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# Survey and excavation of multi-period sites at Crugiau Cemmaes, Nevern, Pembrokeshire, 2009–13

BY FRANCES MURPHY<sup>1</sup> AND KEN MURPHY<sup>1</sup>

with contributions by Louise Austin,<sup>1</sup> John Crowther<sup>2</sup> and Catherine Griffiths<sup>2</sup>

*Four Bronze Age round barrows, all scheduled ancient monuments, occupy prominent local high points at Crugiau Cemmaes. Historical records, twentieth-century observations and recent surveys indicate that these are part of an extensive cemetery of up to nine barrows. In addition, aerial photographs and geophysical surveys show a series of buried enclosures and ditches in and around this cemetery. Concerns about the condition of some of the monuments prompted the programme of survey and excavation described in this paper with the intention of using the results to improve the long-term management of the site. Part of the south-east-facing entrance of an oval enclosure was excavated revealing substantial ditches, palisade trenches and postholes. Three radiocarbon determinations from charcoal from ditch fills and a palisade trench calibrate to the mid-eighth to the early fourth century BC, placing this enclosure firmly within the regional tradition of small, defended Iron Age settlements. Two trenches excavated across the ditches of a large, bivallate enclosure did not produce any dating evidence. However, on morphological grounds, this enclosure is also likely to be of Iron Age date, with its size and its double line of ditches being sufficiently substantial for it to be classified as a hillfort. A trench excavated over a geophysical anomaly exposed a small square enclosure defined by a shallow ditch with a central E–W aligned pit, almost certainly a grave, though no bone survived in the acid soils. A similar pit lay outside the square enclosure to the north. No dating evidence was obtained. However, a growing corpus across Wales indicates that this square enclosure is part of an early medieval cemetery.*

## INTRODUCTION

Geophysical survey followed by small-scale excavation was undertaken at Crugiau Cemmaes in north Pembrokeshire, 7 kilometres south-west of Cardigan (Fig. 1), between 2009 and 2013. Four barrows occupy two locally prominent high points or hillocks at 200m above Ordnance Datum, called Crugiau Cemmaes (also known as Pen-Crugiau Cemmaes, Carnau Pencrugiau and variations on these names) and three other barrows and two possible barrows and other sites lie on undulating ground to the east and west (centred on SN 125415). Underlying geology is Ordovician shale (British Geological Survey 1994) covered with deep deposits of fluvio-glacial sands and gravels. To the west of the Crugiau Cemmaes hillocks (the area of Trenches 1–4; see Fig. 2) these superficial deposits consisted of banded soft sands and fine gravels; to the east (Trenches 5 and 6) they contained more compacted bands of coarse gravels as well as sands and fine gravels. Land-use in the area is predominantly improved pasture with some cereal cultivation, although the two barrows on the southernmost high point are under bracken, gorse and brambles.

The barrows have one of the longest recorded histories of any prehistoric site in Wales. The Royal Commission (1925, 13–14) researched their history, and this short description is based on their published account with additional material from Ordnance Survey record cards (SN 14 SW 4). In about 1600, the Pembrokeshire antiquary George Owen described the barrows as ‘four little tumps of earth, and yet to

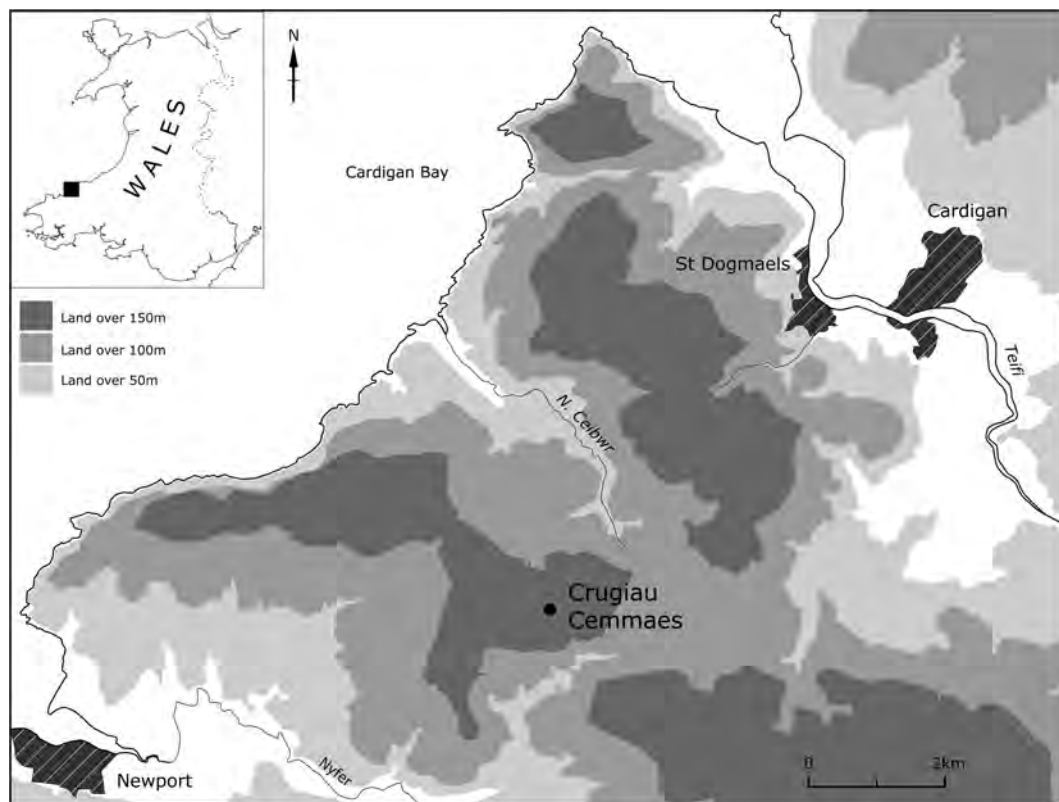


Fig. 1. Location map.

be seen 40 miles off'. By the end of the seventeenth century Edward Lhuyd's account published in the Gibson's edition of Camden's *Britannia* notes the four barrows, and describes the opening of one by a local landowner and the finding of five urns containing burnt bone and ashes. Lhuyd acquired one of the urns for the Ashmolean Museum, Oxford, and the Royal Commission published a photograph of what may be this urn (1925, fig. 59), although expressed doubts about its provenance. Richard Fenton at the end of the eighteenth century described Crugiau Cemmaes as 'a very large group of tumuli, several very conspicuous, perfect and untouched, but the greater number so altered by the intersection of hedges and the repeated process of the plough, that it requires an eye much in the habit of examining such elevations to discover them'. Fenton's account suggests that there were more than four barrows; indeed he notes it was the largest grouping in the county except for those at Dry Burrows at Orierton near to Pembroke, and that by the late eighteenth century some were in poor condition. In 1925, the Royal Commission recorded six barrows. The Ordnance Survey added two more during the mid-twentieth century, but later Ordnance Survey investigators dismissed these, and also cast doubts on the two barrows identified by the Royal Commission in 1925. One more barrow was identified in 2004 (Cook, gazetteer entry 48326). In addition, in the eighteenth century five coins, including one of the Roman emperor Otho (AD 69) were found on the site.<sup>3</sup>

Four of the barrows are Scheduled Ancient Monuments (Pe197), and all the sites lie within the Pembrokeshire Coast National Park. In 2009, National Park staff members were becoming concerned

