A 487 Llanwnda to south of Llanllyfni improvement :

Archaeological excavations north-west of Caerau.

Report No. 388

Produced for Highways Directorate
of the Welsh Assembly

October 2000

Ymddiriedolaeth Archaeolegol
Gwynedd Archaeological Trust

A487 LLANWNDA TO SOUTH OF LLANLLYFNI IMPROVEMENT

EXCAVATIONS NORTH-WEST OF CAERAU (G1639)

Report 388

Prepared for
the Highways Directorate of the Welsh Assembly

by
Jane Kenney

October 2000

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

A487 LLANWNDA TO SOUTH OF LLANLLYFNI IMPROVEMENT

EXCAVATIONS NORTH-WEST OF CAERAU (G1639)

1 INTRODUCTION

1.1 Background

A section of the Caernarfon to Porthmadog road, the A487, from Llanwnda to the south of Llanllyfni, was to be improved by the Transport Directorate of the Welsh Assembly. An archaeological watching brief was carried out, by Gifford and Partners, during groundwork in advance of the improvements. The route of the improvement program ran close to a preserved ancient landscape, and surveillance identified a potential archaeological site north-west of Caerau Farm, at NGR SH 46904840. The continued road works posed considerable threat to the archaeological survival, and the contractors, J Mowlem and Company, agreed to suspend activity on the site until an archaeological investigation could take place.

Gwynedd Archaeological Trust was contracted by TACP, the environmental consultants for J Mowlem and Company, to undertake the excavation. The contract was monitored by Chris Blandford Associates. The excavation was carried out between 8th May and 6th June 2000, covered an area 70m by 12m, and used a team of 6 archaeologists. The record began with area photography taken from the height of a cherry picker, and was followed by manual removal of the disturbed layers. The cleaned area was recorded on plan, and selected sections were removed to allow interpretation of the revealed archaeology. The present report summarises the results of the excavation, and considers the interpretation of the site. To avoid confusion with other excavations near Caerau, the site will be referred to in this report by its GAT site code number, G1639.

1.2 Topography and land use.
(Figure 1)

The area south of Penygroes is distinguished by glacial features, such as cross-valley moraines, and smaller ridges and mounds with shallow channels between (Harris and McCarroll 1990). These deposits are related to the coalescence, retreat, and uncoupling of the Welsh and Irish Sea ice-sheets (Thomas et al 1990). The drift deposits create a landscape of ridges and boggy depressions. The site, G1639, is situated on a small, flat, glacial promontory (at an altitude of 150m OD) adjacent to the western side of the A487, north-west of Caerau Farm. The promontory has springs to the north and south, and boggy ground to the west. The glacial deposits have probably been subject to intense periglacial weathering resulting in ice wedges, frost shattered stones, and vertically orientated stones, which can be confused with archaeological features (Conway 1998). Current land use provides grazing for cattle, sheep, and ponies on rough grass, sedge and scrub.

1.3 Archaeological background
(Figure 1)

The landscape around Caerau is rich in ancient monuments, the majority of which are settlements and field systems dating to the late Iron Age and Romano-British periods, but Bronze Age burnt mounds, and Medieval settlements are also present (Mason 1998). Closest to G1639 are the settlements and field systems that lie on the higher ground to the east of the A487. These extend from a little south of the farmhouse of Caerau, north to the 9th milestone from Caernarfon (PRN 3302, 3319, and 3320). PRN 3302 is scheduled as SAM number Cn 067. Some of the fields do extend to the west of the road.

Five of the hut groups in this area are enclosed settlements, and a sixth is a group of unenclosed dwellings. Two of the enclosed groups have been excavated, and dated to the second and third centuries AD. The fields are irregular in size and are terraced, often with a stone revetment to the terrace. The fields have been cleared of stone, which is deposited in boundary walls and banks (RCAHM 1960, O'Neil 1936).

Some 800m to the west is the gravel ridge at Graeanog, rising to 150m OD. The ridge proved an attractive area for settlement from prehistoric times onwards, and there is a good sequence of archaeological sites from the Neolithic through to the present day, many of which have been excavated in advance of quarrying (Mason, 1998). Three of the homesteads on the ridge have been excavated (Hogg 1969, Mason 1998), revealing multi-phased settlements dating from the fourth century BC to the fourth century AD, and, in some cases, later. The watching brief along the A487 particularly anticipated encountering features of this period, considering the close proximity of some of these sites, eg PRN 3319 and 3302, to the road.

Pollen analysis of peat bog samples, undertaken as part of the Cefn Graeanog II studies (Chambers, in Mason 1998), show an Atlantic period forest, with hazel as a major component, which was not significantly cleared until the Bronze Age. There was 'some circumstantial evidence' for Mesolithic activity, but the first clear signs of human activity occurred in deposits attributed to the Neolithic. Charcoal was found for the first time, together with an increase in grasses and clearance indicator species. There was major clearance, and some secondary forest regeneration, in the Iron Age, but after c. 1950 bp carr woodland was superseded by valley bog. The area was sparsely forested in the post-Roman period, but there were periods of clearance and regeneration.

1.4 Acknowledgements

Gwynedd Archaeological Trust is grateful to many people for their contributions to this project. Gratitude for help in the smooth running of the project is extended to: RP Banks of the Transport Directorate of the National Assembly for Wales; P Roden and D Maynard of Chris Blandford Associates; the staff of Gwynedd County Council, in particular David Mellor; the staff of John Mowlem and Company, particularly Pam Collinson and Mark Watson-Jones, and Lee Jones of TACP. The site was excavated under the direction of Karina Kucharski, who also carried out most of the post-excavation work and research. The excavation team was composed of Fiona Johnson, Ian Grant, John Horsley, Chris Lane, George Luke, and Jane Kenney. Advice was generously given by Frances Lynch of Bangor University, who provided unpublished information on the site at Llyn Aled Isaf, and Stewart Campbell of the Countryside Council for Wales, who suggested the idea of periglacial patterned ground. The final report was compiled by Jane Kenney.

2 RESULTS

2.1 Excavation results

The site proved difficult to decipher, both during the excavation and the post-excavation phase. This section of the report details the findings of the excavation in an objective manner, with the minimum of interpretation. A discussion of the evidence follows in section 3, where a number of interpretations are considered. The features will be referred to by their cut numbers.

2.2.1 The general plan of the site
(Figure 2, and plates 1 and 2)

During topsoil stripping from this area zones of stones and boulders were revealed. These concentrations of stones were not present in most of the natural subsoil exposed by the groundworks, although other similar, but less well defined concentrations were noticed elsewhere during the watching brief. The linear form of the G1639 features resembled the stone structures of the Romano-British homesteads nearby, and the site was initially interpreted as belonging to this period.

The site had been significantly damaged and confused, during topsoil stripping, by the mechanical digger cutting into the features and redepositing stones. Six amorphous pits, attributable to tree root activity or tree throws were identified, scattered over the site. As it is possible that there were more not identified, it is unsurprising that the general patterns on the site were not particularly clear.

Initially obvious were three areas of stone, apparently linear, and running roughly east to west across the site (contexts 2, 3, and 4). Context 2 **(plate 3)** was a broad band of very disturbed rubble, which ran across the northern part of the site. An initial excavation proved that the disruption of the layer was so severe that no further information would be gained, and study of this context was abandoned.

Context 3, further south, seemed to split into two parallel features at its western end, and to curve and join with context 4 at its eastern end. Context 4 was the broadest of these stony areas, joined to context 3 at its eastern end, with two areas of natural clay protruding through the stones.

2.2.2 Context 3

(See **figure 3** for a detailed plan, and **figure 2** for a section)
On excavation both contexts 3 and 4 proved to contain patterns of stone that seemed to form distinct features. These could be recognised in section, as well as in plan. Context 3 was composed of two parallel, linear features (features 16 and 29). Feature 16 **(plate 4)** extended beyond the trench to the west, and seemed to end, in a rounded terminus, before reaching the eastern baulk. It was a maximum of 1.50m wide and 50cm deep, becoming much shallower as the site ran downhill to the west. There was very little silting in the base of the feature, and the main stony fill, context 14, was homogenous. Extending beyond 16, to the south, and possibly to the north, were the remains of an irregular negative feature (feature 34), which seemed to follow the same line as 16, and appeared to be cut by 16.

