The Stones of Stonehenge Project

Investigations in the Nyfer (Nevern) valley in 2013

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Summary

In 2009, geologists Richard Bevins and Rob Ixer identified a rhyolite source of Stonehenge bluestones north of the Preseli hills in the Pont Saeson district, an area including specifically the impressive crag of Craig Rhosyfelin, not far from the spotted dolerite source at Carn Goedog on the northern edge of the hills, although in a much lower topographic situation. Later, they noted that SH32d, an unsampled stump within the bluestone circle, appears macroscopically to conform to a major class of debitage from Stonehenge, namely their 'rhyolite with fabric', that could originate from Pont Saeson (Ixer and Bevins 2011). In March 2011 Rob Ixer and Richard Bevins were able to find a precise match between this 'rhyolite with fabric' from Stonehenge and a particular location on the northwest side of the outcrop of Craig Rhosyfelin.

Follow-up excavations by the Stonehenge Riverside Project and Dyfed Archaeological Trust in September 2011, 2012 and 2013 have confirmed that the outcrop at Craig Rhosyfelin was a prehistoric quarry site. Discoveries include a 4m-long monolith lying prone in the quarry, set upon an artificial platform of soil and stone, a large pit containing two standing stone posts and a sequence of hearths, and a smaller pit containing a standing stone post and set adjacent to the quarry bay for the megalith taken to Stonehenge. Finds associated with this phase of monolith extraction included hammer stones and carbonized wood. The dimensions of the quarry bay indicate that the extracted monolith was 2.50m long, up to 0.45m wide and 0.40m thick, and likely to weigh about a ton or so.

Although not yet dated, these layers associated with megalith removal lay beneath a deep stratified sequence of deposits that have been dated from the Bronze Age, Iron Age and early Medieval period. The Bronze Age layers consist principally of yellow colluvium, on top of which was an occupation site from the Early Iron Age. This consisted of two successive layers of organic soil with a hearth at the centre. Although there was no evidence for a structure or building, 13 cut features were associated with this activity, together with three sherds of pottery and an iron object that is possibly part of a brooch. The Iron Age layers were covered by a deep deposit of colluvium which formed from the 9^{th}-10^{th} centuries AD onwards.

Just a mile north of Craig Rhosyfelin lies the hillfort of Castell Mawr. Geophysical survey in 1988 revealed the possibility that this hillfort's ramparts may have been built upon a pre-existing henge (Mytum and Webster 2003). In 2012 we attempted to test this hypothesis by taking samples for optically stimulated luminescence dating (OSL) from two sections of the rampart's exterior; the results, however, indicate that it was probably built in the first millennium BC. Renewed geophysical survey in 2012 revealed, among other features, traces of two concentric palisade trenches within the hillfort's interior. Short sections of these were excavated in 2013 within two small trenches, each 15m x 10m, against the cross-bank that runs through the centre of the hillfort. Whilst the latter is likely to date to the Iron Age, there was no dating evidence other than carbonised wood to date the palisade trenches. Among the small number of cut features excavated within the two trenches, one was a hole from which a bluestone-sized standing stone had been removed. This discovery may thus be significant for understanding the context of the bluestones' possible initial installation within a local stone circle, prior to their transport to Stonehenge.

Research Aims

The project aims:

- To identify quarry sites from which Stonehenge bluestones (dolerites, rhyolites and other lithologies) were obtained.
- To better understand settlement and monument construction in the late 4th and early 3rd millennium BC within the Preseli region and their relationship to stone quarrying and its long-distance transport to Salisbury Plain.
- To enhance understanding of the ancestral significance of the Preseli region to late Neolithic communities through an examination of aspects of the 4th millennium BC landscape.

Research Objectives

The project's second phase in 2012 identified two main targets. The first was the rhyolite outcrop at Craig Rhosyfelin (SN117362), Brynberian, where a 30m x 10m trench was excavated along the outcrop's northern face. The objective of this work was to identify areas of prehistoric quarrying of megaliths along the rock face, and to date that activity by radiocarbon and luminescence dating methods.

The second research focus was the hillfort of Castell Mawr (SN1187537768) in the parish of Meline, thought by Mytum and Webster (2003) to be a modified Neolithic henge. In 2012 cleaning of two cattle-poached sections of rampart at its east end produced samples for radiocarbon and optically stimulated luminescence (OSL) dating. Geophysical survey (with magnetometer and earth resistivity meter) of the hillfort's interior and environs also in 2012 revealed the existence of two concentric circuits of ditches and pits.

The same two locations were further investigated in 2013. The northeastern two-thirds of the 2012 trench at Craig Rhosyfelin were re-opened, to continue excavation beneath the Iron Age and Bronze Age layers investigated in previous years.

Within the hillfort of Castell Mawr, two trenches were excavated in the southern sector to investigate the two circuits of suspected palisade trenches and to find out whether there were any holes left by dismantled standing stones.

Craig Rhosyfelin

This site, and immediately adjacent outcrops north of Pont Saeson, was first identified by Richard Bevins in 2009 as a likely source of some of the rhyolite debitage found at Stonehenge (Ixer and Bevins 2009). It matches three foliated rhyolite fragments found in the Cursus field 1km to the northwest of the monument (Ixer and Bevins 2010; Bevins *et al*. 2011), first collected by William Young and J.F.S. Stone (Stone 1947). More rhyolitic fragments were found in 2006 by the Stonehenge Riverside Project and in 2008 at Stonehenge by the SPACES and SRP projects (Ixer and Bevins 2010). It is currently thought that the remainder of the Stonehenge rhyolite sources are likely to come from the north Pembrokeshire region (Ixer and Bevins 2011).

Figure 1. Craig Rhosyfelin is the NE-SW aligned outcrop in the bottom of the Bryn valley, at the centre of the photograph (see also the frontispiece)

The rhyolite outcrop of Craig Rhosyfelin (SN117362) forms a dramatic ridge of pillar-like stones on the west flank of the Brynberian valley, two miles north of Carn Goedog, with which it is linked by one of the tributaries of that valley. Its western edge is exposed as a near-vertical face by the presence of a small and short tributary valley running northwards on the west side. There are no visible earthworks around the outcrop or within its vicinity, although some of the land upstream to the north has been landscaped as the garden of a modern house. Dense stands of bracken and brambles, however, have obscured some of the ground surface nearest the outcrop's near-vertical sides.

Ixer and Bevins (2011b) have established that a rock sample from the northern end of the outcrop's vertical western edge (Locality 8 in the accompanying figure) provided an exact petrographical match for a number of rhyolite chips from Stonehenge. This highly distinctive texture they have called 'Jovian' as it resembles the weather patterns on that gas giant.

Figure 2: Geological sampling points at Craig Rhosyfelin; the precise match with Stonehenge 'rhyolite with fabric' was found at location 8.

Methodology

Investigation commenced at Craig Rhosyfelin (site code CRF) in September 2011 with geophysical survey (earth resistivity and magnetometry) and a trial excavation (Parker Pearson *et al*. 2011). Discoveries in 2011 included a prone monolith (context 007), identifiable on the geophysical plot in hindsight as an anomaly of high resistance.

In September 2012 an excavation of over 200sq m was carried out against the foot of the outcrop along its northwest face. The trench was rectangular in plan except for a small extension on the west side to find out whether a second area of high resistance indicated the presence of another prone monolith (but it did not). In September 2013 most of the excavation trench was re-opened, and excavation continued.

The topsoil and most of the colluvium (layers 002-006 and 008) were removed with a mechanical excavator, and the remainder of the deposits above the stone scree and quarry floor were excavated by hand. The colluvium (or hill wash) was over 2m deep in parts of the trench; not only has it sealed archaeological layers beneath it but it has also protected them from opportunistic quarrying in the historical period; in contrast, steel wedge-made holes on the southeast side of the outcrop testify to recent quarrying on that side.

Of those deposits sealed beneath colluviums but post-dating the prehistoric quarrying activity, buried soils (020 and 036) were excavated. Continuing the process commenced in 2011, these were sampled for magnetic susceptibility, phosphorous and other elements and bulk sampled for flotation to recover charcoal. Carbonised round wood and a barley grain

from layer 020 were radiocarbon-dated in 2011, producing dates in the first millennia BC-AD. A date on carbonised round wood from the base of the colluvium indicates that its formation commenced in the first millennium AD.

Stratified beneath layers 020 and 036, a thin occupation layer (041) was associated with stone tools, pottery and an iron object and provided radiocarbon dates on carbonised wood of 550-410 cal BC. This layer was sampled on a half-metre grid for magnetic susceptibility, phosphorous and other elements and bulk sampled for flotation to recover charcoal. Associated features and deposits were hand-excavated and bulk sampled for flotation.

Similar gridded sampling was carried out in 2013 on a sequence of layers beneath 041: a silt-clay layer (081), a buried soil layer (098), and a dark brown loam layer (105). Beneath these and associated features and deposits, a series of layers with little organic content were encountered at the bottom of the stratigraphic sequence (069, 121, 125, 134 and 135). Of these, layer 069 produced a carbonised roundwood fragment that was dated to 5210-4950 cal BC at 95.4% probability (SUERC-46204; 6114±31 BP).

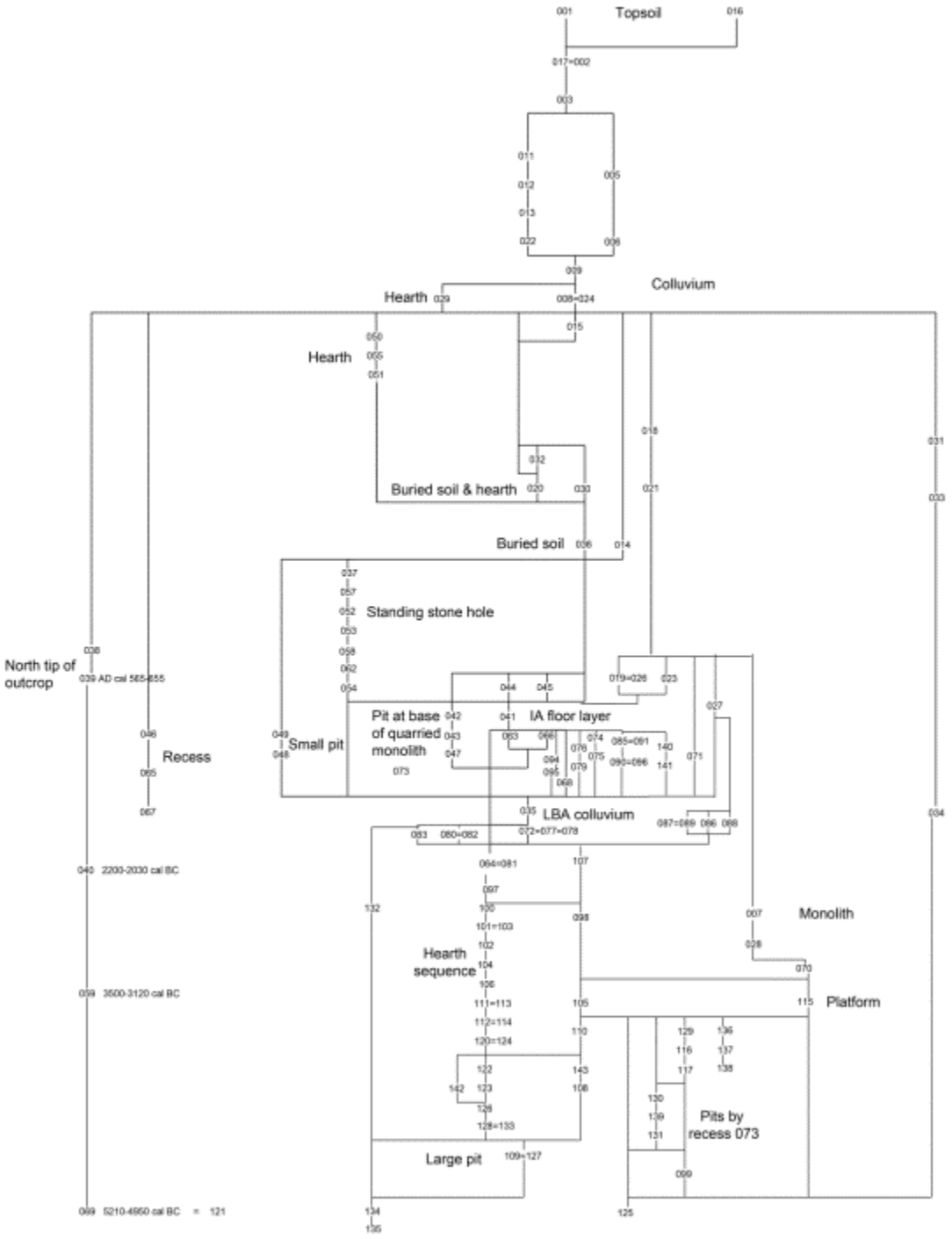

Figure 3. Stratigraphic matrix of contexts within the 2011-2012 excavations at Craig Rhosyfelin.