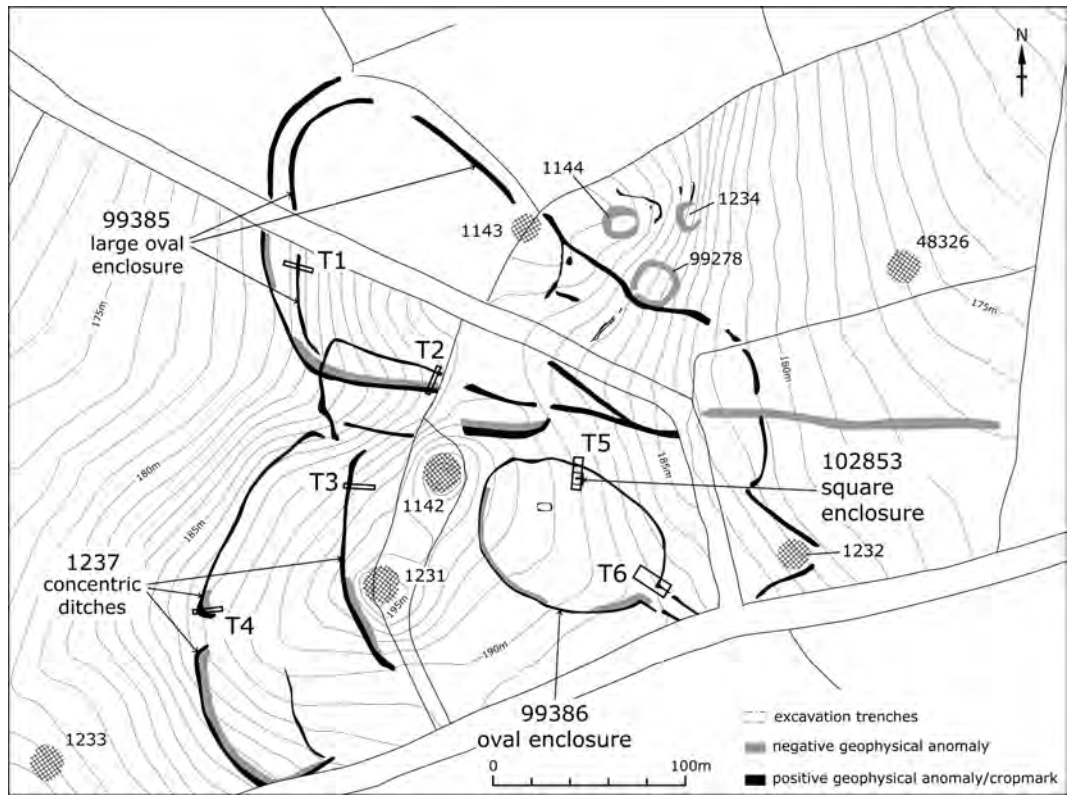


Fig. 2. Interpretation of the geophysical survey and features shown on aerial photographs, and showing the location of the excavation trenches.

about the condition and management of the two barrows under bracken and brambles, especially as there were plans to sell a small, privately-owned, abandoned reservoir lying between them. There were also concerns about the other barrows, as some were occasionally ploughed. The scheduled areas were very close to the edges of the barrows, and Cadw was keen to review their extent, with a view to increasing them, possibly to take in other sites, as a review of aerial photographs had indicated the presence of archaeological sites in the form of cropmark ditches in and around the round barrow cemetery. Cadw and the National Park were thus willing to fund investigations of the sites, the results of which could be used to improve management and possibly extend the scheduled areas. Thus, in 2009 and 2010, geophysical surveys were undertaken (Poucher and Ings 2010), followed by small-scale excavations in 2012 and 2013 (Crane *et al.* 2012 and 2013).

#### AERIAL PHOTOGRAPHY AND GEOPHYSICAL SURVEY

An aerial photograph taken by Terry James of Dyfed Archaeological Trust in 1981 shows clearly defined cropmark ditches in the field to the west of the two barrows under bracken cover, with hints of cropmark ditches in the field to the east. Photographs taken in 2006 by Toby Driver of the Royal Commission on





Fig. 3. Aerial photography showing the oval enclosure 99386. The colour bands of the digital aerial photograph have been rebalanced by the Royal Commission to highlight the poorly defined light green/dark green cropmarks and parchmarks. © *Crown Copyright, RCAHMW, AP\_2006\_3906.*



Fig. 4. Aerial photograph showing part of the ditches of enclosure 99385. The colour bands of the digital aerial photograph have been rebalanced by the Royal Commission to highlight the poorly defined light green/dark green cropmarks and parchmarks. © *Crown Copyright, RCAHMW, AP\_2006\_3907.*

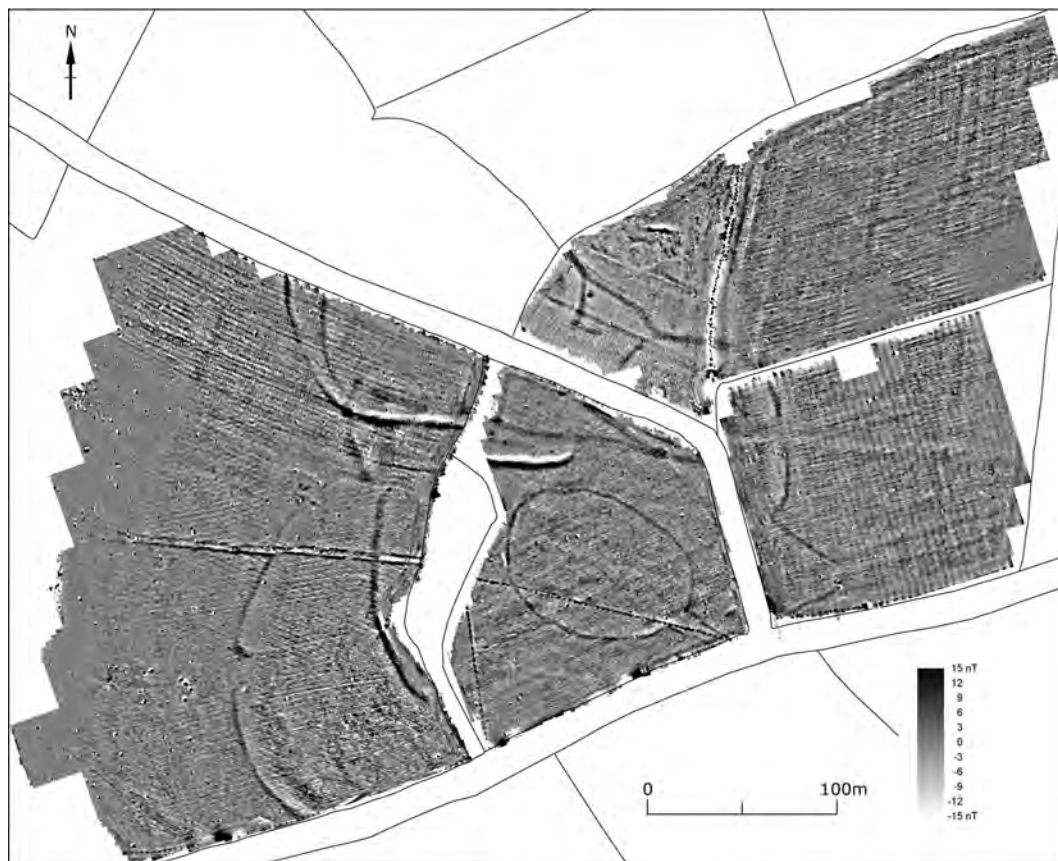


Fig. 5. Combined results of the 2009 and 2010 fluxgate gradiometer survey.

Ancient and Historical Monuments of Wales better define the cropmarks in the field to the east, and also show more cropmarks in the fields to the north (Figs 3 and 4).