At ground surface level, on the southern edge of 16, were at least three large, slabby stones. The original impression of one was found, which demonstrated that it originally stood on edge, and had tumbled over. The other stones may have been similarly positioned, and would have resembled facing stones of a bank or wall.

Down the middle of feature 16 ran what appeared to be a separate, negative feature, feature 11, apparently cutting 16. Feature 11 **(plate 4)** was 45cm wide, survived to 35cm depth, and contained a dark sediment with many stones. The stones were frequently vertically, or near vertically, orientated, with some apparently stacked on top of each other, and others laid flat on top of the feature like capping stones. While feature 16 seemed to terminate, 11 continued to the east, and just before the baulk turned south, and curved round to head west again through context 4, and into the western baulk. Feature 11 as a whole formed a rough oval, or sub-rectangular shape, measuring c. 10 x over 9m.

Where 11 was visible within the stones of context 4, it was broader than in 16, in places over 1m in width, and deeper, up to 0.6m deep. The stones within it were also more massive, up to 1m in length, but many were still vertically orientated, and apparently ordered. The largest stones particularly lined the northern edge of the feature. It proved difficult to trace feature 11 through context 4, and the western end in this area is somewhat hypothetical.

Feature 29 emerged from the western baulk and ended 6m to the east in a bulbous pit, interpreted as tree damage. It ran roughly parallel to context 16, at a distance of 30 to 50 cm to the north. The fill was a brown, peaty matrix with much small angular stone. There was a line of three large upright stones, and the socket of a stone removed by modern disturbance, which ran, axially, along the middle of the feature. Feature 29 was particularly badly damaged by recent soil stripping.

2.2.3 Context 4

(Plates 5 and 6)
Context 4 was composed of mixed glacial boulders and smaller stones, which lay in linear hollows with very undulating bases (contexts 17, 19, 46, and 63), seemingly cut into the natural clay. The bottoms of these hollows were filled with fine gleyed silts, suggestive of waterlogging. The stones, up to 1m in length, often rested on edge, with some sorting by size, the largest stones mainly concentrated towards

the northern side. Separate layers could be seen in section, along with distinct groups and pockets of stones, some resembling individual dumping episodes. In some cases there was soil associated with stone groups, and others appeared to have been voided. There was no sign of silting between the layers. Three small features, resembling stakeholes (contexts 85, 86, and 87 **(Plate 7)**) were found cut into the silts under the south-western part of context 4. Throughout the western part of this context were substantial deposits of charcoal, including charred hazelnut shells as well as charred wood. This charcoal occurred between, and in some cases below, some of the largest stones.

Two areas of natural clay protruded through the stone deposit. One area extended under the eastern baulk, so its full shape could not be determined, but it may have been oval. The other, further west was smaller and roughly circular, but with poorly defined edges. It appeared as a patch of natural subsoil, c. 1.5m in diameter, surviving as an island, with the hollow of context 46/63 running around it. It was largely ignored during excavation as too confusing, and is referred to on figure 3 as feature A.

The larger, eastern patch was surrounded by a curvilinear feature (feature 50 **(plate 8, figure 4)**). It emerged from the eastern baulk, and seemed to form a sub-circular slot, identifiable on the surface as darker soil and larger, looser stone, enclosing an area, roughly 2m in diameter. The feature showed as continuous, and in section the depth varied between 0.45 to 0.80m, the width between 1.30m and 0.85m. The inner face seemed to be cut through orange natural clay, and was easily identifiable; the outer face apparently cut through context 4, and was determined by changes in the fill and pitching stone. Both sides sloped steeply, and the base was fairly flat. Some of the stones within the fill were massive, and the problems of extricating them limited the excavation to four sections. The sections showed basal sediments lying in horizontal lenses, and stones resting upright or at a steep angle within the feature. Some of the largest stones were grouped, so as to suggest packing stones around large posts **(Plate 9)**.

2.2.4 Miscellaneous

There was an area of small worn pebbles, context 42, and a burnt area, context 6. The latter overlay context 4 and an area of disturbance, interpreted as a tree hole. It consisted of a small spread of burnt stone, charcoal and white clay compressed into, and over, the stone, and, although limited in extent, it appeared to be undisturbed. However, this context is high in the stratigraphic sequence, and could be related to more recent burning of hedge clippings, etc.

The worn pebbles (context 42) trailed out from the inner edge of context 4 and into the central area enclosed by feature 11. This was a vaguely linear scatter, composed of stones exceeding 5cm in length, but excavation suggested that it was part of the tree disturbance (45), just to the north.

2.3 The finds

The finds consisted of flake fragments recovered during the initial cleaning of the site, a flint fragment from the fill of 11, a single chert flake from the fill of slot 50, and piece of worked slate from the fill of cut 29. The flakes are indicative of human presence on site during the prehistoric, but are not diagnostic of a particular period within it. The slate is of some importance, and may be the only diagnostic artefact on the site.

Context no.	Material	Description
1	Chert	Black chert flake fragment
1	Chert	Black chert spall from secondary working
1	Flint	Matt grey-brown flake fragment with recent edge damage, possibly natural
1	Chert	Black chert flake fragment

10	Flint	Fragment of white flint, possibly natural
48	Chert	Black chert flake fragment
30	Slate	Sub-rectangular, piece of worked slate

2.4 The radiocarbon dates

2.4.1 The analytical results

Four samples of charcoal, selected from key layers, were sent out for radiocarbon dating. The results initiated a major reassessment of the site, as they proved to be tightly located within the late Mesolithic. The samples were chosen because they contained large and unabraided fragments, which were unlikely to be from a secondary source.

Beta Analytic Ltd.
G1639

Sample Data	Measured Radiocarbon age	Ratio 13C/12C	Conventional Radiocarbon Age(*)
Beta-144916 Sample: 306G16391314 Analysis: Radiometric Advance delivery Material/pre-treatment: 2 Sigma Calibration:	6510+/- 90 BP (charred material): acid/alkali/acid Cal BC 5625 to 5310 (Cal BP 7575 TO 7260)	-25.0*0/00	6510+/-90*BP
Beta-144917 Sample: 306G16392149 Analysis: AMS-Standard delivery Material/pre-treatment: 2Sigma Calibration	7730+/- 40BP (charred material): acid/alkali/acid Cal BC 6625 to 6455 (Cal BP8575 to 8405)	-26.1 0/00	7710 +/- 40 BP
Beta-144918 Sample: 306G16392149 Analysis: Radiometric-Advance delivery Material/pre-treatment: 2 Sigma Calibration	6510 +/- 170 BP (Charred material): acid/alkali/acid Cal BC 5725 to 5070 (Cal BP 7675 to 7020)	-25.0* 0/00	6510 +/-170*BP
Beta-144919 Sample: 306G16392521 Analysis: Radiometric-advance delivery Material/pre-treatment 2 Sigma Calibration:	6400+/- 70 BP (Charred material) acid/alkali/acid Cal BC 5485 to 5270 (Cal BP 7435 to7220)	-25.0* 0/00	6400+/-70*BP

2.4.2 The provenance of the charcoal samples

Beta-144916
Context 14

Fill of linear feature 16. Context 14 was a stony, dark brown, silty clay.

Beta-144917
Context 49

Fill of curvilinear feature 50. Context 49 is a dark reddish brown humic clay, located below a deposit containing large, upright stones (48).

Beta-144918
Context 73

Fill of feature 17, probably part of the general linear hollows also recorded as contexts 19, 46, and 63. Context 73 was a greeny grey, sandy silt; probably natural silting.

Beta-144919
Context 21

Fill of linear hollow 46. Context 21 was a black-brown, stony, silty loam, containing much charcoal, including hazelnut shells. It was stratigraphically later than 73.

2.5 The environmental evidence

The assessment of the environmental material was carried out by BUFAU and concentrated on four samples. Hazelnut shells, fruit stones, and fragments of tuber were found in context 21 and context 15, but all contexts were contaminated with roots and fungal spores. For a detailed report see appendix I.

3 DISCUSSION

There are several, often conflicting, pieces of evidence to consider when attempting to interpret this site. These can be summarised as: the features recorded in the ground, the artefactual evidence, the radiocarbon dates, and parallels with both neighbouring and more distant sites. These issues will be considered separately, and then an attempt will be made to draw general conclusions.

