus sp. (alder) (1929)
Betula sp. (birch) (1929)

Buxus sp. (boxwood) (1929)
Carpinus sp. (hornbeam) (1932-33)
Corylus sp. (hazel) (1929, 1932-33)
Crataegus sp. (hawthorn) (1929)
Fraxinus sp. (ash) (1929, 1932-33)
Prunus sp. (cherry/blackthorn) (1929, 1932-33)
Pyrus sp. (pear) (1929)
Quercus sp. (oak) (1929, 1932-33)
Rhamnus sp. (buckthorn) (1929)
Taxus baccata (yew) (1932-33)
Tilia sp. (lime) (1929)
Ulmus sp. (elm) (1929)
Viburnum sp. (guelder rose) (1929)

For various reasons, there is some controversy inherent in these identifications. Firstly, the individual identification of hawthorn and pear woods would not be conducted by a modern wood anatomist. These woods belong to the Maloideae subfamily, which also includes rowan, service and whitebeam (*Sorbus* sp.) and apple (*Malus* sp.) amongst others. Current scientific consensus states that these taxa do not express sufficient differences from one another to be distinguished on the basis of microscopic wood anatomy alone (Schweingruber 1990, Hather 2000). Therefore the identifications of these taxa must be considered as uncertain.

There has also been uncertainty as to whether or not box (*Buxus sempervirens*) can be considered to be native to Britain (Decocq *et al.* 2004). Box is only found growing in upland chalk environments in southern Britain and its presence in the Early Neolithic at Whitehawk could contribute to arguments for the native status of this species, along with the presence of small quantities of *Buxus* pollen in a local pollen sequence (Waller & Hamilton 2000). However, a second non-native identification in the 1929 publication calls into question the integrity of the deposits. Horse chestnut was identified in the 1929 material, and it was noted that “there are no species occurring in the top two spits which do not also occur lower down, and therefore the question of later intrusion does not arise” (Ross Williamson 1930: 83). Horse chestnut is native to the Balkan region and was first introduced to Britain in the 16th century AD (Schweingruber 1990), and if it were identified throughout these deposits it must be suggested that they are later in date than is currently thought, or have been significantly disturbed. Given the large number of Early Neolithic radiocarbon dates from the site (Healy *et al.* 2011), it is more likely that the charcoal fragments in question were misidentified due to similarities with other native taxa such as willow (*Salix* sp.) and poplar (*Populus* sp.). Unfortunately, this report cannot further address these potential inaccuracies, as no material from the 1929 excavations was present in the assemblage at Brighton Museum.

Present assessment

Of the six wood taxa identified in the 1932-33 report (Curwen 1934), four were identified in the material examined here: oak, hazel, cherry/blackthorn and yew. In addition to this, wood of the Maloideae subfamily, which was noted in the 1929 report (Ross Williamson 1930),

was also recorded, along with fragments of beech, which had not previously been identified at the site. As the charred wood remains derive entirely from ditches and pits representing the secondary deposition of burnt material rather than *in situ* burning, the taxa identified here are likely to represent amalgams of remains of wood used in a variety of burning events, both domestic and ritual. All the wood taxa identified are known to burn well, and are likely to have been specifically selected as fuel (Taylor 1981). Further to this, both yew and several woods of the Maloideae family, most notably hawthorn and rowan, are known to have symbolic and folkloric connotations likely to date back to prehistoric times (Baker 1996), which may have been considered in their selection for use as fuel at the site.

The taxa present in the charcoal assemblage have also been noted in palaeoenvironmental studies from the local area (Waller & Hamilton 2000, Somerville 2003), and as such are likely to derive from local wooded areas. Oak and beech are both typical of mature deciduous woodland, and the relatively rare occurrence of beech is concurrent with pollen sequences from the area (e.g. Waller & Hamilton 2000). Cherry/blackthorn, Maloideae and hazel may have been found as understorey taxa in mixed deciduous or oak-dominated woodland, or in more open woodland margin or hedgerow environments. Yew is commonly found in downland environments (Watt 1926), and occurs regularly in LPAZ3 of the Caburn pollen sequence (Waller & Hamilton 2000), although this taxon has been noted as being relatively rare in the prehistoric archaeological record of the area compared to its frequency in the landscape (Berzins 2002a). Overall, the range of taxa present is typical of prehistoric sites in the area, both contemporary sites such as Bullock Down (Drewett 1982) and Peacehaven (Mooney 2015), and in the later Neolithic and Early Bronze Age at Redhill (Berzins 2002b), Saltwood Tunnel (Alldritt 2006), Mile Oak Farm (Berzins 2002c) and the Westhampnett bypass sites (Fitzpatrick *et al.* 2008).

Year	Context	Qualifier	Feature_ty	Material_ty	Accession_nr	Weight (g)	Volume (l)	<i>Corylus_avellana</i>	<i>Prunus_sp.</i>	<i>Quercus_sp.</i>	<i>Taxus_baccata</i>	Uncalibrated C14	C14_Taxon
1935	1935_W_PII_1	-	Pit	Nut_shell	R4100/147	5.3	-	37	-	-	-	-	-
1935	1935_E_DI_2	-	Ditch	Soil_sample	R4100/263	-	0.5	-	-	-	-	-	-
1933	1933_DIII_CII_4	-	Ditch	Charcoal	R3688/122/4	1.2	-	-	-	10	-	-	-
1933	1933_DIII_CII_4	-	Ditch	Charcoal	R3688/122	<1	-	-	-	10	-	-	-
1933	1933_DIII_CII_4	-	Ditch	Charcoal	R3688/122/H	<1	-	-	-	1	-	4941±39BP	<i>Quercus_sp.</i>
1933	1933_DIII_CII_6	-	Ditch	Charcoal	R3688/123	3.8	-	14	-	-	6	-	-
1933	1933_DIII_CIV_5	-	Ditch	Charcoal	R3688/124	21.2	-	-	-	8	-	4844±34BP	<i>Quercus_sp.</i>
1933	1933_DIII_CV_5	1/5	Ditch	Charcoal	R3688/125	49	-	-	-	20	-	-	-
1933	1933_DIII_CV_5	2/5	Ditch	Charcoal	R3688/125	30	-	-	-	20	-	-	-
1933	1933_DIII_CV_5	3/5	Ditch	Charcoal	R3688/125	<1	-	-	-	8	-	-	-
1933	1933_DIII_CV_5	4/5	Ditch	Charcoal	R3688/125	<1	-	-	-	6	-	-	-
1933	1933_DIII_CV_5	5/5	Ditch	Charcoal	R3688/125	<1	-	1	-	-	-	4729±32BP	<i>Corylus_avellana</i>
1933	1933_DIII_CVII_5	-	Ditch	Charcoal	R3688/126/K	1.9	-	-	-	10	-	-	-
1933	1933_DIII_CVII_6	-	Ditch	Charcoal	R3688/127	43.9	-	1	-	20	-	4835±33BP	<i>Corylus_avellana</i>
1935	1935_E_PIII_1	-	Pit	Charcoal	R4100/195	2.4	-	-	2	4	-	-	-
1935	1935_X_DII_1	-	Ditch	Charcoal	R4100/243	4.4	-	4	-	-	-	-	-
1935	1935_X_DIII_4	-	Ditch	Charcoal	R4100/245	<1	-	-	-	-	-	-	-

Table 27: Quantification of Botanical Remains

Year	Context	Feature_ty	Material_ty	Accession_nr	Weight (g)	Taxonomic identification
1929	1929_DI_CI_1	Ditch	Mollusca (marine)	R3162/179	6.9	
1929	1929_DI_CI_2	Ditch	Mollusca (marine)	R3162/173	3.6	
1929	1929_DI_CI_4	Ditch	Mollusca (marine)	R3162/180	1.1	<i>Tapes decussatus</i>
1929	1929_DI_CII_2	Ditch	Mollusca (marine)	R3162/182	2.8	<i>Tapes decussatus</i>
1929	1929_DI_CII_2	Ditch	Mollusca (marine)	R3162/181	3.1	
1929	1929_DI_CII_3	Ditch	Mollusca (terrestrial)	R3162/171	1.8	<i>Helix nemoralis</i>
1929	1929_DI_CII_4	Ditch	Mollusca (marine)	R3162/183	3.9	<i>Tapes decussatus</i>
1929	1929_DI_CII_4	Ditch	Mollusca (marine)	R3162/184	2.7	
1929	1929_DI_CII_4	Ditch	Mollusca (marine)	R3162/174	5.9	
1929	1929_DI_CII_4	Ditch	Mollusca (marine)	R3162/172	4.5	
1929	1929_DI_CIII_5	Ditch	Mollusca (marine)	R3162/175	2.1	
1929	1929_DI_CIII_5	Ditch	Mollusca (marine)	R3162/192	57.7	<i>Mytilus edulis</i> L.
1929	1929_DI_CV_0	Ditch	Mollusca (marine)	R3162/176	64	<i>Mytilus edulis</i> L.
1929	1929_DI_CVI_3	Ditch	Mollusca (marine)	R3162/193	47.5	<i>Mytilus edulis</i> L.
1929	1929_DI_CVI_4	Ditch	Mollusca (marine)	R3162/177	37.8	<i>Mytilus edulis</i> L.
1929	1929_DII_CI_2	Ditch	Mollusca (marine)	R3162/188	29.7	<i>Littorina littorea</i> L.
1929	1929_DII_CI_3	Ditch	Mollusca (marine)	R3162/202	3.7	<i>Scrobicularia plana</i> Da Cost.
1929	1929_DII_CI_3	Ditch	Mollusca (marine)	R3162/194	39.8	<i>Mytilus edulis</i> L.
1929	1929_DII_CI_3	Ditch	Mollusca (marine)	R3162/194	37.9	<i>Mytilus edulis</i> L.
1929	1929_DII_CII_3	Ditch	Mollusca (marine)	R3162/195	8.3	<i>Mytilus edulis</i> L.
1929	1929_DII_CIV_3	Ditch	Mollusca (marine)	R3162/196	20.3	<i>Mytilus edulis</i> L.
1929	1929_DII_CIV_4	Ditch	Mollusca (marine)	R3162/197	54.1	<i>Mytilus edulis</i> L.
1929	1929_DII_CV_1	Ditch	Mollusca (marine)	R3162/200	11.6	<i>Paphia decussata</i> L.
1929	1929_DII_CV_4	Ditch	Mollusca (marine)	R3162/198	7.2	<i>Mytilus edulis</i> L.
1929	1929_DIII_CI_6	Ditch	Mollusca (marine)	R3162/178	2.3	
1933	1933_DIII_CVI_4	Ditch	Mollusca (terrestrial)	R3688/170	1.9	
1933	1933_DIII_CVI_4	Ditch	Mollusca (terrestrial)	R3688/150	<1	
1933	1933_DIII_CVII_5	Ditch	Mollusca (marine)	R3688/169	3.5	
1933	1933_DIII_CVII_6	Ditch	Mollusca (marine)	R3688/172	3.7	
1933	1933_DIII_CVII_6	Ditch	Mollusca (marine)	R3688/170	32.2	
1933	1933_DIII_CVIII_4	Ditch	Mollusca (terrestrial)	R3688/160	1.5	
1933	1933_DIII_CVIII_6	Ditch	Mollusca (terrestrial)	R3688/162	1.1	
1933	1933_DIII_CVIII_6	Ditch	Mollusca (terrestrial)	R3688/162	<1	
1933	1933_DIII_CVIII_6	Ditch	Mollusca (terrestrial)	R3688/152	<1	
1933	1933_DIII_CVIII_P	Pit	Mollusca	R3688/151	5.5	

			(terrestrial)			
1933	1933_DIII_CVIII_P	Ditch	Mollusca (terrestrial)	R3688/160	<1	
1933	1933_DIII_CVIII_P	Ditch	Mollusca (terrestrial)	R3688/147	8	
1933	1933_DIII_CVIII_P	Ditch	Mollusca (terrestrial)	R3688/150	1.3	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/171	7.7	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/170	43.4	
1933	1933_DIII_X_0	Ditch	Mollusca (terrestrial)	R3688/151	31.1	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/169	4.9	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/170	92.2	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/172	3.7	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/170	<1	
1933	1933_DIII_X_0	Ditch	Mollusca (marine)	R3688/170	1.6	
1933	1933_DIII_X_0	Ditch	Mollusca (terrestrial)	R3688/160	1.1	
1933	1933_DIII_X_0	Ditch	Mollusca (terrestrial)	R3688/147	7.2	<i>Arianta arbustorum</i> L.
1933	1933_DIII_X_0	Ditch	Mollusca (terrestrial)	R3688/151	17	
1933	1933_DIII_X_0	Ditch	Mollusca (terrestrial)	R3688/151	44.3	
1933	1933_DIII_X_0	Ditch	Mollusca (terrestrial)	R3688/150	6	<i>Cepaea hortensis</i> Müll.
1933	1933_DIV_CIII_0	Ditch	Mollusca (terrestrial)	R3688/167	<1	<i>Vallonia costata</i> Müll.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/151	2.3	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/165	<1	<i>Xerophila itala</i> L.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/163	<1	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/160	1.2	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/150	20.7	<i>Cepaea hortensis</i> Müll.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/161	<1	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/158	<1	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/156	<1	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/156	<1	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/147	38.2	<i>Arianta arbustorum</i> L.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/159	<1	
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/157	<1	<i>Helicella nitidula</i> Drap.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/154	<1	<i>Coclicopa lubrica</i> Müll.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/155	<1	<i>Goniodiscus rotundatus</i> Müll.

1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/149	<1	<i>Carychium minimum</i> Müll.
1933	1933_DIV_CV_0	Ditch	Mollusca (terrestrial)	R3688/148	<1	<i>Arion</i> sp.
1933	1933_DIV_CV_7	Ditch	Mollusca (terrestrial)	R3688/151	2.9	
1933	1933_DIV_CV_7	Ditch	Mollusca (terrestrial)	R3688/150	<1	
1933	1933_DIV_CV_7	Ditch	Mollusca (terrestrial)	R3688/147	<1	
1933	1933_DIV_CV_7	Ditch	Mollusca (terrestrial)	R3688/147	<1	<i>Acanthinula aculeata</i> Müll.
1933	1933_DIV_CV_8	Ditch	Mollusca (terrestrial)	R3688/160	<1	
1933	1933_DIV_CV_8	Ditch	Mollusca (terrestrial)	R3688/151	1.6	
1933	1933_DIV_CVI_6	Ditch	Mollusca (terrestrial)	R3688/160	<1	
1933	1933_DIV_CVI_7	Ditch	Mollusca (terrestrial)	R3688/160	<1	
1933	1933_DIV_X_0	Ditch	Mollusca (marine)	R3688/173	4.4	
1933	1933_DIV_X_0	Ditch	Mollusca (terrestrial)	R3688/160	2.4	
1933	1933_DIV_X_0	Ditch	Mollusca (terrestrial)	R3688/151	25.1	
1933	1933_DIV_X_0	Ditch	Mollusca (terrestrial)	R3688/151	37.9	<i>Cepaea nemoralis</i> L.
1933	1933_DIV_X_0	Ditch	Mollusca (marine)	R3688/168	20.6	<i>Patella vulgata</i> L.
1933	1933_DIV_X_0	Ditch	Mollusca (terrestrial)	R3688/151	14.6	
1933	1933_DIV_X_0	Ditch	Mollusca (terrestrial)	R3688/147	9.3	<i>Arianta arbustorum</i> L.
1933	1933_DIV_X_0	Ditch	Mollusca (terrestrial)	R3688/150	<1	
1933	1933_DV_CV_0	Ditch	Mollusca (terrestrial)	R3688/153	<1	<i>Claosilia rugosa</i> Drap.
1935	1935_E_DI_2	Ditch	Mollusca (terrestrial)	R4100/252	11.1	
1935	1935_E_DI_2	Ditch	Mollusca (terrestrial)	R4100/253	7.7	
1935	1935_E_DI_2	Ditch	Mollusca (terrestrial)	R4100/254	3	
1935	1935_E_DIII_1	Ditch	Mollusca (terrestrial)	R4100/251	3.1	
1935	1935_W_X_0	-	Mollusca (terrestrial)	R4100/261	<1	
1935	1935_W_DII_6	Ditch	Mollusca (terrestrial)	R4100/262	<1	
1935	1935_W_PII_0	Pit	Mollusca (terrestrial)	R4100/257	26.5	
1935	1935_W_SKIII_0	Grave	Mollusca (terrestrial)	R4100/256	3	
1935	1935_X_DIII_0	Ditch	Mollusca (terrestrial)	R4100/260	<1	
1935	1935_X_DIII_2	Ditch	Mollusca (terrestrial)	R4100/250	3.4	

1935	1935_X_DIII_3	Ditch	Mollusca (terrestrial)	R4100/255	2.7	
1935	1935_X_DIII_4	Ditch	Mollusca (terrestrial)	R4100/259	3.8	
1935	1935_X_X_0	-	Mollusca (terrestrial)	R4100/258	1.7	

Table 28: Quantification of Mollusca

Context	Context / deposit type	Sample Volume litres	Sub-Sample Volume litres	Residue				Flot												
				Charcoal <4mm	Weight (g)	Bone and Teeth	Weight (g)	Weight g	Flot volume ml	Volume scanned	Uncharred %	Sediment %	Charcoal >4mm	Charcoal <4mm	Charcoal <2mm	Charcoal identifications	Weed seeds charred	Identifications	Preservation	Land Snail Shells
1935_X_DI_2	D	0.5	0.5	**	<2	*	<2	<2	5	5	1	0	*	*	**	Maloideae (4), <i>Corylus avellana</i> (3), <i>Fagus sylvatica</i> (5)	*	<i>Chenopodium</i> sp. (1)	+	**

Table 29: Quantification of Residues (*=1-10, **=11-50, ***=51-250, ****=250+. +=1-10)

7.0 POTENTIAL AND SIGNIFICANCE OF RESULTS

7.1 Whitehawk Camp Community Archaeology Project 2014-2015

7.1.1 Community Engagement

The significance of the project's impact in terms of community engagement and the potential this has for future work on the site is presented in the Project Evaluation Report (Orange 2015, Appendix 5).

7.1.2 Geophysical Survey (Appendix 6)

The results of the geophysical survey are important as they provide the first detailed magnetometry survey of the entire site and its immediate vicinity. The survey defined the extent of modern debris over the site and identified previously unknown below ground impacts (such as the water pipes in the south east of the monument). Whilst a number of geophysical anomalies were identified, some of which correspond with known archaeological features, large areas of the site were masked by modern debris. All of the anomalies tested during the excavation proved to be non-archaeological in nature.

The results of the report have the potential to inform the future management of the site, but no further work is proposed on the data.

7.1.3 The Stratigraphic Sequence

The stratigraphic sequence showed that geophysical anomalies identified in the preceding survey were most likely natural fissures within the chalk bedrock which, in Trench 1, contained clay with flints.

No evidence of Neolithic features was recorded and the sequence has no potential for further study other than confirming the absence of surviving archaeological features in these areas.

7.1.4 Flintwork by Karine Le Hégarat

No further work is proposed on this poorly preserved assemblage.

7.1.5 Prehistoric Pottery by Anna Doherty

No further work is proposed on this assemblage.

7.1.6 Post-Roman Pottery by Luke Barber

The Post-Roman pottery assemblage is interesting in that it sheds some light on late land-use at the site, but the material holds no potential for any further detailed analysis.

7.1.7 The Clay Tobacco Pipes by Luke Barber

The assemblage is too fragmented and divorced from its associated household/s to warrant further analysis.

7.1.8 The Ceramic Building Material by Luke Barber

All of the ceramic building material relates to 19th- to early 20th- century buildings, though it is no longer directly linked with its source. The assemblage has no potential for further analysis.

7.1.9 The Mortar by Luke Barber

The assemblage has no potential for further analysis.

7.1.10 The Slag by Luke Barber

The assemblage has no potential for further analysis.

7.1.11 The Geological Material by Luke Barber

The stone assemblage is essentially of late post-medieval date and comprises of common types for the period. The assemblage is not considered to hold any potential for further analysis.

7.1.2 Other Materials by Luke Barber

The assemblage is not considered to hold any potential for further analysis.

7.2 The reassessment of existing archive

7.2.1 The Stratigraphic Sequence by Jon Sygrave

Whitehawk Camp is one of most complex causewayed enclosure sites in the British Isles (RCHME 1995) and therefore is nationally significant in terms of our understanding and study of early British Neolithic communities. However, separating Neolithic archaeological features from the numerous 19th and 20th century impacts (Section 2) can be highly problematic. The recent geophysical survey (CAA Appendix 6 this report) showed the extent of modern disturbance within the top soil and infilling the ditches and it is known that the monument has been variously affected through the emplacement of several earth bunds, the construction of stable blocks and numerous other development impacts and the levelling and remodelling of earthworks through allotment gardens, footpaths and other activities. Discerning the nature and extent of the original Neolithic monument/s through this palimpsest of later impacts must be a key aim of any future work.