The 15-hectare geophysical survey was conducted using a fluxgate gradiometer, with readings taken every 0.25m on 1m spaced traverses, apart from in the central northern field where readings were every 0.25m on 0.5m spaced traverses. A topographical survey was undertaken at the same time as the geophysical survey. The combined results of the 2009 and 2010 geophysical surveys are shown on Fig. 5 and an overall interpretation of the results of the geophysical survey and of features shown on aerial photographs are shown on Fig. 2. Descriptions of individual sites based on earthwork, aerial photographs and geophysical surveys are provided below.

#### GAZETTEER OF SITES

This gazetteer of sites forming part of the complex is arranged by site type and then numerically using record numbers allocated on the Dyfed Historic Environment Record.



**Round barrow 1142.** A mound *c.* 21m diameter and 3m high under dense bracken, gorse and brambles on a knoll. It has a trig point on its top. Scheduled.

**Round barrow 1143.** A barrow bisected by a hedge/fence. Its dimensions are difficult to assess as it is denuded and under pasture on its east side and gorse covered on its west side. Aerial photographs and the geophysical survey indicate possible ditches around the barrow. Scheduled.

**Round barrow 1144.** This barrow is now denuded and it is impossible to distinguish it with any certainty in the undulating field. However, the geophysical survey shows a clear circular anomaly *c.* 20m diameter. Scheduled.

**Round barrow 1231.** A roughly circular mound located on a knoll under dense bracken, gorse and brambles. Diameter approximately 15–20m. Scheduled.

**Possible round barrow 1232.** The Ordnance Survey identified this barrow from aerial photographs. There is now no surface trace of it, although there are natural undulations in the field. Linear ditches are shown on the geophysical survey at this location, but there are no obvious anomalies indicating the presence of a barrow.

**Round barrow 1233.** Recorded by the Royal Commission in 1925 as a mound *c.* 15m diameter and 1.2m high. Apart from a rather more stony area in a slightly boggy area of the field there is no surface evidence for this site. The geophysical survey did not detect this barrow.

**Round barrow 1234.** Recorded by the Royal Commission in 1925 as a mound *c.* 20m diameter and 1.5m high. There is now no surface evidence for this barrow in the undulating field, although the geophysical survey shows an anomaly at its location.

**Round barrow 48326.** A circular mound stonier than the rest of the field, *c.* 18m diameter and 0.2m high, first recorded in 2004 (Cook 2004).

**Possible round barrow 99278.** A faint negative anomaly defining a sub-circular anomaly *c.* 25m diameter is located in a kink of a ditch, possibly a ditch of enclosure 99385. There are no earthworks at this location, but the anomaly may be of a denuded round barrow.

**Ditches 1237.** Two curving, roughly concentric ditches approximately 50–60m apart with possible banks on their eastern sides are visible on aerial photographs and on the geophysical survey. The western ditch runs along a break of slope, and at its northern end begins to turn to the east up a shallow valley before fading. An inturned entrance lies midway along the ditch as recorded. The eastern ditch runs close to the foot of the hillock on which barrows 1231 and 1142 are located. No entrance is visible through this ditch, but like the western ditch it turns to the east at its northern end. It is assumed that these ditches are related, but this may not be the case. It also appears that they should form the western side of a large, oval enclosure, but neither the evidence from the geophysical survey and the aerial photographs nor the site topography supports this. In 2012, trenches were excavated across both ditches (see below).

**Large oval enclosure 99385.** This large enclosure, at least 150m W–E and 150m N–S straddles several fields. It is bivallate on its western and northern sides (the outer ditch defined by a hedge-bank on the north

side), with ditches *c.* 15m apart. A very distinct geophysical anomaly of a ditch with internal (north side) bank defines its south side. Its extent and form to the east is not clear, nor is its relationship with round barrow 1143. It is possible that it extends for an additional 120m to the east. Alternatively, a ditch to the east of barrow 1143 may mark the extent of this enclosure, and the geophysical anomalies to the east are part of something else.

**Oval enclosure 99386.** An oval ditched enclosure approximately 100m NW–SE and 70m SW–NE, with the SE-facing ‘antenna’ entrance, i.e. approached by a trackway with flanking ditches. The geophysical survey shows a possible bank internal to the ditch around part of the circuit, and a small rectangular enclosure (102853) and other possible internal features.

**Square enclosure 102853.** A square ditched enclosure 7m to 8m across with a distinct central pit is visible on the geophysical survey inside the northern boundary of the oval enclosure 99386.

## THE EXCAVATIONS

In 2012, four trenches (T1–4) were excavated across the ditches of sites 1237 and 99385, and in 2013, two trenches (5 and 6) were excavated across the ditches of the oval enclosure 99386 and small square enclosure 102853 (Fig. 2). In all trenches topsoil was removed by machine. All archaeological features were hand-excavated. The results are described below.

### **Enclosure 99385**

**Trench 1**, 15m × 2m, was located over the inner of two concentric ditches visible on the geophysical survey. Removal of the 0.35–0.5m thick topsoil/ploughsoil (1101, 1103) revealed the surface of geological banded sand (1113) through which the ditch (1104) was cut. A Mesolithic microlith (1602) was found in the top of the sand deposits. The ditch (1104) was *c.* 3.2m wide and *c.* 1m deep with an open V-shaped profile (Fig. 6). Its fills comprised successive layers of slightly different coloured sand (1121, 1109, 1119) with the primary sand layer (1120) containing some rounded stones up to 120mm diameter, including a flint nodule. Other than these stones the ditch fills contained few inclusions.

**Trench 2**, 15m × 2m, was located over the outer of the two concentric ditches where the geophysical survey indicates the presence of a bank on the north side of the ditch. Geological deposits in this trench comprised sand with bands of fine gravel. The ditch (2204) was *c.* 4.5m wide and *c.* 1.8m deep, with an open V-shaped profile, and was filled with several layers of different coloured sand/gravel (2205, 2214, 2215, 2212, 2217, 2218, 2222) probably representing natural accumulation of material (Fig. 7). Owing to the soft character of the sand and gravels, coupled with root penetration and animal burrows, deposits to the north of the ditch are not easy to interpret. However, it would seem that a bank composed of material (2202, 2213) upcast from digging the ditch lay immediately to the north. At the ditch lip it overlay probable geological deposits (2220), but at its northern end it may have rested on an old ground surface/buried soil (2236), but this was not investigated. Layers of sand/gravel (2207, 2209, 2237, 2216) eroded from the bank lay to the north. It would seem that these layers had eroded into a hollow, possibly a hut platform or second ditch, defined on its northern side by natural sands and gravels (2224, 2225). The lower deposits of this possible hollow/ditch were not excavated. A small posthole (2227) cut through the uppermost (2224) of these deposits. Several stake-holes may have been associated with this posthole, but these were not distinct features.

