Mesolithic and Late Neolithic/Bronze Age activity on the site of the American Express Community Stadium, Falmer, East Sussex

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Mesolithic and Late Neolithic/Bronze Age activity on the site of the American Express Community Stadium, Falmer, East Sussex

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Abstract

Excavations on the site of the American Express Community Stadium, Falmer, East Sussex have revealed evidence for over 7000 years of human activity. The earliest occupation was a Mesolithic camp, where the production of flint tools (microliths) was carried out, on a scale unprecedented in East Sussex. There was little recognisable human activity in the Early and Middle Neolithic but geoarchaeological investigations have shown that the landscape continued to change with probable deforestation causing colluvial deposition within the river valley to the west.

In the Late Neolithic/Early Bronze Age, a series of three ring ditches were dug, close to the location of the Mesolithic pits. There are a number of possibilities as to what these ring ditches represent, but the most likely explanation is a group of barrows or other ceremonial ring ditches. Whatever their function, the structures were re-visited later in prehistory; a testament to the continued topographic importance of the site.

Finally the site became the focus of Anglo-Saxon habitation including a sunken-featured building, perhaps an outlying part of the precursor to Falmer village.

INTRODUCTION

Archaeology South-East (UCL Institute of Archaeology) were commissioned to undertake a programme of archaeological investigation in advance of development at the site of the American Express Community Stadium at Village Way, Falmer, East Sussex (NGR 535210, 108510) (Fig.1). The investigations comprised field-walking, evaluation trial trenches, geoarchaeological test pits and two main open area excavations. The two excavation areas, encompassing approximately 8500m^2, were investigated between November 2008 and January 2009 (Fig 1).

The most significant archaeological features were revealed in the open area excavation within Area B and the narrow strip in Area A to the immediate south. Significant quantities of Mesolithic worked flint were recovered, much of it deposited within five groups of deep pits, each group exhibiting different characteristics in the composition of the assemblages, perhaps reflecting different tasks, events or even the unique 'flint' signature of different knappers. Adjacent, and in part overlying some of the pits, a series of three ring ditches were uncovered which have been dated to the Late Neolithic/Early Bronze Age and probably represent a group of barrows or other ceremonial ring ditches. These features were apparently revisited at some point in the later prehistoric as evidenced by several pits cut into the ditches and small amounts of pottery of this date. The latest activity of note is Anglo-Saxon in date and includes a sunken-featured building. The archaeological evidence for over 7000 years of human activity suggests a location of value and importance, the detail of which is explored below.

GEOLOGICAL AND LANDSCAPE SETTING by Matt Pope

The site of the American Express Community Stadium is situated within the South Downs, a chalk escarpment which forms the southern limb of the Weald-Artois anticline (a structural upfold of bedrock between the Sussex coast and London). Locally it straddles a minor north-south orientated dry valley which feeds directly into the larger dry valley currently occupied by the A270 Lewes Road (Fig 2). The solid geology underlying the site comprises sands, clays and discontinuous beds of small sarsen stones of the Tertiary Lambeth Group. The precise limits of these Tertiary deposits were mapped with some accuracy by the British Geological Survey in BGS Sheet 318. These deposits would have previously mantled the surrounding downland, but have been progressively eroded from the higher ground of the chalk escarpment through both periglacial and subaerial weathering. These deposits outcrop on the higher areas of the site and achieve a maximum thickness in excess of 3m in its south-east corner; traces of the Tertiary deposits were also found to be patchily preserved in the south-west of the site.

Significantly, the site occupies a watershed, centred on Falmer village (Fig 3). The watershed is controlled by the presence of the Caburn Syncline, a local down-fold in the underlying Cretaceous geology. The central axis of the syncline passes through the village of Falmer where Tertiary deposits of the Lambeth Group, including sizable Sarsens stones (Ullyott *et al.* 1998; Ullyott *et al*. 2004), outcrop on the modern land surface (Mortimore and Pomerol 1991). The axis of the syncline divides two drainage systems. One flows north-east towards Lewes where it holds its own seasonal fluvial channel, the current Winterbourne Stream. The other flows south towards Brighton to its confluence at The Level, with a similar large dry valley occupying the A23 Patcham Valley. This valley maintained a watercourse known as the Wellesbourne Stream until the 19th century when it was culverted. This stream,

like the Winterbourne Stream in Lewes, was relatively small in size and seasonal in nature; a misfit within a much larger valley system, it being incommensurate with the valley it occupies. Its hydrology, persistence and significance throughout prehistory have not been investigated. Where the north-south dry valley, which runs through the centre of the site, has progressively incised into the local landscape, it has locally removed the Tertiary Beds and exposed the underlying Newhaven and Seaford members of the Upper Chalk.

Overall, the arrangement of the geology is therefore controlled by both a large-scale tectonic structural feature (the Caburn syncline) and the development of local drainage patterns through the Pleistocene resulting in the formation of the dry valley system spreading north and south from Falmer.

Landscape Development

The dry valley system originated in solifluction and fluvial processes associated with the Pleistocene weathering of the chalk downlands. The current network of dry valleys were carved out due to the removal by melt-water of rock weakened sediments made mobile through solifluction and fluvial over-steepening of the foot of valley slopes. Deposits relating to this process are mapped as Head (Fig 2). Given the large, dendritic catchment area of the Lewes Road dry valley, water volumes during seasonal thaws and glacial/interglacial transitions can be assumed to be vast and it should be expected that down-cutting and melt water associated with the last (Devensian) glaciation incised a major channel beneath the current level of the modern valley ground surface. An original geotechnical survey of the wider site, while not detailed, appears to show the expected combination of dry valley deposits overlying both solid chalk and Woolwich and Reading Formation (Sidiropolous 2007). At Bennett's Field, which lies to the west of the Falmer Stadium site and at a lower altitude (Fig 1), no in situ Tertiary geology was encountered, almost certainly due to its lower

altitude and the removal of deposits overlying the chalk in this area by natural erosion (Garland 2011).

Holocene sedimentation, in the form of dry valley deposits and colluvium, fill the superficial valley systems across the site. This sedimentation includes, at depth in the main dry valley axis, poorly sorted and sub-rounded fluvial gravels and alluvial silts and clays. These give way to extensive colluvial sequences relating to the down-slope movements of valley side soils including the removal of vestigial loess deposits, poorly developed rendzina soils and weathered Reading Beds (Allen 1995; Favis-Mortlock *et al*. 1997; Wilkinson *et al.* 2002; Wilkinson 2003; Allen 2005a).

Landscape Affordances

From the American Express Community Stadium site are views over the South Downs from the south-west to the north-west, even though the site it is not located on the highest part or most prominent point of the local landscape (Fig 3). The coastline lies 5.5km to the south and can be accessed directly via the Lewes Road valley. The local presence of outcropping Tertiary deposits would have given rise to locally varied ground conditions, spoils and local vegetation which would have contrasted with the relative uniformity of the surrounding Downlands. These ground conditions would have varied from extremely free-draining sandy soils, providing lighter, more open vegetation (see below), through to local outcropping of impermeable clay or concreted layers. Where these impermeable members of the Tertiary geology lay close to the surface they have allowed for the natural formation or human construction of a sizeable pond in the centre of Falmer Village itself, less than 250m to the east of the site. While the origin of this pond is unknown, the name of the village appears in the Domesday and attests to the presence of a ‘mere’ in the early medieval period at least. Its presence in early prehistory, if possible to prove, would be significant. The pond would

provide a rare Downland water source for livestock watering and, if a feature of the postglacial landscape, for wild mammals, fowl and possibly fish.

The position of the site would have been advantageous, especially in terms of resources - both food and raw materials, including good quality flint - allowing relatively easy exploitation of diverse habitats prevalent in the vicinity, situated on natural routeways, and seasonal spring-fed streams, which run from the site through the downland both west to the coast and east to the Middle Ouse Valley.

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND By Nick Garland

Two Palaeolithic handaxes, both preserved within the collection of Brighton Museum, and both found as surface finds on the flanks of Hollingbury Hill (4.5km WSW of the site) and in Stanmer Park (1km to W of the site) are the only local traces of early human population in the landscape which might potentially date to the Middle Pleistocene. Non-diagnostic flint flakes were found within the head deposits, dated to the middle of the Devensian, occupying the valley bottom at Woollard's Field, 1.25km to the SW of the site (Pope et al 2013). These finds do not allow us to say anything meaningful about the Pleistocene occupation of the immediate landscape but do attest to a human presence deep into prehistory.

A clearer indication of human activity can be documented within the immediate postglacial period, after the cessation of periglacial erosion processes. No evidence for Upper Palaeolithic 'Longblade' industries of the Pleistocene/Holocene transition has been documented for the South Downs and it would appear that hunter gatherers of early Mesolithic cultures were the first to occupy the landscape. Flintwork concentrations, which may correspond to discrete Mesolithic activity zones, are found across Sussex, predominately on the High Weald, such as at Hermitage Rocks, High Hurstwood, (Jacobi

and Tebbut 1981, 29), along the coastal plain and in the river valleys (Drewett *et al.* 1988, 23) but have been more elusive on the downland itself to date.

In the downland landscape around Brighton two localities indicating significant Late Mesolithic occupation have been previously investigated. Excavations at Redhill, located along the A27 to the west of the site, produced a large assemblage of later Mesolithic material (771 pieces of flintwork) suggestive of an occupation site nearby, although no actual features definitely attributed to this period were found during the excavations (Barber & Bennell 2002, 105). This site is located on an area of Clay-with-flints, which seems to have been either a favoured location on the South Downs in the Mesolithic (Jacobi 1978, 15) or a geological substrate indicative of preservation of palaeolandsurfaces, removed by later erosion in the Holocene (Pope 2015). The other locality with significant concentrations of Mesolithic archaeology is centred on Peacehaven. Here Tertiary deposits similarly occupy a local syncline in the chalk, and do not extend out of this down-fold onto the surrounding chalk landscape. Bernard Calkin made significant early collections of Mesolithic material from this landscape (1924), with further material being found since and as part of the recent investigations at Lower Hoddern Farm (Hart 2015). Again while it has been suggested that this concentration reflects the preference of Mesolithic hunter gatherers for sandy soils, the previous wider occurrence of these deposits and their removal from areas of the landscape through anthropogenic erosion must be borne in mind.

Evidence for Neolithic settlement sites in Sussex is limited, with many suitable locations, such as the chalkland dry valleys of the South Downs, buried by thick deposits of colluvium (Allen 2005b, 24). Nevertheless, the downlands have produced a wealth of archaeological evidence for Neolithic activity, including flint mines and funerary monuments, and the major Early Neolithic causewayed enclosure at Whitehawk (Curwen 1931; 1934; 1936). Thirteen Neolithic findspots are recorded within the vicinity of the site. Seven of these

were flint axes, five found on separate occasions on Hollingbury Hill 3km to the west of the site, one discovered on Falmer Hill 1.2km to the south and one retrieved in Coldean 2.2km to the north-west. Also of some significance is a Neolithic/Bronze Age cross dyke at Pudding Bag Wood, located 2.4km to the north-west of the site.

There are over twenty Bronze Age sites recorded in the East Sussex Historic Environment Record (ESHER), within a 5km radius of the site, barrows being particularly well represented. A round barrow was observed 2.6km to the north-west in Pudding Bag Wood, although no surface traces now remain. A further possible round barrow is located 2.2km to the north-west in Great Wood and bowl barrows can be found 1.5km to the south and 2.8km to the north-west. An inhumation burial was found, along with bronze ornaments, in a barrow 1.8km to the south-west as was a further possible inhumation of this date, located 3.0km to the north-west. Other types of Bronze Age sites include three Mid-Late Bronze Age downland settlements located about 2km to the west at Patcham Fawcett, Downsview and Varley Halls and the Late Bronze Age/Early Iron Age enclosure on Hollingbury Hill, 3.5km to the west, which also contains within, but pre-dating the enclosure, an alignment of three barrows (Curwen 1932; Hamilton & Maney 1997, 97). The Hollingbury hillfort is the most prominent feature in the immediate landscape, and would have been clearly visible from the site.

Given that no Iron Age or Roman remains were found during the excavations, the background to these periods is not considered in detail here but there is good evidence for occupation in these periods in the wider vicinity of the site including both settlements and field systems (Rudling et al 2002b, 257).