3.1 The features

The main area investigated covered the southern part of the site, and revealed spreads of stone overlying glacial clays, as described above. Within the general spreads features could be identified, and these were often well defined, at least along part of their length, both by the interfaces with the natural subsoil and the position of stones within them. The linear feature 11, enclosing a sub-rectangular area, had stone lined sides, and contained a fill much darker than the matrix of contexts 3 and 4. Its proportion, construction, and the positioning of stones, as if to function as packing stones, were highly suggestive of a foundation slot for upright timbers. The problems encountered in following feature 11 through context 4 could have been due to the practicalities of cutting a slot through such heavy rubble. This could have forced a change to levering out the stones, to provide support for putative timbers, rather than digging a continuous slot.

Feature 16, running along the line of part of feature 11, was less obviously structural, but some of its stones also resembled packing stones and the homogeneity of the fill suggested rapid back-filling of the feature. The large stones on its southern side were suggestive of the remains of a bank or wall facing.

The semi-circular feature, 50, in particular, contained stones positioned as if to support posts. The evidence could be interpreted as a ring of posts; three large posts, packed with huge stones, and

apparently rotted *in situ* causing loose rubble to collapse in the posthole, and three much smaller posts, only one of which (82) could be excavated to any depth.

Various groupings of stones in the western part of context 4 were tentatively interpreted as cut features, slots or postholes. A highly organic context (81) was suggested to be remains of a decayed post located between large stones, which may represent post packing. With all these proposed features attempts to follow them, vertically or horizontally, generally led to further confusion, rather then clarification.

Although initially the excavators felt the site to be of natural origin, the excavation of these well defined, apparently structural features seemed to provide clear evidence of human activity. However, many of the supposed postholes were recorded with the comment that the exact location of the post could not be determined. Feature 50 was described as clearly structural, but very difficult to interpret. The first section dug to investigate feature 50 revealed a narrow cut with steep sides, and was considered by the excavator to be a natural channel. This hypothesis was abandoned when it was clear that the feature curved sharply and could not be explained as a fast flowing stream channel, but it does resemble an ice wedge cast **(plate 10)**.

With many features there were problems in establishing the edges, with comments about over-dug edges appearing fairly frequently in the site archive. Although apparently clear cut in section there were problems in plan identifying the interface between features 16 and 34, with deposits, in places, seemingly interdigitated. The edges of feature 29 were also unclear, but this was attributed mainly to the recent disturbance of the area. A section through feature 50 is recorded as slightly over-dug during excavation, because of the difficulty in identifying the eastern side. When feature 11 was studied closely it could be seen that stones, apparently forming the sides of feature 11, were firmly embedded in the fill of feature 16. Such problems in defining the edges of features are not uncommon in archaeology. An archaeological site is not frozen in time, but is subject to numerous post-depositional processes that can alter the features significantly. However, G1639 seemed to be particularly problematic.

The size of some of the boulders in the features also presents a problem. If they were deposited by fluvial activity it would require a very high energy water flow, which would presumably have carved a clearer channel, running more consistently downhill than the existing features. It would tend to carry smaller particles also, such as sand and gravel, of which there was little trace amongst the boulders. Glacial activity could have easily deposited the boulders, but glacial till deposits are less sorted than fluvial deposits, and the presence of clay and other fine sediments would be inevitable. The matrix between the stones was dark, humic and soily, very different to sediments of either glacial or fluvial origin.

Moving the boulders would represent a significant commitment of labour if the origin of the deposits were anthropogenic, especially the filling of the large linear hollows. The motivation for this expenditure is far from clear, although levelling the site or removing boulders from the fields has been suggested, there would be much easier ways of doing either. Yet fluvial or glacial deposition seem even more unlikely.

3.2 The finds

Finds were extremely scarce on the site, and some of the pieces collected as potential artefacts where not conclusively anthropogenic. Occasional pebbles of grey, poor quality flint do occur in the natural gravels around Caerau, brought down with the glacial drift. The two pieces of flint collected where not definitely struck, and may just be natural fragments. The black chert did not seem to be local, but only occasional small chips of debitage were found, which could represent one or more, very transitory knapping events. They can only give a general indication of human presence.

The slate piece measures 0.2 x 0.15m, and its sub-rectangular shape has been regularised by removing flakes around its edges. Shaped slates have been found at Cefn Graeanog II (Mason and Fasham 1998, p41) and at Caerau village (O'Neil 1936, plate LIV.2). In most, but not all cases they are perforated. Those at Caerau tended to be roughly circular, though there were some sub-rectangular examples. At Cefn Graeanog II they were typically sub-rectangular with one end shaped into a shallow triangle and

perforated towards the point of the triangle. The G1639 example also has a fairly triangular point, though no hole. Although these artefacts resemble roofing slates they have not been found in sufficient quantities to be explained as such. Mason and Fasham (1998) considered them unlikely to be loom weights, suggesting instead that they may have been used around a smoke hole to protect the thatch.

The G1639 slate did not resemble pieces naturally occurring on the site, and the flake scars are convincing as anthropogenic, rather than accidental. Although not perforated it is extremely similar to the Cefn Graeanog examples, and seems to be an example of this Romano-British artefact type. However, it came from within the eastern end of feature 29, confused by the tree hole. When a tree is blown over stones and other objects frequently fall into the hole, and are buried within the fill of the tree hole. The presence of a Romano-British slate in such a feature merely shows that the tree blew over during or after the Romano-British period. With the proximity of G1639 to the Caerau settlements, the presence of one of these slates lying discarded on the ground surface would not be surprising. Therefore, great caution should be exercised in using this artefact to imply a date for the rest of the site, or even for feature 29.

The difference in artefact assemblages between G1639 and the neighbouring sites is striking. On the other sites there was a wide range of artefact types, many of them diagnostic, whereas at G1639 the sparse collection of lithics was such as might be found on almost any random patch of ground in Britain. At Cefn Graeanog there were also occasional flints found, but in this case they were recognisable tool types (Mason and Fasham 1998, p41). The only artefact that can be compared with these other sites is the insecurely contexted piece of slate.

3.3 The radiocarbon dates

The radiocarbon dates are important because, in the near absence of artefacts, they provide the only dating evidence for the site. The dates that were produced were unexpected, and require careful consideration.

Three of the radiocarbon dates overlap at one standard deviation, that is they are statistically indistinguishable, although they all have fairly large errors, especially Beta-144918. The one date with a small error, Beta-144917, is significantly earlier than the others, as it does not overlap even at two standard deviations.

The stratigraphy suggests that samples Beta-144916 and Beta-144917 should be the most recent, then Beta-144919, and Beta-144918 the earliest. As the actual dates for Beta-144916, Beta-144918, and Beta-144919 are indistinguishable, it suggests that the samples were deposited within a time-span short enough for the radiocarbon method to be unable to detect the difference between them.

Beta-144917 is a bit of an anomaly. It is the only accelerator mass spectrometry (AMS) date, and the difference in techniques may be significant. It is possible that the AMS date is not only more precise, but also more accurate than the other dates, which, perhaps are older than they appear. However, it is very common for one radiocarbon date to fail to fit into the expected stratigraphic chronology, and the only way to discover whether it is a genuine error or not is to carry out more dates on other samples.

It is possible that the samples predate the features, and represent residual contamination of the fills. However, a wider spread of dates would be expected if this were the case. The charcoal dated was in large and unabraided fragments, including recognisable hazelnut shells, whereas redeposited pieces would be expected to be much more fragmentary. Alternatively the charcoal may have been from bog oak, burnt long after its deposition in the bog. The use of bog oak for firewood, requiring a long drying process, indicates a dire shortage of dry wood, yet for most of its history the area had considerable woodland (Chambers 1998). Again a wider variation in the radiocarbon dates would be expected with this scenario. That three of the dates are essentially the same, within the precision of the dating technique, strongly suggests that they are related, and possibly originate from the same activity.

