Beehive Plantation, Willingdon

BPW22

Research Excavation

A Preliminary Report on the Community Excavations of 2022.

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INTRODUCTION

1.1 The 2022 excavations at the Butts Brow Early Neolithic causewayed enclosure was the continuation of a series of community excavations being undertaken by Heritage Eastbourne staff, National Trust archaeologists, freelance professional archaeologists and members of the public. (See Seaman and Buckland 2022)

1.2 The excavations were part of the Big Dig project with the Changing Chalk Partnership and was funded by the National Lottery Heritage Fund and Eastbourne Borough Council over the period of two weeks 16th July to 31st July 2022. Over 2000 visitors attended the excavation and 43 volunteers took part – 35 of whom received training in archaeological fieldwork on site.

1.3 Changing Chalk is a partnership of organisations supported by the National Lottery Heritage Fund working together for the future of the South Downs. The project is reversing the decline of the fragile chalk grassland and connecting local communities to the nationally significant landscape on their doorstep. Led by the National Trust, the partnership connects nature, people and heritage. It is restoring lost landscapes and habitats, bringing history to life and offering new experiences in the outdoors.

1.4 In July and August 2016, July 2017 and July 2020 as part of Heritage Eastbourne's community and research archaeology projects a number of potentially significant but hitherto undated archaeological features were investigated in the vicinity of the Eastbourne Borough Council owned Butts Brow Car Park and Beehive Plantation just above Willingdon.

1.5 The features that form the core of this investigation are a sub-circular earthwork consisting of a probable single, irregularly cut, ditch that is banked internally and possibly in parts, externally (visible on the ground in fragmentary form but clearer in aerial photographs and from lidar data) and a suspected burial mound, recorded as a tumulus from the 1870 OS Map to the present.

1.6 The areas excavated were selected due to previous excavations revealing an area of interest to the eastern 'entrance' to the enclosure and to confirm the existence of a fully circular ditch around the site indicated by lidar survey undertaken by the geomatics company Geodime.

2.0 TOPOGRAPHICAL & GEOLOGICAL BACKGROUND

2.1 The Beehive Plantation stands on a ridge at the eastern terminus of the South Downs just west of Willingdon at around 185m above sea level. To the north connected by a gently sloping ridge is the slightly higher spur (194m OD) of Combe Hill, to the south this ridge continues to climb to 201m OD where it joins the South Downs Way (coming in from the west). To the west of the site the land has a gradient of 1:19 (5.4%) down to Jevington village around 1.75km away whereas to the east the gradient is a more dramatic 1:7 (15.5%) to Ratton, just over 1km downhill.

2.2 The site comprises an area of former open Downland, partially landscaped in the late C19th and having undergone considerable tree planting of native and non-native species between 1910 and 1925. The tumulus itself lies within the copse of trees that appear on the 1925 OS Map and this copse uses part of the earthwork as a boundary. The earthwork also appears in a patch of scrubby grass within the confines of the present car park and also beyond the southwest boundary of the copse in an area of Downland grass and scrub.

During the 2016 excavations the ditch was also found to be on scarp slope to the northeast of the Copse and it is presumed that it continues around to the south.

2.3 The 1: 50,000 scale British Geological Survey (Sheet 334: Eastbourne) records the 'natural' (drift) geology at the site as Lewes Nodular Chalk Formation (Chalk off-white, hard nodular with regular seams of large nodular flints). The 2016 excavations also discovered that there are also frequent areas of clay with flints covering the southern and south-western sections of the site and subsequent geophysical survey has shown rising seams of flint also within this area.

3.0 ARCHAEOLOGICAL and HISTORICAL BACKGROUND

3.1 The East Sussex County Historical Environment Record – Centred on Beehive Plantation and describing all records within a 500m radius

3.1.1 The area of evaluation lies within a defined Archaeological Notification Area (ANA 740 – Butts Brow) encompasses evidence for significant Prehistoric (MES523, MES524, MES8127) activity and is also the probable site of a C16th Beacon (MES1935).

3.1.2 Outside of the excavation site within the 500m radius are another seventeen records including four likely Bronze Age (MES519, MES522, MES781, MES26079), three undated but given a broad Prehistoric period (MES656, MES783, MES29617), three Post Medieval (MES5086, MES24369, MES29143) and seven from World War Two (MES19307, MES23056, MES23057, MES24368, MES24481, MES29615, MES29616).

3.1.3 Of the above sites two (MES519 & MES522) are Scheduled Ancient Monuments and are both recorded as Bowl Barrows.

3.2 Just beyond the limit of the HER search, around 550m to the north, but of a high potential significance to the context of the Beehive Plantation site is the Neolithic Causewayed Enclosure of Combe Hill (SMC List Entry No 1012497). The monument takes the form of a double circuit of ditch segments of lengths between 10m and 35m, each with an earthen bank on its inner edge and each separated from the next ditch by a causeway of undisturbed chalk. The inner circuit encloses an area of some 1.1 ha. It does not appear to be complete, however, since the slope on the north side is very steep and shows no evidence on the surface of earthworks, it is likely this side was open. The outer ditch survives as earthworks to the east and west of the inner circuit but there is some indication of an outer circuit of ditches on the south sides where the ground slopes. During excavations by Musson in 1949 & Seton Williams 1962, a considerable amount of worked flint and pottery was recovered. This has been tentatively dated to the period around 3640-3010 cal BC through pottery analysis and a single radio carbon date. There are similarities in size and construction between the Beehive Plantation and Combe Hill sites and they are both clearly visible to and from each other, neither being that visible from other locations in the area. If the Beehive Plantation earthwork is contemporary the ditches and banks of its' northern sector would have been clearly visible from Combe Hill. The dating of the pottery from the ditch at Beehive Plantation would point to the two sites being near contemporary or that Combe Hill is slightly later.

3.3 The earthworks (MES524) on the Beehive Plantation do not appear on any historic maps, but they were recorded in an excellent plan by the local antiquarian, historian and Vicar Walter Budgen around 1927 and were subsequently described somewhat dismissively by Curwen as : -

Babylon Down – A poorly marked circular enclosure some 400 foot in diameter….

They are also clearly shown on an undated (but c1935) black and white photograph (see Figure 4) extending in an oval shape from the north to the south west of the Plantation itself. From this photographic evidence, a ditch is clearly shown with perhaps a trace of bank on the inside, but really it could be described as a ditched platform. Recent lidar images and geophysical surveys (Staveley, 2017 see Appendix 1) of the area seem to indicate that this ditch is still more or less complete in this form, though evidence on the ground is less tangible in places.

3.4 The evaluation excavations in 2016 comprised of 7 trenches excavated and 2 test pits. The ditch was examined in 5 of these trenches and was found to be of a different nature in each. On the north-east (scarp) side it was deep (c1.2m) and narrow (less than 1m), cut into chalk and with a slight bank both internally and externally. This ditch had been rapidly backfilled (to about three-quarters of its' depth) soon after excavation with the backfill almost forming a 'clunch' type surface within the ditch. Within this fill were a large number of humanly struck flint flakes but no other cultural material. The most northerly trench (opened between the two car parks) showed the ditch to be broad (over 2m) and shallow (less than 0.5m) with the internal natural bank enhanced but not greatly enlarged. There is the possibility that there is a further shallow ditch and bank to the north of this one along the level neck of land that leads to Cold Crouch. The ditches exposed in the south-west quadrant were cut into a seam of clay with flints just beneath the natural ridge created by the underlying chalk geology. At this stage it is not clear whether they were cut down to expose the chalk beneath or whether the ditch base lay just above the natural geology. In one ditch section from this area over 30 sherds of pottery were found in a cluster within the ditch fill. These have subsequently been identified (see Appendix 2) as being from early Neolithic fabrics that are uniformly backed with crushed or struck flint inclusions, with a minimum of two vessels present, a single open-mouthed high-shouldered carinated bowl and at least one neutral bowl. The fabric and forms of this pottery point to a date ranging from 3750 to 3550 cal BC, making this site broadly contemporary or slightly earlier than the neighbouring Combe Hill. One trench placed to the south-east of the ditch with the pottery, encountered a very shallow ditch, suggesting it was petering out at this point, perhaps relating to an entrance We cannot say that the ditch is definitely continuous but no causeways have yet been identified through excavation or geophysical survey, although possible examples are visible on the ground on the western side.

3.5 The investigation in 2017 established that there appears to be a causeway or entrance at the south of the site and careful excavation of the ditch here showed more structured deposits including a large amount of flint and a piece of ferruginous sandstone that may have been associated with the polishing or finishing of flint tools, in particular axes. It was established that ditch had been deliberately backfilled using material (clay rich soil) not originating from the bank but from likely from the nearby seams of clay with flints. This act of backfilling is not uncommon on Early Neolithic sites and could have happened 200 or more years after the ditch was first dug. The chalk sides and base of the ditch were weathered indicating that they had remained clear for some time. There was only a little evidence of erosion of chalk from the banks again, a good indicator that the ditch was, at least periodically, maintained and kept clear from vegetation or soil. After the ditch had been filled a number of small pits were cut into the clay soil and sherds of Early Neolithic pottery deposited. Around 50 sherds were recovered and these were predominantly of plain bowl

type dating to around 3300BCE, along with a few later Neolithic and Early Bronze Age pieces. The report commissioned from Archaeology South East can be found in Appendix 2.

3.6 In our main trench in 2020 (Trench 12), a long, narrow section from outside the ditch towards the middle of the site, we revealed the ditch and recorded some of the best stratigraphy so far seen on the site.

The ditch (at this point over 1.5m deep and 3m wide) was cut into the chalk which had split along their horizontal planes giving the steep sides a slightly stepped appearance. The bottom of the ditch was flat with some large natural flints still sitting in a seam where they had formed over 95 million years earlier. Above the ditch floor was a thick layer of very loose chalk rubble and deposited within it pieces of knapped flint with debitage.

The looseness and freshness of the material at the bottom, together with the unweathered appearance of the sides of the ditch show us that soon after it was dug, at least this part of the ditch was backfilled with the broken chalk recently removed. As some of the extracted flints were replaced, they were roughly struck and flakes removed and then placed together in discrete piles.

Once this initial process was done and the ditch about half filled, it was then left open for some time, this was evident from the top of the chalk backfill weathering considerably and forming a much smoother, hard surface. It looks as if the ditch had been kept clear of vegetation at least for some periods of time, then it began to gradually silt up with clay rich soil through the weathering of the bank above to the east.

Later, the ditch was once again filled, this time with large flint nodules and some clay soil, but no chalk, to form a very solid layer. Within the natural flints were a large number of struck flakes including a very few tools that may have been in deposits like those flints right at the bottom.

The final event in this sequence was the more gradual filling of the upper levels of the ditch through natural erosion of the clay bank above. It has been speculated that the initial backfilling took place soon after excavation, then the half-filled ditch remained open and periodically cleaned for some time, probably decades, before the mass of flint was deposited, filling the remainder of the ditch.

The bank referred to above to is certainly worthy of a mention, although much more will be revealed through post excavation work. It was quite astounding to find the remains of a Neolithic clay bank surviving, literally, just a few centimetres beneath the present ground surface. Indeed, we have not found evidence of this soil bank elsewhere on the site. The fact that any of this bank remains must show that this area has not been ploughed extensively for much, if any of its' 5500 years of existence. Within the bank we found a number of pieces of Early Neolithic pottery (dated by Stephen Patton, report pending) within the bank giving us some very valuable dating evidence for its' construction.

Beyond the evidence above, the interior of the enclosure was largely devoid of any prehistoric features, though areas of rooting did contain some worked flints and debitage. What was recorded were two WW2 slit trenches (report pending from Peter Hibbs) of a type not previously known from this area and not before excavated.

In Trench 13 on the southern part of the earthwork (where in 2018 we had found evidence for a causeway or entrance) we established the sequence of digging and sporadic refilling within a large oval pit or short ditch section.

In this pit/ditch that separated two causeways, the backfilling events were present but somewhat different. In this case there is an initial deposit of fine, clean clay at the bottom and running about half way up the sides without actually filling it, like a lining rather than a fill. There was then a more substantial deposit or fill of chalk pieces that looks like it may have come from the bank, but with little or no clay soil. Originally this might have filled about half of the volume of the ditch and the surface was very weathered, again indicating that for some time the ditch was left open, but kept, at least periodically, clean and free of vegetation.