The American Express Community Stadium lies just to the west of what is currently understood to be the core area of Saxon settlement within East Sussex (although much of the evidence is burials and cemeteries) which lies in a block of downland between the Ouse and Cuckmere (Welch 1971; Harrington 2016). There are a number of burial sites or barrows of Saxon date in the vicinity including a small group of nine barrows/mounds on Falmer Hill 1.4km to the south (East Sussex HER MES1366), and an inhumation found cut into a Bronze Age barrow at Great Wood, Stanmer 2.8km to the west (Scheduled Monument 27018).

The South Downs in the post-medieval period was dominated by agriculture, mostly sheep farming and arable cultivation. A single post-medieval ditch was the only feature found in excavation Area A, but is not present on any historic maps and is not further discussed in this report.

RESULTS By Nick Garland

EXCAVATED AREAS AND STRATIGRAPHIC SEQUENCE

The excavations revealed a typical stratigraphic sequence of 0.35m of plough soil, overlying the natural chalk or Woolwich and Reading Beds. Chalk was fairly consistently exposed across the bottom of the slope to the west (Area A) whilst on the ridge to the north-east, (Area B), the natural sand was present (Figs 1 and 4).

All of the archaeological features discussed below were found in Area B and the narrow strip to the south in Area A, and were, with one exception, cut into the Woolwich and

Reading Beds and sealed by the plough soil (Fig 5). A single feature (Structure 5) was cut into the chalk. The predominantly sandy geology and distinct northwest to southeast slope on which the site is located means that there may have been considerable movement of artefacts within the soil horizon and evidence for residual and intrusive material within fills of cut features has been identified. However the size and signature of several of the flint assemblages recovered from some contexts suggests *in-situ* knapping, the inference being that the material was being deposited within these features (mostly pits) soon after it was struck.

PERIOD 1 LATE MESOLITHIC

The earliest intensive archaeological activity identified is represented by an extensive flint assemblage dating to the Late Mesolithic (*c* 7000–4500 BC). The flint assemblage was recovered from a series of pits and also found residually in the topsoil, subsoil and in later cut features.

Pit digging and flint working

The pit groups formed a roughly circular pattern around an area free from cut features (Fig. 6). It is probable that they were dug in a clearing within the wooded landscape of the South Downs; an area potentially at least 30m in diameter.

Fifteen pits, forming five distinct spatial clusters, were found (groups G1-G5). These features have been dated through a combination of recovered flintwork, radiocarbon dating and stratigraphic relationships with later features. A further 11 pits (G20) are possibly

associated with this phase of activity but are not as securely dated as they contained smaller or less diagnostic flint assemblages.

Pits groups G1 to G4 each consisted of three or four large pits and together formed a roughly circular pattern around the cleared space, Open Area 1. Two pit groups were located to the north (G1 and G3) and two to the south (G2 and G4). A single pit (G5) was located to the east of the main cluster of features.

The pits were all generally sub-circular in shape and varied in diameter from 0.69m to 1.27m and in depth from 0.60m to 1.3m (Fig. 7). They all had vertical sides and flat bases and were generally infilled with a single fill of yellow brown silt sand. Substantial Mesolithic flint assemblages (approximately 3000 pieces in total) were recovered, characterised by core preparation and the production of various tools. The make-up of the assemblage suggests that a high quantity of the material worked at the site was being used elsewhere. The environmental samples produced small assemblages of wood charcoal fragments, poorly preserved cereal grains and other charred macrobotanical remains (primarily hazelnut shell fragments). Within this assemblage, grains of wheat including possible bread wheat, highlights the complex taphonomy of the site (ADS supplementary information: charred macro-botanical remains).

The five pit groups (G1-G5) were not only spatially distinct but contained flint assemblages with distinct compositions of tool types. This suggests differences in the type of activity carried out on the site, perhaps over time, or by separate groups of people. The exact nature of these assemblages and what they may mean is explored in more detail in the struck flint report and discussion sections (see below).

The groups of pits seemingly demarcated an open clearing that was left devoid of cut features (Fig 6). Given that this space was surrounded by pits filled with flintworking debris, it is probable that it represents the focus of the knapping. An abundance of residual flintwork (approximately 1500 pieces) was recovered from later cut features in this area, predominantly the main ring ditch (Structure 1) and suggests that a substantial surface scatter may have been present. Although it is possible that some of this material results from the truncation of the Mesolithic pits by later ploughing or erosion, it is plausible that the groups of pits were dug around a central 'flint-working area', perhaps over a considerable time period.

Radiocarbon dating

Hazelnut shell recovered from two pits in groups G2 and G4 returned radiocarbon dates in the third quarter of the seventh millennium cal BC. Pit [133], fill [134] (G2) yielded a date of 7410±35 BP (SUERC-32618, 6400-6220 BC) and pit [175], fill [176] (G4) produced another of 7440±40 BP (SUERC-32623, 6420-6220 BC). However, two charred cereal grains recovered from the same two pits returned early medieval dates: one of 1085±35 BP from pit [133], fill [135] (SUERC-32617, AD 880-1030), and another of 1030±35 BP from pit [175], fill [176] (SUERC-32622, AD 780-1000). Given the size and condition of the flint assemblages recovered, the charred cereal grains must represent intrusive material (ADS supplementary information: scientific dating). No material suitable for dating was recovered from the pits to the north of the site but two pits in group G3 were truncated by the large ring ditch (Structure 1) and a fragment of charred hazelnut shell was recovered from the primary fill of the ditch less than 2m from these pits. This returned a radiocarbon date of 7280±35 BP (SUERC-32615, 6230-6050 BC), which is later than the dates associated with the southern

pit group. Whilst it cannot be certain that this fragment derives from pit group G3, it does provide some evidence for long-lived use of this area in the Mesolithic period and it may hint that there are chronological differences between groups G1 and G3 to the north and groups G2 and G4 to the south.

PERIOD 2 NEOLITHIC/BRONZE AGE RING DITCHES

A group of three ring ditches forming a linear alignment defined the next phase of occupation (Fig 8). Understanding the construction and development of these features is not straightforward because the dating evidence is unclear.

Structure 1: ring ditch

The largest and most complete of these features, Structure 1 consisted of two thirds of the circumference of a ring ditch, surviving from its north-eastern to south-western extents (Figs 9 and 10). The north-western section of the ditch appeared truncated, possibly by down slope water flow. The remains of the ditch appear to be slightly oval in shape and fairly large, with a maximum internal diameter of approximately 16.3m. The ditch ranged in width from 0.35m to the south-west and 1.3m to the east and reached a maximum depth of 0.62m. There were no definite terminal ends on the surviving ditch, suggesting that, if there was an opening, it must have faced towards the north-west.

The south-western part of the ditch generally contained a single fill of silt sand or sand, probably the remnants of the initial silting of the feature. It is likely, due to its position down slope, that the upper levels of the ditch in this location were removed by erosion. The remainder had a more complex fill sequence with up to four episodes of silt sand infilling

with, in places, frequent sandstone inclusions (Fig 9). There was no evidence to suggest slumping of material from within the ring ditch itself. While this may indicate the absence of an internal mound, the topography of the area suggests erosion would have occurred down slope to the north-west, in the direction of what is now the truncated section of the ditch and therefore any such evidence may have been removed.

Three postholes [111], [310] and [365], appeared to follow the alignment of the ring ditch in the truncated north-western area. These survived, despite the erosion, due to their depth. All of the postholes had single fills from which small assemblages of undiagnostic struck flint were recovered, making precise dating impossible. The location of these postholes strongly suggests that they represent features associated with the ring ditch although it is impossible to determine whether they were contemporary with it. While little information is available from the site itself, possible comparable examples suggest some pit or posthole circles were cut by the construction of later ring ditches (Healy and Harding 2007, 57). This may, circumstantially at least suggest, the re-use of an earlier structure or ceremonial space.

Dating

Dating evidence from the ring ditch comprised a mixture of material which has, to a greater or lesser extent, been affected by post-depositional factors. These include the movement of material within the loose sandy fills and erosion caused by the sloping ground surface.

A large Late Mesolithic flint assemblage, of approximately 1500 pieces, was recovered from the fills of the ditch. This is almost certainly residual material resulting from

the ditch cutting through earlier Mesolithic pits (pit group G3), and flint rich soils. The abundance of Mesolithic material in the general area suggests it would have constantly washed in through the life of the monument.

Residual and intrusive material was also present within the environmental samples, which produced charred plant remains including some wheat grains, occasional wild/weed taxa and hazelnut shell fragments, all of which were poorly preserved. A charred hazelnut fragment and a charred cereal grain recovered from the primary fill of the ditch, [214] (Structure 1), were submitted for radiocarbon dating. These returned dates of 7280±35 BP (SUERC-32615, 6230-6050 BC) and 880±35 BP (SUERC-32614, AD 1030-1230).

Some elements of the flint assemblage are more likely to represent the contemporary material culture. A total of 23 retouched tools from Structure 1 were broadly dateable to the Neolithic or Early Bronze Age, including a pressure-flaked end scraper considered fairly typical of the Late Neolithic/Early Bronze Age. Although the majority of the flint assemblage recovered from features post-dating period 1 was thought to be Mesolithic in origin, there was a small reduction in the quantity of blades and blade cores associated with the ring-ditch activity, which may be indicative of Neolithic/Early Bronze flint-working (see Struck Flint).

Optically Stimulated Luminescence (OSL) dating was carried out on the final fills of the ring ditch in two locations. These fills were considered more likely to provide reliable dates because they represent the later infilling of the ditch when sedimentation rates may have slowed down, preventing the presence of ‘rogue’ sand grains disrupting the results (ADS supplementary information: Optically Stimulated Luminescence Dating report). The OSL dates from context [234] of 3350-1652 BC (X3516) and [217] 3770-1293 BC (X3515) were statistically similar (although it should be noted that they are quoted at 68%

confidence). Although they do not provide much clarification on the date of construction or use, they do give an indication that the ditches had silted up by the Middle Bronze Age.

Seven small sherds of flint-tempered pottery were also recovered from upper fill [234] from which an OSL date was obtained (X3516). The fabric types and wall thicknesses of the sherds are most typical of the Late Bronze Age Post-Deverel-Rimbury tradition (c.1150-800BC). Similar fabric types can be encountered locally in other periods, most notably the Early/Middle Neolithic; however it is worth stating that thinner-walled vessels, moderately coarsely tempered with flint, are atypical of the Late Neolithic/Early Bronze Age and are less likely to be associated with Middle Bronze Age assemblages. This fill had, however, been cut by a later pit so it is possible that the sherds are intrusive. Despite the dating difficulties, morphological similarities between this ring ditch and similar examples in South-East England suggest a Neolithic or Bronze Age origin (Garwood 2007).

Internal structures associated with Structure 1

Seventeen postholes were located within the interior of Structure 1. Despite a lack of dating evidence (only residual flintwork was recovered), these features have been interpreted as broadly contemporary with its construction because of their spatial location within it. In general, these postholes were sub-circular in shape, varied in diameter from 0.25m to 0.7m and in depth from 0.19m to 0.9m and were infilled with a single fill of yellow brown silt sand or sand. Three of the postholes, [121], [312] and [332] were greater in depth, reaching approximately 1.1m to 1.3m.

Potential structure and central feature [300]

Ten postholes formed a possible rectangular structure around a large feature [300], located at the centre of Structure 1 (Fig 9). This central feature was sub-rectangular in shape, measured 2m in length, 1.5m in width and 0.3m in depth and was filled by a dark reddish brown sandstone rich deposit. Potentially the feature marked the location of a central burial, located within an associated rectangular structure, although no human remains survived in the sandy soil.

Posthole arc

A semi-circular arc of postholes, potentially representing an associated construction within Structure 1, was located to the south of the central feature (Fig 9). This alignment is based on the inclusion of several of postholes that may form part of the rectangular structure and it is unclear what purpose it may have served.

Structure 2: segmented ring ditch

A second smaller and seemingly segmented ring ditch, Structure 2, lay to the east (Fig 11). The remains of the ditch consisted of the southern and western extents, comprising at least two distinct segments (G8), with the rest of the feature lying beyond the limit of excavation and impact area of the development. This ditch appears to be oval in shape and smaller than the adjacent Structure 1. It had a maximum internal diameter of approximately 9.65m (conjectured) but may have been significantly narrower across its other, shorter, axis. The ditch ranged in width from 0.3m to the west to 0.67m to the north and reached a maximum depth of 0.35m, with a single fill throughout and no evidence of slumping from an internal bank or mound.