The stones of context 4 were surrounded by, and overlay, charcoal deposits. Sample Beta-144917 came from close to the bottom of feature 50, below a deposit of large stones. This would suggest that the charcoal was deposited before the stones, and supports the argument for a human agency. In this case it

would imply that substantial post-built structures were being created in the Mesolithic period, as well as huge amounts of labour being expended on in-filling hollows with boulders.

Alternatively the possibility of the charcoal having been introduced into the features from above must be considered. A forest fire in the Mesolithic period, either natural or caused by human activity, could have provided the extensive layers of charcoal discovered, and all samples would date from the same event, as appears to be the case. If the matrix between the stones were sufficiently voided, it may have been possible for the charcoal to be washed down between the stones, and even underneath them. If this washing was due to ordinary rainfall, it is unlikely that the charcoal fragments would have been abraded by the process. Whether it is really possibly for lumps of charcoal to travel as far into the deposits as necessary to explain these dates, has not been established, but if it is the case, it would suggest that the features are pre-Mesolithic and probably entirely natural.

The palynological work carried out near Cefn Graeanog (Chambers 1998) revealed apparent competition between hazel and alder, which could not be easily explained by comparisons to modern environments. There was also the presence of light loving species, such as plantain and rowan. Chambers considers that these features in the pollen diagram could be explained by Mesolithic activity, but that the evidence is inconclusive. These features occur during a period dated to c. 7350 to c. 6025 bp, into which the radiocarbon dates from G1639 fall. If the dated charcoal does originate from a forest fire of anthropogenic origin, it would be another example of human disturbance of the forest cover. However, a human agency cannot be proved.

3.4 Parallels

3.4.1 Late Iron Age/Romano-British

The justification for the initial watching brief was that, in an area so rich in late Iron Age and Romano-British sites, the likelihood of the road works disturbing archaeology of this period was high. Therefore, when what appeared to be the remains of stone banks or walls were identified, it was natural to provisionally attribute them to this period. On excavation the G1639 features proved to be negative features, rather than positive, upstanding remains, and only a single artefact that could be dated to this period was found.

There were some similarities between the features on G1639 and the neighbouring Romano-British sites. Stone clearance was obviously of considerable importance in the Romano-British fields, and the deposition of large boulders in a natural hollow, could possibly have been a solution to the problem. The use of large boulders in construction is common in the Romano-British settlements, as can be seen in the photographs from Graeanog (Mason and Fasham 1998). However, in most cases, the structures are built directly on the sub-soil, and are not negative features as at G1639. Features on the other excavated sites were easily interpreted as hut structures, but those at G1639 did not follow the usual patterns for Romano-British or earlier domestic structures.

Although many of the huts are stone built, the earlier structures at Cefn Graeanog were built of timber (Hogg 1969), and left negative features as traces of the foundations. The G1639 features could be interpreted as slots and postholes for substantial timbers. One particular semi-circular slot forming part of the earliest phase at Cefn Graeanog (Hogg 1969, p10) resembled in some respects feature 11 at G1639. Both were curvilinear slots with packing stones, and in parts capping stones, though neither appeared to be drains. The Cefn Graeanog feature was much smaller than feature 11, and was interpreted as part of a hut circle with a central hearth.

While close to Iron Age and Romano-British settlements, and having some very basic similarities with them, it is not possible to identify the features of G1639 as part of this activity. If the site is not Romano-British, it is possible that it is Mesolithic as the radiocarbon dates suggest.

3.4.2 Mesolithic

The four radiocarbon dates from G1639 all fall within the late Mesolithic period. There is another Mesolithic date from the immediate locality, as the excavation of a burnt mound at Graeanog Farm (SH 4616 4945) produced a Mesolithic date from deposits beneath the mound (Kelly 1992).

CAR-721 5955-5500 cal BC (6840+/-80 BP)

The dated feature was a small patch of burnt stone fragments and charcoal located within the B-horizon of the buried soil under the mound. Two small samples of charcoal were combined to provide the dating sample. Kelly considers that the patch of stones was unlikely to be *in situ*, and attributes the early date to the small size of the sample. However, considering its position within the buried soil, there seems little reason to discount the date. Excavations at Brenig 53 (Lynch 1993, p18) revealed many burnt stones and charcoal within the subsoil, which were associated with Mesolithic activity.

This possibly demonstrates that there was Mesolithic activity in the immediate area, but it does not clarify the relationship of the dates to the boulder features. Charcoal, whether from hearths or forest fires, could possibly be intrusive in the stone deposits. Also there is no artefactual evidence to support Mesolithic activity on the site.

The vast majority of evidence from the Mesolithic period suggests a mobile hunter-gather economy, with temporary settlements, the traces of which survive as flint scatters, hearths, and worn hollows, with occasional postholes representing small huts and windbreaks. The potential structures on G1639 were much more substantial than usually found for the Mesolithic. A Mesolithic site at Llyn Aled Isaf, Denbighshire (Lynch pers. comm.) produced evidence of relatively substantial postholes, but still nothing unusual for a simple hut. Artefacts were numerous on this site (Jacobi 1980), demonstrating that a lack of artefacts in the Mesolithic suggests the site is not domestic in nature, or indeed, not Mesolithic in date.

However, there is an example of large structures, with Mesolithic dates, but no artefacts, close to Stonehenge. The lack of artefacts in this case is explained by the ceremonial, not domestic nature of the site. Three pits, between 1.27 and 1.93m diameter, and 1.27 to 1.55m deep, and a fourth possible pit, were discovered in a line, during an excavation in 1966 of the carpark at Stonehenge (Allen 1995). The three well-preserved pits seem to have held large pine posts, which had rotted *in situ*. Although initially assumed to be late Neolithic, because they contained no diagnostic artefacts, the radiocarbon dates on charcoal from two of the pits produced early Mesolithic dates.

Pit A – HAR-455 8820-7730 cal BC (9130+/-180 BP)
Pit B – HAR-456 7480-6590 cal BC (8090+/-140 BP)

When in 1988 another pit was discovered, not aligned with the others, but not far away, more extensive studies were carried out on, it to investigate the early date. This feature seems, originally, to have been a posthole, like the others, but instead of the post rotting *in situ* it was removed, and a broader shallow pit recut in the top of the first pit. All three radiocarbon dates came from this recut, from the tertiary, secondary and lower secondary fills.

Tertiary fill – OxA-4220 7580-7090 cal BC (8400+/-100 BP)
Secondary fill – OxA-4219 7700-7420 cal BC (8520+/-80BP)
Lower secondary fill – GU-5109 8090-7690 cal BC (8880+/-80 BP)

All the charcoal dated was *Pinus*, but that in the upper two samples was comminuted, and probably residual; a piece of rhyolite in the tertiary fill suggested its association with phase 3 of Stonehenge (late Neolithic to Bronze Age). However, the charcoal in the lower part of the secondary fill survived as larger fragments, implying that it was not residual, and that this is a reliable date for the construction of the feature. This was supported by mollusc and pollen studies, which demonstrated that the pit had been dug in an environment covered by an open mixed pine and hazel woodland, consistent with the Boreal period (ie early Mesolithic).

Allen (1995) interprets the evidence as representing a "formal display" consisting of some sort of ceremonial posts or totem poles. He also considers that while such structures are uncommon, evidence

from Scandinavia shows that it they are "culturally acceptable" (p472). He also stresses the scarcity of diagnostic Mesolithic artefacts both in these features and in the surrounding area, which leads to such features being classed as belonging to later periods, except where they are radiocarbon dated.

A Mesolithic ceremonial complex is therefore a very tempting interpretation for G1639, but it relies entirely on the radiocarbon dating evidence. Despite their well preserved state, the pieces of charcoal dated were not part of an identifiable hearth, and their relationship to the potential structures on the site must be considered to be essentially unknown. Even if the dates themselves are assumed to be entirely reliable, attributing these dates to the boulder features cannot be done with any confidence.

3.5 An Alternative Hypothesis

3.5.1 Periglacial Landforms

There are problems with interpreting the site archaeologically, and identifying the function and date of possible anthropogenic features. Similarly the natural processes of glaciation and fluvial activity do not account for the evidence. An alternative approach is to look again at possible natural causes, but this time to consider periglacial activity.