Cut through the chalk backfill and into the base of the ditch itself was a large posthole (around 50cm across) that was still part filled with large flints once used to pack the posthole and give what must have been a substantial piece of timber, good, firm support.

To the east of the oval pit, it was established that what is now a track (and appears to have been used by vehicles during WW2) was an area of undisturbed solid natural chalk and there is no reason not to believe that this was an original entrance to the enclosure.

3.7 The Ratton Estate map of 1775 has 'Babylon' clearly marked and above it a semi-circular wooded enclosure that also seems to contain a mound or other feature (see Figure 2). The enclosure does have some parallels with the ovoid earthwork noted in the c1940 photograph described in 3.3, but the 'mound' would not. The 1870 map also has 'Babylon' marked, this time without an enclosure but with a bank (possibly relating to the 'mound', noted above) half way down the hill between the Beehive Plantation and Ratton Manor. This would seem to confirm that the 'Babylon' feature on the 1775 map and the Beehive Plantation 'enclosure' are separate entities. In fact there is a parallel to 'Babylon' at the nearby Compton Estate, where a bower and later a folly was placed at a point approximately a third of the way up the scarp face of the Downs, this time historically called 'Paradise'. It was obviously fashionable in the late C18th to name your estate viewing points after famous biblical and legendary gardens!

3.8 The suspected burial mound (MES523) is recorded as a bowl barrow in the ESHER records but in reality, at least in recent times, appears more like a cairn. Although today this feature appears as an irregular flinty mound, it is clearly depicted on the historic map record from 1870 as a tumulus. Certainly, the planting of trees after the creation of the Plantation in the first quarter of the C20th has damaged the profile of the mound and subsequent use of the wood by walkers has led to erosion. A brief survey of the trees in the plantation would suggest that the original scheme left the mound unplanted, with a ring of trees around it (the 1925 map shows the plantation dissected by paths leading to the tumulus in the centre) but unfortunately in subsequent years a single tree has been planted in the centre. This has now been felled and the stump will subsequently be removed as part of an archaeological scheme of works. The 1925 map shows that the tumulus was at the centre point of the planting and it is highly likely that it was used as the focus for creating the circular plantation around it.

Surface inspection of the area over recent years has revealed a large quantity of worked flints (one findspot MES8127 is recorded from 2007) including over 10 waste flakes picked up by the author around 20m from the tumulus itself.

The small evaluations that looked at the area in 2016 around the tumulus to better understand this monument were largely inconclusive due the extensive disturbance from tree roots. There were indications that the 'tumulus' was ditched and that the mound itself appears to be constructed, at least in part, from flint debitage.

3.9 A search of the Heritage Eastbourne Collection has brought to light some other finds not yet recorded on the HER:

• RS85 Beehive Plantation – 2 hard hammer struck flakes, 8-9cm long, cortex present on both, one primary flake, the other secondary

• RS86 South of Beehive Plantation – 3 flakes, 2 hard hammered (one of which primary), 6-7cm long and the other a small flake 3cm long with small notch

• RS192 Butts Brow (west of Willingdon Links) – Provenance not certain but 13 Medieval pottery sherds (mostly course grit cC12-14th), 3 sherds Iron Age (one at least possibly RB) pottery and a radiate coin of Tetricus I AD270-73

• RS192 Bag 8 Willingdon Links – 4 Medieval strap handle sherds

• RS251 Cold Crouch (south of barrow, north of Beehive Plantation) – 1 hard hammered, secondary flake and 1 hard hammered secondary flake with considerable re-touch to form an end scraper, possibly Neolithic

• E344 North West of Beehive Plantation – hard struck, secondary flake, 8cm long

• E346 Babylon Down – 2 hard struck secondary flakes, 5 and 7cm long and one primary 5cm long, one dubious hard struck flake and a piece of calcined flint

• E347 Willingdon Hill (south west of Beehive Plantation) – 3 very fresh looking hard struck secondary flakes 5-8cm, one possible broken bladelet

4.0 Overview of Excavations 2022

4.1 The following areas of the site were investigated see Figure 6

- The mound in the centre of the tree plantation to ascertain its' date and function and to see if current management needs to be changed ie whether the footpath may need re-routing to protect it and if the tree stump can be removed. This trench was 3m. long and 1m. wide (Trench 14 Figure 8)

- The earthwork bank and ditch on the scarp slope to the north west of the Plantation adjacent to the excavations of 2016. This identified the difference in design from Combe Hill and that both sides of the monument were not treated in the same way, particularly in terms of structure, deposition and infilling. This trench was 2 x 6m (Trench 15, Figure 9)

- An area in the south east of the enclosure including the bank, ditch and interior of the enclosure was opened and planned and features targeted by excavation. This aimed to define the other side of the terminus uncovered in the 2020 excavation – This was also extensively sampled for environmental and dating evidence. This trench was 2x 8 and 2 x 4m (Trench 16, Figure 10)

4.2 The initial results from Trench 15 are: the excavation confirmed the LIDAR survey identification of a continuous ditch along the scarp to the north, and that there was no second outer ditch within this vicinity. This indicates that the Budgen plan (Fig. 3) is accurate, and the combining of the LIDAR image (Fig. 5) over the Budgen plan (Fig. 11) supports this accuracy in terms of shape and size. Of interest is a notable cache of

flint debitage localised within the ditch fill, potentially indicating one episode of flint knapping and the subsequent discard of waste.

The ditch shape and size on the scarp slope is also notable, being smaller and less deeply defined than elsewhere on the site. But the method of construction, the joining of individual pits and creation of small 'causeways' has not been seen elsewhere.

4.2 Trench 16 revealed a large feature, possibly a pit, of unknown date and size. This feature has potentially truncated the original Neolithic ditch and possibly removed one terminus of the ditch. However, the lack of dating evidence makes this a lacuna in the understanding of the site. It could potentially be a large Neolithic pit between two termini designating an entrance to the enclosure, or, and arguably more likely, it is the result of 20th century activity, possibly from the military occupation at the site. Trench 10 from the 2017 excavation was dug into the middle of this feature and that provides explanation for the lack of clarity in stratigraphy from that year. It was within an internal part of this area that burial cut [17] was located.

5.0 The Prehistoric Finds

5.1 Finds Overview by Stephen Patton (ASE)

The following section provides reports on the prehistoric material, excluding flint, that was recovered during the 2022 excavations. The flint has been excluded at this time as a substantial quantity of material has been recovered during the four seasons of excavation (2016, 2017, 2020 & 2022) and reporting on this material will be undertaken once phasing for the site has been completed. It should be noted though, that the flint assemblage will be informing phasing as a notable quantity of blade-like-flakes have been identified, and this form of debitage is diagnostic of the Early Neolithic Period.

The following reports were commissioned by Heritage Eastbourne and undertaken by specialists from UCL Archaeology South-East (ASE) and Glasgow University Centre for the Isotope Sciences (SUERC).

5.2 The Neolithic Pottery by Stephen Patton (ASE)

A single sherd of Early Neolithic pottery was recovered from context [15/013] during the 2022 excavation. Weighing just under 4g, it is a plain body sherd made from fabric FLIN3 (see Doherty 2018 & Patton 2020 for site-specific pottery fabrics) with the flint tempering being more chipped in appearance than the flint used in later Bronze Age fabrics.

The sherd is consistent with the other Neolithic pottery from the site, and whilst it does not add a huge amount of new evidence towards the understanding of the Stone Age activities at Butts Brow, it does provide a date for the ditch on the scarp area of the monument. This sherd takes the total of Early Neolithic pottery from Butts Brow to 88 sherds, with the assemblage weighing a total of 377g and representing an estimated number of vessels of 33.

5.3 Human Bone by Lucy Sibun (ASE)

The excavations uncovered a single grave containing skeleton [16/007]. Whilst the majority of the bone was recovered by hand excavation, environmental samples from the grave produced a small quantity of additional bone fragments. The bone was in a poor state of preservation, soft and highly fragmentary.

Methodology

The analysis comprised an age and sex estimation as well as the recording of pathologies. Age-at-death was established using the standard osteological techniques available, which included epiphyseal union and dental development (Scheuer and Black 2000). An assessment of the biological sex of the skeleton was made using multifactorial methods including dimorphic traits of the pelvis and skull following Buikstra and Ubelaker (1994) and Bass (2005).

Results

Despite the poor state of preservation, most areas of the skeleton were represented. This included the cranium and mandible, fragments from the axial skeleton as well as long bones from both upper and lower limbs, hands and feet. In many instances the ends of long bones had been lost, with only shaft fragments surviving. Many teeth were recovered but the majority were loose.

Dental development and epiphyseal fusion suggest that this individual is a young adult. Two characteristics in the skull suggest that this individual is a probable female and a single measurement on the femoral head would support this conclusion. All fragments were examined for pathologies but none were noted.

Discussion

The analysis suggests that this individual is a young adult and a possible female. However, this sex estimation is based on few characteristics and more would be needed for a confident assessment. No pathologies were noted but surface weathering would have made observation of subtle surface anomalies almost impossible. The poor preservation is likely to result from taphonomic processes and ground conditions.

5.5 Radiocarbon dating and isotopic analyses of human remains by Derek Hamilton (SUERC)

A rib, femur, and tooth from a Bronze Age burial recovered from archaeological deposits at Butts Brow, East Sussex were subjected to radiocarbon dating and a suite of isotopic analyses at the Scottish Universities Environmental Research Centre (SUERC), East Kilbride, UK. The light stable isotopes on the radiocarbon-dated bone sample suggest there was either no or minimal marine protein in the diet of this individual, and so no correction needs to be been made for the Marine Reservoir Effect (MRE).

Methods

Radiocarbon dating

The bones and tooth dentine were pretreated following Dunbar *et al.* (2016). Briefly, samples were sanded, weighed, and placed in a beaker with 100 mL of 1M HCl at room temperature for 24–48 hrs or until fully demineralised. If more than 48 hrs are required, the sample is rinsed and the acid replenished. After demineralisation the sample is rinsed to near neutral pH and 100 mL of ultrapure MillQ® water is added. The sample is placed on a hotplate at ~80ºC until fully solubilised. The solution is then passed through GF/A filter paper and reduced to 5–10 mL prior to freeze-drying.

For graphitisation, 10–20 mg of the collagen is weighed into a clean quartz insert and placed into a precleaned quartz combustion tube containing copper oxide to provide the oxygen for the reaction and silver foil to remove gaseous impurities (Vandeputte *et al.* 1996). The resulting carbon dioxide is then cryogenically purified and a 3 mL subsample reduced to elemental carbon (graphite) using the two-step iron and zinc process proposed by Slota *et al.* (1987). The graphite is then pressed into aluminium target holders and measured on either the SUERC 5MV tandem or 250kV single-stage AMS.

The radiocarbon result (Table 1) is a conventional radiocarbon age (Stuiver and Polach 1977). It has been calibrated using the internationally agreed terrestrial (IntCal20) calibration curve of Reimer *et al.* (2020) and the OxCal v.4.4 computer program (Bronk Ramsey 2009). The $\delta^{13}C$ and $\delta^{15}N$ values on the bone collagen suggest there was either no or minimal marine protein in the diet of this individual, and so no correction has been made for the Marine Reservoir Effect (MRE).

$\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$ stable isotope methods

Sayle *et al.* (2019) fully describe how the simultaneous $\delta^{13}C$, $\delta^{15}N$ and $\delta^{34}S$ values were obtained by combusting approximately 1–1.5 mg of collagen, which was weighed into a tin capsule and subsequently introduced to a single combustion reactor containing tungstic oxide and reduced copper wires held at 1020ºC. Samples were introduced via the Thermo Scientific MAS Plus Autosampler alongside a pulse of oxygen to aid combustion. The resulting N_2, CO_2 and SO_2 gases produced in the reactor were separated using a temperature variable GC column (70–240ºC), and then transferred to a Thermo Scientific DELTA V Advantage IRMS via a Thermo Scientific ConFlo IV Universal Interface (Thermo Fisher Scientific, Bremen, Germany). Optimising the gas chromatography separation and helium carrier gas flow during sample analysis in the EA IsoLink IRMS System enabled simultaneous $\delta^{13}C$, $\delta^{15}N$ and $\delta^{34}S$ values of archaeological bone collagen to be obtained in approximately 10 minutes, providing sharp peak shapes, and significantly improved sensitivity and signal-to-noise ratios for SO_2. There is 20% duplication of all samples in each run. Results are reported (Table 2) as per mil (‰) relative to the internationally accepted standards V-PDB, AIR, and V-CDT with 1σ precisions of ±0.1‰, ±0.2‰, and ±0.4‰ for $\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$ respectively.