Two postholes, [248] and [461], follow the line of the ditch to the north and south respectively. Both were sub-circular in shape and had steeply sloping sides and a flat base. As with Structure 1, the relationship of these postholes to the ring ditch is difficult to determine and no dating evidence was recovered. However they may also, circumstantially, suggest a possible pit/posthole circle as a precursor to the ring ditch.

A single posthole [296], was uncovered within the confines of Structure 2, similar to the feature located within the centre of Structure 1. The majority of the feature lay beyond the limit of excavation; however, it was generally sub-circular in shape with moderately steep sloping sides and a concave base. It measured 0.77m in diameter and 0.25m in depth. Although no finds or other datable material were recovered, the segmented form of this ring ditch suggests a broad Neolithic or perhaps Early Bronze Age date.

Structure 3: ring ditch

A third possible ring ditch, Structure 3, was located to the far eastern extent of the site, approximately 20m east of Structure 1. The majority of this feature lay beyond the limit of excavation. As exposed, the ditch measured 8.15m in length, 0.99m in width and 0.59m in depth. Extrapolating from the known extent, the maximum internal diameter of this ditch could have reached approximately 9.8m. No dating evidence was recovered from the single fill and no evidence of slumped material from within the ring ditch was noted. The morphological similarity of the ditch to the other two examples suggests it is of similar date and function.

PERIOD 3: LATE BRONZE AGE

Later in prehistory, possibly in the Late Bronze Age, several pits were dug into the infilled ring ditches of Structures 1 and 2. These are phased by their stratigraphic relationship to the earlier features and only dated by two small scraps of pottery. These features appear to represent later activity associated with the ring ditches.

Pit groups

Four pits cut the earlier, large ring ditch of Structure 1 (Fig 12). The features varied in diameter from 0.83m to 1.5m and were excavated to a depth of 1.2m, although not bottomed. They were all filled by a silty sand fill and contained no dating evidence. Poorly preserved, possibly residual, environmental remains (small quantities of wood charcoal, hazel nut shells, poorly preserved cereals, common pea and occasional seeds of arable weeds/wild taxa) were recovered from the fills of these features but none were suitable for dating. All four pits were located along the line of the ring ditch and are stratigraphically later than its last surviving infilling.

Two pits, [273] and [279] (see Fig. 11) were also cut into the line of the adjacent ring ditch, Structure 2. They were sub-circular in shape and measured approximately 0.9m in diameter and 0.75m in depth. Two small abraded pieces of prehistoric pottery, of probable Late Bronze Age date were recovered from the single silt sand fill of pit [273].

Pit [271] was located to the south of this ring ditch (not shown on plan). It was sub-circular in shape and measured approximately 2.2m in diameter and 1.14m in depth. No finds were recovered and the dating of this feature within this period has been based on its stratigraphic relationship with later medieval features.

PERIOD 4: ANGLO-SAXON

Structure 4

A small area of occupation in the early Anglo-Saxon period was represented by a possible sunken-featured building (Structure 4) and two associated, intercutting pits (Fig 13).

Structure 4 was represented by a large hollow which was sub-circular in shape and measured 8.1m in length, 5.5m in width and 0.39m in depth. It contained a single fill from which sherds of 6th century pottery were recovered. A single posthole was located at the base of the feature. Intercutting pits [257] and [444], were located adjacent to the building and measured 1.4m in diameter and 0.29m in depth. The single fill contained later 6th- early 7th century Saxon pottery (ADS supplementary information: The Saxon Pottery). The lack of further evidence suggests that these features are representative of a fairly limited occupation of the area in the Anglo-Saxon period.

Structure 5: flint mining, ritual activity or marling?

To the west of the main group of features the underlying geology changed from Woolwich and Reading Beds to chalk, and sloped down into the dry valley (Fig 5). A large pit, Structure 5, was cut into this chalk geology. The pit was sub-circular in shape with vertical sides and a flat base, where exposed. It measured 9.2m in diameter and 2.8 m in depth. Investigation revealed a complex depositional sequence comprising twenty-three episodes of infilling, representing phases of slumping and gradual episodes of silting. Flintwork recovered from the upper fills, was generally Mesolithic in date (421 pieces) but Anglo-Saxon pottery (4 sherds dating to the 7th to 8th century) and post-medieval ceramic

building material (2 pieces dating to 16th to 18th century) were also recovered. An OSL date of 2310-353 BC (X3575) was obtained from a lower fill of the pit, [486], however, because of a large margin of error, this date has been discounted as unreliable (ADS supplementary information: Optically Stimulated Luminescence Dating report). The possible interpretations of this feature are discussed below:

Flint mine

One plausible explanation is that the pit was dug as a mine to extract flint from the chalk. Large useable nodules of relatively good quality flint were visible within the natural solid chalk in the side of the feature. These did not form continuous solid seams but were concentrated at two different levels which, evidently, reflect flint-rich beds in the chalk. The original excavators of the feature would therefore have removed quantities of flint nodules during its construction which would have been suitable for flint tool production. The pit is broadly comparable in plan and section to known flint mines along the South Downs such as those excavated at Easton Down and Harrow Hill (Russell 2000, 71, 76); however, only a small segment of the base was uncovered due to on-site constraints. As such the possibilities of viewing potential galleries at the base of the shaft; a common feature of flint mines, were limited.

Clearly, evidence of flint manufacture was present on the site. However, the majority of this material was dated to the Mesolithic period (99%), a period for which there is no evidence of the use of flint mines. The analysis of the recovered flintwork (see Struck Flint) also highlights that the source of the raw material for flint working was taken from the surface, either in local tertiary deposits or gravels with no evidence for the use of mined flint, though it is possible that mined flint was taken to be worked and used elsewhere.

Ritual shaft

A large pit excavated at Staines Road, Shepperton, in close proximity to a Neolithic ring ditch, also provides a comparable example (Jones 2008, 16). This pit, interpreted as a 'ritual shaft' was approximately the same size and shape (8.5m x 6.5m x 1.5m, steep sides and a flat base) as the current example (9.2m x 9.1m x 2.8 m steep sides and a flat base) and dated to the Early to Middle Bronze Age. The dating evidence derived from radiocarbon dating of a preserved wooden ard (2140-1880 BC), recovered from the waterlogged primary fills of the feature (Jones 2008, 16). It is thought by the excavators that this feature represents a 'ritual shaft', with the placement of the ard representing structural deposition as a representation of the agricultural landscape (Jones 2008, 79). None of the artefacts recovered from structure 5 indicate structured deposition.

Post-medieval marl pit

Another possibility is that the feature was excavated in the medieval or post-medieval periods as a pit to extract chalk to be spread on the fields. This process improved the fertility of acid soil and was a common feature across the South Downs (Brandon 1999, 110). While marl pits can vary morphologically, the feature does broadly appear of similar size and shape to other local examples, if somewhat deeper.

GEOARCHAEOLOGICAL OBSERVATIONS AND LAND SNAIL ANALYSIS

by Matt Pope and Mike Allen

Methodology

Four geoarchaeological test pits (GTP) were excavated to observe the sedimentary sequence of the dry valley and to recover land snail evidence for environmental

characterisation of the site and its immediate environs (Fig 1). The shallow depth of topsoil, resting onto solid geology within the main excavation area in the north-east of the site, precluded any detailed geoarchaeological investigation in that location. The main dry valley, lying downslope from this area offered a potential proxy for on-site environmental information, to determine the presence of both undisturbed palaeo-landsurfaces buried at depth below colluvium and to sample Pleistocene deposits for artefacts and palaeoenvironmental evidence.

Each geoarchaeological test pit was located along the long axis of the dry valley (represented by a dashed line on Fig. 1) and measured 10m x 10m at ground level but were stepped down to 3m x 3m at their maximum. All four test pits were successfully excavated to the base of Pleistocene sedimentation exposing the underlying Cretaceous Bedrock.

Results

A consistent sedimentary sequence was established for all test pits. Table 1 details the results of GTP2 as a typical example.

Depth (m)	Context	Lithology
0.00 – 0.4	G2/1	Topsoil. 10YR 4/4 Dark Yellowish Brown. Friable. Clay Silt. 40% angular flint gravel 10-50mm with some chalk flecks.
	G2/2	---Ploughed contact---
0.4 – 0.70	G2/3	Subsoil/Colluvium. 10YR 6/6 Brownish Yellow. Compact Clay Silt. < 10% angular flint gravel 10-40mm

Depth (m)	Context	Lithology
		---Abrupt contact--
0.70 – 1.20	G2/3-4	Colluvium. 10YR 6/6 Brownish Yellow. Silty Clay. 60% subangular nodular flint 10-50mm. Charcoal flecks noted.
		--Abrupt contact---
1.20 – 1.80	G2/4	Basal Colluvium. 10YR 3/4 Dark Yellowish Brown. Cohesive Silty Clay. 5% angular flint gravel 5-20mm with some chalk fragments. Charcoal flecks, ceramic fragments and fire cracked flint noted.
		--Graded contact---
1.80- 1.90	G2/5	Decalcified Head. 10YR 3/4 Dark Yellowish Brown. Adhesive Silty Clay. 65% sub-angular flint gravel 10-90mm, Sarsen noted.
		--Solution zone contact---
1.90- 3.10	G2/6	Calcareous Head. White putty chalk at .0mm clast size in silty matrix. 40% sub-angular flint gravel 10-50mm. Solifluction gravel with no evidence for fluvial reworking.
		--Graded and micro faulted contact---
3.1-3.3	G2/7	White chalk with large angular chalk clasts and chalky silt matrix (putty chalk) Solid Chalk
		---base of Test Pit 3.2m---

Table 1: Summary of geoarchaeological observations in GTP2. Colours are referenced using the Munsell system of classification.

Land-snail evidence

A series of fifteen samples were taken through the deeper stratified colluvial sequence in GTP2 for land snail analysis characterisation. Samples of approximately 1.5kg – 2kg were taken at constant 10cm intervals from very wet/moist sediment. The assessment of the flots is presented in Table 2. Shell numbers are moderate in the lower part of the sequence (110cm to 170cm). Flot assemblages are typically dominated by open country species, but subtle changes are present in them and the presence and proportions of *Vallonia costata* and *Vallonia excentrica* seem to vary up the profile. There is clearly no evidence of the former ancient woodland landscape in the sampled sequence, but there are hints of changes within the open country environments (arable, short grazed grassland pasture) in the sequence. Much of the upper colluvial sequence sampled (40-100cm) was devoid of shells.

Sample	**Depth**	**Description/ context**	**No. of snails**	**Flot assemblage character**	**Comment**
15	40-50cm	Subsoil / G2/3	0	-	No molluscs from flot
14	50-60cm		0	-	No molluscs from flot
13	60-70cm		0	-	No molluscs from flot
12	70-80cm	Colluvium / G2/3-4	0	-	No molluscs from flot
11	80-90cm		0	-	No molluscs from flot
10	90-100cm		+	+	
9	100-110cm		2	*Trichia, Cecilioides*	open conditions
8	110-120cm		40	*Cecioliodes, Vallonia, Trichia,*	open conditions
7	120-130cm	Basal Colluvium / G2/4	75	*Ceciloides, Vallonia, Trichia,*	open conditions
6	130-140cm		75	*Ceclioides , Vallonia, Trichia,*	open conditions
5	140-150cm		75	*Cecliooides, Vallonia, Trichia,*	open some shade
4	150-160cm		30	*Ceclioides, Vallonia, Trichia*	open conditions
3	160-170cm		40	*Cecilioides, Vallonia, Trichia,*	open some shade -cereal
2	170-180cm		35	*Cecilioides, Vallonia, Trichia,*	open conditions
1	180-190cm	Decal Head / G2/5	10	*Ceclioides, Vallonia, Trichia, Cochlicopa*	open conditions

Table 2: Assessment of snails from the flots from colluvial sequence in test pit GTP2

Interpretation

The following phases of sedimentation were interpreted from the sedimentary sequence.

1: Exposure and weathering of the solid chalk surface under cold conditions presumably during the last Glaciation (MIS2-3) although as part of a cyclical series of valley incision cycles throughout the Pleistocene [G2/7].

2: Emplacement of calcareous gelifluction gravel through mass movement during thawing events in the last Glaciation (MIS 2-3) [G2/6-5].