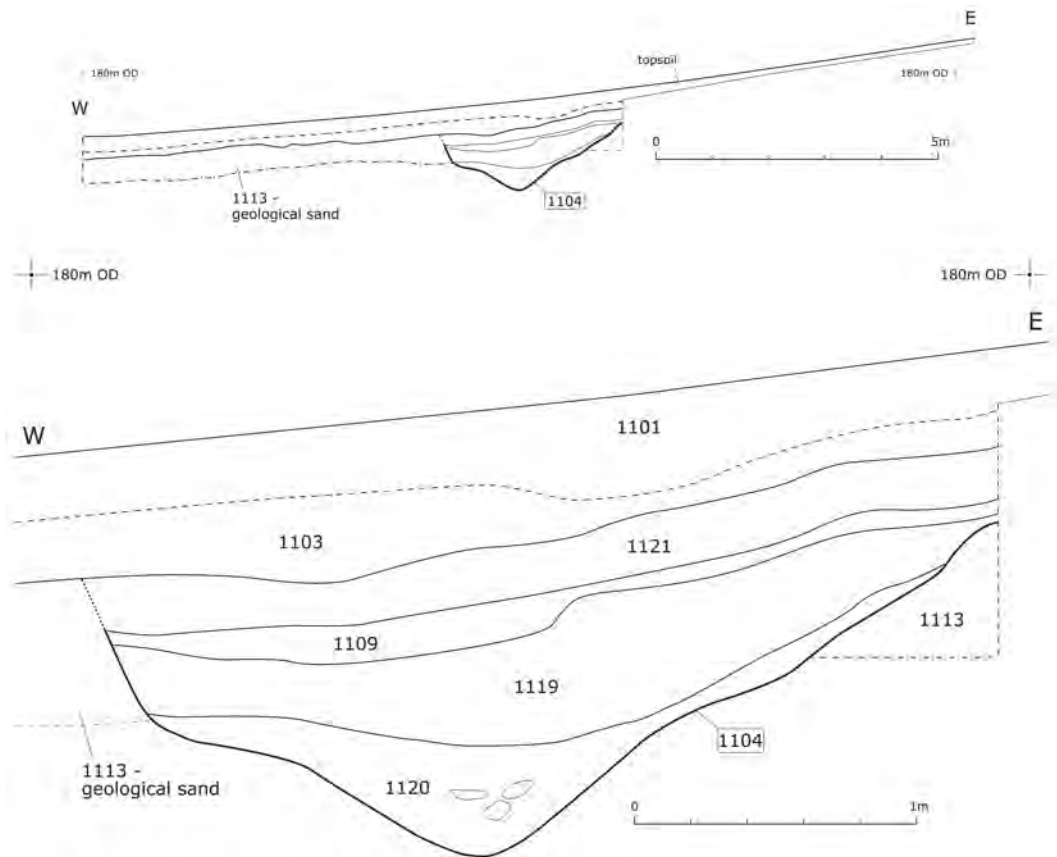


Fig. 6. Section drawing of Trench 1.

### Ditches 1237

**Trench 3**, 15m × 2m, was positioned to investigate a ditch running below and immediately to the west of round barrow 1142. The ditch (3311) lay directly below the 0.3m thick topsoil/ploughsoil and was cut through geological deposits of sand, silty-sand and gravel, although due to root and animal disturbance the upper edges of the ditch were not clearly defined (Fig. 8: the zigzag line between 3306 and 3312 depicts this zone of disturbance). It had a steep-sided, V-shaped profile, c. 3.7m wide and 2.7m deep. The upper ditch fills (3306, 3312) had a high humic content; lower fills comprised almost pure sand and silty-sand with a few stones (3316, 3317, 3318, 3319, 3325, 3324, 3321, 3322, 3323). Outside the confines of the ditch, deep plough marks scored the surface of the geological deposits.

**Trench 4**, 15m × 2m, was located across a north–south ditch, immediately to the north of a gap in the ditch. The terminals of the ditch have an easterly inturn, suggesting a formal entrance. Geological deposits consisted of banded sand, sandy-silt, gravel and pebbles.

The ditch (4410) was located below the 0.3m thick topsoil/ploughsoil (4401). It was c. 5.5m across and c. 2m deep (Fig. 9). The lower half of the ditch had a steep-sided V-shaped profile. At c. 1m from the bottom the ditch edges flared out to produce the very wide upper profile. The upper edges of the

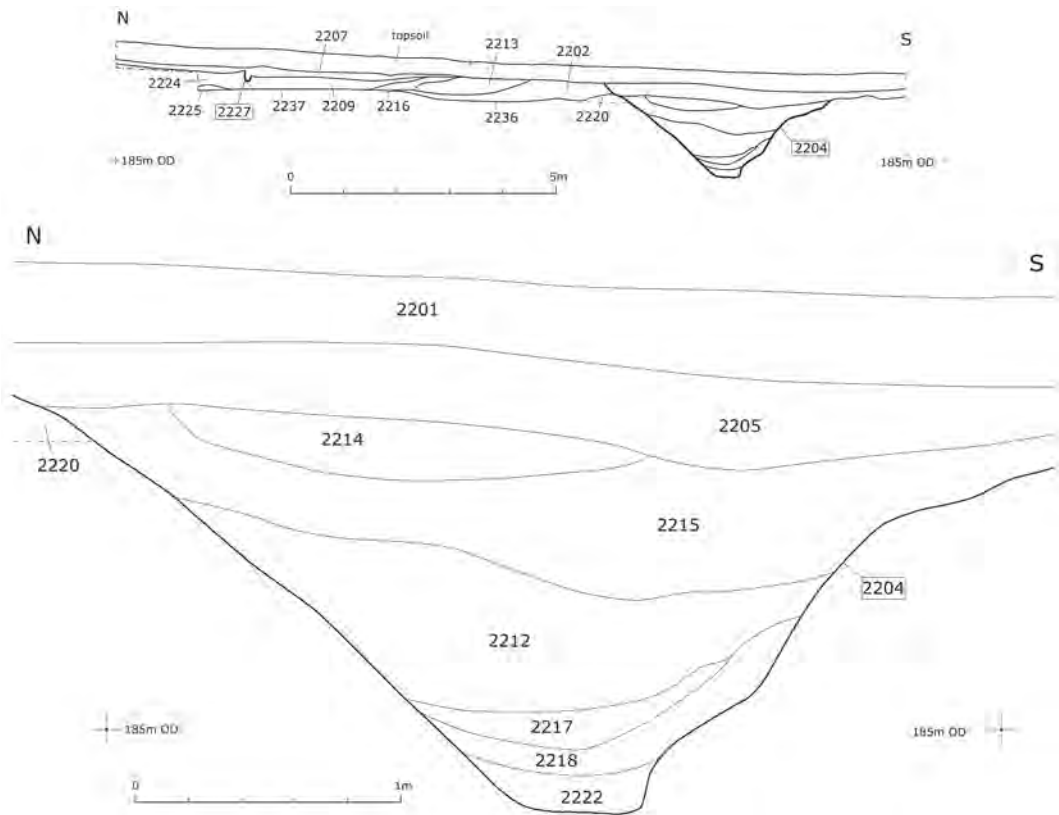


Fig. 7. Section drawing of Trench 2.

ditch were not obvious, particularly on the eastern side, but became clear with depth. The upper ditch fills (4403, 4409) had a humic element, which decreased with depth. Apart from the humic element, fills (4414, 4415, 4416, 4417, 4418, 4419) comprised almost entirely unmodified sands, silts and gravel, with no other inclusions. An exception was a thin charcoal-rich layer (4411). Outside the confines of the ditch, deep plough marks scored the surface of the geological deposits. Two struck flint flakes (1 and 4) were found in the topsoil (4401) of this trench.

### Oval enclosure 99386

Part of the entrance to the oval enclosure was examined in Trench 6. Removal of the 0.2m-thick ploughsoil revealed an orange-brown sandy subsoil through which the wide, main enclosure ditch (6024, 6049), the entrance ditch (6025) and internal features were cut (Fig. 10). Three stone spindle whorls (Fig. 13, nos 1, 2 and 4) and a possible loom weight (no. 3) were discovered at the ploughsoil/subsoil interface.

