Proc. Univ. Bristol Spelaeol. Soc., 2011, 25 (2), 133-163

NEW EXCAVATIONS AT PRIDDY CIRCLE I, MENDIP HILLS, SOMERSET

by

JODIE LEWIS and DAVID MULLIN

With contributions by

Michael J Allen, Peter Marshall,
Rob Scaife and Alan J Clapham

ABSTRACT

In August 2008, small-scale research excavations were carried out at Priddy Circle 1, one of four related circular earthwork enclosures located on the Mendip Hills in Somerset. The date and function of the Priddy Circles has been much debated, largely due to the morphology of the monuments: they have external ditches and internal banks which seem to have been revetted by wooden posts. Although E. K. Tratman, who was involved in excavating a number of trenches across Priddy Circle 1, suggested that the monuments were related to henges and thus of Neolithic date, the lack of artefacts and radiocarbon dates, together with the unusual layout and construction, has led to much speculation. The reopening of one of the earlier excavation trench across the bank and ditch of Circle 1 showed that his interpretation of the constructional sequence was erroneous, with greater complexity revealed in the bank/ditch/posthole sequence, suggesting that the monument's construction went through more than one phase. So far, three radiocarbon determinations have been returned and these suggest a Later Neolithic date for the monument but it is argued that the monuments are not henges but belong to a tradition of enclosure that predates them and had a different function. A palaeo-environmental study was able to successfully retrieve and analyse pollen from several different contexts and all confirm Dimbleby's original assertion (1967) that the Circles were constructed in an open grassland environment.

INTRODUCTION

The four Priddy Circles lie in the parish of Priddy, on the Mendip Hills of Somerset. There are three complete circles, formed by external ditches and internal banks, and one that might never have been finished (Tratman, 1967): each appears to have a single entrance. The four stretch in a NNE-SSW line for a distance of *c.* 1.2 km (Figure 1), though their centres are not on a single axis. They are numbered from south to north, Circle I being the most southerly and are considered, by analogy alone, to be Late Neolithic henge monuments. However, no dating material has ever been recovered and this provided the impetus for the research described here.

Scheduled Monument Consent (DCMS ref HSD 9/2/10291) was granted for a small excavation trench across part of Circle I, in an area previously excavated by the Taylor brothers and published by Tratman (1967). Excavation took place between 2nd and 17th August 2008 with a team of 15 students directed by Dr Jodie Lewis and David Mullin. The excavation focussed on re-excavating one of the trenches excavated by Christopher and Peter Taylor across the bank and ditch of Circle I. Their 'Cutting III' was selected for excavation as the charcoal lens noted in most of their trenches was found to be best preserved here. A small test pit was also excavated within an adjoining swallet, supervised by Dr Mike Allen, in order to assess the potential for the preservation of palaeo-environmental material within the fill of this feature. An

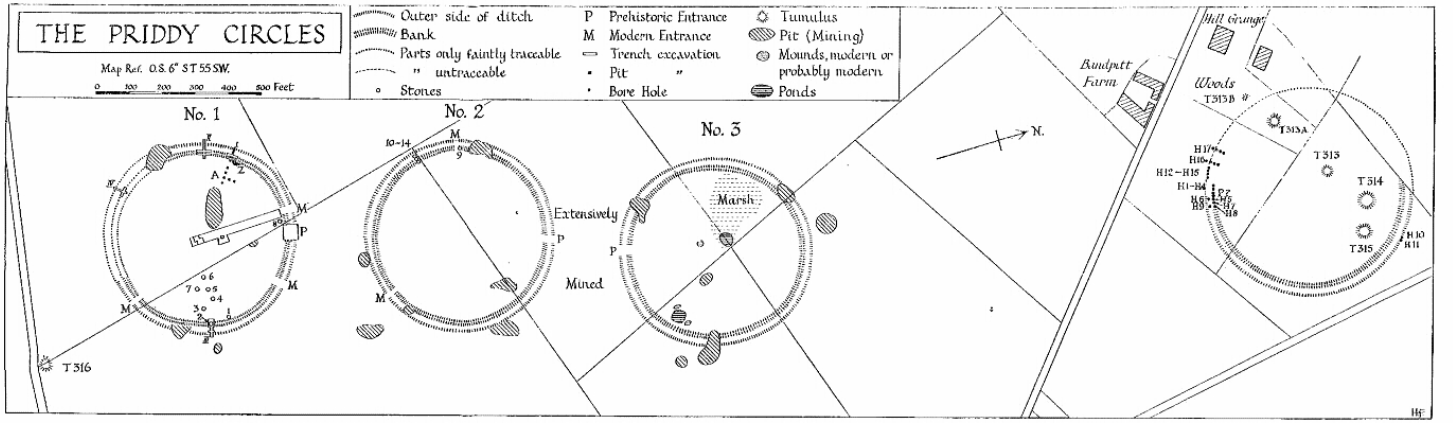

Figure 1.*Plan of Priddy Circles.*
After Tratman (1967) PL.14.

auger transect was also carried out over a possible ring ditch surrounding a large, deep sinkhole that was visible on an aerial photograph, to the south-east of Circle 1.

The Taylors' trench was successfully located and the structure of the bank and the ditch sequence were excavated. The buried soil below the bank was sampled for pollen and micromorphological work, and bulk samples were taken of the ditch fills. The worked flint recovered from the ditch suggests a Late Neolithic date and this was confirmed by a series of radiocarbon dates from the fill of the ditch.

THE NEW EARTHWORK SURVEY

Figure 2 shows a new earthwork survey of Priddy Circle 1, drawn by Sarah Baker, who undertook this project as part of an undergraduate dissertation in Archaeology at the University of Worcester. The survey was carried out by Sarah Baker and Elaine Jamieson of English Heritage (Archaeological Survey and Investigation) and shows the physical form of the monument in detail, the location of the excavation trench, the excavated swallet and the site of the purported ring ditch around the swallet to the south-east. The survey also discovered several small square and rectangular enclosures on the western side of Circle 1, which are later than the monument but otherwise undated.

THE EXCAVATION

The Taylor brothers excavated a small trench across the eastern part of Circle I in the 1950s, as part of a programme of excavations which were eventually taken over by E.K Tratman and published as Tratman (1967). The Taylors' trench took the form of a cross-shaped area (C1) over the bank and ditch, with two smaller, rectangular trenches (R1 and L1) over the bank and an open area around a stone situated on the bank (F1).

The Taylors' trench was still visible as a depression in the bank prior to the 2008 excavations and this was further confirmed as the correct location by geo-referencing the 1950s excavation plan onto a modern OS base map within a GIS. An area measuring 10 m wide by 18 m long over this depression was stripped of turf and topsoil by hand (Figures 3 and 4). The Taylors' trench was apparent as a cross-shaped area of looser soil running down the bank and ditch (Taylors' Trench C1), flanked by two rectangular trenches over the bank (Taylors' Trenches L1 and R1). Trench F1 was less clear, but the limit of this trench was marked by the outline of a grid peg from the earlier excavations.

The infill of the Taylors' excavation trenches was removed by hand and sieved, but this process revealed very few finds. Whilst Trenches R1 and L1 showed the sequence illustrated in the published sections, it was clear that the ditch in C1 had not been fully excavated by the Taylors. Similarly, area F1 was not as expected, appearing to have been unsystematically excavated, leaving no obvious sections. This area was trowelled to the bottom of the topsoil.

After the Taylors' trenches had been excavated and recorded, two additional trenches measuring 1 m wide were excavated parallel to C1, at right angles to the 'arms' of this trench and forming a continuous section along the bank and ditch on each side of the Taylor's excavation trench (Figure 5). This revealed a more complex sequence than recorded by the Taylors, both in the area of the bank and of the ditch.

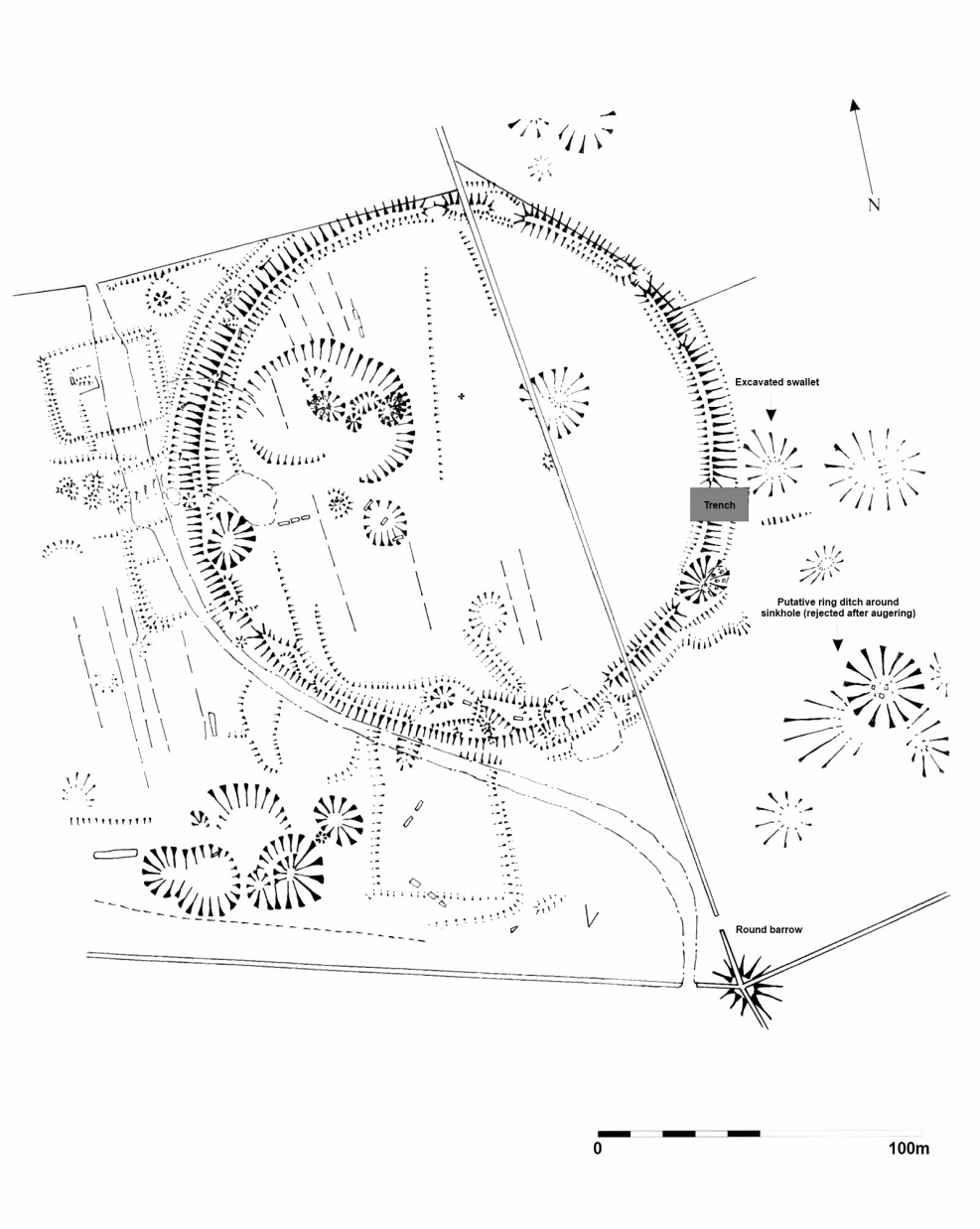

Figure 2. *New earthwork survey of Circle 1 by Baker and Jamieson, showing trench location and the swallets investigated.*

Figure 3. *The 2008 excavation, looking NW, showing the Taylor's trenches*

The Bank

NB: The trench was orientated WNW/ESE, but for the sake of brevity in this report, North and South are used respectively. It should be noted that North was incorrectly identified on several of Tratman's figures in the 1967 report.

