

A477(T) SAGESTON-REDBERTH BYPASS

EXCAVATION OF A NEOLITHIC OCCUPATION SITE 2001



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By

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**A477(T) SAGESTON-REDBERTH BYPASS
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SUMMARY

Excavations ahead of the construction of the A477(T) Redberth-Sageston Bypass, Pembrokeshire, revealed extensive evidence of Neolithic activity, which included part of a hut or round house, two windbreak-like structures and possibly domestic hearths. Seven radiocarbon dates were obtained from charcoal samples, which suggested two main phases of activity; the early to mid Neolithic and the later Neolithic to early Bronze Age. Later activity is indicated by a single late medieval date obtained from a pit.

Although the exact nature of the Neolithic activity at Redberth is uncertain, the structures and hearths suggest some domestic occupation. The evidence is similar to many other Neolithic sites in Wales, with scatters of stakeholes, postholes and pits indicating periodic rather than permanent occupation. Very limited environmental evidence was recovered, which indicates a Neolithic landscape characterised by oak woodland with areas of grassland and heath.

The fragmentary and often ephemeral nature of the evidence may perhaps be a significant reason for the general lack of Neolithic occupation sites in southwest Wales and beyond.

INTRODUCTION

Construction work on the long-proposed Redberth-Sageston bypass, a section of the A477(T) St. Clears to Pembroke road, Pembrokeshire, began in May 2001. A programme of archaeological works had been previously initiated to define and investigate a preferred route. This included a desk-based assessment (Ludlow and Murphy 1995) and some targeted geophysical survey and palaeoenvironmental sampling at several sites along the route. The results of the geophysical investigations indicated the presence of potential archaeological features at two sites, one at Redberth (centred on SN08100380) and one near Sageston village (centred on SN05900320). A field evaluation carried out to investigate the geophysics results revealed extensive features at the Redberth site, but nothing of archaeological interest at Sageston, where the geophysical anomalies were caused by local geological conditions. Therefore, this report deals exclusively with the results from the Redberth site.

It was originally intended to carry out the field evaluation and any mitigatory excavation ahead of the road construction works so the site would be clear when

construction started. However, the outbreak of the foot-and-mouth epidemic in early 2001 coincided with the intended start date for the evaluation, which had to be put on hold until the situation regarding the spread of the disease was properly assessed. In practical terms this meant that the time available for the evaluation was compressed, and eventually the evaluation and construction works started at the same time. Because of these timing problems the main contractor, Edmund Nuttall Ltd., supplied the machinery necessary to undertake site stripping as quickly as possible. Close liaison with the contractors and Hyder throughout the project ensured that the resources necessary for the excavation were always available, and that any delays to the overall construction programme were minimised.

The fieldwork was carried out by Cambria Archaeology Field Operations during May and June 2001. The project, including the post-excavation reporting, was funded by The Welsh Assembly Transport Directorate through the design build team Edmund Nuttall Ltd/Arup. Hyder acted as overall project managers on behalf of the Welsh Assembly, and they employed CgMs Consulting as their archaeological consultants to monitor and advise on the progress of the fieldwork. Cadw: Welsh Historic Monuments acted as the statutory archaeological advisors to the Welsh Assembly.

THE BYPASS ROUTE (Fig. 1)

The new road line runs from east of Redberth to Milton, bypassing the villages of Redberth and Sageston. The selected route follows the broad valley of the Carew River, which flows westward across an extensive peneplain. The plain has an undulating topography cut by several, generally northward flowing streams and rivers. From a low point near sea level at its western end, between Milton Marsh and Carew River, the route rises gently to c.50m OD at Redberth. Pre-bypass landuse was largely pasture with some areas of arable cultivation.

The route crosses a mixed geology comprising bands of the Upper Coal Measures in the east, which gives way to Millstone Grit and Carboniferous Limestone to the west, and Old Red Sandstone to the south and west. The area of limestone has produced a more undulating landscape, with a number of swallow holes (Ludlow and Murphy 1995, 16).

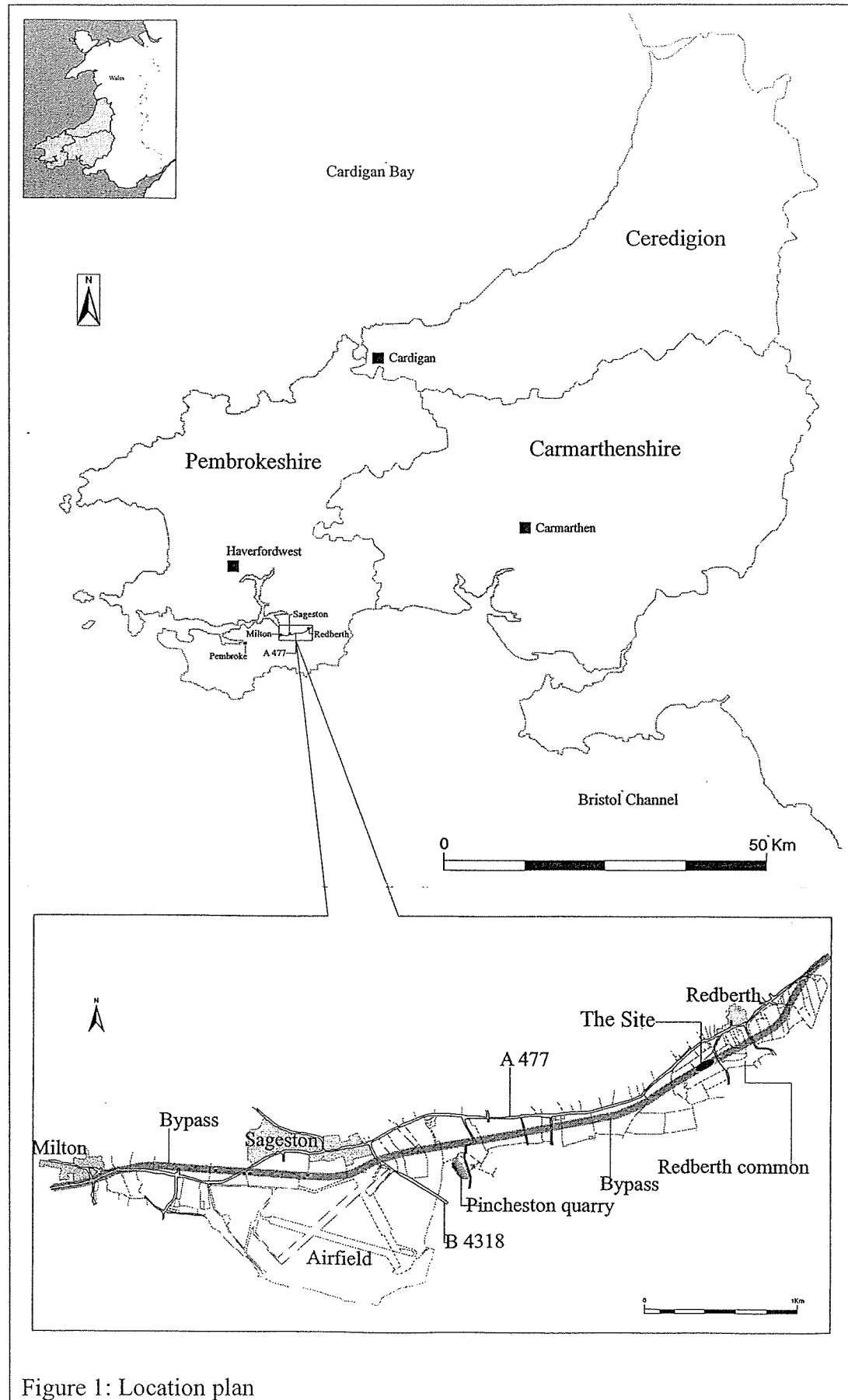


Figure 1: Location plan

The site: location and topography

The site was located just south of the village of Redberth on the western edge of what was the former village Common. It occupied a gentle southwest facing hillslope, which was part of a field known as Kitt's Park on the Redberth parish tithe map and apportionment of 1841-2. The field at the time of the excavation was under pasture, although it had been regularly ploughed (see below).

A scheduled round barrow (Hoyles Barrow: PRN 14287¹; SAM Pe453²) is located c.100m to the northwest (fig. 2) and a large circular earthwork (PRN 30120), which may be a ring barrow, was recorded from aerial photographs some 10-20m north of the excavated area (Ludlow and Murphy 1995, 61). There was no surface indication of this site during the excavation, but together 30120 and 14287 suggest a Bronze Age burial complex, which may also have included some of the later features recorded in this excavation.

A large clay-filled sinkhole lies c.300m southwest of the site, just outside the southern boundary of the bypass route at SN07830364. Samples were recovered from close to the east side of the sinkhole for palaeoenvironmental analysis. They revealed a sequence 'consisting almost entirely of natural clays', although the upper deposit contained some charcoal flecking (Ludlow and Murphy 1995, 76), presumably from later agricultural activity. Samples were also taken from Milton Marsh c.4km to the west at (SN04220318), which revealed deposits of Old Red Sandstone silt and gravels overlying weathered Carboniferous Limestone bedrock. Neither site produced the hoped for environmental evidence (Ludlow and Murphy 1995, 76).

Natural landscape features such as sinkholes are increasingly being recognised as foci for activity during the prehistoric period. Sites from other areas are known to have been located close to sinkholes, which were sometimes used for the placement of structured deposits (Bradley 2000, 88). As noted above, samples from close to the Redberth sinkhole revealed little. Nevertheless, it may still have played a part in the location and use of the site and future sampling of the sinkhole deposits themselves may reveal archaeological deposits.

THE EXCAVATION

Method

The original evaluation at Redberth consisted of two trenches (T1 and T2), 27m x 2m and 16m x 2m (total area 86 square metres), positioned with reference to the results of the geophysical surveys carried out in 1995 (Fig. 2). This revealed extensive archaeological features and deposits in both trenches, most notably a stakehole structure in T1. It was agreed to extend both T1 and T2 slightly to further investigate specific features.

¹ PRN = Primary Record Number as recorded on the Sites and Monuments Record, held by Cambria Archaeology, Llandeilo, Carmarthenshire.

² SAM = Scheduled Ancient Monument number allocated by Cadw: Welsh Historic Monuments.

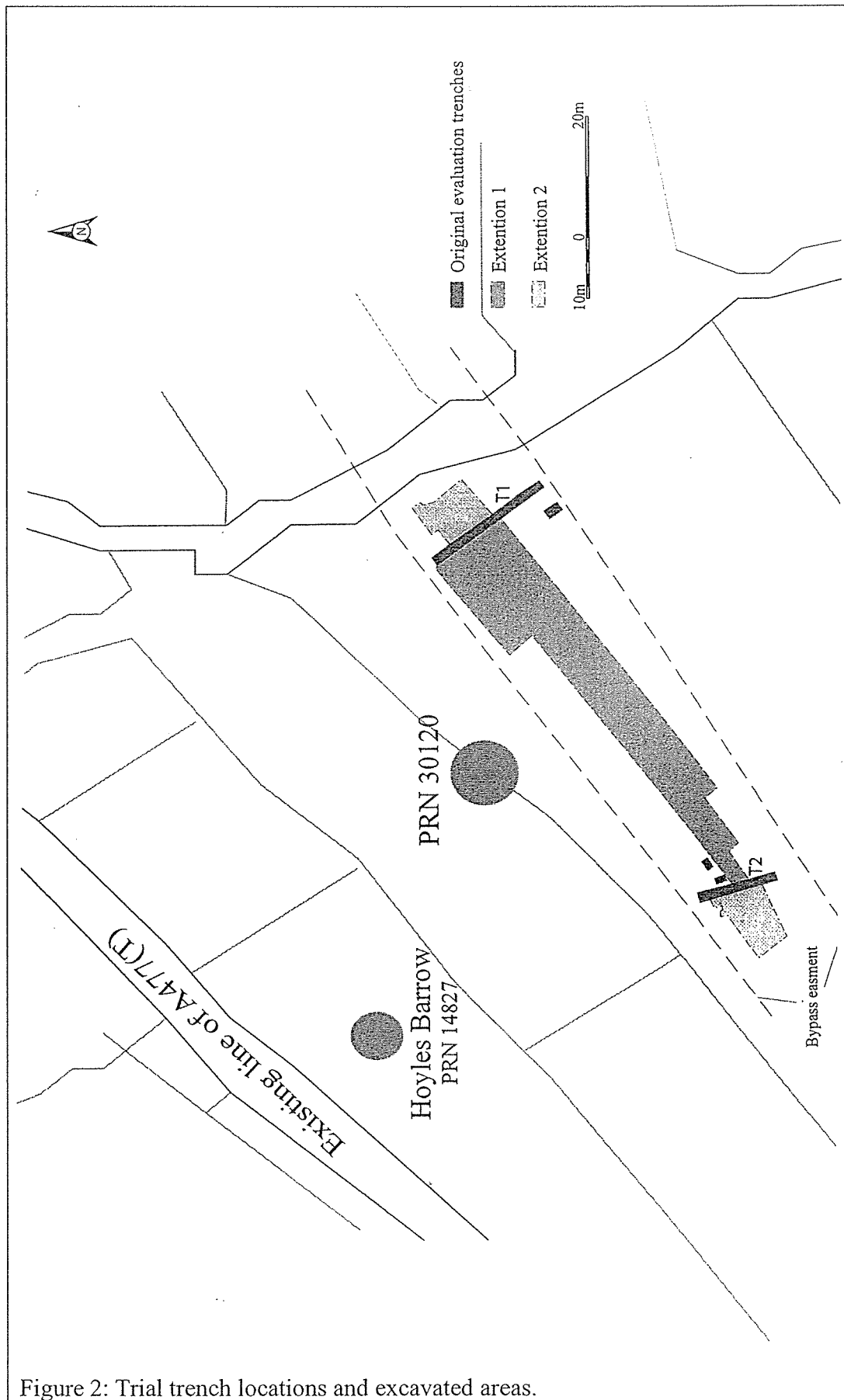


Figure 2: Trial trench locations and excavated areas.