The entrance ditch (6025) had an open V-shaped profile, 2.5m wide and 0.8m deep (Fig. 11). Fills comprised successive layers of sandy grit and soft sand, with occasional small/medium-sized stones and few other inclusions (6062, 6063, 6064, 6065). The upper surface of the top layer (6065) was heat-affected—coloured bright red with black patches and containing charcoal flecks. A radiocarbon

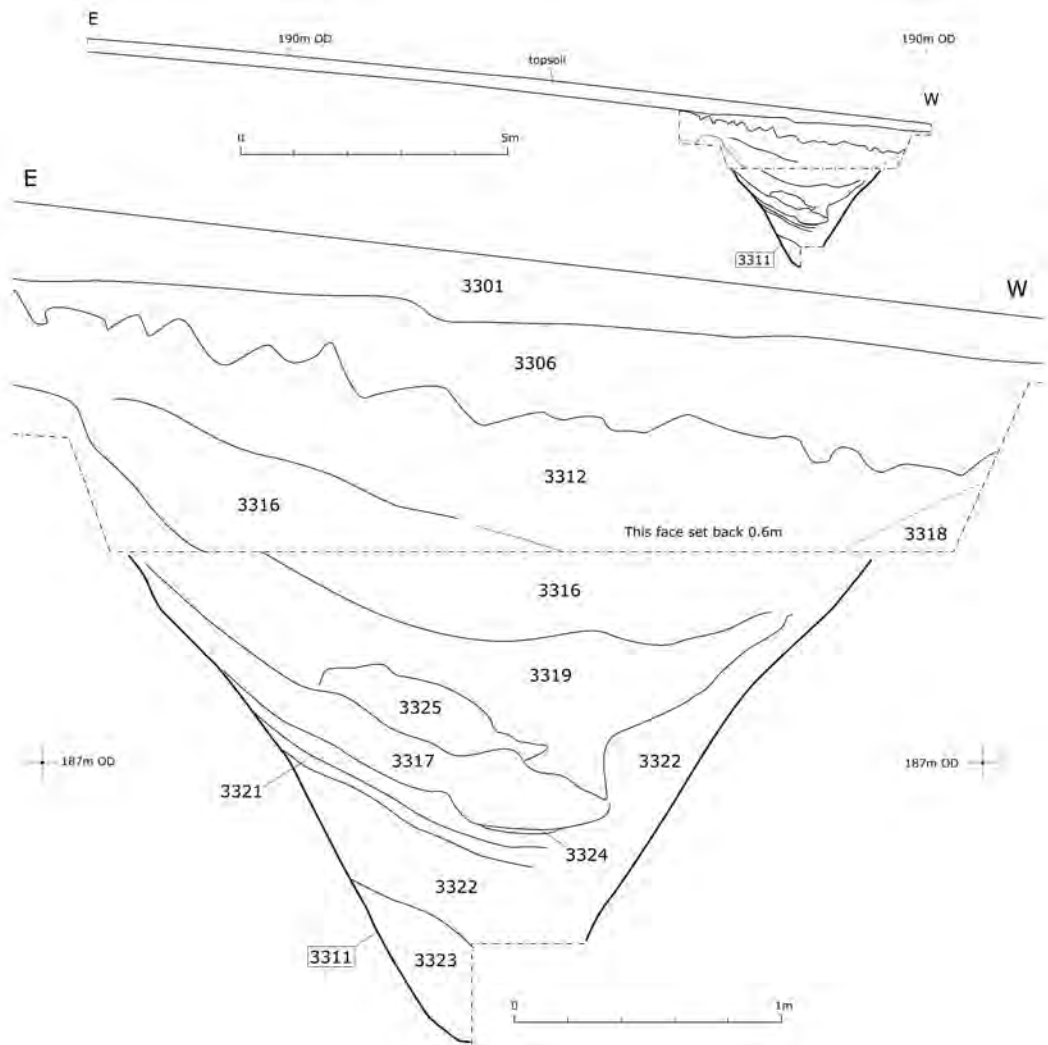


Fig. 8. Section drawing of Trench 3.

determination of 745–395 cal. BC (SUERC-56591) was obtained from charcoal from this layer. A large posthole (6002) cut through ditch fills on the southern side of the ditch.

The main enclosure ditch (6024) terminated abruptly at its southern end, and had a funnel-shaped profile, 4.0m wide and 2.25m deep (Fig. 11). Below the bowl of the funnel where the ditch narrowed dramatically, bands of re-deposited natural gravel and silt formed successive ditch fills (6050); a relatively large amount of grey silt that the ditch cut through had slumped in from the from the west (6051). It is clearly unknown from the relatively small excavated area whether this unusual funnel-shaped profile is due to the original excavators' reaction to the different textures and compaction of the banded geology at this particular part of the site, or whether it is a characteristic of the ditch which continues around its complete circuit. In the bowl of the funnel, layers of different coloured silty gravels containing small stones but little humic material was present (6052



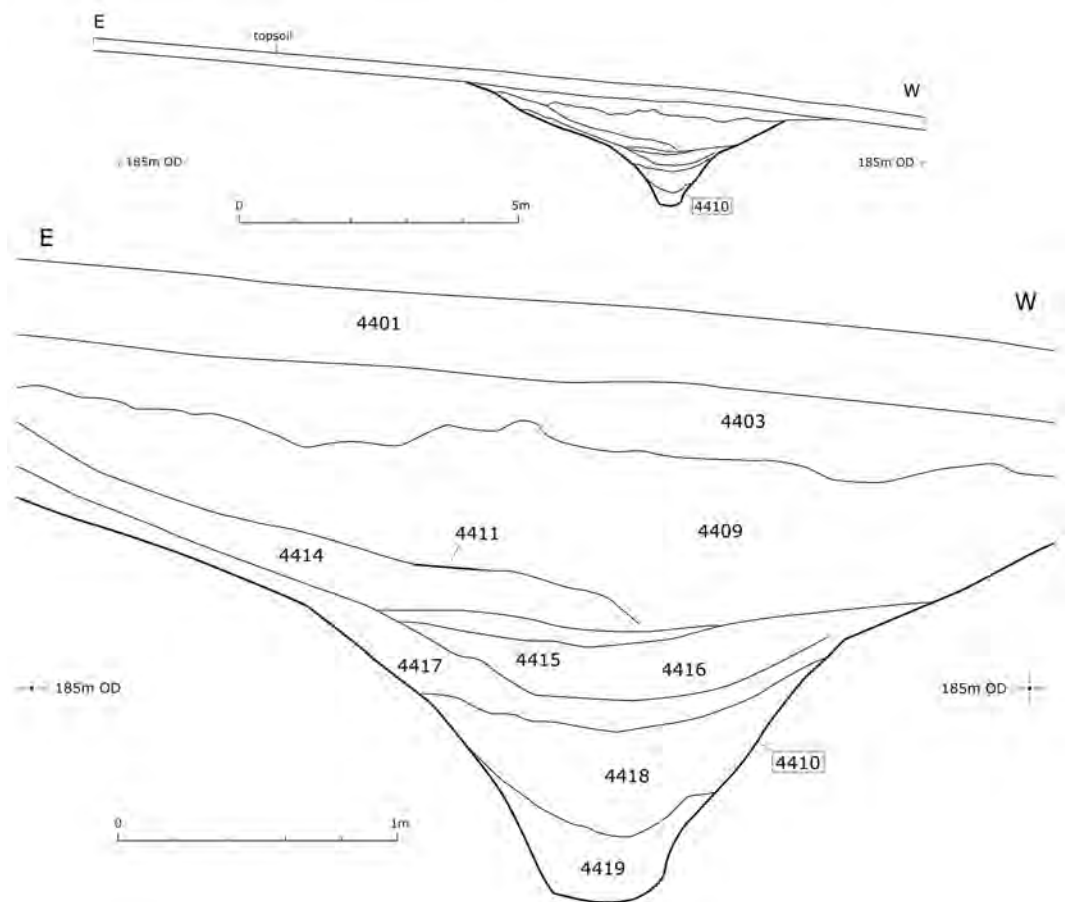


Fig. 9. Section drawing of Trench 4.

and 6053). At a depth of 0.94m the ditch had been recut (6049). The primary fill of the recut ditch was visible as a layer of dark brown silt containing charcoal (6046). A radiocarbon determination of 755–415 cal. BC (SUERC-56) was obtained from charcoal from this layer. Three further fills were noted above this: a dark grey-brown silt with many stones (6054), a layer of gravel with iron-pan (only in the centre of the ditch) (6055), and uppermost dark grey-brown silt with relatively few stones (6056). The fills of the recut were noticeably much darker than the fills of the earlier ditch and contained heat affected stone, charcoal and a few tiny fragments of burnt bone. Part of a spindle whorl (no. 7) was found in the upper fill of the re-cut ditch (6056).