The southern section of the bank (Figure 7) was composed of a turf core (1008), which corresponded to that seen by the Taylors (their Layer 9). This was, however, very stony in this section and contained stones up to 1.00 m x 0.80 m x 0.80 m, intermixed with remnant turf to a depth of 0.30 m. No structure could be observed, the stones apparently forming a dump, rather than a wall (Figure 6).

The central turf/stone core was abutted on each side by a later clay bank (1003)/(1004), which was noted by the Taylors and assigned Layer 2. However, the Taylors recorded this feature as *overlying* the central turf wall, which was not the case. Sealed by (1004) and close to the junction of (1004) and (1008) was posthole [1014] measuring 0.25 m in diameter and 0.20 m deep, sloping to a V-shaped base. The spoil from this posthole (1016) had been dumped next to it and was sealed by (1008). No finds were recovered from the fill, which did not show any indication of a post pipe.

Both the turf core and clay bank overlay a buried soil (1012), which was 0.20 m thick and lay directly over a silty clay subsoil (1017). Two monolith samples (M4 and M5) were taken through the buried soil and the turf core in this section and two further samples of the buried soil (1012) were taken from the west-facing section of R1 (see environmental report, below).

The structure of the northern section of the bank was less obvious and the turf bank was only visible as a slightly darker area, with an area of iron staining (1005) to the east (Figure 7). This iron staining was interpreted as the eroded turf core of the bank, which was being washed downslope into the ditch: preservation of this part of the monument was poor (Figure 8). To the west of the area of the turf bank a large, flat bottomed posthole [1006] measuring 0.30 m in diameter and 0.45 m deep, cut the natural and was sealed by clay bank (1004). No finds were recovered from the fill, which did not show any evidence for a post pipe.

Figure 4. *The 2008 excavation, looking E, sinkhole in background. Foreground: sections through turf bank and buried soil.*

The Ditch

The ditch [1009] was obvious in the excavated trenches and measured 2.20 m wide by 0.96 m deep (Figure 7). The ditch cut had gently sloping sides, grading into a steeper cut at the centre, which had a slightly rounded base. Although this profile was suggestive of a recut, no evidence for this was found in the ditch fills and it is likely the result of weathering. The primary fill of the ditch (1013) was a compact, slightly greenish silty clay which contained occasional charcoal. This was 0.10 m thick and lay below a secondary fill (1011), which was a

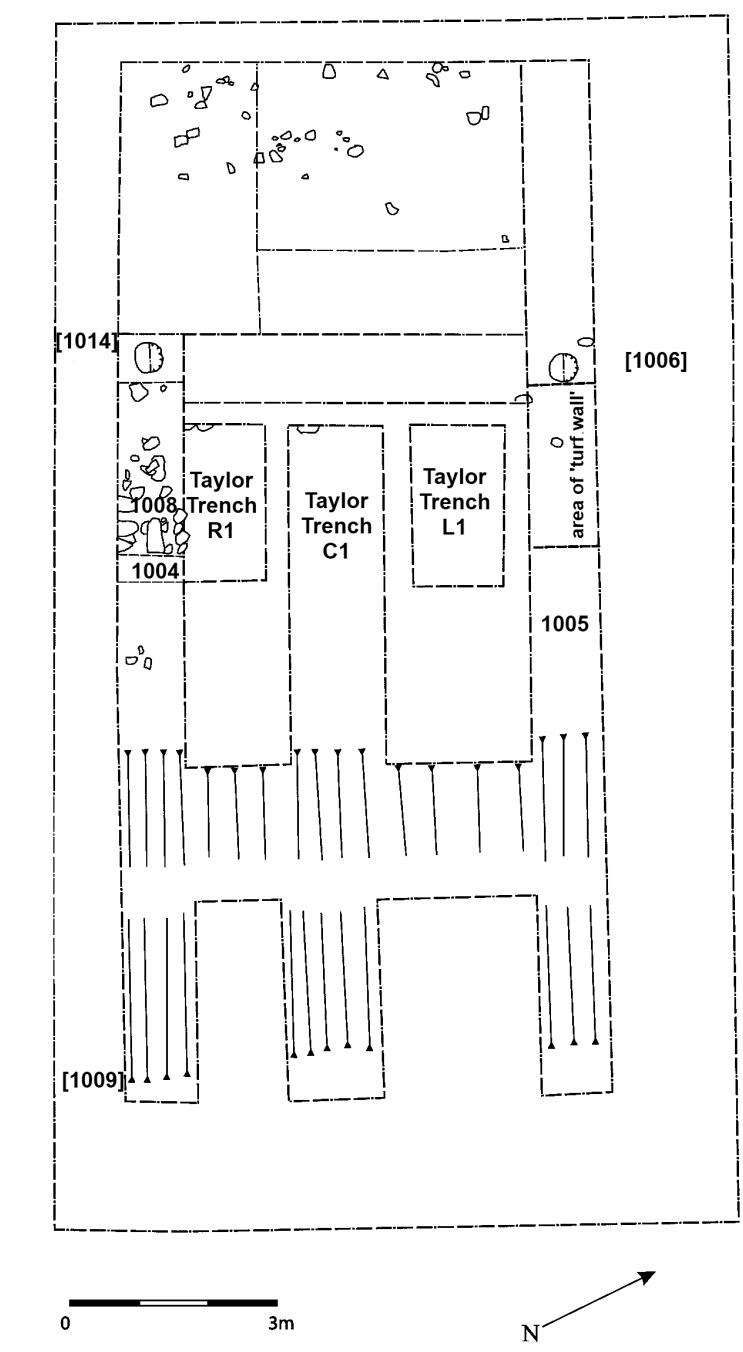

Figure 5. *Plan of the 2008 excavations at Circle 1.*

moderately compact red/orange silty clay up to 0.30 m thick. This contained charcoal and some worked flint, but the lenses noted by the Taylors (their Layer 7) were not readily apparent in the newly excavated trenches. The upper fill of the ditch (1010: Taylor's Layer 6) was 0.25 m thick, but had an indefinite boundary with the topsoil. This also contained charcoal and worked flint.

Figure 6. *The 2008 excavation, section through bank looking SW. Buried soil visible left of centre; stony bank centre.*

The Swallet (see also Allen, below)

A large number of swallets are known in the vicinity of the Priddy Circles and these have been surveyed by Stanton (1986). Such features may contain chronologically long sediment sequences and have the potential to aid with the reconstruction of the local and regional landscape history. In order to examine the geoarchaeological potential of the wider landscape, a number of local infilled swallets were augered to examine the nature of the deposits and assess their suitability for providing a geoarchaeological and palaeo-environmental history. Following a programme of augering several swallets in the area adjacent to Circle I, the swallet nearest the excavation was selected for more detailed investigation as the moist sediments had enabled augering to 4.25 m and were also more likely to contain pollen than drier sediments (Figure 9).

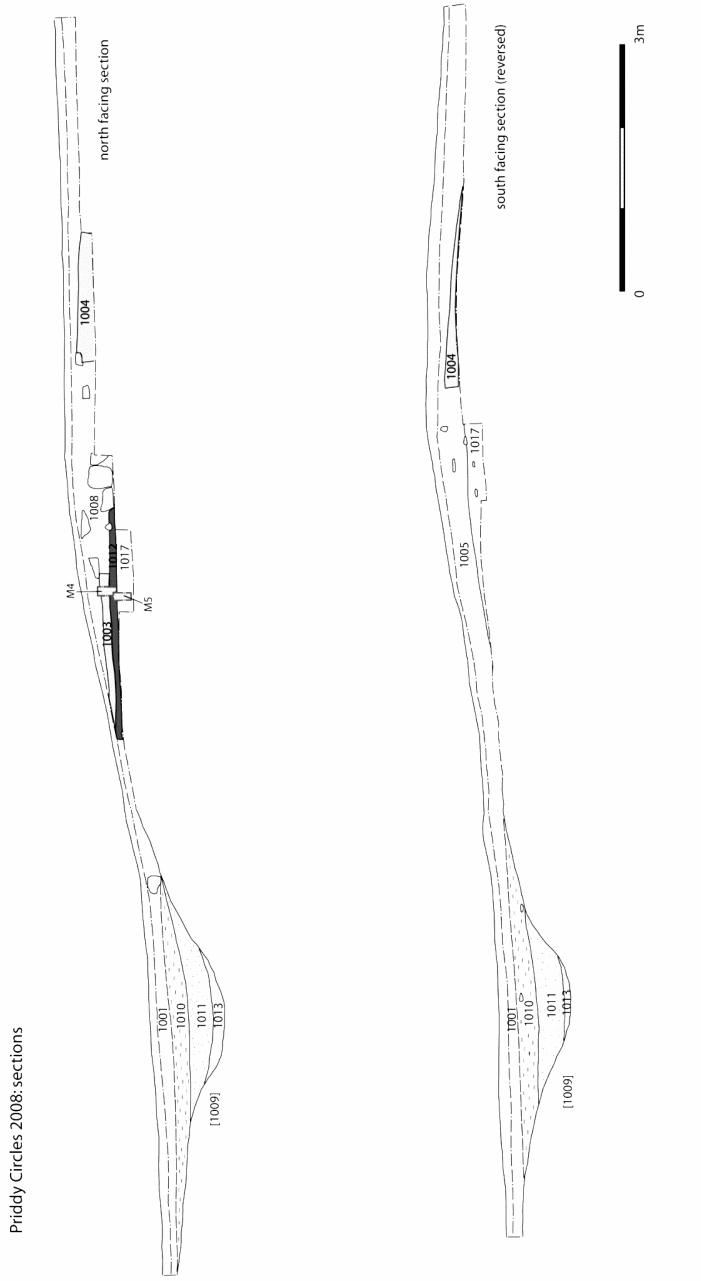

Figure 7. *North and south facing sections at Circle 1.*

Two auger profiles were undertaken to examine a crop mark seen on aerial photographs encircling the large wooded sinkhole to the south-west of Priddy Circle I. The auger transects were roughly west-east and north-south and perpendicular to the encircling crop mark. Augering was conducted with a 40 mm diameter dutch auger and a 2.5 mm diameter gouge auger, but no archaeological feature (ditch, bank etc) was located on either transect.