The current reassessment highlights the potential the site has to address many research aims in terms of not only its own development and use, but also our understanding of early British Neolithic communities in general. However, the archive suffers from a general lack of clear stratigraphic evidence due to the manner in which it was excavated and recorded. This is particularly of note in regards to the phasing of the circuits, whether they were recut or remodelled and if there was an earlier phase of activity predating the construction of the causewayed enclosure. Addressing these issues would not only clarify the significance and potential of the monument but facilitate appropriate site management and interpretation. An example of this is the potential

long barrow which lies to the north of Ditch II (RCHME 1995). If this were proven to be correct this would be the only such monument within a British Causewayed Enclosure and help answer questions as to the relationship between these monument types.

The site also has the potential to contain evidence relating to post-depositional processes which may have affected how material entered the ditches. This could address assumptions as to the intentional placing of artefacts/ecofacts/human remains.

7.2.2 The Prehistoric Pottery by Anna Doherty

The Whitehawk assemblage has long been acknowledged as being of national significance but the purpose of this assessment is to determine whether new analysis is warranted or indeed possible, given the age of the archive. Neolithic pottery assemblages in Sussex are rare and very few of any size have been published to current standards. Although the 1930's Whitehawk reports give a reasonably accurate overview of the general range of forms and decoration, there is very little consideration of fabric type and no quantified data on any aspect of the assemblage. This makes it almost impossible for modern ceramicists to compare new assemblages with that from the local type-site in anything but the broadest terms. For this reason, it would certainly be beneficial for future comparative purposes to produce a pottery analysis report including the Early and Middle Neolithic and Beaker pottery in a modern format, fully describing and quantifying fabric, form and decoration. The Late Iron Age/early Roman pottery is however, of no further significance and has no potential for further work.

Certain limitations have been encountered as a result of past excavation and archiving policies. Although enough of the pottery survives to make meaningful analysis possible, uncertainties about loss or discard will have some impact on the potential reliability of any results. For example, any conclusions concerning differential distribution of different pottery types would have to be tempered by the fact that some selective discard *might have* taken place, skewing the results of the analysis. Similarly, although investigating any possible chronological change in the pottery assemblage is potentially an exciting area of analysis, the lack of secure stratigraphic provenance for material excavated in horizontal spits during the first two seasons may limit the extent to which material from possible recuts – or simply from lower and upper fills within the same ditch – can be compared.

7.2.3 The Worked Flint by Karine Le Hegrat

The principal significance of the flint assemblage comes simply from its direct association with the causewayed enclosure. Its origin alone makes this flint archive very important.

The surviving flint assemblage is moderately large (1035 pieces). Overall, it is well preserved, and the bulk of the assemblage is considered contemporary with the main use of the causewayed enclosure during the Early Neolithic period.

The overall composition of the assemblage seems to differ from the majority of the flint material from other causewayed enclosures from Sussex. However, it does fit well within the flint assemblages from many other well-known causewayed enclosures in terms of the tools represented and their concentration. The composition of the assemblage consisting of flakes, blades, cores, hammerstones as well as various tools suggests that an array of activities - mostly "domestic" activities - were undertaken at the monument site.

However, the main drawback is the incompleteness of the assemblage. The current collection doesn't represent the total of flints encountered on site during the three excavations, nor does it represent the total of flints recovered and examined. Furthermore, some of the existing material currently kept at the Whitehawk Micro Museum was not examined during this re-assessment.

The current collection has the potential to characterise the various flint artefacts present at causewayed enclosures. It has the potential to provide a valuable point of reference for other causewayed monuments in Sussex; although, in terms of overall composition, it contributes little information to the existing corpus of well-studied flint assemblages from similar sites located further afield.

The main restriction of the surviving assemblage is that we know we have lost a significant proportion of it to discard, non-collection in the field and, presumably, loans to other institutions. Under-representation of the true flint assemblage hinders more specific studying methods such as refitting, metrical or spatial analysis. It also limits the interpretation of the surviving flint assemblage in regards to knapping, tool manufacturing, repairing techniques and activity areas.

Despite this, the assemblage is considered to have potential to shed light on the nature of the site's occupation. It also has the potential to be cautiously interpreted in regards to sourcing of raw material, types and areas of activities and depositional practices. In addition, the material has the potential to be compared and contrasted with other flint assemblages from similar monuments.

The most interesting aspect of the surviving assemblage lies in its potential to study use-wear. The results could provide information regarding the functions of the lithics and therefore the type of activities undertaken at Whitehawk. This work may also shed light on the site formation processes and in turn further define the depositional practices.

7.2.4 The Registered Finds by Trista Clifford

The Whitehawk bone and chalk Registered Finds assemblage is one of regional and national significance that has not been published to current standards. Only a cursory description of a selection of finds was published, with rather limited consideration given to function or contemporary parallels.

Detailed recording during assessment has questioned some of the original assumptions made regarding technology and function, and this,

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together with a re-assessment of other finds categories, has the potential to challenge the accepted interpretation of the site.

It is therefore suggested that further analysis of the assemblage is warranted and a number of potential areas for future research arise based on this assessment.

7.2.5 The Geological Material by Luke Barber

The geological material from the site is considered to have only limited potential for further analysis and publication due to its relatively restricted nature and generally sound original identifications.

However, as a particularly early assemblage from the county, and one that can be related to perhaps the most extensive monument type, a fuller publication is desirable. This will allow better comparative studies to be made of the exploitation of stone during the period and how it was manipulated for use. Much of this can be gained from the factual record (see Section 5.11), but any future publication ought to consider the size/weight of the quartzite pebbles to see if there is evidence of preferential selection and illustrate perhaps three to four of the more complete querns. Some limited further parallels of stone usage from other Sussex Neolithic sites is also recommended to set the assemblage in a wider context.

7.2.6 The Human Bone by Dr Paola Ponce

The human remains from the Whitehawk assemblage are potentially of national significance. Although in line with other Neolithic sites from Sussex in that burial appears to be represented by articulated and disarticulated human remains. Articulated burials are not widely represented nationally; therefore the articulated skeletons from Whitehawk offer a unique opportunity to study funerary patterns during this period.

The articulated burials not only demonstrate a good degree of preservation but also an excellent degree of completeness. This enables the clear observation of diagnostic landmarks for sexing and ageing that form the basis of the biological reconstruction of the assemblage. Other significant aspects related to such good preservation and completeness are the possibilities of quantifying the presence of any peri-mortem and post-mortem modification of bone and the number of observable cases for most types of pathology as well as gathering metric data for biodistance research.

The skeletal assemblage of the Whitehawk Camp has excellent potential for further research. The basic demographic information can be compared with other Neolithic populations. Stature calculations can be made for two individuals and these can be used to obtain an indication of the overall health status and nutrition of the population. Considerations and comparisons can also be made with regards to the pathological manifestations noted in this assemblage.

Finally, isotopic analysis would be a significant research area that could be explored in relation to palaeodiet, migration and cultural affinity. As

dental attrition was heavy during the Neolithic period (Roberts and Cox 2003) and the initial dental assessment on the Whitehawk teeth supported this idea, further studies involving isotopic analysis will be essential to get a better insight as to the nature of food consumption on the site and its abrasive and gritty elements.

The results obtained in this study would have great potential for publication as these will complement the research carried out in the assemblage by Curwen in the early 30's and more recently those by Schulting (2012) but in the light of the latest biomolecular methods

7.2.7 The Animal Bone by Hayley Forsyth

The faunal assemblage is of regional and national significance. The good level of preservation and the assemblage size enables clear comparisons of faunal assemblages from other causewayed enclosures in Sussex and further afield. Further analysis of which may aid in the understanding of the role and function of causewayed enclosures to the Neolithic community of Britain.

The faunal remains represented at Whitehawk are directly comparable to other causewayed enclosure sites. Further analysis regarding the composition of the faunal assemblages present provides an opportunity to study the animal husbandry practices of these Neolithic communities.

Further metrical, depending on bone completeness, and element representational analysis of the faunal assemblage with other causewayed enclosure sites and the wider Neolithic landscape would be worthwhile. This would enable the study of animal husbandry in more detail including the possible identification of domestic and wild animals, breeds, yields of resources and butchery practices; highlighting the social and economic functions of causewayed enclosures in Britain. Analysis of the pathologies present and absent amongst the faunal assemblage may give an insight into the utilisation of animals at causewayed enclosures.

The complete faunal assemblage was not available for study during the re-assessment of the archive. Unfortunately it is unclear how much of the original assemblage is absent and which Museums may have material from the 1929, 1932-3 and 1935 excavations. An associated bone group (ABG) was included in the faunal remains unavailable for study, now that the location of this important bone group is known, analysis of this rare ABG is highly recommended. Analysis of the ABG burial; an almost complete skeleton of a female roe deer, would provide additional information regarding ritual and religious practices at causewayed enclosure sites.

Further scientific analysis of the faunal assemblage to include isotopic and aDNA analysis would be beneficial. Isotopic analysis would determine if the faunal assemblage is local to the region, or if animals migrated from further afield and if there is any connection to the human remains also present at Whitehawk. Isotopic analysis and aDNA can also provide information regarding animal husbandry such as herd management and diet.

Further study of the faunal assemblage at Whitehawk is highly recommended.

7.2.8 The Environmental Remains by Dawn Elise Mooney

No further work is recommended on the charcoal assemblage from the site. It is unfortunate that the assemblage is so small, especially given that the ditch fills described in the original site reports appear to have been rich in charred remains (Ross Williamson 1930; Curwen 1934, 1936). However, as the excavations were conducted before the collection of samples for flotation was widely practiced, the remains present can only comprise charred botanical remains large enough to have been hand-collected.

The assemblage of mollusca from the site is relatively large, and includes both marine and terrestrial taxa. Some identifications have previously been conducted, and are given in the original excavation reports (Ross Williamson 1930; Curwen 1934, 1936) and in the catalogue prepared in the course of this assessment (Table 27). More detailed characterisation of the assemblage is recommended to be undertaken in the future.

8.0 RESEARCH AGENDA

8.1 Introduction

8.1.1 The following chapter sets out: the original site specific research aims established in the *Gathering Time* publication (Whittle et al 2011, 916-7); the original research aims set out as part of this project in the HLF Approved Purposes (see Section 4) and preceding WSI's for geophysical survey (CAA 2014a) and excavation (2014b); assesses whether these aims have been achieved; and sets out a series of revised research aims informed by the work of the current project. For a full discussion of the wider project aims relating to Community Engagement please refer to the project *Evaluation Report* (Orange this report Appendix 5).

8.2 Original Research Aims

8.2.1 The following research questions were set out for Whitehawk Camp in the *Gathering Time* publication (Whittle et al 2011, 916-7):

ORA 1 Does the external bank of ditch 2 incorporate a pre-existing long barrow? One of the segments excavated by Ross Williamson seems to change course around a conspicuous part of that bank: 'Curwen shows a length of bank to the north of this, adjacent to the ditch excavated in 1929. This is the only part of the second bank noted by him, so it must have been more prominent than the rest. Indeed, it is depicted on both plans as a long mound, measuring c. 16m long and 9.5m wide, and it is conceivable that it was an earlier feature incorporated into the bank and ditch' (RCHME 1995a in Whittle et al 2011, 917).

ORA 2 What are the date and stratigraphic relationships of enclosures 2a and 3a, identified by the RCHME in 1993? Were they originally complete circuits, subsequently reworked into and partly overlain by later ones?

ORA 3 What are the date and stratigraphic relationships of the north east tangential ditch?

ORA 4 Are there further circuits, perhaps corresponding to the fifth and sixth ditches observed by Curwen?

ORA 5 What is the date of the north-south row of pits or ditch segments on the race course to the south of the circuits, and does it relate to the complex?

8.2.2 Prior to the present phase of fieldwork the WSI's for the geophysical survey (ASE 2014a) and excavation (ASE 2014c) established the following stratigraphic research aims, in part to address **ORA's 4 and 5** (Whittle et al 2011, 917):

ORA 6 The general aim of this initial programme of field investigation (geophysical survey) is to obtain a better understanding of the archaeological potential of the site in relation to previous surveys and fieldwork. In particular, the survey hopes to better define the extent and character of the monument to inform an updated assessment of the site and aid its future management.

ORA 7 Establish whether anomalies noted in the geophysical survey are archaeological features and if so their character and date.

8.2.3 Prior to the present phase of fieldwork the WSI for the excavation (ASE 2014c) established the following site management research aims:

ORA 8 Better our understanding of Whitehawk Causewayed Enclosure and its associated features to facilitate its protection and management

ORA 9 Inform community volunteers and the wider population as to the value of Whitehawk Causewayed Enclosure and how its study can lead to a better understanding of our own lives

ORA 10 Improve the quality of the land and associated furniture (fencing etc.) to facilitate the ongoing management of the site and the betterment of the adjacent area for the local population

8.2.4 Prior to the commencement of the archive and reassessment work the following aims were established:

ORA 11 Work to catalogue and reassess the finds from past excavations

ORA 12 Create Interpretation through a digital app and archive

8.3 Revised Research Aims

8.3.1 Stratigraphic

All of the original research aims which address stratigraphy (**ORA's 1-5**) remain relevant. However, the reassessment of the stratigraphic archive can offer some refinement:

RRA 1 Can the presence/absence of recuts, especially in the 3rd and 4th circuits, be established by modern excavation techniques? And can this aid in the phasing of the monument?

RRA 2 Was the 'black mould' deposited intentionally or by post depositional processes and does it lie within a recut of the original ditch? How does its deposition relate to human burials within the ditch and the movement of disarticulated human bone? Can micromorphology show the presence/absence of Curwen's 'occupation levels' within the ditches.

RRA 3 Can the study of colluvial deposits in the neighbouring Whitehawk and Bakers Bottom's provide information as to soil erosion and post-depositional processes at Whitehawk Camp?

RRA 4 Is the bank to the north of Ditch II an earlier monument, long barrow, respected by the causewayed enclosure or is it related to the external bank to the south of Ditch II, as recorded during the RCHME survey (1993)?

RRA 5 To what extent was top and sub soil stripped prior to the construction of the monument, as evidenced under banks associated with the rampart inside Ditches III and IV (Curwen 1936, 66 & 74)? Can geoarchaeological techniques, such as micromorphology, provide information as to potential buried land surfaces under the banks and whether the banks were intentionally 'concreted' with chalk mud?

RRA 6 Is there any further evidence of human burial within or under bank material, as postulated in regards to Skeleton III (Healy et al 2011, 222)?

RRA 7 Can other remote sensing techniques, such as Ground Penetrating Radar, provide a clearer indication of the below ground character of the monument and whether there are related features outside of the present scheduled area?

RRA 8 Can the date of the various earthworks identified by the RCHME survey be confirmed and an accurate phasing of the monument be established?

8.3.2 Site Management

The site is presently managed by CityParks, BHCC and Brighton Racecourse, who have developed a good working relationship through the present project. This goodwill has led to various site improvements including the removal of imported material from the monument, the reduction of practises which could damage the site (such as the parking of cars on the monument) and amended management practises (such as the reintroduction of sheep grazing and reduction in the need for mowing which can 'scalp' the land surface). However, this situation is largely due to the personnel currently in post and the relationships which they have established. Were they to leave the situation could deteriorate. The history of the site (Section 2) has shown that since the sites designation as a Scheduled Ancient Monument in 1923 it has suffered numerous piecemeal impacts, many of which occurring without the involvement of suitably qualified archaeologists. Given its location within a large urban centre and its proximity to residential areas, businesses, telecommunications installations and allotments the site needs to be actively managed to avoid any future impacts.

RRA 9 Can Whitehawk Camp be better protected from future impacts through the production of a Conservation Management Plan for the site and its environs and/or consistent enforcement measures by BHCC to prevent further impacts from development, site use and site management?

8.3.3 Community Engagement

The recent HLF funded project has shown (Appendix 5) there is a significant depth of interest in the local community for the archaeology and ecology of Whitehawk Camp and volunteering opportunities associated with the site and its archive. The project has always aimed to involve and inform local communities in its activities in order to make the site relevant to local people and through them protect it.

RRA 10 To keep the local community involved in any future fieldwork, academic study and/or site management at Whitehawk Camp through the creation of volunteering opportunities, free community events and/or literature/social media.

8.3.4 Finds - General

RRA 11 Can spatial analysis of the finds assemblage (as far as is possible given the stratigraphic record) using GIS software, inform as to how the

monument was used and whether post-depositional processes affected the assemblage?

RRA 12 Could a finds assemblage created by modern excavation techniques (including the 3D plotting of finds and sieving of spoil to recover small finds) provide a more detailed understanding of the extent and nature of artefacts and the manner in which they were deposited?

RRA 13 Can finds known to be missing from the original archive (such as the roe deer skeleton) be traced and returned to RPM to consolidate the archive?

8.3.5 Pottery

With the major caveats detailed in Section 7.2.1 aside, the creation of a basic quantified dataset significantly increases the usefulness of the pottery assemblage as a tool in understanding the monument. Beyond improving the availability of comparative data on pottery, further analysis has the potential to contribute to a number of wider research aims:

RRA 14 What does vessel choice, in terms of size, openness of profile, use of decoration etc., suggest about what pottery was used for on the site, for example short-term feasting vs longer term occupation or large vs small population groups? How does this evidence compare with other Causewayed Enclosures and pit sites?

RRA 15 Can detailed quantification of subtle variations in pottery fabric, form and decoration contribute anything to our understanding of the chronological development of the site? Can pottery provide any support to the hypothesis that Ditches 1 and 2 pre-date Ditches 3 and 4? Is there any evidence that the recuts produced later assemblages?

RRA 16 Accepting that the majority of pottery is likely to have been redeposited from reasonably long-lived middens rather than at its initial point of use/discard, can analysis of the distribution of pottery using GIS suggest anything about the organisation of space within the monument? Are aesthetically or functionally different types of pottery favoured in different parts of the site?

RRA 17 Can a closer study of the distribution of pottery, its fragmentation and its association with other artefacts reveal any unusual patterns of structured deposition? For example, are partially complete profiles disproportionately deposited with other artefacts? Is pottery more complete or more abundant in butt-ends of ditches? How does deposition in pits vary from that in ditches? Can the use of GIS aid this spatial analysis?

RRA 18 Can a programme of petrographic/chemical analysis on pottery fabrics further confirm that pottery used on the site comes from quite a wide territory in the monument's hinterland? How does fabric variation and diversity of sources compare with other local sites? Can this contribute to discussions on the function of Whitehawk as a regional centre?

RRA 19 How does the Whitehawk assemblage compare with other contemporary regional sites (Lower Hodder Farm Peacehaven, The Trundle, Shepperton, Staines, Kingsborough Farm) and non-region Causewayed Enclosures such as Windmill Hill and Hambledon Hill?

8.3.6 Worked Flint

Overall, the probable under-representation of the original archive of worked flint hinders specific studying methods such as refitting, metrical analysis (followed by comparison with other assemblages) or spatial analysis. It also limits the interpretation of the surviving flint assemblage in regards to knapping, tool manufacturing or repairing techniques and activity areas although cautious interpretations should still be possible.

RRA 20 Can spatial analysis of the flint assemblage suggest where specific activities took place?

RRA 21 Can use wear analysis provide information as to the function of the worked flint?

RRA 22 Can spatial analysis, further work on the condition of the flints and comparative studies with other artefact types provide further evidence as to whether artefacts were deposited as part of domestic waste, intentionally placed or a mixture of the two?

RRA 23 Can further excavation at the site inform as to the presence of debitage/micro debitage, which could have been missed during the original excavations? And what could a more complete flint assemblage from the site tell us in terms of the extent and nature of manufacturing and tool use?

8.3.7 The Registered Finds

The Whitehawk bone and chalk Registered Finds assemblage is one of regional and national significance that has not been published to current standards. Only a cursory description of a selection of finds was published, with rather limited consideration given to function or contemporary parallels. Detailed recording during assessment has questioned some of the original assumptions made regarding technology and function, and this, together with a re-assessment of other finds categories, has the potential to challenge the accepted interpretation of the site. It is therefore suggested that further analysis of the assemblage is warranted and a number of potential areas for future research arise based on this assessment:

RRA 24 Can use-wear analysis on the bone objects contribute to our understanding of their production, technology and function? How does this compare with similar objects from contemporary assemblages both elsewhere in Britain and in Europe? Can a useful typology of Neolithic bone tools be produced based on this data?

RRA 25 What further information might be gleaned by utilising technology such as photogrammetry and 3D scanning to record the bone and worked chalk objects?

RRA 26 How can an analysis of spatial distribution of worked bone and chalk objects contribute to the understanding of the organisation of the causewayed enclosure? Does this compare with the spatial distribution of such objects on other similar monuments?