This revealed more features confirming the potential of the site. Therefore, it was recommended by Cadw: Welsh Historic Monuments and Jim Hunter of CgMs, on behalf of the Welsh Assembly and Hyder respectively, that the area between the trial trenches be stripped. The topsoil was stripped mechanically to a depth of up to 0.5m over an area of 900 square metres and a large number of archaeological features were exposed. The density and complexity of the archaeological features necessitated additional extensions to the excavated area and a further 393 square metres were stripped, giving a total stripped area of 1,379 square metres (Fig. 2; Plate 1).

The nature of the evidence

Features were recorded over much of the stripped area. Nearly all were negative features cut into the subsoil, stakeholes, postholes, pits and ditches, but there were also several areas of apparently burnt material, possibly the bottoms of small hearths, or spreads of fire residue.

It became clear during the site stripping that the area had been deep ploughed, and the landowner later confirmed that the field had been ploughed regularly (almost annually) since his family acquired the farm in 1927. Ploughmarks were visible in several places across the site, often at a significant depth below the existing ground surface. This had truncated most, if not all of the features to a greater or lesser extent. As a consequence there were few clear stratigraphical relationships between features, although some vertical stratigraphy survived in one or two places. This, coupled with the radiocarbon dates obtained from charcoal samples recovered from several deposits has allowed the partial reconstruction of the relationships between some of the features. The radiocarbon dates (Table 1) range from the, early to middle Neolithic to the later Neolithic and early Bronze Age. Later activity is indicated by a single late medieval – early post-medieval date. Where mentioned in the text radiocarbon dates are calibrated at 2 sigma (95.4% probability).

Lab No. WK-	Sample	Context	Radiocarbon date	Calibrated date @ 2 sigma (95.4% probability)	Comments
10153	SR01-026	026	4656 ±67bp	3650BC- 3100BC	Charcoal from the secondary fill of linear pit 025.
10158	SR01-537	537	4965 ±57bp	3940BC- 3640BC	Charcoal from the fill of a post- hole (536) in posthole row 552.
10159	SR01-554	554	4791 ±57bp	3700BC- 3370BC	Charcoal from the fill of post- hole 553.
10154	SR01-502	502	3761 ±56bp	2400BC- 1970BC	Charcoal from the fill of a post- hole (512) in posthole row 505.
10156	SR01-517	517	4553 ±62BP	3500BC- 3030BC	Charcoal from a spread of burnt material.
10157	SR01-522	522	4024 ±68BP	2900BC- 2300BC	Charcoal from the fill of a small pit (523), just west of the hut circle.
10155	SR01-511	511	377 ±57BP	1430AD- 1640AD	Charcoal from the fill of a linear pit 510.

Table 1: Radiocarbon dates.

Because of the difficulty in distinguishing secure phases, for the following description the site will be divided into two: the west half and the eastern half. No stratified artefacts were recovered during the excavation, except for a small, unworked chert nodule from the fill of pit 544 and a residual sherd of 3rd or 4th century Roman pottery recovered from the post-medieval pit (510). A small assemblage of material ranging from the medieval to the early modern period was also recovered from the ploughsoil and topsoil.

THE WESTERN HALF OF THE SITE (Fig. 3)

The postholes

Row 552

Row 552 consisted of three postholes (536; 538; 540) and was aligned north-northeast – south-southwest (Plate 2). The postholes were *c.*2m apart and they varied in size and form. Both 536 and 538 were oval, 0.15 x 0.1m x 0.09m deep and 0.25m x 0.18m x 0.15m deep respectively, whereas 540 was slightly more irregular, 0.2m x 0.14m x 0.09m deep. They were all filled with grey stiff silty clay containing small angular stones. The fill (537) of 536 also contained charcoal fragments, which were identified as hazel (*Corylus avellana*) and oak (*Quercus* sp.) heartwood. The hazel fragments produced a radiocarbon date of 3940 – 3640 cal BC (Wk-10158).

Postholes 553 and 555

These postholes were *c.*2.2m apart and they had fairly similar surface dimensions, 0.2m x 0.17m (553) and 0.22m diameter (555), but 553, 0.36m deep, was more than double the depth of 555, 0.14m deep. Their forms varied, with 553 having vertical sides tapering to a pointed base, indicative of a driven post with a pencil-point, and 555 being less steeply sided and flat-bottomed.

The fills of these two postholes were very similar, a grey/brown silty clay containing small angular stones. The fill (554) of 555 contained a good assemblage of charcoal fragments, comprising hazel (*Corylus avellana*) and oak (*Quercus* sp.). The hazel charcoal produced a radiocarbon date of 3700 – 3370 cal BC (Wk-10159). Given that the other postholes in this area of the site were in recognisable rows it seems likely that there would have been other postholes associated with 553 and 555 outside the excavated area.

Row 551

This was a northeast – southwest row, *c.*7.25m long, of five postholes (524; 527; 530; 532; 534) located *c.*2.5m west of row 552 (Plate 2). Four of the postholes had similar surface dimensions, between 0.23m x 0.19m (534) and 0.3m x 0.25m (524), although there was some disparity between their depths which ranged from 0.07m (527) to 0.17m (534). These four postholes were positioned 1.8m - 2m apart, but the fifth (530) was located midway between (527 and 532). It was also much smaller than the others, 0.12m x 0.08m x 0.07m deep, suggesting that it may have been either a later addition, or possibly unrelated to the row.

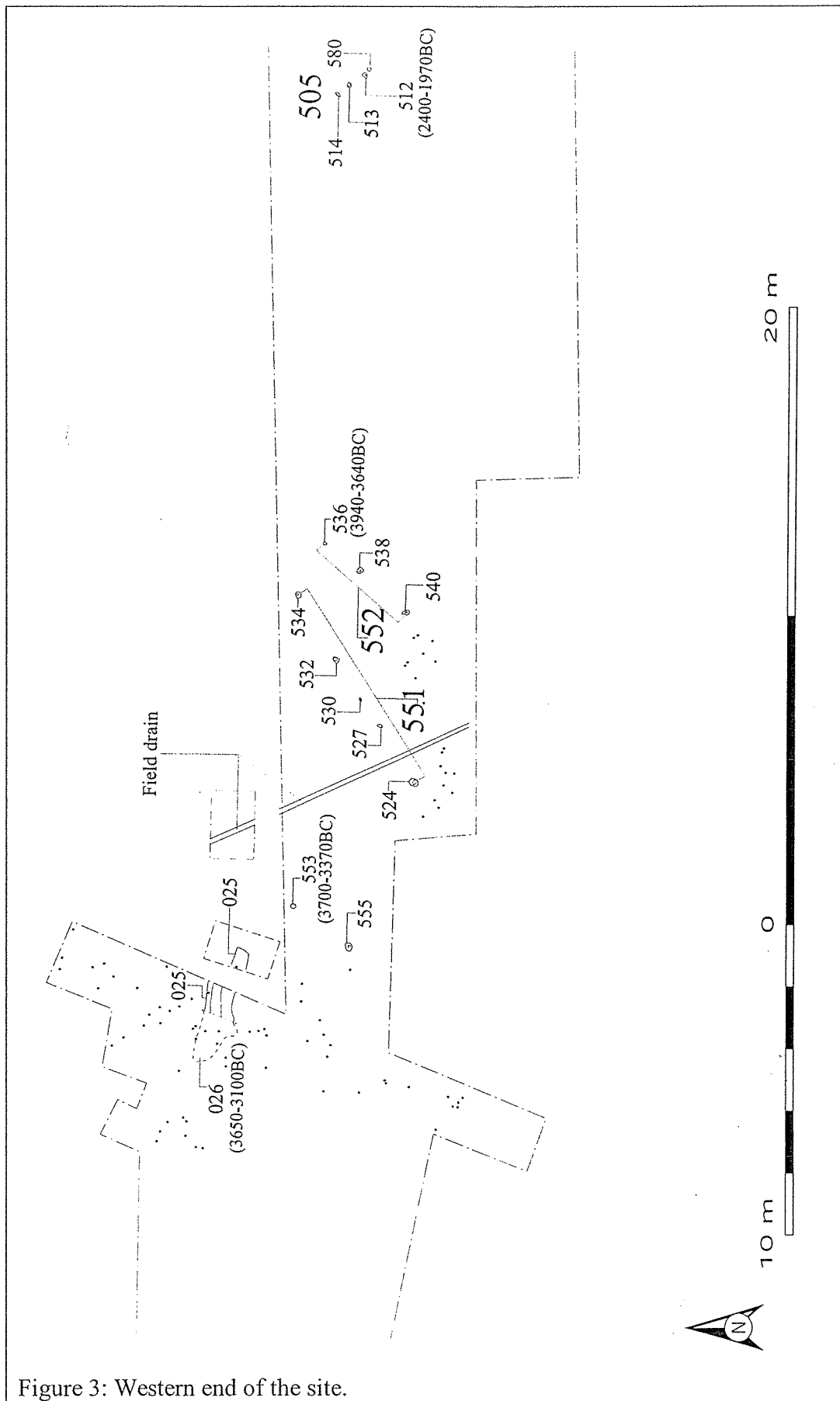


Figure 3: Western end of the site.

Two of the postholes (524 and 527) had clearly defined post-pipes, 0.15m and 0.14m diameter respectively, and 532 contained three medium sized angular stones that may have been packing for a post. The impression left by the removal of the posts from 524 and 534 were clear enough to show that the posts had pencil points. The west side of 534 was sloped, possibly indicating the direction from which the post was removed.

The fill (535) of 534 was a stiff silty brown clay that contained small angular stones and some fragments of charcoal, which were identified as oak (*Quercus* sp.) heartwood and therefore, unsuitable for radiocarbon dating. Possible charcoal staining was also noticed in the fill (528) of 527.

Although not dated, the proximity of row 551 to row 552 and postholes 553 and 555 suggests that it belongs to the early phase of the site.

Posthole row 505

Row 505 consisted of three definite postholes (512; 513; 514) and a possible posthole (581). This row measured 1.5m long in total and it was aligned northwest – southeast and located slightly west of centre of the excavated area. The postholes were of similar size, ranging between 0.15m diameter (580) and 0.19m x 0.17m (512) and from 0.08m (513) and 0.1m (512) deep. They were c.0.5m apart and all four were filled with mottled brown/orange clay with small angular stones and some charcoal fragments. The charcoal recovered from the fills was identified as oak (*Quercus* sp.), comprising mostly heartwood, but with some sapwood suitable for radiocarbon dating in the fills (502 and 504) of 512 and 514. The charcoal from fill 502 produced a radiocarbon date of 2400-1970 cal BC (Wk-10154).

The fact that only oak charcoal was recovered from these postholes may indicate structural timbers burnt *in situ* rather than fuel debris.