Due to the presence of a water pipe it was not possible to examine the relationship between the main enclosure ditch (6024), its recut (6049) and the entrance ditch (6025). The fills of 6024 and 6025 were, however, broadly similar, and it is assumed that they accumulated at approximately the same time. The fills of large posthole (6002) and the upper fill of the recut (6049) were also broadly similar, possibly indicating contemporaneity.

Posthole (6047) lay approximately 0.7m west of the curving corner of the main enclosure ditch, with two palisade trenches leading away from it, one running north-east (6039) and the other west (6014). The fill (6015) of palisade trench 6014 contained packing stones indicating the position of former



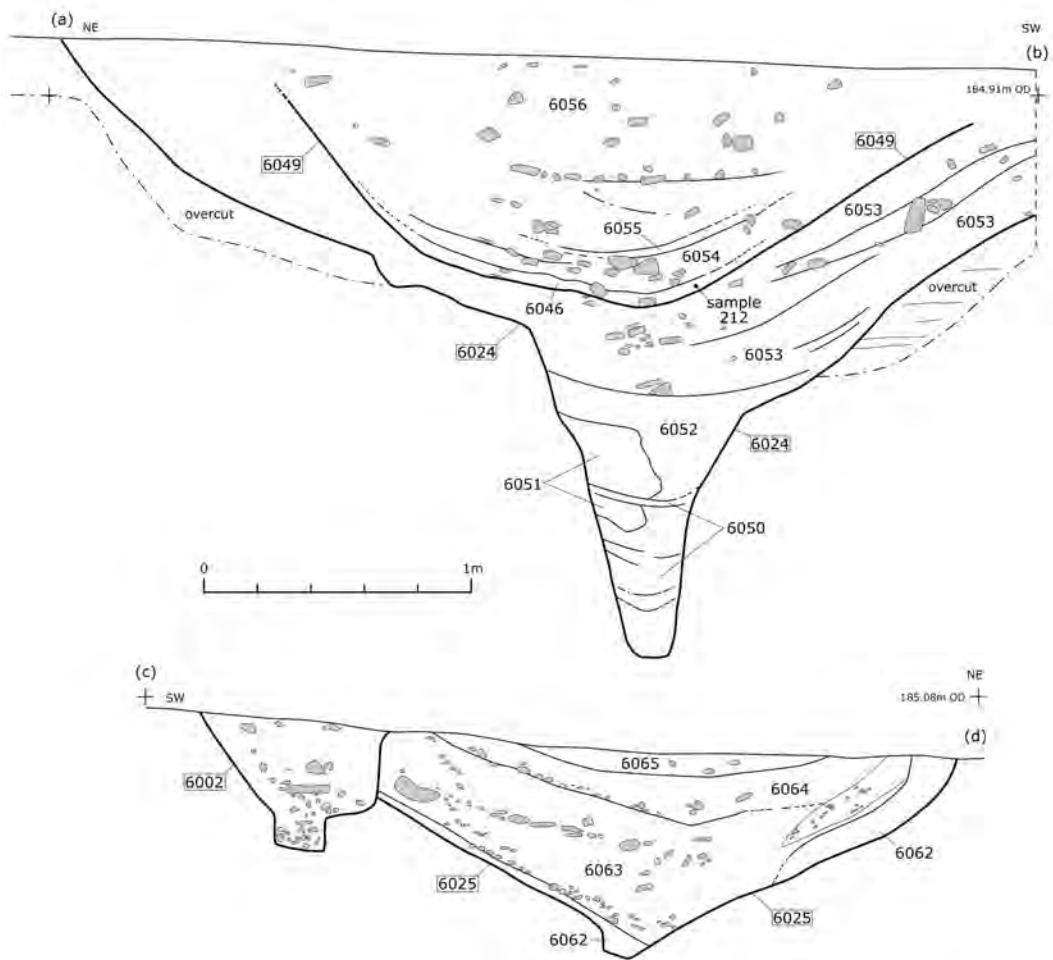


Fig. 11. Trench 6. Section drawings of ditches 6024 and 6025 of the oval enclosure 99386.

Although no skeletal remains survived, as a result of leaching in the well-drained acid soils, it was considered that the three rectangular pits could be graves. It would be expected that clear phosphate enrichment would have occurred if bodies had been placed in the pits, and therefore samples were taken from 5006 and 5019, and subsequently analysed by John Crowther (2014). Results from 5006 support its interpretation as a grave. In contrast, those from 5019 provide no clear evidence for a burial.

Two flint blades (9 and 10) were found at the interface of topsoil/subsoil in this Trench.

#### RADIOCARBON DETERMINATIONS

The Scottish Universities Environmental Research Centre (SUERC) provided the radiocarbon determinations. The calibrated age ranges were determinations from the university of Oxford Radiocarbon Accelerator Unit calibration program (OxCal14).

**SUERC-56589**

*Material:* wood charcoal, not round wood: alder

*Context:* primary fill (6046) of recut ditch 6049 of oval enclosure 99386

*Radiocarbon age BP:* 2455±35

*Calibrated date range at 2 sigma level of confidence (95.4% probability):* 755 (26.5%) 680 cal. BC and 670 (68.9%) 415 cal. BC

**SUERC-56590**

*Material:* wood charcoal, not round wood: alder

*Context:* fill (6015) of palisade trench 6014 of oval enclosure 99386

*Radiocarbon age BP:* 2443±35

*Calibrated date range at 2 sigma level of confidence (95.4% probability):* 755 (23.8%) 680 cal. BC and 670 (13.9%) 610 cal. BC and 595 (57.7%) 410 cal. BC

**SUERC-56591**

*Material:* wood charcoal, round wood: blackthorn

*Context:* Heat-affected surface of upper fill (6065) of ditch 6025 of oval enclosure 99386

*Radiocarbon age BP:* 2396±35

*Calibrated date range at 2 sigma level of confidence (95.4% probability):* 745 (10.4%) 690 cal. BC and 665 (2.8%) 645 cal. BC and 550 (82.1%), 395 cal. BC

**FLINT**

By Louise Austin

A small assemblage of flint was collected during the excavations. On analysis only five were found to be worked and are reported on here. The remainder were disposed of.

1602. (Fig. 13) Trench 1, subsoil. 29mm × 8mm × 3mm. Obliquely blunted narrow microlithic point on beige/cream coloured opaque flint. Bulb of percussion removed with oblique blunting. Retouched from ventral surface. Probably late Mesolithic.