RRA 27 Chalk as a material appears to have an association with the body or burial in the Neolithic. Is there evidence for structured deposition of chalk objects with human remains, or with other finds categories?

RRA 28 Current typologies of chalk objects (Varndell 1991 and Teather 2008) are problematic. How can the Whitehawk assemblage contribute to enhancing these typologies?

RRA 29 Does the utilisation of chalk in the south and south east of Britain have parallels with other stone types elsewhere in the UK where chalk is not available?

8.3.8 The Geological Material

RRA 30 Does the size/weight of the quartzite pebbles show evidence of preferential selection?

RRA 31 Can study of stone usage on other contemporary Sussex Neolithic sites suggest whether the usage at Whitehawk is common?

8.3.9 The Human Remains

RRA 32 Can a comparative study with other contemporary Neolithic populations in terms of demography, stature and pathology provide an indication of the overall health status and nutrition of the population? Does it suggest any other impacts on the population caused by specific activities?

RRA 33 Can DNA and/or isotope analysis contribute to our understanding of palaeodiet, migration and cultural affinity? And is differential treatment of human bone on the site related to differences in genealogy or palaeodiet?

RRA 34 Can future excavation clarify: how the disarticulated human bone entered the ditch fill? Whether previous excavation techniques missed small bones and/or bone fragments? Whether there was an actual difference in deposition of human bone or whether this was due to post-depositional processes?

8.3.10 The Animal Bone

Analysis of the assemblage has highlighted the following research questions:

RRA 35 Can an understanding of the role and function of Whitehawk within the wider context of causewayed enclosures in Britain be gained from further analysis of the animal bone assemblage?

RRA 36 Were different animals being exploited at different locations and seasons at Whitehawk?

RRA 37 Is it possible to determine whether the wild taxa were utilised intentionally as a resource or as opportunistic discoveries within the landscape?

RRA 38 Can further analysis of the ABG tell us about the social use of Whitehawk?

RRA 39 Can isotope analysis shed light on animal diet and husbandry at Whitehawk?

RRA 40 How does the Whitehawk assemblage compare with other contemporary regional assemblages?

8.3.11 The Environmental Remains

The soil descriptions and presence of many and varied environmental remains indicates that the site has a high potential to reconstruct aspects of the palaeoenvironment. However, techniques were not sufficiently advanced during the previous phases of excavation to allow this to happen. This has left a significant gap in our understanding of the site, its local environment and its use and exploitation by the people of Whitehawk Camp. Key environmental research aims would therefore focus on the need to recover new samples through modern excavation techniques.

RRA 41 To recover a suite of environmental samples using modern excavation techniques, to facilitate the reconstruction of the sites palaeoenvironment, how it changed through time and how its resources were exploited by the people of Whitehawk Camp.

8.3.12 General - British Neolithic

RRA 42 Does Whitehawk Camp provide evidence of wider Neolithic trade or migratory networks either through its: associated artefacts; genetic or isotopic signature of its animals and people; or by their cultural traits?

RRA 43 Is there evidence at Whitehawk Camp of social stratification? Are some people being treated differently and if so is this related to their genetic or isotopic signature?

8.3.13 General

RRA 44 That all future work will be properly reported upon/published in a timely fashion and disseminated to the wider community.

9.0 SCOPE OF POTENTIAL FUTURE PROJECTS

9.1 The future of the Whitehawk Camp Project

9.1.1 As detailed in Section's 1.1 and 1.2 the Whitehawk Camp project has evolved over many years developing numerous relationships with local communities, government and business (Appendix 5). Through the recent HLF funded project this has built a significant momentum and it is the intention of the partnership to maintain involvement in community engagement, academic research and site management at Whitehawk. This will be achieved in part by voluntary work, but it is also the intention to seek further appropriate funding to achieve the lengthier or complex aims as outlined in Section 8.

9.1.2 The partnership will also seek to collaborate with other institutions, local government, societies and voluntary groups to achieve the aims set out in Section 8.

9.1.3 The outcomes of any further work undertaken on the site or archive will be properly reported upon/published in a timely fashion and disseminated to the wider community.

9.2 Potential future projects could include:

- A **Conservation Management Plan** for the site, building on the work the project has undertaken with local community groups, government and business to safeguard it for the future and explore ways to link the site to local initiatives, such as the Brighton and Lewes Downs Biosphere.
- A **Synthetic Article** in the county journal (Sussex Archaeological Collections) presenting a discussion of the new evidence uncovered by the recent project and its relevance to our understanding of Whitehawk Camp and Neolithic Studies in general.
- Targeted **Archaeological Excavation** and **Geophysical Survey** to address specific gaps in our knowledge as described in the revised research aims as set out in Section 8 and publication of the results in an appropriate journal. To include volunteers, if the scale or the project is appropriate.
- Further **Specialist Analyses** to address specific gaps in our knowledge as described in the revised research aims as set out in Section 8 and publication in appropriate specialist journals.
- A full **Synthetic Monograph** presenting the combined results of any further archaeological excavation and specialist analyses and discussing their relevance to our understanding of Whitehawk Camp and Neolithic Studies in general. This may also be able to address wider topics such as climate/environmental change.

- **Public Outreach** events and **Popular Publications** to accompany any further research to maintain local public awareness of the site and disseminate the project results to the widest audience.
- To encourage further **Academic Research** of the Whitehawk Camp archive and site and develop further **Educational Resources** for its study in schools.
- Further **Site Improvement works** in combination with the Brighton Rangers, BHCC and Brighton Racecourse and voluntary groups/ individuals. Ideally as an outcome of a Conservation Management Plan.

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APPENDIX 1: List of organisations involved in the Project

- * Friends of Craven Wood
- * Due East Neighbourhood Council
- * Brighton & Hove and Lewes Downs Biosphere Project
- * CityParks, BHCC
- * Brighton Racecourse
- * Sussex Police
- * South Downs National Park Authority
- * Wyld Service
- * Sussex Past
- * Archaeological Services Lewes
- * Newmarket Farm Dig
- * Jane Hawkins - artist
- * Brighton Conservation Volunteers
- * Mike Allen and Julie Gardiner (Allen Environmental Archaeology)
- * SWT Youth Rangers
- * South Downs Society
- * Sussex Community Rail Partnership
- * Lewes District Council
- * Racehill Orchard
- * Sussex School of Archaeology
- * Band of Brothers
- * Red Earth
- * Roedean School
- * Brighton College
- * U3A Brighton & Hove
- * University of Brighton
- * Heritage Open Days
- * Council for British Archaeology
- * Craven Vale Community Association
- * Bristol Estate Community Association
- * Brighton and Hove Allotments Federation
- * Craven Vale Over 50's Group
- * Southease Tenant's Association
- * The Catalyst Club
- * Tuesday at Friends, Friends Meeting House, Brighton
- * Young Archaeologists Club, Sussex Weald Branch
- * Queens Park Primary School
- * Fairlight Primary School
- * St Lukes Primary School
- * Carlton Hill Primary School
- * City Academy Whitehawk
- * Glebe School
- * Whitehawk Library
- * Patcham Junior / Middle Schools

APPENDIX 2: HER Data

Site_no	MonUID	RecordType	Name	MonType	Easting	Northing	Type
1	MES174	MON	Whitehawk Camp: Neolithic causewayed enclosure	LINEAR FEATURE, DITCH, LONG BARROW, PIT, POST HOLE, INHUMATION, CAUSEWAYED ENCLOSURE, FINDSPOT, PIT, INHUMATION, SITE	533030	104770	Causewayed Enclosure
2	MES1516	MON	Offham Hill: Neolithic causewayed enclosure	FINDSPOT, FINDSPOT, HUMAN REMAINS, CAUSEWAYED ENCLOSURE, CROUCHED INHUMATION, SITE	539900	111770	Causewayed Enclosure
3	MES1112	MON	Cockroost Hill: ?causewayed enclosure	CAUSEWAYED ENCLOSURE, ENCLOSURE, SITE	524600	108600	Possible Causewayed Enclosure
4	MES301	MON	Surrenden Road: ?long barrow	LONG BARROW	530500	107000	Possible Long Barrow
5	MES1873	MON	Plumpton Plain: barrow cemetery & long barrow	BARROW CEMETERY, SAUCER BARROW, BOWL BARROW, LONG BARROW	535900	112680	Possible Long Barrow
6	MES230	MON	Beacon Hill: long barrow	BOWL BARROW, INHUMATION, CREMATION, LONG BARROW, HUMAN REMAINS	536388	102771	Possible Long Barrow
7	MES1841	MON	Money Burgh: long barrow	LONG BARROW	542480	103690	Possible Long Barrow
8	MES1599	MON	The Camel'S Humps: Long barrow	LONG BARROW	543130	111000	Possible Long Barrow
9	MES302	MON	Preston Drove / Havelock Road: ?long barrow	LONG BARROW, HUMAN REMAINS, LONG MOUND,	530890	106623	Possible Long Barrow

				HUMAN REMAINS			
10	MES174	MON	Whitehawk Camp: Neolithic causewayed enclosure	LINEAR FEATURE, DITCH, LONG BARROW, PIT, POST HOLE, INHUMATION, CAUSEWAYED ENCLOSURE, FINDSPOT, PIT, INHUMATION, SITE	533030	104770	Possible Long Barrow
11	MES1	MON	Beacon Hill: Neolithic Long Barrow	LONG BARROW, SITE	536456	102583	Possible Long Barrow
12	MES1748	MON	Saxonbury: pit with neo axe fragment	FINDSPOT, PIT, FINDSPOT, DITCH, SITE	540750	109450	Neolithic Pits
13	MES1779	MON	Malling Down: ?Neo pits and later finds	PIT	542372	111130	Neolithic Pits
14	MES7210	MON	Malling Down: Neo pit & later lynchet	PIT, FINDSPOT, LYNCHET	542319	111107	Neolithic Pits
15	MES18927	MON	Peacehaven Wtw: early Neolithic features	SETTLEMENT	542346	101587	Neolithic Pits
16	MES18994	MON	Seaview Avenue Bovis Site: Neolithic pits	PIT, SITE	542052	101059	Neolithic Pits
17	MES22358	MON	7-9 Springfield Road: poss neo pit	PIT	530978	105769	Neolithic Pits
18	MES25604	MON	Land North of Arundel Road, Peacehaven: Neo -B.A Features and Finds	GULLY, PIT, TREE THROW, POST HOLE	541876	101075	Neolithic Pits
19	MES177	MON	St Nicholas' Church: ? Stone circle	STONE CIRCLE	530760	104500	Other possible Neolithic Monuments
20	MES16396	MON	Falmer Stadium: Flint Mine and pits	PIT, FLINT MINE, QUARRY	535207	108603	Other possible Neolithic Monuments
21	MES1558	FS	Falmer Road: flintwork	FINDSPOT, FINDSPOT	535960	106510	Neolithic Worked Flint Findspots
22	MES344	FS	'Upper Bevendean': flintwork concentration	FINDSPOT, FINDSPOT	535500	106200	Neolithic Worked Flint Findspots

23	MES1033	MON	Dyke Road: Flintwork scatters	FINDSPOT	530250	105560	Neolithic Worked Flint Findspots
24	MES321	MON	BA bracelet and possible Neolithic flints	FINDSPOT, FINDSPOT	533300	107300	Neolithic Worked Flint Findspots
25	MES270	FS	'Upper Bevendean': scraper	FINDSPOT	534000	106000	Neolithic Worked Flint Findspots
26	MES1088	FS	'Ne Of Portslade': neo flints	FINDSPOT	526000	105000	Neolithic Worked Flint Findspots
27	MES1089	FS	Neo flints	FINDSPOT	525000	107000	Neolithic Worked Flint Findspots
28	MES1047	MON	Red Hill: meso- neo flints	FINDSPOT	528700	108000	Neolithic Worked Flint Findspots
29	MES1053	FS	Portslade: Neo axes	FINDSPOT, SITE	525000	107000	Neolithic Worked Flint Findspots
30	MES1037	FS	Mile Oak: ?Neo arrowhead	FINDSPOT	524850	107070	Neolithic Worked Flint Findspots
31	MES1039	FS	Vallance Gardens: Neo arrowhead	FINDSPOT	528400	104610	Neolithic Worked Flint Findspots
32	MES356	MON	Waterhall Golf Course: BA settlement and possible Neolithic flints	FINDSPOT, FINDSPOT, FINDSPOT, DITCH, PIT	528520	110150	Neolithic Worked Flint Findspots
33	MES1368	MON	Falmer Hill : Neolithic flints	FINDSPOT	535460	107330	Neolithic Worked Flint Findspots
34	MES297	FS	Hollingbury Hill: neolithic axe	FINDSPOT	532200	107900	Neolithic Worked Flint Findspots
35	MES298	FS	Hollingbury: neolithic? quern	FINDSPOT	532200	107700	Neolithic Worked Flint Findspots
36	MES299	FS	Hollingbury Hill: neolithic axe	FINDSPOT	532200	107900	Neolithic Worked Flint Findspots
37	MES219	FS	Hollingbury Hill: neolithic axe	FINDSPOT	532200	107900	Neolithic Worked Flint Findspots
38	MES221	FS	Patcham: Neolithic axe	FINDSPOT	530000	108000	Neolithic Worked Flint Findspots
39	MES222	FS	Falmer Hill: neo axe	FINDSPOT, SITE	534800	107400	Neolithic Worked Flint Findspots
40	MES253	FS	neo flints	FINDSPOT	537000	102000	Neolithic Worked Flint Findspots
41	MES1347	FS	St Marys Farm: Neo flints	FINDSPOT	535170	110860	Neolithic Worked Flint Findspots

42	MES1497	FS	Mount Harry: neo pick	FINDSPOT, SITE	538000	112000	Neolithic Worked Flint Findspots
43	MES1489	FS	Offham: Neo stone axe	FINDSPOT, SITE	539000	112000	Neolithic Worked Flint Findspots
44	MES1490	FS	Offham Chalk Pit: Flint arrowhead	FINDSPOT	539000	112000	Neolithic Worked Flint Findspots
45	MES1491	FS	Mount Harry: ?neo axes	FINDSPOT, SITE	538000	112000	Neolithic Worked Flint Findspots
46	MES2059	FS	'Westmeston': neo axe	FINDSPOT, SITE	533000	113000	Neolithic Worked Flint Findspots
47	MES1657	FS	Lewes Station Bridge: neo axe	FINDSPOT, SITE	541600	109860	Neolithic Worked Flint Findspots
48	MES1842	FS	neo arrowheads	FINDSPOT	542000	102000	Neolithic Worked Flint Findspots
49	MES1847	MON	neo flint hoe	FINDSPOT, FINDSPOT, FINDSPOT	541200	102500	Neolithic Worked Flint Findspots
50	MES1831	FS	109, Ambleside Avenue: neo axe	FINDSPOT, SITE	540600	101890	Neolithic Worked Flint Findspots
51	MES1789	FS	Neo axes	FINDSPOT, SITE	544000	100000	Neolithic Worked Flint Findspots
52	MES1836	FS	Hodderm Farm: neo flint tool	FINDSPOT	542200	102300	Neolithic Worked Flint Findspots
53	MES1566	FS	'Lewes': neo axe	FINDSPOT, SITE	541000	110000	Neolithic Worked Flint Findspots
54	MES21821	FS	29 Steyning Avenue: Flints	FINDSPOT	541279	101024	Neolithic Worked Flint Findspots
55	MES1747	FS	'Near Lewes': neo axe	FINDSPOT, SITE	542000	110000	Neolithic Worked Flint Findspots
56	MES1947	MON	Northease Farm: neo? flints	LITHIC WORKING SITE, FINDSPOT, FINDSPOT, FINDSPOT, SITE	541000	106000	Neolithic Worked Flint Findspots
57	MES1834	MON	Hodderm Farm: worked flint concentration	FLINT SCATTER, SITE	541800	102300	Neolithic Worked Flint Findspots
58	MES2013	MON	neo? flint assemblage in LBA-RB. Settlement	LITHIC WORKING SITE, SETTLEMENT, SETTLEMENT, BURIAL, SITE	538900	109900	Neolithic Worked Flint Findspots
59	MES2015	MON	Neo flints	LITHIC	538900	110000	Neolithic

				WORKING SITE, SITE			Worked Flint Findspots
60	MES1330	MON	Norington Manor: Neo? flints / BA settlement?	FINDSPOT, SITE	537000	113500	Neolithic Worked Flint Findspots
61	MES18921	MON	200-204 South Coast Road: Meso/Neo flint	FLINT SCATTER	541110	100991	Neolithic Worked Flint Findspots
62	MES7197	FS	Cowlease Farm: neo axe	FINDSPOT	541900	113800	Neolithic Worked Flint Findspots
63	MES7199	FS	East Of Hollingbury: neolithic axe	FINDSPOT	532370	107810	Neolithic Worked Flint Findspots
64	MES310	MON	Surrenden Road: neo/eba flint concentrations	FINDSPOT	531357	107718	Neolithic Worked Flint Findspots
65	MES8675	FS	31 Aldrington Avenue: neo/BA? scraper	FINDSPOT	528025	105768	Neolithic Worked Flint Findspots
66	MES11186	PAS	Cliffe Hill (Lewes Golf Course): multiple neo? lithic finds	FINDSPOT	543300	110600	Neolithic Worked Flint Findspots
67	MES11523	PAS	Kingston Near Lewes: neo? lithic find	FINDSPOT	538500	109000	Neolithic Worked Flint Findspots
68	MES11107	PAS	Plumpton (Known As): neo? lithic finds	FINDSPOT	536900	113500	Neolithic Worked Flint Findspots
69	MES12875	PAS	Peacehaven (Known As): neo? lithic finds	FINDSPOT	541900	101700	Neolithic Worked Flint Findspots
70	MES12296	PAS	Lewes (Known As): neo? lithic finds	FINDSPOT	540900	109800	Neolithic Worked Flint Findspots
71	MES13223	PAS	Plumpton (Known As): Neo axe	FINDSPOT	536400	112200	Neolithic Worked Flint Findspots
72	MES13224	PAS	Plumpton (Known As): Neo axehead	FINDSPOT	536400	112200	Neolithic Worked Flint Findspots
73	MES13561	PAS	Glynde (Known As): neo? flint flake	FINDSPOT	543800	108700	Neolithic Worked Flint Findspots
74	MES13968	PAS	Neolithic blade	FINDSPOT	531940	113978	Neolithic Worked Flint Findspots
75	MES14937	PAS	Beddingham (Known As): neo? lithic find	FINDSPOT	543400	106100	Neolithic Worked Flint Findspots
76	MES15568	FS	Plumpton College: Flintwork	ARTEFACT SCATTER	535810	113490	Neolithic Worked Flint Findspots
77	MES15666	PAS	Cornwall	FINDSPOT	542250	100970	Neolithic

			Avenue Allotments: Neolithic Axe				Worked Flint Findspots
78	MES16129	FS	Field West Of Court Farm: Scraper	FINDSPOT	544056	103854	Neolithic Worked Flint Findspots
79	MES16399	MON	Famer Stadium: Late Mesolithic/Early Neolithic	PIT	535272	108602	Neolithic Worked Flint Findspots
80	MES322	MON	Incham Road: IA/RB settlement with neo? broken axe	ROUND HOUSE (DOMESTIC), PALISADED ENCLOSURE, DITCH, FINDSPOT, DITCH, CREMATION	532910	108648	Neolithic Worked Flint Findspots
81	MES1095	MON	West Blatchington Villa: Roman villa neo? lithic finds	DITCH, PIT, PIT, DITCH, CORN DRYING KILN, CREMATION, DITCH, FIELD BOUNDARY, ROAD, FINDSPOT, FLINT SCATTER, VILLA, SITE	527510	107230	Neolithic Worked Flint Findspots
82	MES1358	FS	Balmer Down: neo axe	FINDSPOT	537000	110000	Neolithic Worked Flint Findspots
83	MES1787	FS	Tor Road: neo hoe	FINDSPOT	541200	102500	Neolithic Worked Flint Findspots
84	MES23767	MON	Rayford Close / Steyning Avenue: Mesolithic site	FINDSPOT, SITE	541297	101246	Neolithic Worked Flint Findspots
85	MES11523	PAS	Kingston Near Lewes (Known As): Kingston near Lewes (known as)	FINDSPOT	538500	109000	Neolithic Worked Flint Findspots
86	MES12875	PAS	Peacehaven (Known As): neo? flints	FINDSPOT	541900	101700	Neolithic Worked Flint Findspots
87	MES13223	PAS	Plumpton (Known As): Neo axe	FINDSPOT	536400	112200	Neolithic Worked Flint Findspots
88	MES13224	PAS	Plumpton (Known As): Neo axehead	FINDSPOT	536400	112200	Neolithic Worked Flint Findspots
89	MES13968	PAS	Neolithic blade	FINDSPOT	531940	113978	Neolithic Worked Flint Findspots
90	MES14937	PAS	Beddingham	FINDSPOT	543400	106100	Neolithic