Linear pit 025

Pit 025 was aligned east – west and, even though it was fairly irregular in plan, it measured overall 2.5m x 0.8m x 0.4m deep (Plate 3). The sides of the pit were steep, almost vertical in places and its ends were rounded. The east end narrowed considerably, from its widest point and it was 0.4m wide. It contained two fills. Its primary fill was a grey silty clay that contained very few small angular stones (027). This layer was confined to the bottom 4-5cm and represents silting in the base of the open pit. The main, secondary fill was a layer of very mottled grey and brown silty clay (026). This layer was much more clayey than the other soils on the site, and it had a thick, buttery consistency. It contained a fairly high proportion of small to medium angular stones and areas of manganese staining. This layer was noticeably stonier along its northern edge. Hazel (*Corylus avellana*) charcoal was recovered from towards the base of fill 026, which gave a radiocarbon date of 3650 – 3100 cal BC (Wk-10153). An intermittent hard orange and black iron panning deposit had accumulated down the north side of the cut caused by groundwater seeping down between the side of the pit and the looser fill deposit 026.

The stakeholes

Stakeholes were the most numerous features on the site. Over three hundred were recorded from across the site, seventy-eight of which were at the west end of the site. Whilst there were no identifiable structures in this part of the site, there were definite groups and linear alignments, one of which consisted of at least seven stakeholes and cut the surface of the fill (026) of pit 025. Also, one semi-circular arrangement of six stakeholes and two trapezoidal groups of four were identified. See below for a discussion of the stakeholes.

The western half of the site: interpretation

The evidence from the west half of the site was fragmentary and showed no coherence. There was no definitive evidence for any structures in this part of the site, although the posthole rows 551 and 552, along with the postholes 553 and 555, may have been parts of rectangular post-built houses, of a type found on other sites in Wales and elsewhere. Whatever their function, the radiocarbon dates obtained from the fill of the posthole in row 552 and from the fill of posthole 555 suggests roughly contemporary activity during the early Neolithic. The more isolated posthole row (505) may relate to a different phase of activity and this is supported by the early Bronze Age radiocarbon dates.

The general proliferation of pits towards the southeastern quadrant of the site and the fact that they were apparently back-filled fairly rapidly will be discussed below, but it is worth emphasising the point that linear pit 025 was left open for some time before it was filled. Even though its purpose has not been established, it was the only pit on the site that showed evidence of being left open for any length of time. Four to five centimetres of silt (027) had accumulated in the base of the pit before it was filled with layer 026. Why pit 025 should have been treated differently, and have such a different form, from the others on the site is not clear.

THE EASTERN END OF THE SITE (Fig. 4)

Pit 544 and associated features (Figs. 4 and 5)

Description

Pit 544 was a sub-rectangular feature, 1m x 0.9m x 0.25m deep, with rounded corners and a slightly curved northern end. It tapered towards the northern end, which was c.0.5m wide. The sides of the pit were near vertical. The base of the pit was reasonably flat, but it rose to a shelf, c.0.3m wide, in the southeast corner. The pit was filled with a very mixed layer of dark yellowish brown silty clay mottled with grey silty clay patches (545). The fill was very stony, with c.40% medium sized angular stones, a lesser amount of small angular stones and a small amount of oak (*Quercus* sp.) heartwood charcoal, which was unsuitable for radiocarbon dating. An unworked chert nodule was also recovered from 545.

The south end of the pit fill (545) was covered by a small irregular spread, 0.4m x 0.3m x 0.02m thick, of apparently burnt material, consisting of orange/grey silty clay with some charcoal staining (518). There were several other areas of similar material in this area of the site, which will be discussed below. When excavated, the charcoal in 518 was completely degraded and it was, in fact, more like staining than proper charcoal flecks or lumps and was therefore not recovered.

An irregular spread, c.1.2m x 1m, of very mixed reddish brown silty clay (573) extended west from the edge of 544. This spread was visible in the west side of 544, suggesting that it was perhaps filling a cut feature. Investigation of this spread was inconclusive, excavation showed that it was not in a definite cut feature, rather its edges seemed to merge into the surrounding subsoil in the same way as several other features in the original evaluation. It may be that 573 was filling a grubbed out tree bole, hence its rather amorphous nature, or it may have been the result of some other process that resulted in a discolouration of the subsoil.

A number of stakeholes surrounded the area of 544, and even though it was not possible to directly link any to the use of the pit, five of them appeared to form a semi-circular arrangement, the northwest end of which cut pit fill 545 and was, therefore, obviously later.

Interpretation

There was no evidence in either the form of the pit or in the nature of its fill to suggest a possible former function, although its plan was distinctive and unlike any of the other pits on the site. It was larger and squarer than the pits in the group towards the southeast end of the site.

This was one of the very few areas on the site where any vertical stratigraphy survived. The pit was clearly earlier than the burnt material 518 that overlay its south end and the stakeholes that cut its fill. Like the majority of the other pits on the site it did not exhibit any primary silting or weathering of the sides, suggesting

that it may have been excavated and then backfilled fairly rapidly. However, it may have been cleaned shortly before it was backfilled.

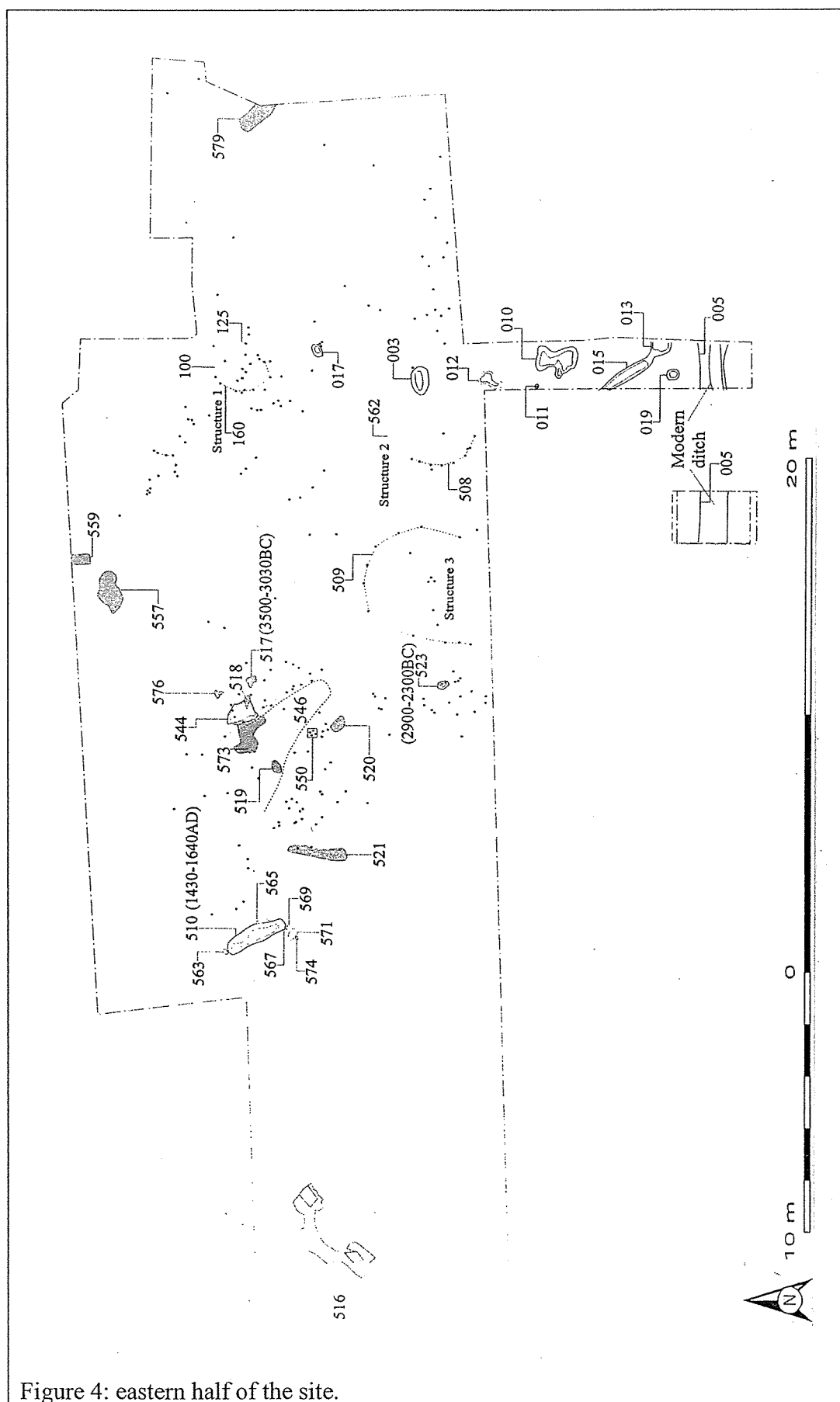


Figure 4: eastern half of the site.

The areas of possible burning and charcoal spread 579 (Figs. 4 and 5)

Description

Six areas of orange grey silty clay containing some charcoal fragments, flecking or staining (517; 518; 519; 520; 557; 579) were recorded towards the eastern end of the site. They were concentrated in the area of greatest activity on the site. Four of the spreads were very similar in size, 0.5m x 0.29m (517), 0.45m x 0.3m (519), 0.4m x 0.3m (518), 0.3m x 0.3m (520). They were generally very thin, only 0.02m – 0.03m thick, except 517 which was 0.11m thick. This produced oak (*Quercus* sp.) heartwood charcoal and some hazel (*Corylus avellana*) charcoal that was suitable for radiocarbon dating (see above), which produced a calibrated date of 3500 – 3030 cal BC (Wk-10156).

The other two spreads were much larger, c.1.2m x 1m (557) and c.1.5 x 1m (579). Spread 579 was recorded at the extreme east end of the site: it extended beyond the excavated area and was not re-located during a subsequent watching brief. The exposed area consisted of an intermittent and irregular spread of oak (*Quercus* sp.) heartwood charcoal fragments on the surface of the exposed shale bedrock. It is possible that this spread was an anomaly recorded during the geophysical survey of the site (anomaly M17 - Ludlow and Murphy 1995, Fig 7b). The spread appears to have been deposited on the surface of the bedrock after the area had been cleared of topsoil.

Interpretation

This group of features, with the exception of 557 and 579 are possibly the bases of small domestic hearths. The predominance of oak heartwood charcoal (which makes excellent firewood as it is a long-lasting high-energy heat source) would tend to support this. There was no evidence to suggest that the deposits were associated with any funerary activity.

Deposit 521 (Fig. 4)

Description

This deposit consisted of a slightly curving irregular stripe of red/brown/orange silty clay, containing charcoal flecks and occasional small stones, aligned roughly north – south and measuring c.2.5m x 0.2m x 0.02m deep.

Interpretation

It was thought that this deposit was the fill of a narrow slot, but excavation was inconclusive because, like some of the other features on the site, the form of 521 was indistinct and difficult to distinguish from the surrounding subsoil. It contained some oak (*Quercus* sp.) heartwood charcoal. This deposit was very similar to the spreads of burnt material and it could represent burnt material in a slot, or gully, the edges of which may have been blurred by modern ploughing.

Similar linear features have been excavated on other Neolithic sites in Wales, such as Gwernvale, Brecknockshire, and Cefn Bryn, Gower, where they have been interpreted as 'bedding trenches' for the walls of timber buildings (Britnell and Savoury 1984, 51; Barker 1992, 69), or as slots to hold upright stones to define a hearth at Trelystan, Powys (Britnell 1982, 139). There was no evidence at Redberth to suggest that 521 was part of a structure, or that it had the same function as the Trelystan example.

Clay spread 546 (Figs. 4 and 5; Plate 4)

Description

Clay spread 546 was 5m x 2m and consisted of very compacted yellow/brown silty clay. It tapered from its northwest end, which was indistinct, and it had a rounded southeast end, 1m wide. Despite the fact that this clay spread was in the area of the main concentration of stakeholes, it was only cut by one or two stakeholes, suggesting that its surface may have been avoided when the stakes were erected. Clay 546 was partially overlain by one of the possible domestic hearth features 519, and was cut by feature 573.

Interpretation

The majority of the stakeholes appear to respect the edges of this deposit, and there is a noticeable alignment of larger stakeholes parallel to its northeast side. The possibilities include the spread being the interior of a structure, with the alignment of larger stakeholes being the remains of the northeast wall, or it may have been an external working space. It may also be worthy of note that a group of four stakeholes were close to its southwest edge.