3: Decalcification, through to present, of upper facies of gelifluction gravel, following a clearly defined zone of solution with regular formation of solution hollows up to 1.1m depth [G2/5].

4: Basal colluvium, darker more cohesive but discontinuous bed of slope deposits [G2/4]. Fewer and smaller flints compared to the overlying colluvial deposits of [G2/3-4] suggesting relatively low-energy surface run-off may be the main agent of deposition and restricted erosion of chalk in the valley sides.

5: Main phase of mass down-slope soil movement as colluvium of stony soils from the valley sides exposing more Cretaceous chalk geology and releasing flint into the colluvium. Neolithic to Bronze Age date

hypothesised and assumed to relate to destabilisation of the valley sides through agriculture [G2/3-4].

6: Return to relatively low-energy slope processes with fewer and smaller-sized flint gravels as a component. Initial stabilisation of valley slope profile or change in local landuse [G2/3].

7: Final stabilisation of valley side to current profile and modern agricultural activity [G2/2] and [G2/1].

Charcoal flecks and fire cracked flint within the basal colluvium and its main body suggest human activity was associated with the beginning of colluvial processes at the location or close by. The presence of ceramics within the basal colluvium suggest an Early Neolithic date for the beginning of this phase at the earliest, but much later dates are not precluded. It is likely that any post glacial woodland and associated soils, remained intact until the beginning of agriculture in the area. If there had been any substantial woodland clearance during the Mesolithic immediately adjacent to the valley sequence it is likely the fine sandy soils would have become very mobile and led to the development of an aceramic sandy colluvium, which we do not see. It is possible that the local sandy conditions gave rise to only light woodland from the beginning, allowing Mesolithic settlement to take place without substantial need for clearance.

Molluscs from the base of the main colluvial deposit (5) indicate a broadly open, occupied, environment from the start. However some shade specific species appear in the sequence at 140cm and 160cm suggesting the local presence of, or re-establishment of some woodland cover.

There is an absence of both chalk fragments and molluscs in the upper part of the colluvial above 1m depth. This is phenomena is likely to be controlled by decalcification, with either an original lack of chalk fragments in the matrix of the colluvial precluding the preservation of molluscs, or later decalcification through the percolation of rainwater enriched with carbonic acid from surface soils removing both the chalk and molluscs together. The upper colluvial deposit [G2/3] indicates a slower, lower-energy rate of colluviation which might have resulted from stabilisation of the valley sides through, for example, a switch from arable practises to grazing. The modern ploughsoil [G2/1] and [G2/2] is thought to date to the 20th century when sheep pasture on the South Downs around Brighton was once again brought under the plough.

THE FINDS

The Struck Flint by Hugo Anderson-Whymark

This report has been edited for publication. The full version is available online via the Archaeology Data Service (ADS).

Introduction and quantification

Although struck flint was hand collected during excavation, the occurrence of microliths and associated debitage also highlighted the need for sieving of the deposits. This was undertaken, using a 5mm mesh, by ASE staff and volunteers from the Brighton and Hove Archaeological Society. Approximately 50% of the soil removed from the large ring ditch, Structure 1, was sieved in this way.

In total, 7636 stuck lithic artefacts, 7 flint hammerstones and 1 imported quartzite pebble were recovered from the excavations (Table 3). In addition, 557 pieces of burnt unworked flint weighing 3.127 kg were recovered. The vast majority of these lithics date from the late Mesolithic and a significant proportion of the assemblage (2985 flints) was recovered from 15 contemporary pits groups (G1, G2, G3 and G4). A further 11 pits tentatively dated to the Mesolithic (G20) produced more limited assemblages (152 pieces in total).

Later archaeological features, including three probable Neolithic/Bronze Age ring ditches and associated features, incorporated a significant quantity of residual late Mesolithic flint, but 23 tools are considered to date from the Neolithic or Bronze Age and undoubtedly a small number of flakes and cores of this date range are also present. It was, however, not possible to distinguish the debitage with absolute confidence.

LITHICS TYPE	Period 1 Mesolithic	Period 1? Mesolithic?	Period 2 Neolithic/EBA	Period : Later Prehistoric	Post prehistoric /unphased	Total
DEBITAGE						
Flake	1755	88	1142	674	1086	4745
Blade	142	16	93	52	133	436
Bladelet	408	19	218	116	185	946
Blade-like	82	3	55	30	64	234
Irregular waste	17		18	8	7	50
Chip	100		54	9	18	181
Sieved chips 10-4 mm	128	10	50	8	79	275
Sieved chips 4-2 mm	182	3	62		24	271

LITHICS TYPE	Period 1 Mesolithic	Period 1? Mesolithic?	Period 2 Neolithic/EBA	Period : Later Prehistoric	Post prehistoric /unphased	Total
Rejuvenation flake core face/edge	4	1	1	1	3	10
Crested blade	8	1	4	5	7	25
Rejuvenation flake tablet	7		4		2	13
CORES						
Single platform blade core	6	2	2	5	12	27
Bipolar (opposed platform) blade core	5	1	2	2	7	17
Other blade core	2		3		2	7
Tested nodule/bashed lump	10	2	11	6	9	38
Single platform flake core	8	3	10	5	23	49
Multiplatform flake core	15	1	7	6	19	48
Keeled non-discoidal flake core	1					1
Flake core on a flake	4		5	2	10	21
Unclassifiable/fragmentary core	2		1	1	1	5
Micro-burin	40		17	3	17	77
Burin spall	1		1			2
Tranchet axe sharpening flake	3		1		4	8
Thinning flake					1	1
TOOLS						
Microlith	18	1	11	7	6	43
Unfinished microlith	5		5	1	3	14
Backed blade			1			1
Truncated flake	9	1	7		3	20
Burin	2			1		3
Chisel arrowhead					1*	1
Laurel leaf					1*	1
End scraper	4		2*	1+2*	3+2*	14

LITHICS TYPE	Period 1 Mesolithic	Period 1? Mesolithic?	Period 2 Neolithic/EBA	Period : Later Prehistoric	Post prehistoric /unphased	Total
End scraper on blade	1			1		2
Side scraper				1*		1
End and side scraper				2*	1*	3
Disc scraper			1*			1
Denticulated Scraper					1*	1
Scraper on a non-flake blank			1*			1
Piercer	1		1			2
Notched piercer	2		2	4	2	10
Spurred piece			1*			1
Serrated flake			1*			1
Denticulate			1*			1
Notch/Notched tool	1		1*		1*	3
Other knife	1				1*	2
Retouched flake	5		3+1*	1	2	12
Misc. retouch			1*			1
Unfinished core tool	3		1	1	2	7
Tranchet axe	2				1	3
Hammerstone	1			3	3	7
Imported Stone					1	1
Grand Total	2985	152	1802	958	1747	7644

* Artefacts considered to date from the Neolithic or Bronze Age. Note flake debitage cannot be accurate divided, but little appears to be of Neolithic or Bronze Age date.

Table 3: The lithic assemblage by stratigraphic phase and artefact/debitage type

Methodology

The flint assemblage was recorded onto a Microsoft Access database using standard morphological and typological descriptions (Jacobi 1978; Bamford 1985, 72-77; Healy 1988, 48-49; Bradley 1999, 211-227; Butler 2005).

Raw materials

The raw material for the struck lithics was flint available from the local landscape. The majority of the flint was light to mid mottled grey and the cortex, where present, was typically 2-4mm thick and buff coloured with a slightly weathered surface. This material is available from the surface of the chalk downs and the local tertiary deposits. A small number of flints exhibited more extensively abraded and pitted cortical surfaces indicating that the raw material was obtained from a fluvial source, such as gravels. In addition, fourteen pieces of Bullhead Bed flint, which exhibits an olive green cortex with an underlying orange band, were recovered; this flint was probably obtained from local tertiary deposits. Thermal flaws and thermally fractured surfaces were observed on many of the lithics but these only significantly hindered the knapping of larger core tools. Overall the raw material was of good flaking quality and reasonably substantial flint nodules were readily available.

Condition

The majority of the lithic assemblage recovered from archaeological features was in fresh condition. In contrast, artefacts from the topsoil exhibited extensive edge-damage that probably results from ploughing and soil movement. The majority of artefacts exhibited a light to moderate bluish-white surface cortication, but a small number of flints, including several of the Neolithic and Bronze Age artefacts, were entirely free from cortication.

Possible Late Upper Palaeolithic or early Mesolithic lithics

Three blades measure over 100 mm in length and these are considerably larger than the other blades and flakes in the assemblage (see Fig. 15, no. 65-66). Superficially, these blades are comparable to Late Upper Palaeolithic long blades, but their mode of production from single-platform cores is not entirely consistent with this early industry as long blades are typically struck from opposed platform cores, with blades removed alternately from each end. These blades are therefore more consistent with early Mesolithic reduction techniques, although dating can only be tentative and it is possible that these flakes are unusually large late Mesolithic products.

The late Mesolithic lithic assemblage

Tools and debitage from tool manufacture

Tools form 1.5% of the Mesolithic assemblage and 1.4% of the total assemblage; the latter percentage excludes artefacts considered to date from the Neolithic or Bronze Age. These artefacts are dominated by microliths (Fig 14, nos 1-44), truncated flakes and piercers (Fig 15, nos 45-51), but small numbers of edge-retouched flakes, scrapers, burins and tranchet axes were also found and single examples of a notched tool and knife were recovered (Fig 15, nos 52-60 and Fig 16, nos 61-64). Debitage from the manufacture of tools forms 1.7% of the Mesolithic assemblage and 1.4% of the total assemblage. This debitage comprises micro-burins, unfinished microliths, unfinished core tools, burin spalls, tranchet axe sharpening flakes, and a thinning flake. Blade cores include single platform (Fig. 16, nos 67-69) and opposed platform forms (Fig.16, nos 70-71), but the former are most numerous.

Distribution

The Mesolithic lithics were predominately recovered from the south-east corner of Area A. In total fifteen pits in five groups (G1-G5) are confidently dated to the Mesolithic and a further 11 pits are tentatively dated to the Mesolithic (G20). In total, 2985 flints were recovered from the Mesolithic features and a further 152 flints were recovered from the features tentatively phased to the Mesolithic; these features yielded 41% of the lithic assemblage from the site (Tables 4 and 5). Fourteen of the securely dated pits, in four clusters (groups G1-G4), were located within a very discrete area c 25 m in diameter and the later archaeological features in this area yielded the majority of the residual Mesolithic flint. The residual flintwork probably indicates that a substantial surface scatter also existed in this area, although some of the residual flint in Structure 1 may result from the truncation of the Mesolithic pits in pit group G3.