Figure 8. *The 2008 excavation, section through turf bank and posthole [1006] looking N.*

THE FINDS

A total of 51 worked lithics were recovered from the excavation, mostly from unstratified contexts and the backfill of the Taylors' trenches, but a small amount of worked flint was recovered from the upper fill of the ditch (1010) and a single flint flake was recovered from a depth of 2.3 m in the environmental test pit. Further burnt flint was also recovered from the environmental samples taken at this depth within the test pit.

Unstratified: a total of nine flints were recovered from the turf and topsoil, consisting of seven tertiary flakes, one secondary flake and one retouched, ?backed blade. Also a .303 rifle cartridge and a miscellaneous metal (Fe) strip.

Taylor Backfill: a total of seven flints from the backfill of C1, consisting of five small chips and two broken narrow blades. Also a small sherd of trailed slip decorated pottery (?18th century).

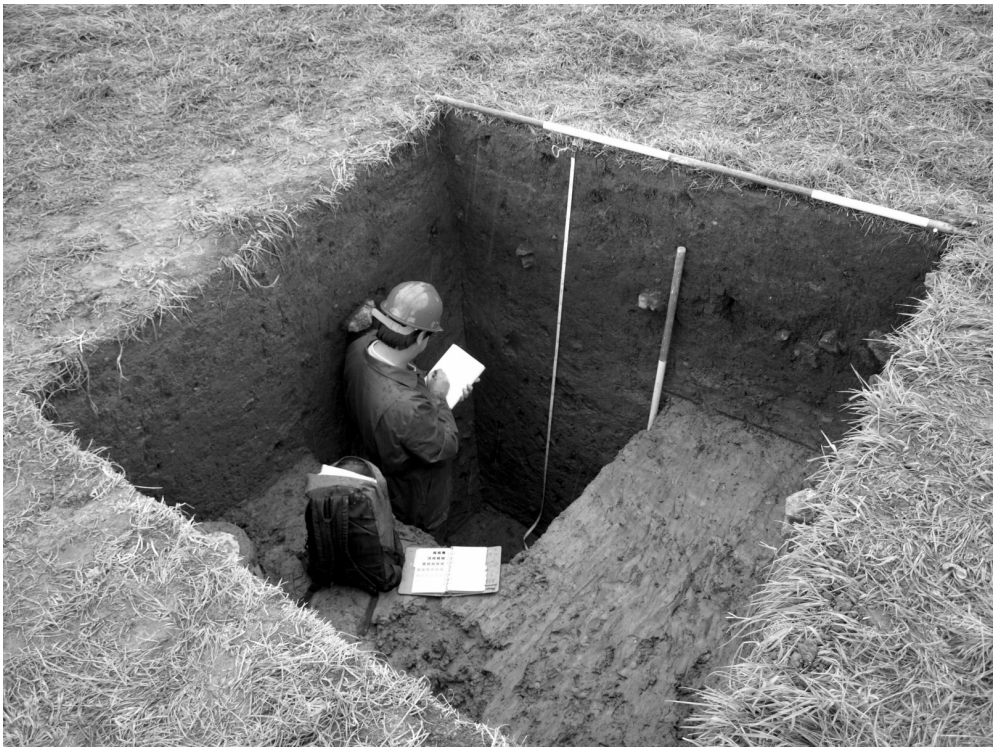

Figure 9. *Test excavation in sinkhole looking S, showing upper fills and colluvium.*

A further 25 flints were recovered from the backfill of F1, mainly small chips (16) and tertiary waste (8) and a narrow blade.

Upper Ditch Fill (1010): a total of nine small chips (one burnt), two tertiary flakes, one broken narrow blade and five retouched items (discussed below).

Retouched items:

One broken knife with a retouched point at the proximal end. The distal end is missing. The flint is grey-brown in colour. Fresh condition.

One complete oblique arrowhead of grey-brown flint, 48 mm long, 20 mm wide, 3 mm thick (Figure 13). The flint is fresh and unweathered.

Three fragments of a broken knife of opaque grey flint. Two of the pieces refit. The breaks and fragments are fresh but occurred before the excavation.

Swallet Test Pit: one small piece of flint: ?blade shatter.

Raw material and condition

The lithic assemblage is dominated by a grey-brown translucent flint, with lesser quantities of darker grey-black flint, opaque mid-grey flint and opaque light grey flint. On those pieces where cortex is present it is thick and rough, suggesting a chalk origin for the materials.

The condition of the flints from context (1010) is excellent: all the pieces appear fresh and unweathered. Much the same is true for the material from the Taylors' backfill, although several of these pieces are patinated. The unstratified lithics also appear remarkably fresh and unweathered, although several pieces exhibit incipient patination.

Date of the Flints

The unstratified flints and those recovered from the Taylors' backfill are largely undiagnostic, with the exception of the narrow blades and the retouched backed blade which are indicative of a Late Mesolithic or possibly an Early Neolithic date. These items show a human presence in this area before the Circles were built, confirmed by charcoal of Late Mesolithic date from the buried soil below the bank (see Marshall, below).

The retouched items from context (1010), the upper ditch fill, are consistent with a Late Neolithic date.

GEOARCHAEOLOGY AND PALAEO-ENVIRONMENT

Michael J Allen and Rob Scaife

The Priddy Circles lie on a variety of geological formations. Circle I lies mostly on Dolomitic Conglomerate (DCG) of Triassic age; its northern edge, including the entrance, on Harptree Beds (HaB), silicified Lower Jurassic rocks; its western side on Black Rock Limestone (BRL), of Carboniferous age, only thinly covered by superficial deposits. Circle 2 lies wholly on HaB; Circle 3 mostly on Downside Stone (DnS), of Early Jurassic age, its southern edge on HaB; Circle 4 on Mercia Mudstone (MMG), of Triassic age, its north-west edge on DCG (Farrant, 2008)[1].

The soils of Mendip are generally typical paleo-argillic brown earths of the Nordrach Association over fractured limestone, however at the Priddy Circles the soils are mapped as typical brown earths of the Milford Association and Ferric podzols of the Larkbarrow Association (Findlay, *et al.* 1983; 1984; cf. peaty gleyed podzols Findlay in Tratman, 1967, 123). The area around the Priddy Circles contains a large number of swallets and such features may contain chronologically long sediment sequences which have the potential to aid with the reconstruction of the local and regional landscape history. In order to examine the geoarchaeological potential of the wider landscape, a number of local infilled swallets were augered to examine the nature of the deposits and assess their suitability for providing such histories.

Excavations through the bank of Priddy Circle 1, described above, revealed the buried soil described in the original excavation report by Dimbleby (Dimbleby in Tratman, 1967). This was sampled for pollen to provide information about the immediately pre-bank environment and land-use, allowing the results to be compared with that reported by Dimbleby (*ibid*.).

[1] This paragraph on the geology of the Priddy Circles has kindly been provided by one of the referees of this paper.

The Priddy Circle 1 buried soil

The clear buried soil (context 1012) underneath the core of the bank was described following standard terminology (Hodgson 1976) and full details are given in the archive and Allen (2008). The core of the bank where described and sampled (Figure 7), was stony, mixed soil material comprising both 'topsoil' (A horizon) and weathered parent material (Rw). The buried soil survived to about 0.18 m thickness and was a truncated humic rendzina-form soil. The Ah (turf horizon) was not uniformly present; whether this was deliberately stripped and removed, or was destroyed by trampling and the construction activity associated with the ditch and bank was not clear. A soil micromorphological slide was prepared and resides in archive to examine these questions. Where relict part of Ah (turf) material was present it had a fine crumb structure, indicating the presence of a worm-sorted turf, probably grazed.

depth (cm)	***description***
0-6	Dark brown (10YR 3/3) soft humic silty loam, stone-free, common fine fleshy roots, weak medium blocky structure, abrupt smooth boundary A horizon - Topsoil
6-27	Mixed bank comprising dark greyish brown to brown (10YR 4/2-3) soft humic stone-free loam with clear large patches of strong brown (7.5YR 5/6) silty clay (R / Rw derived material), clear to abrupt boundary Bank: mixed A horizon material
27-34	Very dark greyish brown to very dark brown (10YR 3/2 to 2/2) humic silty loam, very weak blocky structure, rare, small charcoal pieces, clear to abrupt boundary Buried soil: bA Humic Rendzina-form soil
34-45	Strong brown (7.5YR 4/6) massive stone-free silty clay Buried soil: bB/Rw (weathered parent material)
45+	Brown (7.5YR 4/4) massive stone-free silty clay Parent material: R

Table 1. *Depths and descriptions of the bank and buried soil at Priddy Circle 1. Depths here also relate to those in the pollen report of the buried soil*.

Pollen and palaeo-environment

The buried soil was sampled from the north facing section in a single 0.5 m long monolith tin on 16th August 2008. This was fully described (Allen, 2008), and subsampled for pollen (see below). Preliminary pollen analysis was conducted on this sequence to provide a more recent parallel with that recorded by Dimbleby (1967).