$^{87}Sr/^{86}Sr$ analysis

Strontium isotope analysis was made on the tooth enamel from the burial (Table 3). A small fragment of tooth was removed from the junction of the occlusal surface and one of the side faces of the tooth, with preference given to the best-preserved location. The fragment was placed in a 10 M NaOH solution and heated to approximately 80°C for 8 hrs and then allowed to cool. The dentine was scraped from the enamel using a dissecting needle and the procedure repeated until all the dentine had been removed. The sample was then repeatedly rinsed with 0.5 M HCl to remove all traces of the NaOH and finally rinsed with ultra-pure water. The isolated enamel sample was then oven dried overnight and transferred to a labelled glass vial to await analysis.

Strontium was separated from the enamel sample using conventional extraction chromatography using the Sr.Spec (Eichrom) crown ether, and loaded onto a single Re filament using a Ta_2O_5 activator for mass spectrometry. The total procedural blank was <200 pg. The sample was analysed on a VG Sector 54–30 mass spectrometer operated in dynamic (3 cycle) multi-collection mode. Instrumental mass fractionation was corrected to $^{86}Sr/^{88}Sr = 0.1196$ using an exponential fractionation law. Data were collected as 12 blocks of 10 ratios. NIST SRM-987 was used as a quality control monitor. A small volume of a high-purity Sr-84 spike was weighed carefully and added to the sample prior to dissolution and analysis, and the amount of Sr-84 relative to sample Sr was measured during the TIMS analysis for $^{87}Sr/^{86}Sr$.

$\delta^{18}O$ and $\delta^{13}C$ analysis on carbonate

To analyse the biogenic carbonate ($\delta^{18}O_{carb}$) in the tooth sample, the excess material that was removed for strontium analysis was crushed using the Retsch® Micro-mill sample preparation kit, until it passed freely through a 400 µm stainless steel sieve (Retsch®). The sample was then sent in glass vials to Iso-Analytical (Cheshire, UK) where it was processed for both $\delta^{18}O$ and $\delta^{13}C$ analysis.

The sample (~7 mg) was weighed in duplicate into Exetainer™ tubes and then flushed with 99.995% helium. After flushing, phosphoric acid was added to the samples and they were allowed to react in the acid overnight to allow complete conversion of carbonate to CO_2. Reference and control materials were prepared the same way.

The CO_2 gas liberated from samples was then analysed by Continuous Flow-Isotope Ratio Mass Spectrometry (CF-IRMS). Carbon dioxide was sampled from the Exetainer™ tubes into a continuously flowing He stream using a double-holed needle. The CO_2 was resolved on a packed column gas chromatograph and the resultant chromatographic peak carried forward into the ion source of a Europa Scientific 20-20 IRMS where it is ionized and accelerated. Gas species of different mass are separated in a magnetic field then simultaneously measured using a Faraday cup collector array to measure the isotopomers of CO_2 at m/z 44, 45, and 46.

The phosphoric acid used for digestion had been prepared for isotopic analysis in accordance with Coplen *et al.* (1983) was injected through the septum into the vials. The reference materials used during analysis was: IA-R022 (Iso-Analytical working standard calcium carbonate, $\delta^{13}C_{V\text{-}PDB}$ = −28.63‰ and $\delta^{18}O_{V\text{-}PDB}$ = −22.69‰), NBS-18 (carbonatite, $\delta^{13}C_{V\text{-}PDB}$ = −5.01‰ and $\delta^{18}O_{V\text{-}PDB}$ = −23.20‰), IA-R066 (chalk, $\delta^{13}C_{V\text{-}PDB}$ = +2.33‰ and $\delta^{18}O_{V\text{-}PDB}$ = −1.52‰) and ILC1 limestone.

Acid preparations of samples and controls were measured directly against acid preparations of the working Iso-Analytical calcium carbonate standard. This procedure removes the need to apply separate corrections for temperature dependent isotope fractionation. The results obtained for the NBS18 and IA-R066 controls are used to check and correct the data as required.

Results

The results of the analyses on the samples are given in Tables 1–3. As mentioned above, the $\delta^{13}C$ and $\delta^{15}N$ values from the bones suggest little or no marine component to the diets. Therefore, when calibrated, the individual died in 2140–1960 cal BC (95% probability).

The samples of bone collagen can be related to different periods in this individual's lifetime. The tooth dentine does not remodel after initial formation, and so captures the dietary isotope signature of the food they ate during childhood. The femur provides a longer average that covers approximately the last 10–20 years of a person's life, with the turnover slowing with age. The rib bone is very active, and the collagen captures the final few years of a person's life. This enables the investigation of movement between isotopically distinct areas through the course of a lifetime. In the case of the Butts Brow individual, the $\delta^{34}S$ values are very consistent with one another, suggesting little movement throughout life (Fig. 2). Furthermore, the values are entirely consistent with having lived on the White Chalk geology for their lifetime, though the elevated values of the chalk are also observed more generally in coastal settings where sea spray, which has a $\delta^{34}S$ value of around +21.0‰ (Wadleigh *et al.* 1994), can alter the local values (Zazzo *et al.* 2011).

Turning to the strontium and oxygen values on the tooth enamel (Fig. 3), the White Chalk that underlies Butts Brow has an expected strontium isotope range of 0.7079 and 0.7088 (Moore and Montgomery 2023). However, within a 50 km arc of the site is also located bedrock of the Wealden series, which has a more radiogenic strontium isotope ratio. The strontium isotope ratio from this individual is entirely consistent with having been raised on food from the White Chalk, suggesting most of their dietary protein came from local sources, which further underscores the lack of identifiable mobility seen in the sulfur isotopes.

Lab Code	Sample	Material	$\delta^{13}C_{V\text{-}PDB}$ (‰)	$\delta^{15}N_{AIR}$ (‰)	C:N	Radiocarbon age (BP)	Calibrated date (95% probability)

SUERC-108977	BPW22	rib	−21.6	9.5	3.3	3670 ±25	2140–1960 cal BC

Table 1: Radiocarbon dating result from the sample from the Butts Brow skeleton

Lab Code	Sample	Material	$\delta^{13}C_{V\text{-}PDB}$ (‰)	$\delta^{15}N_{AIR}$ (‰)	$\delta^{34}S_{V\text{-}CDT}$ (‰)	C:N	C:S	N:S	%C	%N	%S
SUERC-108977	BPW22	rib	−21.6 ±0.1	9.5 ±0.2	16.3 ±0.4	3.3	495	148	39.8	13.9	0.21
GUsi14860	BPW22	femur	−21.8 ±0.1	9.6 ±0.2	15.6 ±0.4	3.3	474	146	40.0	14.3	0.23
GUsi14860	BPW22	tooth	−21.9 ±0.1	10.2 ±0.2	15.9 ±0.4	3.2	468	146	40.0	14.5	0.23

Table 2: Isotope results from all burials from Eckington, Worcestershire

Lab Code	Sample	Material	$\delta^{13}C_{V\text{-}PDB}$ (‰)	$\delta^{18}O_{V\text{-}PDB}$ (‰)	$\delta^{18}O_{VSMOW}$ (‰)	$^{87}Sr/^{86}Sr$	Sr_{conc} (ppm) [±2σ %]
GU63534	BPW22	tooth	−16.5 ±0.03	−3.77 ±0.17	27.03	0.70815 ±0.0011	58.4 [0.2]

Table 3: Isotope results from the tooth enamel from the Butts Brow skeleton

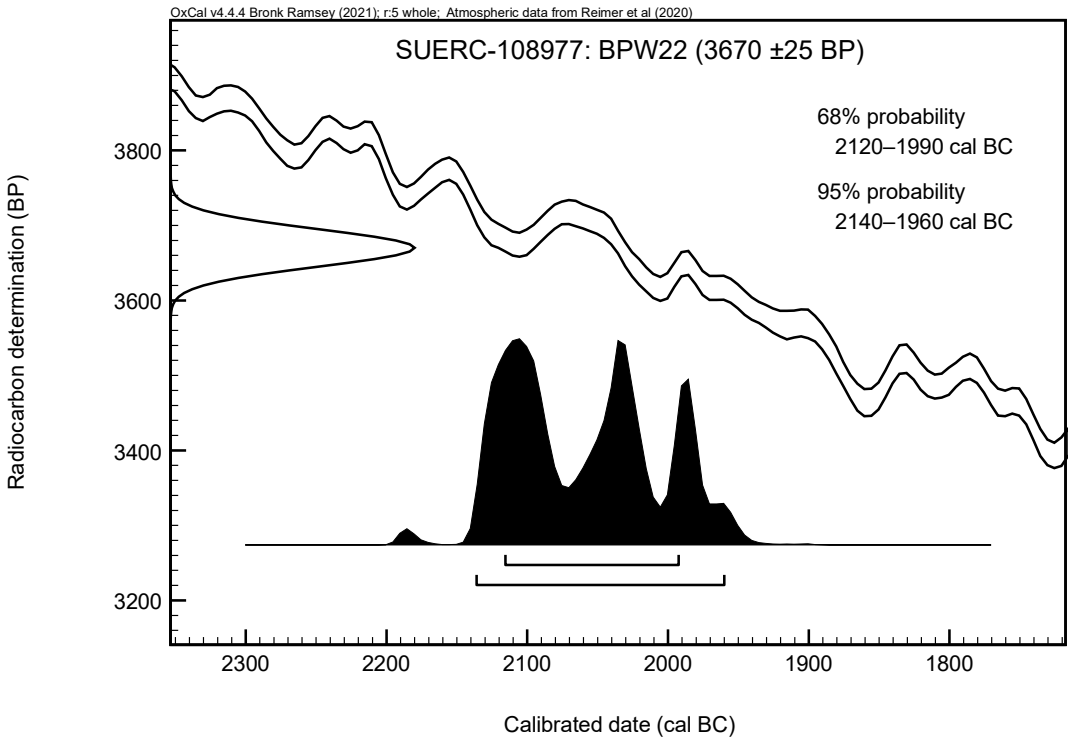

Figure 1: Probability distribution for the calibrated radiocarbon date from Butts Brow, East Sussex