			(Known As): neo? flints				Worked Flint Findspots
91	MES15666	PAS	Cornwall Avenue Allotments: Neolithic Axe	FINDSPOT	542250	100970	Neolithic Worked Flint Findspots
92	MES17516	PAS	24 Selham Close, Coldean: Scraper	FINDSPOT	533020	108820	Neolithic Worked Flint Findspots
93	MES18989	MON	Bovis Site Keymer Avenue: Neolithic activity	SITE, LITHIC WORKING SITE, PIT, GULLY, SETTLEMENT	541762	101147	Neolithic Worked Flint Findspots
94	MES18995	FS	Bovis Homes Phase 2: Mesolithic - Neolithic finds	ARTEFACT SCATTER	542178	101110	Neolithic Worked Flint Findspots
95	MES25684	FS	Piddinghoe Sports Park, Peacehaven: Neo-B.A Flints	FINDSPOT	541902	101298	Neolithic Worked Flint Findspots
96	MES21203	FS	North End: Mesolithic flints	FINDSPOT	541272	113439	Neolithic Worked Flint Findspots
97	MES21396	FS	Newmarket Hill: Neolithic axe	FINDSPOT	536175	107057	Neolithic Worked Flint Findspots
98	MES22455	FS	Brookside, Piddinghoe: Prehistoric finds	FINDSPOT	543592	102931	Neolithic Worked Flint Findspots
99	MES22651	FS	Greenway Bottom, Ovingdean: Prehistoric flint	FINDSPOT	535800	103300	Neolithic Worked Flint Findspots
100	MES23145	FS	Woodingdean: Prehistoric flakes	FINDSPOT	535630	106319	Neolithic Worked Flint Findspots
101	MES23273	FS	Plumpton Plain: PH Flint Tools	FINDSPOT	535726	112203	Neolithic Worked Flint Findspots
102	MES23688	FS	Hodder Junior School: Neolithic flints	FINDSPOT	540917	101611	Neolithic Worked Flint Findspots
103	MES23686	MON	11-13 Roundhay Avenue: Neolithic site	SITE	542488	100794	Neolithic Worked Flint Findspots
104	MES6990	FS	Balmer Farm: Neo flint chisel	FINDSPOT	535950	109950	Neolithic Worked Flint Findspots
105	MES23771	FS	Ambleside Avenue: Neolithic axe	FINDSPOT	540576	101908	Neolithic Worked Flint Findspots
106	MES23838	FS	Near Cockshut Stream, Kingston:	FINDSPOT	540239	108744	Neolithic Worked Flint Findspots

			Prehistoric Flintwork				
107	MES24654	FS	Axe roughout		538877	109840	Neolithic Worked Flint Findspots
108	MES24693	MON	30 Western Road Lewes: Neo-B.A Flints	FINDSPOT	540811	110052	Neolithic Worked Flint Findspots
109	MES25508	FS	Hodderm Farm : Neolithic axe	FINDSPOT	541700	101600	Neolithic Worked Flint Findspots
110	MES25492	FS	29 Highdown Road, Lewes: PH flints	FINDSPOT	540204	110928	Neolithic Worked Flint Findspots
111	MES25547	FS	Newhaven Primary School: Neo/B.A Flints	FINDSPOT	544009	100536	Neolithic Worked Flint Findspots
112	MES25570	FS	Monk's House, Rodmell: Meso- B.A Flints	FINDSPOT	542118	106428	Neolithic Worked Flint Findspots
113	MES25645	FS	Farrington Farm, Peacehaven: Meso-Neo Flints	FINDSPOT	541666	101258	Neolithic Worked Flint Findspots
114	MES25653	FS	Woollards Field, Falmer: PH Flint	FINDSPOT	533908	108143	Neolithic Worked Flint Findspots
115	MES25740	FS	Brighton Racecourse: PH Flints	FINDSPOT	533201	105217	Neolithic Worked Flint Findspots
116	MES25866	FS	145 Vale Avenue, Patcham: PH Flints	FINDSPOT	530099	109127	Neolithic Worked Flint Findspots
117	MES25918	MON	Tideway School, Newhaven: PH Features and finds	DITCH, FEATURE	543864	100558	Neolithic Worked Flint Findspots
118	MES19819	FS	Baxters Printworks Site: Prehistoric Flint	FINDSPOT	541636	110072	Neolithic Worked Flint Findspots
119	MES26029	MON	Land off Arundel Road Peacehaven: Neo-Rom Features and Finds	PIT, DITCH, TREE THROW	541880	101060	Neolithic Worked Flint Findspots
120	MES26058	FS	25&27 Dorothy Avenue, Peacehaven: P.H Flints	FINDSPOT	541129	101061	Neolithic Worked Flint Findspots

APPENDIX 3: Context Register

Context Trench/context	Type	Interpretation	Feature Type
1/1	layer	topsoil	bioturbated natural strata
1/2	layer	subsoil	natural strata
1/3	layer	Geological deposit	natural strata
1/4	cut	Natural chalk bedrock	natural strata
2/1	layer	topsoil	bioturbated natural strata
2/2	layer	subsoil	natural strata
2/3	layer	Natural chalk bedrock	natural strata
3/1	layer	topsoil	bioturbated natural strata
3/2	layer	subsoil	natural strata
3/3	layer	Natural chalk bedrock	natural strata
4/1	layer	topsoil	bioturbated natural strata
4/2	layer	subsoil	natural strata
4/3	layer	Natural chalk bedrock	natural strata
4/4	cut	ditch	ditch, gully, drain, sewer etc
4/5	Fill	fill	ditch, gully, drain, sewer etc
4/6	Fill	fill	pit (unspecified)
4/7	cut	Pit	pit (unspecified)
5/1	layer	topsoil	bioturbated natural strata
5/2	layer	subsoil	natural strata
5/3	layer	Natural chalk bedrock	natural strata
5/4	cut	pit	pit (unspecified)
5/5	fill	fill	pit (unspecified)
5/6	cut	posthole	structural cut (posthole, stakehole)
5/7	fill	fill	structural cut (posthole, stakehole)
6/1	layer	topsoil	bioturbated natural strata
6/2	layer	subsoil	natural strata
6/3	layer	Natural chalk bedrock	natural strata
6/4	layer	Geological deposit	Natural strata
7/1	layer	topsoil	bioturbated natural strata
7/2	layer	subsoil	natural strata
7/3	layer	Natural chalk bedrock	natural strata
7/4	cut	stakeholes	structural cut (posthole, stakehole)
7/5	fill	fill	structural cut (posthole, stakehole)
8/1	layer	topsoil	bioturbated natural strata
8/2	layer	subsoil	natural strata
8/3	layer	Natural chalk bedrock	natural strata
9/1	layer	topsoil	bioturbated natural strata
9/2	layer	subsoil	natural strata
9/3	layer	Natural chalk bedrock	natural strata
10/1	layer	topsoil	bioturbated natural strata
10/2	layer	subsoil	natural strata
10/3	layer	Natural chalk bedrock	natural strata
10/4	cut	?pit	pit (unspecified)
10/5	fill	fill	pit (unspecified)
10/6	cut	posthole	structural cut (posthole,

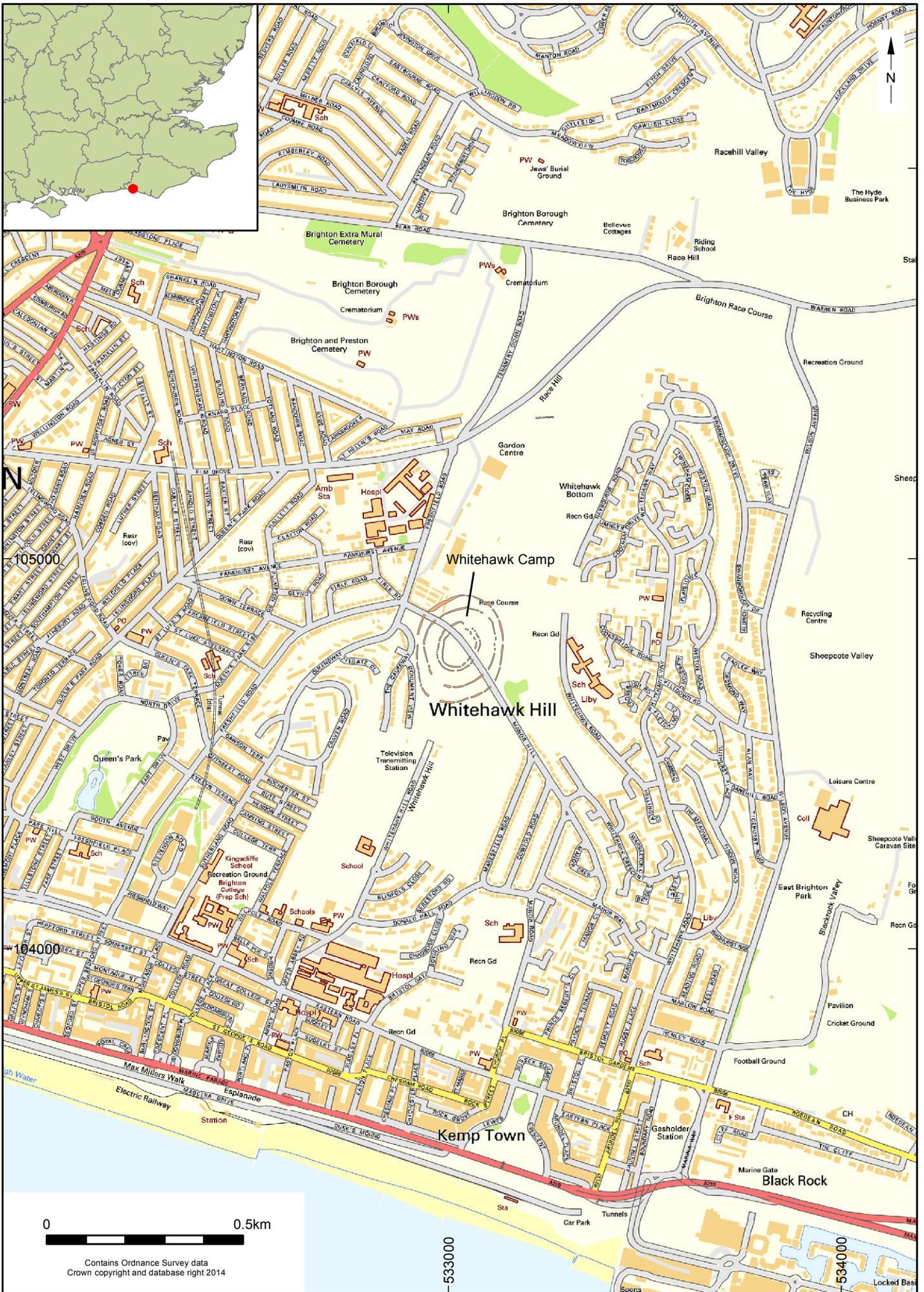
Context Trench/context	Type	Interpretation	Feature Type
			stakehole)
10/7	fill	fill	structural cut (posthole, stakehole)
10/8	cut	posthole	structural cut (posthole, stakehole)
10/9	fill	fill	structural cut (posthole, stakehole)
10/10	cut	posthole	structural cut (posthole, stakehole)
10/11	fill	fill	structural cut (posthole, stakehole)
10/12	cut	posthole	structural cut (posthole, stakehole)
10/13	fill	fill	structural cut (posthole, stakehole)
10/14	cut	posthole	structural cut (posthole, stakehole)
10/15	fill	fill	structural cut (posthole, stakehole)
10/16	cut	posthole	structural cut (posthole, stakehole)
10/17	fill	fill	structural cut (posthole, stakehole)
10/18	cut	posthole	structural cut (posthole, stakehole)
10/19	fill	fill	structural cut (posthole, stakehole)
10/20	layer	layer	
10/21	cut	posthole	structural cut (posthole, stakehole)
10/22	fill	fill	structural cut (posthole, stakehole)
10/23	cut	posthole	structural cut (posthole, stakehole)
10/24	fill	fill	structural cut (posthole, stakehole)

APPENDIX 4: Accessioned artefacts known to be missing or currently on loan to the Whitehawk Micro Museum from the archive held by RPM

	Date Accessioned	Accession Number	Find Type	Reason Missing	
R3162	1929	R3162/	1	Pottery	Restored Pot - stack ?
		R3162/	2	Pottery	Restored Pot - stack ?
		R3162/	39	Pottery	Whitehawk Micro Museum
		R3162/	64	Pottery	Missing (pt found)
		R3162/	83	Pottery	Restored Pot - stack ?
		R3162/	93	Flint	Missing
		R3162/	96	Flint	Missing
		R3162/	107	Flint	Missing
		R3162/	120	Flint	Whitehawk Micro Museum
		R3162/	135	Flint	Missing
		R3162/	136	Flint	Missing
		R3162/	140	Flint	Missing
		R3162/	166	Bone	Missing
		R3162/	185-187	Mollusc	Missing
		R3162/	189	Mollusc	Whitehawk Micro Museum
		R3162/	190	Mollusc	Whitehawk Micro Museum
		R3162/	191	Mollusc	Whitehawk Micro Museum
		R3162/	199	Mollusc	Whitehawk Micro Museum
		R3162/	201	Mollusc	Whitehawk Micro Museum
R3688	1933	R3688/	21	Pottery	Located 22/10
		R3688/	43	Pottery	Missing
		R3688/	51	Pottery	Missing
		R3688/	52	Pottery	Missing
		R3688/	72	Pottery	Whitehawk Micro Museum pt
		R3688/	79	Pottery	Restored Pot - stack ?
		R3688/	80	Pottery	Restored Pot - stack ?
		R3688/	82	Flint	Whitehawk Micro Museum
		R3688/	86	Flint	Missing
		R3688/	93	Flint	Missing
		R3688/	98	Flint	Missing
		R3688/	106	Flint	Whitehawk Micro Museum
		R3688/	115	Chalk	Whitehawk Micro Museum
		R3688/	119	Stone	Oversized - in basement
		R3688/	137	Bone	Missing
		R3688/	166	Mollusc	Missing
R3688/	174	Chalk	Oversized x2		
R4100	1935	R4100/	1	Pottery	Restored Pot - stack ?
		R4100/	2	Pottery	Restored Pot - stack ?
		R4100/	3	Pottery	Restored Pot - stack ?
		R4100/	4	Pottery	Whitehawk Micro Museum
		R4100/	5	Pottery	Restored Pot - stack ?
		R4100/	6	Pottery	Restored Pot - stack ?
		R4100/	7	Pottery	Whitehawk Micro Museum
		R4100/	8	Pottery	Restored Pot - stack ?
		R4100/	9	Pottery	Restored Pot - stack ?

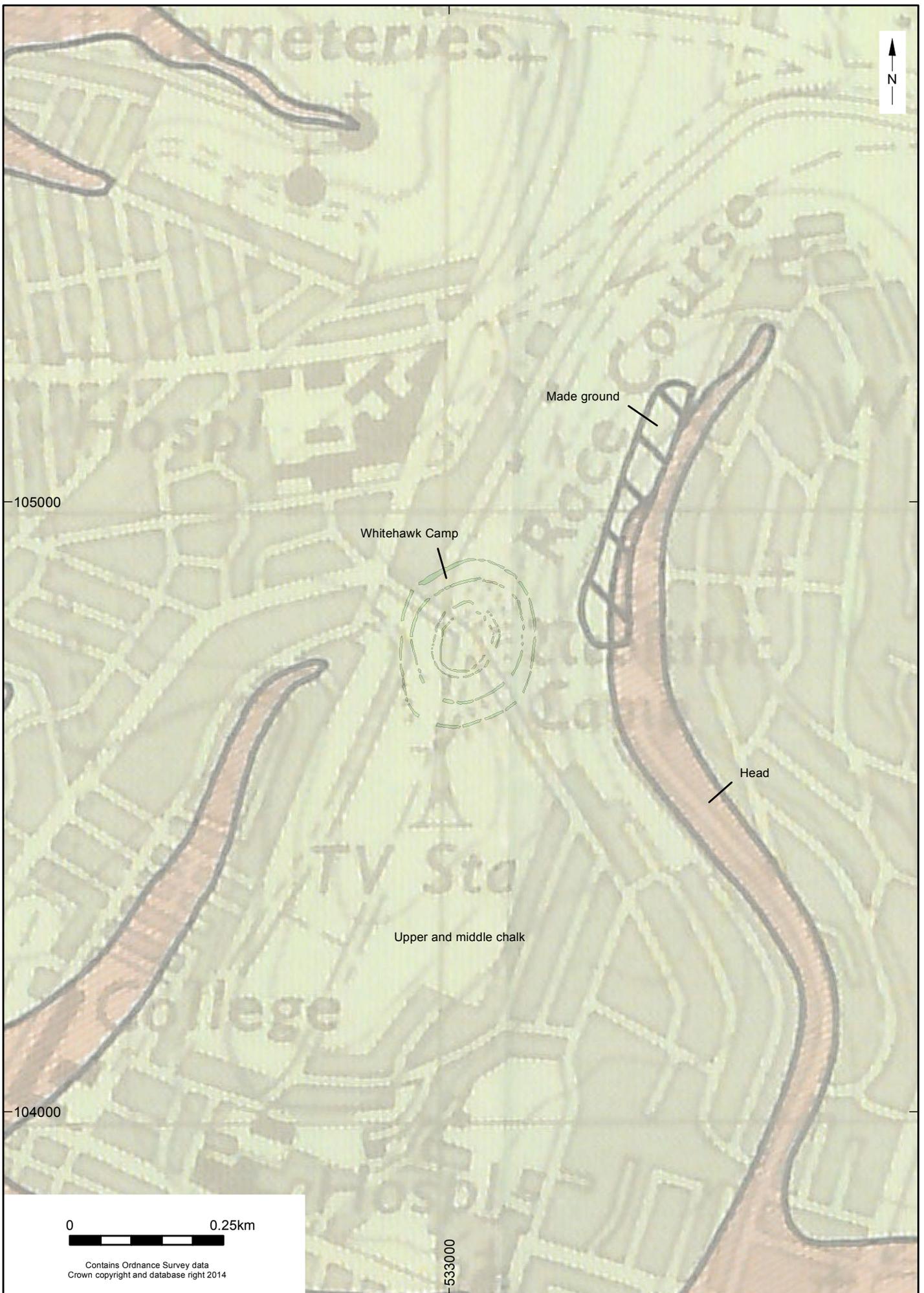
R4100/	18	Pottery	Located 22/10
R4100/	26	Pottery	Located 22/10
R4100/	42	Pottery	Missing
R4100/	76	Flint	Missing
R4100/	79	Flint	Missing
R4100/	85	Flint	Whitehawk Micro Museum x 1
R4100/	124	Stone	Whitehawk Micro Museum
R4100/	133	Chalk	Whitehawk Micro Museum
R4100/	134	Chalk	Missing
R4100/	136	Stone	Missing
R4100/	162	Stone	Booth Museum

APPENDIX 5: An Evaluation Report to the Heritage Lottery Fund on the Outcomes of the Whitehawk Camp Community Archaeology Project (Orange et al 2015)