Pollen technique

Monolith profiles were taken from the open excavation. Stratigraphical description and sub-sampling of the profile for pollen was carried out in the laboratory (Dr M.J. Allen). Standard pollen extraction techniques were used on samples of 2 ml volume (Moore and Webb, 1978; Moore, *et al*. 1992). Pollen was identified and counted using an Olympus biological

research microscope fitted with Leitz optics. Absolute pollen frequencies were calculated using the addition of a known number of exotic spores (Lycopodium) to the measured volume of sample (Stockmarr, 1971). A total count (pollen and spore sum) of up to 330 pollen grains/spores per level was identified and counted (av. 200 grains/level).

A pollen diagram has been constructed (Figure 10). Calculation of the percentages used in this diagram follows that adopted by Prof. G.W. Dimbleby. Thus, percentages are as a total of the sum of all pollen and spores. This differs from the now more usual system of division into % of total dry land pollen with marsh and spores as separate categories. Prof. Dimbleby states that as a soil, on which the plants grew, the different vegetation elements should all be considered equally (Dimbleby, *pers. comm*.). This has been adopted here to facilitate comparison with his earlier analysis of the Priddy Circle site.

Taxonomy, in general, follows that of Moore and Webb (1978) modified according to Bennett, *et al*. (1994) for pollen types and Stace (1992) for plant descriptions. These procedures were carried out in the Palaeoecology Laboratory of the School of Geography, University of Southampton.

The Pollen Data

Pollen analysis was carried out on 10 samples which span the lower bank (from 16 cm to 22 cm), the buried soil (22 cm to 35 cm) and the underlying sub-soil (35 to 42 cm). Sub-fossil pollen and spores were obtained from all but the basal sample (at 42 cm). Absolute pollen numbers present are small throughout but are in sufficient quantity to produce counts and a pollen diagram. Absolute pollen numbers decline markedly downwards in the profile from 29,000 grains/ml to 1,000 grains/ml. This is typical of soil pollen analyses of old land surfaces. In contrast, the values of the more robust spores of *Dryopteris* type (monolete form Pteropsida; typical ferns) increase in number in the lower part of the profile (to 39,000 grains/ml). This is also diagnostic of the variable/differential preservation that occurs throughout a soil profile.

Overall, herb pollen is dominant throughout with only relatively small numbers of trees and shrubs. The taxonomic diversity is small with only 20 taxa identified.

The bank: 16 cm to 22 cm: *Poaceae* (grasses; 50%) are dominant. *Corylus avellana* type (hazel; to 16%) has its highest numbers in this zone. Other taxa which are of note are *Calluna* (ling; 5%), *Plantago lanceolata* (ribwort plantain; 5%) and sporadic grains of cereal type pollen. Spores of ferns include monolete *Pteropsida* (*Dryopteris* type; 11%) and *Polypodium* (polypody fern 14%).

The buried soil: 22 cm to 35 cm: *Poaceae* are dominant throughout (to 58%; av. 40%) but with a sharp decline in the basal soil level. *Alnus* (alder; <1%), *Corylus avellana* type (most likely to be hazel but may also include bog myrtle) and *Calluna* (ling) increase from the middle of the spoil profile upwards. Cereal pollen is present in the lower part of the profile (35-30 cm; <1%). Spores become increasingly important downwards in the soil with monolete forms (*Dryopteris* type) forming 50% of total pollen + spores. *Polypodium* and *Pteridium* (bracken) are also present.

The bRw: 35 cm to 42 cm: Total numbers of pollen decrease markedly in this horizon to absence below 38 cm. Spores of ferns, however, become important with high numbers/percentages of monolete forms including *Dryopteris* type and *Polypodium*.

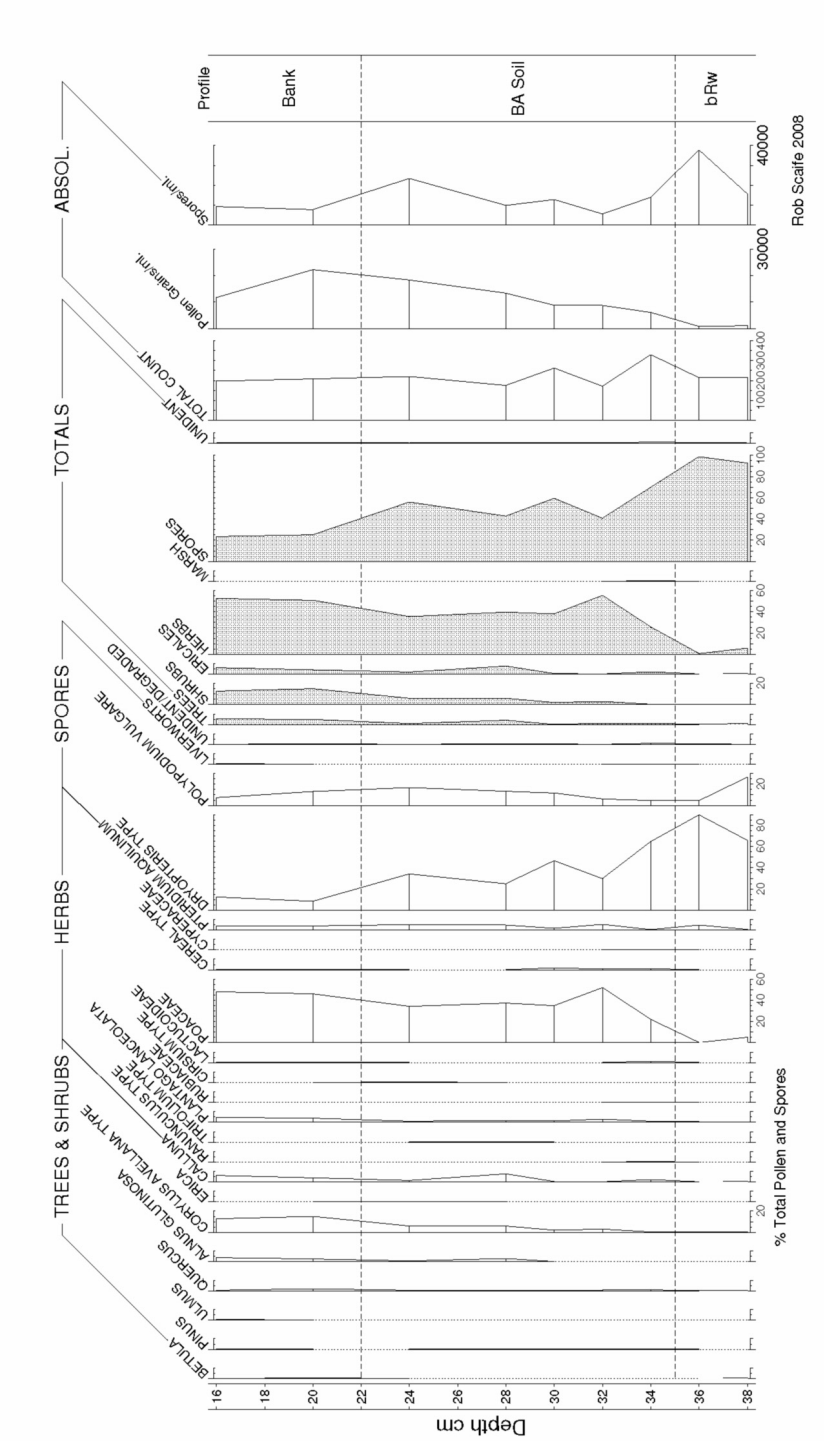

Figure 10. *Bank section pollen diagram.*

The Vegetation and Environment

This pollen analysis shows the typical characteristics of buried soils. There is a marked decrease in absolute pollen numbers downwards in the profile whilst there is a corresponding increase in more robust forms. Typically, *Asteraceae* types (esp. *Lactucoideae*) are present in this part of the profile (Dimbleby, 1985), whereas at the Priddy Circles the spores of ferns are more common. This is a result of the longevity of these pollen and spores in the soil which may result, in extreme cases, in differential preservation and skewing of the pollen assemblage data. Thus, the upper levels of any buried soil tend to provide most representative data on the vegetation and environment that existed immediately prior to the burial of the soil by any overlying structure. Pollen analysis of overlying structures such as a bank frequently demonstrates a marked reduction in the absolute numbers of pollen present. Where pollen levels remain the same, as is the case at the Priddy Circles, two factors require consideration: i) is the soil context sealed and not influenced by the incorporation of post-burial pollen through more recent pedogenesis and ii) does the bank consist of top soil which has been taken from the surrounding area and thus contains pollen which is also broadly contemporaneous with the time of burial of the deposits below it.

Here, it is assumed that the pollen in the old land surface and the lower part of the bank is contemporaneous with the later Neolithic. This is because there are no recent/modern exotics such as pine and spruce pollen, which is frequently an indication of pollen which has become incorporated in the last 300-400 years after its introduction initially in parks and gardens.

The buried soil environment: Dominance of grasses with some ribwort plantain (*Plantago lanceolata*) clearly shows that the on- and near-site habitat was grassland, probably pasture. Small numbers of cereal pollen grains are present which suggest that arable agriculture was also being practised, but probably not in the close vicinity. It is also possible that the cereal pollen may have come from pollen liberated during crop processing procedures (threshing and winnowing). There are slightly greater numbers of cereal pollen in the lower part of the soil profile and it may be tentatively suggested that there was an earlier phase of arable activity which was replaced by grassland/pasture. Of note are small numbers of ling (*Calluna*) and heather (*Erica*). These indicate some growth of heath taxa on acid soils and it is also tentatively suggested that these are possible indications of the onset of soil depletion. There is no evidence of local woodland growth in the buried soil but the higher values of hazel pollen from the overlying bank are enigmatic. Dimbleby (see below) similarly found higher oak and hazel values and suggested that these may have come from deeper soil obtained from the ditch.

Dimbleby (1967) interpreted the pollen sequence recovered from below the bank during the previous excavations as representing a quite open landscape, possibly with some persistent hazel scrub. He showed that the local environment was clearly grassland, probably meadow pasture with no clear sign of agriculture (arable). Dimbleby also had a substantial representation of fern spores with large numbers in the lower levels. His samples from the bank had a greater representation of oak which, along with ling (*Calluna*), were more than recovered in this recent analysis. This he tentatively attributed to the presence of an acidophilous vegetation, perhaps heathy woodland.