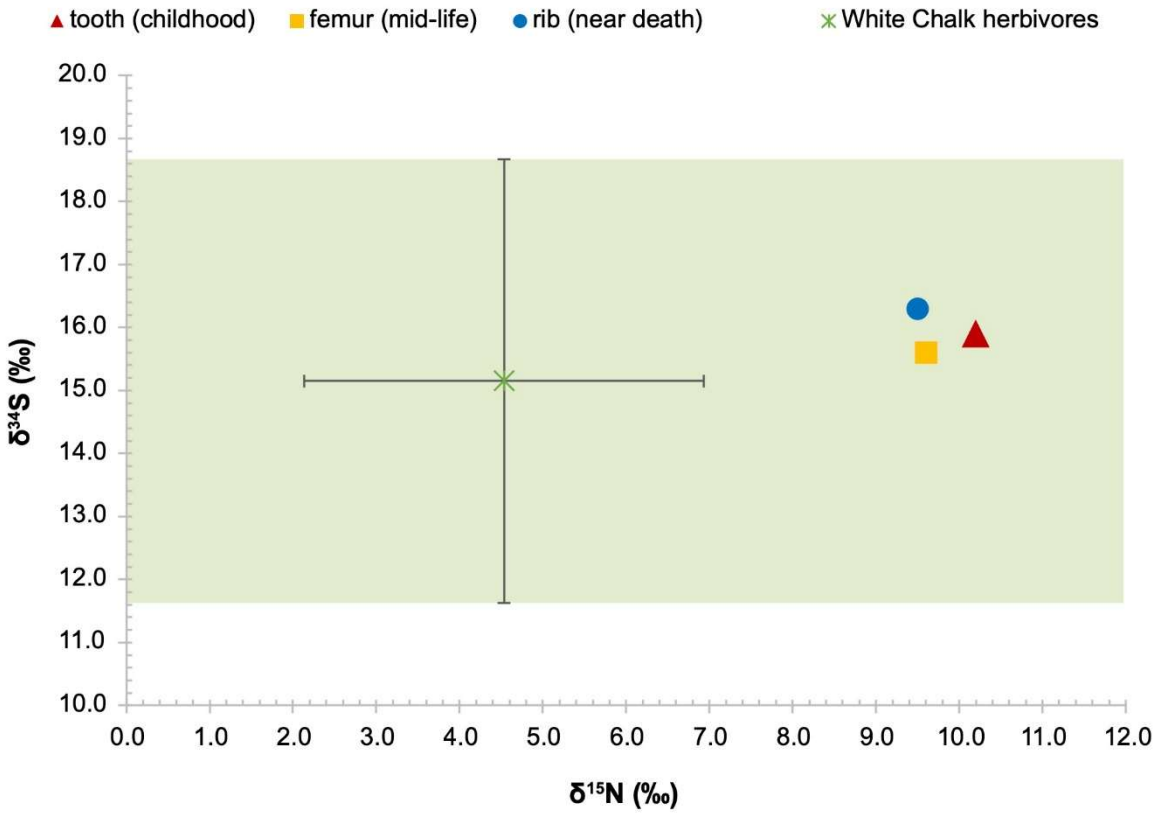

Figure 2: Plot of $\delta^{34}S$ versus $\delta^{15}N$ for the samples from BPW22, Butts Brow, East Sussex. The plot also shows the mean and 95% confidence interval for terrestrial herbivores from sites on the White Chalk in southern central England (*n*=113), with the green bar representing the 95% confidence range for the $\delta^{34}S$ value of herbivores raised on the White Chalk

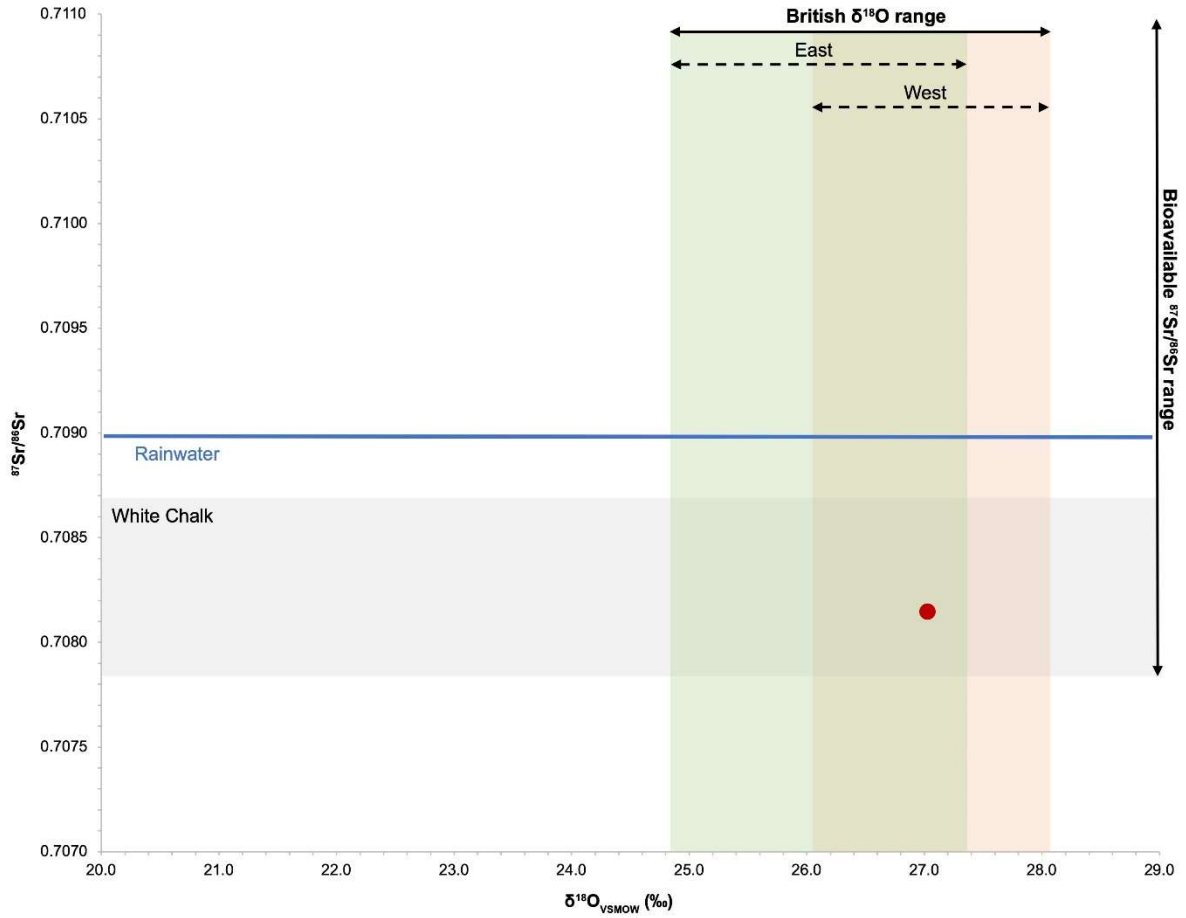

Figure 3: Plot of $^{87}Sr/^{86}Sr$ and $\delta^{18}O_{carb}$‰ (VSMOW) for the human tooth enamel sample from Butts Brow, East Sussex. These data are compared to strontium isotope ratio expected for the White Chalk (Moore and Montgomery 2023) and the values that appear within approximately 50 km from Butts Brow in the BGS BGS Biosphere Isotope Domains online viewer (http://mapapps.bgs.ac.uk/biosphereisotopedomains/index.html)

5.5 Environmental Samples by Elsa Neveu (ASE) and Lucy Allott (ASE)

Introduction

Three bulk samples <6> [15/017], <7> [15/009] and <8> [16/051], measuring 10, 2 and 40 litres respectively (Table 1), were collected from neolithic ditches and a burial during excavation at the site in order to retrieve dating evidence and environmental remains, such as charcoal and charred plant macrofossils, bone and mollusca. This report examines the potential of these samples to contribute information regarding arable agriculture, fuel use and the local vegetation environment, whilst also considering the presence of other environmental proxies.

Methodology

These samples were processed by flotation using a 500 µm mesh for the heavy residues and a 250 µm mesh for retention of the flots. Residues and flots were air-dried and were passed through 8, 4 and 2mm sieves. The residues were sorted for artefacts and ecofacts and are quantified in table 1. A stereozoom microscope, at 7-45x magnifications, was used in order to scan the flots and identify remains through comparison with a modern botanical reference collection and published atlas (Cappers *et al.* 2006). Their contents are described and recorded in tables 1 and 2. Nomenclature for the wild taxa follows Stace (2010).

Results

All samples revealed uncharred material comprising rootlets and weed seeds (table 2), which suggested potential modern disturbance since, unless charred, these remains are highly unlikely to preserve over time in such well-drained deposits. Unfortunately, no charred plant macrofossils were evident in samples from the ditches or the burial.

Charcoal fragments mostly measuring <2mm in size were noted in the flots, highlighting the potential for these remains to preserve. The charcoal assemblages were exceptionally small and no taxonomic identifications were obtained.

Uncharred bone fragments, including those recorded as human were moderately common in the residue of the burial fill, sample <8> [16/051] (Table 1) and have been integrated into the hand collected bone assemblage. Further bone fragments were also recorded in the corresponding flot. Land snail shells were well represented in the burial deposit [16/051] as well as being recorded in lower quantities in sample <6> [15/017]. These mollusca include *Cecilioides acicula*, a burrowing species, and are likely to be of modern origin especially given the high proportion of uncharred botanical remains.

An array of other archaeological remains were recovered including worked flint, fired cracked flint and magnetic material which may be of natural or industrial origin. Small fossils, which are natural inclusions within the chalk, were noted in sample <8>. Archaeological artefacts were extracted from the sample residues and are available to be incorporated into the relevant finds reports.

Significance

Given the importance of the site, it was expected that any environmental remains arising from the samples would also hold regional significance for further understanding Neolithic activities in the area, tying in with what is already known through previous excavations in Peacehaven (Le Hégarat 2015) and at Kingsmead Quarry, Horton (Berkshire, Chaffey *et al.* 2012). However, the fills of the sampled features did not produce charred plant remains and the assemblages of charcoal were too small for further identification work to be informative of fuel

use or vegetation. The paucity of charcoal fragments and the lack of plant macrofossils in the fills of these features could be party explained by the poor conditions of preservation or the small volume collected from the ditch contexts. They could, however, indicate the infrequence of activities related to fuel use, crop husbandry and processing that was undertaken near these features.

Bone fragments recovered from the burial, sample <8> [16/051], will be considered alongside the hand collected remains and are not discussed further here.

Potential

The collected samples have no potential to reveal further plant macrofossils and charcoal fragments and therefore have no potential to provide information on fuel acquisition, vegetation environments, crop husbandry and processing. However, there is still potential for nearby deposits comprising better preserved charcoal and charred plant remains. Any future work at the site should continue to include sampling, targeting a range of features in order to retrieve environmental remains.

Sampling aimed to establish the presence of material suitable for dating and while bone from the burial has clear potential, the potential of the wood charcoal is less secure. Small fragments of charcoal can be used for radiocarbon dating, although in this instance these fragments may be too small identify in order to verify the presence of short-lived taxa whilst still leaving sufficient charcoal intact for dating. It is also possible, given the presence of significant small rootlets and some burrowing Mollusca that the charcoal could also have been subject to post depositional movement.

The potential of mollusca remains uncertain due to the presence of burrowing taxa that are likely to be modern and signficant root disturbance. If well sealed deposits are encountered in future excavations molluscs may contribute information regarding ground cover and vegetation in the vicinity while the site was in use.

Recommendations for further work

No further work is recommended for the botanical remains due to the lack of charred plant remains and paucity of charcoal. However, in the event of further excavations at the site sampling should continue, targeting a range of features, especially those with primary deposits that might best preserve in situ remains.

It would be beneficial for a specialist to scan the mollusc assemblages together with those from previous excavations to establish their overall potential and possible association with the features.