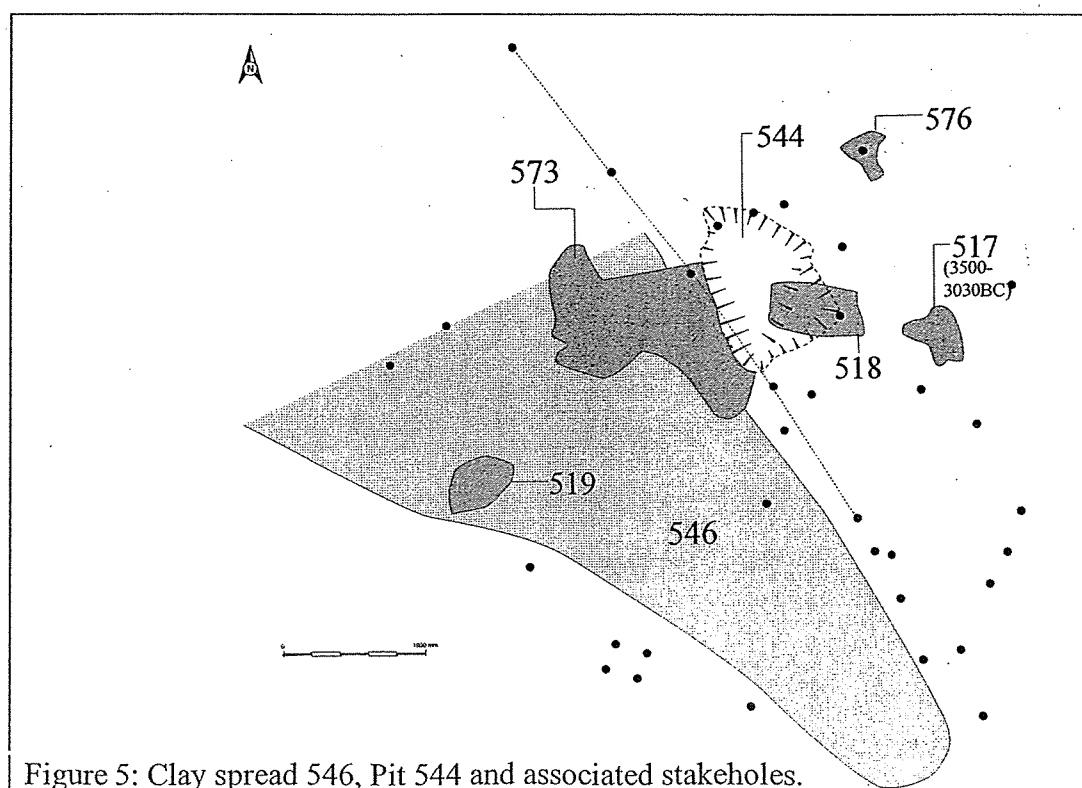


Figure 5: Clay spread 546, Pit 544 and associated stakeholes.

Pit 523 (Figs. 4 and 6)

Description

Pit 523 was ovoid, 0.46m x 0.27m x 0.11m deep, and located 2.5m west of Structure 3. Its sides were steeply cut and its base was fairly flat. The bottoms of two stakeholes were recorded in the base of the pit. The northern stakehole was only 3cm deep and the southern stakehole 6cm deep. Pit 523 was filled with a single layer of brown silty clay containing a few medium – large rounded stones and some alder (*Alnus glutinosa*), hazel (*Corylus avellana*) and oak (*Quercus* sp.) heartwood charcoal (522). A radiocarbon date of 2900 – 2300 cal BC (Wk-10157), obtained from the alder charcoal.

Interpretation

There was no evidence in the form or fill of the pit to suggest a possible function. The shallow depths of the two stakeholes clearly indicate that they were not driven into the bottom of the pit when it was empty. This suggests two main possibilities: first, the stakes were driven through the fill of the pit, although they were not visible in the fill (522); and secondly, the pit was later than the stakeholes and the stakeholes were all but removed when the pit was dug. The charcoal, which typically reflects the use of oak and hazel found in the other charcoal samples across the site, although with the addition of alder, is considered to be of domestic origin. The vicinity of Structure 3 may also be indicative of some kind of domestic function.

Structure 3

Description

The evidence for this structure consisted of a curving alignment of eight stakeholes forming approximately three-quarters of a circle, c.5m diameter (509). The structure appears to be incomplete, but a circular or slightly oval plan is likely. Two stakeholes to the southwest may continue the line, which would then have extended beyond the southern edge of the excavated area giving an oval plan. The spaces between the stakes were fairly random, ranging between 0.6m and 1m, except for on the northwest side, where there was a significantly wider gap, almost 1.8m, and on the southeast side where there was a gap of c.1.6m. All the stakeholes were pointed at their base, and had clearly held driven pointed stakes. There was a slightly off-centre triangular setting of three stakeholes that may represent a support for a roof, although they may equally be part of a small internal fixture. A line of three stakeholes that cross the interior from northwest to southeast can be extended to join with two of the stakes in the wall, and may have been a partition.

Interpretation

It is probable that structure 3 is the remains of a circular or oval hut or roundhouse with a central roof support and possibly an internal partition that would have

divided the interior into two, and presumably restricted access to the northwest compartment. As with Structures 1 and 2 (below), it is not unreasonable to assume that the hut was covered with a lightweight covering, possibly of grasses, or animal skin. Unlike the other two, however, there was no identifiable associated clay surface. The gap between the stakeholes on the southeast side may represent an entrance.

The layout of the stakes does not provide much in the way of information regarding the above ground form of the hut, but the layout of the stakeholes suggests three main possibilities for reconstruction. The first is that the building was cylindrical with a conical roof supported on a ring-beam, the second is that the stakes were bent inwards at the top to form a freestanding tent-like domed structure, and the third is that the roof timbers of a conical roof extended to ground level, somewhere outside the line of stakes, with the stakes forming a line of support inside the hut. If the line of stakeholes represented the outer limit of a circular, or near circular, hut then a floor space of *c.*19.5 square metres is obtained. However, the floor space may have been roughly double that if the roof extended to ground level beyond the ring of stakes.

There was no evidence for an internal hearth, however pit 523 may have contained the residue from a small associated external domestic fire.

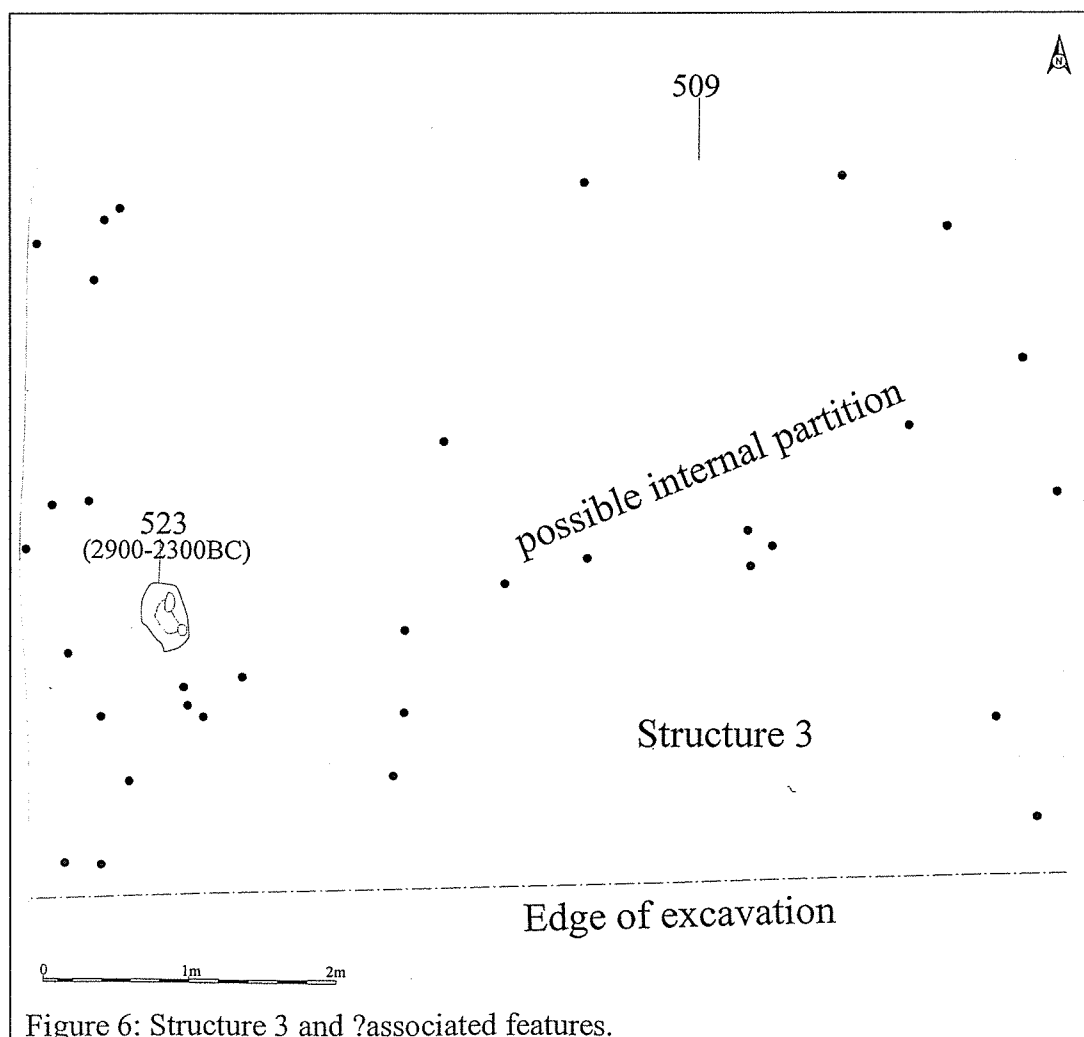


Figure 6: Structure 3 and associated features.

Structures 1 and 2 (Figs. 4 and 7; Plates 5 and 6))

Description

Structure 1 consisted of a group of twelve stakeholes (160) arranged around the edges of an irregular spread of compacted orange brown silty clay, c.2.4m x 1.2m (100). In some places the clay spread merged into the surrounding subsoil making its edges indistinct and its form fairly amorphous. The centre of the spread was 2-3cm thick. The stakeholes that made up 160 were all 5-6cm diameter x 7-8cm deep, and filled with grey brown silty clay. They were between 0.4 and 0.6m apart and they enclosed an area measuring c.2m x 1.1m.

A further eight stakeholes were uncovered below the clay spread. These stakeholes had no identifiable pattern and appeared to be a random spread.

Structure 2 was located 4.2m south-southwest of Structure 1 and 2.5m east of the Structure 3. It consisted of a semi-circular alignment of eight stakeholes (508) along the south and west sides of a spread of compacted yellow brown silty clay (562). The stakeholes were aligned along the outside of the west edge of 562, but their line curved inwards (east) to cut the southern edge of the clay. A 'central' stakehole cut through the clay spread. Two further stakeholes, one just inside the southwest edge and one outside the west edge of alignment 508 may also have been associated with this structure. The stakeholes were c.0.5m apart and they enclosed an area c.2.5m x 1.1m, and they were the same size as those in Structure 1. The 'central' stakehole may have held a single stake to support a lightweight brushwood, grass or skin roof cover.

Many of the stakeholes in Structures 1 and 2 were slightly ovoid, suggesting that they had been rocked backwards and forwards to release them as they were pulled from the ground. Unlike Structure 1, Structure 2 had no stakeholes below the associated clay spread (562).

Interpretation

There are similarities between Structures 1 and 2. Both consisted of arrangements of stakeholes, which formerly held pointed driven stakes, around the edges of a clay spread. In both cases the stakeholes were concentrated along the west and south sides. They probably represented the remains of temporary constructions partially surrounding a small clay surface. Structure 2 was slightly longer, by approximately 0.5m, than Structure 1, but both structures were seemingly built to a similar design and intended for the same purpose.