During the ice age, the Devensian, the ice sheet extended over most of Wales, so any periglacial features in North Wales formed after this. The main Devensian period ended c. 13,000 BP, but after the Windermere interstadial there was a renewed expansion of ice in highland areas, referred to as the Loch Lomond stadial, c. 11,000 to 10,000 BP. Relatively small cirque and valley glaciers developed in Snowdonia. There were severe periglacial conditions in North Wales both as the main Devensian ice sheet retreated and during the Loch Lomond Stadial, so the periglacial features at the foot of the Snowdon massif could have been created during either period (Ballantyne and Harris 1994).

Periglacial features are mainly caused by the presence of permafrost, defined as ground in which the temperature remains below 0°C over at least two consecutive years. Permafrost was widespread in Britain in the Quaternary cold stages. The surface of the ground over the permafrost tends to thaw annually, producing a soil zone termed the active layer. It is this successive thawing over still frozen ground which produces the periglacial features (Ballantyne and Harris 1994). Features such as ice wedge casts and pingos have been recorded on the Llyn peninsula (Goudie 1990, Ballantyne and Harris 1994).

Similar processes also produce small-scale landforms and sedimentary structures, generally termed patterned ground. The depth of the active layer, and therefore the depth of the patterned ground features varies with temperature and substrate, but can be between c. 0.5m and 2m in depth. Repeated freezing and thawing causes the sorting of sediments, with stones gradually migrating towards the surface. Stones can also be moved laterally to produce patterns, including stripes, circles, and polygons (Ballantyne and Harris 1994). In rock polygons boulders up to 2.5m in axial length can be moved , and the polygons are normally up to 7-9m in diameter (Goudie 1990). Sorted patterns are formed on sparsely vegetated ground with a substrate composed of fine sediments including a high proportion of stones. Patterned ground has been recorded on the Llyn peninsula (Ballantyne and Harris 1994), and is still being produced at a small scale in Snowdonia (Goudie 1990). Fitzpatrick (1987, p157) emphasises that these processes tend to cause stones to be vertically orientated, and curvilinear features with vertically orientated stones would equally describe the G1639 features. Akerman (1987, p20) provides some good photographs of contemporary, active polygons and circles in northern Scandinavia, which closely resemble the G1639 features.

3.5.2 The Interpretation of G1639 as Periglacial Patterned Ground

Periglacial forms resembling the features at G1639 are present in the area, but it must be considered in detail if these can explain the excavated evidence. Considered from this point of view G1639 appears to be a part of a net of rock polygons. The net is composed of a large polygon defined by feature 11, a smaller one defined by 50, and another, feature A, where the island of natural lies within the western

part of context 4. The size of the features, and of the stones that form them, are completely consistent with rock polygons, but the sediment matrix is also important. The matrix is not discussed in most geological texts, but photographs and diagrammes clearly show how effectively the stones can be separated from their original matrix, to lie exposed on the surface with nothing between them but voids. The next stage of the process would seem to be the build up of a humic, soily deposit, as seen at G1639. If this was a gradual, low energy process it seems possible that voids could have existed for a long period of time, allowing the in-wash of charcoal in the Mesolithic period. Ballantyne and Harris (1994, p194) provide section drawings through patterned ground on British mountains, which look remarkably like some of the sections from G1639.

Most geological texts are concerned only with the identification of the overall polygons, and do not discuss structures within them. Whether relatively well defined features such as 11 could be created by periglacial action must be left open until considered by trained geologists, but untrained speculation would consider that this is perfectly possible. Perhaps feature 11, rather than being one of the latest features cut through the site, is actually the earliest trace of the large polygon, which has subsequently continued to develop and become broader and deeper. As the frost would have had longer to work on the stones of feature 11, it would not be surprising that the typical vertical orientation was best developed here. The odd "capping stones" can also be explained as stones, which have been raised so far by frost activity, that they have protruded from the ground surface and eventually fallen over. This same explanation can be applied to the horizontal slabs along the southern side of feature 16. The concentric nature of features 11, 16, 29, and 34 is suggestive of repeated periods, or differing intensities, of frost activity across the same polygon.

The three small features, resembling stakeholes, which were found below the stone of context 4, are more of a problem. If they were stakeholes the stakes could not have passed through the stone deposits, and the holes must have been formed before the deposition of context 4. It may have been possible for large roots to grow through the stone spread and cause the holes, though they were noted to be rather too regular in shape for root holes. Whether such forms could have been created by frost action is, again, a question for the geologists. As the holes were circular in plan, they were not conventional ice wedge casts, but, perhaps, smaller frost features may be formed round rootlets.

4 CONCLUSIONS

G1639 was dug by a team of experienced excavators, who had worked on numerous different types of stratum, and were familiar with ice wedge casts. Several of the team initially believed the site to be of natural origin, but the features they excavated were real, and in places well defined, convincing the team that they were anthropogenic. There were continual doubts, which were recorded in the site archive, and the near absence of artefacts was also a problem. However, if the radiocarbon dates had happened to be of Neolithic or later date, the site would have been accepted by all involved as archaeological, without further investigation. The contradiction between the orthodox view of the Mesolithic and the suggestion of substantial Mesolithic structures demanded a thorough reassessment of the site, which lead to the consideration of periglacial activity as a possible explanation.

It is doubtful whether periglacial activity could form all of the sub-structures on the site, especially feature 11, although this seems possible. There is greater doubt over the possibility that charcoal with a Mesolithic date could have washed into the basal deposits of a rock polygon, and the origin of the stakehole-like features has not been established. Otherwise the periglacial theory adequately explains the excavated evidence, and solves the considerable problems of trying to explain the site as archaeological.

5 BIBLIOGRAPHY

Addison K, Edge MJ and Watkins R (eds), 1990 *North Wales Field Guide.* Quaternary Research Association

Akerman J, 1987 Periglacial forms of Svalbard: a review. In Boardman (ed)

Allen MJ, 1995 Before Stonehenge In Cleal RMJ, Walker KE and Montague R *Stonehenge in its landscape; twentieth-century excavations.*

Ballantyne CK and Harris C, 1994 *The Periglaciation of Great Britain.* Cambridge University Press.

Boardman J (ed), 1987 *Periglacial processes and landforms in Britain and Ireland.* Cambridge University Press.

Chambers FM, 1998 The palynological investigations. In Mason (ed)

Conway JS, 1998 The Physical Setting of the Site. In Mason (ed)

Fitzpatrick EA, 1987 Periglacial features in the soils of north east Scotland . In Boardman (ed)

Goudie A, 1990 *The Landforms of England and Wales.* Blackwell

Harris C and McCarroll D, 1990 Glanllynnau. In Addison et al (eds)

Hogg A H A, 1969 Cefn-Graeanog, Caernarvonshire: a native site of the Roman period. *Caernarvonshire Historical Society Vol.30*

Jacobi RM, 1980 The early Holocene settlement of Wales. In Taylor JA (ed) *Culture and environment in prehistoric Wales BAR 76.*

Kelly RS, 1992 The excavation of a burnt mound at Graeanog, Clynnog, Gwynedd in 1983. *Archaeologia Cambrensis CXLI*

Lynch F, 1993 Excavations in the Brenig Valley: a Mesolithic and Bronze Age landscape in North Wales. *Cambrian Archaeological Monographs No.5*

Mason MA (ed), 1998 The Graeanog Ridge: the evolution of a farming landscape and its settlements in North-West Wales. *Cambrian Archaeological Monographs No.6*

Mason MA and Fasham PJ, 1998 The report on RB White's excavations at Cefn Graeanog II, 1977-79. In Mason (ed)

O'Neil BH St.J, 1936 Excavations at Caerau ancient village, Clynnog, Caernarvonshire, 1933 and 1934. *The Antiquaries Journal Vol.XVI*

Royal Commission on the Ancient and Historical Monuments in Wales, 1960 *Caernarvonshire Inventory Vol.II*, p47-51

Thomas GSP, Chester DK and Crimes TP, 1990 Eastern Llyn. In Addison et al (eds)

APPENDIX I

An assessment of the charred plant remains from the site of Caerau (G1639)

Excavation at the site of Caerau, Gwynedd, uncovered a number of prehistoric features from which soil samples were collected. The samples were collected in order to investigate the presence and the quality of the preservation of the biological remains. It was hoped that through the analysis of the biological remains the evidence and the nature of the human occupation could have been better understood.