The pre-quarry sequence
Five deposits in different parts of the excavation trench appear to have been laid down before those unequivocally associated with human activity. The lowest of these was yellow clay (135), which was cut into by pit 109=127. Above 135 was a layer of sandy yellow clay (134), observed in the base of the large pit for the broken-up standing stone. Layer 135 was similar to the layer of yellow clay and small stones (125) encountered beneath the platform (115) on which the prone monolith (007) lay. At the north end of the trench, a hard-packed, gritty yellow-orange layer (121) close to the edge of the outcrop could be matched with a similar deposit (069) on the very end of the outcrop. Of all these five layers, only 069 contained visible fragments of carbonised material; a hazelnut shell from this layer provided a date of 5210-4950 cal BC at 95.4% probability (SUERC-46204; 6114±31 BP). This raises the possibility that there was Mesolithic activity at the outcrop in the late sixth millennium BC, though there were no lithics recovered from this layer.

The deposits pre-dating megalith extraction
In the northeast end of the trench, the deposits associated with megalith extraction consisted of a buried ground surface (098), its suspected B-horizon (105) and a series of cut features of which four were excavated in 2013 (109=127, 117, 131, 138) and one in 2012 (054, dug into in the Iron Age). Another two cut features in the very northernmost corner of the trench remain unexcavated. Two positive features were also recorded in the northeast half of the trench: a deposit of medium-sized stones between two large, laid slabs (099), and a circular or D-shaped area of hard-standing (132). The southwest half of the trench was largely covered by an artificial platform of sediment and laid stones (115), about 8m NE-SW x 4m NW-SE, on which the stone 'rails' (028) and other propping stones beneath monolith 007 were sat.

Finds from the buried ground surface (098) consisted of a rhyolite flake (SF62). Layer 105 beneath produced a rhyolite flake (SF68) and a stone flake (SF86).

Deposits associated with megalith extraction
A sequence of layers of sediment above layer 098 was excavated in the northeastern half of the trench. Above this was a purple-brown layer of sandy clay (064) that could be seen beneath rubble at various places throughout the trench. A variety of localized contexts were identified beneath the Iron Age layer 041 and above the dark brown silt-clay (081) that sealed the quarry layer (098 and 105): these were found to be natural variations in the subsoil (072=077=078, 080=082, 083, 086, 087=089 and 088). The finds from these layers consisted of a rhyolite flake (SF47) from layer 064, a piece of worked chert (SF59) from layer 077, and a piece of worked rhyolite (SF53) from layer 083. The piece of chert (SF59) has two polished facets, suggesting that it is possibly from a polished axe (close to the blade).

Layer 081 produced 13 artefacts of a variety of lithic materials: a hammer stone (SF55), a flint flake SF78), six rhyolite flakes (SF74, SF76, SF79, SF80, SF82 and SF84), a piece of worked rhyolite (SF83), a quartz core (SF85) and three quartz flakes (SF75, SF77 & SF81). Their distribution was concentrated around the hearth, especially the quartz artefacts, whereas the rhyolite artefacts had a wider spread east of the hearth. The flint flake and one rhyolite flake came from the northern end of layer 081, close to the outcrop.

Pits 131 and 117
Pit 131 was an irregular, shallow, oval feature cut into the southeast side of stone feature 099. Its gritty brown-black-orange fill (130) contained medium-sized stones including four large

river cobbles. The largest of these (0.44m x 0.30m x 0.23m) was jammed into the top of a 0.22m-diameter, 0.15m-deep cylindrical hole in the northwest edge of pit 131. This hole, having the appearance of once holding the end of a log, was not vertical but was angled southwards towards the outcrop, specifically the recess (073) from which a rhyolite pillar is missing.

The south corner of pit 131 was cut by pit 117, a sub-rectangular, shallow pit that abutted against the outcrop on its southwest side. This pit contained a 0.65m-high standing stone, set within a matrix of brown-black, orange-mottled loam (116) within which were yellow clay lumps (129) and large packing stones. Signs of damage on the standing stone's west top side and the stone's lean towards the north are evidence that it once supported a heavy weight. Its position 0.5m from the recess (073) from which a pillar is missing makes it likely to have been used as a pivot or fulcrum for the detached Stonehenge 'rhyolite with fabric' monolith.

Stone setting 099
This feature was visible in the top of the buried ground surface (098) where it consisted of a series of cobbles and stones, one of which was an upright slab leaning northeastwards. Other stones were set on edge and there were also river cobbles incorporated into the matrix. This feature was bounded on its southwest and northwest sides by two large flat slabs, and on its southeast side by pit 131.

Figure 4. Pit 131 in half section, showing its fill (130) with medium-sized cobbles and stones on edge. On the left is the standing stone stump set within pit 117, which cuts the south corner of pit 131. On the right (northwest) of pit 131 is the stone setting 099

Figure 5. The standing stone (centre) in pit 117, with recess 073 behind (left of scale)

Figure 6. Stone setting 099 (left of the scale), with the standing stone within pit 117 in the bottom right

The recess (073) for the Stonehenge 'rhyolite with fabric' monolith
This recess was located about 3m from the northern end of the outcrop, immediately north of geological sample point 8. It was formed by removal of a thin, tapering monolith 2.50m high, up to 0.45m wide and 0.40m thick (073), isolated from the rock face by wide, deep vertical fissures on either side.

Unlike the prone monolith (007), the monolith that had sat in the recess had not been attached to the living rock at its base; in this part of the outcrop, there was a weathered, horizontal fault line that ran just above ground level. There were no signs of burning along the edges of the recess to suggest that the monolith had been detached by fire-setting, a method of axe quarrying used in the European Neolithic (Pétrequin *et al.* 2008). Instead, there were three areas along the north edge of the recess with indentations formed in antiquity. These could have been made with hammer stones to widen a pre-existing fissure behind the extracted pillar but they cannot be demonstrated with certainty to be artificial.

Although chippings of the 'rhyolite with fabric' monolith have been identified at Stonehenge (Ixer and Bevins 2011), the actual monolith has not yet been positively identified. On the basis of macroscopic appearance, it is thought to be SH32d, a laminated 'spotted dolerite' stump recorded by Richard Atkinson and Stuart Piggott in 1954 as 0.40m x 0.40m in width and thickness (Cleal *et al*. 1995: 226, fig. 120). These dimensions, including the stone's profile and angled base (Cleal *et al*. 1995: fig. 141) correspond exactly to those of the stone (073) taken from the recess at a height of 0.3m or more from its base.

Figure 7. The recess from which a monolith has been removed. Geological sampling location 8 is in the top right of the picture, just right of centre. The surface of pit 047 (unexcavated at this stage) is visible as a cluster of stones at the base of the recess.

Pit 138

This was a small, concave, sub-circular pit close to the outcrop but south of features 099, 131 and 117. Its dark brown clay fill, mottled with yellow clay (137) contained small stones on edge that appeared to be packing for an upright, although there was no post pipe or void from an upright's removal. Within the fill there were small fragments of what appear to be burnt or baked clay. This feature was cut by the large pit 109=127.

Figure 8. Pit 138 in half section, showing packing stones on edge

Pit 109=127
One of the largest features encountered in 2013 was a pit (109=127), about 4m N-S x 3m E-W and 0.5m deep. Within it were set a series of eight large slabs, two of them set vertically at its south end, one set at an angle at its north end and the remainder lying in between, against the east and west sides of the pit. The two standing stones at the south end were just under 1m high and were surrounded by packing formed by large stones and dark brown clay with stones and pebbles (110). None of the other slabs were supported with packing other than the stone-free yellow clay (layers 128=133, 126, 142, 143, 123, 122 and 120=124) that was backfilled into the pit once the stones were set in it. The eastern of the two standing stones (108) had been damaged in antiquity on its top, where spalls had been removed and crush damage was visible, indicating that a heavy weight had passed over its top. Despite the extent of packing around stone 108 and its partner, both were out of position from the vertical, leaning southwards.

The pit was backfilled soon after digging, presumably to set the large slabs in position. Some of the packing for stone 108 was covered by material from the platform (115) to the south, on top of which was positioned the large threshold slab 070. Thus the platform (115), the threshold slab (070) and the monolith (007) all date to after pit 109=127 was backfilled.

The only finds from the pit were worked flakes of chert (SF71) and rhyolite (SF70), both from layer 120.

The sequence of hearths within the top of pit 109=127
In the top of the backfilled pit, a small hollow (112=114) was cut into layer 120 and was filled with fine, soft black soil containing ash and many fragments of carbonised wood

(111=113). Above this was a darker layer of ash and carbonized material (106), covered with a spread of fist-sized quartz and rhyolite lumps, some of them burnt (104). A third ash and carbonised wood layer (102), above 106 and 104, was similarly covered by quartz lumps (101) and unburnt grey clay (103). Above layers 101 and 103 was a fourth layer of ash and carbonised wood fragments (100), this last hearth being capped by a spread of burnt and unburnt lumps of quartz and rhyolite (097). Finds from the hearth sequence consisted of a worked rhyolite flake (SF63) from among the capping stones (097).

The sequence of four hearths clearly dates to after the backfilling of pit 109=127 and the setting of large uprights and other slabs within it. However, although pit 109=127's construction clearly pre-dates the quarry features to the south (115, 070, 028 and 007), no such stratigraphic relationship could be established between these features and the hearth sequence in the top of pit 109=127.

Figure 9. Pit 109=127 (left) in section (scale on baulk) with the threshold stone (070) and the prone monolith (007) to the right

Prepared surface 132

Layer 132 was a prepared surface about 0.05m thick, of small stones and re-deposited gravel, covering an area 1.7m NE-SW x 1.5m NW-SE. It was cut on its south side by pit 054 (an Iron Age disturbance of an earlier pity that contained a 1.15m-high standing stone, presumably another prop stone before it was dismantled; see below). This cut prevented us from establishing the southern edge of the prepared surface but it was more likely D-shaped than circular in plan. It provided an area of hard standing on the north side of the dismantled prop stone within pit 054 and further north of the stone settings in pit 109=127.

Figure 10. Prepared surface 132, viewed from the northeast, with pit 054 behind

Layer 059 at the north end of the outcrop
At the north end of the outcrop a dark red-orange-brown clay silt layer (059) lay beneath layer 040, both of them excavated in 2012. Layer 059 contained burnt cobbles and charcoal flecks throughout. Carbonized pomoideae wood in 040 is dated to 2200-2030 cal BC at 95.4% probability (SUERC-46206; 3717±27 BP), whereas a carbonised hazelnut shell in 059 dates to 3500-3120 cal BC at 95.4% probability (SUERC-46205; 4590±30 BP). A section was cut to establish the relationship between layers 069, 059 and 040 on the one hand and 098 and 105 on the other; unfortunately there was a large stone that prevented a stratigraphic relationship being established with certainty but it is most likely that layer 059 is equivalent to 105.

The platform supporting the prone monolith (007)
Southwest of pit 109=127, the ground rises steeply before levelling off. This change in height is the result of terracing, caused by the deposition of an artificial platform of mixed orange-grey soil and stones (115). Groups of these stones are often stacked horizontally or vertically (the latter observed below the north side of the monolith (007)).

The horizontal pillar (070), 2.2m x 0.55m x 0.4m, has the appearance of a threshold over which prehistoric quarry workers may have envisaged dragging monolith 007 before they abandoned the monolith in the position in which it now sits. Yet there is a 1m-wide zone of flake-scarring and damage on the top surface of this threshold pillar that suggests a previous, unidentified monolith was dragged over it prior to the quarrying of monolith 007. In addition, one of the vertical stumps of rhyolite embedded into layer 064 north of this threshold also has a damaged top surface. It is not clear how a monolith was (or was envisaged as being)

transferred onto a wooden sledge and rollers, since the width of the stone-free area for a distance of 3m below the threshold stone is limited.