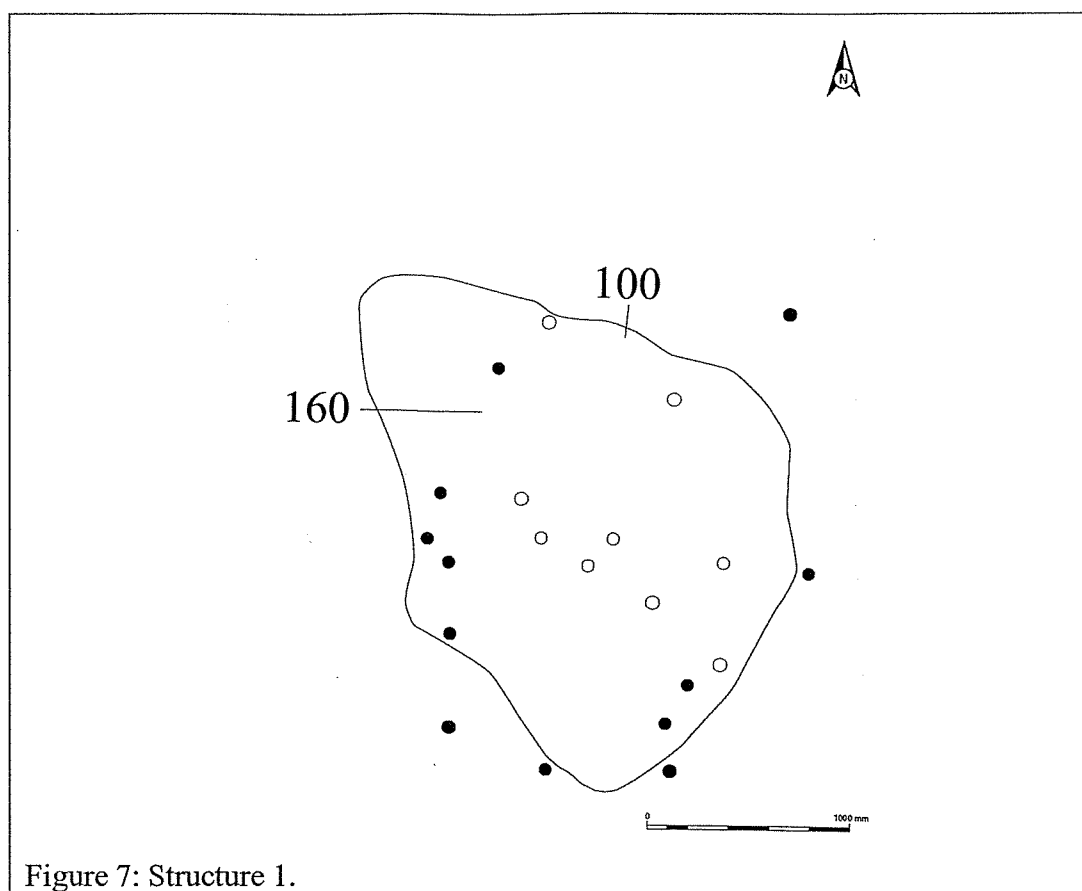


Figure 7: Structure 1.

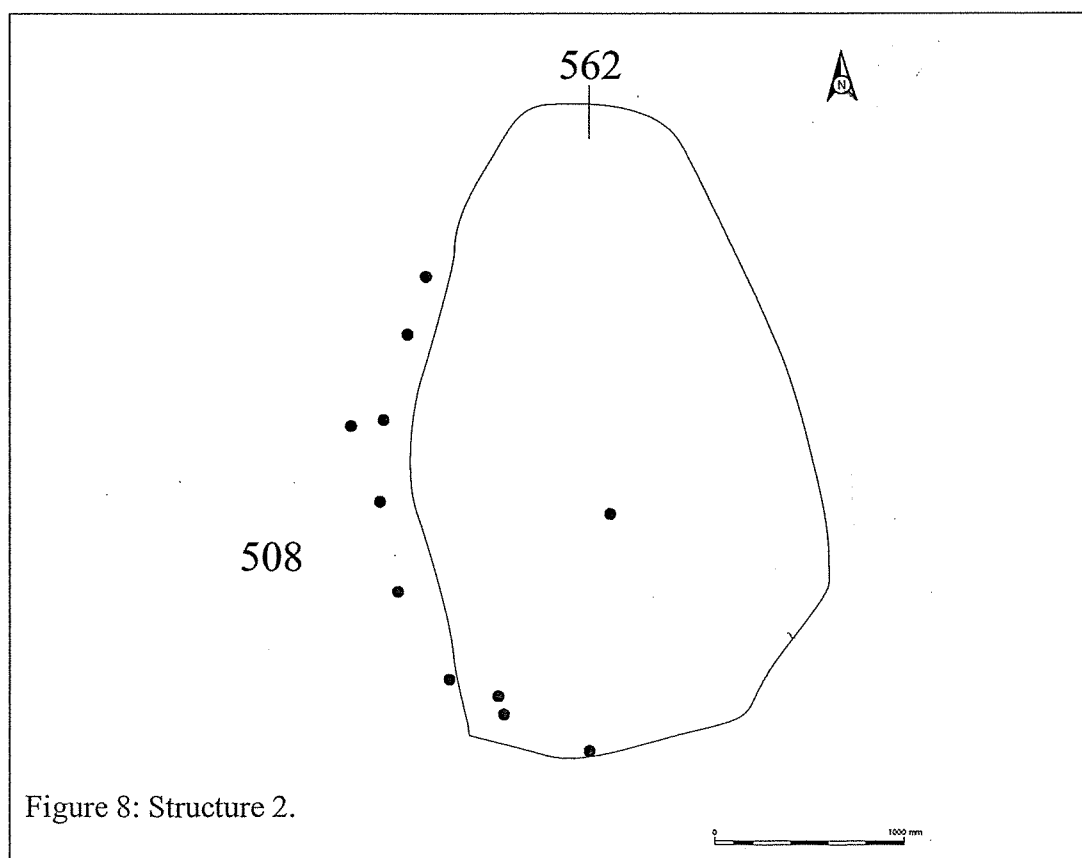


Figure 8: Structure 2.

The stakeholes

Description

Well over two hundred stakeholes were recorded in the eastern half of the site (plate 7), including structures 1, 2 and 3. There were some recognisable alignments and groups of stakeholes, apart from the hut and Structures 1 and 2. Several arcs, or short curving alignments were visible as were some straight alignments of up to seven or eight stakeholes. As with the western end of the site a number of trapezoidal groups of four stakeholes, plus one small square group were also recorded.

All the stakeholes fell within a size range of 5cm – 8cm diameter; the depths varied from the shallowest at 2cm to the deepest at c.10m. It was very clear from early on that only the bottoms of the stakeholes had survived, and it is likely that ploughing had removed many shallower ones. All the stakeholes had pointed bases indicating that they formerly held pointed and driven stakes.

Interpretation

The number of stakeholes, and their fairly uniform diameters is suggestive of coppicing. Whether this was achieved through deliberate woodland management, or as a consequence of periodic clearance of regenerating trees during repeat visits to the site is unclear.

It is possible that some of the stakehole alignments and groupings were the remains of structural elements. Others appeared to be the result of random activity.

Other features (Fig. 4)

Several features, consisting for the most part of small pits, which were not assignable to any phase, were recorded at the eastern end of the site.

Curvilinear ditch 516

Feature 516 was a coffin handle-shaped ditch, up to 0.5m wide x 0.3m deep, with larger, sub-square terminals (Plate 8). The sides of the ditch were steep and the base rounded. The two excavated sides differed in width: the east side was the larger of the two at 0.4m wide and the west side was 0.3m. The terminals were irregular spreads, c.1m x 1m, rather than square and were 2m apart. Investigation revealed that they had no definite form to them; rather they were amorphous and the sides were often indistinguishable from the subsoil. Filling the ditch was a single layer of very brown red silty clay containing frequent small to medium angular stones and occasional charcoal staining (515). A possible extension ran north from the middle of the curve beyond the excavated area.

A small group of features (565; 563; 567; 569; 574) was recorded c.4m west of pit 544 in close association with a linear pit (510). Pit 510 measured 2.55m x 0.7m and was up to 0.36m deep. It was aligned north – south. The west side of the pit was straight and vertically cut, but its east side bowed outwards in the middle and was less steeply cut. The north and south ends were rounded and almost vertical. The base was slightly uneven and dipped from 0.3m at either end to 0.36m in the centre.

The pit was filled with a single layer of mottled red brown silty clay containing a high proportion of angular stones and charcoal fragments (511). The charcoal was distributed throughout the fill, although there was a concentration in the centre of the pit. However, this did not appear to be *in situ* burning, nor did it seem to be deliberate deposition. The charcoal included oak (*Quercus* sp.), small quantities of alder (*Alnus glutinosa*) and gorse (*Ulex* sp.) or broom (*Cytisus* sp.). The charcoal produced a radiocarbon date of 1568 – 1682 calAD (Wk-10155) and a small sherd of residual Roman, 3rd – 4th century Severn Valley Ware, pottery was recovered from the fill.

The eastern edge of pit 510 truncated a rectilinear feature (565), of which only the east and south sides survived. The east side of 565 was 0.47m long and the south side was 0.27m long. It was filled with a single deposit of dark reddish brown silty clay containing c.25% small angular stones (566). The surviving portion of 565 was steep sided, but shallow, c.0.1m deep.

There were three postholes or stakeholes (567; 569; 574), to the south of the pit and one (563) positioned c.2m to the north. The northern posthole (563) was 0.2m diameter and 0.24m deep, with vertical sides that tapered to a narrow rounded base. It was filled with a single layer of mid reddish brown silty clay (564).

The southern postholes (567, 569 and 574) were arranged in an irregular row roughly aligned northeast – southwest. These three features were very shallow, ranging in depth from only 4cm (567) to 10cm (574), suggesting that only the bases of them survived. Feature 567 had vertical north and east sides and shallow sloping south and west sides. The diameters of the three varied considerably from 0.2m (567) to 0.1m (569) and 8cm (574). This suggests that 567 and 569 were postholes and 574 was a stakehole. All three were filled with very similar material (568; 570; 575), a red brown silty clay containing small angular stones, although the fill (568) of posthole 567 was slightly more orange coloured than the others. The base of 567 sloped from excavated ground level on the southwest to its maximum depth of 4cm on the northeast side. Its north and east sides were vertical, but its southeast side had been truncated by the later medieval pit. If 567 was, as interpreted, a posthole the form of the base indicates that the post it once held did not have a pencil point, but was more likely to have had a chisel point or to have been wedge-shaped.

Between 569 and 574 was a small straight-sided pit with rounded ends, 0.46m x 0.26m x 0.13m deep (571) filled with a layer of yellowish brown silty clay that contained two medium sized angular stones and a high occurrence of small angular stones (572). The pit had a flat base.

Other pit group

Description

A small group of pits were excavated towards the eastern end of the site. None had any form of datable evidence and so are not assignable to any of the site phases.

Pit 003 and possible associated stakehole

Approximately 1m east of Structure 2 was a small ovoid pit, 1.03m x 0.8m x 0.42m deep (003). It had steeply sloped sides and a slightly concave base. The pit was aligned east – west and cut into the subsoil (009). It was filled by a single homogenous layer of mottled mid reddish brown silty clay containing some small angular limestone fragments and very occasional charcoal flecks (002). At times it was difficult to distinguish this fill from the surrounding subsoil, as both oxidised quickly when exposed. In fact, the west end of the pit was slightly overcut during excavation because of the similarity.

A stakehole, 0.08m diameter x 0.1m deep (116), on the northwest edge of pit 003 may have been associated with it, although a direct relationship is not certain, particularly given the extensive spread of stakeholes across the site.

Samples taken from fill were assessed for palynological potential (see below). Unfortunately, despite the presence of some badly degraded Pteridophyte spores (*Polypodium* and pteropsida (monoete) indet.), the preservation conditions within the fill were too poor for pollen survival.

Pit 013 and natural? feature 015

A partially excavated, possibly circular, pit extending beyond the eastern edge of the excavation, 4m south of Pit 003. The excavated section measured 0.75m wide and extended 0.45m into the trench. It was up to 0.15m deep and filled with a single homogenous layer of orange brown silty clay containing c.20% small to medium angular limestone stones (014).

Extending northeast from the edge of 013 was a narrow gully (015) filled with compacted, stony orange brown silty clay (016). This feature followed the general direction of the bedding planes in the geological deposits in this area and it appeared to be a natural feature.

Pit 017 and possible associated stakeholes

A small oval pit, 0.5m x 0.38m x 0.17m deep, 2m southeast of Structure 1, with steep sides and a flat base: the southwest side was less steeply sloping than the others. The long axis was aligned northeast – southwest. It contained a single layer of dark orange brown silty clay (018), which was very similar to the fills of the other pits in this area, although it was slightly darker than most of them.