Methods

The samples were collected at the excavator's discretion and were later processed by an environmental officer at BUFAU. The samples were floated by using bucket flotation according to the guidelines outlined in *On-site guide to Environmental Sampling and Processing,* BUFAU 2000.
The light fraction of the soil (flot) was recovered on a 500 μm sieve while the heavy fraction (residue) was recovered on a 1mm mesh. The residue was thoroughly sorted by eye while the flots were scanned under a low power stereomicroscope.

Results and recommendation

The result of the scanning of the samples is summarised in table 1.

Sample	Vol. Processed	Notes
011a - C21	16	Modern roots and fungal spores. Modern seeds of buttercup (*Ranunculus* sp.) and *Potentilla* sp. A few fragments of **charcoal.** Bud (prob. Modern), 1 frag. of **hazelnut shell** (*Corylus avellana*) and a probable fragment of **tuber**
11b – C21	1	**Charcoal** very abundant and fragments are rather large. **Hazelnut shell** (*Corylus avellana*) and a probable fragment of **tuber**. Some fragments of quartzite
010 – 015	12	Lots of modern roots, fungal spores and fragments of bark. **Charcoal** present in good quantity. Some buds observed but probably modern. A probable fragment of **tuber**. **Fruit stone fragment? Oak acorn (*Quercus* sp.)?** prob. modern
012 – C21	14	Lots of modern roots, fungal spores and a modern yew leaf. **Charcoal** present but not abundant. A probable fragment of **fruit stone?**
18 – C049	14	Lots of modern roots and fungal spores. **Charcoal** present in good quantity, some large fragments

Table 1. Caerau (G 1639). Results from scanning of flots and residues

Two samples had the same code (C21 – 11) but they appearance was very different and they were, therefore, distinguished by calling them 11a and 11b. Sample 11a contained many modern roots and was more similar to the rest other samples, whereas sample 11b contained large pieces of charcoal and no modern roots. All the samples, with the exception of sample 011b – C21 contained abundant modern roots and fungal spores.

Sample 010 – 015 also contained decomposed bark and buds possibly modern. A fragment of fruit stone and of acorn were recorded from this sample but, they too, looked modern and were not fully carbonized and had a brown colour. No bone fragments were observed, either in the flot or in the residue.

All the samples contained well preserved charcoal suitable for identification and radiocarbon dating.
The fragments of hazelnut shells from 011a – C21 and 11b – C21 were well preserved and their identification is secure.

The fragments of tubers will require further work for identification including the use of a reference collection and more sophisticated microscopic analysis (SEM).

It is suggested that further identification work be carried out on the charcoal and the tuber fragments, especially in consideration of the early dating of the archaeological features.

It will be necessary to ascertain whether any contamination of the sample with modern plant remains has occurred, before interpreting the plant remains from sample 010 – 015.

Marina Ciaraldi 9//2000
Birmingham University Field Archaeology Unit
Project no. 739

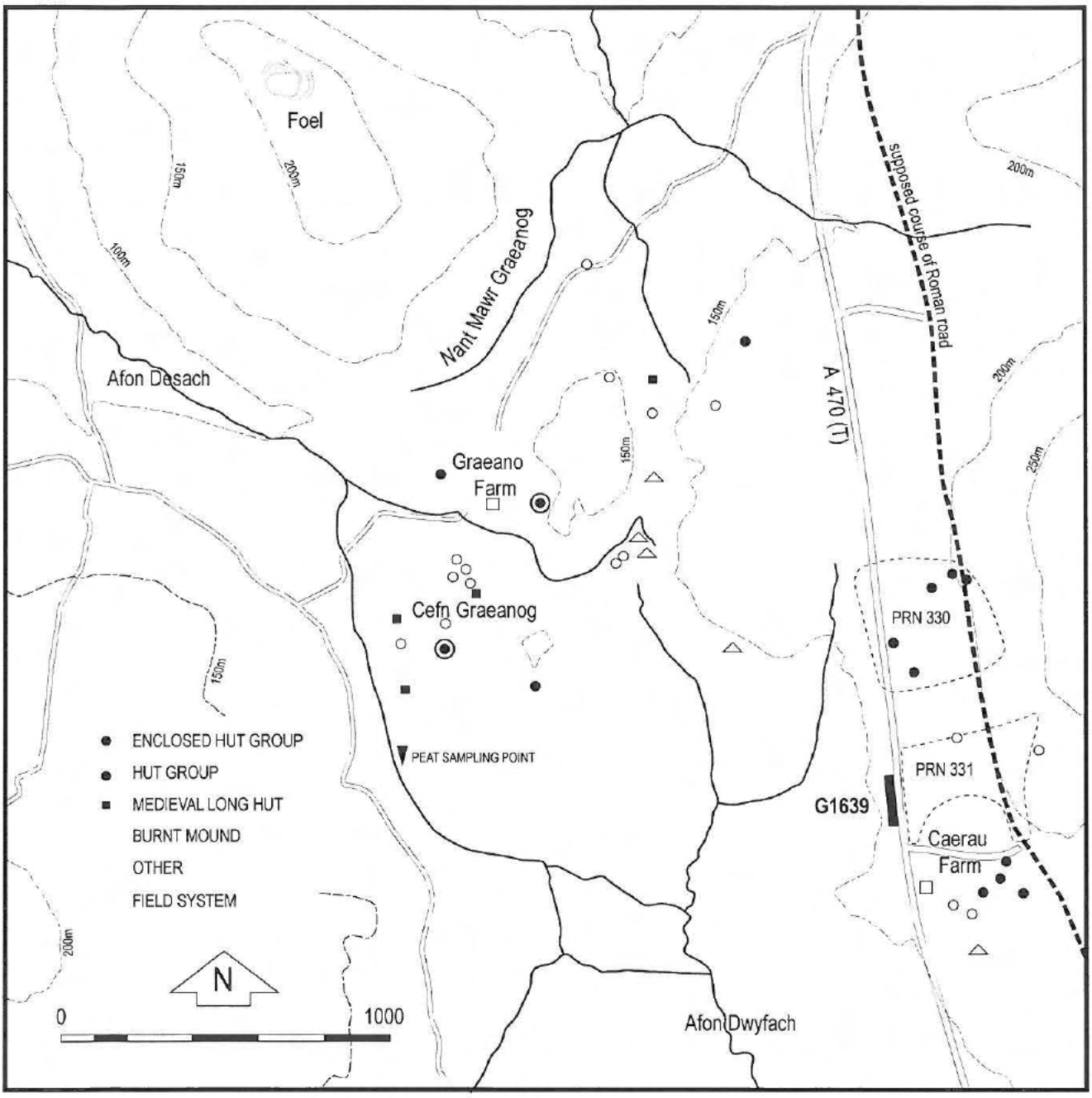
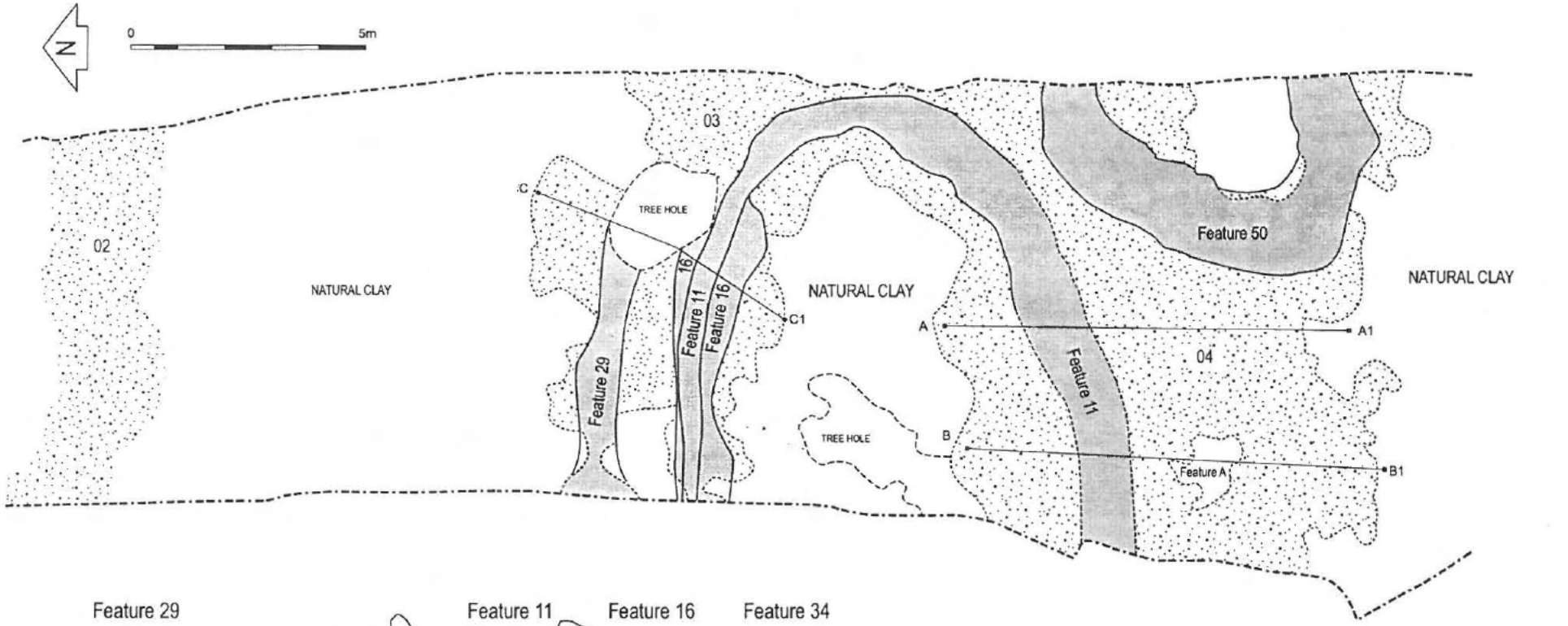
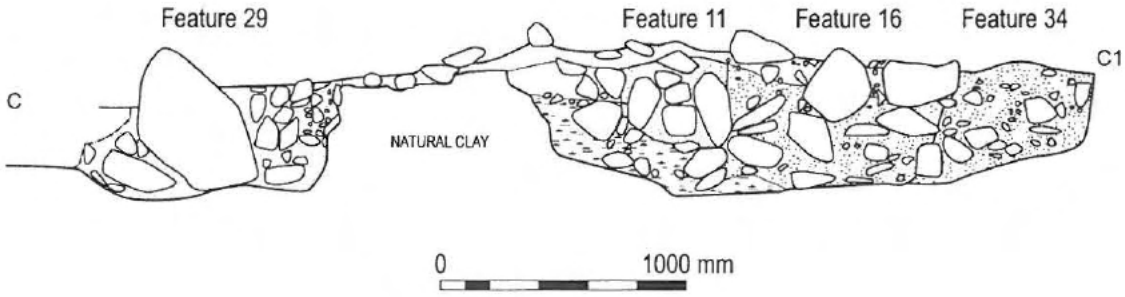
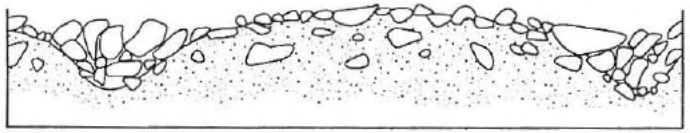