Figure 11. The 'threshold' stone (070) north of monolith 007, viewed from the northeast. It has been fractured and flaked, perhaps from the weight of a monolith dragged across it.

A group of four long, thin rail-like pillars of rhyolite (context 028) lay on a northwest-southeast axis on top of layers 027 and 019. They were 0.2-0.4m wide and 1.1m-1.5m long. Together they formed three parallel lines with an overall width of 2.1m. They were initially interpreted in 2011 as the end of a series of stone runners or rails along which monolith 007 was manoeuvred. However, when examined in 2012, two of them could be seen to prop up the southwest end of monolith 007.

Figure 12. Trench through the artificial platform (115, beneath 028 and 007) to the top of layer 125 below

Figure 13. The stone 'rails' (028) underneath the southwest end of monolith 007

The precise location where monolith 007 was detached from the living rock could not be found, due most likely to its being covered by debris from more recent rock falls. A wide recess east of monolith 007 (between geological sample locations 17 and 18) was investigated to see if a match could be found with the base and sides of the monolith. A sequence of three layers was excavated against the face of the outcrop and beneath colluvial layer 017. The lowest was orange-brown clay silt (034) with weathered rhyolite fragments, likely to be equivalent to subsoil layers 035 and 064. This was covered by mid-brown clay silt (033) with rhyolite fragments, possibly equivalent to layer 020. Above this, a brown-black clay silt (031) with charcoal flecks is probably equivalent to layer 018.

The prone monolith (007)

The rhyolite monolith (007) is 4.10m long, up to 1.25m wide and 0.54m thick. It lies with its top downhill towards east-northeast at an angle of about 30° to the stone 'rails' on which its west-southwest basal end rests. Whilst its thickness is relatively even, its width varies; it is mostly about 1.1m wide for most of its length and is about 1m wide at its base. Its top end, lying downhill, is naturally weathered indicating that the monolith was detached from the top of the outcrop. Its basal end, lying uphill, is unweathered and fractured, indicating that it has been snapped off from the outcrop.

The monolith lies with its unweathered face (*i.e.* that side that was prized from the bedrock) lying upwards, indicating that it has been moved from the rock face through 90° in the vertical plane and then rotated through 120° in the horizontal plane. On the basis of comparison with the varying geology along the rhyolite outcrop, it seems that the monolith was detached from the living rock in the immediate vicinity of geological sample 18, about 5m to the south-southeast.

The southeast side of the monolith has a large splinter of rhyolite poking out from under its base. This was initially thought to be a prop stone but it is actually a broken-off fragment of the monolith's underside. Its fracture may have been the reason why the monolith was abandoned in the quarry, although there is also a hairline crack across the monolith's upward face. However, there could have been other reasons why the monolith was abandoned: for example, it appears to have slipped forward and sideways, perhaps when the splinter sheared off.

Other than having been split from the parent outcrop, the monolith has no evidence of working other than two possible flake scars on the upper surface of its southeast corner. These derive from flakes (0.05m x 0.10m wide by 0.05m long) that have been struck across (not along) the foliations, leaving the negative depressions of bulbs of percussion. There are two curious parallel gouges on its north side about 0.08m apart and 0.10m long, running across the grain of the rock. They are slightly wider at the bottom (nearest the ground) and narrow to points at the top.

Pre-Iron Age deposits

The uppermost layer in this sequence of naturally formed deposits between 081 and 041 was a thick deposit of bright yellow sandy clay (035) confined to the northern end of the trench. This contained large blocks of rhyolite (072) buried beneath the surface of layer 035. The uppermost 0.10m of this layer (035) contained pieces of carbonised wood. Finds from layer 035 were worked pieces of quartz (SF 50 & SF 51) and rhyolite (SF 49) and a snapped microlithic flint blade (SF 48).

Carbonised oak within layer 035 was dated by radiocarbon to 1030-890 cal BC at 90.7% probability (SUERC-46199; 2799±30 BP) and 1090-920 cal BC at 93.3% probability (SUERC-46203; 2841±28 BP); an OSL determination of 5410-3590 BC (CRF12-02; X5454; 6500±910 BP) is older, possibly because the sampled portion of these sediments may not have been fully exposed to daylight during deposition.

At the north edge of the trench, beyond the end of the outcrop, the buried soil (098) falls away to the north down a slope. Down this slope it is covered by a sequence of thin lenses of sediment (collectively layer 107), becoming thicker towards the north. Layer 107 lies beneath layer 035.

Iron Age activity

The Iron Age ground surface consisted of a spread of rhyolite blocks (context 019=026) on top of a mixed dark brown clay loam (layer 041; 0.05m thick) that sat on the yellow sandy clay (layer 035; 0.06m thick) and purple-brown clay (layer 064). An unmodified beach pebble (SF4), a stone with traces of grinding (SF6) and a possible hammerstone (SF8) were recovered from context 026. The rhyolite blocks on the surface of these two layers petered out towards the northeast end of the trench where the outcrop terminated.

Layer 041 was a thin deposit of clay loam that extended from the northern end of the outcrop to the spread of rhyolite blocks (context 019=026) and a large 'threshold' slab (070) to the south. From the face of the outcrop, it extended westwards to the edge of a large stone hole (054). It was covered by layers 036 and 020. It contained quantities of wood charcoal and burnt rhyolite fragments (burnt to a red colour). Two worked flints – an awl (SF29) and a snapped flake (SF31) – were found on the interface between the top of layer 041 and the base of layers 020 and 036, together with a quartz chip (SF34) and a quartz flake (SF35). A quartz core (SF38) and a possible quartz core (SF39) were found in layer 041. During analysis of flotation residues, an iron object (possibly part of a fibula spring), a small sherd of pottery, a worked rhyolite disc and three quartz flakes were found to have come from layer 041.

At the centre of layer 041 was the remains of a hearth, detectable from a dense concentration of burnt rhyolite stone fragments about 1.5m away from the side of the outcrop. Although there were a few cut features associated with this activity (see below), there was no evidence for a roofed structure or building. Given the good preservation of old ground surface, it is most likely that this was an open-air camp site that appears to have been returned to again and again during the Iron Age.

After layer 041 was removed, two small concentrations of charcoal (063 and 066) were identified close to the outcrop and pit 047. Two samples of carbonised oak roundwood from 066 date to 745-410 cal BC at 95.4% probability (SUERC-46480; 2434±20 BP) and 735-410 cal BC at 95.4 probability (SUERC-46481; 2432±19 BP). A piece of non-roundwood oak from 063 dates to 390-205 cal BC at 95.4% probability (SUERC-46198; 2243±27 BP). Given the difference in date between 063 and 066, these are more likely the bottoms of charcoal concentrations within 041 rather than deposits pre-dating layer 041.

Likely Iron Age layers on the platform

The southern edge of layer 041 abutted a large horizontal rhyolite pillar (070) and a line of stones (071), several of them placed on edge, bedded into layer 064 and serving as a low revetment wall, up to 0.1m high, separating the stony part of the site from the largely stone-

free zone to the north. Deposited after this revetment, a layer of small, broken-up stones and grey-brown soil (027) filled the area uphill from the revetment for about 5m to a depth of up to 0.1m. This appears to be a fill of grey soil and stones, deposited against the edge of the rubble (019) on top of the earlier platform (115). In 2011, layer 027 produced four knapped rhyolite flakes; in 2012 a further rhyolite flake (SF42) was recovered from it and, in 2013, a possible hammer stone (SF55) was found within it. In this area, layer 019 forms a consolidated, relatively level surface of small rubble, beyond 4m from the rock face, along the northeast long side of the monolith and extending beneath it. Layer 019 contained a hammerstone (SF2).

Within 1.5-4m of the outcrop wall, many of the stones in rubble layers 019 and 026 (the latter post-dating layer 041) are pitched at right angles to the rock face; some towards the northeast end of the trench even appear to have been stacked.

Against the rock face opposite monolith 007, there was a pocket of dark brown-black clay loam (018) in a loose fill with small 'slates' of rhyolite. This was a localised deposit set into larger rubble (019) on both sides (northeast and southwest). It pre-dated the upper colluvium (002=017) but could not be related stratigraphically to other layers lying upon the rubble (026 and 023). Layer 017 contained a large cobble of spotted dolerite with one end heavily flaked and battered (SF19), and a rhyolite flake (SF24).

Iron Age cut features

Features cut into layers 064 and 035 within the northern part of the trench included a small bowl-shaped circular pit (048) 3m to the north of the recess, and a large stone hole (054) to the northwest. In addition, there was a shallow scoop (060) filled with a flat slab (061) immediately in front of the recess and semi-circular pit. Other features recorded in 2013 were a small oval pit (075), a shallow scoop (079), a small oval pit (095), a shallow, irregular pit (090=096) and a cut against the outcrop (141).

The shallow scoop in front of the recess was filled with mid brown clay loam (061) and a foot-sized rhyolite slab lying flat and perpendicular to the rock face. Layer 061 was covered by layer 041. It is possible that the slab was used as a solid surface by those extracting the monolith and lowering it to the ground.

The small bowl-shaped circular pit (048) was 0.55m x 0.48mm in diameter and 0.26m deep. Its fill of grey-brown clay loam (049) contained many burnt rhyolite cobbles and charcoal flecks. Its stratigraphic relationship with layer 041 could not be established.

About 5m northwest of the recess lay a large pit (054), 2.00m x 1.45m diameter and 0.7m deep. The pit was dug after layer 041 had accumulated. In the base of the pit was an impression, 0.60m wide x 0.50m thick, of the bottom of a stone upright. One of the stones (053b) protruded out of the pit at an angle of about 30º, oriented to the north and with its base about 0.3m to the south of this impression. We thought initially that stone 053b was the broken stump of a tall standing stone but its dimensions (1.15m long) are too small for this to be a broken standing stone of any height; instead, it is likely to have been a large prop stone, similar to the two in pit 109=127 and the one in pit 117. To support this interpretation, one end of this stone exhibits damage caused in antiquity.

Figure 14. A section through the fill (049) of bowl-shaped pit 048

Figure 15. The re-fitted standing stone (053) from pit 054, showing ancient damage at the left end

The lower fill of this pit was pale cream sandy clay (062) packed with three large blocks of rhyolite to provide support for the standing stone. A fine quartz core (SF36) was found within layer 062. Above this, there was a deposit of large rhyolite blocks (053 and 058), packing stones for the fallen standing stone. Of these, context 058 consisted of the undisturbed, *in situ* packing stones.

Long after its erection, the standing stone was pulled over and removed, after a buried soil (036) had accumulated over the pit fill but before the onset of colluviation (layer 008). The rest of the pit was filled with a mixed deposit of re-deposited yellow subsoil and grey silt (052) and, in the pit's centre, its uppermost fill of fine grey silty clay (057). The latter is probably slumped soil from the old land surface above (layer 036) filling the void of the removed standing stone whilst layer 052 results from disturbance of previously stratified layers within the stone hole.

The stone hole (054) was covered by a heap of rhyolite blocks (037), one of which (037c) conjoins with this stumpy standing stone (053b). A possible hammerstone (SF32) came from among the blocks in layer 037. The upcast (052 and 057) created by pulling down the stone was very similar to that of a tree-throw, with deep fill material brought to the surface and surface soil forced deep underground. On present dating evidence, this destructive event may have occurred after the middle of the first millennium BC but before the mid first millennium AD.

Figure 16. Pit 054, filled with packing stones; stone 053b protrudes out of the pit on the left hand side.

A small oval pit (075), 0.36m x 0.29m and 0.34m deep, was filled with dark grey silt (074), and is possibly the remains of a posthole angled towards the south. A shallow scoop (079), 0.65m x 0.38m and 0.05m deep, was filled with ash and carbonised wood flecks (076), possibly the remnants of a hearth. A small oval pit (095), 0.32m x 0.20m and 0.14m deep, was filled with orange-brown clay (094). A shallow, irregular pit (090=096), 0.53m x 0.22m and 0.16m deep, was filled with dark brown clay (085=091) and contained a burnt fragment of a rib (SF57).