Overall, the results presented from this analysis compare very closely with those of Dimbleby, showing an open grassland environment with little tree growth, except perhaps some local hazel scrub woodland. Differences in the taxa, which occur only occasionally, reflect the pollen input from plants growing immediately on the land surface at the point of sampling.

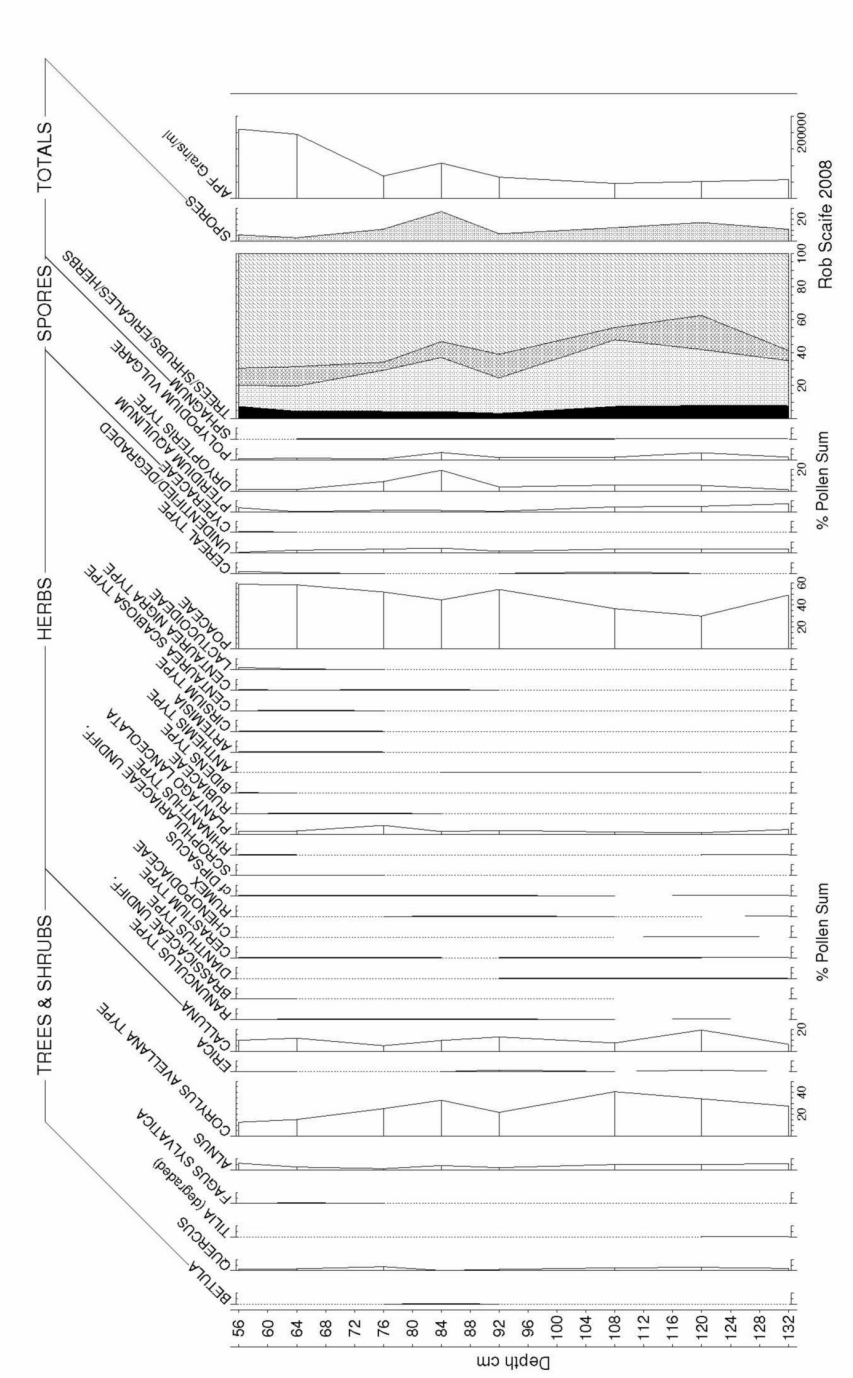

Figure 11. *Pollen diagram for the swallet hole.*

Absolute pollen frequencies as calculated using two different techniques are also shown to be comparable.

The swallet/doline

A number of swallets were augered in the vicinity of Circle 1, particularly to the south. Several swallets were test augered, eight of which were augered to determine depth and nature of the deposits, and full auger records made from three. Almost stone-free colluvial infills to in excess of 3 m were regularly recorded, with two recording unbottomed depths of greater than 2.45 m and 2.8 m. However, the swallet adjacent to the excavation and just outside the monument contained moist sediments which were augered to a depth 4.25 m and this was deemed likely to contain the longest and better preserved sediment and pollen sequence (see Scaife below) which could be directly relevant to activities relating to Circle 1. It was investigated by a hand-dug test pit to 2.2 m and augered a further 2 m, exposing over 4.25 m of Holocene deposits. The full profile was recorded, and the upper portion sampled in a series of three overlapping monoliths tins and the lower by small samples retrieved from the auger (Allen, 2008). The combination of subsamples removed from the monoliths and those from the auger provide a full sequence.

Excavation and augering of the swallet revealed a reddish yellow (7.5YR 6/6) stony colluvium at 4.2 m, above which (*c.* 0.9-4.2 m) was *c.* 3.3 m of stone-free brown to strong brown (7.5YR 4/4-4/6) silty clay with large prismatic structure containing occasional charcoal flecks from c. 1.4 m. Within this at 2.05-2.2 m depth was a humic brown soil with some stones and clear concentrations of charcoal, many impregnated with iron. Despite careful excavation and a sieving programme, no artefacts were recovered from this layer, but a single small struck flint was recovered from just below this basal buried soil at 1.33 m. A second well developed deep (0.44 m) colluvial brown earth soil with clear blocky structure was present in the upper colluvium *c.* 0.4-0.8 m. As it was sealed by a very mixed horizon it is assumed that this is the former soil sealed by extraneous spoil from Tratman's excavation.

Pollen and palaeo-environment

The likelihood of pollen survival was low: if any were present it would require intensive extraction methods involving micromesh sieving, and identification likely to be difficult. As such, assessment concentrated initially on the upper humic part of the profile (the modern buried soil c. 1956-9) despite its recent date, and upon the sediment to 1.32 m. On proving pollen survival two samples were also assessed from the buried soil thought to be of the same date as the construction of the monument.

The primary objective of this analysis was to establish the presence or absence of pollen in these sediments and their potential for establishing the past vegetation and environment. To this end, a series of samples was taken from test pit 1. From these, samples of more humic character from a depth of 1.32 m upwards were selected as having the best potential for pollen preservation, and two samples from within the buried soil horizon, of potential Neolithic date, at 1.96 m and 2.08 m.

Pollen was obtained from all of the samples which facilitated the construction of a pollen diagram from the upper, more humic sediments. This along with the samples from the lower, Neolithic soil/stabilisation horizon are discussed.

The upper humic soils and colluvial sediments

These occur from a depth of c. 1.32m to the surface and are attributed to the medieval and post medieval periods. Pollen is present with increasing absolute pollen frequencies up profile from

25-30,000 grains/ml to 210,000 grains/ml at the top of the analysed profile (0.56 m). Pollen assemblages are dominated by *Poaceae* (grasses) with important numbers of *Corylus avellana* type (hazel) and *Calluna* (ling) (Figure 11). *Plantago lanceolata* is more frequent from c. 0.80 m.

The environment of the medieval and post medieval period within the confines of the pollen catchment is suggested as one of hazel scrub and degraded acidic soils in close proximity to the swallet site.

The buried soil horizon

Pollen analysis was carried out on two samples taken from within the suggested Neolithic horizon which contained fragmentary charcoal. Pollen spectra are dominated by grasses with small numbers of other herbs. These suggest a predominantly open environment. However, occasional pollen grains of *Tilia* (lime) were also noted along with the fern *Polypodium*. The latter are typical of woodland pollen assemblages but here may be remnants from an earlier phase of woodland.

The large hand-recovered charcoal at 2 m was identified by Debra Costen (Bournemouth University, Research Assistant in Environmental Archaeology) as heartwood oak (*Quercus*).

Land snails

Land snails rarely survive on Mendip as the Limestone weathers slowly and the overlying soils are calcium carbonate poor, or acid drift deposits overlying the limestone create acidic non-calcareous pedological conditions (Bell, 1984; 1987). Although no snail shell fragments were observed in the field, five large 2 kg snail samples were processed by standard methods from the main colluvial infill. No shell fragments were recovered in any of the five samples, nor in three *c.* 8 l bulk samples processed for charcoal and charred plant remains.

Discussion of the swallet

Pollen was found to be present in all samples examined and a pollen diagram has been constructed for the medieval and post medieval sediments represented by the upper and more humic sediments. The medieval and post medieval vegetation was one of hazel scrub possibly on the slopes of the swallet with areas of degenerating soils and grassland, possibly pasture. The assemblages of hazel and *Ericales* are similar to the pollen assemblages obtained from the bank of the henge by Dimbleby and Scaife (above). It is probable that pedogenic processes have incorporated pollen through down-soil movement into these levels. The Neolithic soil/sediment levels have also produced pollen which is dominated by grasses which at this early stage of analysis suggest an open grassland environment at least in proximity to the site. However, there are some minor indications of woodland including lime (*Tilia*).

Discussion of the local contemporaneous land-use history

The long and deep stratified sequence in the swallet reflects a long land-use history. Although not bottomed, the lower buried soils (2.05-2.20 m) may be contemporary with the construction of Priddy Circle 1 and the ensuing colluvial inwash may largely be a product of the construction and ensuing activity at Circle 1. This soil, like that under the bank, supported developed grassland with no local woodland, but former woodland is indicated by the pollen recovered, which includes lime. Oak charcoal was also present. If this is contemporary with the construction of Circle 1 then it, like the buried soil, suggests a pre-existing open landscape, with clearance of woodland at some considerable time prior to the construction of the Circles.

The buried soil beneath the bank indicated pasture and a meadow grassland with the presence of ling and heath indicating soil depletion and the establishment of some open heath conditions. These conditions were possibly accelerated by sporadic tillage of the soil, as indicated by sparse cereal pollen. This interpretation is tentative, however, as only an assessment of the pollen from the swallet was possible and soil micromorphological analysis of the slides from the buried soil may amplify some of the comments made above, and interpretation provided below.