Fig 1 : location of G1639 and known archaeological sites in the Graeanog area







Section through example of relict sorted circle, Rhum, Scotland.
(after Ballantyne & Harris 1994)

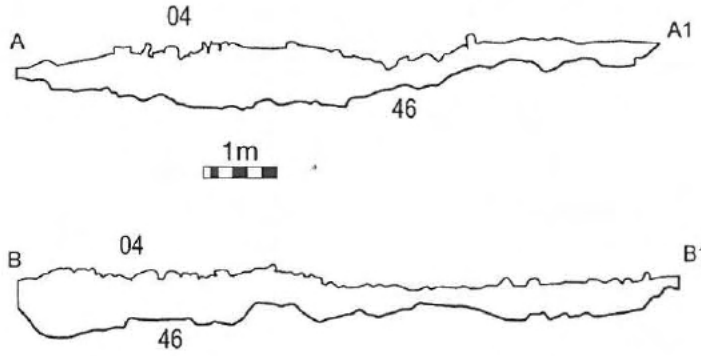


Fig 2 : Semi-schematic site plan, sections and profiles.

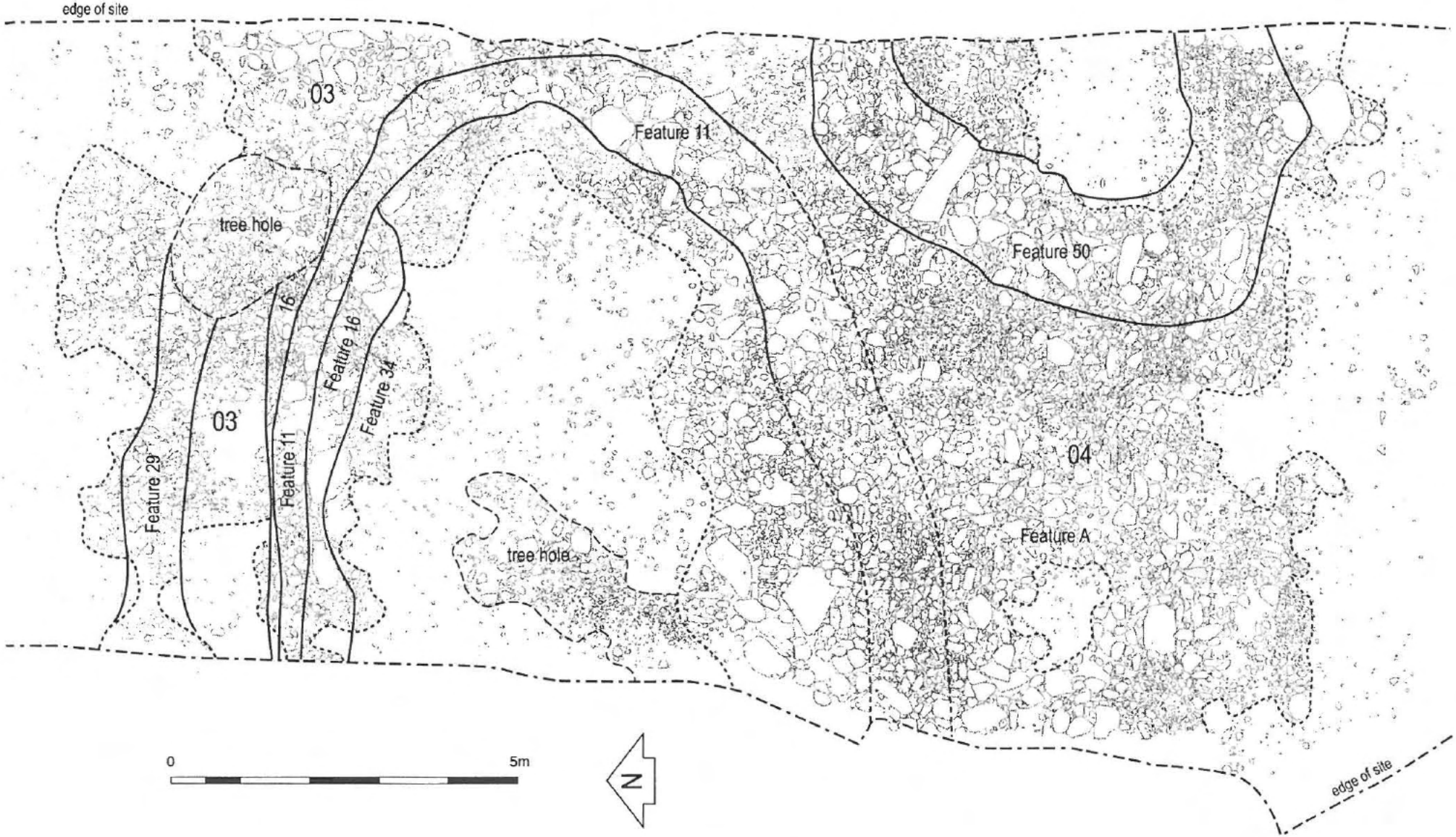
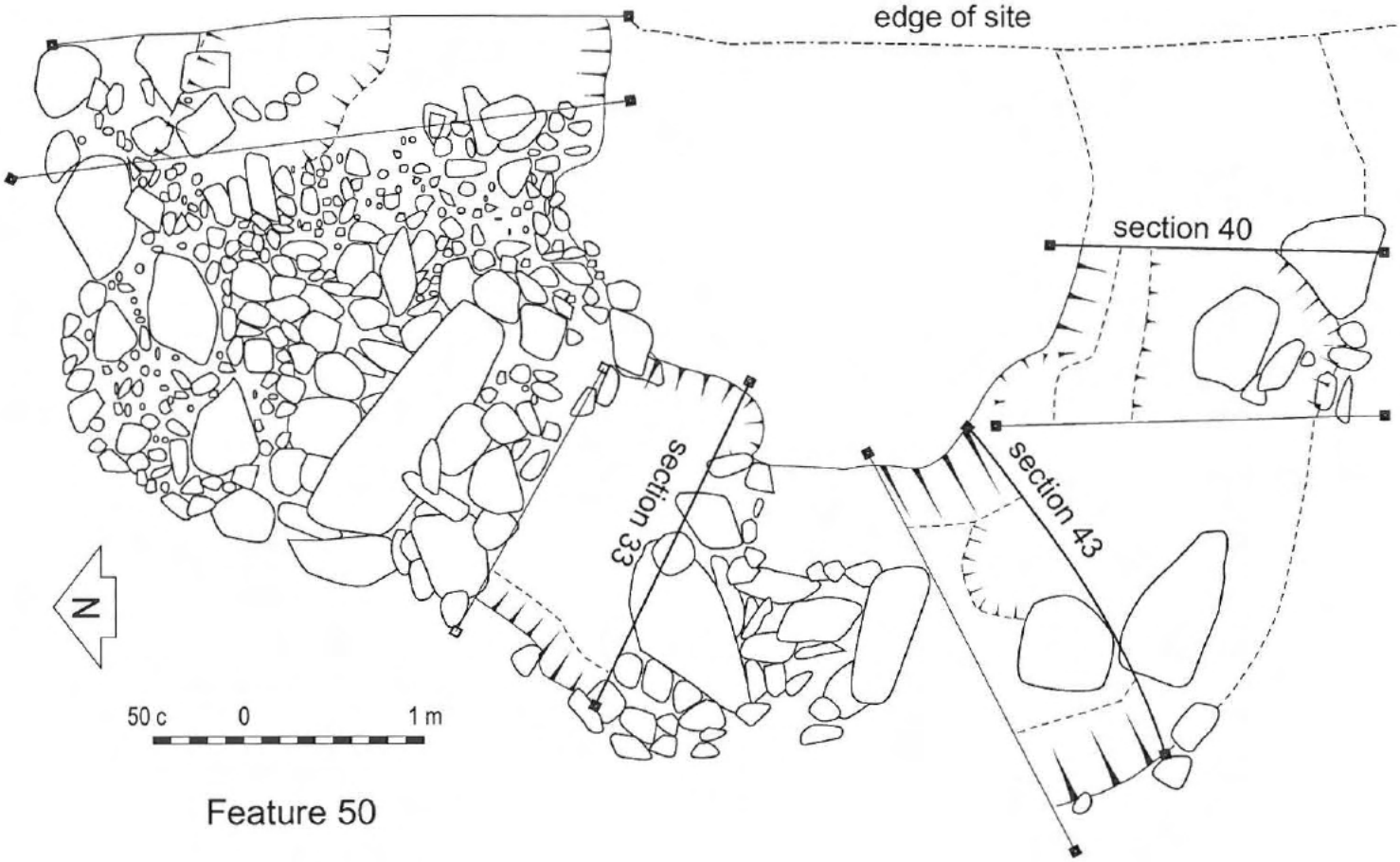
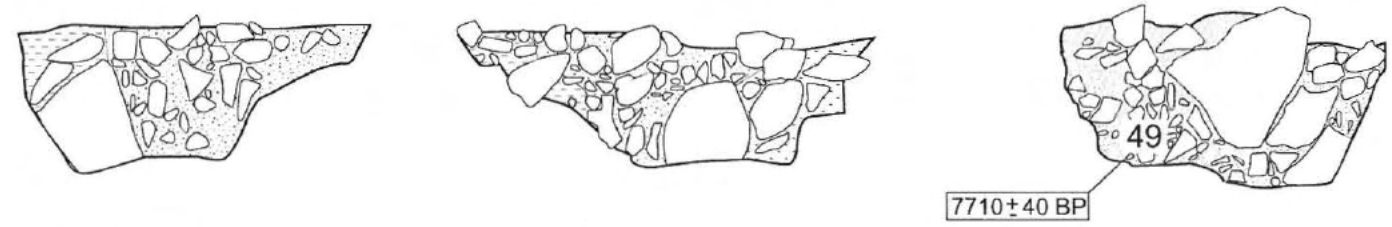


Fig 3 : Detailed plan of contexts 03 and 04.



Feature 50



section 40 section 43 section 33

50 c 0 50 c

Fig 4 : Plan and sections of Feature 50.

Plate 1: View of site from cherry-picker, before cleaning

Plate 2: General view of site during excavation, looking north