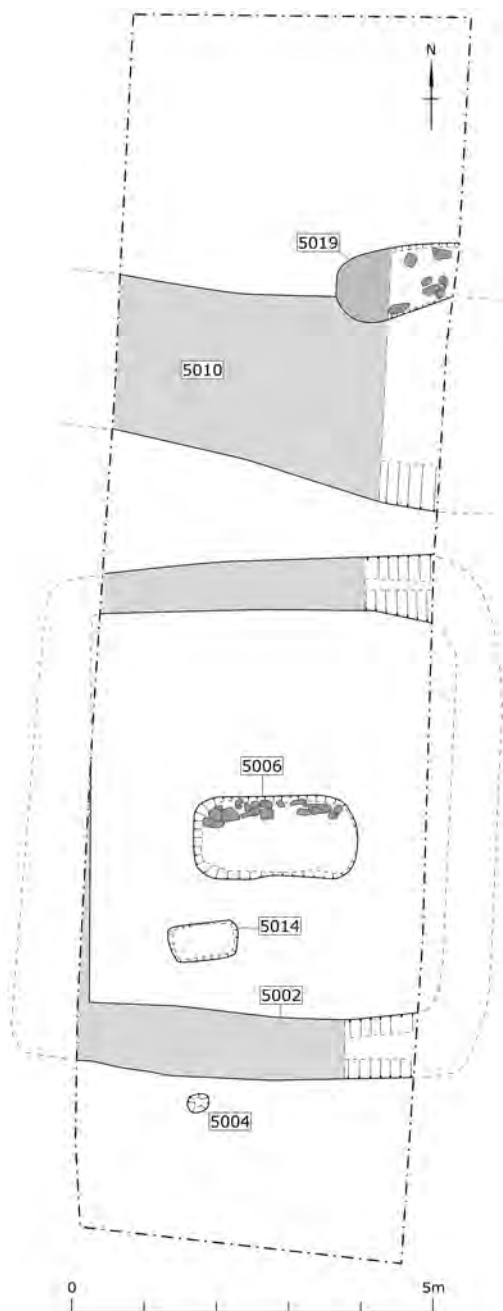


Fig. 12. Trench 5. Plan of the square enclosure and related features.

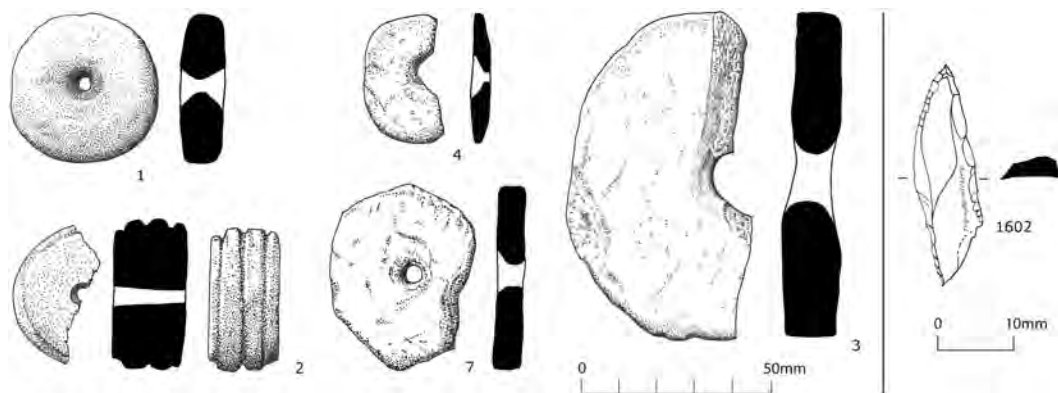


Fig. 13. Spindle whorls 1, 2, 4 7 and perforated stone 3 (all 1:1) and microlith 1602 (2:1).

1. Trench 4, topsoil (4401). 21mm × 15mm × 2mm. Small broken flake, proximal end removed, on beige flint.
4. Trench 4, topsoil (4401). 27mm × 17mm × 4mm. Small flake with very fine retouch/possible use wear on oblique edge/break at distal end on beige flint.
9. Trench 5, interface of topsoil/subsoil. 70mm × 17mm × 10mm. Uneven blade with natural fractures on 60% of dorsal surface, on beige/cream coloured flint. Flake scars on remaining dorsal surface are from distal end of blade. Waste removal from bi-polar core.
10. Trench 5, interface of topsoil/subsoil. 18mm × 13mm × 2mm. Broken bladelet, proximal and distal ends removed. Edge break on lower right hand dorsal edge. On beige flint.

## WORKED STONE

By Ken Murphy

Four spindle whorls and a perforated stone possibly representing a loomweight were found during excavation (Fig. 13).

Spindle whorls are common artefacts on Iron Age/Romano British sites in Wales and the examples from Crugiau Cemmaes can be paralleled from domestic sites across the Principality, such as Coygan Camp in Carmarthenshire (Wainwright 1967, 168–9 and fig. 44) and Llawhaden in Pembrokeshire (Williams and Mytum 1998, 90, fig. 91), and elsewhere (see Savory 1976, fig. 34). Stones or pebbles roughly formed into discs, perforated and with no decoration, are the most common type of spindle whorl—see items 1, 4 and 7—but examples where greater care has been taken to create a more rounded object and then decorate it are not uncommon. Item 2 falls into this category.

Perforated stones, probably used as weights, in some cases loom weights, are also common artefacts on Iron Age/Romano British sites. They vary from unshaped perforated stones and stones roughly formed into discs (as in item 3) to carefully rounded stones. Large numbers were found during the excavation of Castell Henllys hillfort, 2.5km to the south of Crugiau Cemmaes (H. Mytum pers. comm.) and examples are illustrated in the Coygan Camp report (Wainwright 1967, fig. 43).

1. Spindle whorl. Circular, 38mm diameter, 8mm thick, with hour-glass central perforation 4mm diameter at its narrowest drilled from both the slightly convex faces. Blue-grey shale. From ploughsoil/topsoil interface, Trench 6.



2. Spindle whorl. Less than half survives. Circular, approximately 38mm diameter, 20mm thick. One face is flat the other slightly convex. The central perforation narrows from 6mm on the flat face from which it has been drilled, down to 4mm on the convex face. The convex edge is decorated with three concentric incised groves. Made from pink-red stone, possibly a heat-reddened Dolerite. From ploughsoil/topsoil interface, Trench 6.
3. Perforated stone, possible loom weight. Half survives. Flat stone, roughly shaped into circle, 85mm diameter, 13–16mm thick. The 14mm-diameter central perforation splays out to both faces to *c.* 20mm diameter. The sides of the perforation are smooth from wear. From ploughsoil/topsoil interface, Trench 6.
4. Spindle whorl. Half a spindle whorl, roughly circular, 35mm diameter. 4mm thick. The central perforation splays out from *c.* 4mm to 11mm on the face from which it has been roughly drilled. Blue-grey shale. From ploughsoil/topsoil interface, Trench 6.
7. Spindle whorl. Rounded polygon with part broken off, 45mm across, 7mm thick, with flat faces. The approximately central perforation is 4mm diameter, splaying out to 8mm on the face from which it was made. Blue-grey shale. From Trench 6 ditch fill 6056.

#### PLANT REMAINS

By Catherine J. Griffiths

Three bulk samples, all from oval enclosure 9938 (6013 a shallow posthole in the entrance; 6064 and 6065 ditch fills) were assessed for their potential to provide palaeo-environmental and palaeo-dietary data. Hulled barley grains (*Hordeum* sp.) and cereal fragments were present in all three samples, with bread wheat (*Triticum aestivum*) grains and fragments present in sample 6046. Other plant remains were also present in all the samples. It is likely that moderate quantities in the assemblages and their presence in ditch fills and a posthole suggests that remains entered the archaeological record as refuse, rather than the result of a major event such as accidental destruction of a whole crop. Small, burnt bone fragments in the sample support this. No further analysis was undertaken. A report on the assessment (Griffiths 2014) has been lodged with the site archive.