The environmental and geoarchaeological evidence indicate a landscape which had a long history of activity prior to the constriction of the Circles and that woodland clearance, tillage and pasture had started to degrade brown earth soils to thinner more acidic heath conditions. Some small open scrub was available within the vicinity, as evidenced by the charcoals (see Clapham below), but the fact that the pollen shows a very open, largely unwooded, landscape suggests that the timbers used in the construction of Circle 1 were brought to the site from elsewhere on, or close to, the Mendip plateau.

THE CHARCOAL
Alan J Clapham

Samples were taken from deposits considered to be of high potential for the recovery of environmental remains. A total of eleven samples were taken from the site from the following contexts: Samples 1, 2, 3, 7 and 8 from the upper fill (1010) of ditch 1009. Samples 6 and 9 from the primary fill (1013) of ditch 1009. Sample 4 from the fill (1007) of posthole 1006. Sample 5 from the buried soil (1012) and two from the environmental pit (swallet hole) situated outside the circle at depths of 2.0 and 2.2 m.

Processing and analysis

The samples were processed by flotation using a Siraf tank. The flots were collected on a 300 m sieve and the residue retained on a 1 mm mesh. This allows for the recovery of items such as small animal bones, molluscs and seeds.

The residues were fully sorted by eye and the abundance of each category of environmental remains estimated. The flots were scanned using a low power MEIJI stereo light microscope. Nomenclature for the plant remains follows the New Flora of the British Isles, 2nd edition (Stace, 2001). Apart from charcoal there were no other environmental finds. All pieces of charcoal over 4 mm in size were identified.

The cell structure of all the oak and non-oak identification samples was examined in three planes under a high power microscope and identifications were carried out using reference texts (Hather, 2000) and reference slides housed at the Worcestershire Historic Environment and Archaeology Service.

Results

A total of two hundred and sixty fragments of charcoal over 4 mm were identified from eleven samples from seven contexts of Neolithic date. The results are shown in Table 2. Both the number of pieces and the weight of each taxon identified were recorded.

Some of the samples could be identified to species level, either anatomically or because only one species of a genus was likely to have been present on the site at the time of deposition. Identification has been taken only to genus level in cases where there is more than one native species of a genus and the cell structure of these is very similar (e.g. *Quercus* sp).

Site		**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**PC1 08**	**Totals**
Context	**Common name**	**1007**	**1010**	**1010**	**1010**	**1010**	**1010**	**1012**	**1013**	**1013**	**Env pit**	**Env pit**	
Sample number		**4**	**1**	**2**	**3**	**7**	**8**	**5**	**6**	**9**	**2**	**2.2**	
Description													
Species													
Quercus sp.	Oak	2 (<0.1)	20 (0.2g)	8 (0.1g)	10 (0.1g)	26 (0.7g)	27 (0.8g)	1 (<0.1g)	3 (<0.1g)	82 (1.3)	32 (0.6g)	39 (0.8g)	**250 (4.9)**
Acer campestre	Field maple							4 (0.1g)					**4 (0.1g)**
Corylus avellana	Hazel							2 (<0.1g)					**2 (<0.1g)**
Maloideae	Apple/pear/white-beam/ hawthorn											1 (<0.1g)	**1 (<0.1g)**
Unidentifiable		3 (<0.1g)											**3 (<0.1g)**
Total no. of pieces		**5**	**20**	**8**	**10**	**26**	**27**	**7**	**3**	**82**	**32**	**40**	**260**
Total weight (g)		**<0.1**	**0.2**	**0.1**	**0.1**	**0.7**	**0.8**	**0.1**	**<0.1**	**1.3**	**0.6**	**0.8**	**4.9**

Table 2. *Charcoal from Priddy Circle 1.*

Other identifications included more than one species of a genus because similarities in the wood structure make it difficult to separate them to species level (e.g. *Maloideae*).

Of the 260 fragments of charcoal identified from the eleven samples, 250 pieces were of oak (*Quercus* sp.) heartwood. This taxon was found in all of the contexts analysed. Four pieces were identified as maple (*Acer* sp.) and all four pieces were from the buried soil (1012). As there is only one native species of maple in the British Isles it can be identified as field maple (*Acer campstre*). Two pieces of hazel (*Corylus avellana*) were also identified from the buried soil (1012). One piece of *Maloideae*, (this category includes apple (*Malus* sp.), white-beam (*Sorbus* spp.), pear (*Pyrus* sp.) and hawthorn (*Crataegus* spp.) was also identified from the lowest sample (2.2 m) of the environmental pit. It is most likely that this is hawthorn (*Crataegus* spp.). Three pieces from the fill (1007) of the posthole (1006) were too distorted and could not be identified.

The dominance of oak charcoal along with smaller quantities of field maple, hazel and *Maloideae* suggests that oak woodland was present in the landscape with open scrub in the vicinity of the monument. There is no evidence for woodland management.

THE RADIOCARBON DATES
Peter Marshall

A total of three samples were submitted to the University of Oxford Radiocarbon Accelerator Unit for AMS dating. A further sample from the swallet was submitted, but problems with the sample have meant that this date will be published separately, in the next *Proceedings.*

The three samples of charcoal submitted for radiocarbon dating from Priddy Circle 1 comprised *acer* charcoal from the buried soil below the bank (context 1012) and *quercus* charcoal from the upper and primary fills of the ditch (contexts 1010 and 1013). The charred material was pretreated using an acid-alkali-acid wash (Hedges, *et al* 1989). Following pre-treatment the samples were combusted to produce carbon dioxide (Hedges, *et al* 1992) then graphitised (Dee and Bronk Ramsey, 2000) prior to being measured by AMS (Bronk Ramsey, *et al* 2004)

The laboratory maintains a continual programme of quality assurance procedures, in addition to participation in international inter-comparisons (Scott, 2003). These tests indicate no laboratory offsets and demonstrate the validity of the measurement quoted.

The results are conventional radiocarbon ages (Stuiver and Polach, 1977), and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra, 1986).

The calibrations of these results, which relate the radiocarbon measurements directly to the calendrical time scale, are given in Table 3 and in Figure 12. All have been calculated using the datasets published by Reimer, *et al* (2009) and the computer program OxCal v4.1 (Bronk Ramsey, 1995; 1998; 2001; 2009). The calibrated date ranges cited are quoted in the form recommended by Mook (1986), with the end points rounded outward to 10 years. The ranges in Table 3 have been calculated according to the maximum intercept method (Stuiver and Reimer, 1986); the probabilities presented in Figure 12 are derived from the probability method (Stuiver and Reimer, 1993).

Laboratory Code	Sample ID	Material	$\delta^{13}C$ (‰)	Radiocarbon age (BP)	Calibrated date (95% confidence)
OxA-21939	PC108 1010 <8>	Charcoal, *Quercus*. sp.	-25.2	4113±33	2880-2500–cal BC
OxA-21940	PC108 1013 <9>	Charcoal, *Quercus*. sp.	-23.7	4271±32	2920-2870–cal BC
OxA-22023	PC108 1012 <5>	Charcoal, *Acer*. sp.	-25.6	6246±36	5320-5700–cal BC

Table 3. *Calibrated radiocarbon measurements for Priddy Circle 1.*

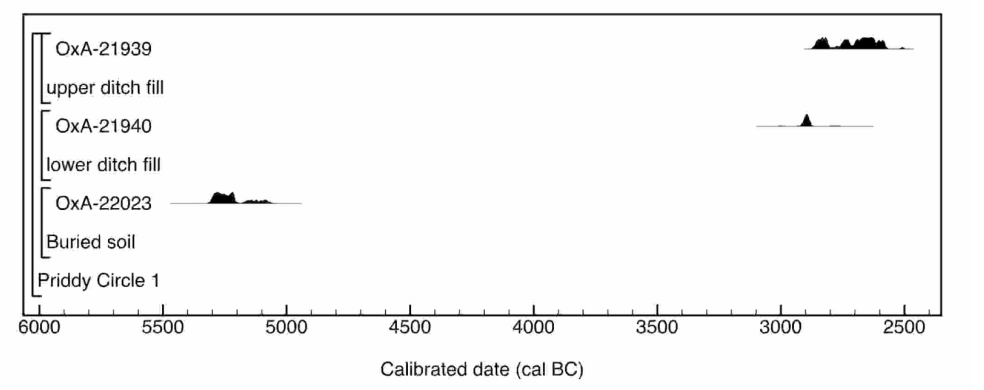

Figure 12. *Probability diagram for ^{14}C dates.*

DISCUSSION

The re-excavation of Cutting III has provided new information about the date and construction of Priddy Circle 1 and has added more detail to the understanding of the contemporary environment.

Charcoal recovered from the ditch suggests that this feature was open before *c.* 2870 cal BC. This does not, however, firmly date the *construction* of the monument, which, we suggest below, seems also to have been multi-phase. Dating oak heartwood charcoal from a ditch fill is also not ideal, due to the possible "old wood" effect and the potential for residuality. However, this was the only material found that could be dated and the fact that Tratman noted charcoal in the other ditch sections at the same level as that found here seems to indicate that this was not an isolated event but relates to an episode of burning significant enough to have resulted in the charcoal becoming part of the ditch sediments in all parts of the monument. It is possible that the charcoal resulted from the burning of timbers removed from the monument (see below) but it is not possible to prove this.

Although no finds were recovered from within or under the bank, the upper fill of the ditch contained flint which was largely Late Neolithic in character. This was confirmed by the radiocarbon dates from the ditch itself, which place the construction of the monument some time before 2870 cal BC. As such, the Priddy Circles fit within an emerging monument class of circular enclosures which date to the very beginnings of the third millennium BC. These monuments include the enclosure of Stonehenge itself and are characterised by external ditches and internal banks, and by their size. The enclosure at Stonehenge measures 110 m in diameter and is comparable to the 90 m of the monument at Llandegai A, Gwynedd (Lynch and Musson, 2001). A newly discovered cropmark site at Walton Court, Powys, also appears to fit this class of monument, having a diameter of 100 m and a radiocarbon date from the bottom of the ditch suggests construction before 2570 to 2300 cal BC (Anon, 2010). The Priddy Circles vary in diameter: Circle 1 has an external diameter of c. 180 m, Circle 2, 177 m, Circle 3, 178 m and Circle 4, 192 m, but all are comparable to the other large enclosures mentioned above. Both Stonehenge and Llandegai A were associated with cremated human remains. None were found at Priddy, but the small area excavated may be a factor here.