Plate 3: Context 2

Plate 4: West facing section through features 11, 16 and 34

Plate 3: Context 2

Plate 4: West facing section through features 11, 16 and 34

Plate 5: Context 4

Plate 6: North facing view of context 4, showing sections

Plate 7: Stakehole-like feature below context 4

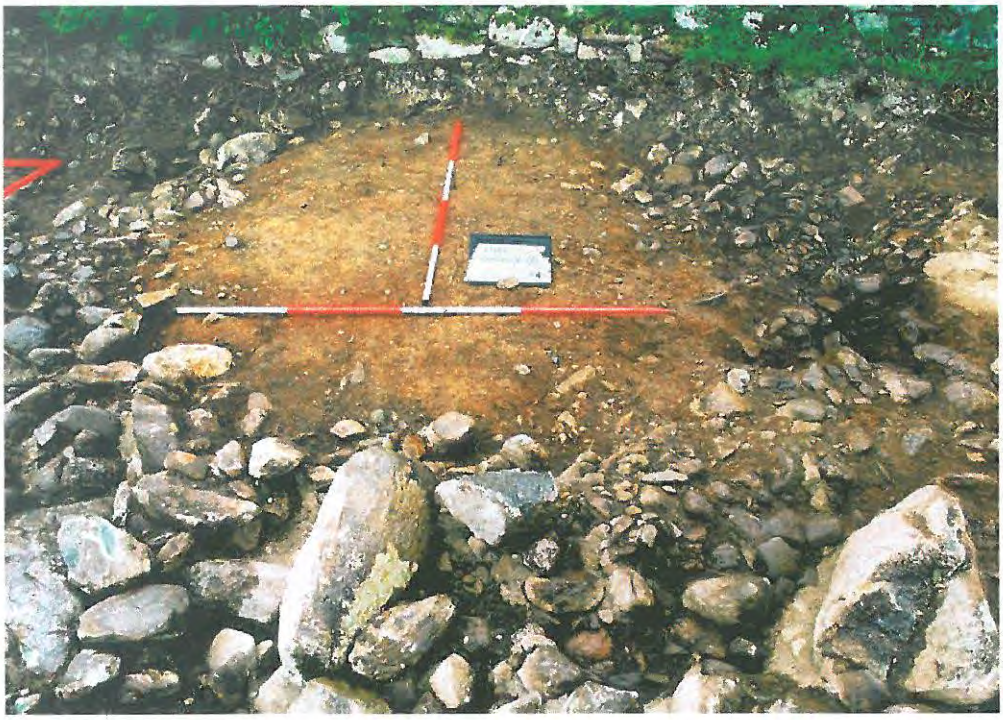


Plate 8: Feature 50

Plate 9: Section through feature 50

Plate 10: Section through part of feature 50, which most resembles an ice wedge

Ymddiriedolaeth Archaeolegol
Gwynedd Archaeological Trust

☎ 01248 352535 FAX 01248 370925 email-gat@heneb.co.uk www.heneb.co.uk
Craig Beuno : Ffordd y Garth : Bangor : LL57 2RT