Two cuts had been made against the outcrop, one (047) against the base of recess 073 and the other (141) a metre to the southwest. Feature 141 was a semi-circular pit, 0.2m in diameter and about 0.15m deep, filled with dark brown-grey silt and stones (140). The other, a small, roughly semi-circular pit (047), 0.70m in diameter and 0.25m deep, had been dug against the base of the recess (073). Its upper fill of dark brown clay loam (042) was packed with medium-sized and small stone blocks, some of them burnt; one of them was a large, thin slab of burnt rhyolite. Its basal fill (043) was hard-packed with a thin slab of rhyolite pressed down the pit's northern side to its base. From this primary fill came a knapped flake of rhyolite (SF40). Layer 042 could not be distinguished from 041, and the two deposits appeared to merge into one at the side of the pit.

Two samples of carbonised hazel roundwood and pomoideae roundwood from the primary fill (043) of pit 047 produced widely variant radiocarbon dates of 3090-2925 cal BC and 1765-1635 cal BC.

Three samples of carbonised roundwood collected in flotation samples from the upper fill (042) of the pit produced three widely variant radiocarbon dates. A sample of *Tilia cordata* / *platyphyllos* dated to AD cal 428-539 at 95.4% probability (SUERC-42903; 1575±19 BP), another of the same species to 1414-1306 cal BC at 95.4% probability (SUERC-42905; 3081±18 BP) and a hazelnut shell (*Corylus avellana*) to 2836-2498 cal BC at 95.4% probability (SUERC-42906; 4074±19 BP). An OSL sample from this upper fill (042) provided an age overestimate because it had to be taken close to the sloping rock face which has contributed a substantial (and as yet unestimated) percentage of the sample's dose.

Figure 17. A section through the upper fill (042) of pit 047 at the base of the recess (073) from which a monolith has been removed.

The recess north of the Stonehenge monolith's recess

About a metre north of the recess from which the Stonehenge monolith (073) was extracted, there is a triangular-shaped recess that contained a sequence of two cultural layers on top of a basal deposit of natural stone clitter (067). The lowest of these was a mottled dark red-brown and grey clay silt (065). This lay on top of a mid-grey-brown silty clay (046) with fragments of charcoal, possibly a dump of hearth ash. Layer 046 lay directly below colluvium (008). Immediately outside the recess, there is a group of five stones set on edge (context 068) into layer 064, some of them at right angles. There was no sign of any cuts for the stones so it is difficult to establish whether they were arranged by human agency or not. One of them has a fire-reddened top, probably burnt when it was exposed within either layer 041 or 020.

The burnt deposit at the north end of the outcrop

The northern tip of the outcrop is formed by two natural upright slabs of rhyolite about 1m apart to provide a recess among the rocks. The western upright has split in two longitudinally and has also lost its top, surviving as two large slabs (context 038) lying within the recess. Traces of burning on the sides of the western upright raise the possibility that the slabs were deliberately detached by fire-setting.

One of the two slabs sealed a deposit of burnt material, consisting of an uppermost layer of black soil and ash (layer 039) and a lower, thicker layer of reddened sediment and burnt rhyolite cobbles (layer 040). These are interpreted as dumps of re-deposited burnt debris,

although there is no indication of where the original sources of this burnt material lay. Layer 040 was excavated for flotation on the same half-metre grid as layer 041.

Carbonised pomoideae roundwood from 039 provided a radiocarbon date of AD cal 565-655 at 95.4% probability (SUERC-46207; 1444±30 BP). Carbonized pomoideae roundwood in 040 is dated to 2200-2030 cal BC at 95.4% probability (SUERC-46206; 3717±27 BP).

Layer 040 lay on top of layer 059 (see above). Beneath layer 059 was a thick layer of orange, iron-rich, dark brown mottled sediment (069) with charcoal flecks throughout.

Figure 18. The burnt deposit (040) sealed beneath a fallen slab (038) at the north end of the outcrop.

The buried soil 020

Most of the northern half of the trench, especially against the western edge, was covered with a thin layer of grey clay loam (036). This appears to have formed a B horizon of a buried soil (020) although the two layers were not always found in the same place. Finds from 036 included a rhyolite flake (SF30) but others attributed to this layer actually came from its interface with layer 041 below it.

Figure 19. The buried soil (020) at the north end of the outcrop. The fireplace (030) is visible as an orange discolouration just above the right end of the bottom ranging rod.

On the interface between layer 036 and the occupation layer 041, there were two small concentrations of charcoal (044 and 045), stratified beneath 036 but on top of 041. The larger of these two concentrations (045) lay within a shallow scoop 0.4m x 0.2m across and 0.02m deep. Carbonised roundwood of *Corylus avellana* (hazel) from layer 044 produced radiocarbon dates of 516-407 cal BC at 95.4% probability (SUERC-43193; 2410±29 BP) and 540-394 cal BC at 91.5% probability (SUERC-43194; 2387±29). Carbonised roundwood of *Quercus* sp. (oak) also from 044 produced radiocarbon dates of 750-405 cal BC at 95.4% probability (SUERC-43195; 2434±29 BP) and 704-391 cal BC at 95.4% probability (SUERC-43196; 2377±29).

Most of the north/northeast half of the trench was covered with a thin buried soil (020), about 0.1m or less to the west and increasing to 0.2m thick near the outcrop where it appears to have formed from a dense mat of vegetation and organic matter against the vertical side of the outcrop, much as a similar horizon does today above the colluvium here, due to the growth of bracken and the accumulation of dead organic matter at the base of the outcrop. Layer 020 also covered the entire western side of the trench from south to north. In the centre of the trench, around and beneath the monolith, there were very few patches of buried soil (021), most of them being to the west of the monolith. In all cases (020 and 021) the buried soil was a black-brown clay silt with occasional stones and charcoal flecks, although it contained few artefacts.

Finds from within layer 020 included three quartz flakes (SF22, SF23 and SF27, a quartz core (SF25) and possible quartz core (SF26), a flaked tool of rhyolite (SF20) and an unworked prism of clear rock crystal (SF28).

Initial results of environmental analysis of layer 020 in 2011 demonstrate that this layer contained large quantities of carbonised plant remains, particularly twigs and berry seeds. The centre of this deposit appears to have been a small, informal fireplace (030) about 2m from the face of the outcrop, marked only by its orange colour; there was no setting of hearth stones or any stone surround for the fire. The seeds of raspberry, blackberry and wild strawberry, together with hazelnut shells and branch tips suggest an autumn-winter period for the accumulation of this deposit.

There was no clear evidence that this part of layer 020 had accumulated within a walled or roofed structure. Whilst the positions of certain stones on edge could suggest the presence of a partial wall base, there was no evidence for any roof support save for a single small stake hole (032) on the southwest side of the fireplace (030).

The buried soil accumulated after the quarrying events. Some pockets of it lay beside and even beneath the monolith but these soils could have developed long after the quarry was abandoned and before the onset of colluviation. Radiocarbon dates were obtained from carbonised material in the upper and lower parts of layer 020: a carbonised grain of barley in the upper part (sample 15 in layer 020) provides a date of cal AD 540-650 at 95.4% probability (SUERC-38132; 1470±35 BP) whilst carbonised round wood in the lower part (sample 25 in layer 020) dates to 746-394 cal BC at 95.4% probability (SUERC-38134; 2400±35 BP).

Sampling of the buried soil was carried out on a 0.5m x 0.5m grid (a method established for sampling prehistoric house floors; Smith *et al*. 1998); quantities of phosphorous and other elements were recorded using a portable XRF machine whist samples were taken for soil magnetic susceptibility (environmental sample group 005). The extensive buried soil in the northern half of the trench was gridded into 1m x 1m blocks and 100% bulk sampled for flotation to recover charcoal, charred plant remains and micro-debris (environmental samples 006-023). Two further bulk samples for flotation were taken, one (environmental sample 024) from the pocket of 021 southeast of the monolith, and the other (environmental sample 025) from the lower component of 020 in the north of the trench where it was sealed beneath a flat slab and unaffected by any worm action.

The colluvial sequence

The quarry deposits and buried soil were covered by a deep sequence of colluvial layers, between 1m and 2.5m deep. These deposits were deepest along the west side of the trench furthest from the outcrop.

The basal colluvial layers formed multiple lenses of loam and gravel, thinner than the layers of colluvium at the top of the sequence. These were particularly dense and complex in the northern half of the trench, petering out within three metres of the outcrop. This was particularly noticeable on the west side of the monolith where colluvial layers were thick and stony, indicating that much subsoil had been displaced from the western edges of this small valley.

The lowest layer of colluvium was a thin spread of gravel (context 015; up to 0.04m thick) within the central northern half of the trench where it lay upon a patchy lens of brown-grey clay directly on the buried soil (020).

Layer 015 was covered by a 0.1-0.3m thick layer of mid brown silt loam (008=024). Layer 008=024 was dated by OSL to AD 810-1030 (CRF12-04; X5456; 1080±110 BP). Within the northern part of 008=024, within its upper component, there were two dense but shallow deposits of charcoal (context 009, environmental sample 1, 1m x 0.35m; and context 010, 0.25m x 0.11m). A date of cal AD 775-972 (SUERC-38133; 1165±35 BP) was obtained for *Corylus avellana* round wood charcoal from sample 1 in context 009.

Figure 20. The colluvial sequence at the northwest corner of the trench, showing the positions of OSL samples 3 (left) and 4 in layers 005 and 008.

Layer 008=024 was covered by layer 022 (largely stone-free mid-brown clay) in the northwest and by yellow-brown gravel (006) beneath grey-brown silt loam (005). Layer 005 was dated by OSL to AD 780-1040 (CRF12-03; X5455; 1090±130 BP). A sample of charcoal (environmental sample 004) was taken from the basal component of 022 immediately north of the monolith. A spread of flat rhyolite slabs on the top of layer 022 were concentrated against the northwest side of the monolith but were probably deposited by natural agency.

Layer 022 was overlain by a sequence of layers – 013, 012 and 011 – in the western part of the trench, of which 012 is equivalent with 005. Layer 013 was a gritty sand with small-medium sized stones; its clay content increased with proximity to the monolith. Above it, layer 012 was a thin layer of largely stone-free black clay loam, probably a buried soil. Layer 011 was a sandy, gritty silt loam with small stones that can be equated with layer 005 in the north half of the trench.

There were two hearth features at different depths within the lower colluvium (008) in the northeast corner of the trench immediately beyond the northern tip of the outcrop. The lower (and presumably earlier) of these was a surface of burnt and unburnt cobbles (055), 0.2m x 0.8m and 0.08m deep, lying beneath a deposit of grey-brown clay loam and charcoal (050). Positioned on the south side of a large, flat slab, its fire had burned the surface of the rock where the cobbles adjoined it. Southeast of feature 055, within the basal unit of layer 008, lay the rim sherd of a coarse earthenware vessel (SF13) and a possible hammerstone (SF14). Beneath both layers 008 and 050 there was a thin layer of mid grey-brown mixed clay silt (051) running east-west between the outcrop and the burnt flat slab. It lapped against layer 040.

The higher hearth deposit (029), 0.36m x 0.30m and 0.1m deep, within layer 008 was located about 1.5m to the north, against the north side of a small boulder. Among the burnt cobbles forming the hearth base, one may formerly have been used as a hammerstone (SF15) but it is indeterminate. No charcoal survived on the surface of this small hearth. Other finds from layer 008 included a large hammerstone with a heavily battered end (SF17), from about 3m south of monolith 007.

The uppermost layers of colluvium were a band of grey-brown silt loam (003) up to 0.2m thick, beneath a thicker layer of orange-brown loam (002). These two layers were hard to differentiate in parts of the trench. Close to the outcrop, 002 was equivalent to 017 which lapped against rubble (023). A charcoal sample (sample 003) was taken from layer 003 whilst 002 contained sherds of 19th century ceramics. The uppermost layer was topsoil (001) covering the entire trench, with 016 being part of the black topsoil against the rock face. A flint flake (SF11), two rhyolite flakes (SF18) and a hammerstone (SF21) were found in layer 016. A similar layer of black organic soil (014) within a cleft in the rock face in the northwest contained a retouched flint flake (SF1) at its base.