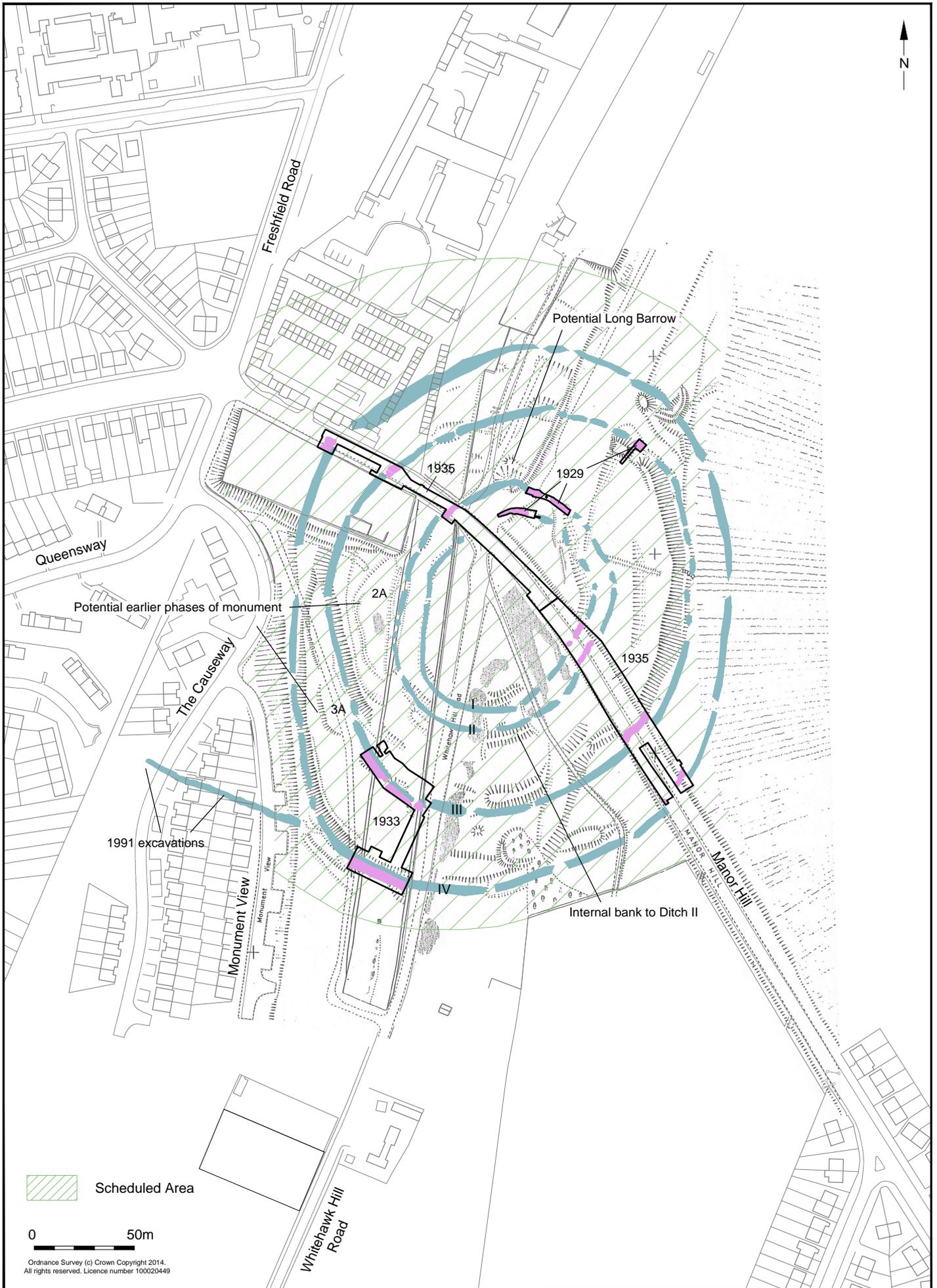


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© Archaeology South-East		Whitehawk Camp		Fig. 1
Project Ref: P106	July 2015	Site location		
Report Ref: 2015222	Drawn by: JLR			

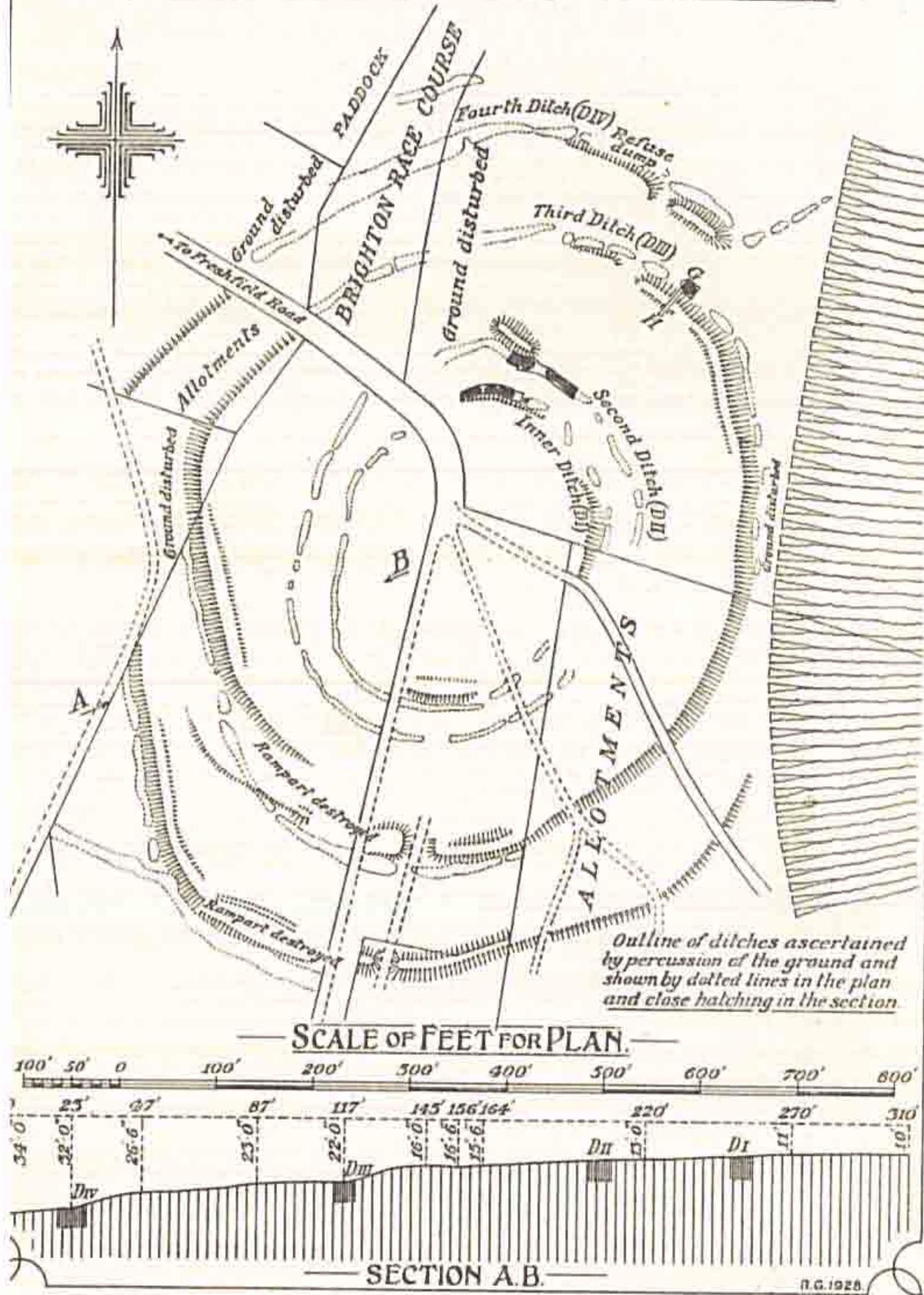


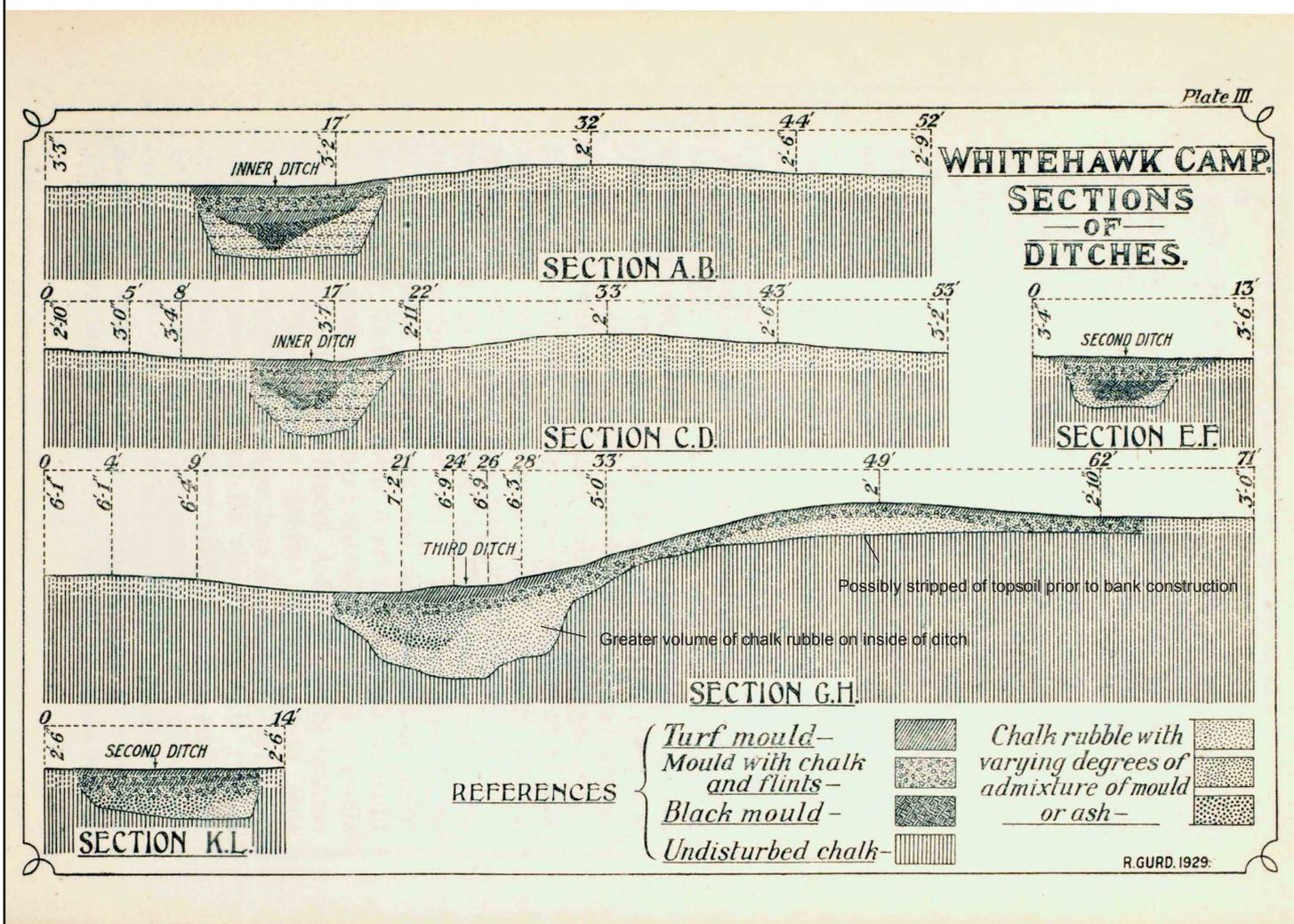
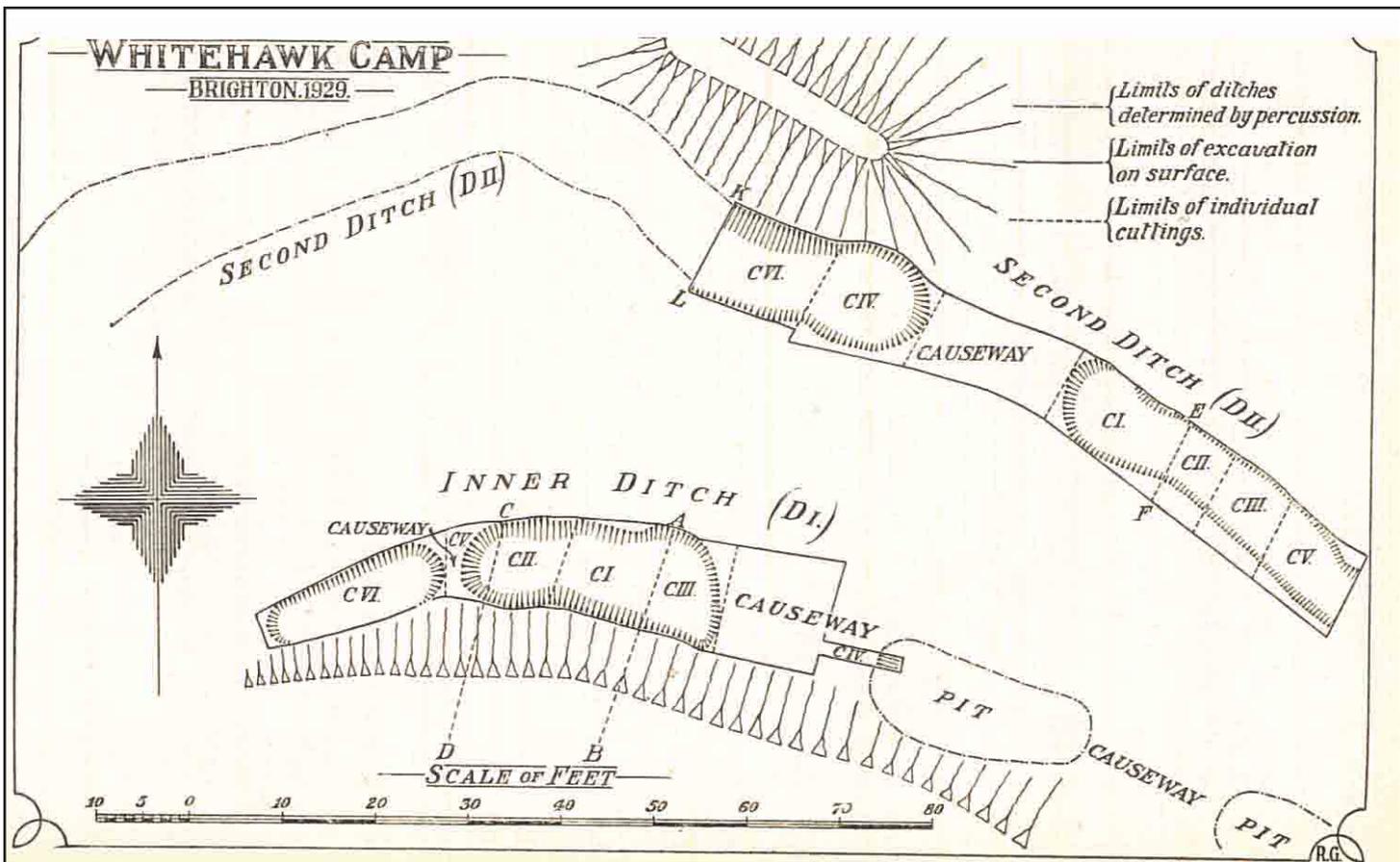
© Archaeology South-East		Whitehawk Camp	Fig. 2
Project Ref: P106	July 2015	Geological map	
Report Ref: 2015222	Drawn by: JLR		



© Archaeology South-East		Whitehawk Camp	Fig. 3
Project Ref: P106	July 2015	Location of the 1928, 1933 and 1935 excavations	
Report Ref: 2015222	Drawn by: JLR		

WHITEHAWK CAMP, BRIGHTON.