There was a triangular arrangement of three stakeholes on the southeast edge of the pit. It is not clear if the stakeholes were associated with the pit or not. The general proliferation of stakeholes across the site means that their position may be accidental and there may be no direct association between them and the pit.

Pit 019

A small, 0.2m diameter x 0.15m deep, pit with step sides and a flat base filled with a single homogenous layer of brown orange silty clay (020). The regular shape and steep sides suggest a cut feature rather than a feature caused by root action. This pit is one of a group of pits recorded in T1 during the initial evaluation.

Interpretation

The pits that make up this group contained single fills of similar material. The lack of any silting or apparent weathering on the sides of any of the pits indicates that they were not open for any great length of time and their single fills suggests that they were backfilled in a single action. The function(s) of the pits is unclear, they never held posts, they did not contain any cultural material, unless it was organic and therefore decayed, and they were apparently only open for a short time before being rapidly backfilled.

East end of the site: discussion

The small spreads of burnt material recorded towards the eastern end of the site indicate small-scale, possibly domestic fires and the general use of oak heartwood, which is a long-lasting high-energy heat source, would tend to support this. They are some distance from the other features with earlier Neolithic dates, the posthole rows and pit 025, but with such fragmentary evidence it is difficult to make much of the distribution.

The evidence for the later phase of the site is similar to other Later Neolithic sites in Wales, such as Cefn Caer Euni, Cefn Cilsanws and Walton Basin (Lynch 1986, 83-7; Webley 1958 and Gibson 1999, 36-43). They all have a proliferation of stakeholes, only some of which formed identifiable structures or alignments, suggesting that most were probably the result of random actions, such as tethering animals, or erecting small drying frames.

The interpretation of the Redberth structures as windbreaks seems reasonable, given that they were not parts of a circular or oval structure and that they were both on the side of the prevailing wind. Furthermore, similar structures are known from Wales, and presumably they were intended to shelter someone performing some form of activity, as apparent at Moel-y-Gaer, or to prevent something (cereals, grain or fodder?) from blowing away. No artefacts were recovered from the clay surfaces associated with the windbreaks and the preservation conditions within the clay were too poor for pollen or other environmental evidence to survive.

DISCUSSION

The excavation has revealed evidence of activity at Redberth from the early Neolithic through to the Early Bronze Age. Whilst the nature of the activity is not always certain, there is evidence that it included some kind of occupation, in the shape of the Structure 3, which probably dates, on form and limited stratigraphical grounds, from the later Neolithic. However, the lack of any material culture or any evidence of the site's economy makes the nature of the occupation unclear.

The excavation evidence

Even though much of the evidence from Redberth was fragmentary it has many similarities with other excavated Neolithic sites in Wales and elsewhere.

Structure 3

The excavated form of Structure 3 gives it an internal size of *c.*19.5 square metres, which places it amongst the smaller of the known Neolithic houses in Britain (Gibson 1996, 238, Figure 9.3), but similar to comparable structures in Wales at Trelystan (Britnell 1982, 139-140) and Upper Ninepence, Walton Basin (Gibson 1999) and to known Neolithic circular houses in Ireland (Gibson 1999, 163). It is also similar to the size and form of some known Mesolithic houses recorded in Britain and Ireland (Green 1996, 119; Woodman 1985, cited in Aldhouse-Green 2000, 31) and hinted at on the Mesolithic site of Nab Head, Pembrokeshire (Aldhouse-Green 2000, 31-32).

Structures 1 and 2

The fact that the stakeholes in both these structures were grouped along the south and west edges of the clay surfaces suggests that they may have been intended as windbreaks against the southwesterly prevailing wind. Similar structures have been noted elsewhere. At Moel-y-Gaer, Flintshire, (Darvill 1987, 57), for example, the remains of a wooden windbreak surrounded by flint working waste was excavated. Windbreaks have also been excavated on Welsh sites of other periods. For example, a Mesolithic windbreak was recorded at Frainslake, Pembrokeshire, where a curved structure consisting of gorse, birch and hazel, was recorded in the intertidal zone. Several curved alignments of postholes at Rhuddlan, Flintshire, may have served a similar function (Aldhouse-Green 2000, 32).

The stakeholes

The stakehole evidence from Redberth is similar to that from many other Neolithic sites in Wales, such as Cefn Caer Euni, Cefn Cilsanws and Walton Basin (Lynch 1986, 83-7; Webley 1958 and Gibson 1999, 36-43). They all have a proliferation of stakeholes, only some of which formed identifiable structures or alignments, suggesting that most were probably the result of individual actions, such as tethering animals, or erecting small drying frames.

One discernible pattern was the identification of several trapezoidal settings of four stakeholes. The presence of trapezoidal settings of stakeholes has been noted on other prehistoric sites in Wales, most notably at Brenig, Denbighshire, where several trapezoidal settings were discovered below and associated with Bronze Age barrows (Lynch 1993, 77-83). A similar type of arrangement was also present at the Neolithic site of Upper Ninepence, Walton Basin, Clwyd, where it was interpreted as a possible formal entrance to a hut (Gibson 1999, 36). There was no association between the settings at Redberth and any identifiable structure.

The spreads of burnt material

The small spreads of burnt material recorded towards the eastern end of the site indicate small-scale, possibly domestic fires. The general use of oak heartwood, which is a long-lasting, high-energy heat source, would tend to support this. They are some distance from the other features with earlier Neolithic dates, the posthole rows and pit 025, but with such fragmentary evidence it is difficult to make much of the distribution.

The nature of the activity at Redberth

The incomplete floor plan of the hut (Structure 3), the small areas of burnt material and the fuel residues, in the form of charcoal, are suggestive of domestic-type activities, but the complete lack of other forms of evidence makes a simplistic, one-dimensional interpretation difficult.

A puzzling aspect of the Redberth site, particularly with regard to any form of domestic interpretation is the absence of material culture. It might be expected that a domestic site would result in the deposition of an identifiable and distinctive artefact package, which could be expected to become more complex with the length of stay at a particular site. The longer a group stayed in one place the likelihood is that they would carry out a more diverse range of activities, which may then be reflected in a wider variety of artefacts recovered through excavation. Even though the activity levels at Redberth have been ploughed away it is surprising that not a single artefact was recovered from any of the cut features, or any contemporary material contained in the topsoil – ploughsoil assemblage.

The lack of material culture at Redberth is perhaps even more interesting when the distribution of finds from the period are plotted for Pembrokeshire. Study of the previously recorded Neolithic evidence, with particular reference to finds of axes and flint, in the Sites and Monuments Record, shows a county-wide distribution and it highlights the fact that lithics were available and being used, or at least deposited, in all parts of Pembrokeshire, including sites close to Redberth. Furthermore, several Group VII axes from the Graig Llwyd factories, Caernarvonshire, have been found, showing that Pembrokeshire was part of a widespread sphere of contact. The same can be inferred from the pottery recovered from various sites in the county, which includes early undecorated pottery from contexts as varied as the settlement at Clegyr Boia (Lewis 1974), Carreg Coitan and Carreg Samson chambered tombs (Lynch 2000, 61-2) and several cave sites. Sherds of Peterborough Ware were recovered from Daylights Rock Cave, Caldey Island (Lacaille and Grimes 1961, 37-9) and Ogof Govan, on

the south Pembrokeshire coast (Davies 1989, 82) further stressing the availability of pottery to the group at Redberth.

Even though this distribution reflects the varied circumstances of deposition of the artefacts, which in some cases was clearly structured, rather than occupation or settlement, it does highlight the lack of artefacts at Redberth, but unfortunately not the reasons for it.

The Neolithic in southwest Wales

The Neolithic period in southwest Wales (like most, if not all, areas of Wales and beyond) is known largely through its burial monuments and chance finds, neither of which can necessarily be taken as being representative of the extent or nature of settlement. Where settlement or evidence of domestic occupation has been recorded it has very often been an accidental discovery (Holgate 1988, 105). Furthermore, where definite structures have been recorded, the nature of the site is frequently ambiguous and their unequivocal interpretation as 'domestic' structures, i.e. houses, is difficult. This has long been thought to be a consequence of discovery, recovery and preservation and that the 'houses' were out there waiting to be found, if only we knew where to look. However, what the evidence is now making apparent is that for the most part, the construction of permanent domestic structures was not necessarily the norm during the British Neolithic (Thomas 1996, 2) and that settlement mobility was more typical (Whittle 1997; Pollard 1999, 77).

Therefore, the traditional view that there was some form of agricultural revolution, which saw the introduction of farming as a complete and 'ready-made' way of life during the British Neolithic is no longer tenable. Rather, it was a much more subtle process achieved through myriad adaptive and adoptive responses to changing circumstances and influences over several millennia. Evolution rather than revolution. And it has been suggested that it may not have been until the Middle Bronze Age that communities became truly sedentary and began farming a settled and permanent plot of land (Brück 1999; Barnatt 2001, 93).

The evidence is also beginning to question the concept and meaning of terms like settlement and domestic when applied to the Neolithic (Brück 1999; Edmonds 1999; Thomas 2001). The modern western idea of domestic, as relating to the home and separate from economic, religious or subsistence activities cannot safely be applied to the past. Brück (1999, 70) has argued fairly convincingly that there was no notion of 'domestic' prior to the middle Bronze Age, and that before that, life was structured around a set of 'occupation practices', in effect, there was no compartmentalizing of the different aspects of group life, the ritual and secular, the subsistence and social were all inextricably bound and were defined, and presumably redefined over time, through 'traditions of movement around the landscape'.

Only one site in southwest Wales, Clegyr Boia, Pembrokeshire, has revealed structures that can definitely be interpreted as permanent houses clearly associated with domestic material. Traces of three possibly rectangular timber houses were recorded, at least two of which were contemporary, as well as sherds of

undecorated shouldered bowls, a style of pottery common to the Irish seaboard and considered to be of middle Neolithic date (Lynch 2000, 51). A small assemblage of cattle bones was also recovered from a midden, although the fact that only cattle bones were present is probably a consequence of preservation and recovery than a true reflection of the animal based economy. However, two Iron Age radiocarbon dates were obtained from Clegyr Boia and the possibility remains that the cattle bones may also date from that period.

For the most part, occupation throughout the region has been inferred from small material culture assemblages recovered from a wide variety of contexts and considered to be domestic. The regional Sites and Monuments Record records another four sites in Pembrokeshire that had been previously recorded as Neolithic occupation sites, Kilpaison Burrows, Brownslade Burrows, St. Michael and Daylight Rock Cave. Periodic occupation has also been inferred at a number of other sites, Rhos-y-Clegyrn (Lewis 1974), Stackpole Warren, (Benson *et al*, 1990), both Pembrokeshire, Coygan Camp, Carmarthenshire, (Wainwright 1967), and Plas Gogerddan (Murphy 1992) and Llanilar (Briggs *et al*, 2000) both in Ceredigion. This gives a total of nine sites. Even though Redberth can now possibly be added to this group, the number is extremely low and presumably does not reflect the true pattern of Neolithic occupation in the region.

A further five sites, all caves along the south Pembrokeshire coastline, have produced very similar assemblages of finds (Davies 1989), including a possible hearth in Ogof Morfran, to the recorded 'occupation' sites and, therefore, on artefactual evidence could be included in the group. However, the recovery of Neolithic human remains alongside supposed domestic material from three of the Pembrokeshire caves is a vivid indication of the ambiguity and fluid nature of many of the sites and the variety of roles they may have performed. Remains of nine individuals were recorded in Little Hoyle Cave, a single skull was retrieved from Skull Cave, and bones from a single undated skeleton were recovered from Hoyle's Mouth Cave, which imply either burial or deposition of skeletal parts in funerary or ritual contexts. In all of these cases, along with two other cave sites, Potters Cave and Nanna's Cave on Caldey Island, material from other periods was also recovered indicating a continuity use, which in some cases extends back to the Upper Palaeolithic and forwards to the Roman period and beyond. This is true not only for the coastal caves, as a number of inland cave sites around Wales have also produced similar assemblages (Britnell 1991, 64).

Stable isotope analysis of the human bones from some of the coastal caves in Pembrokeshire has shown that marine resources were not a significant part of the Neolithic diet (Shulting 1998, cited in Cummings 2001), which suggests that the visits to the caves were not necessarily subsistence based. The problems of exactly where caves fit into the Neolithic social landscape is perhaps beyond the scope of this present report. However, it seems fair to say that they had many roles, which seems to have included short-term occupation, and they clearly remained important to how the groups perceived and moved around the landscape.