Castell Mawr

This impressive hillfort (SN1187537768; NPRN304047) of 1.52ha lies above the confluence of the Afon Nyfer (River Nevern) and the Afon Brynberian, just a mile north of Craig Rhosyfelin and three miles north of Carn Goedog. It is recorded by the RCAHMW as follows (Wiles 2008):

'Castell Mawr is generally considered to be a later prehistoric settlement enclosure, possibly of two phases, although it has been suggested that it is an earlier ritual or ceremonial henge enclosure reused in the Iron Age. The site was subject to partial geophysical survey in 1988.

The monument occupies the gently rounded summit of a hill. It consists of a 1.3ha oval enclosure defined by: a slight inner bank; a broad and shallow ditch; a prominent outer bank, preserved as a hedgerow and apparently ditched. There are entrances on the north-west and east. The interior is subdivided by a curving west-facing rampart and ditch cutting off the 0.7ha eastern part of the enclosure. No entrance between the two divisions has been identified.

The character of the main enclosure, with a strong outer bank over-shadowing the weaker inner bank, has prompted the suggestion that it represents a Neolithic henge. In support of this flints have been found within the enclosure. However, the prominence of the outer bank may be a product of its reuse as a hedge bank and flints continued to be used into the historic period.'

Figure 21. Castell Mawr from the air, photographed by Toby Driver (RCAHMW).

It has also been described by Murphy *et al*. (2007) as follows:
'Castell Mawr is a bivallate hillfort located on a rounded high hilltop at c.145m above sea level. It is egg-shaped, measuring internally *c*.130m southeast-northwest and 130m southwest-northeast. The inner bank rises up to 1m above the interior and 2m above a wide shallow ditch. The outer bank rises up to over 3m above the exterior ground surface and in places dominates the inner bank. A field bank runs along the crest of the outer bank. The outer ditch is now virtually ploughed out. The original entrance faces east, at the point of the 'egg', and is a simple gap through the ramparts. In addition there is a modern break through the rampart on the southeast side and a breach through the outer bank on the north side. A boomerang-shaped rampart running north-south, which rises 1.3m above its east side and 2m above the west over a shallow ditch, divides the interior.'

In the wake of geophysical survey in 1988, Mytum and Webster reinterpreted Castell Mawr as 'a Late Neolithic or Early Bronze Age hengiform enclosure, partially re-used in the Iron Age or Romano-British period by an enclosed farmstead in the eastern part of the interior' (2003: 2). Their geophysical survey included both earth resistivity and magnetometry as well as soil magnetic susceptibility. Although magnetometry produced disappointing results, perhaps due to problems with the magnetometer, the other two methods revealed evidence to support their notion that this was a henge. In particular, there was no indication from resistivity or magnetic susceptibility of an external ditch and they concluded that 'it can be confidently assumed that no such feature existed' (2003: 4).

Research aims
Recent geological and archaeological investigations have shown that, 3 miles along the Brynberian valley from Castell Mawr, lies the likely source of many of Stonehenge's spotted dolerite bluestones at Carn Goedog (Bevins *et al*. 2013); even closer, just a mile away, is a monolith quarry for Stonehenge rhyolite bluestones at Craig Rhosyfelin (Ixer and Bevins 2011; Parker Pearson *et al*. 2012). The close proximity of a large prehistoric earthwork with the only two certainly identified sources of Stonehenge bluestones raises the possibility that Castell Mawr was the first site where the bluestones were erected, literally the first installation of 'Stonehenge' in Britain.

Previous work in 2012
Three programmes of investigation were carried out at Castell Mawr (site code CM) in September 2012. One was a geophysical survey (magnetometer and earth resistance) of the interior and exterior of the hillfort. Magnetometry revealed two concentric circular anomalies, later found on excavation to be palisade trenches.

The second programme was an earthwork survey of the hillfort, completed in all areas except those parts of the ramparts most heavily covered in gorse. This was completed in 2013 after National Park volunteers had cleared some of the gorse off the ramparts.

The third programme involved cleaning of the hillfort's external rampart in two locations (Trenches 1 and 2) where it was already eroded by cattle poaching, and sampling of the rampart and buried soil for radiocarbon and OSL dating.

Research objectives in 2013
The objectives of research at Castell Mawr in 2013 were:

a) to date and characterize the concentric circuits within the enclosure's interior, through targeted excavation of stretches of these two features;
b) to establish whether other archaeological features survive in the vicinity of the concentric circuits, notably sockets for standing stones dismantled and taken to Stonehenge;
c) to carry out full recovery within the excavation trenches of a wide suite of archaeological data: artefactual, ecofactual (flotation and palynological), chemical and geophysical;
d) to date the boomerang-shaped cross-bank (using OSL) assumed to post-date the concentric circuits;
e) to assess the impact of more recent cultivation on archaeological preservation, compared with areas protected beneath the enclosure's boomerang-shaped cross-bank.

Methodology in 2013

In 2013 the earthwork survey was completed and two 15-18m x 10m trenches were excavated within the southern part of the hillfort's interior on top of linear features identified by the magnetometer survey. The western end of each trench was positioned across the western half of the cross-bank so as to examine the stratigraphic relationship between this rampart and the linear magnetometry features.

Excavation of Trenches 3 and 4 commenced with excavation of 12 test pits (six arranged on a systematic grid in each trench) in order to establish the density of flints and other artefacts within the 0.23-0.40m-deep plough soil. The plough soil in each test pit was sieved through a 10mm mesh. Despite records of flints being collected from the surface of the field in the past, the only find was an unmodified flint pebble.

Both trenches were 10m wide (broadly east-west) and trapezoidal in shape (15m along the south side and 18m along the north side) in order to examine the intersection between the cross-bank and the two concentric palisade ditches. Trench 3 was the northernmost, examining the 55m-diameter palisade trench, and Trench 4 was the southernmost, examining the 97m-diameter, outer palisade trench.

The plough soil and the topsoil on top of the cross-bank were then removed by machine, except where the palisade trenches' upright packing stones protruded into the plough zone; the plough soil above each palisade trench was removed by hand to avoid damage to the protruding packing stones.

The palisade trenches and other features were excavated by hand, mostly with 50% of their fills being excavated and the other half left undisturbed. All soil from excavated feature fills was collected for environmental sampling, to ensure an appropriately large suite of carbonised plant and wood remains for palaeobotanical analysis and radiocarbon dating. A few features, such as the pit (120) for a robbed-out standing stone, were 100% excavated.

After three weeks of excavation, the two trenches were backfilled by machine, re-turfed and re-seeded, and the earthwork of the cross-bank was reinstated and re-seeded.

Geophysical survey in 2012

By Kate Welham and Charlene Steele

The geophysical surveys described here were conducted between 1st and 21st September 2012. Grids were laid out using a Leica Viva differential global positioning system (dGPS). Magnetic survey was carried out using a Bartington Grad601 Single Axis Magnetic Field Gradiometer System (fluxgate gradiometer) with dual 1m Grad-001-1000L sensors over 20m by 20m grids with readings taken at 0.125m intervals along traverses spaced 1m apart, at a resolution of 0.1nT. Earth resistance survey was conducted over 20m by 20m grids using a Geoscan RM15-D resistance meter and a PA5 multi probe array frame in the 0.5m configuration. Data acquired via both methods were output to ArcheoSurveyor 2.5 for minimal processing.

Georeferenced and interpretive plots were composed in ESRI ArcGIS 10. Note that, in Figures 15 and 16, black represents positive magnetic anomalies or areas of high resistance and white represents negative magnetic anomalies or areas of low resistance.

Magnetometry

There are a number of linear positive magnetic anomalies to the northeast of Castell Mawr which are most likely associated with previous field boundaries or a possible enclosure. A linear positive magnetic anomaly to the east of the Castell is of a difference alignment to the existing and previous field boundaries, which may indicate that it is a prehistoric, geological or agricultural feature It is unclear whether this anomaly is related to a series of positive magnetic anomalies indicative of pits or negatively-cut features adjacent to the bank of the Castell, near the eastern entrance. In the southwest of the survey is a circular positive magnetic anomaly which is 6m in diameter and may represent the drip gulley of a small round house. The positive-negative magnetic anomaly encircling the Castell is most likely caused by the effects of the rising ground associated with the external bank. A similar, but weaker, response can be seen in the interior, where the survey area has approached the small interior bank and the cross bank. Within the eastern section of the Castell interior are a number of curvilinear, weakly positive anomalies which appear to run concentric to the ditch and bank. The outer of these features appears to extend in to the western half of the Castell. It is possible these anomalies represent enclosure ditches or palisade trenches associated with a monument that pre-dates the Iron Age. However, it is also possible that they could also relate to activity in later prehistory. The whole survey area has a range of magnetic responses that are likely to be representative of plough scarring, and it is known that the site has a long history of heavy agricultural use.

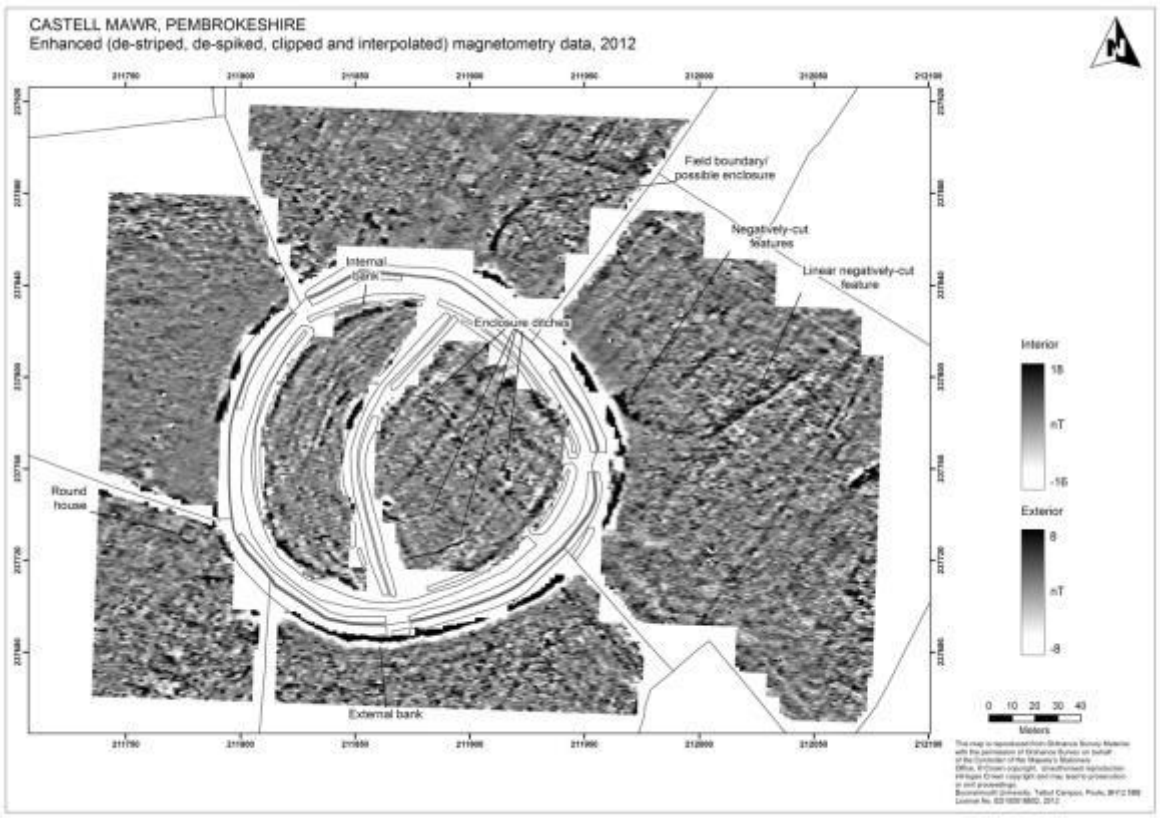

Figure 22. Magnetometry survey plot of Castell Mawr.

Earth resistance

Adjacent to the western entrance of Castell Mawr are several curvilinear anomalies which may be indicative of an external ditch with a causeway, and defensive banks protecting the entrance to the interior. However, the extent of agricultural activity in the fields surrounding the site makes this interpretation uncertain, and these anomalies may be the product of past agriculture. There is further tentative evidence for a partial external ditch surrounding the Castell in the form of low resistance curvilinear anomalies contiguous with the course of the exterior bank. However, this could also be a response to agricultural and animal activity on the site. The interior bank exhibits a clear high resistance response around the majority of its circuit. Adjacent to the west side of the cross bank is a curvilinear area of low resistance that is indicative of the cross bank ditch. Immediately west of this is a patchy area of low resistance. It is unclear whether this a natural feature or represents anthropogenic activity. The data within the interior of the Castell exhibit a greater level of disturbance in comparison with the surrounding fields. This is likely to be due to increased anthropogenic activity within the Castell.