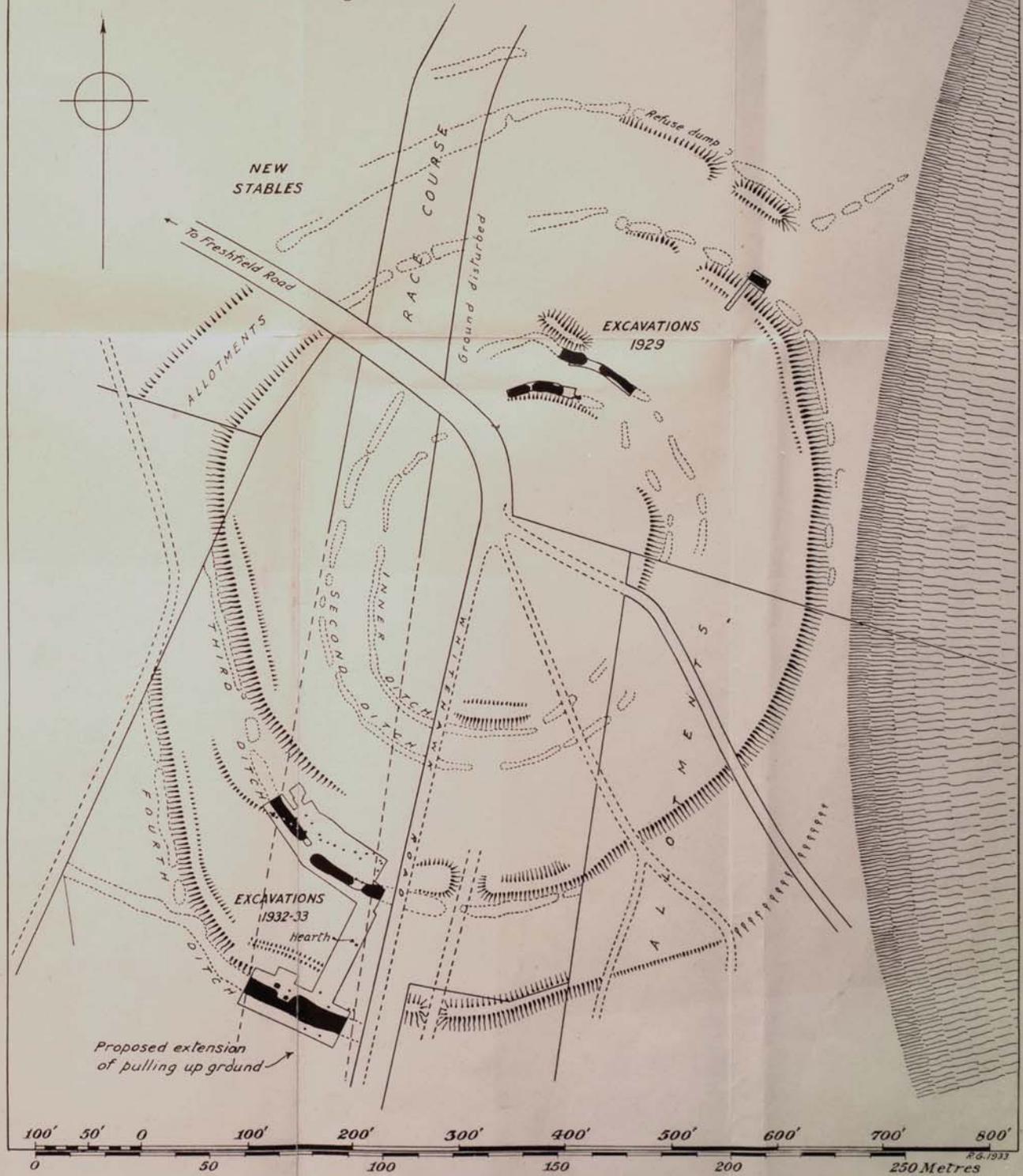


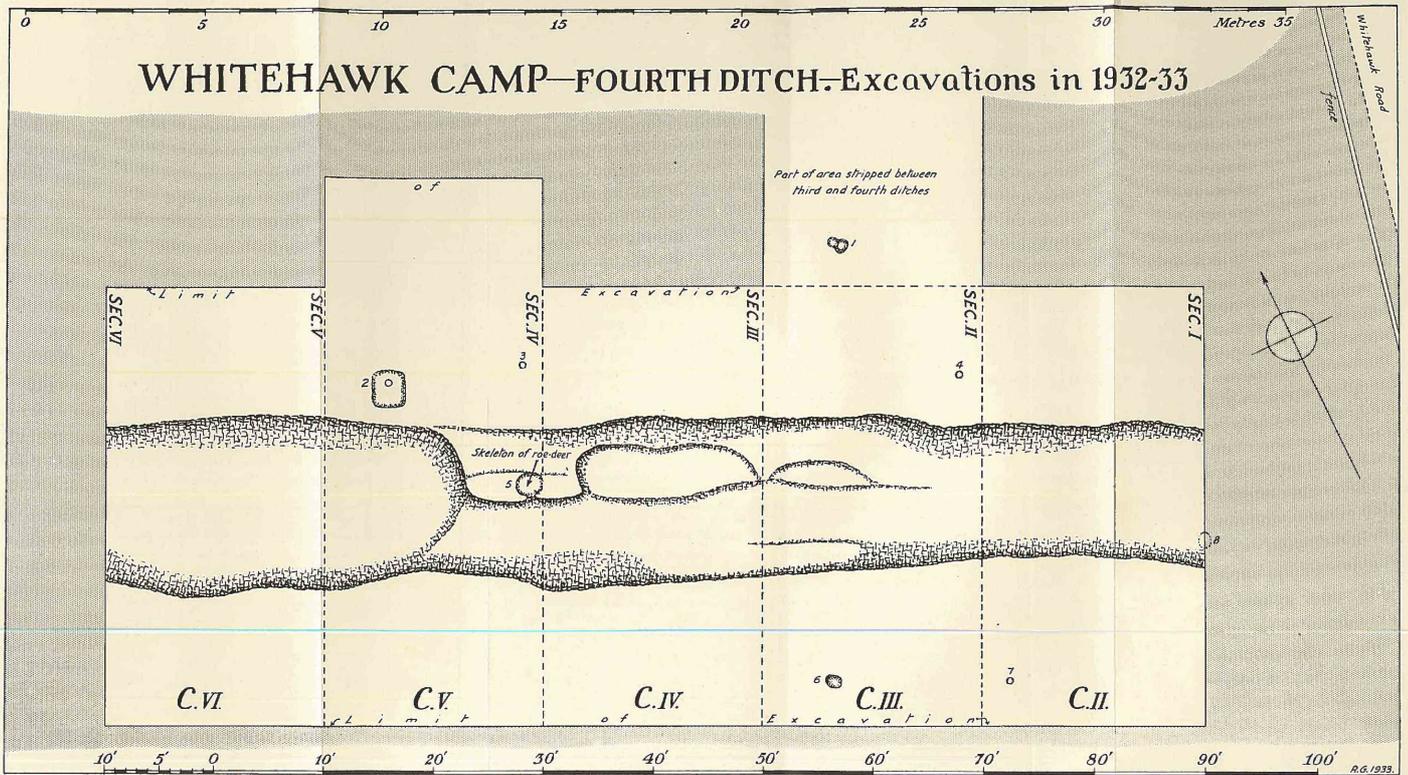
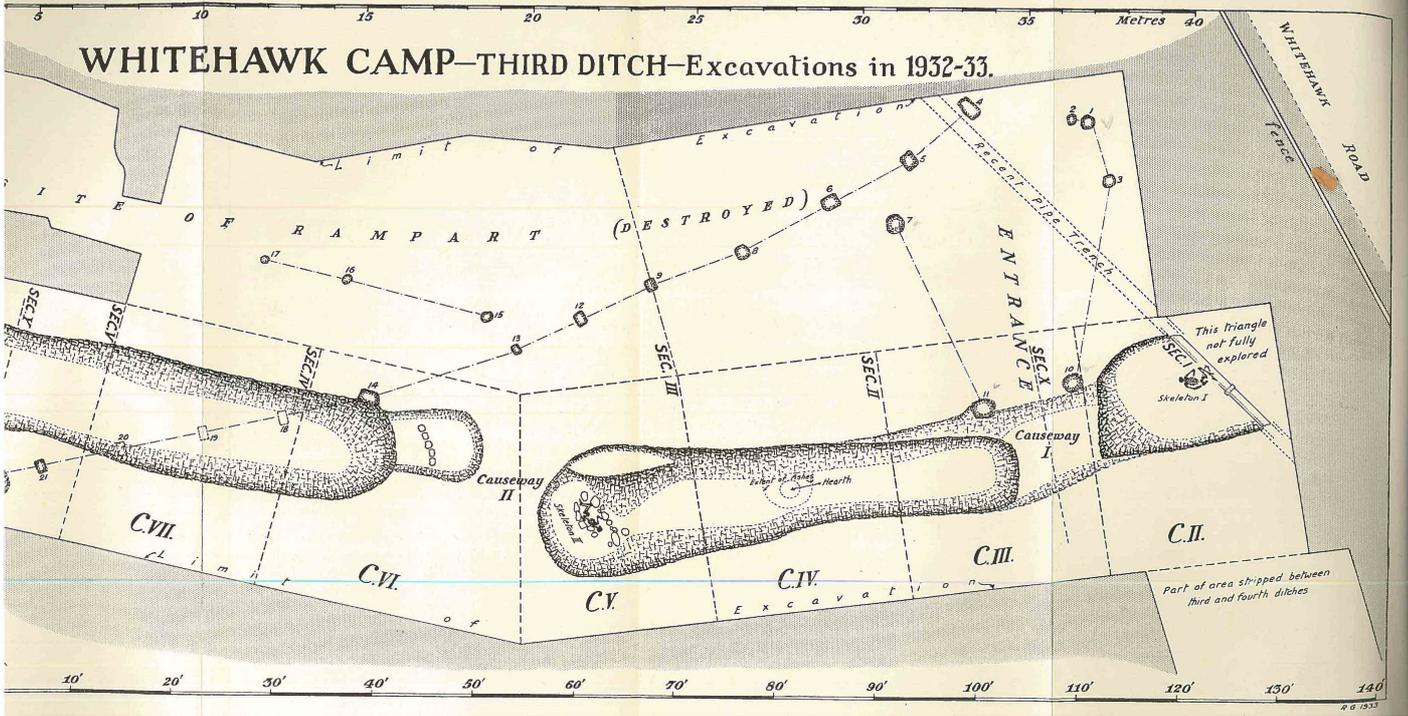


© Archaeology South-East Whitehawk Camp
 Project Ref: P106 July 2015 Plan and sections of the 1928-9 excavation areas
 Report Ref: 2015222 Drawn by: JLR (after Ross Williamson, 1930) Fig. 5

WHITEHAWK CAMP, BRIGHTON.

Showing excavations in 1929 & 1932-33.





THIRD DITCH SECTIONS

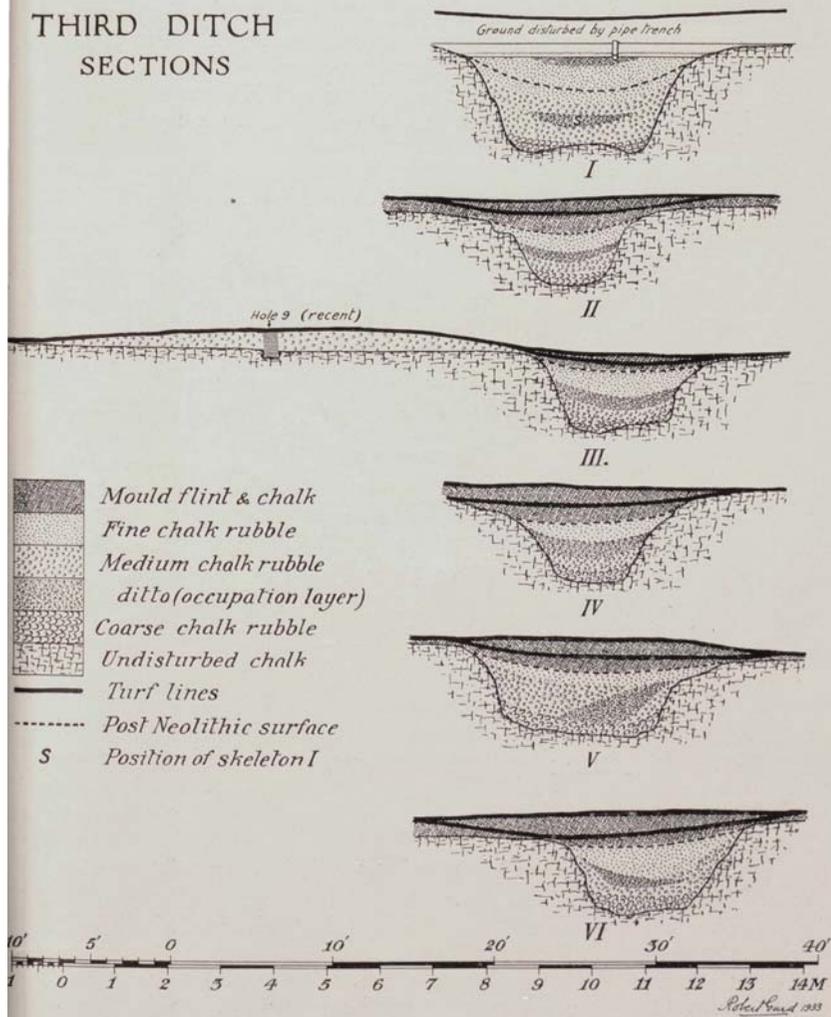


FIG. 2. Third Ditch, Sections

FOURTH DITCH SECTIONS

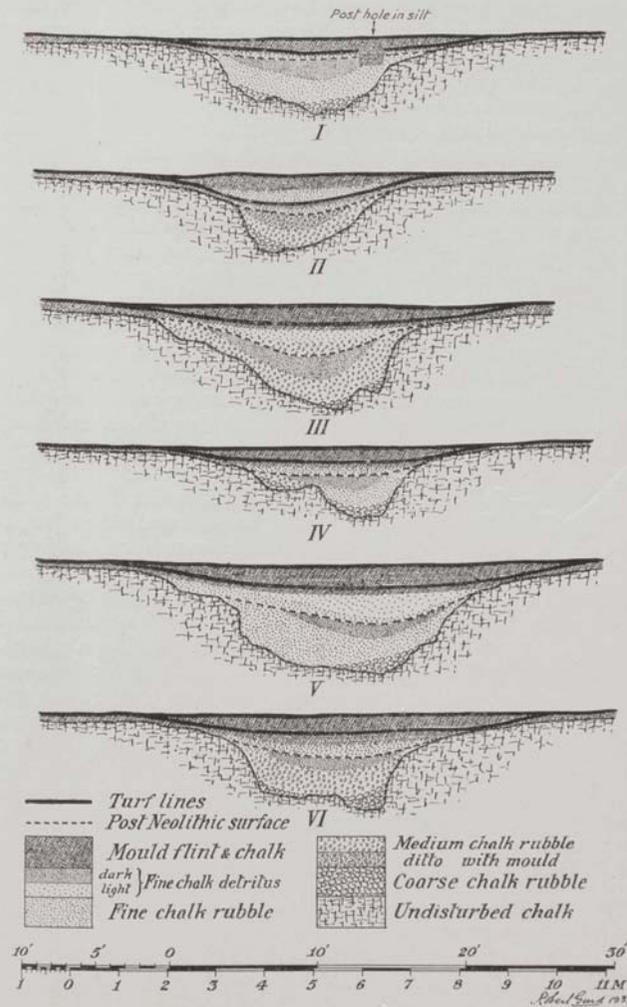


FIG. 1. Fourth Ditch, Sections

WHITEHAWK CAMP
 showing
Excavations in 1935
 and 1929

*Excavated ditches & post holes
 shown in black;
 Dotted lines indicate course of
 ditches ascertained by percussion.*

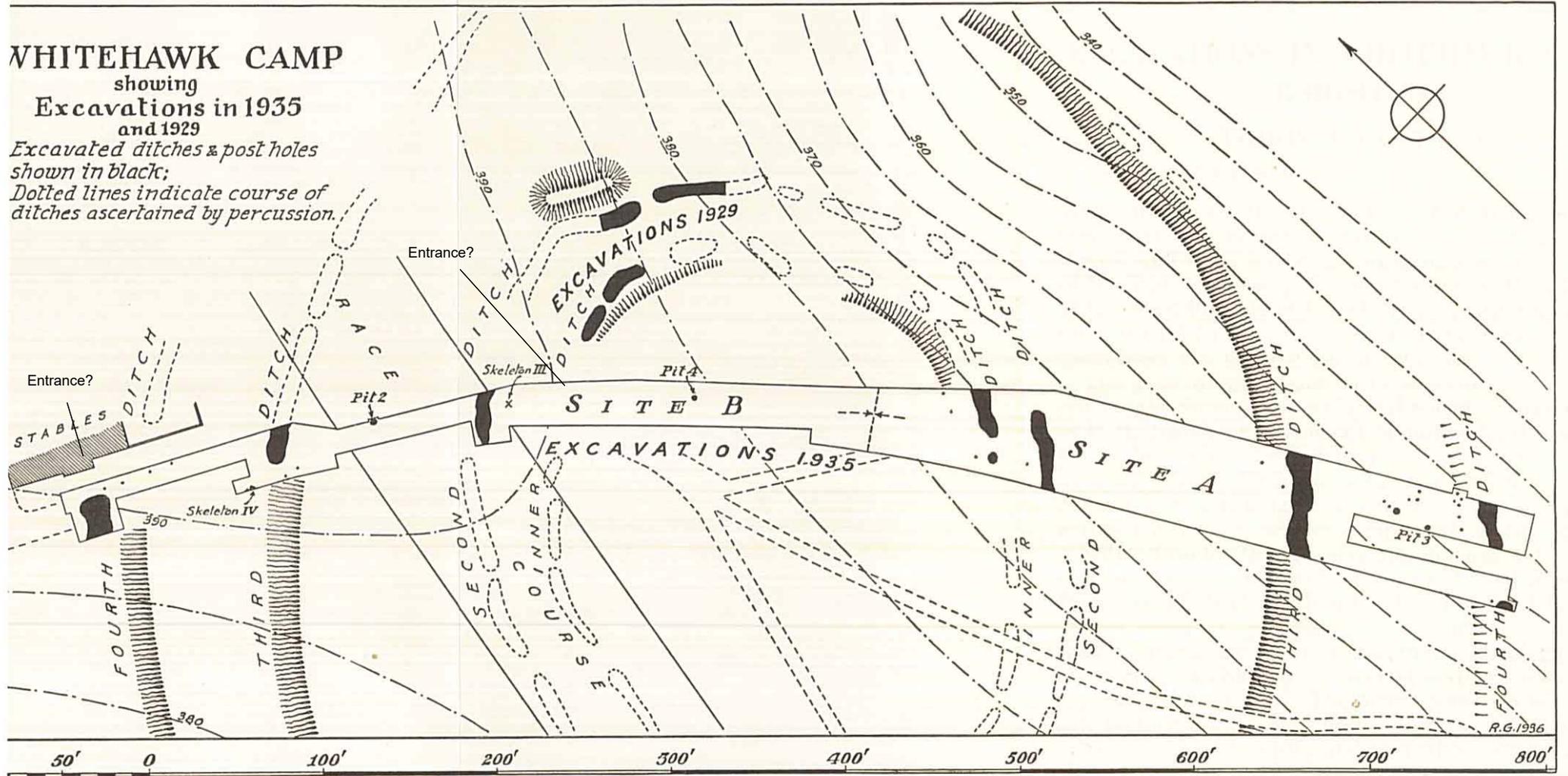


PLATE I.

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Project Ref: P106

Report Ref: 2015222

July 2015

Drawn by: JLR

Whitehawk Camp

Plan of the 1935 excavation (after Curwen 1936)

Fig. 9

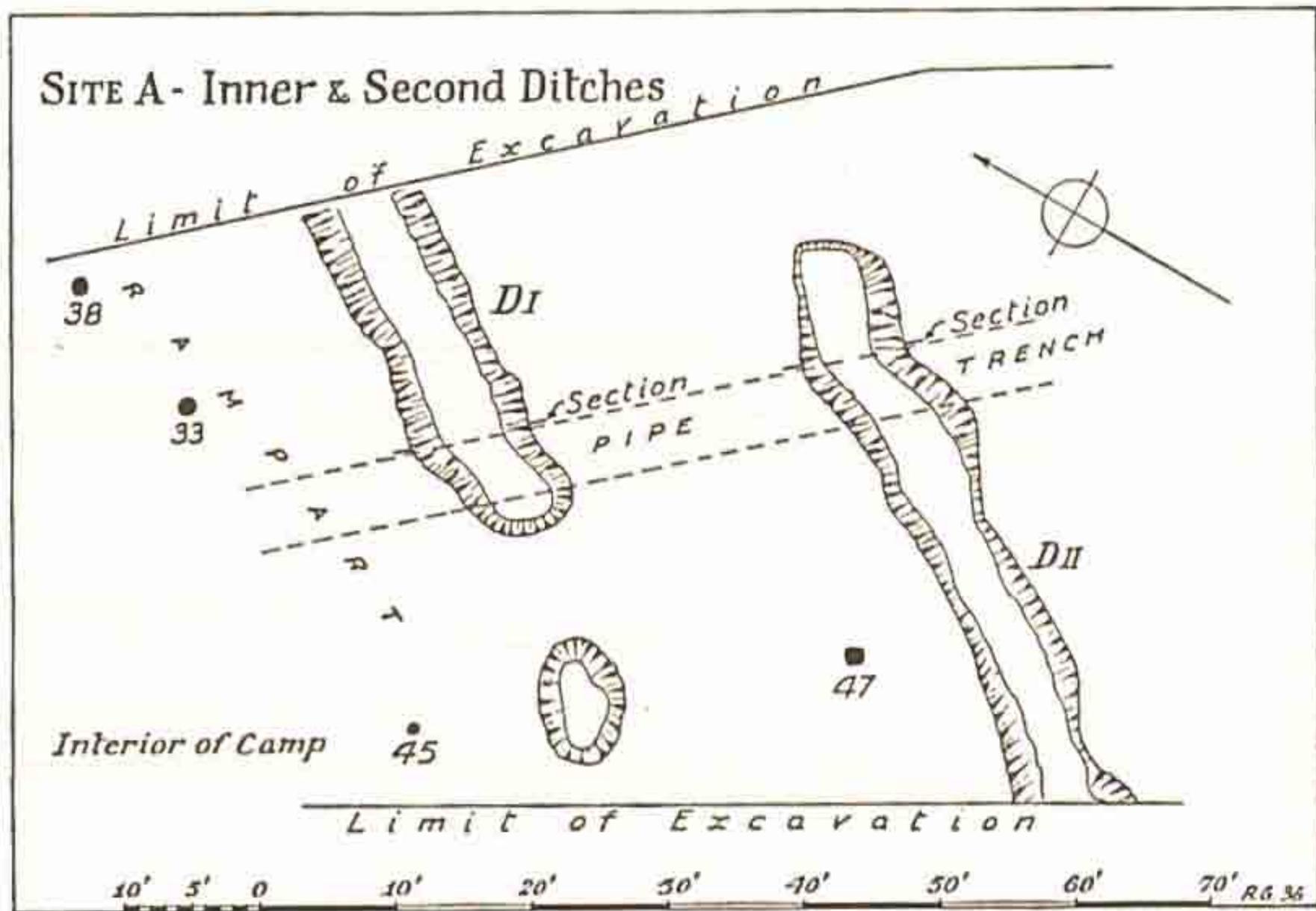


FIG. A.

© Archaeology South-East		Whitehawk Camp	Fig. 10
Project Ref: P106	July 2015	Plan of the 1935 excavations	
Report Ref: 2015222	Drawn by: JLR		

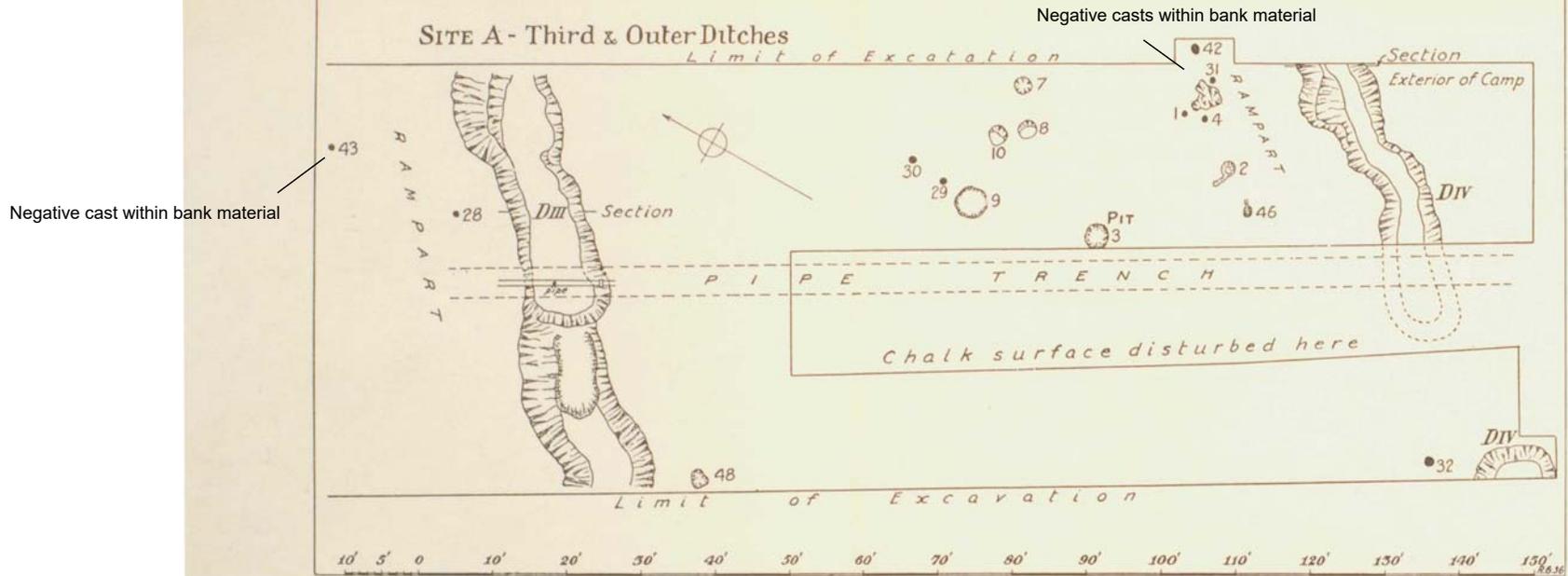
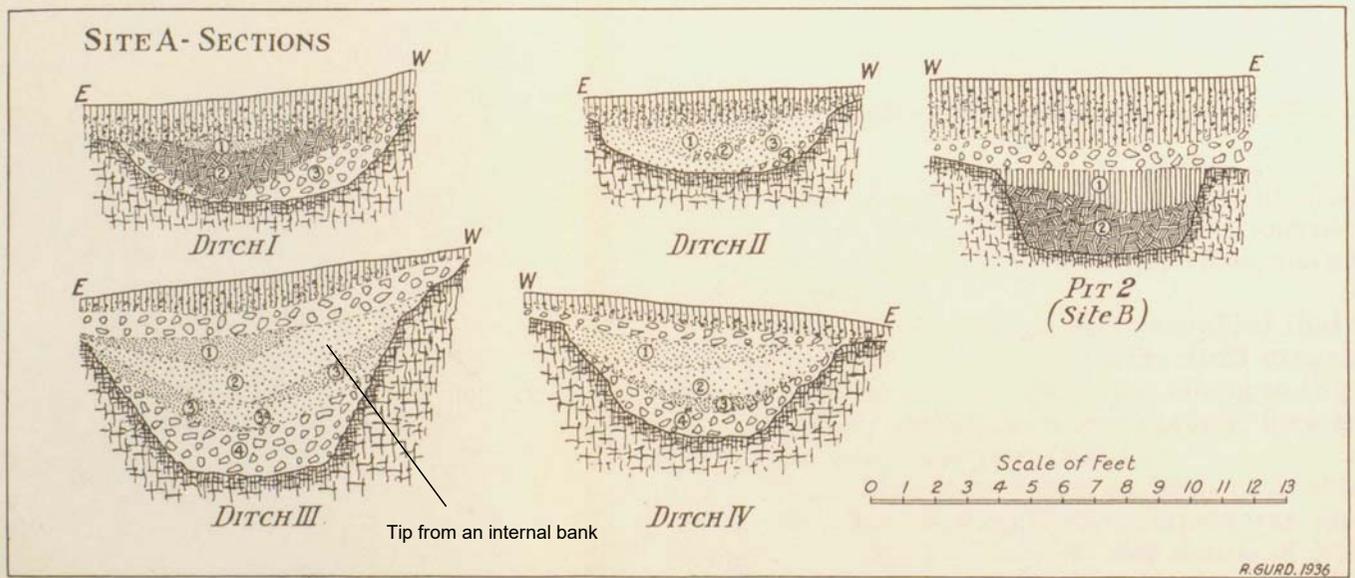


FIG. B.