	G1			*G 1*	G2				G3						G4				G5	
CATEGORY TYPE (cut no.)	**222**	**261**	**298**	***Total***	**127**	**133**	**163**	***G2 Total***	**238**	**242**	**254**	**397**	**413**	***G3 Total***	**171**	**173**	**175**	***G4 Total***	**381**	**Grand Total**
Debitage																				
Flake	202	131	138	*471*	92	185	287	*564*	110	62	124	82	211	*589*	57	7	65	*129*	2	1755
Blade	19	8	8	*35*	11	15	19	*45*	9	7	9	7	13	*45*	6	2	9	*17*		142
Bladelet	48	25	27	*100*	30	37	91	*158*	17	5	23	28	30	*103*	16	1	30	*47*		408
Blade-like	13	7	5	*25*	7	5	13	*25*	4	2	6	4	5	*21*	2	1	8	*11*		82
Irregular waste	3	3	1	*7*		4	1	*5*	1				1	*2*			3	*3*		17
Chip	6	10	6	*22*		12	48	*60*	2		1	1	12	*16*	2			*2*		100
Sieved chips 10-4 mm	30	8	2	*40*	5	49	26	*80*	8					*8*						128
Sieved chips 4-2 mm		9	3	*12*	9	67	17	*93*	9				48	*57*			20	*20*		182
Rejuvenation flake core face/edge						1	1	*2*			2			*2*						4
Crested blade			1	*1*		1	1	*2*	3				2	*5*						8
Rejuvenation flake tablet		2		*2*			1	*1*		1			3	*4*						7
Cores																				
Single platform blade core	1	1		*2*		1	2	*3*								1		*1*		6
Bipolar (opposed platform) blade core	2	1		*3*			1	*1*					1	*1*						5
Other blade core			1	*1*								1		*1*						2
Tested nodule/bashed lump	1	3	2	*6*		1		*1*				1	1	*2*		1		*1*		10
Single platform flake core		1		*1*	1	2	2	*5*	1		1			*2*						8
Multiplatform flake core	1	1		*2*	1	4	2	*7*	3		1			*4*	1	1		*2*		15
Keeled non-discoidal flake core																	1	*1*		1
Core on a flake	1	2		*3*		1		*1*												4
Unclassifiable/fragmentary core							1	*1*									1	*1*		2

	G1			G 1	G2				G3						G4				G5	
CATEGORY TYPE (cut no.)	**222**	**261**	**298**	***Total***	**127**	**133**	**163**	***G2 Total***	**238**	**242**	**254**	**397**	**413**	***G3 Total***	**171**	**173**	**175**	***G4 Total***	**381**	**Grand Total**
Micro-burin	1	4		*5*	2	3	10	*15*	1	1	1	5	5	*13*	3		4	*7*		40
Burin spall						1		*1*												1
Tools																				
Microlith			1	*1*	2	2	6	*10*		1	1		4	*6*			1	*1*		18
Unfinished microlith											1	1	3	*5*						5
Truncated flake	1			*1*	1	2	1	*4*		1	1		1	*3*			1	*1*		9
Burin							1	*1*					1	*1*						2
End scraper		1	1	*2*							1			*1*			1	*1*		4
End scraper on blade													1	*1*						1
Piercer	1			*1*																1
Notched piercer	1			*1*																1
Other borer															1			*1*		1
Notch															1			*1*		1
Other knife						1		*1*												1
Retouched flake			1	*1*							1	2	1	*4*						5
Unfinished core tool						1		*1*				1		*1*	1			*1*		3
Tranchet axe							1	*1*											1	2
Tranchet axe sharpening flake							2	*2*									1	*1*		3
Hammerstone											1			*1*						1
Grand total	331	217	197	*745*	161	395	534	*1090*	168	80	174	133	343	*898*	90	14	145	*249*	3	2985

Table 4: The lithic assemblage from the Mesolithic phase by group and feature

	Mesolithic? features G20											
CATEGORY TYPE (cut no.)	**161**	**169**	**227**	**367**	**447**	**453**	**455**	**463**	**499**	**501**	**503**	**Grand Total**
Flake	5	29	5	1	5	13	5	19	3	2	1	88
Blade		3	1	2	4	2	1	3				16
Bladelet	2	4		1	1	1		10				19
Blade-like		1			2							3
Sieved chips 10-4 mm		10										10
Sieved chips 4-2 mm											3	3
Rejuvenation flake core face/edge						1						1
Crested blade					1							1
Single platform blade core		1				1						2
Bipolar (opposed platform) blade core		1										1
Tested nodule/bashed lump					1				1			2
Single platform flake core	1							1			1	3
Multiplatform flake core		1										1
Microlith (isosceles triangle)						1						1
Truncated flake								1				1
Grand total	8	50	6	4	14	19	6	34	4	2	5	152

Table 5: Lithics from Mesolithic? phase (G20) by feature

Composition of stratified assemblages and site function

The composition of the flint assemblages from Mesolithic and possibly Mesolithic features are shown by pit and feature group (Tables 4 and 5). The overall size of these assemblages is variable, but the majority of pits in groups G1-G4 yielded assemblages of 100-300 flints and pit [163] yielded the largest assemblage of 534 flints. In general, the composition of each pit is relatively similar with comparable proportions of flakes, cores and tools (Tables 4 and 5). The proportion of burning and breakage are also relatively consistent between the features and on average 7.4% of artefacts were burnt and 35.1% were broken (Table 6). This indicates that each pit deposit probably results from a broad range of activities, rather than one specific task, and the high proportion of burning indicates that activities may have been undertaken close to fires. The quantity of lithics from each pit is, however, comparatively small, potentially indicating that each event that created a pit assemblage was of short duration.

	G1	**G2**	**G3**	**G4**	**G5**	**G20**	**Grand Total**
No. of burnt worked flints (%*)	66 (9.8%)	61 (7.1%)	51 (6.2%)	23 (10.1%)	-	1 (0.7%)	202 (7.4%)
No. of broken worked flints (%*)	266 (39.6%)	302 (35.2%)	272 (33.3%)	85 (37.4%)	-	27 (19.4%)	952 (35.1%)

* Percentage of total assemblage excluding chips

Table 6: Burnt and broken worked flints in the Mesolithic/Mesolithic? feature groups (G1-G5 and G20)

Flint knapping was a particularly prominent activity on this site and tasks undertaken included the preparation and working of cores for blades and flakes, and the production of various tools including tranchet axes, microliths and burins. Indeed, more tranchet axes and microliths were manufactured at this location than were deposited. On the site as a whole, ten tranchet axes and core tools were found, but only one has the appearance of a finished artefact; a further eight tranchet axe sharpening flakes further also attest to the production of these tools. It is also notable that micro-burins, the debitage from manufacturing many forms of microlith, outnumber finished microliths in the Mesolithic features at a ratio of 2:1. The tools being produced at this location were therefore predominately being used and lost or discarded elsewhere, although given the fairly limited excavation areas, this may be nearby.

As previously noted the assemblage of finished retouched artefacts is comparatively limited, comprising only 1% and 2.6% of the assemblage in each pit group, excluding chips. Overall, the retouched component of the assemblage is dominated by microliths and truncated blades, with low proportions of scrapers, core tools, piercers, burins and other tools (Table 7). The dominance of microliths, which are thought to represent component parts of composite tools such as projectiles, may indicate an emphasis on hunting. However, considering the evidence for microlith production, it is most probable that the microliths recovered result from the maintenance of composite tools that were damaged when hunting at another location. The low proportion of scrapers indicates that hides were probably not prepared at this location and the presence of a single finished tranchet axe and the absence of serrated flakes indicate little plant working.

	G1	G2	G3	G4	G5	G20	Total

	G1		G2		G3		G4		G5		G20		Total	
Retouched tool type	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Microliths	1	14.3	10	55.6	6	35.3	1	16.7			1	50.0	19	37.3
Truncated flakes	1	14.3	4	22.2	3	17.6	1	16.7			1	50.0	10	19.6
Scrapers	2	28.6			2	11.8	1	16.7					5	9.8
Core tools (inc. Unfinished tools)			2	11.1	1	5.9	1	16.7	1	100			5	9.8
Piercing tools	2	28.6					1	16.7					3	5.9
Burins			1	5.6	1	5.9							2	3.9
Other tools (edge retouch, notch, knife)	1	14.3	1	5.6	4	23.5	1	16.7					7	13.7
Total tools	7	100	18	100	17	100	6	100	1	100	2	100	51	100

Table 7: Comparison of the key tools groups in the Mesolithic/Mesolithic? feature groups (G1-G5 and G20)

There are, however, subtle differences in the retouched assemblages from individual pits and pit groups that are potentially of great significance for dating the site and interpreting temporal patterns of activity. Firstly, the retouched tools present in pit groups G1-G4 differ, but the artefacts from each pit within a group are broadly comparable. Pit groups G1 and G4 yielded a broad range of artefacts and no particular tool type was dominant. In contrast, pit groups G2 and G3 contain elevated proportions of microliths, but the microliths from each group are of different forms. Group G2 is dominated by obliquely blunted points and scalene micro-triangles, with the only other forms comprising a rod and a bi-truncated rhombic point, while Group G3 is dominated by rods and convex-backed points, with the only other microlith type being an edge blunted form comparable to a rod (Table 8). Groups G1 and G4 each yielded only one microlith: group G1 contained a convex-backed point comparable to those from the adjacent pits in group G3 and group G4 yielded a scalene micro-triangle comparable to those from the adjacent pits in group G2.

	Mesolithic	**Mesolithic?**	

		G1	G2			G3			G4	G20	Grand Total
CATEGORY TYPE	**Jacobi code**	**298**	**127**	**133**	**163**	**242**	**254**	**413**	**175**	**453**	
Edge-blunted point	-							1			1
Obliquely-blunted point	1a		1	1	1						3
Isosceles triangle	2a									1	1
Bi-truncated rhombic point	3a				1						1
Convex backed point	4	1				1		1			3
Rod	5				1		1	1			3
	6							1			1
Scalene micro-triangle	7a1			1					1		2
	7a2		1		3						4
Grand total		1	2	2	6	1	1	4	1	1	19

Table 8: Microliths from the Mesolithic/Mesolithic? phase features

The microlith forms in groups G1 and G3 to the north of the main cluster are therefore distinctly different from those in groups G2 and G4 to the south of the site. This difference may result from the maintenance of different types of composite tools, but equally it may reflect chronological changes in microlith typology. This point will be returned to in relation to the programme of radiocarbon dating, but whichever the case, the difference in the range of retouched tools between pit groups G1/G4 and G2/G3, and the combined with presence of different microlith types between pit groups G1/G3 and G2/G4 indicates that each of these four pit groups has its own character. This indicates that each cluster of pits is the product of spatially and/or chronologically discrete activity. This observation is of great significance as it allows speculation over the temporality and duration of occupation on the site (cf. Garrow 2006).

As noted above, the individual pits yielded comparatively limited assemblages and this may indicate that each represents a brief occupation event. It is however unclear if the pits within each group were excavated sequentially or if the pits were open and being filled at the same time. If the pits were excavated sequentially it is possible to envisage a pit group developing as one group occupy the site on one or more occasions. If, however, the pits within a single group were open at the same time we may envisage the contents of each pit being generated by different groups occupying the site at the same time (e.g. 3-5 pits may represent 3-5 population groups) as the comparable assemblages from the pits within each group certainly do not indicate that the features had different functions. These scenarios can be further expanded to consider the relationship of the four pit groups. Each pit cluster could result from successive occupation events by one or more groups of people, or the four clusters could represent four groups occupying the site at the same time with each group periodically excavating pits. Various permeations and combinations of these arrangements are also possible.

Radiocarbon dating

The radiocarbon dating only partially assists with interpreting the temporal patterns of occupation. The dates reveal that two dated pits from the southern pit groups G2 and G4 are broadly contemporary, dating from c 6420-6200 BC, although the individual features may have been excavated many decades apart. However, the date from the ring ditch provides evidence for later activity on site. This date cannot be directly associated with pit group G3 and the date of the northern pit groups G1 and G3 associated with rods and convex backed points must remain open. The later date does however indicate that the Late Mesolithic activity was potentially of some duration, allowing the possibility that all of the pit groups were developing contemporaneously to be discounted.

The Neolithic and Bronze Age lithic assemblage

Neolithic and Bronze Age lithics were comparatively scarce and the lithic assemblages recovered from the Neolithic and Bronze Age features were dominated by residual Mesolithic artefacts.

Neolithic to Bronze Age retouched tools were more readily identifiable on typological and technological grounds and 23 artefacts are considered to date from these periods. Neolithic/Bronze Age ring ditch Structure 1 yielded nine artefacts that may be broadly contemporary with the feature: two end scrapers (see Fig 17, no. 73), a disc scraper (Fig 17, no. 74), a spurred piece, a serrated flake, a denticulate, a notched tool, an edge retouched flake and a piece of miscellaneous retouch), while the internal ring ditch features G7 yielded one further tool (a scraper on a non-flake blank). These artefacts were typically manufactured on broader and thicker flakes than were present in the Mesolithic assemblage and many of the artefact types are not present in the Mesolithic phase features. Two artefacts from ring ditch Structure 1 are of particular note: a pressure flaked end scraper probably dating from the late Neolithic/early Bronze Age and a large well manufactured disc scraper dating from the Neolithic/early Bronze Age.

The remaining Neolithic and Bronze Age artefacts were recovered as unstratified finds. The most diagnostic artefacts are a small early Neolithic laurel leaf type point recovered from the topsoil (Fig 17, no. 72); a middle Neolithic chisel arrowhead recovered from layer [469]; a fragment of a Neolithic/early Bronze Age knife from pit [471]; and, a Neolithic or Bronze Age denticulated end scraper with seven 3 mm long teeth spaced at 10 mm intervals, recovered from the surface of the natural ([101]).