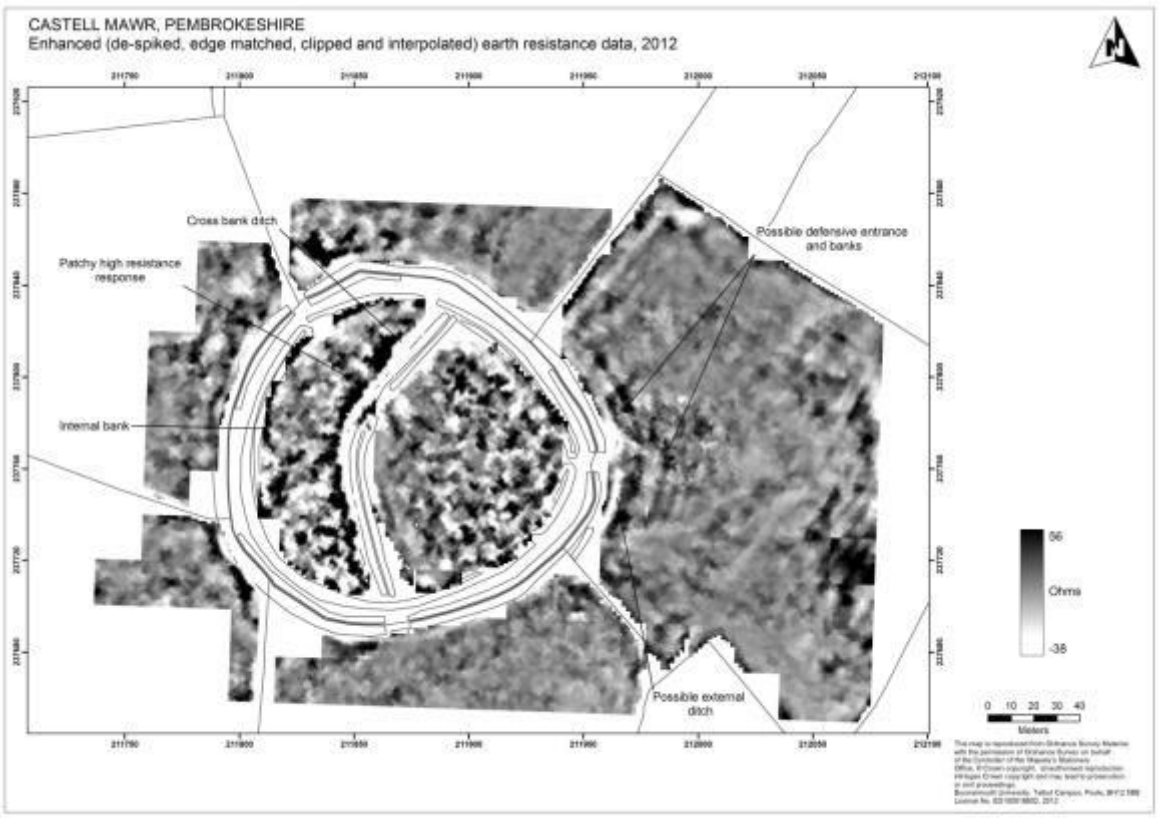

Figure 23. Earth resistance survey of Castell Mawr.

Conclusions

The surveys conducted here have identified possible features both within and outside of the Castell that would be interesting to investigate by trial trenching, notably the concentric enclosure ditches or palisade trenches within its interior. It would also be useful to extend the magnetometry survey to the west of the area where the possible roundhouse has been identified in order to identify any further structures or evidence of activity. The earth resistance survey has identified potential fortification beyond the east entrance. There was little correlation between the earth resistance and magnetometry data.

Earthwork survey in 2012-2013

By David Field

The hill reaches 149mOD and commands views of the lower ground for some distance around including over the nearby promontory forts of Castell Henllys, Castell Llwyd and Pen y benglog Camp as well as the coast and river mouth at Newport, but is ultimately overlooked by the slopes that lead up to Carn Menyn some 5km to the south-west and Carn Ingli a similar distance to the west. Despite scarring from cattle scrapes, the earthworks survive well, but today are in large part covered with gorse and some hawthorn and consequently are difficult to observe and indeed record. As a result the present survey remains incomplete although sufficient detail has been obtained to provide a depiction and analysis of the earthworks. The interior has been ploughed in the recent past and there is evidence from mapping of an earlier episode of cultivation (Mytum unpublished), but is currently is down to grass.

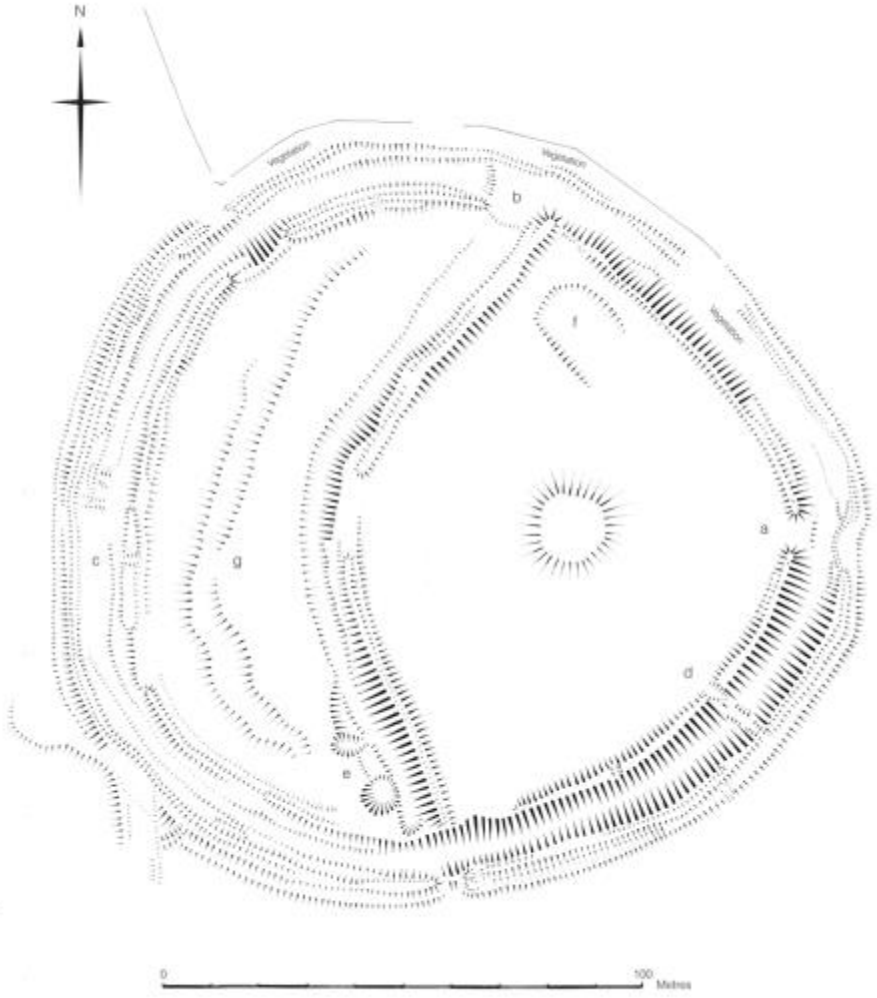

Figure 24. Earthwork survey map of the enclosure of Castell Mawr

The enclosure

In plan the enclosure is slightly ovoid or rather cordate, the long axis, oriented west to east measuring 167m, while north to south is only a little less at 160m. It is the shape rather than size that enhances the impression of asymmetry, although in fact, north and south halves of the enclosure mirror each other and consequently it is considered that the form is deliberate rather than an accident of layout or the result of the influence of topography.

The enclosure boundary comprises a wide shallow ditch with bank within, supplemented by an external bank or considerable counterscarp. The ditch itself measures *c*.5m in width and today is little more than 0.5m deep, although assuming that much of the bank and counterscarp material derived from it, the original depth must be considerably greater. The bank measures up to 10m in width and although there is generally a berm separating it from the ditch it is not always possible to discern the separate elements, particularly where the vegetation is dense. Internally, it commonly reaches a height of *c*.0.2 although it achieves 0.5m in places. There appears to be two components, a shallow lower element with a further bank or wall on top, although it is not always possible to distinguish these as the many cattle scrapes have obscured detail.

The outer bank or counterscarp is up to 14m wide and up to *c*.3m in height and looks substantial enough, but this also comprises a number of elements, essentially a bank of varying proportions surmounted by at least one phase of walling. In places the latter has fallen and merged with the bank and in others it appears to have been rebuilt, there being evidence of different walling techniques, some of which match those found in the local field walls. Unfortunately the vegetation restricted observation of this and continuity could not be established. The impression of height is also enhanced by an external ploughstep which reaches over 0.5m in places around the monument. Despite this, and the fact that it is located slightly further down a natural slope than the inner, the outer bank retains a similar height and it would appear that more material had been placed there deliberately giving it greater emphasis.

An apparently original entrance lies in the east (a), but is blocked by a later enclosure wall. In two other locations in the north (b) and west (c) the surmounting wall similarly appears to be freestanding, that is, it does not overlie a bank and it maybe that these points also mark former entrances or perhaps gaps in bank construction. That in the west disappears beneath the later wall for some 40m and although clarity is obscured by later digging within the ditch here, it may be that this marked an entrance in the west referred to by the RCHM (Wales) (1925: 225). It should be noted, however, that in the latter two cases there is no indication of former access from the exterior. There are also two modern entrances, one in the north-west; the other in the south.

The ditch appears to have been recut for there are no causeways at the entrance(s) and the only access across it a narrow causeway in the south-east (d), almost 2m wide and room enough for an individual to pass. This, however, is not original as it is matched by gaps that cut through in the respective banks at this point, while the cut visible in the inner bank adjacent is the result of cattle damage rather than a constructed entrance. The position of the causeway is aligned on an exterior field boundary, one of two formerly parallel banks depicted on early OS editions that lead to and focus on this point and it once clearly held some significance. It is not clear if the ditch is rock cut but it is conceivable that it retained water as drainage appears to be poor. Almost 0.5m of mud was present in places during survey and one particularly wet patch in the west contained reeds, perhaps indicative of an almost permanent water supply.

The interior comprising *c*.1.3 hectares and measuring 130m north to south by 130m east to west is divided into unequal parts by a generally north to south but curving cross-bank and ditch. This has straight elements at its limits but curves westwards to skirt the highest ground. The ditch lies to the west of the bank and this along with the nature of the curve, suggests that the eastern and highest part of the enclosure comprised the most important element. Like the enclosure ditch, this is relatively shallow reaching no more than 0.5m in depth and little more than 5m in width. The adjacent bank is up to 5m wide and reaches over 2m in height but, like the enclosure banks, there are traces of a surmounting wall that enhances the impression of height. The ditch terminates almost 1.5m from the enclosure ditch in the south and, although not visible at this point, it may have respected the inner bank of the enclosure. In the north the ditch flares out into the enclosure ditch effectively cutting through the bank at that point. The adjacent bank lies over the enclosure bank at that point and the relationship indicates that the cross-bank was a later construction. No original access way was noted between the respective parts of the interior. The central portion of the cross-bank has been considerably worn by modern traffic and it is difficult to be certain whether footings for a bridge might have

existed, but although much reduced, the bank appears to be continuous. Certainly there is no causeway across the ditch and as a result it might be concluded that passage from one part to the other was not intended or at least was made difficult.

Two small quarries cut into the southern end of the cross-ditch (e); one approximately 7.5m in diameter, the other 7.5 by 5m and both reach little more than 1m in depth. The purpose of extraction is curious. They are small scale and of no great depth, yet are placed away in a corner of the enclosure. Their function is likely to be entirely local and related to the activities within the enclosure.

Central to the eastern part of the interior, a 22m by 21m area of the summit of the hill appears to be enhanced by little more than 0.1 in height. Its position introduces the possibility that it merely represents an underlying rock formation, but it may equally be artificial and of archaeological interest; perhaps the site of an agricultural building, barn, or even a levelled barrow.