Neolithic structures in southwest Wales

Where Neolithic structures have been excavated in Wales, they tend to fall into two categories: early structures, which are typically rectangular post-built houses, and later structures that are invariably circular and more lightweight. Most of the early sites contained single structures as at Llandegai, Caernarfonshire (Houlder 1968; Lynch 2000, 51), Gwernvale, Brecknock (Britnell and Savoury 1984) and possibly at Moel y Gaer, Flintshire (Lynch 2000, 51). However, at Clegyr Boia there were at least two contemporaneous buildings (Baring-Gould 1903; Williams 1952). These sites suggested an early pattern of small isolated and unenclosed farmsteads based on individual, possibly extended, family groups, which were focused on the family tomb (Lynch 2000, 54).

However, as has been seen this small group of sites is not typical of the majority of Neolithic sites. The evidence more usually consists of scatters of features, which may include postholes, stakeholes and pits and the recovery of supposed domestic material, such as pottery, flint tools and flakes and at some sites charcoal and animal bones. This situation is true not only for Wales, but also throughout central and southern Britain.

Apart from Clegyr Boia (Baring-Gould 1903; Williams 1952) and Redberth, the only other site in southwest Wales with evidence for Neolithic structures is Rhos-y-Clegyrn (Lewis 1974). At Rhos-y-Clegyrn the evidence is limited and the nature of the settlement uncertain, but it does appear to be periodic, perhaps seasonal. The site contained the remains of up to seven turf-built circular, or sub-circular huts and an assemblage of stone tools and waste of presumed Neolithic date. Charcoal of oak (*Quercus* sp) and hazel (*Corylus avellana* L.) was also recovered (Lewis 1974, 28-32). The lithics included tools and waste made from beach pebble flint. The huts were constructed with a stony-clay foundation topped by turf walls and each one had several floor layers associated with it. In most cases, the floor layers were distinguished as hard iron-panned clay surfaces, which in hut III were separated by thin sandy layers representing reoccupations after brief periods of abandonment (Lewis 1974, 29). No pottery was recovered from the site, although a modern radiocarbon date was obtained from charcoal recovered from a pit.

Redberth: where does it fit into the Neolithic landscape?

Redberth seems to fit into an emerging picture of Neolithic Wales, based on mobile groups visiting sites on a seasonal, or periodic basis. The community at Redberth, as with other Welsh sites, such as Cefn caer Euni, Cefn Cilsanws, Trelystan and Upper Ninepence, Walton Basin (Lynch 1986, 83-7; Webley 1958; Britnell 1982; and Gibson 1999, 36-43), were apparently erecting lightweight temporary stake-built huts, which can be seen to support the idea of mobile communities moving around the countryside. The family tomb may have acted as an anchor, or a focus for the groups, acting to maintain links between the group and their ancestors, therefore allowing them to retain a sense of place and identity. The ability to demonstrate some form of continuity with the past may have been a significant practical consideration in securing or strengthening a group's claim to the use of land during repeat visits.

The identification of the stake built hut and windbreaks has an interesting parallel with the lightweight architecture associated with modern mobile farming groups visiting sites on a periodic basis (Kent and Vierich 1989, 99). Whilst acknowledging the problems resulting from the uncritical use of ethnographic data, it is difficult to ignore the striking similarities between the evidence from Redberth and that presented by Kent and Vierich, for some mobile farming communities in the Kalahari, Botswana, where 'although site composition varies with length of anticipated mobility, all sites have habitation hut(s), hearth(s) and windbreak(s)'.

The Neolithic environment of Redberth

Although scarce, the environmental evidence from Redberth indicates a mixed landscape of oak dominated woodland with areas of heath and grassland, although the region would almost certainly have supported a wider range of trees and shrubs than indicated from the charcoal analysis. The charcoal recovered from the site indicates a preference for oak (*Quercus* sp.), which testifies to its ready availability and frequency in the environment, and it is probable that oak formed the major woodland component. Hazel (*Corylus avellana*) may have been growing either as understorey within the oak woodland or in shrubbier form in woodland glades or clearings. Some fragments of hazel from the fill (026) of the pit 025 included wide growth rings, suggesting stress-free growing conditions. Poorly preserved remains of *pteridophyte* pollen from the fill (002) of pit 003 suggest areas of heath and grassland, although this pollen may have derived from plant material imported to the site.

The origin of the charcoal is uncertain, but a large proportion, if not all, probably derived from fuel debris that was either dumped in pits or that accumulated naturally in these features during the use of the site. On the evidence available it is difficult to speculate whether this represents domestic, ritual or some other use of the fuel, although the absence of human bone or other funerary items in the deposits suggests that domestic origins are more likely. In addition, pit 523 was situated close to the hut circle, thereby supporting the suggestion of domestic use. Assuming a domestic function to be relevant, firewood appears to have been obtained from a relatively narrow range of trees and shrubs. Oak, particularly the heartwood, provides a long-lasting, high-energy heat source (Webster 1919).

It has already been noted that the proliferation of stakeholes suggests coppicing, through whether deliberate woodland management or periodic clearance of regenerating woodland during repeat visits. This may account for some of the areas of heath or grassland indicated by the *pteridophyte* pollen in pit 003.

During the Early Bronze Age oak was also being cut and shaped for use as structural posts, which may have been burnt *in situ* in postholes 512-514 and 580.

The charcoal was too comminuted to assess origins from managed woodland, but the uniformity of the stakeholes is suggestive of some kind of coppicing, either through woodland management or periodic clearing of regenerating trees during repeat visits. Increasing amounts of alder in the charcoal samples during Phase 2

may indicate a period of increasingly wet conditions close to the site, possibly associated with the small stream that ran close to the east end of the site.

Early Bronze Age activity

Definite evidence for the Early Bronze Age at Redberth was confined to posthole row (505), about which little can be said. The nearby Hoyles Barrow and the possible second barrow (PRN 30120) suggest that by this period the activity at Redberth was largely ritual, centred on the rites of burial and commemoration. It seems reasonable to assume that some of the stakeholes uncovered during the excavation may also have been from this period, although none were definitely attributable.

Interestingly, there is an apparent link between Neolithic structures and later burial and ritual monuments elsewhere in Wales. At some sites later burial monuments have been constructed over the earlier structures, Gwernvale (Britnell and Savoury 1984), Trelystan (Britnell 1982; Gibson 1996), Upper Ninepence (Gibson 1999), Cefn Caer Euni (Lynch 1986), Newton, West Glamorgan (Darvill 1996, 81) and Cefn Cilsanws (Webley 1958) and at other sites they are close to either burial or ritual monuments as at Redberth, Llanilar (Briggs 1997), Plas Gogerddan (Murphy 1992) and Rhos-y-Clegyrn (Lewis 1974). The 'occupation' deposit at Stackpole Warren was also found in association with a later ritual complex (Benson *et al* 1990). This accounts for the vast majority of sites in Wales where Neolithic occupation is confirmed or supposed and it seems unlikely to be a coincidence. Therefore, it appears that deliberate decisions were being taken to reuse these sites.

CONCLUSIONS

The excavation at Redberth highlights the problems of identifying Neolithic sites in Pembrokeshire and elsewhere, and it may go some way to explaining why the hoped for settlement sites remain so elusive. Many sites may be similar to Redberth with ephemeral features and little or no material culture, which means that not only is the pattern of occupation likely to be much more extensive than currently recorded, but it also means that recorded findspots may not, as often assumed, necessarily indicate occupation sites. It also highlights the fact that 'settlement' during this period may not conform to our preconceived notions of domestic as opposed to non-domestic activities, with the situation being much more fluid with little or no distinction between them.

With no reliable method of predicting the locations of sites such as Redberth it seems that for the near future at least the discovery of Neolithic occupation sites may still be largely an accidental occurrence.

APPENDIX ONE: THE CHARCOAL by Rowena Gale³

INTRODUCTION

Thirteen samples of charcoal were examined primarily to select juvenile material for radiocarbon dating. Following unexpectedly early dates for several of these samples the remainder of the charcoal was examined. This report includes the results of the charcoal analysis from contexts from Early Neolithic - Early Bronze age and later features. A Bronze Age burial site had previously been recorded close the area currently under discussion, and interaction between the cemetery and the occupation of the site at Redberth seems a strong possibility.

MATERIALS AND METHODS

The charcoal was mostly very degraded and many of the fragments included silty deposits which had permeated throughout the wood structure. The charcoal was too fragmented to include intact radial segments of roundwood. Charcoal fragments measuring >2mm in radial cross-section were considered for species identification.

Samples were prepared for examination using standard methods (Gale and Cutler 2000). The fragments were supported in washed sand and examined using a Nikon Labophot-2 microscope at magnifications up to x400. The anatomical structures were matched to prepared reference slides. Where possible, the maturity of the wood was assessed (i.e. heartwood/ sapwood).

RESULTS

The charcoal analysis is summarised in table 1 and discussed below. Group names are given when anatomical differences between related genera are too slight to allow secure identification to genus level. This includes members of the leguminosae (*ulex* and *cytissus*). Where a genus is represented by a single species in the british flora this is named as the most likely origin of the wood, given the provenance and period, but it should be noted that it is rarely possible to name individual species from wood features, and exotic species of trees and shrubs were introduced to britain from an early period (godwin 1956; mitchell 1974). Classification follows that of *flora europaea* (tutin, heywood *et al* 1964-80).

The anatomical structure of the charcoal was consistent with the following taxa or groups of taxa:

Betulaceae. *Alnus glutinosa* (L.) Gaertner, European alder

Corylaceae. *Corylus avellana* L., hazel

Fagaceae. *Quercus* spp., oak

Leguminosae. *Cytissus scoparius* (L.) Link, broom; *Ulex* spp., gorse. These taxa are

anatomically similar.

³ Folly Cottage, Chute Cadley, Andover, Hampshire, SA11 9EB.

The west end of the site

Postholes

Row 552 included postholes 536, 538 and 540. Charcoal (537) was examined from the fill of 536, an oval feature some 0.09m deep. The charcoal fragments were small and mostly consisted of oak (*Quercus* sp.) heartwood, although hazel (*Corylus avellana*) was also identified and produced a date of 3940 – 3641 cal BC (Wk-10158).

A further row of postholes (551) was aligned roughly parallel to row 552. Charcoal (535) was examined from the fill of posthole 534, the most northerly of the group. The charcoal was very sparse and identified as oak (*Quercus* sp.).

A pair of postholes west of row 552 included features 553 and 555. 553 reached a depth of 0.36m, considerably deeper than pit 555, and contained charcoal (554). The charcoal was mainly hazel (*Corylus avellana*), and provided a radiocarbon date of 3700 – 3370 cal BC (Wk-10159); oak (*Quercus* sp.) was also recorded.

A large pit, 025, occurred on the western edge of the site. The secondary fill (026) formed the major deposit and included fairly large pieces of charred hazel (*Corylus avellana*) up to 20mm in length. Some of the charcoal included wide, fast-grown growth rings. Silting in the base of the pit suggested that, unlike most other pits on site, it may have remained open for some time.

The clear association of several postholes to form a group/ row suggested that features 512, 513, 514 and 580 were contemporary. Charcoal (most of which was very fragmented) was examined from the clayey fills of 512, 513 and 514 (contexts 502, 503 and 504), and identified as oak (*Quercus* sp.) (predominantly heartwood). Sapwood from posthole 512 indicated a radiocarbon date of 2400 – 1970 cal BC (Wk-10154).

The east end of the site

A spread of silty clay with included charcoal (517), occurred close to pit 544. The condition of the clay was indicative of burning and the deposit was interpreted as a possible hearth base. The charcoal, which consisted entirely of oak (*Quercus* sp.) was composed of fragments up to 10mm in length.

Charcoal was examined from the fill, 522, of the small pit 523, sited close to a possible hut circle. The function of the pit was not clear. The charcoal was sparse but included alder (*Alnus glutinosa*), hazel (*Corylus avellana*) and oak (*Quercus* sp.) heartwood. A date of 2900 – 2300 cal BC (Wk-10157) was obtained from the alder charcoal.

Late medieval – early post-medieval pit

Charcoal was also examined from the fill (511) of a linear pit (510) located roughly in the centre of the site. Charcoal here was conspicuously more abundant than in the earlier features and included relatively large pieces of oak (*Quercus* sp.), e.g. 40x40x30mm. In addition to oak (*Quercus* sp.) heartwood, small quantities of alder (*Alnus glutinosa*) and gorse (*Ulex* sp.) or broom (*Cytisus* sp.) were named. A radiocarbon date of AD 1568 – 1682 cal (Wk-10155) was obtained.