These flints provide some evidence for Neolithic and Bronze Age activity in the landscape, with a slight focus on ring ditch Structure 1, but the assemblage is limited and provides little insight into the character of later prehistoric activity**.**

Illustration catalogue

1. Edge-blunted point with slight break to tip. Pit [413], fill [414]. SF23. Phase 1, G3. Late Mesolithic.
2. Obliquely-blunted point, Jacobi 1a, with slight break to tip. Pit [127], fill [128]. SF42. Period 1, G2. Late Mesolithic.
3. Obliquely-blunted point, Jacobi 1a. Pit [133], fill [135]. SF27. Period 1, G2. Late Mesolithic.
4. Obliquely-blunted point, Jacobi 1a. Pit [163], fill [164]. SF3. Period 1, G2. Late Mesolithic.
5. Obliquely-blunted point, Jacobi 1a, burnt and broken medial fragment. Ditch [230], fill [231]. SF33. Period 2, G6. Late Mesolithic.
6. Obliquely-blunted point, Jacobi 1a. Pit [341], fill [347]. SF25. Period 3, G11. Late Mesolithic.
7. Isosceles triangle, Jacobi 2a, with slight damage to tip. Pit [453], fill [454]. SF56. Period 6, G20. Late Mesolithic.
8. Bi-truncated rhombic point, Jacobi 3a, with broken distal end. Pit [163], fill [164]. SF38. Period 1, G2. Late Mesolithic.
9. Large convex-backed point, Jacobi 3d. Ditch [131], fill [130]. SF1. Period 2, G6. Late Mesolithic.
10. Convex-backed point, Jacobi 4, broken. Pit [242], fill [243]. SF22. Period 1, G3. Late Mesolithic.
11. Convex-backed point, Jacobi 4. Pit [298], fill [299]. SF26. Period 1, G1. Late Mesolithic.
12. Convex-backed point, Jacobi 4. Pit [413], fill [414]. SF35. Period 1, G3. Late Mesolithic.
13. Convex-backed point, Jacobi 4 variant. Pit [341], fill [348]. SF19. Period 3, G11. Late Mesolithic.
14. Convex-backed point, Jacobi 4 variant. Layer [395]. SF31. Period 3, G13. Late Mesolithic.
15. Rod, Jacobi 5. Pit [163], fill [164]. SF40. Period 1, G2. Late Mesolithic.
16. Rod, Jacobi 5. Pit [254], fill [255]. SF24. Period 1, G3. Late Mesolithic.
17. Rod, Jacobi 5, broken. Pit [285], fill [286]. SF30. Period 3, G11. Late Mesolithic.
18. Rod, Jacobi 5, broken. Pit [285], fill [286]. SF29. Period 3, G11. Late Mesolithic.
19. Rod, Jacobi 5. Pit [440], fill [437]. SF52. Period 3, G 11. Late Mesolithic.
20. Rod, Jacobi 5c?, broken. Ditch [233], fill [234]. SF18. Period 2, G6. Late Mesolithic.

21. Rod, Jacobi 6, broken. Pit [413], fill [414]. SF49. Period 1, G3. Late Mesolithic.

22. Rod, Jacobi 6, broken. Pit [155], fill [156]. SF13. Period 2, G6. Late Mesolithic.

23. Rod, Jacobi 6, oblique break creates resemblance to Jacobi 7a2. Ditch [181], fill [182]. SF8. Period 2, G6. Late Mesolithic.

24. Rod, Jacobi 6, oblique proximal and distal breaks, both prior to retouch. Ditch [183], fill [184]. SF45. Period 2, G6. Late Mesolithic.

25. Rod, Jacobi 6, with slight distal break. Pit [413], fill [414]. SF20. Period 1, G3. Late Mesolithic.

26. Rod, Jacobi 6 or elongated 7a2 scalene micro-triangle. Pit [440], fill [437]. SF6. Period 5, G17. Late Mesolithic.

27. Scalene micro-triangle, Jacobi 7a1. Pit [133], fill [135]. SF44. Period 1, G2. Late Mesolithic.

28. Scalene micro-triangle, Jacobi 7a1. Proximal end snapped without using micro-burin technique. Pit [175], fill [176]. SF10. Period 1, G4. Late Mesolithic.

29. Scalene micro-triangle, Jacobi 7a1, backing retouch is relatively crude. Pit [273], fill [274]. SF54. Period 3, G12. Late Mesolithic.

30. Scalene micro-triangle, Jacobi 7a2, note distal point and incomplete retouch on blade edge. Pit [127], fill [128]. SF41. Period 1, G2. Late Mesolithic.

31. Scalene micro-triangle, Jacobi 7a2 variant with squared basal retouch. Ditch [230], fill [231]. SF7. Period 2, G6. Late Mesolithic.

32. Scalene micro-triangle, Jacobi 7a2. Ditch [131], fill [129]. SF46. Period 2, G6. Late Mesolithic.

33. Scalene micro-triangle, Jacobi 7a2. Ditch [131], fill [130]. SF43. Period 2, G6. Late Mesolithic.

34. Scalene micro-triangle, Jacobi 7a2. Pit [163], fill [164]. SF4. Period 1, G2. Late Mesolithic.

35. Scalene micro-triangle, Jacobi 7a2, elongated form with slightly concave edge. Pit [163], fill [164]. SF39. Period 1, G2. Late Mesolithic.

36. Scalene micro-triangle, Jacobi 7a2, elongated form with concave edge. Pit [163], fill [164]. SF37. Period 1, G2. Late Mesolithic.

37. Scalene micro-triangle, Jacobi 7a2, elongated form with slightly concave edge. Pit [400], fill [272]. SF12. Period 5, G17. Late Mesolithic.

38. Scalene micro-triangle, Jacobi 7a2, burnt and broken. Pit [440], fill [437]. SF12. Period 5, G17. Late Mesolithic.

39. Scalene micro-triangle, Jacobi 7a2 variant without backing retouch. Ditch [302], fill [301]. SF47. Period 2, G6. Late Mesolithic.

40. Scalene micro-triangle, Jacobi 7a2 variant without backing retouch. Pit [440], fill [347]. SF5. Period 5, G17. Late Mesolithic.
41. Micro-lunate, Jacobi 9. Pit [257], fill [258]. SF14. Period 4, G15. Late Mesolithic.
42. Unclassified microlith. Ditch [233], fill [234]. SF17. Period 2, G6. Late Mesolithic.
43. Unclassified broken microlith, possibly a Jacobi 5 rod or 1a obliquely blunted point. Pit [341], fill [342]. SF99. Period 3, G 11. Late Mesolithic.
44. Backed bladelet comparable to Jacobi type 5 rod. Ditch [213], fill [214]. Period 2, G6. Late Mesolithic.
45. Obliquely truncated flake; truncated to left hand side. Pit [222], fill [223]. SF80. Period 1, G1. Late Mesolithic.
46. Obliquely truncated flake; truncated to left hand side. Pit [242], fill [243]. SF69. Period 1, G3. Late Mesolithic.
47. Bi-truncated flake with distal concave truncation to left hand side and a straight proximal truncation. Ditch [213], fill [217]. SF122. Period 2, G6. Late Mesolithic.
48. Obliquely truncated flake; convex truncation to left hand side with limited retouch on ventral distal right hand side. Comparable to piercers. Pit [133], fill [135]. SF124. Period 1, G2. Late Mesolithic.
49. Notched piercer. Pit [115], fill [116]. SF85. Period 3, G11. Late Mesolithic.
50. Notched piercer. Pit [222], fill [223]. SF78. Period 1, G1. Late Mesolithic.
51. Notched piercer. Pit [271], fill [406]. SF36. Period 6, G21. Late Mesolithic.
52. Edge-retouched flake snapped into a wedge-shaped segment. Pit [397], fill [396]. SF127. Period 1, G3. Late Mesolithic.
53. Broken blade with edge-retouch along right hand side. Pit [397], fill [396]. SF126. Period 1, G3. Late Mesolithic.
54. Double-ended burin with truncated ends manufactured on a crested blade. Pit [163], fill [164]. SF111. Period 1, G2. Late Mesolithic.
55. Burin on a blade, note the notch to terminate burin blow on right hand side. Pit [285], fill [287]. SF75. Period 3, G11. Late Mesolithic.
56. End scraper on a flake. Pit [261], fill [262]. SF92. Period 1, G1. Late Mesolithic.
57. End scraper on a flake. Pit [298], fill [299]. SF106. Period 1, G1. Late Mesolithic.
58. End scraper on a blade with notched side. Pit [413], fill [414]. SF113. Period 1, G3. Late Mesolithic.
59. Notched tool. Pit [171], fill [17]2. SF90. Period 1, G4. Late Mesolithic.
60. Knife? Pit [133], fill [135]. SF81. Period 1, G2. Late Mesolithic.
61. Tranchet axe sharpening flake. Pit [163], fill [164]. Period 1, G2. Late Mesolithic.
62. Tranchet axe, possibly unfinished. Pit [163], fill [164]. Period 1, G2. Late Mesolithic.
63. Tranchet axe, broken. Surface of site [123]. SF60. Late Mesolithic.

64. Unfinished core tool weighing 390 g. Pit [397], fill [396]. SF137. Period 1, G3. Late Mesolithic.

65. Blade. Unusually large for the assemblage. Pit [261], fill [262]. Period 1, G3. Contained within a Late Mesolithic feature, but possibly Late Upper Palaeolithic or early Mesolithic.

66. Blade. Unusually large for the assemblage. Pit [220], fill [218]. Unphased. Possibly Late Upper Palaeolithic or early Mesolithic.

67. Single platform blade core weighing 33 g. Pit [133], fill [135]. Period 1, G2. Late Mesolithic.

68. Single platform blade core weighing 33 g. Pit [115], fill [116]. SF87. Period 3, G11. Late Mesolithic.

69. Single platform blade core weighing 55 g. Pit [163], fill [164]. Period 1, G2. Late Mesolithic.

70. Opposed platform blade core weighing 41 g. Pit [163], fill [164]. Period 1, G2. Late Mesolithic.

71. Opposed platform blade core weighing 24 g. Pit [222], fill [223]. Period 1, G1. Late Mesolithic.

72. Laurel leaf. Topsoil [13/001]. Early Neolithic.

73. End scraper with pressure flaked retouch, proximal break. Ditch [213], fill [216]. SF112. Period 2, G6. Late Neolithic/early Bronze Age.

74. Disc scraper. Ditch [131], fill [129]. SF104. Period 2, G6. Neolithic/early Bronze Age.

DISCUSSION

Period 1: The Mesolithic occupation: pits and flint production by Nick Garland

Late Mesolithic Sussex is relatively poorly understood and the excavations at the site of the American Express Community Stadium are therefore an important addition to our knowledge of this period.

Mesolithic pits have been described as the one of the 'earliest signs of deliberate human intervention in the ground' (Morigi *et al.* 2011, 215). As examined above, the microlith forms in the pits assemblages are subtly different, giving each of the four pit groups a distinctive character and indicating that each cluster of pits is the product of spatially and/or chronologically discrete activities. Pit groups G1 and G3 to the north of the flint-working area had some similarities in the composition of their flint assemblage as did groups G2 and G4 to the south. The latter two groups each produced one radiocarbon date in the third quarter of the 7th millennium BC. These pits could therefore have been dug more or less contemporaneously or over some decades. Although groups G1 and G3 did not produce any material suitable for radiocarbon dating, a date on hazelnut shell recovered from a nearby feature, which cut G3, produced a statistically later date in the final quarter of the 7th millennium. This provides limited evidence that the differences in the flint assemblages from the northern and southern groups of pits could be at least partly chronologically determined. It also gives a good indication that the site as a whole was characterised by a long period of intermittent short term occupation and reoccupation during the Late Mesolithic.

The function of these features is difficult to determine. The pits are characterised by a single fill, possibly a rapid, deliberate backfilling or fast silting; there is little evidence to

differentiate between the two. Pits from this period are particularly rare in Sussex but were once suggested to represent ‘pit dwellings’, now an outdated term and concept, or areas of flint working (Holgate 2003, 34-5). Exactly how these types of features were used for such activities is uncertain. It may be more useful to consider their social or cultural significance. Recent analysis suggests such pits may have been cut and filled in a fairly short period of time and may facilitate the deliberate deposition of material into the ground, examples being put forward in the Thames Valley area (Morigi *et al*. 2011, 215). This links with a growing body of evidence, including ethnographic sources, that suggest ‘ritual, magic and superstition would have pervaded Mesolithic life’ (ibid), the implication being that the flintwork was placed into these features purposefully.