In the north within the angle of the enclosure bank and the cross-bank is a shallow sub-rectangular hollowed area 20m by 15m (f). As noted above, the interior of the enclosure has certainly been cultivated and this might form part of one of the early plots depicted on early mapping (Mytum unpublished) but it is not the result of ploughing. Instead it may represent the site of a structure or stock yard.

In the western part of the interior, two shallow linear scarps *c.*0.1 to 0.2m in height can be traced north to south (g). They are straight for *c.*60m then curve to the south-east. Both are undoubtedly plough scarps but embody the removal of a significant weight of soil and appear to represent the levelling out of an earlier feature, perhaps a bank or platform. It may be that there was once a counterscarp to the cross-bank, although the location seems a little far away and another explanation might be sought.

In the southwest in the angle of the enclosure and a field boundary, stone clearance has resulted in the formation of wall that may have provided a sheep shelter (h). Adjacent is a pile of stone from field clearance.
Outside the enclosure in the south are a number of shallow scarps, one that appears to mirror the course of the field boundary, perhaps hinting at unrecognised significance of that particular boundary. Associated with it is a curving scarp with a radius of *c.*20m that forms a platform (j).

Conclusions
The enclosure is curious both in its plan form and its structure. The cordate form with reflecting halves appears meaningful in design and possibly intended. The fact that the outer bank has been built to a similar height as the inner despite the fact that it lies further downhill is undoubtedly significant and seems unlikely to be a defensive measure. The east facing entrance may have been a significant component of the plan. It does not provide access from a natural routeway, for the easiest access would be from the north where field boundaries and lanes lead from springs around Castell Henllys. Should the anomaly noted in the west prove to be an entrance it would provide an opposing cardinal partner.

At least three phases can be picked out from among the earthworks, although it cannot be certain whether these represent structural elements such as a wall set on a plinth, or complete chronological separation. The surmounting wall, however, which in places is of similar

construction to local field walls, blocks the only certain original entrance and must be of later date. Similarly, it can be surmised that the ditch has been recut as no causeway terminals can be identified. The recut must have occurred at a point when the original function had changed and the entrance no longer required, perhaps a response to changing protection requirements. Subsequent access would need to be by bridge.

Although an early component, the internal division was a secondary feature to the enclosure. It is curious that while its ditch has not been backfilled part of the bank/walling is missing, presumably dismantled or robbed for later purposes and this has provided access from one part to the other during later times.

All of these phases and constructional events are, unfortunately floating and the only indication of date comes in the similarity of field wall construction to the overlying enclosure wall. That at least, is presumably of post-medieval or medieval date. Typologically, the enclosure itself is likely to date to sometime in the Iron Age although modification might be expected through to the Early Medieval period. The excessively high outer bank, however, as Mytum formerly observed, has more in common with henges than hillforts and it may be, therefore, that origins are more distant.

Excavations in 2012

In Trench 1, four OSL samples were taken in a stratigraphic sequence from the top of the rampart to the buried soil (sample 9 in layer 006, sample 10 in layer 002, and samples 11 and 12 in buried soil 004). In Trench 2, eight OSL samples were taken in a stratigraphic sequence from the topsoil to the subsoil (sample 1 in topsoil 1001, sample 2 in 1004, sample 3 in 1006, sample 4 in 1007, sample 5 in 1008, sample 6 in upper 1014, sample 7 in lower 1014 and sample 8 in 1009). Pollen samples were taken in blocks from the buried soil in both trenches (sample 1003 from layer 004 in Trench 1, and sample 1004 from layer 1008 in Trench 2). Bulk samples for flotation (sample 1001 from buried soil 004 and sample 1002 from rampart fill 002) were taken only in Trench 1, from within the slot cut for OSL sampling.

Figure 25. Panoramic view of Castell Mawr, looking north, with Carn Ingli to the left. Trench 1 is on the right hand side of the hillfort, and Trench 2 is centre left.

Trench 1 north of the east entrance (2012)
A short section of the external bank, 9m long and 1m high, was cleaned of topsoil (001), mixed deposits of grey-brown bank slip (007) and intrusive root holes, down to the top of the natural mudstone subsoil. This was then recorded in plan and in section as well as in 3-D. A small 0.5m wide slot was cut into the rampart and buried soil at the north end of the trench so that samples could be taken for OSL, radiocarbon dating and pollen analysis.

Figure 26. Trench 1 north of the east entrance at Castell Mawr, viewed from the south.

The orange mudstone that forms the subsoil (005) was covered by a buried soil of reddish-brown hue (004) which could be divided into a relatively stone-free A-horizon about 0.07m thick and a B-horizon about 0.10m thick. Charcoal was picked out by hand from this layer and was also recovered in flotation of a sample from the 0.5m-wide slot. The only artefact from the A-horizon of this layer was a tiny pottery sherd (SF2), too small to be identified to type of vessel or period.

On top of the buried soil lay the primary rampart of re-deposited orange mudstone (002), about 0.5m high. A flotation sample was taken from the 0.5m-wide slot to recover charcoal from this layer but otherwise only a single piece of charcoal could be picked out by hand from the deposit. The only artefact from this layer was a flint core (SF1).

Two layers of light brown, stony fill were found to lie on top of the primary rampart layer (002). One of these was located at the south end of the trench (layer 003) and has extended the north terminal of the rampart so as to narrow the east entrance. It contained two large blocks of stone, one of which was removed during cleaning. The other light brown layer (006) sits on top of layer 002 at the north end of the trench; it is either an upper layer of the rampart or the foundations for a stone-built field wall constructed along the top of the rampart.

Trench 2 south of the east entrance (2012)
Trench 2 was located about 70m south of Trench 1, and about 60m from the east entrance of the hillfort. In contrast to conditions within Trench 1, the erosion scar caused by cattle poaching was narrow so the trench was only 1m wide. However, the rampart is considerably higher (2m high) and steeper than encountered in Trench 1.

The subsoil in Trench 2 is completely different to that in Trench 1, being a soft yellow-orange sand (1009) on top of volcanic tuff deposits. The reddish-brown buried soil (1008) is similar in colour to that in Trench 1 but is softer and sandier. The primary rampart (1007) is constructed of medium-sized stones and yellow sand. Above it, a series of sequential layers of yellow and orange sand (1004-1006) constitute the secondary rampart. Layers of topsoil (1001), brown soil (1002) cover the rampart along its top, where the remains of a field wall survive. It is clear that the secondary rampart was already a substantial earthwork prior to the field wall's construction, and is not a product of the rampart's reuse as a hedge bank (*contra* Wiles 2008). There is also a layer of displaced yellow-grey soil (1003) that has tipped down the exterior face of the rampart.

In contrast to Trench 1, there is evidence here of an external ditch (1010) around this part of the hillfort, corroborated by results from the geophysical survey. Only the uppermost parts of this ditch's three upper fills were investigated. The lowest of these was brown loam (1013) beneath brown loam (1012) beneath dark brown loam (1011). This last layer contained a lump of iron slag (SF8) and lay directly beneath the plough soil (1014).

In summary, the ditch (1010) was dug close against the rampart, virtually cutting the primary rampart deposit (1007). It is likely to be less than 3m wide. We suspect that the fill of this relatively shallow ditch is the yellow-orange sand deposited as the secondary rampart (1004-1006). In contrast, the stony primary rampart (1007) is likely to derive from a much deeper ditch, namely the 7m-wide internal ditch of the hillfort.

Figure 27. Trench 2, south of the east entrance at Castell Mawr, viewed from the south. The primary rampart is visible as layers of stones.

Conclusions for 2012 excavations

The stratigraphic sequences revealed in Trench 1 and 2 do not support Mytum and Webster's hypothesis (2003) that Castell Mawr's external rampart is a multi-phase construction that has its origins as a Neolithic henge. Although there is clear evidence of secondary deposition to

heighten the external rampart and to narrow the east entrance, the primary rampart is dated by OSL to the middle of the 1st millennium BC and not to the Neolithic period. The rampart south of the east entrance was enhanced by digging of a small ditch, although no such external ditch could be found – either by excavation or geophysical survey – to the north of the entrance.

OSL dating of the rampart deposits in Trenches 1 and 2 provides absolute dates for this stratigraphic sequence, indicating that the hillfort's ramparts were most likely constructed in the middle of the 1st millennium BC. There is thus no evidence that the enclosing earthwork was built during the Neolithic period.

Trench 3 (2013)
The magnetometry plot showed that the inner concentric palisade trench circle bifurcated in two places. Excavation of Trench 3 revealed that the palisade trench actually consisted of two phases, the later one (102) cutting an earlier phase (104=106). Both palisade circles shared the same diameter of *c*.55m but the centre of the later one (102) was positioned a few metres east of palisade trench 104=106's centre. Other significant features in Trench 3 consisted of a large rectangular pit (153=156) and a well-preserved stretch of the cross-bank's stone-walled rampart (110).

Figure 28. Trench 3 (left) and Trench 4 during excavation in 2013, viewed from the west

Deposits pre-dating cut features in Trench 3
All deposits within both Trench 3 and Trench 4 lie on top of turbated mudstones and their associated subsoil. In the western third of Trench 3 (4m wide), these were covered by a relatively stoneless brown-red clay silt (168) which contained flecks of carbonised wood but

was earlier than all other features. Its depth was not established but an environmental sample was taken to obtain material for radiocarbon-dating.

The palisade trenches and penannular ditch
Palisade trench 104=106 was 0.30m wide, filled with red-brown friable loam (103=105) and packed with stones (average size 0.25m x 0.15 x 0.05m), most of them placed on edge. The only find from this palisade ditch was a baked clay ball (SF18) from its western arm (103).

This palisade trench pre-dated palisade trench 102, as did a 7m-diameter penannular post trench and gully (108) which was cut by trench 102 towards the west end of Trench 3. Feature 108 was initially found to be 0.20m wide and marked with occasional packing stones placed on edge within dark red-brown fill (107). Further excavation revealed that this palisade trench was set within a wider, curving, irregular gully (174), up to 1.3m wide and 0.25m deep, filled with grey-brown silt and small stones (173). Post trench 106's terminal could not be pin-pointed precisely since it was cut through by palisade trench 102. Layer 173 contained a worked stone (SF 28).

The penannular feature (108) continued outside the north edge of Trench 3 but may have continued to the west, re-emerging into Trench 3 as a 2m-long stretch of a gully (164), 0.4m wide and 0.36m deep. The gully's terminal contained a post hole, and small stones placed on edge within the gully are probably packing for other, smaller posts. The gully's fill (163) was light brown clay-silt.

Palisade trench 102 was 0.35m wide and was filled with dark red-brown friable loam (101) and was packed with stones (average size 0.3m x 0.2m x 0.05m), most of them placed on edge. The deepest parts of fill 101 were given new context numbers (123 and 133) though they are essentially the same as layer 101. Finds from layer 101 included a hammer stone (15) and a pot boiler stone (24).

Figure 29. Trench 3, viewed from the south. The west end of palisade trench 102 is in the bottom left, with the west end of palisade trench 104=106 (with which it intersects) slightly further to the north. The penannular gully (108) meets the north edge of the excavation trench close to the planks

Other cut features in Trench 3

Pit 162 was circular and concave in profile, 0.5m in diameter and 0.18m deep, filled with mid to dark brown–grey silty clay (161), burnt cobble stones and a burnt fragment of a stone artefact (SF 39). Pit 160 was sub-circular and flat-bottomed, 0.94m in diameter and 0.1m deep, and filled with red-brown clay silt and stones (130). Pits 160 and 162, in the northwest part of Trench 3, were sealed beneath a layer of red-brown sandy clay and stones (159) that lay beneath the cross-bank.

Close to the east edge of Trench 3, pit 150 was circular and concave in profile, 0.48m in diameter and 0.29m deep, filled with red-brown silt (149) containing burnt/cremated bone fragments (small find 23), carbonised wood fragments and angular stones.

Rectangular pit 153=156

Within the centre of the area enclosed by the penannular ditch (106), there lay a sub-rectangular, flat-bottomed pit (153=156), 3.9m east-west x 1.2m north-south and 0.5m deep. Its lowest fill (166=155) was a 0.29m-deep deposit of burnt stone fragments and large chunks of carbonised wood. Most of the stones were relatively large (0.35m x 0.15m) and derive from a variety of sources including river cobbles as well as mudstones and other rocks.