Undated samples

Radiocarbon samples were also collected from features 544 and 579 but both these proved to be unsuitable for dating.

Feature 579 occurred on the eastern edge of the site and appeared contain a spread of charcoal. Identifiable fragments of charcoal were, however, extremely sparse but included oak (*Quercus* sp.) heartwood.

Pit 544 was sited in an area that included small patches of burning or hearth bases (e.g. 517) and a large concentration of stakeholes. Associated charcoal consisted of oak (*Quercus* sp.) heartwood.

Discussion

The site was located just south of Redberth on a southwest facing hillslope. Postholes and other features were dated, using radiocarbon charcoal samples, to the Early Neolithic (Phase 1) and the Mid-Late Neolithic to Early Bronze Age (Phase 2), and the post-medieval period (see Table 1). The close proximity of the BA features to Bronze Age barrows (Ludlow and Murphy 1995) suggests some association of activity.

Charcoal was examined from 13 features including postholes, pits/ ditches, a spread and a possible hearth (Table 1). Charcoal recovered from the spread 579 and the ?hearth 517 probably represents *in situ* deposits that have endured since the time of burning. The origin of the charcoal in the remaining features, however, is unknown, but a large proportion, if not all, probably derived from fuel debris that was either dumped in pits or that accumulated naturally in these features during the use of the site. On the evidence available it is difficult to speculate whether this represents domestic, ritual or some other use of the fuel, although the absence of human bone or other funerary items in the deposits suggests that domestic origins are more likely. In addition, some features may have been relatively close to dwelling houses, e.g. pit 523 sited just west of the hut circle, thereby supporting the suggestion of domestic use.

Assuming domestic origins to be relevant, firewood appears to have been obtained from a relatively narrow range of trees and shrubs. In the early Neolithic, oak (*Quercus* sp.) and hazel (*Corylus avellana*) seem to have formed the bulk of the fuel. A similar use but with the addition of alder (*Alnus glutinosa*) is demonstrated in the Late Neolithic pit 523. Deposits from the Early Bronze Age alignment of postholes 512, 513 and 514 are more difficult to interpret since the high frequency of oak and the absence of other taxa could implicate the burnt

remains of structural posts, rather than fuel debris. It was not possible to estimate the diameter of the oak poles or trunks but the abundance of heartwood suggests that the wood may have been fairly mature. This assessment, however, should be tempered with the knowledge that in some environments heartwood can develop in juvenile or diseased wood.

A similar preference for oak (*Quercus* sp.) fuel was indicated in the deposit from the 16th – 17th century pit 510, although here alder (*Alnus glutinosa*) and gorse (*Ulex* sp.) or broom (*Cytisus* sp.) were used, perhaps as kindling or to supplement the supply of firewood.

Fuels and fuel resources

It seems clear from the charcoal analysis that oak (*Quercus* sp.) was the preferred fuel. Given the early date of the contexts and the absence of industrial evidence, this would almost certainly have been used as firewood (as opposed to charcoal). Oak, particularly the heartwood, provides a long-lasting, high-energy heat source (Webster 1919). Hazel (*Corylus avellana*), gorse (*Ulex* sp.) and broom (*Cytisus* sp.) also provide good quality firewood but the calorific value of alder (*Alnus glutinosa*) wood is significantly lower. The charcoal was too comminuted to assess the character of the fuel used, i.e. whether from narrow roundwood, larger branches (e.g. cordwood) or trunkwood. As noted above, oak heartwood was frequent and it is probable that branches or trunkwood were used.

Environmental evidence

The settlement/ site was located on a gentle southwest slope. Extensive plough damage to many of the features testified to the arable use of the area in more recent times. During the early phases of the site, the region would almost certainly have supported a wider range of trees and shrubs than indicated from the charcoal analysis, and it is interesting that fuel was selected from comparatively few species. The evident preference for oak (*Quercus* sp.) testifies to its ready availability and frequency in the environment, and it is probable that oak formed the major woodland component. Extant remains of natural oakwoods bear witness to their ancient origins and predominance in this region of Wales (Marren 1992). Hazel (*Corylus avellana*) may have grown either as understorey within the oak woodland or in shrubbier form in woodland glades or clearings. Some fragments of hazel from the fill of the pit/ ditch 025 included wide growth rings, suggesting stress-free growing conditions. Alder (*Alnus glutinosa*) suggests the presence of damp soils or streams, while gorse (*Ulex* sp.) and broom (*Cytisus* sp.) typically grow on poor or impoverished soils, and rapidly colonise cleared or open areas.

The charcoal was too comminuted to assess origins from managed woodland. And, although there was little evidence from the charcoal deposits, it could be anticipated that continued occupation of the region combined with agricultural clearance would, ultimately, have reduced the size and distribution of woodland zones.

CONCLUSION

This report includes the analysis of charcoal from pits, postholes and a possible hearth base dated to Phases 1 and 2 (Early Neolithic and Late Neolithic to Early Bronze Age), and also from a post-medieval pit. Although all the samples were provisionally designated as fuel residues, those from an alignment of pits (512, 513 and 514), dated to the first half of the second millennium BC, could represent the structural remains of oak (*Quercus* sp.) posts burnt *in situ*. The charcoal deposits demonstrated a clear preference for the use of oak (*Quercus* sp.) fuel, although those from Early Neolithic contexts tended to be mixed with hazel (*Corylus avellana*).

It seems likely that local woodland was predominantly oak. Other species identified from the charcoal study included hazel, alder (*Alnus glutinosa*) and gorse (*Ulex* sp.) or broom (*Cytisus* sp.). Although absent from the fuel residues, it is suggested that a range of other trees and shrubs would have been present in the environment.

APPENDIX TWO: PALAEOENVIRONMENTAL SAMPLES FROM PIT FILL 002 by Dr. J E Schofield⁴

Two samples (context no. 002, upper and lower fills) were prepared for pollen analysis. Due to their high clay content, preparation involved fine sieving (retaining the fraction >10 µm) and repeated treatment with the deflocculant sodium pyrophosphate (Na₄P₂O₇) (Bates *et al*, 1978) prior to standard stages of coarse sieving, hot HF treatment and acetolysis (Moore *et al*, 1991). The processed samples were then mounted in silicone oil and analysed at x400 magnification under an Olympus microscope.

Both pollen samples were found to contain extremely low microfossil concentrations, and appear to be of very little palaeoecological value. Scanning of residues under 20 x 20mm coverslips revealed very occasional pteridophyte spores (*Polypodium* and pteropsida (monoete) indet.). These types of spores are widely regarded as being one of the most resistant to decay (e.g. Havinga, 1984). However, all spores present here were badly preserved, exhibiting signs of both mechanical damage (breakage, crumpling) and chemical degradation. Considering the limited number and poor quality of the spores present in these assemblages, it appears likely that post-depositional conditions in these clays have been largely unsuitable for the preservation of other sub-fossil pollen types.

Sample material remaining after pollen analysis was sieved through 1.00mm and 106 µm mesh, and the residues retained for inspection. Again these analyses produced little of interest in terms of palaeoenvironmental potential. Plant macrofossils were completely absent, although small particles (size fraction 106-1000 µm) were observed in both samples.

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**A477(T) SAGESTON-REDBERTH BYPASS
EXCAVATION OF A NEOLITHIC OCCUPATION SITE 2001**

REPORT NUMBER 2002/87

NOVEMBER 2002

This report has been prepared by Nigel Page

Position Project Manager

Signature  Date 11/11/02

This report has been checked and approved by Ken Murphy on behalf of Cambria Archaeology,
Dyfed Archaeological Trust Ltd.

Position Principal Archaeologist - Field Operations

Signature  Date 11 November 2002

As part of our desire to provide a quality service we would welcome any comments you may have
on the content or presentation of this report



Plate 1: General view looking east along the excavated area.



Plate 2: Posthole rows 551 and 552 looking southwest. The area around the postholes has been dampened with water to emphasize them against the clay subsoil.



Plate 3: Linear pit 025 and some of the stakeholes at the western end of the site.

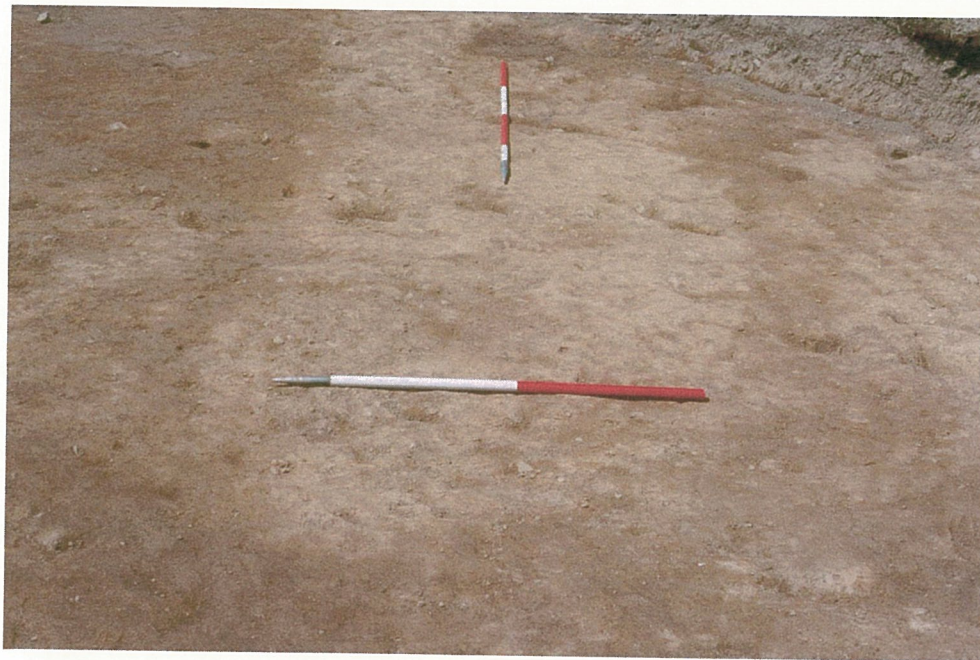


Plate 4: Clay spread 546 when first exposed.



Plate 5: Structure 1 looking northeast.

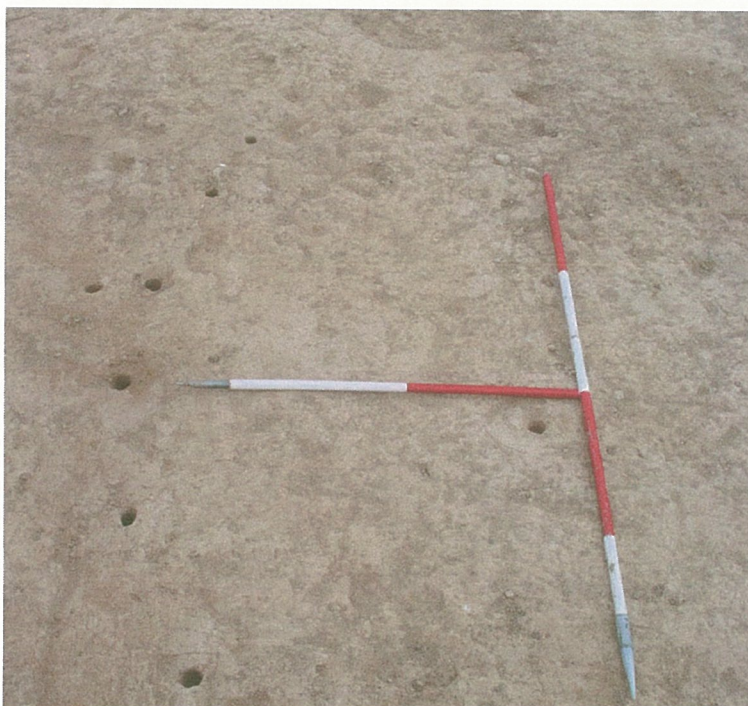


Plate 6: Structure 2 looking north.



Plate 7: Recording the stakeholes using an EDM proved to be the quickest and most accurate method of plotting the 300+ stakeholes across the site.



Plate 8: Excavating feature 516. The shallow feature is visible as a dark line curving between the two sub-square terminals at either end of the ranging pole.



Plate 9: Recording the late medieval/early post-medieval pit 510.