The pit groups (G1-G4) appeared to define an open, circular space. This area was devoid of Mesolithic features; however, it potentially defines a substantial surface scatter of flint, as indicated by the large assemblage of Mesolithic flintwork recovered as residual material from the fills of Structure 1. The South Downs are thought to have been occupied by mixed deciduous woodland in this period (Holgate 2003, 35) forming as part of the original post-glacial clay-rich Brownearth soils, which would have developed across much of the chalkands. The local occurrence of Tertiary sands underlying the site is significant; they would have given rise to different vegetation communities and lighter forest cover. This light woodland would potentially have been easier to clear than the surrounding Downland cover, and less likely to re-establish itself. Activities ranging from deforestation by human groups to long term animal grazing could have led to the formation of a clearing at the site (Morigi *et al*. 2011, 218). Potentially then, this was always an area of sparse woodland cover or open ground, attractive to Mesolithic occupation and defined by pit groups around its edges leaving an open space in the centre.

Regional context by Hugo Anderson-Whymark

Rod and scalene micro-triangle dominated assemblages are comparatively common in Britain, but few assemblages are securely dated. The dates of 6420-6200 BC and 6400-6200 BC, obtained from pits [133] and [175] respectively, represent the earliest secure dates for scalene micro-triangles in southern Britain. This microlith type, however, endures for a long period of time and its use potentially spans the greater part of the late Mesolithic. The recent excavation of seven pits containing scalene micro-triangles and an obliquely blunted point on the M1 motorway widening at Junction 9 provided a series of dates that have been modelled at 5220-5060 cal BC (68.2% probability; Griffiths and Stansbie in prep), but latest secure dates for scalene micro-triangles have been obtained from March Hill Carr in the Pennines: the dates from this site have been modelled at 4710-4610 BC (68.2% probability; Ibid).

A number of sites in the more immediate landscape have yielded artefact assemblages comparable to those from the American Express Community Stadium, but unfortunately the radiocarbon dates obtained from these sites are all problematic. At Broom Hill, Braishfield, Hampshire a remarkably similar artefact assemblage was recovered, but unfortunately this site has not been fully published and only a summary interim report is available (O'Malley and Jacobi 1978). The range of retouched tools includes obliquely blunted points, rods, scalene micro-triangles (including elongated forms), convex backed points, notched piercers (micro-awls) and tranchet axes. A large proportion of the assemblage from this site was also recovered from a series of pits. Pit 3, was 'dominated by scalene micro-triangles and narrow rods' (O'Malley and Jacobi 1978, 35) and three dates were obtained on samples of unspecified charcoal from the base of the feature. These dates

overlap in the middle of the 7th Millennium BC: 6365±150 BP (5620-4990 BC at 95.4% confidence), 6565±150 BP (5760-5210 BC at 95.4% confidence) and 6590±150 BP (5800-5220 BC at 95.4% confidence; Ibid. 37). The upper fill of the Pit 3 yielded a later date on hazelnut shells of 5880±120 BP (5050-4460 BC at 95.4% confidence), but this date may relate to later activity. Although problematic (e.g. there is potential for an 'old wood' effect), the dates from Broom Hill indicate the site is at least c 500 years later than those found on the site of the American Express Community Stadium and potentially of considerably later date. This indicates that the retouched artefacts from the stadium excavations may not represent closely datable forms.

A comparable artefact assemblage was also recovered from the rock shelter at High Hurstwood, Sussex (Jacobi and Tebbutt 1981). Notably, the range of microliths from this site includes a high proportion of lanceolate/convex backed points that are comparable to the examples from the northern Pit Groups 1 and 3 from the American Express Community Stadium, and although scalene micro-triangles are also present they are significantly outnumbered. The assemblage also contains a high proportion of truncated blades and few scrapers. Three radiocarbon dates were obtained on charcoal from the High Hurstwood cave shelter: Spit B 6800± 100 BP (Q-1311) – 5970-5520 BC at 95.4% confidence; Spit C 6920± 110 BP (Q-1312) – 6010-5630 BC at 95.4% confidence; Spit D 7105± 70BP (Q-1562) – 6210-5800 BC at 95.4% confidence

These dates are again problematic due to the unspecified charcoal that was dated. The High Hurstwood dates, however, appear to be marginally later than those obtained from the obliquely blunted point/scalene micro-triangle associated pits found during the stadium excavations. It is, however, not possible to determine on the current evidence if the elevated proportions of lanceolate/convex backed points forms in this assemblage or the northern pit

Groups G1 and G3 at Falmer represents a chronological change in the microlith industry or variation due to the specific range of activities and tools used at these locations.

LR added needs integrating: At Redhill, the 771 fragments of later Mesolithic flintwork remains undated and residual in context (Barber & Bennell 2002, 101).

Flint production and the surrounding landscape

While evidence for this period is sparse in the adjacent area, there is still enough data to provide an interpretation as to how this site related to the surrounding landscape in the Mesolithic period. As discussed above, the pits provide evidence for flint manufacture that may indicate an emphasis on hunting, shown by the dominance of microlith production. The lithic evidence also suggests alteration and construction of tools that do not appear within the assemblage as a whole and suggests their use and discard elsewhere. Finally the limitation of tool types suggests there was little hide preparation, because of the low proportion of scrapers and little plant working due to the presence of only a single finished tranchet axe and the absence of serrated flakes. All of this evidence points to a highly mobile population for whom the site at the American Express Community Stadium was just one of many occupied locations. Holgate has suggested that studies of Mesolithic sites in Europe show evidence for sedentary occupation of areas near the coastline, due to the abundance of resources, with specific tasks taking place further afield (2003, 35). The American Express Community Stadium site, therefore, appears to be a clearing where flint production took place in the preparation for nearby hunting activities in the densely forested areas of the South Downs. As demonstrated above, the pit groups represent different events over a few hundred years period, with repeated visits probably within each season of activity.

The importance of this location is apparent almost certainly as a part of a larger network of movement in the Mesolithic, but also potentially as a 'special' position in the landscape, defined by a clearing in the woods. The unoccupied circular area does have a parallel with the establishment of the circular ring ditches in the same location in the Late Neolithic / Early Bronze Age for a ritual purpose and potentially indicates the beginning of an important focal point in the landscape.

Neolithic/Bronze Age

Period 2: The ring ditches: Structures 1, 2 and 3 by Nick Garland

Dating and Interpretation

The dating evidence derived from Structure 1 is complex and challenging to interpret, while the related features Structure 2 and Structure 3 are completely undated. Despite this, the available evidence suggests that a Neolithic or Bronze Age date is considered most likely.

Two OSL dates recovered from upper fills span the Middle Neolithic to Middle Bronze Age. The latest date in the earlier of the two OSL determinations may provide a reliable *terminus ante quem* for the deposition the upper fill, (1652 BC: at the start of the Middle Bronze Age). However, as this date is only cited with 68% confidence, it seems possible that the final filling happened later, particularly as the other OSL date allows for a date of deposition as late as 1293 BC. A number of flint tool types of Neolithic to Early Bronze Age date were also recovered from the fills of Structure 1 and an upper fill also produced a few sherds of pottery of probable Late Bronze Age date.

Morphologically, ring-ditches are an unknown feature type in the Mesolithic occupation of Southern Britain and, on the grounds that the feature cut though Mesolithic deposits, the hazelnut shell radiocarbon dated to the 7th millennium and the bulk of the flintwork can be regarded as redeposited. Similarly, this feature is completely atypical of the medieval period and the close proximity of Anglo-Saxon deposits, suggests that it is highly probable that the radiocarbon dated charred grain of this date worked its way into the primary fill through post-depositional processes.

The dating evidence allows for a date of construction/use at any time during the Neolithic or Early Bronze Age with good evidence that the final filling occurred by (although not necessarily in) the Middle Bronze Age. This presents a number of possible interpretations.

Domestic buildings

The possibility that the ring ditches represent drainage or space-defining gullies surrounding a building does not withstand close scrutiny. Examples of buildings on the Downs, including those at, Mile Oak Farm, Coldean Lane and Black Patch have been firmly dated to the Middle Bronze Age (Russell 2002; Rudling 2002a; Drewett 1982), however, there is fairly good evidence that Structure 1 had gone out of use by this period. Buildings of this type are invariably associated with evidence for domestic occupation (pottery, fired clay, and charcoal for example) something which is lacking not only within the American Express Community Stadium ring-ditches and associated features, but across the site in general. Finally, examples at Coldean Lane illustrate the average size of a Bronze Age building,

approximately c.8m or less in diameter Rudling 2002a. 141-201), in contrast to the large diameter of Structure 1 (15-16m).

Henges

Another possible interpretation is that Structure 1 represents a henge. Its general size and plan may suggest similarities to hengiform monuments such as the Neolithic ring ditch at Staines Road Farm, Shepperton, whose primary fills dated to between 3620 BC and 3350 BC (Jones 2008, 10). However, unlike the Staines Road Farm example, Structure 1 did not feature the segmented ring-ditch or multiple entrances typical of henges. Furthermore, it contained numerous internal post-holes: features very atypical of this type of ceremonial monument (Harding and Lee 1987).

Debate as to whether henges have been uncovered on the South Downs was initiated by Russell (2002) who suggested that there are number of examples of henge-like structures in Sussex. This has been refuted convincingly by Garwood (2003, 56-7) who argues that these are a disparate group, some of which, such as those at Black Patch Hill barrow 9 and Church Hill, would be better interpreted as pond barrows, or other types of settlement dating to the period. As such, the example at the site of the American Express Community Stadium appears unlikely to represent a henge.

Barrows and other ceremonial ring ditch monuments

The third interpretation, that the ring-ditches represent a series of Late Neolithic/Early Bronze Age barrows, or other related forms of ring ditch monument, is considered by far the most likely. However, some elements which would support this interpretation have probably

been removed by erosion and taphonomic processes. For example none of the three structures had any evidence of an internal mound. Ploughing on site would have removed any positive earthworks from the landscape, whilst the lack of evidence of slumped material in the ring-ditches may be attributed to rapid erosion in the direction of the downward slope, or, more likely perhaps, it is unidentifiable in the homogenous fill. These structures did not contain any definite burials, although features [300] and [296], within ring ditches Structures 1 and 2, are in suitable locations and of the right dimensions and form to contain a burial. The acidic nature of the soil in Area B would have removed any trace of human remains. Grave goods, particularly pottery, are more likely to have survived had they been present but Garwood suggests that the lack of grave goods in barrows across Sussex may represent a regional phenomenon (2003, 52).

The continuous and segmented ring ditches represented by Structures 1, 2 and 3 form just part of a highly diverse array of excavated ring ditch monuments in southern Britain that includes a variety of continuous, segmented and/or penannular examples. Dating evidence for this diverse group of monuments is scarce, although the available evidence suggests they may span the period from the 4th to the 2nd millennia (Garwood *et al.* 2011, 360). Direct parallels to the monuments excavated at the American Express Community Stadium are difficult to identify as a result both of their incomplete survival and exposure. However, several broadly comparable examples are known elsewhere in Sussex. In the context of the South Downs perhaps the closest parallel to the segmented Structure 2 is the small segmented ring ditch S16 recently excavated at the nearby site of Lower Hoddern Farm, Peacehaven, which consisted of a small oval, segmented and penannular ring ditch measuring around 8.9m by 8.55m across, with a causeway to the southeast (Hart 2015, 000). It may also be worth noting here that Structure 2 bears a passing resemblance in size and shape to the penannular oval ring ditch of the Pycombe barrow, which measured around

11m by 12m across, with a narrow causeway on its longitudinal axis (Butler 1991). Further afield, a segmented ring ditch monument similar in size and shape to Structure 2 has been excavated at Barrow Hills, Radley, Oxfordshire (Barclay and Halpin 1999).

Parallels for the larger Structure 1 ring ditch are harder to find. Again, the monument is not dissimilar in size and shape to ring ditch S7 excavated at Lower Hoddern Farm, which consisted of a slightly ovoid ring ditch with a maximum diameter of around 15.2m. This particular monument is of note in that it appears to have started out as a segmented ring ditch, later modified and 'closed off' with the creation of a continuous ring ditch circuit. The completion or 'closing off' of initially segmented ring ditch monuments is a well attested phenomenon in southern Britain (Hey and Barclay 2011, 281) and is often inferred by kinks or irregularities in ring ditch circuits, as at the Neolithic ring ditches such as Staines Road Farm, Shepperton (Jones 2008) and Ashford Prison (Carew et al 2006). While a comparable constructional sequence cannot be categorically proven in the case of Structure 1, the irregularities apparent along the length of the surviving ditch are rather suggestive of a similar sequence of events. Certainly, the presence of internal features within the circuit of this ring ditch suggests a degree of complexity in the constructional sequence of this monument that is well attested elsewhere (Hey and Barclay 2011, 273).