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Figure 1: Site Location –The site of the enclosure is circled in red

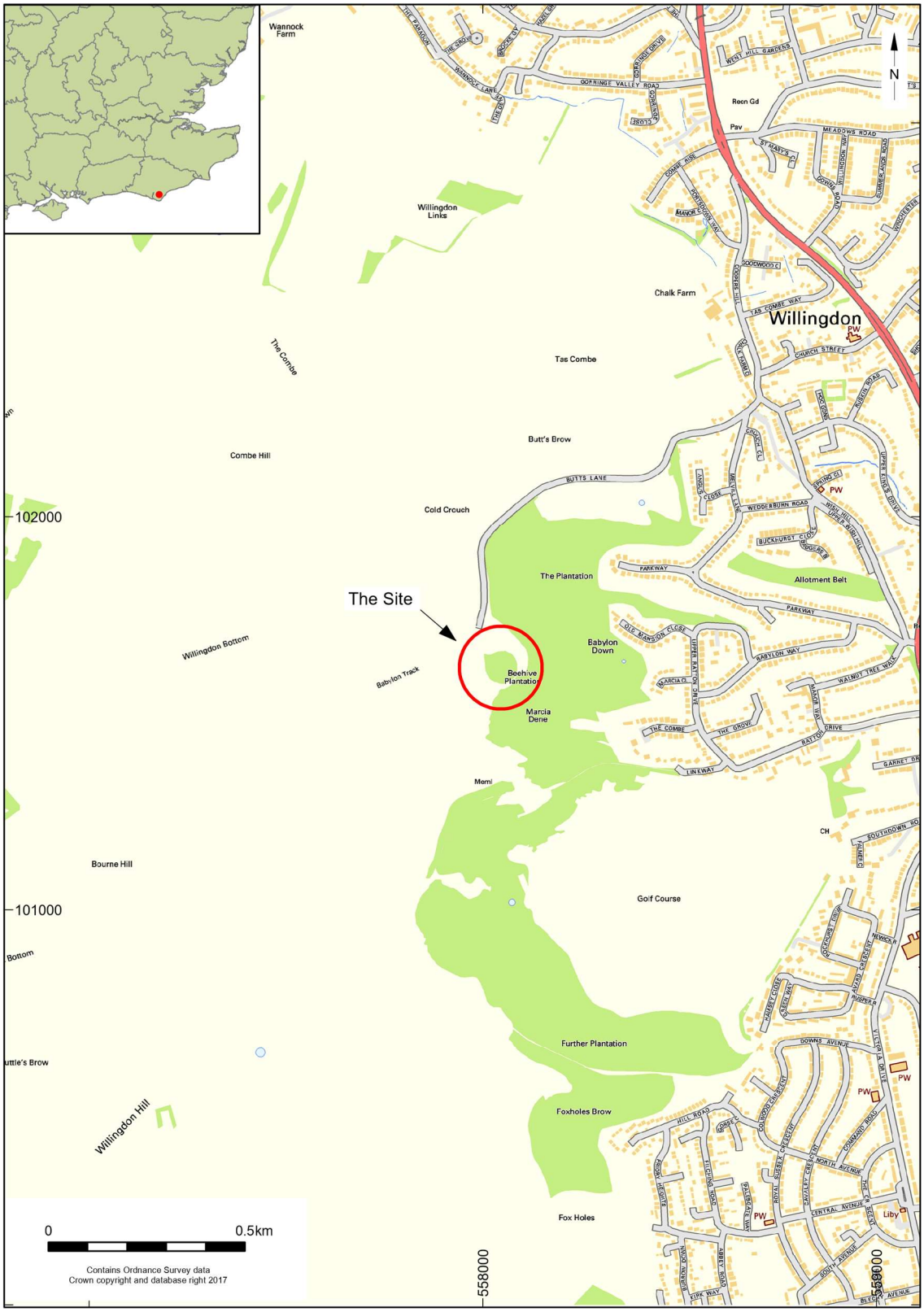


Figure 2: 1775 Ratton Estate Map with 1925 Overlay

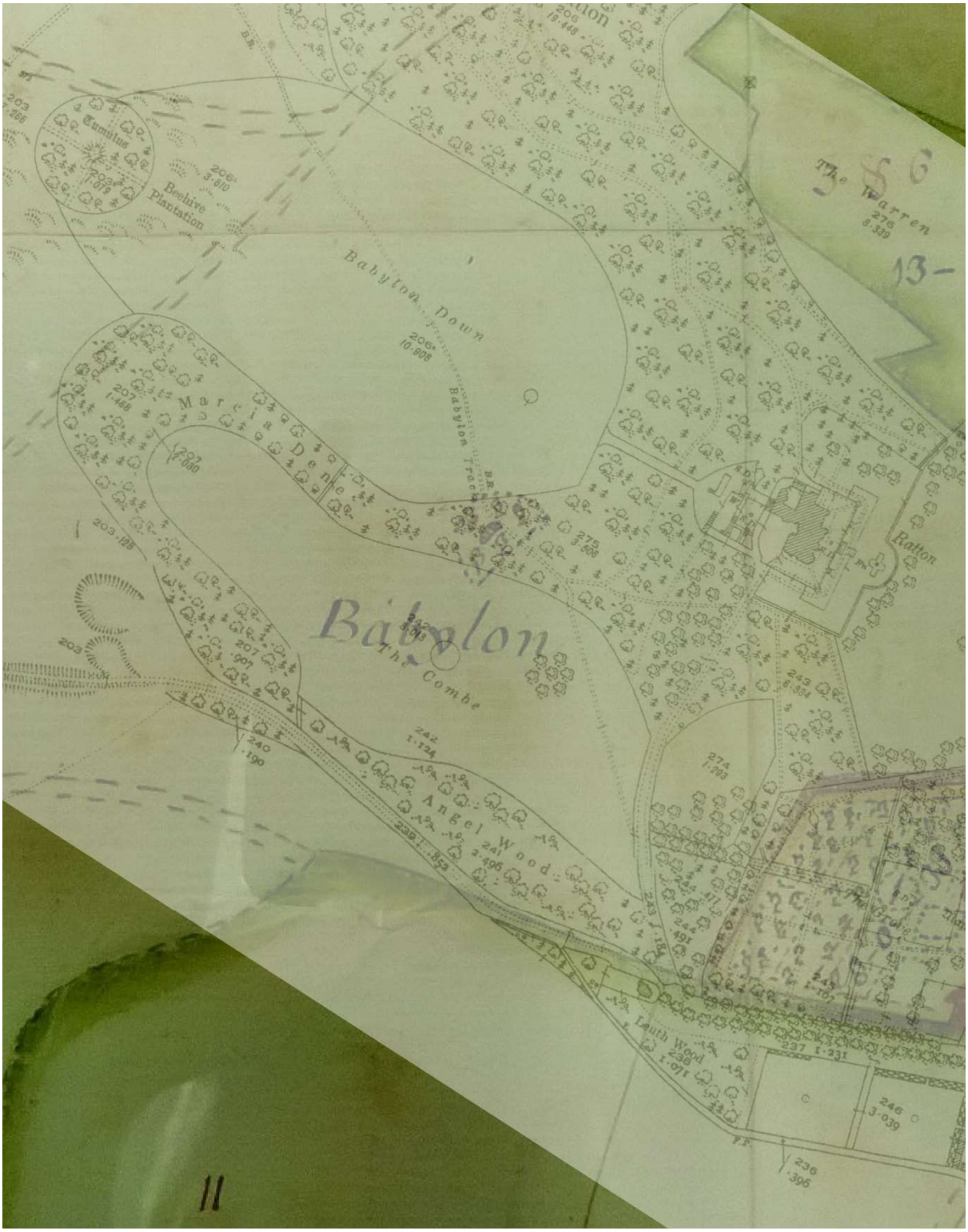


Figure 3 Budgen Plan of Beehive Plantation Earthwork c1924 (Barbican House Library)

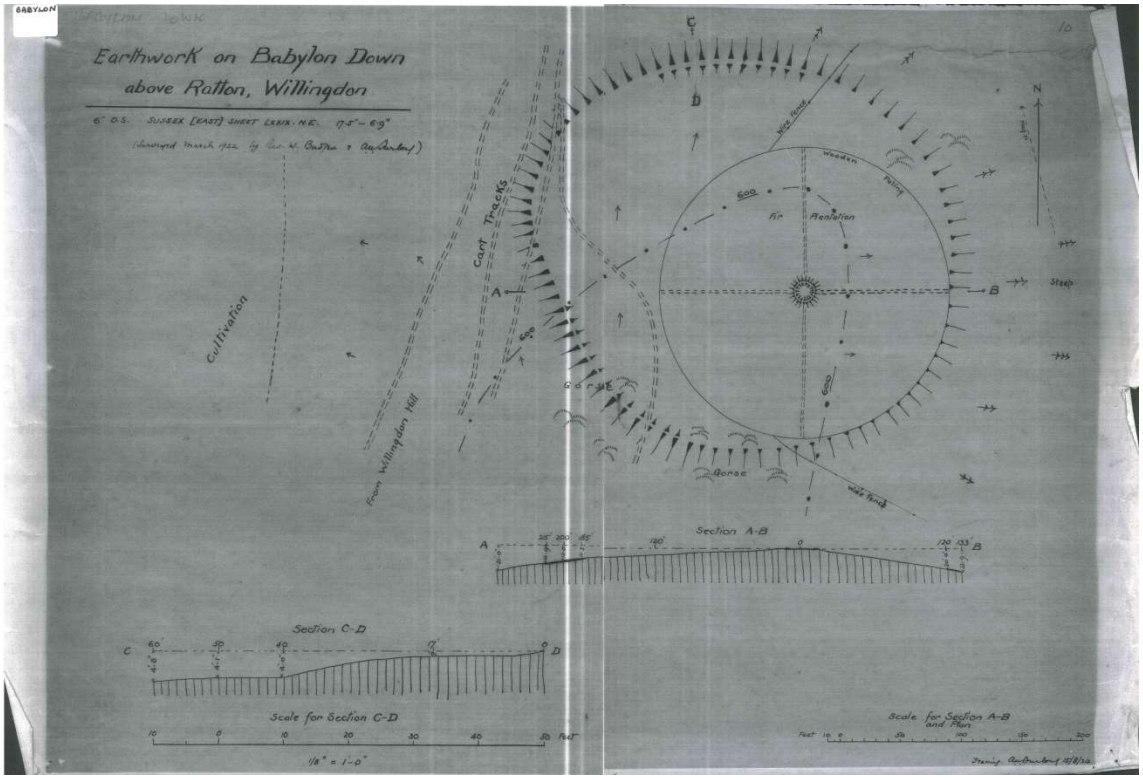


Figure 4: 1930's Photograph of Willingdon Hill showing Beehive Plantation and Earthwork lower centre, right (ESHER)