Figure 13. *The oblique arrowhead from the upper ditch fill.*

Whilst similar to these sites morphologically, the construction of the bank at Priddy has more in common with Blackshouse Burn, Lanarkshire (Lelong and Pollard, 1998). Here, a subcircular enclosure 300 m in diameter, was enclosed by a low stony bank. The sequence of construction appears to have comprised the erection of two radial rings of timber posts, with the bank built between them, revetted on its outer face with flagstones. The excavators were able to determine that the posts were erected before the bank; the flagstone kerb/revetment respected the postholes and indeed one slab had a notch which curved around a post. A radiocarbon date from outer heartwood of an oak post stump standing in the easternmost posthole on the bank's inner edge gave a date of the site of 2860 to 2400 cal BC (Lelong and Pollard, 1998, 41). Lelong and Pollard suggest that the large size, shape in plan and timber revetment/palisade at Blackshouse Burn lend themselves to comparison with henges such as Durrington Walls, Avebury and other large henge monuments of the Later Neolithic. The construction technique for phase 2 of the site is, however, a close analogy to that of Priddy Circle 1. The date of 2860 to 2400 cal BC also overlaps with those from Circle 1.

It is clear from the published sections that the Taylors did not fully excavate the ditch within Cutting III and the poor weather conditions during their excavations (noted in Tratman's site diaries) may account for this. The new excavations showed that a further 0.40 m of fill remained in the ditch here, which can now be seen to have more in common with the ditch as excavated in the other cuttings in the 1950s excavations. The ditch in Cutting I, for example, had three fills and was a total of *c.* 0.90 m deep, whilst the ditch in the Entrance Cutting also had three fills and measured just over 1.00 m deep. The outer ditch of Circle I therefore appears to be of uniform construction, with the same sequence of fills throughout its circuit.

The structure of the bank was also shown to differ from that suggested by Tratman and the Taylors. Whilst the turf core of the bank was revealed, the southern part of this was shown to contain large stones, mixed with the turf. This did not appear to resemble the dry stone wall in Tratmans Cutting I, but was rather a dump of stone and turf. This was not apparent in the northern part of the excavated area, where the turf core was poorly preserved. This appeared to be due partly as a consequence of active bioturbation reforming the bank into topsoil and partly to erosion, the bank being washed downslope towards the ditch, the resultant material forming a heavily iron panned layer above the natural. It can be suggested, therefore, that the stones in the southern section help to prevent erosion downslope, leading to better preservation in this area. This also suggests that the bank here is of different construction than suggested by Tratman and that as well as containing a turf bank and dry stone wall, at least part of the bank is formed of a turf-with-stone core. The area of transition between the turf and turf-with-stone construction techniques lay in the area of the Taylors' excavation and appears to have been removed by them during their excavation.

The core of the bank was abutted by two postholes, in addition to those seen by the Taylors (P6 and P7). The spacing of these postholes is similar to that of the postholes in Cutting I and appear to have been freestanding posts behind the turf-with-stone bank. The spoil from one of these postholes was preserved below the bank, suggesting that the posts predate the bank. This confirms that Tratman was correct in identifying posthole spoil beneath the bank in Cutting I and in the Entrance Cutting. However, what Tratman did not see, and what was clear from this excavation, was that the posts themselves were removed prior to the construction of a clay bank (1003)/(1004), which sealed their backfilled postholes.

No postholes were identified in front of the bank (although the ghost of the base of P6A was located in Trench R1). This is probably due to the spacing of the postholes, being offset from those in the interior of the monument and therefore lying just outside the trenches.

Similarly no small stakeholes, as found in the Entrance Cutting and described by Tratman as supporting hurdling, were located within the excavated areas.

Tratman (1967) suggested the following constructional sequence for the whole of Circle 1:

1. The erection of two concentric rings of posts, with some of the spoil from the postholes placed in discrete heaps underneath the bank structure. Dark central cores in the postholes were the remains of the posts, rotted *in-situ*.
2. Stakeholes driven in between the posthole between both inner and outer sets of postholes.
3. Small holes possibly representing hurdles, set behind the rows of postholes and larger stakeholes.
4. Drystone walls constructed behind the hurdles, with slight recesses showing that the postholes must have been dug before its construction. In the south-east quadrant of the Circle, the drystone walls were replaced by low walls of turves.
5. Stones placed within the drystone walls.
6. Ditch dug outside of the bank, apparently in a continuous trench and the earth from the ditch placed over the stones in between the drystone walling.

The new excavations suggest a different sequence for this part of Circle I. A simplified version is:

1. The erection of inner and outer circles of timber posts, with spoil from the postholes placed between them. No evidence for the rotting *in-situ* of posts in this part of the monument and also no stake or hurdle holes.
2. The construction of a turf and turf-with-stone bank between the timber circles, sealing the posthole spoil.
3. Removal of the post circles and construction of a clay bank either side of turf core, sealing the postholes. Ditch also dug during this phase?

We cannot be certain when the ditch was dug, although it is likely to have provided the clay for the second phase of bank construction and is presumably contemporary with this. The sequence of construction is unusual, as it would be difficult to construct the turf bank between the upright timbers, although here the gaps between the posts were sufficiently large to allow this, especially as no evidence for hurdling was found. Whatever the mechanics of the operation, the presence of discrete patches of spoil from the postholes beneath the bank proves that no great length of time elapsed between the erection of the posts and the construction of the bank: the small spoil heaps would not have survived intact if not quickly sealed by the bank material.

Tratman argued that the posts, stakes and hurdles rotted *in-situ* as the holes contained darker cores, shown on several photographs in the 1967 report. However this interpretation is wrong. What Tratman actually witnessed were post pipes, formed by the deliberate removal of a post/stake and the filling of the resulting void with soil, a natural process. This is supported by the fact that his putative "rotten posts/stakes" were only evident in the post/stake *hole* and not in the bank structure that he argued slipped around the posts. No evidence for posts rotting *in-situ* or post pipes were found during the new excavations, although it is not inevitable that post pipes will always form. However, what the results of the new excavations, together with the photographs in the 1967 publication, prove is that the timbers were deliberately removed

and their locations "hidden" by the construction of a new clay bank, placed either side of the stone/turf bank structure. Tratman suggests that this clay bank represented material from the ditch which was placed over the stone/turf bank and that this slipped either side of it and around the timbers. The new excavations show that that this clay rather than slipping was deliberately placed either side of the bank, covering the postholes: none was found on top of the turf bank. This interpretation is supported by some of Tratman's published plans and sections: his illustrations of the entrance cuttings show no clay *above* the earlier bank but instead both sides of the structure, covering the postholes, just as was found during the new excavations.

The reasons behind this complex construction technique are difficult to explain. A prosaic explanation may be that the timbers were decaying and the primary bank structure becoming unstable and thus the timbers were removed and a ditch dug to provide material to stabilise the primary bank. However, the making, unmaking and remodelling of Neolithic ritual and funerary monuments is well-documented and may be the result of social rather than functional concerns. Bailey and McFadyen (2010) have drawn attention to the dynamic nature of prehistoric architecture and argue that it can be viewed as a process rather than an a fixed entity, with Neolithic constructions resulting from discontinuous and episodic activities that could be altered and changed depending on how it suited the needs of the time. Moreover, interpreting the changing architecture at Priddy Circle 1 only functionally ignores the significance of the ditches of Neolithic monuments. The ditches of both Earlier and Later Neolithic monuments are often found to contain highly structured deposits which can include human remains, animal bones, tools and weapons, axeheads and pottery (see for example Wainwright, 1989), though no such deposits were found at Circle 1. They can also act to define or reiterate the special nature of the space inside and even restrict access to it. Ditches then, are not only functional in that they provide material for the construction of banks or mounds, but they also become an important part of the architectural experience of the monument and have their own symbolic associations. It should also be considered whether the removal of the timbers and concealment of their position, the excavation of the ditch and the construction of a new earth bank at Circle 1 was a way of changing the associations of the site. We have drawn chronological and morphological comparisons with Stonehenge Phase I and Llandegai A and highlighted that these sites may have links with the deposition of human remains. If the Priddy Circles were also associated with the treatment/deposition of the dead (and rituals associated with these) then the remodelling of the monuments may have been a way of signifying the beginning or end of such practices.

The excavation of a test pit within a swallet adjacent to Circle 1 allowed the assessment of a long sediment sequence and led to the recovery of burnt and unburnt flint, as well as oak charcoal. This shows that some swallets have the potential to provide a long Holocene palaeo-environmental sequence for Mendip, unprecedented for the region and further work on this material is currently underway.

There remain a number of outstanding questions about the Priddy Circles. The most important is, perhaps, the contemporaneity of the monuments: were all four constructed at the same time and, if not, what was their sequence? Did each have the same function? Were similar construction techniques used in all of the Circles? This also has important repercussions for monument preservation, as the work reported here has shown that turf wall sections of bank are extremely vulnerable to damage by vegetation growth (particularly bracken). While Tratman excavated a single, long, trench across the interior of Circle I the way in which this was carried out (by a front-acting bucket on a tracked mechanical excavator) means that it is unlikely that features would have been visible, if present. The presence of internal features in any of the circles therefore remains unproven. As has been stated, other enclosures of similar date are

associated with human cremation burials. There remains the possibility that this is also true of the Priddy Circles.

The areas between and around the circles also remain relatively unexplored, though Lewis (2007) has suggested that the large gap between Circles 3 and 4 may be explained by the presence of a pre-existing route way, in use since at least the Late Mesolithic. Moreover, whilst the Priddy Circles are surrounded by one of the highest concentrations of round barrows on Mendip, the relationships between these monuments is poorly understood. As Stanton (1986) noted, this part of the Mendip plateau also contains very high numbers of swallets and sinkholes and Lewis (2003; 2005) has argued that the placement of the Priddy Circles was intrinsically linked to this density of swallets. The authors hope to establish a larger research project investigating the other circles, the circles-round barrow relationships, the wider vegetational history of the area and the landscape itself in order to better understand the prehistory of this very special place.