All but the eastern end of layer 166 was covered with a deposit of yellow-brown clay silt (165) with stone fragments, most of them burnt. The top of the pit was filled with dark red-brown silt and small stones (layer 152 in the west and 154 in the east of the pit).

The purpose of this feature is unknown. After it was dug, it was filled with branches and twigs that were set on fire and then covered with quantities of large stones that were burnt by the fire. Most of these stones settled *en masse* on top of the burnt wood, compressing it against the base and sides of the pit to create a reducing atmosphere in which the wood became charcoal. The only finds from this feature were a quartz flake (25) and fragments of a possible stone rubber (26), both from layer 166.

The cross-bank rampart
In Trench 3, the cross-bank rampart consisted of a drystone wall face (110) standing to four or five courses and built against a wall core (111) of small stones (0.1m x 0.1m x 0.02m on average) within a thin matrix of yellow-brown silt. These were constructed on top of a layer of red-brown sandy clay and stones (159) that separated the base of the rampart from palisade trenches 102, 104=106 and cut features 160, 162 and 164. Layer 159 is not a buried soil with A and B horizons but it may be a layer of plough soil beneath the rampart. It produced a possible flint pebble (small find 21).

The wall face (110) is well-built and appears to have been constructed in three separate sections within Trench 3, each having a different character and meeting the next section at an apparent join. The length of the middle section is about 6m, suggesting that the wall was built in relatively short 'gang sections'.

Three layers post-dated the wall. The first of these was a 0.1m-thick layer of stone fragments in a light yellow-grey clay matrix (148), forming a compacted surface abutting the base of the wall face and resulting from the wall's construction. On top of this lay a 0.07m-thick layer of red-brown clay silt (129) with concentrations of carbonised wood fragments. This layer, along with the wall core and wall face, were covered with a large deposit of stones and grey-brown clay (109), the tumbled material from the collapsed rampart. Finds from layer 109 consisted of a hammer stone (3) and a stone ball (5). An unstratified hammer stone (6) may also have come from this deposit but this is uncertain.

Figure 30. The drystone wall face (110) of the cross-bank rampart with layer 129 in front of it, viewed from the southeast

Trench 4 (2013)

The magnetometry plot showed the outer palisade trench as a strong linear anomaly in this southern part of the hillfort's interior. Other small anomalies along the inside of the palisade trench within Trench 4 turned out to be small pits or, in two cases, were not associated with any sub-surface features.

Figure 31. Trench 4 with stone hole 120 (near the middle of the trench) and palisade trench 125 (along the top of the trench), viewed from the north

A pit for a standing stone

In the middle of Trench 4 was a pit (120), 1.3m SE-NW x 1m SW-NE and about 0.45m deep. Its primary fill was a thin deposit (0.03m deep but up to 0.1m) of yellow clay sand and small, angular stones. The main fill of the pit, above 124, was orange-brown clay sand (122), more clayey than 124 and containing large packing stones on edge within the pit's western half. Similar large stones were displaced in the eastern half of the pit where the otherwise bowl-shaped profile altered to form more of a ramp-like slope towards the southeast. The top of layer 122 was capped by a large stone, about 0.7m long, that sat in the middle of the filled-in pit and protruded into the plough soil (100). The top of the pit was filled with a tertiary layer of mid-brown clay sand and small stones (121).

The size, shape and width:depth ratio of this pit, together with its large packing stones and ramp-like southeast side, indicate that this was dug to hold a standing stone, about 0.5m wide and 0.4m thick. The disturbed packing stones on the east side and in the upper part of layer 122 provide evidence for the standing stone's removal. Whilst the primary layer (124) appears to have been re-deposited subsoil, secondary layer 122 fills an irregular void left after stone withdrawal. The third layer (121) may have accumulated long after the formation of these primary and secondary fills. During excavation, it was initially considered that layer 122 might have filled a re-cut into fill 124 but, as excavation progressed, this interpretation became less plausible as it became clearer that a large monolith had once sat in this pit.

Although the entire fill of the stonehole (layers 124, 122 and 121) was sampled for flotation and sieving through a 2 millimetre mesh, there was no indication of any stone chips of lithologies different to the underlying bedrock of mudstones that could have derived from a

standing stone. Nor were there any artefacts or burnt stones within the fill (except for two burnt stones in the tertiary fill [121]). However, a few small pieces of carbonised wood were recovered from both 122 and 121.

Figure 32. Stone hole 120 excavated in half-section, viewed from the west

The palisade trench

Palisade trench 126, with a width of up to 0.34m and a depth of up to 0.28m, has similar dimensions to those of palisade trench 102 in Trench 3. Its packing stones, mostly placed on edge and protruding into the plough soil (100 and 171; see below), are also similar to those of the two palisade trenches in Trench 3. With vertical sides and a flat base, the palisade trench (126) also exhibits scalloping along its edges, especially along its west end. This scalloping is interpreted as resulting from the insertion of posts, generally each 0.15m-0.2m in diameter, every 0.25-0.3m. This line of posts would have left narrow gaps between them but too close to allow passage by people or domestic animals.

The palisade trench was filled with friable mid-dark brown silty loam (125), containing packing stones that mostly lined the sides of the cut. As with palisade trenches 102 and 104=106 in Trench 3, this appears to be largely the fillings of post pipes, entering the cut after the decay of the palisade's posts *in situ*. There was no evidence that any of the posts had been removed. At its western end, the palisade trench's fill (125) contained burnt/cremated bone (SF 7, SF 8, SF 19, SF 20, SF22 and SF 27), pot boilers (SF10, SF 11, SF 16 and SF 17), a trimmed circular flat stone, possibly a pot lid (SF 9) and large quantities of burnt stones. On the basis of their concentration along the base and sides of the palisade trench, it is likely that these deposits entered the cut as it was dug and as the posts were erected.

This concentration of burnt materials in the western part of Trench 4 raises the possibility that this section of the palisade trench was dug through an area where such materials lay within a midden on a since vanished land surface. The palisade trench here was sealed beneath the rampart (119 and 146) of the cross-bank by a 0.2m-deep red-brown clay and stony layer (151) that contained carbonised wood flecks and struck flakes of quartz (SF 12) and flint (SF13 [one flake] and SF 14 [two flakes]). If this were a buried plough soil (as it and its counterpart layer 159 in Trench 3 are thought to be), the presence of this cultural material within layer 151 supports the possibility that the burnt materials may have fallen into the palisade trench as it was being dug through a pre-existing midden subsequently destroyed by ploughing.

Towards the eastern end of Trench 4, a sub-circular scoop (128), 0.8m in diameter and 0.04m deep, was cut into the top of the palisade trench (126). It was filled with friable dark brown silty clay (127) and carbonised wood flecks. Although there was no artefactual material from it, it was considered during excavation to be of no great antiquity.

Other cut features
On the north edge of Trench 4, pit 132 was a shallow, sub-circular scoop, 0.27m in diameter and up to 0.05m deep, filled with dark yellow-brown silt (131) with large quantities of carbonised wood fragments. It may be the truncated base of a fire pit or sunken hearth.

Pits 137 and 139 were contiguous bowl-shaped, sub-circular features in the western part of the trench. No stratigraphic relationship between them could be established. Pit 137, 0.45m x 0.32m and 0.1m deep, was filled with mixed dark brown and light orange silt (136). Pit 139, 0.56m x 0.42m and 0.14m deep, was filled by three layers: a primary fill of dark brow-grey silt (158), a second layer of light brown silt (157) and a top layer of dark brown-grey friable silt (138).

In the western part of Trench 4, pit 141 was a sub-circular feature with irregular concave sides, 0.63m x 0.55m and 0.07m deep. It was filled with friable dark brown silt (140). To the north of pit 141, pit 145 was a sub-oval, concave-sided feature, 1.2m x 0.6m and 0.16m deep. It was filled with friable light brown silt (144).

One feature that could be matched with one of the magnetometry anomalies was an oval pit (169), 0.3m x 0.25m and 0.11m deep, in the southwestern part of Trench 4. It was filled with red-brown clay (170) containing carbonised wood fragments and burnt stones.

The cross-bank rampart
At the west end of Trench 4, the palisade trench (126) was sealed by a 0.2m-deep layer of red-brown sandy clay and stones (151) that was absent in the rest of the trench as the result of more recent ploughing where it was not protected by the cross-bank rampart. It is odd that, like its counterpart layer 159 in Trench 3, layer 151 was not a buried old ground surface (as was detected as layers 004 and 1008 in Trenches 1 and 2 beneath the hillfort's encircling rampart). Whilst layers 151 and 159 could have been an imported levelling layer brought in after an old land surface was deliberately removed, it is more likely that they are remnants of a buried plough soil on which the cross-bank was built. Layer 151 was partially covered by a thin deposit of light orange sandy silt (172) that did not extend as far as the north baulk of the trench. This layer may be a primary deposit of wall core material.

The rampart's wall face (146) and wall core (119) were constructed on top of layers 151 and 172. The wall face was much less well preserved here than in Trench 3, standing at best only 2-3 courses high. As a result it was excavated and removed in its entirety, in order to gain a full view of deposits preserved beneath it (whereas the wall face and core in Trench 3 were left unexcavated). As in Trench 3, the wall core (119) was formed of small stones in a thin yellow silt matrix, and the wall face (146) showed evidence of having been built in 'gang-sections', with two locations within Trench 4 where there were discontinuities in the line of the wall face. A layer of light orange-brown sandy clay (134=135) abutted the exterior of the wall face (146), similar to layer 129 in Trench 3.

Tumbled stones and debris (116) from the collapsed rampart wall survived best in the southern end of the trench but extended along the entire wall line as a deposit of large and medium-sized stones within a matrix of friable brown loam. This differential preservation of layer 116 was the result of robbing along the central and northern length of the wall in Trench 4. The hollows left by robbing of the collapsed wall had then filled up with stones brought from the quarry pits on the west side of the cross-bank in this part of the hillfort's interior. This stone rubble formed three deposits, 117 and 118 beneath 115. A small fragment of burnt/cremated bone (SF 4) was recovered from layer 116, and a complete saddle quern base (SF 29) was found in layer 118. A struck flake (SF 2) was found during trowelling of the subsoil in the northeast part of Trench 4.

Topsoil in Trenches 3 and 4

In both trenches the topsoil consisted of a plough soil (100) of soft to friable mid-brown clay silt mixed with small stones. Its depth varied from 0.40m nearest the cross-bank to 0.23m at its shallowest, on average 0.32m deep. The lowest 0.05m-0.1m of this topsoil consisted of a thin layer of mid to dark brown clay silt (171) that was most likely formed after the last episode of ploughing and is thus not of any great antiquity.

Conclusions for 2013 excavations

The 2013 excavations confirmed the existence of multiple phases of activity on the hilltop, notably the sequence of palisade trenches prior to a cross-bank rampart prior to an episode of quarrying. It is likely but not certain that the cross-bank rampart post-dates or is contemporary with the encircling rampart of the hillfort, on the grounds that the cross-bank rampart's terminals appear to respect the hillfort's inner bank and ditch rather than being cut by them. Topographic earthwork survey revealed the possibly of a blocked western entrance within the outer, encircling rampart.

No dateable artefacts were recovered from the 2013 excavations to indicate that any of the excavated features might be more closely dated than broadly to the prehistoric period. The saddle quern from the rampart in Trench 4 is likely to date to before 300 BC so it is possible that the cross-bank was built in or around the Middle Iron Age if not earlier. Until carbonised wood samples are dated, it is not possible to establish the dating of the various palisade trenches and other cut features.

One of the main aims of the 2013 excavations was to establish whether Castell Mawr had been the location of a bluestone circle, subsequently dismantled and taken to Stonehenge. Since the outer palisade trench has a similar diameter (97m) to the midline of the enclosing bank at Stonehenge, it was hoped that stone holes for such a dismantled circle of former standing stones might be identified inside the palisade in a position comparable to Stonehenge's Aubrey Holes. One such stone hole (120) was indeed found in such a location

within the middle of Trench 4 but there was no sign of any others. It sustains the hope that there may indeed be the remnants of a dismantled stone circle but the standing stones would have to have been at least 8m apart, much wider than the approximately 5m spacing of the Aubrey Holes at Stonehenge.

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