Figure 5: LIDAR survey data, Geodime., 2022

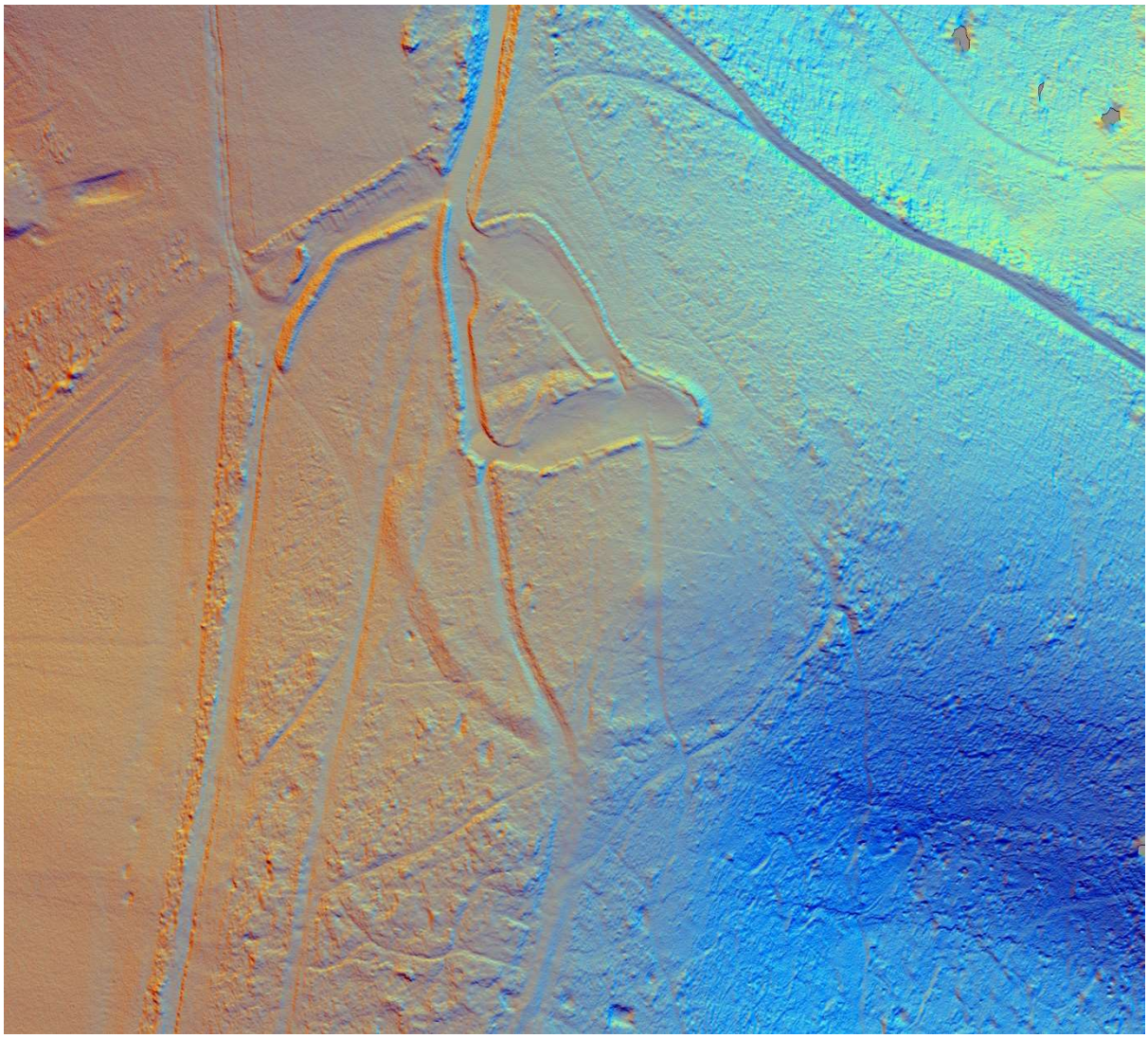


Figure 6: Site for trenches for BPW22 Excavation in yellow

Illustration by J. Russell and Updated by N. Humphreys

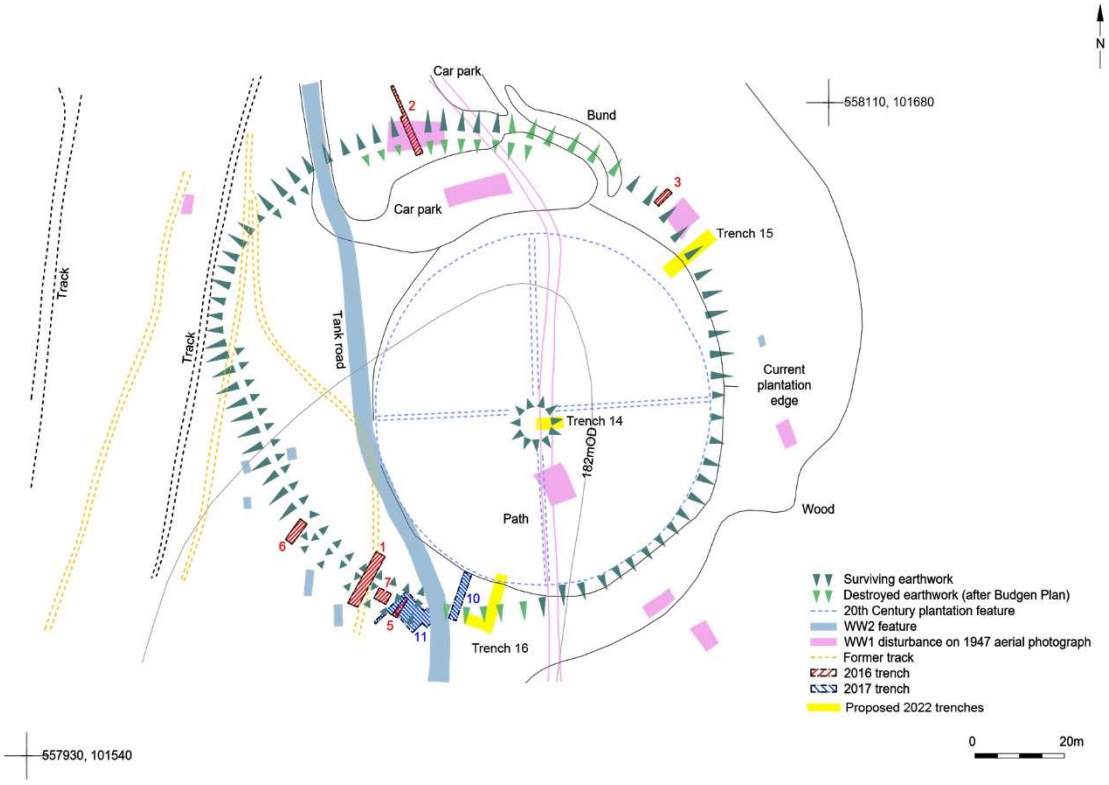


Figure 7: Aerial Photograph of site, Maxine Monaghan

Figure 8: Aerial photograph of Trench 14, Maxine Monaghan

Figure 9: Aerial photograph of Trench 15, Dave Sands

Figure 10: Aerial photograph of Trench 16 Maxine Monaghan

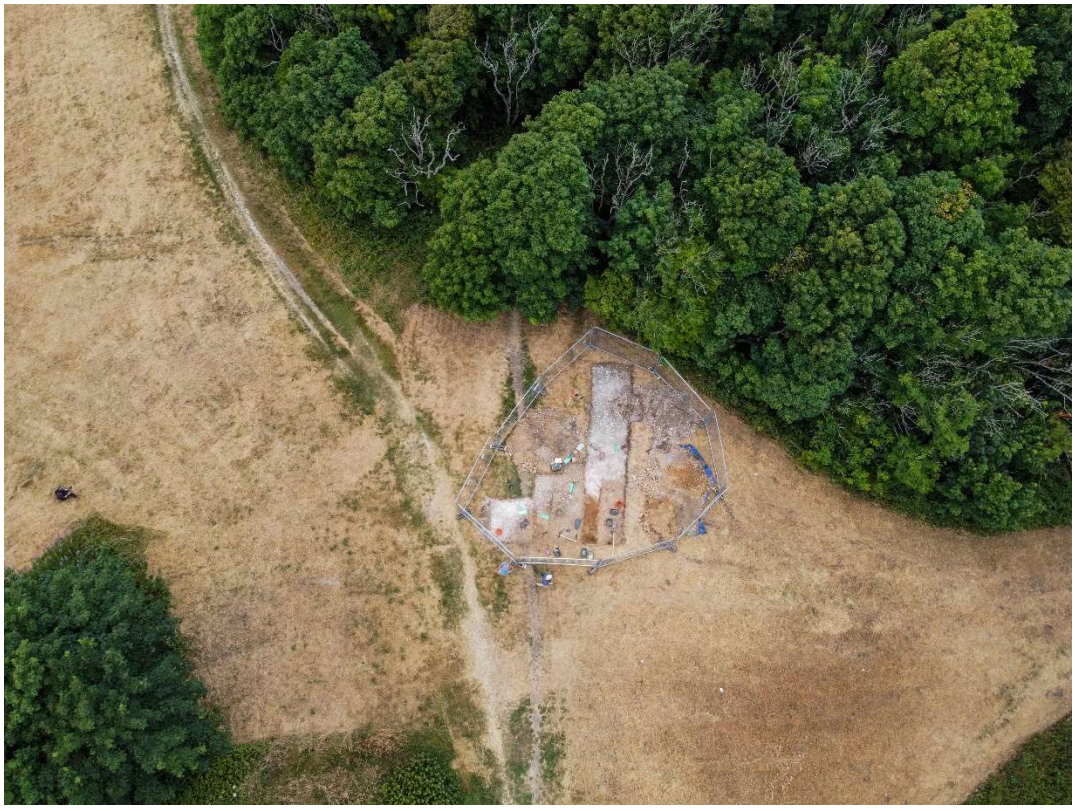
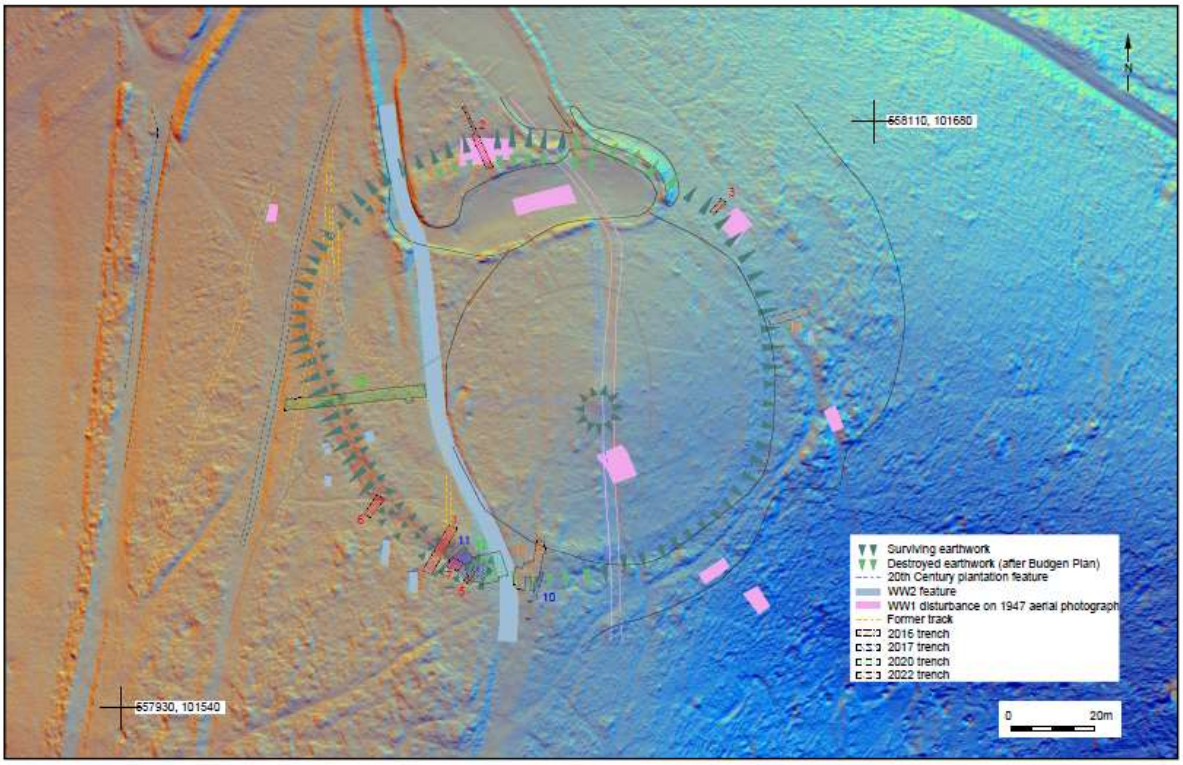


Figure 11: Budgen plan (Fig. 3) combined with LIDAR image (Fig. 5)



APPENDIX 1

Butts Brow Overview 2020

The site of Butts Brow is situated on the Upper Cretaceous chalk of the South Downs, within the north-west boundary area of Eastbourne, East Sussex. It is situated directly to the west of the village Willingdon, and to the east of the village Jevington (see figure 1 for site location) The site is 185m above sea level and consists of a sub-circular earthwork comprising of a ditch with internal bank. It has been recorded on OS maps from 1870 onwards as having a potential burial mound in the centre, referred to as a *tumulus* (Seaman 2016).

550m to the North of the earthwork is the higher spur of Coombe Hill, upon which is the early Neolithic causewayed enclosure of the same name that was excavated in 1949 (Musson 1950) and 1962 (Drewett 1994). Coombe Hill causewayed enclosure consists of two concentric non-continuous ring ditches with earthen banks on the inside, and it is broadly contemporary with the other causewayed enclosures in East Sussex, such as Whitehawk (Brighton) and Offham (Lewes). Other causewayed enclosures of contemporary age are also in West Sussex, north of Chichester, and are located at The Trundle, Court Hill and Barkhale.

Heritage Eastbourne undertook excavations at Butts Brow between 27th July to 9th August 2016, between 17th to 30th July 2017 and between 13th July – 2nd August 2020, along with volunteers and two or more professional archaeologists (Seaman 2016; Seaman 2017). In 2016 seven evaluation trenches were excavated across the site, in 2017 a larger area around trench 5 was excavated (trench 11) as well as an area to the east on the other side of the WW2 tank track which now appears as a modern path (trench 10) and in 2020 two areas The earthwork bank and ditch to the south west of the Plantation and a large area including the bank, ditch and interior of the enclosure to the south east.

These excavations provided evidence via pottery that the site was an early Neolithic enclosure dating to approximately 3700-3300 BC (Doherty 2018). The 2017 excavation uncovered a terminus to the ditch located just west of the tank road and the beginning of potentially a new ditch, suggesting there could be a narrow causeway between them.

Butts Brow is currently defined as an early Neolithic enclosure. Potentially the monument is a single circuit enclosure comparable to Barkhale. Currently, however, evidence for the purpose and usage of the site is scarce.