Negative cast within bank material

Tip from an internal bank

© Archaeology South-East		Whitehawk Camp	Fig. 11
Project Ref: P106	July 2015	Plan and sections of the 1935 excavations (after Curwen 1936)	
Report Ref: 2015222	Drawn by: JLR		

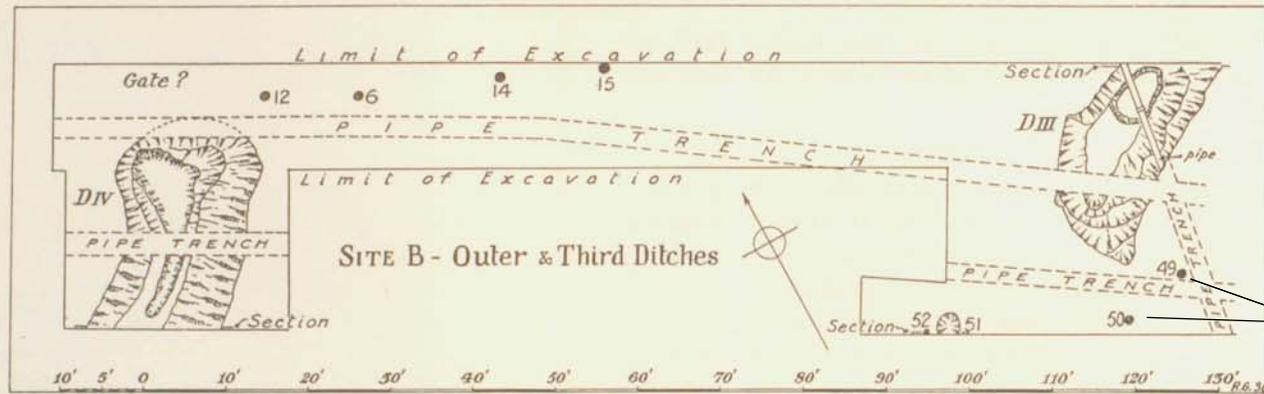
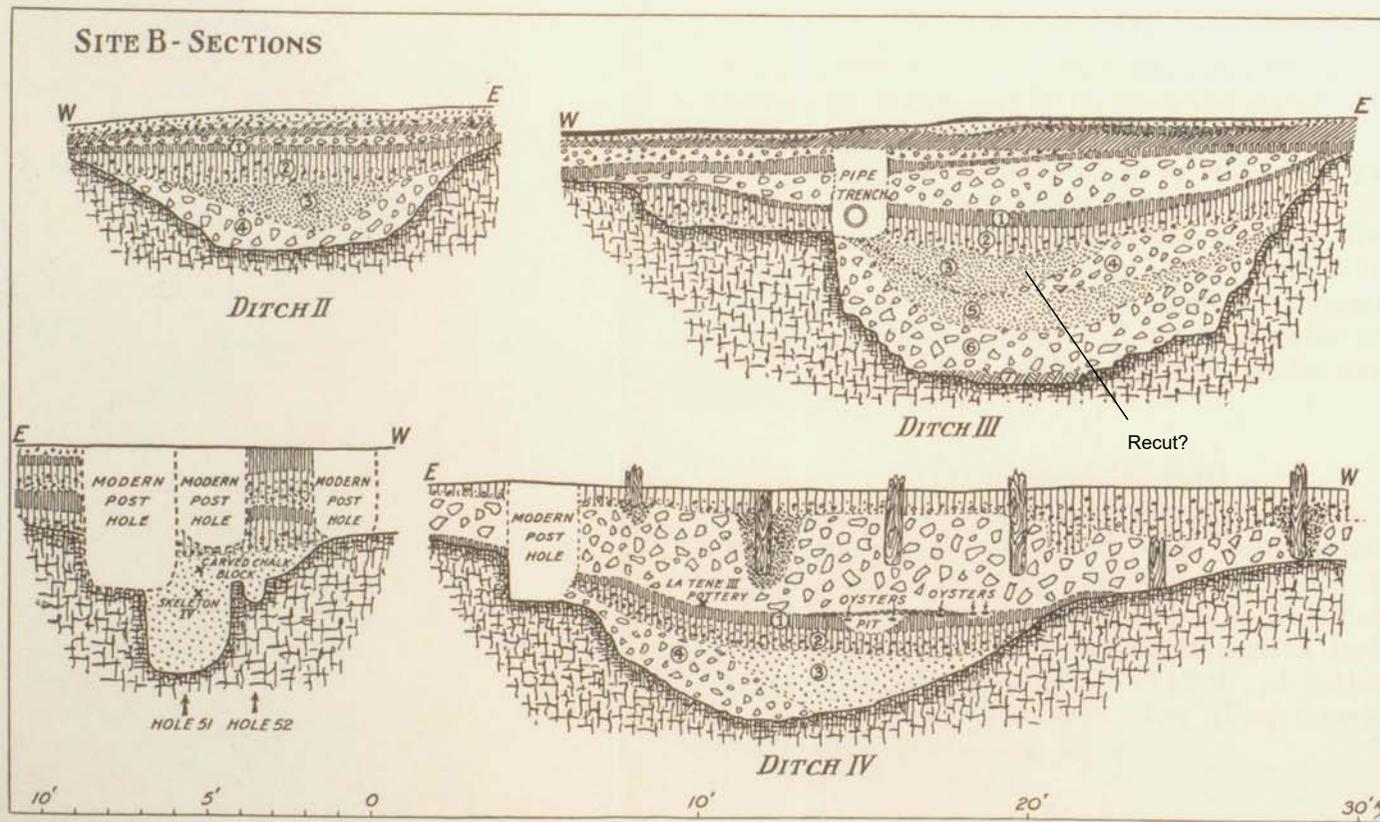


FIG. D.

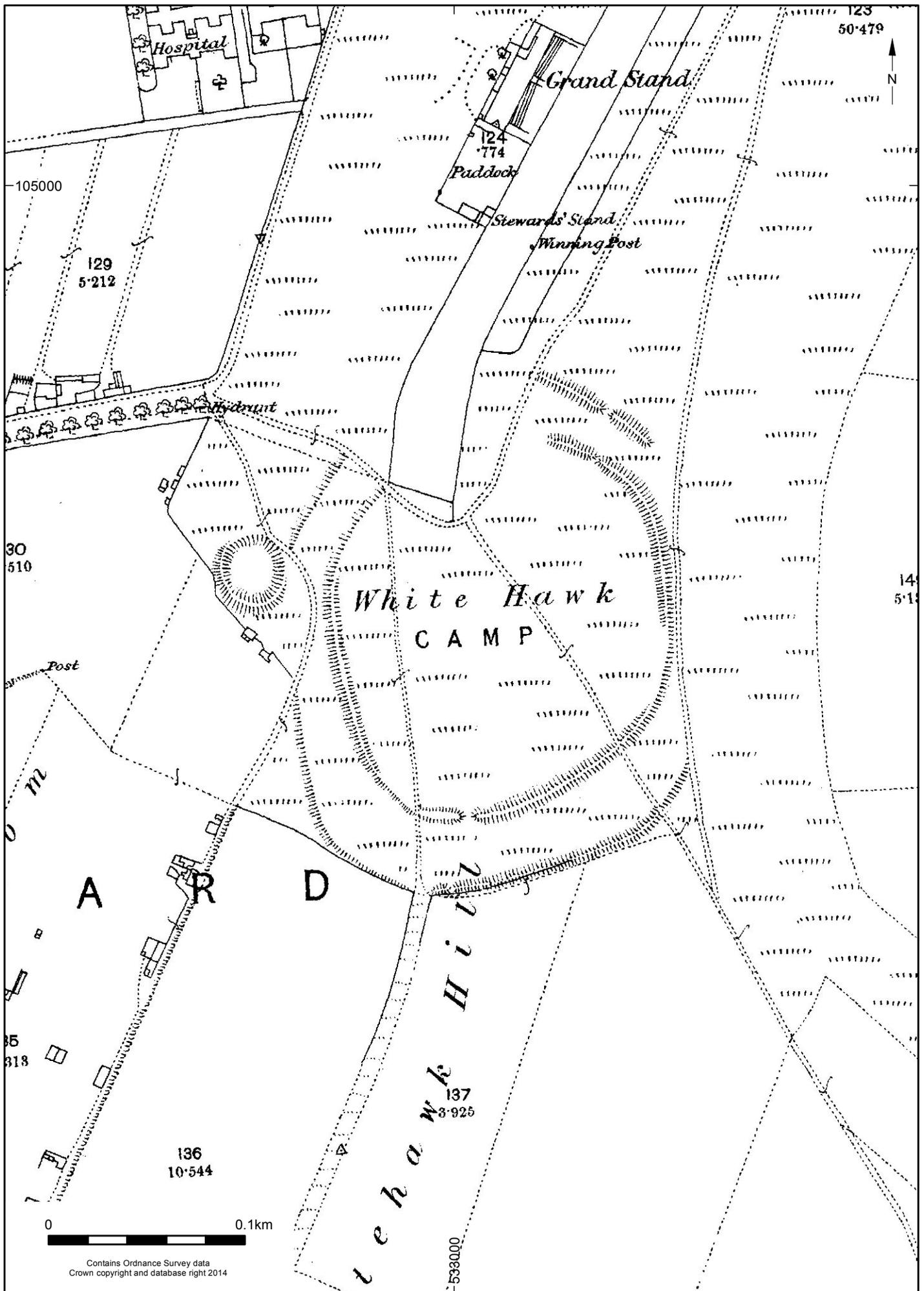




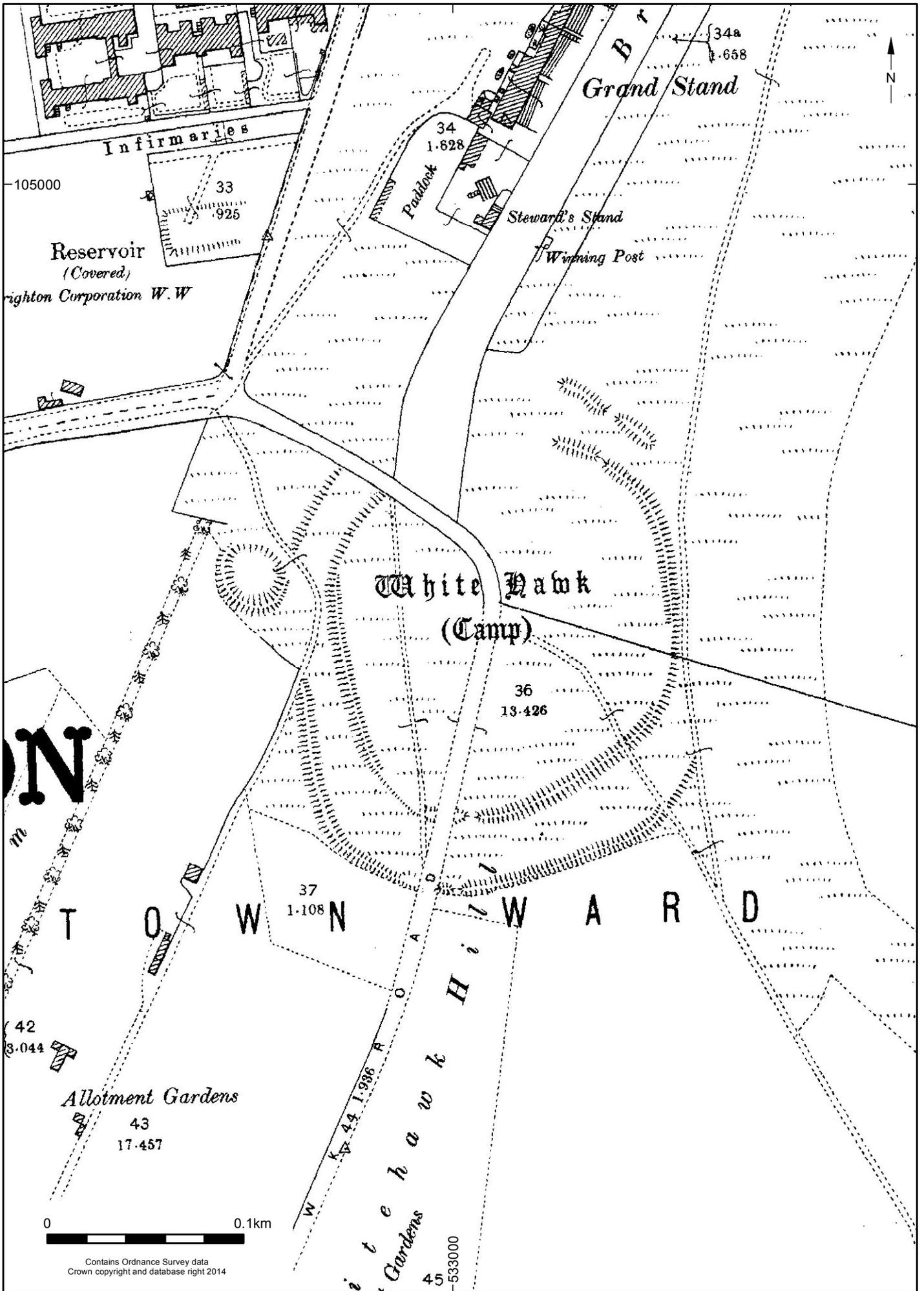
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© Archaeology South-East		Whitehawk Camp		Fig. 13
Project Ref: P106	July 2015	Composite plan of monitored intrusive works from 1991-2014		
Report Ref: 2015222	Drawn by: JLR			

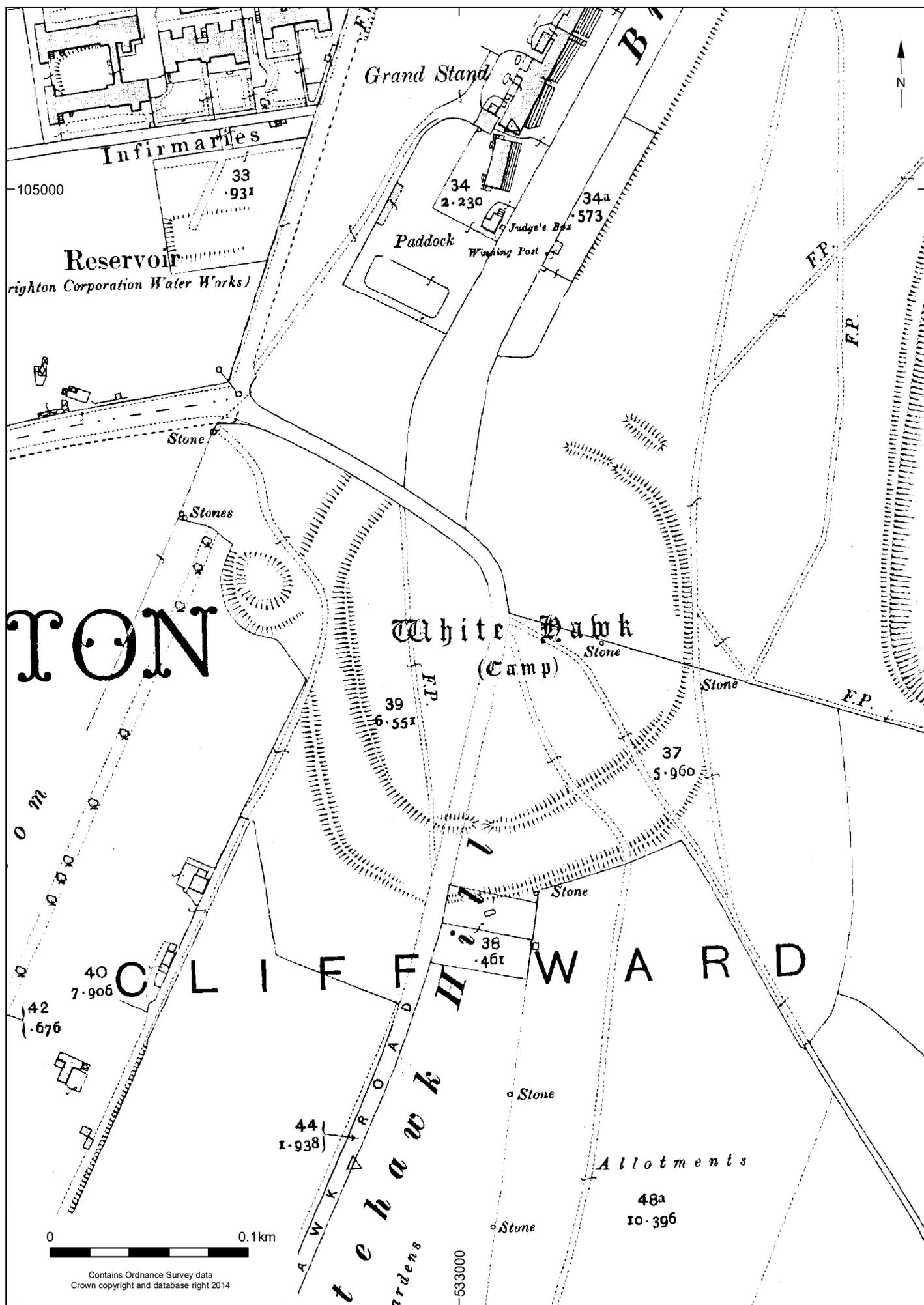




© Archaeology South-East		Whitehawk Camp	Fig. 15
Project Ref: P106	July 2015	OS 25 inch, 1st edition, 1876	
Report Ref: 2015222	Drawn by: JLR		