Choice of location

The importance of the natural landscape in the location of prehistoric monuments has been stressed in studies of other periods (Bradley 2000). Although not at the highest point in the local topography, the site lies in an elevated position close to a natural watershed.

Elsewhere it has been suggested that sites of earlier ceremonial importance may have been selected as the site of barrows (Garwood 2007, 37). Interestingly there is a very close, in fact almost identical, correlation between the location of Structure 1 and the postulated Mesolithic knapping area (Open Area 1) defined by pit groups G1-G4. While any association between the end of the Mesolithic activity and the construction of Structure 1 should be approached with some caution as it seems fairly unlikely that there was any visible trace of the pits and open working area which defined the Mesolithic camp, the clearing itself may have left traces extending into the Neolithic period. Additionally the presence of Mesolithic flint tools on the ground surface may have been noticed by people in later periods, giving the site special significance in the wider landscape.

Internal features and processes of construction

If Structure 1 does indeed represent a round barrow, construction would have logically entailed the excavation of the ring ditch followed by the construction of an internal mound. There is no direct stratigraphic evidence as to where chronologically in the sequence the internal pits and post-holes fall, although a number of points can be inferred.

If the central pit does represent a grave, it is likely that it was cut prior to the construction of the mound, probably at the same time as the ring-ditch. The rectangular arrangement of post-holes surrounding this feature could represent a wooden structure which seemingly respects the position of the burial. It has been suggested that the construction of barrow mounds may not always have directly followed the process of burial (Taylor 2001, 45). It is therefore possible that such a wooden structure might initially have been designed as a monument or marker for use during or after the funerary rite. Equally, it is possible that the rectangular post-hole structure was used as a support upon which the

earth was mounded against. The fact that this structure may have functioned to keep earth away from the central pit leaves open the intriguing possibility that a central shaft was maintained after the construction of the mound, possibly to allow further offerings or the internment of further individuals. The arc of internal post-holes potentially represents an entirely earlier phase of activity. However, as already noted, there is very little positive dating evidence and furthermore this arrangement appears to be closely interrelated with the rectangular structure. A number of the post-holes appear to form part of both, perhaps suggesting that they are part of a single phase of construction. It is plausible that the two functioned together to prevent the weight of the mound, which was constructed of fairly loose sandy material, from slumping to the north and north-west, in the direction of the slope. Certainly the size and depth of the post-holes, suggest that they supported quite a substantial structure which might have been suited to such a purpose.

Alternatively, it is possible that the Structure 1 ring ditch never encircled an internal mound but rather represented a ditched and embanked enclosure similar in form and/or function to so-called open arena style monuments (Garwood 2003; 2007). The difficulties in reconstructing the original form of monuments from the truncated remains of their ring ditches is well-rehearsed (e.g. Garwood *et al.* 2011, 360) and it may be unwise to automatically assume a central mound in the absence of any good evidence for such.
A final possibility to consider is the idea that the internal features represent a later phase of activity, cutting through the mound. If this is the case, the features appear to respect the limits of the barrow and could therefore be part of the same phase of modification as the later prehistoric pits/post-holes cutting the barrow ditch. On a practical level this interpretation seems less likely simply because the post-holes are already of quite substantial depth (in some cases over a metre as measured from the top of the natural geology). If the depth of contemporary topsoil and the surviving mound are taken into

account, the ratio of depth to diameter of these features would probably render their excavation difficult if not impossible. Furthermore the rectangular structure seems centred on the burial itself, suggesting prior knowledge of its position. Perhaps the only explanation which would fit this sequence is a later shaft associated with an episode of grave robbing, although it seems unlikely that such a feature would be so elaborately constructed.

Relationship between the individual barrows Structures 1, 2 and 3

The three probable barrows were obviously deliberately located together, although there is no direct dating evidence to inform us about their sequence of construction or how long may have elapsed between the individual burial events.

Garwood suggests, based on the excavations of Barrow Hills, Radley, a three stage construction to a ceremonial complex such as this one (Garwood 2007, 37). Phase 1 comprises the construction of an initial structure, often built in close proximity to earlier monuments. Phase 2 represents further construction based on the alignment of monument from the first phase and Phase 3 represents the construction of a close knit array of single phase round barrows, possibly creating an avenue. The construction of the Structure 1 as the largest example would seem logically to represent the earliest feature, as paralleled at Barrow Hills, Radley, with the addition of Structures 2 and 3 forming a linear arrangement that may have continued further to the east. However, other constructional sequences are equally plausible. In particular, though often poorly dated, segmented ring ditches are usually considered to be Neolithic in date and as such, it is quite possible that the segmented Structure 2 ring ditch comprised the earliest element of this monument complex. This is borne out to an extent by detailed analysis of the chronology and development of organised monumental landscapes at Barrow Hills, Radley, Oxfordshire and at Lower

Hoddern Farm, Peacehaven, East Sussex (Garwood 1999, 293–309; Hart 2015, 000), which suggests that the segmented ring ditch monuments at these sites belong to earlier phases of monument construction.

The linear alignment on an east-west orientation is of particular interest because of its similarity to examples from West Sussex including The Devil's Jumps and Heyshott Down. As at the American Express Community Stadium, both of these feature a larger barrow at the highest point, probably suggesting that this was the initial focus of activity from which the smaller barrows proceeded. Interestingly both of these groups are thought to have been constructed to 'an elaborate cosmological scheme' aligned with sunrise on mid summer's day (Garwood 2003, 60), although this alignment only broadly compares to the examples found during the stadium investigations.

This interpretation perhaps has some implications for our understanding of the chronological development of the barrow complex, because it implies an element of structured planning. This seems more likely to be associated with closely contemporary burials, perhaps of close family members or successive generations. If this were the case we might then expect the monuments to have been constructed over timespan of decades rather than centuries.

Later veneration of the barrow monuments

The significance of this complex appears to have extended beyond the initial phases of construction and use, as demonstrated by the later pits associated with Structures 1 and 2: a phenomenon well attested elsewhere (Healy and Harding 2007, 65). These features, only broadly dated to the later prehistoric period, may be significant in expressing routine

revisits and continued respect of the barrows. This might have involved some kind of modification or repair to the standing monuments or could be associated with episodes of structured deposition, whether of human remains or artefacts (Hey *et al*. 2011, 363). Such revisits may have represented a continued ceremonial purpose (Morigi *et al.* 2011, 363) and demonstrate the importance and visibility of this complex within the wider, demonstrably open, landscape. The later insertion of pits around the circumference of ring ditches is also a feature of ring ditches S7 and S16 at Lower Hoddern Farm, Peacehaven (Hart 2015, 000).

Conclusions

While a definitive interpretation may be somewhat elusive, it is possible to theorise that these ring ditch monuments represent an area of ceremonial or burial architecture, due to the similarity between their morphology to other examples and the lack of any domestic debris.

There are many examples of barrow monuments on the South Downs, accounting for 90% of the total within Sussex and representing a range of form, building materials and structural features across this region (Garwood 2003, 50). The examples found at the site of the American Express Community Stadium represent a part of this tradition and contribute to the representation of the Downs as a ‘special place during this period’ (Garwood 2007, 60).

Their position along the north-facing slopes of the South Downs, indicates that they were visible from the valleys to the north, possibly the main route to reach the resources of the coastline. The comparison to examples of barrow complex at the Devil’s Jumps and Heyshott Down suggest a date stretching from the Late Neolithic in its origins, to the Early

Bronze Age as the last phase of barrow construction. This indicates the importance of this location and reinforces the ‘sacred’ qualities of the Downs.

Anglo-Saxon

Structure 4

While there are limited structural remains representing occupation in the Anglo-Saxon period, an interpretation of this landscape may possibly be formed. Anglo-Saxon remains are not widespread in the surrounding region; however, there have been several large excavations that have revealed evidence for the settlement hierarchy across the landscape. Two excavations at Bishopstone, East Sussex (Bell 1977), 1.5 km to the east and at Botolphs, West Sussex (Gardiner 1990), 1.7 km to the west have revealed large early Anglo-Saxon settlements. These sites consisted of multiple structures, including sunken-featured buildings, and were occupied from the 5th to 7th centuries, representing the large 'home settlements' of the region (Gardiner 2003, 154).

However, smaller scale sites have also been uncovered, in this period, including one comparable site excavated at North Marden, West Sussex in 1982 (Drewett *et al.* 1986, 109-118). This single sunken-featured building was located immediately next to a Neolithic oval barrow and therefore shares a similar topographic position to the example found at the site of the American Express Community Stadium. While at Falmer the positioning of the single building in the far eastern edge of the site suggests that other remains may have been located beyond the limit of excavation, research into the example at North Marden suggests that there was no further occupation in the immediate vicinity and that this was an isolated building (Down & Welch 1990, 221).

The location of these features could be related to the ritual monuments themselves; however, the degree of soil movement apparent at the site suggests that the ring ditch may

have been almost covered by this period. It is possible that the higher topographic position over the dry valley was a good location for shepherding flocks of sheep or other animals. Perhaps more likely, the remains could be an outlying building associated with the earliest development of Falmer village.

These examples reveal a pattern in the early Anglo-Saxon period of emerging large scale sites such as those at Botolphs and Bishopstone which were served by 'temporary' locations for 'resource procurement' (Gardiner 2003, 154). This is evidenced in the excavations at both of these locations where evidence such as animal bone, pottery and shell was uncovered from sources covering a large distance. Small scale sites, such as those, at Marden and Falmer were probably utilising the downland for pastoral farming, as part of a wider economy in the vicinity of these larger sites.

7000 years: a model of the occupation on the site of the American Express Community Stadium

The excavations carried out in advance of the construction of the American Express Community Stadium have demonstrated repeated occupation from the Mesolithic to the Saxon periods. The continued importance of this location in the landscape was clearly strongly related to its natural environment, on the top of the South Downs, on the border between differing geological areas and in the location of a natural watershed.

The initial occupation, in the Mesolithic period, took place within a locally sandy, relatively open or lightly forested area of the South Downs, which would have been widely forested at the time. This may represent area deliberately cleared by human means or the utilisation of a natural glade. This site was visited and revisited, probably as part of a wider

network of temporary camps in the area, and may have been seen by its occupants as a functionally-specific camp utilized for flint working. Visits to the camp may have been in preparation for hunting expeditions or indeed for the repair of toolkits following hunting activities. These functional concerns may have been supplemented by ritual acts with the remains of flint working placed into pit features and rapidly backfilled.

There was no significant activity in the Early and Middle Neolithic periods but the landscape continued to change around the site, with the mass deforestation of the area as demonstrated by colluival deposition within the river valley to the west possibly beginning during this time. The Late Neolithic or Early Bronze Age saw the creation of a large barrow. While there is no evidence for earlier monuments associated with ceremony or burial in this area, the Mesolithic activity on site, and perhaps the technologically distinct flintwork left behind, may have been considered significant and influenced the location of the later funerary monuments.

A barrow complex was constructed on the site and developed into a linear alignment with the construction of two further barrows. The absence of any evidence of burial or grave goods within these barrows may be the result of aggressive soil conditions or result from a tradition in which items were not deposited with the burial. The cutting of at least some new features in the later prehistoric period, possibly in the Late Bronze Age, which appear to respect the line of the barrow ditch shows the continuing importance of this space and perhaps a respect for the past.

The final phase of occupation in the Anglo-Saxon period saw the creation of a sunken-featured building and apparent small scale occupation, potentially an outlying part of a precursor to Falmer village. The significance of the location of this occupation, in close

proximity to a possibly still visible barrow group, is paralleled in an example at North Marden West Sussex, (Drewett *et al.* 1986, 109-118) and potentially suggests a wider custom. This site respected the importance and functional position of this area with its views over chalk Downland from to the south west to the north west.

The following supplementary reports can be found on the ADS website at http://archaeologydataservice.ac.uk/articles/view/sac/
The Struck Flint, The Anglo Saxon Pottery, Scientific Dating, Optically Stimulated Luminescence Dating, and Charred Macro-botanicals.

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