The project in 2020 was necessarily affected by Covid-19 in terms of numbers of participants and therefore the scope of the excavations, it was nonetheless a great success.

In our main trench in 2020 (Trench 12), a long, narrow section from outside the ditch towards the middle of the site, we revealed the ditch and recorded some of the best stratigraphy so far seen on the site.

The ditch (at this point over 1.5m deep and 3m wide) was cut into the chalk which had split along their horizontal planes giving the steep sides a slightly stepped appearance. Evidence suggests the gruelling process of how the ditches were dug, with the digger striving to find a natural fissure or crack weathered into the surface of the chalk in which to thrust an antler tine and prising out ever diminishing blocks as the rock became more solid.

The bottom of the ditch was flat with some large natural flints still sitting in a seam where they had formed over 95 million years earlier. Above the ditch floor was a thick layer of very loose chalk rubble and deposited within it pieces of knapped flint with debitage (the debris created by the process of knapping flint by hand) so fresh it looked as if it had been struck yesterday. Indeed had it been found on the surface of a field I may well have thought it recently plough-struck rather than the result of ancient hands.

The looseness and freshness of the material at the bottom, together with the unweathered appearance of the sides of the ditch show us that soon after it was dug, at least this part of the ditch was backfilled with the broken chalk recently removed. As some of the extracted flints were replaced, they were roughly struck and flakes removed and then placed together in discrete piles.

Once this initial process was done and the ditch about half filled, it was then left open for some time, this was evident from the top of the chalk backfill weathering considerably and forming a much smoother, hard surface. It looks as if the ditch had been kept clear of

vegetation at least for some periods of time, then it began to gradually silt up with clay rich soil through the weathering of the bank above to the east.

Later, the ditch was once again filled, this time with large flint nodules and some clay soil, but no chalk, to form a very solid layer. Within the natural flints were a large number of struck flakes including a very few tools that may have been in deposits like those flints right at the bottom.

The final *event* in this sequence was the more gradual filling of the upper levels of the ditch through natural erosion of the clay bank above.

It has been speculated that the initial backfilling took place soon after excavation, then the half-filled ditch remained open and periodically cleaned for some time, probably decades, before the mass of flint was deposited, filling the remainder of the ditch. This whole process, or the life of the monument, at least with the ditch playing an important part, may have been as little as a century or as much as 500 years.

The bank referred to above to is certainly worthy of a mention, although much more will be revealed through post excavation work. It was quite astounding to find the remains of a Neolithic clay bank surviving, literally, just a few centimetres beneath the present ground surface. Indeed, we have not found evidence of this soil bank elsewhere on the site. The fact that any of this bank remains must show that this area has not been ploughed extensively for much, if any of its' 5500 years of existence. Within the bank we found a number of pieces of Early Neolithic pottery (dated by Stephen Patton, report pending) within the bank giving us some very valuable dating evidence for its' construction.

Beyond the evidence above, the interior of the enclosure was largely devoid of any prehistoric features, though areas of rooting did contain some worked flints and debitage. What was recorded were two WW2 slit trenches (report pending from Peter Hibbs) of a type not previously known from this area and not before excavated.

In Trench 13 on the southern part of the earthwork (where in 2018 we had found evidence for a causeway or entrance) we established the sequence of digging and sporadic refilling within a large oval pit or short ditch section.

Here though, there were differences, maybe because this part of the monument had a different 'function' or significance. In this pit/ditch that separated two causeways, the backfilling events were present but somewhat different. In this case there is an initial deposit of fine, clean clay at the bottom and running about half way up the sides without actually filling it, like a lining rather than a fill. There was then a more substantial deposit or fill of chalk pieces that looks like it may have come from the bank, but with little or no clay soil. Originally this might have filled about half of the volume of the ditch and the surface was very weathered, again indicating that for some time the ditch was left open, but kept, at least periodically, clean and free of vegetation.

Cut through the chalk backfill and into the base of the ditch itself was a large posthole (around 50cm across) that was still part filled with large flints once used to pack the posthole and give what must have been a substantial piece of timber, good, firm support.

As to why a posthole was here in particular, we can say that this position does stand between one small causeway and the probable end of one bank section on one side and what looks very much like an entrance to the monument on the other. So the idea of a marker post by an entrance, enhancing it or focussing the eye on this point does actually make some sort of sense.

Another reason to think that this area was an important part of the monument was the nature of the finds in this pit. Though, like the rest of the site, finds beyond flint debitage were scarce, we did find deposits of pottery in this pit and also (in 2018) a stone used for polishing flint tools. This form of deposition is very similar to some found in the ditch at the nearby Combe Hill – again indicating some possible contemporary activity at both monuments.

We cannot be sure when the post was removed but there is no evidence to suggest it rotted in this position. There then follows another filling of the ditch with flints and a clay rich soil and it is in to this that the deposits of pottery were placed.

So we have Early Neolithic pottery deposited in the upper (latest) fills of an Early Neolithic feature, indicating that this ditch was 'in use' throughout the Early Neolithic, not just at a given moment within it.

To the east of the oval pit, it was established that what is now a track (and appears to have been used by vehicles during WW2) was an area of undisturbed solid natural chalk and there is no reason not to believe that this was an original entrance to the enclosure.

Essentially what we have at Butts Brow is an Early Neolithic enclosure (dated by pottery deposited in the ditches to around 3600BCE (from excavations in 2016 & 2017) or a space marked out by a ditch with an inner bank. This space was *special*, it must have been created by burning and hacking down the woodland that covered the Downs at this time. Perhaps bringing order to the wild chaos, or marking the sacred from the profane, the safe from the dangerous?

Whatever the reason, a ditch or segments of ditch, most over 10m long , around 1.5m deep and over 3m across were dug all around the hill, with antler picks, wooden or bone tools and hands. Then a huge bank over 2m thick built with the chalk rubble and clay thrown up inside. A massive, monumental endeavour for which some serious motivation must have been needed.

This ditch is broken in at least two places by what could be described as possible entrances or more properly, causeways – so technically in archaeological terms we could now describe this site as a *Causewayed Enclosure*. With a similarly dated but better preserved Causewayed Enclosure at Combe Hill, less than 1km away, it could be unique to have two so close together[1].

So we have a 5500 year old space delineated in the chalk and marked out with a segmented (at least partly) ditch and inner bank that has a possibly more elaborate twin just across the head of a valley that runs south west towards Jevington.

Both monuments have steep scarp slopes on one side where the ditch disappears (Combe Hill) or is smaller (Butts Brow – tbc) and the most substantial earthworks face each other across the valley. There are incredible 360 degree views from both sites, but is the focus down to the south west and the sea beyond rather than to the east over the levels?

The location of the site at Butts Brow utilises steep slopes of natural terrain to limit directional accessibility, and in these areas are a lack of ditches, which has also been noted at Whitehawk and Coombe Hill. This provides evidence of a continuity of ideas between the

[1] Some other Causewayed Enclosures in the south east have ditched enclosures (lacking the causeways) nearby

choices made as to where to initially construct these monuments, and Butts Brow is therefore consistent with other Sussex enclosure monuments.

Neither enclosure is on the hill top, Combe Hill lies cradled between two tumps to the east and west while the ‘peak’ near Butts Brow is to the south of the monument. Space and location could be just as important here as the earthworks themselves.

In antiquity the site appears to have undergone similar modifications to other early Neolithic enclosure monuments. It has been observed at other sites that the ditches are open and cleaned for a period of years, and then purposefully backfilled within only decades of their initial excavations, and new ditches and pits then being cut into this redeposited material. At Butts Brow it was clear that the chalk at the base of the ditch had been weathered for some time, and the primary deposits in some areas indicated that some natural silting had occurred, but there was also evidence that the other material had been purposefully redeposited into the ditches. There are also two pits identified so far that have been cut into this backfill containing pottery and flint also dating to the early Neolithic.

No evidence so far has been identified to ascertain an approximate date for the monument of Butts Brow ceasing to be occupied. Evidence for later prehistoric activity at Butts Brow is scarce, but pottery fragments found in subsoil and stratigraphically later contexts show that there were some incidences of Bronze Age and late Iron Age / early Romano-British people being on the site (Doherty 2018).

A total of 86 sherds of pottery have been found so far, weighing a total of 382g, 58 of which date to the early Neolithic and were from primary fills or features such as pits cut into these fills (Doherty 2018, 2). This early Neolithic pottery was identified as being Plain Bowl ware which has also been found at other enclosure monuments in Sussex such as The Trundle and Whitehawk. This pottery provides the evidence that Butts Brow is broadly contemporary with the other early Neolithic enclosures of Sussex.

Approximately 1,144 pieces of flint debitage were found during the 2016 excavations, and approximately 687 were found in 2017, resulting in a total of around 1,831. These flints are undergoing recording and analysis by Stephen Patton. They were retrieved from most contexts, ranging from primary fills of the ditches to an abundance within the topsoil and subsoil over the site. The site has substantial potential for further analysis, and even the small areas excavated so far have provided artefacts that can provide a considerable amount of information on early Neolithic activity in this area.

The earthwork is not recorded on any historical maps, but it was noted in writing during the 1930s by H Toms, and in 1937 by Curwen (Seaman 2016).

During the 1940s Allied Infantry and artillery military were present at the site, with a tank road running across the earthwork. The road has visibly and notably disturbed some of the prehistoric contexts. For example, within trench 11 a pit was found in which approximately

100 rounds of live ammunition had been disposed of, as well as other disturbance where food tins and glass bottles had been discarded. There appear to be a number of possible foxholes dating from this period across the site and it is likely that some utilise the ditch fill as a much softer soil to dig in to. The amount of damage from mid-C19th intrusion is not yet understood but the evidence of stratified earlier features and material is at least encouraging. A large quantity of the finds from the site are 20th century in origin and are associated with these WWII activities though there is a small quantity of slightly later material that indicates the growing tourist use of the site from the 1950's onwards.

Future excavation would need to focus on gaining evidence for termini and causeways, the existence of a second or more outer earthworks, activity within the enclosure itself and potentially finding organic material to gain C14 dating from, such as an antler pick. A low flint mound (marked on the OS series of maps as a tumulus) located within the enclosure will also be investigated in 2022 along with some restorative works associated with the removal of an intrusive tree stump. In addition, and of equal importance, is the valuable outreach work being undertaken with the public to spread information of the extremely significant local heritage. Additionally, if it can be demonstrated that Butts Brow predates or is contemporary with Coombe Hill this could provide information of national importance in understanding the role of causewayed enclosures to the Neolithic communities of Sussex.

APPENDIX 2

The Prehistoric/Early Roman Pottery by Anna Doherty

Introduction

A small assemblage of 85 sherds of pottery, weighing 381g, was recovered during two seasons of excavation at Butts Brow Car Park and Beehive Plantation, Willingdon. The pottery predominantly comprises Early Neolithic Plain Bowl but includes a few sherds of Late Neolithic/Early Bronze Age date, probably belonging to the Beaker tradition. In addition, a small number of undiagnostic sherds are probably suggestive of later prehistoric dating. A single deposit produced a few sherds of Late Iron Age/Roman grog-tempered "East Sussex Ware".

Methodology

The pottery was examined using a x 20 binocular microscope and quantified by sherd count, weight and estimated vessel number (ENV) on *pro forma* records and in an Excel spreadsheet. Fabrics were defined using a site-specific fabric type series in accordance with the guidelines of the Prehistoric Ceramics Research Group (PCRG 2010, Table 1).