CONCLUSIONS

The new excavations at Priddy Circle 1 were successful in retrieving material for radiocarbon dating and palaeo-environmental analysis. Importantly, dating has revealed that Circle 1 was constructed at the beginning of the Later Neolithic and the artefactual evidence supports this. The palaeo-environmental results confirm Dimbleby's original assertion that the Circles were built in an open grassland environment. The constructional sequence proposed by Tratman has been shown to be incorrect and we now know that the bank of the monument was built in two distinct stages. This remodelling of the monument may have been necessitated by the decay of the first bank phase or could have been linked to a change in its perception or function. Although no evidence was found irrevocably proving what Circle 1 was used for, chronological and morphological similarities between it and other sites in Britain suggest that it belongs to a rare type of Late Neolithic ritual monument, predating henges, and may have been associated with the dead.

ACKNOWLEDGEMENTS

We would like to thank the Mendip Society, the Maltwood Fund, the Society of Antiquaries, the Prehistoric Society and the University of Worcester for providing funds for the excavation and post-excavation analysis. The referees provided helpful comments which have made this a stronger report and Graham Mullan has been patient and supportive throughout. Jimmy and Sharon Sparks gave permission to excavate on their land and Rupert Firbank graciously allowed access across his land to site. Bob Croft, County Archaeologist for Somerset, was enthusiastic about the project from the outset and Rob Iles and Vanessa Straker of English Heritage are thanked for their help with the project design and SMC. Sarah Baker (formerly University of Worcester) and Elaine Jamieson (English Heritage) carried out the new earthwork survey of Circle 1 and graciously allowed us to reproduce it here. Mark Bowden, Graham Brown and Elaine Jamieson of English Heritage also trained the students in survey techniques over two (mercifully sunny) days, for which many thanks. The Wessex Cave Club provided accommodation and moral support. Finally, the students of University of Worcester and old hands (Chris Castle) are thanked profusely for working extremely hard and putting up with the very poor weather and the resulting stress this caused!

REFERENCES

ALLEN, M.J., 2008. Priddy Circle 1 (PDC1 08); Palaeo-environmental Reporting 1. Unpubl. project manuscript, AEA 047.01. September 2008.

ANON., 2010. *Even bigger prehistoric circles.* Clwyd-Powys Archaeological Trust Newsletter. Autumn 2010.

BAILEY, D. and McFADYEN L., 2010. Built Objects. *in* Hicks, D and Beaudry, M (eds). *The Oxford Handbook of Material Culture Studies*. Oxford. Oxford University Press.

BELL, M.G., 1984. Environmental archaeology in South West England. *in* Keeley, H.C.M. (ed.), *Environmental Archaeology; a regional review*. London, Department of the Environment, Directorate of Ancient Monuments and Historic Buildings Occasional Paper. **6.** 43-133.

BELL, M.G., 1987. Recent mollusc studies in the South West. in Balaam, N.D., Levitan, B. and Straker, V. (eds). *Studies in palaeoeconomy and environment in South West England.* Oxford, British Archaeological Report (British Series). **181.** 1-8.

BENNETT, K. D., WHITTINGTON, G. and EDWARDS, K.J., 1994. Recent plant nomenclatural changes and pollen morphology in the British Isles. *Quaternary Newsletter.* **73.** 1-6.

BRONK RAMSEY, C., 1995. Radiocarbon calibration and analysis of stratigraphy: the OxCal program. *Radiocarbon*. **37.** 425–430.

BRONK RAMSEY, C., 1998. Probability and dating. *Radiocarbon.* **40.** 461–474.

BRONK RAMSEY, C., 2001. Development of the radiocarbon calibration program. *Radiocarbon.* **43.** 355–363.

BRONK RAMSEY, C., 2009. Bayesian analysis of radiocarbon dates. *Radiocarbon*. **51.** 337–360.

BRONK RAMSEY, C., HIGHAM, T. and LEACH, P., 2004. Towards high precision AMS: progress and limitations. *Radiocarbon*. **46.** 17-24.

DEE, M. and BRONK RAMSEY, C., 2000. Refinement of Graphite Target Production at ORAU. *Nuclear Instruments and Methods in Physics Research* **B 172**. 449–453.

DIMBLEBY, G.W., 1985. *The Palynology of Archaeological Sites*. London. Academic Press.

DIMBLEBY, G.W., 1967. Pollen analysis, in Tratman, E.K., The Priddy Circles, Mendip, Somerset, henge monuments, *Proceedings of the University of. Bristol Spelaeological Society.* **112.** 121-122.

ENGLISH HERITAGE. 2002. *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation.* Centre for Archaeology Guidelines.

EVANS, J.G., 1972. *Land Snail in Archaeology.* London. Seminar Press.

FARRANT, A.R. 2008. *A walker's guide to the geology and landscape of western Mendip.* Book and map at 1:25 000 scale. Keyworth, Nottingham: British Geological Survey.

FINDLAY, D.C., COLBOURNE, G.J.N., COPE, D.W., HARROD, T.R., HOGAN, D.V. and STAINES, S.J. 1983. *Soils of England and Wales. Sheet 5, South West England*. Southampton: Ordnance Survey.

FINDLAY, D.C., COLBOURNE, G.J.N., COPE, D.W., HARROD, T.R., HOGAN, D.V. and STAINES, S.J. 1984. *Soils of England and Wales. Sheet 5, South West England*. Rothampstead: Soil Survey of England and Wales.

HATHER, J.G., 2000. *The identification of the Northern European Woods. A guide for archaeologists and conservators.* Archetype Publications.

HEDGES, R E M., BRONK, C R, and HOUSLEY, R A., 1989. The Oxford Accelerator Mass Spectrometry facility: technical developments in routine dating. *Archaeometry*. **31.** 99–113.

HEDGES, R E M., HUMM, M J., FOREMAN, J., Van KLINKEN, G. J., and BRONK, C. R., 1992 Developments in sample combustion to CO2, and in the CO2 ion source system, *Radiocarbon*. **34.** 3. 306-311.

HODGSON, J.M., 1967. *Soil Survey Field Handbook.* Harpenden, Soil Survey Technical Monograph 5.

LEWIS, J., 2007. Experiencing the Prehistoric Landscape of Somerset. *in* Costen, M. (ed.) *People and Places: essays in Honour of Mick Aston*. Oxford. Oxbow Books.

LEWIS, J., 2005. *Monuments, Ritual and Regionality: The Neolithic of Northern Somerset.* BAR British Series 401. Oxford. Archaeopress.

LEWIS, J., 2000. Upwards at 45 degrees: the use of vertical caves during the Neolithic and Early Bronze Age on Mendip, Somerset. *Capra* **2.** available at - http://capra.group.shef.ac.uk/2/upwards.html

LYNCH, F. and MUSSON, C., 2001. A Prehistoric and Early Medieval Complex at Llandegai, near Bangor, North Wales. *Archaeologia Cambrensis*. **150.** 17-142.

MOOK, W. G., 1986 Business meeting: Recommendations/Resolutions adopted by the Twelfth International Radiocarbon Conference. *Radiocarbon.* **28.** 799.

MOORE, P.D. and WEBB, J.A., 1978. *An illustrated guide to pollen analysis*. London. Hodder and Stoughton.

MOORE, P.D., WEBB, J.A. and COLLINSON, M.E., 1991. *Pollen analysis*. Second edition. Oxford. Blackwell Scientific.

REIMER, P J, BAILLIE, M G L, BARD, E, BAYLISS, A, BECK, J W, BLACKWELL, P G, BRONK RAMSEY, BUCK, C E, C, BURR, G, EDWARDS, R L, FRIEDRICH, M, GROOTES, P M, GUILDERSON, T P, HAJDAS, I, HEATON, T J, HOGG, A G, HUGHEN, K A, KAISER, K F, KROMER, B, MCCORMAC, F G, MANNING, S W, REIMER, R W, RICHARDS, D A, SOUTHON, J R, TALAMO, S, TURNEY, C S M, VAN DER PLICHT, J, and WEYHENMEYER, C E., 2009. IntCal09 and Marine09 radiocarbon age calibration curves, 0–50,000 years cal BP. *Radiocarbon.* **51.** 1111–1150.

SCOTT, E. M., 2003. The Third International Radiocarbon Intercomparison (TIRI) and the Fourth International Radiocarbon Intercomparison (FIRI) 1990–2002: results, analysis, and conclusions. *Radiocarbon*. **45.** 135–408.

STACE, C., 2001. *New Flora of the British Isles*. Cambridge. Cambridge University Press. (2nd Edition).

STACE, C., 1992. *New flora of the British Isles.* Cambridge. Cambridge University Press.

STUIVER, M., and KRA, R. S., 1986. Editorial comment *Radiocarbon*. **28.** ii.

STUIVER, M., and POLACH, H. A., 1977. Reporting of 14C data, *Radiocarbon.* **19.** 355–363.

STUIVER, M., and REIMER, P. J., 1986. A computer program for radiocarbon age calibration. *Radiocarbon.* **28.** 1022–1030.

STUIVER, M., and REIMER, P. J., 1993. Extended 14C data base and revised CALIB 3.0 14C calibration program, *Radiocarbon.* **35.** 215–230.

STANTON, W., 1986. Natural sinkholes affecting the Priddy Circles, Mendip, *Proceedings of the University of Bristol Spelaeological Society*. **17.** 3. 355-358.

STOCKMARR, J., 1971. Tablets with spores used in absolute pollen analysis. *Pollen et Spores*. **13.** 614-621.

TAYLOR, J. and TRATMAN, E.K., 1956. The Priddy Circles Preliminary Report. *Proceedings of the University of Bristol Spelaeological Society.* **8.** 1. 7-17.

TRATMAN, E.K., 1967. The Priddy Circles, Mendip, Somerset - henge monuments *Proceedings of the University of Bristol Spelaeological Society.* **11.** 2. 97-125.

WAINWRIGHT, G., 1989. *The Henge Monuments*. London. Thames & Hudson.

WEBSTER, C.J., 2007. *The Archaeology of South-West England. Resource Assessment and Research Agenda.* Somerset County Council.

Dr Jodie Lewis BA, MA
University of Worcester

Mr David Mullin BA, MPhil
University of Reading

Dr Michael J Allen, MIFA, FLS, FSA
Bournemouth University

Dr Peter Marshall
English Heritage

Dr Rob Scaife
University of Southampton

Dr Alan J Clapham
Worcestershire Historic Environment and Archaeology Service