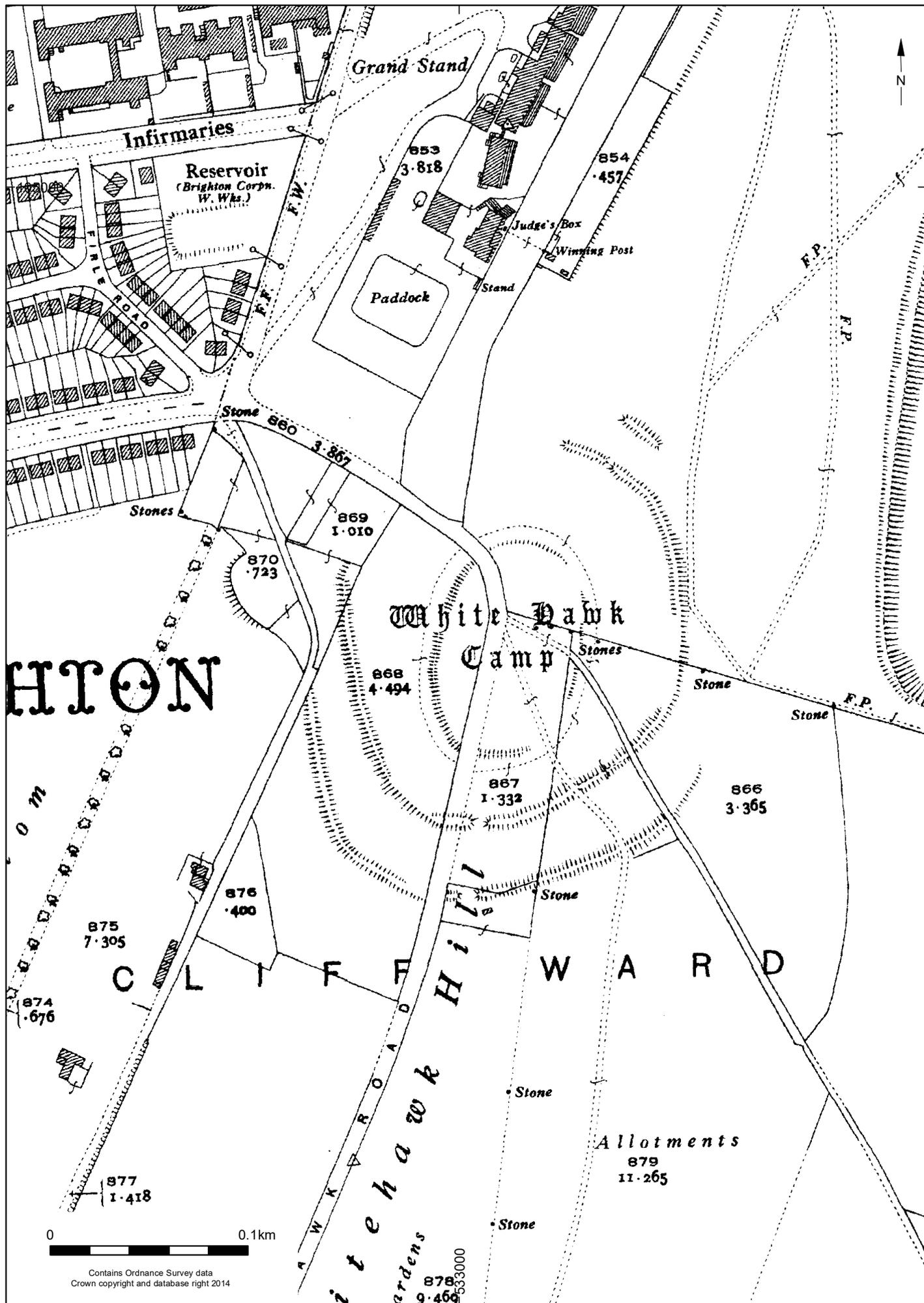


© Archaeology South-East		Whitehawk Camp	Fig. 16
Project Ref: P106	July 2015	OS 25 inch, 2nd edition, 1898	
Report Ref: 2015222	Drawn by: JLR		



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Project Ref: P106	July 2015	OS 3rd edition 25 inch 1911	
Report Ref: 2015222	Drawn by: JLR		

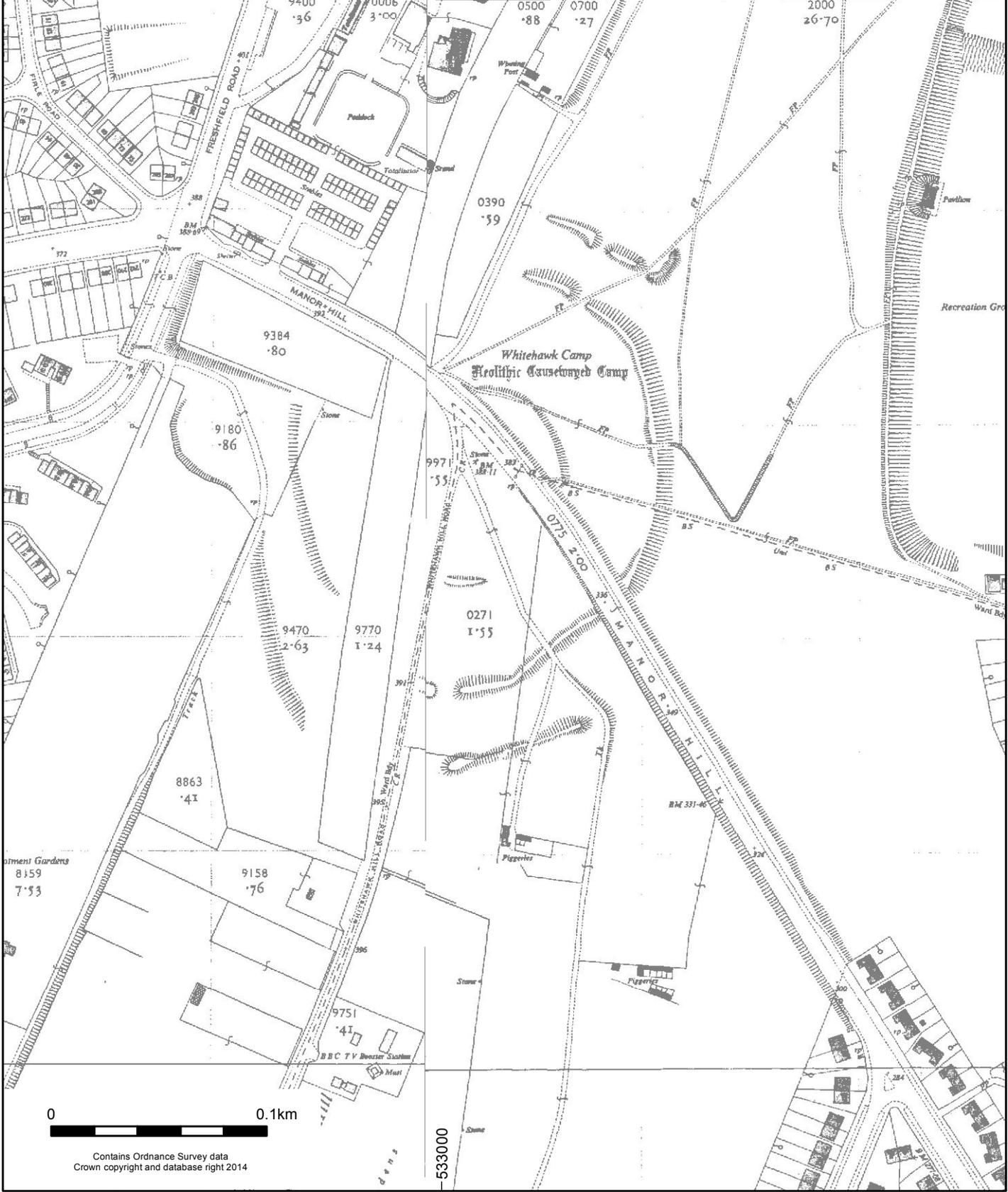


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Project Ref: P106	July 2015	OS 4th edition 25 inch 1931		
Report Ref: 2015222	Drawn by: JLR			

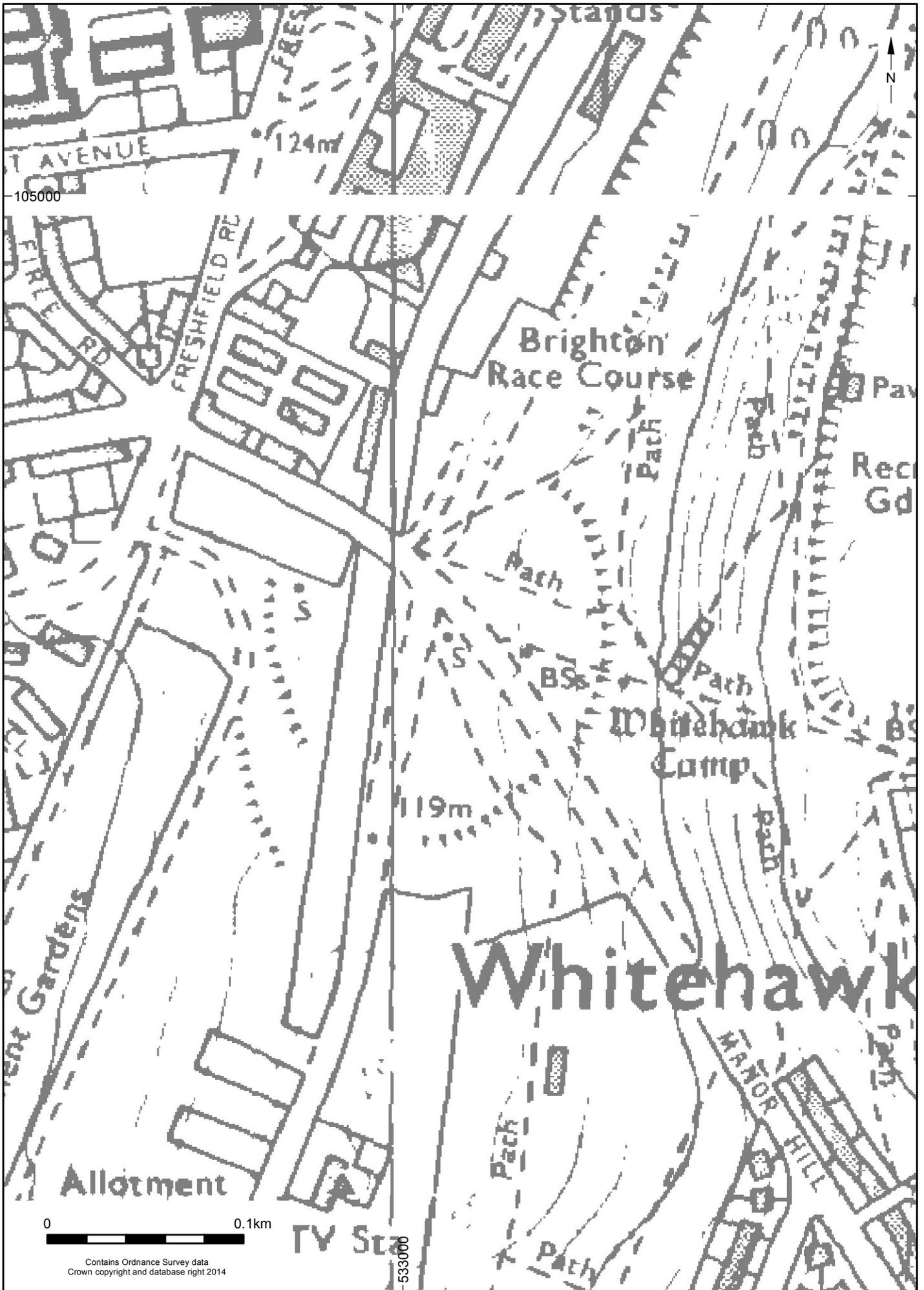


105000



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© Archaeology South-East		Whitehawk Camp	Fig. 20
Project Ref: P106	July 2015	OS 1:2500, 1961	
Report Ref: 2015222	Drawn by: JLR		



© Archaeology South-East		Whitehawk Camp	Fig. 21
Project Ref: P106	July 2015	OS 1:10,000 1980	
Report Ref: 2015222	Drawn by: JLR		

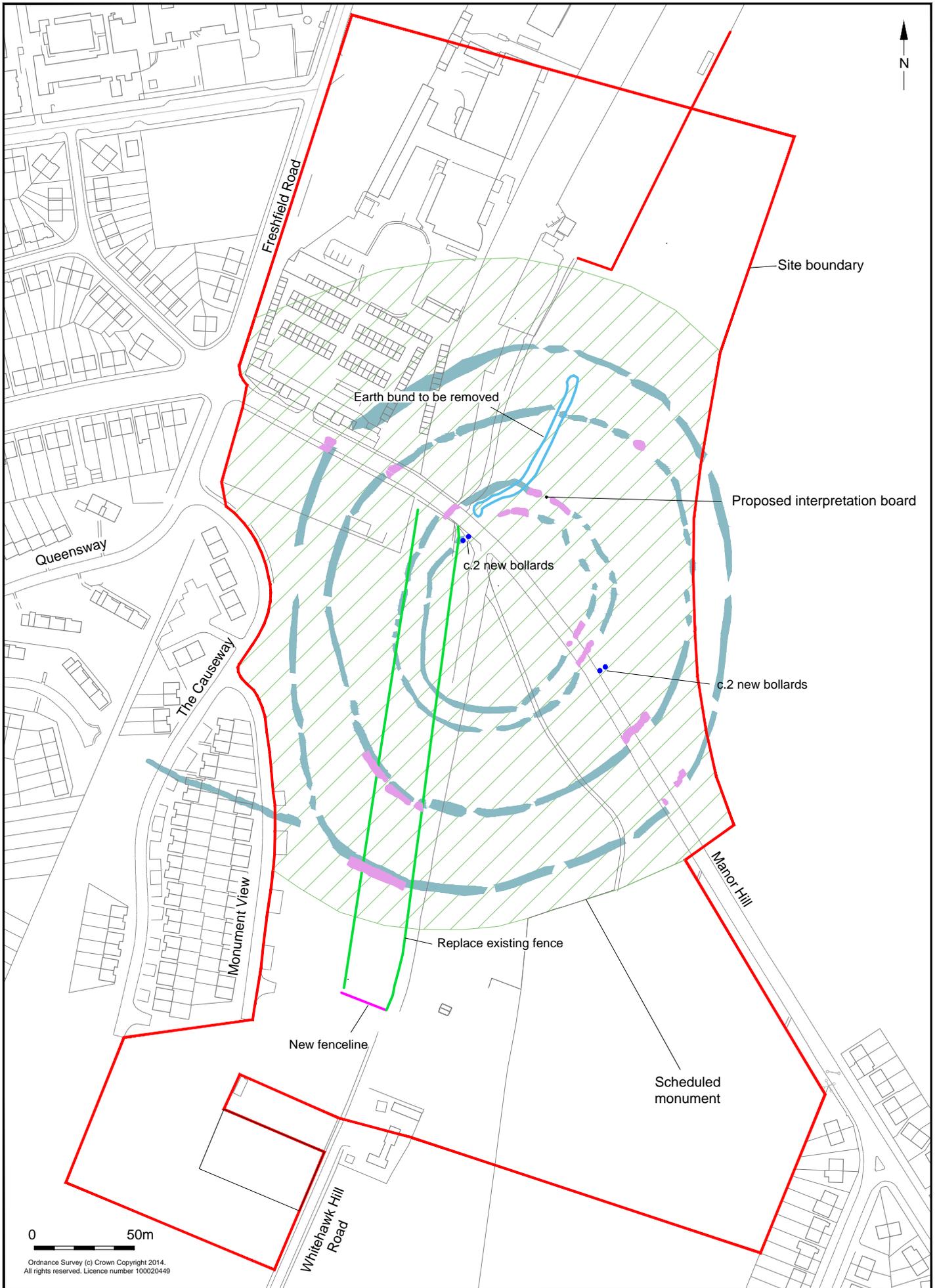


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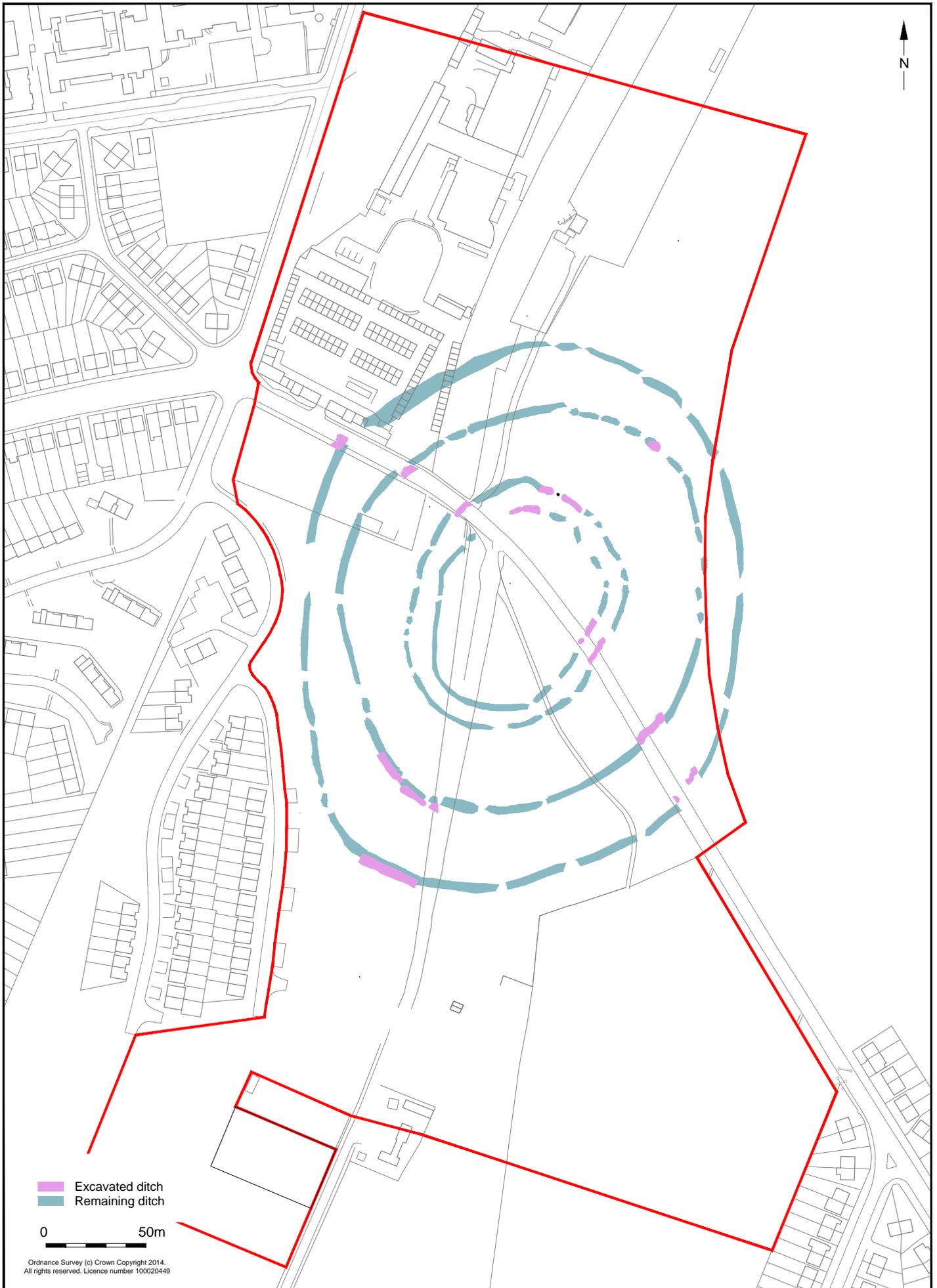
© Archaeology South-East		Whitehawk Camp	Fig. 22
Project Ref: P106	July 2015	OS 1:10,000 1991	
Report Ref: 2015222	Drawn by: JLR		



© Archaeology South-East		Whitehawk Camp	Fig. 23
Project Ref: P106	July 2015	Geophysical survey results and WHC 14 excavation locations	
Report Ref: 2015222	Drawn by: JLR		



© Archaeology South-East		Whitehawk Camp	Fig. 24
Project Ref: P106	July 2015	Location of site improvement works	
Report Ref: 2015222	Drawn by: JLR		



© Archaeology South-East		Whitehawk Camp	Fig. 25
Project Ref: P106	July 2015	Excavated and remaining ditches	
Report Ref: 2015222	Drawn by: JLR		



Project volunteers examining, relabeling and rebagging the Neolithic pottery assemblage at RPM



Specialist seminar providing feedback to the project volunteers at RPM

© Archaeology South-East		Whitehawk Camp	Fig. 26
Project Ref: P106	July 2015	Images from the volunteer works	
Report Ref: 2015222	Drawn by: JLR		



Trench 1 looking east showing clay-with-flints deposit in the foreground infilling a natural fissure in the chalk bedrock



Trench 1 looking east showing a section through a fissure in the chalk bedrock

© Archaeology South-East		Whitehawk Camp	Fig. 27
Project Ref: P106	July 2015	WHC14 trench photographs	
Report Ref: 2015222	Drawn by: JLR		



Trench 2 looking south-west



Trench 3 looking north-east

© Archaeology South-East		Whitehawk Camp	Fig. 28
Project Ref: P106	July 2015	WHC14 trench photographs	
Report ref: 2015222	Drawn by: JLR		



Trench 4 looking west



Trench 5 looking north-east

© Archaeology South-East		Whitehawk Camp	Fig. 29
Project Ref: P106	July 2015	WHC14 trench photographs	
Report ref: 2015222	Drawn by: JLR		



Trench 6 looking north



Trench 7 looking north-east

© Archaeology South-East		Whitehawk Camp	Fig. 30
Project Ref: P106	July 2015	WHC14 trench photographs	
Report Ref: 2015222	Drawn by: JLR		



Trench 8 looking north



Trench 9 looking south

© Archaeology South-East		Whitehawk Camp	Fig. 31
Project Ref: P106	July 2015	WHC14 trench photographs	
Report Ref: 2015222	Drawn by: JLR		



Trench 9 looking north



Trench 10 looking west

© Archaeology South-East		Whitehawk Camp	Fig. 32
Project Ref: P106	July 2015	WHC14 trench photographs	
Report Ref: 2015222	Drawn by: JLR		