Fabric	Description
FLIN1	Common flint of 0.5-1.5mm in a silty matrix

FLIN2	Rare/sparse moderately-sorted flint of 1-3mm in a dense, fairly quartz-free, slightly laminar matrix
FLIN3	Sparse/moderate, very ill-sorted flint of 1-6mm in a dense, fairly quartz-free, slightly laminar matrix
FLIN4	Very rare flint of 0.5-2mm in a dense, fairly quartz-free, slightly laminar matrix
FLQU1	Sparse flint of 0.2-1mm and common quartz of 0.1mm with rare iron rich argillaceous inclusions of up to 2mm
FLQU2	Rare flint of 0.5-2mm with moderate to common quartz of 0.4-0.6mm
FLQU3	Sparse large flint of 4-6mm with moderate to common quartz of 0.4-0.6mm
GROG1	A typical "East Sussex Ware" fabric with common grog of 1-2mm in a silty matrix
GRFL1	Moderate grog of 0.5-2mm with rare flint of <1mm
GRFL2	Moderate grog of 0.5-2.5mm with rare flint of up to 3mm
GLFL1	Rare flint of 1-4mm with moderate glauconite of 0.2-0.3mm
SHEL1	Moderate fine linear/elliptical voids of up to 4mm in length in a dense laminar matrix

Table 1: Site specific fabric definitions

Early Neolithic

A total of 58 sherds, weighing 299g, are of Early Neolithic date, belonging to the Plain Bowl tradition (dating to around 3700-3300 BC). Two small to moderate sized groups of this type were recovered: from BPW16 fill (704), of ditch [704] and BPE17 fill (217), of ditch [206] (Slot Y), both representing deposits within the main enclosure ditch. Single bodysherds with similar fabrics and surface finishes were also found in topsoil (1), bank material (2) and solution hollow (610) in BPW16, Trench 6 and in BPW17 context (205). A further 13 sherds, weighing 24g, discussed in more detail below, have been classified as of uncertain prehistoric date. Whilst these are considered probably of later prehistoric type, an Early Neolithic attribution cannot be totally excluded.

As shown below in Table 2, sherds assigned with some degree of confidence to the Early Neolithic period represent a homogenous group of sparsely or moderately flint-tempered fabrics with dense, fairly quartz-free matrixes. These are generally relatively coarse fabrics, the most common (FLIN3) containing inclusions of up to 6mm in size. Moderately coarse fabric FLIN2, containing flint of up to 3mm, is also fairly well represented, while three sherds were recorded in a moderately fine flint-tempered ware (FLIN4).

Fabric	**Sherds**	**Weight (g)**	**ENV**
Early Neolithic: Plain Bowl			
FLIN2	13	33	5
FLIN3	42	261	16
FLIN4	3	5	2
Late Neolithic/Early Bronze Age: Grooved Ware/Beaker			
GRFL1	5	21	5
GRFL2	3	21	1
Uncertain dating, possibly Iron Age			
FLIN1	1	1	1

FLQU1	1	4	1
FLQU2	1	2	1
FLQU3	6	10	2
GLFL1	3	4	1
SHEL1	1	3	1
Late Iron Age/Roman: "East Sussex ware"			
GROG1	7	17	1
Total	**86**	**382**	**37**

Table 2: Quantification of fabrics, broken down by period and ceramic tradition

Very few diagnostic feature sherds were recorded amongst this material. In context (704), a rim from a Plain Bowl with an open profile and slight internal bead rim was recorded. Broadly similar vessel profiles can be seen in assemblages from Whitehawk, Bury Hill and Peacehaven, for example (Piggott 1936, Figs 15-16; Drewett 1981, Fig 7, no 8 & 10; Doherty 2015a, Fig 6.8, no 41). Other diagnostic elements include finger indents or incomplete perforations and a sherd probably from the edge of a wide oval lug. Both of these elements are very common in "Whitehawk style" Plain and Decorated Bowl assemblages. For examples of the former see Williamson 1930, Plate XI, no 48 and 51; Doherty 2015a, Fig. 6.8, no 4 and 37a; for the latter see Williamson 1930, Plate IX, 20-22; Piggott 1934, Fig 23; Piggott 1936, Fig 2-3 and 23-24; Doherty 2015a, Fig 6.8, no 22, 23 and 44.

In context (217), a Plain Bowl with a slightly beaded rim and neutral/slightly closed profile was recorded. Again, it can be broadly paralleled in many Causewayed Enclosure and Early Neolithic pit assemblages from the region (e.g. Williamson 1930, Plate XI, no 34, 35, 38; Piggott 1934, Fig 38; Drewett 1977, Fig 11, 7, 12, 17, 18; Bell 1977, Fig 7, no 13). Further sherds with finger indents or incomplete perforations were also noted in this group.

In both of the larger groups of pottery from contexts (704) and (217) many of the sherds are of similar fabric, firing colour and wall-thickness but lack any cross-fits and feature enough variability as to make it uncertain whether they represent different vessels or not. In each case, a minimum of two or three vessels were recorded based on diagnostic sherds, though each group possibly contained sherds from up to nine or ten vessels.

Late Neolithic/Early Bronze Age

A total of eight sherds, weighing 42g, were associated with Late Neolithic/Early Bronze Age grog-and-flint tempered wares (GRFL1 and GRFL2). These were predominantly found in BPE17 fill (102), of ditch [106]. Although part of the main enclosure ditch, it was suggested that these may originate from the top of the deposit and therefore probably represent a secondary phase of activity. Single sherds of Late Neolithic/Early Bronze Age date were also found in a thin deposit, BPW16 Trench 6, context (609), beside the main enclosure ditch and as – presumably intrusive – material in enclosure ditch fill (217) (slot Y) which otherwise produced a moderate-sized assemblage of Early Neolithic Plain Bowl.

Most of the sherds are fairly undiagnostic with moderate wall thickness and little evidence of decoration or overall vessel profile. Many of these could represent either Late Neolithic Grooved Ware (*c.*2900-2100 BC) or Late Neolithic/Early Bronze Age Beaker, the latter being much more common in East Sussex, especially on sites earlier in use as Causewayed Enclosures. Beaker has, for example, been recovered from later pits or deposits at both

Whitehawk and Combe Hill (Piggott 1934; Drewett 1994). One base/lower wall sherd with faint linear horizontal impressed or incised decoration from (217) is more certainly attributable as Beaker and another abraded sherd with similarly faint decoration from (102) is probably of the same tradition.

Uncertainly dated, possibly later prehistoric material

In addition to the Neolithic-Early Bronze Age pottery, 13 very fragmentary bodysherds, weighing just 24g, may belong to the later prehistoric period, though their dating remains ambiguous. Quite a variety of different fabrics was noted, including a relatively fine but non-sandy flint-tempered ware (FLIN1) in BPW16 Trench 3, layer (2). Although occasional examples of fine well-sorted flint-tempered wares occur in Early Neolithic assemblages, such fabrics are probably more typical of the Late Bronze Age/Early Iron Age Post-Deverel-Rimbury tradition.

Relatively sandy and well-sorted flint-tempered wares (FLQU1 and FLQU2) were noted in BPW16 Trench 2, fill (204) of ditch (202), while a well fired but fairly ill-sorted and coarse sandy flint-tempered ware (FLQU3) and a glauconitic flint-tempered ware (GLFL1) were recorded in BPW16 Trench 3, layer (3). A single example of fabric FLQU3 was also noted in BPW16 Trench 1, context (106). Meanwhile a fairly fine shelly ware (SHEL1) was recovered from BPW16 Trench 10, context (7).

In general, this group of fabrics is fairly typical of Early/Middle Iron Age assemblages from East Sussex. Good parallels can be found in the recently excavated assemblage from Pocock's Field, Eastbourne for example (Doherty in prep). One caveat to bear in mind however, is that sandy flint-tempered, glauconitic flint-tempered and shelly wares have all recently been identified as minor fabric groupings during rerecording of the Early Neolithic Plain/Decorated Bowl assemblages from 1920s and 30s excavations at Whitehawk (Doherty 2015b). The use of such fabrics was however, seen as highly unusual in the context of other Sussex Early Neolithic assemblages, possibly indicating that Whitehawk was used by people from a much wider territory than other contemporary sites (ibid). Where inclusions like shell, glauconite and quartz sand were identified in the Whitehawk assemblage, they were still associated with other Early Neolithic characteristics such as low-firing temperature. The current assemblage is generally quite well fired and notably very different to the pottery recorded in the two securely dated Early Neolithic contexts described above. It is therefore suggested that these sherds are likely to belong to the Iron Age although, in the absence of diagnostic features, an Early Neolithic date cannot be entirely excluded.

Late Iron Age/Roman

Seven sherds of probable Late Iron Age/early Roman pottery, from a single vessel, weighing 17g, were recovered from BPW16 Trench 2, fill (203) of ditch [202]. The sherds are associated with a typical "East Sussex ware" grog-tempered fabric (GROG1). While grog-tempering remains common throughout the Roman period in the Eastbourne area, the relatively low-fired matrix and well-burnished surfaces seen on this example are very typical of the Late Iron Age/early Roman period.

Discussion

The presence of Plain Bowl pottery in two deposits within the main enclosure ditch suggests that it is broadly contemporary with Causewayed Enclosures such as Whitehawk, The Trundle,

Offham Hill and Bury Hill, as well as with pit sites such as Peacehaven and Bishopstone (Williamson 1930: Curwen 1934: Curwen 1936: Curwen 1929: Curwen 1931; Drewett 1977: Bedwin 1981: Bell 1977: Hart 2015). A recent radiocarbon dating programme suggests a maximum date range of *c*.3755-3300 cal BC for the primary use of Sussex Causewayed Enclosures with a strong probability that this activity occurred within the narrower range of 3655-3470 cal BC (Whittle et al 2011, 251). These date ranges can probably be equally applied to the currency of the Plain and Decorated Bowl traditions in Sussex, vessels of which have principally been recovered from Causewayed Enclosures. Unfortunately, the current assemblage is not large or diagnostic enough to date beyond these broad parameters.

It is worth noting the complete absence of decoration in the current assemblage, though this is not necessarily out of keeping with other assemblages from Causewayed Enclosure or pit sites. Although Decorated Bowl occurs in very small quantities in Early Neolithic assemblages dominated by Plain Bowl from Offham Hill, Bury Hill, Bishopstone and Peacehaven, these were all substantially larger assemblages than that from Butts Brow (Drewett 1977; 1981; Bell 1977, Doherty 2015a). It is possible that proportions of decoration increased over time as the more highly decorated Middle Neolithic Ebbsfleet-style Peterborough Ware tradition developed form Decorated Bowl. At present however, there is little scientific dating evidence to support such a chronology. Indeed Whitehawk, which produced the largest assemblage of Decorated Bowl from Sussex, appears to have been largely constructed prior to 3500 cal BC and Peacehaven, which produced similarly early radiocarbon dates, also included an element of Decorated Bowl (Whittle et al 2011, 226; Marshall 2015).

Instead, it seems more likely that Plain and Decorated Bowl were parallel traditions that may have been used in different social contexts. It has been noted for example, that Whitehawk and the Trundle appear to contain a much higher proportion of Decorated Bowl than the other Causewayed Enclosure or pit sites; between a quarter and third of the diagnostic vessels from the Whitehawk 1920s-30s archive are decorated (Doherty 2015b). These two sites also seem to have had a much more complex history of construction and use than the other Sussex enclosures (Whittle et al 2011, 252). Recent reassessment of the Whitehawk pottery suggests that a far greater range of fabric types was used than in other Sussex assemblages, perhaps suggesting that pottery was being brought to the site from a wider area of the surrounding landscape (Doherty 2015b). Meanwhile, assemblages from simpler enclosures and pit sites appeared, like that from Butts Brow, to represent very local manufacture with much more minimal use of decoration (Drewett 1980, 26).

The absence of any Peterborough Ware traits, which have been noted in stratigraphically late deposits in ditch circuits at Whitehawk, Combe Hill and Halnaker (Piggott 1934; Musson 1950; Drewett 1992), may suggest that the assemblage is less likely to date towards the very end of the currency of Plain Bowl. The last synthetic overview of associated radiocarbon dating, published over 20 years ago, noted a lack of reliable data but suggested an overall date range of 3400-2500 cal BC for Peterborough Ware (Gibson & Kinnes 1997, 67), whilst Barclay (2008) suggests a slightly earlier initial development, between 3600-3500 BC. On the other hand, it must be remembered that the current assemblage contains just two diagnostic rimsherds and a few other elements, like part of a lug, which are specifically diagnostic of the Plain Bowl tradition. Although it is likely that the associated undecorated bodysherds belong to the same ceramic style, the very small size and undiagnostic nature of the assemblage make it difficult to determine whether the absence of Ebbsfleet Ware is chronologically significant.

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