#### PHOSPHATE ANALYSIS

By John Crowther

The excavations revealed the presence of two cut features (5006 and 5019) which appeared from their size and morphology to be graves. However, no skeletal remains were found, presumably as result of decomposition and leaching in the well-drained, acidic, fluvio-glacial sands and gravels in which the features are cut. Accordingly, a programme of phosphate analysis was undertaken on 14 bulk soil samples (including control samples) taken from the two supposed graves in the hope that this might confirm the origins of the features. In addition to phosphate, determinations were also made of loss-on-ignition (LOI), which provides an estimate of the organic matter concentration, in order to facilitate the interpretation of the phosphate results. The full report (Crowther 2014) on the phosphate analysis has been lodged with the site archive.

#### **Possible grave 5006**

In total, seven samples were analysed: six from within the cut of the feature and one as a control. The samples from the basal fills are moderately organic (LOI range, 2.08–3.10%), which presumably reflects

the inclusion of topsoil or other organic-rich materials. In view of the fact that no skeletal material was found, it seems unlikely that significant amounts of organic matter present will be derived from burial remains. Unfortunately, the control sample has a somewhat higher organic matter content (LOI, 4.24%), suggesting perhaps a greater topsoil component, and might not therefore provide a good basis for evaluating the background phosphate concentration against which the fills may be evaluated.

The samples from the supposed grave have moderately high phosphate-P concentrations (range, 0.580–1.12mg g<sup>1</sup>) for quite heavily leached soils on fluvio-glacial deposits. As anticipated above, the concentration recorded for the control sample (0.802mg g<sup>1</sup>) exceeds that recorded in four of the six grave samples and cannot therefore be used as a yardstick against which to evaluate levels of phosphate enrichment within the fill of the cut. The fact that there is no strong underlying relationship between LOI and phosphate-P across this sample set indicates that organically-derived phosphate (i.e. from mineralisation of organic matter) is not the dominant cause of the variability in phosphate-P concentration recorded, and that inorganically-derived phosphate (most likely from bone) is a significant source. In light of this, the higher phosphate concentrations recorded in grave samples 1 and 2 (0.998 and 1.12mg g<sup>1</sup>, respectively), taken centrally along the long axis of the cut feature, are likely indicative of the presence of bone-derived phosphate. This finding supports the interpretation of the feature as a grave—the absence of phosphate enrichment in the other samples (three of which are close to the edge of the cut) probably reflecting the original positioning of the body.

### **Possible grave 5019**

In total, seven samples were analysed: six from within the cut of the feature (four on a grid and two additional samples) and one as a control. In this case, again, the control sample has a somewhat higher LOI (4.41%) than the six samples from within the cut of the feature (range, 1.62–3.68%), and cannot therefore strictly be regarded as a control.

The samples from the within the supposed grave have generally lower phosphate-P concentrations (range, 0.228–0.665mg g<sup>1</sup>) than those from cut feature 5006 (above) and, in further contrast, exhibit quite a strong underlying relationship between phosphate-P and LOI. This latter finding suggests that much of the variability in phosphate-P concentration within the cut feature is directly associated with variations in organic matter content, and there is no evidence in this case of enrichment from minerogenic phosphate (as might be indicative of bone). Of the six samples, grave sample 1 stands out as having the highest phosphate-P concentration (0.665mg g<sup>1</sup>) and, since this is located centrally within the feature, could possibly be indicative of a burial. However, the other ‘grave samples’ taken from the fill immediately above the cut, show no signs of phosphate enrichment; and neither sample 207 or 208, which were both taken of specific darker marks and stains within the cut feature, have particularly high phosphate-P concentrations (0.398 and 0.517mg g<sup>1</sup>, respectively).

Thus, the present analytical data provide no firm support for cut feature 5019 having been a grave. It seems unlikely that no signs of phosphate enrichment would be evident in the basal fills if there had been a burial. However, it could be that any phosphate enrichment within the fill may have been so ‘diluted’ through leaching as to be no longer detectable.

### **Conclusion**

The results of the phosphate and LOI analysis undertaken on samples from cut feature 5006 provide evidence to support its interpretation as a grave. In contrast, the results from cut feature 5019, provide no clear evidence of a burial. However, as noted above, leaching of these well-drained soils developed on fluvio-glacial sands and gravels could well have weakened and dispersed the phosphate signal. Absence of phosphate enrichment is not evidence of the absence of burial.

## DISCUSSION

There are at least four round barrows at Crugiau Cemmaes, and possibly as many as nine, if historical reports are accepted, making it similar in size to the largest known round barrow cemetery in Pembrokeshire, which has eight barrows, at Dry Burrows, Orielson, in the south of the county. Unlike Dry Burrows, the Crugiau Cemmaes barrows are very conspicuous landscape features, occupying, as they do, the highest point in this part of north Pembrokeshire, and visible, as George Owen pointed out over 400 years ago, as tumps visible from over 40 miles off. It is clear that the Crugiau Cemmaes examples have been deteriorating since at least the late eighteenth century when Richard Fenton visited them. Seventeenth-century discoveries reported by Edward Lhuyd confirm that they are Early Bronze Age funerary monuments dating to 2400–1800 BC.

Very little more can be said about the round barrows, but the date, character and relationship of the crop-marked enclosures to these round barrows is of interest, as is the inter-relationship of the enclosures. The date and character of the enclosures first needs to be addressed. None has provided any dating evidence, apart from three radiocarbon determinations from the oval enclosure 99386. These determinations, although from different contexts, are very similar, with a combined range of 755 cal. BC to 395 cal. BC. The provenance of the charcoal that provided these determinations is not ideal, and unfortunately the determinations lie on the plateau of the radiocarbon calibration curve, hence the wide range of the calibrated dates: mid-eighth to the early fourth century BC. Broadly, these centuries are probably when the site was in use, although charcoal used for the determinations may have been residual, later incorporated into the posthole and ditches, and thus the use of the enclosure could have been later. The four spindle whorls and one perforated stone found in association with the oval enclosure are typical of the artefacts found in Iron Age settlements in the region, though are not chronologically diagnostic.

The oval enclosure is similar in size and character to Iron Age enclosures found in large numbers across south-west Wales (Murphy and Murphy 2010) and although with a *c.* 0.5 hectares internal area it is above the average (478 of 787 enclosures of the region are between 0.10 and 0.4 hectares), in character it sits comfortably in the known corpus of defended settlements of the period (Murphy and Mytum 2011). Classifying the larger enclosure (99385), which has an internal area of approximately 1.8 hectares, putting it in the top 3 per cent of enclosures by size (Murphy and Murphy 2010, table 7), is more problematical. The internal area of most sites classified as hillforts in south-west Wales is less than 1.8 hectares (*ibid.* table 3), and therefore if this enclosure is Iron Age it represents a major, previously unrecognised, hillfort. It is highly unusual for the banks and ditches of a hillfort to be erased from the landscape, but at Crugiau Cemmaes the defensive banks constructed from up-cast sand and gravel would have rapidly eroded back into the ditches, rapidly reducing the monument from a substantial earthwork to a site only now detectable by aerial photography, geophysical survey or archaeological excavation.

It is assumed that both these enclosures are Iron Age and post-date the round barrows by at least 1500 years, and that large-scale excavation would reveal roundhouses, four-post structures and artefacts consistent with late prehistoric settlements, as hinted at by excavation to the entrance of enclosure 99386. It is tempting to interpret the ditches 1237 as concentric out-works or outer defences to the oval enclosure 99386. Concentric outer defences are common features on Iron Age enclosures in the region (see Murphy and Mytum 2011, figs 3a and 3b), but at Crugiau Cemmaes the topography—the twin knolls lying between the ditches 1237 and enclosure 99386—would seem to militate against this. However, round barrows lying within the defensive circuits of Iron Age hillforts or enclosures are not unknown, and one of the best examples, Y Foel Trigarn hillfort, can be seen from Crugiau Cemmaes. Indeed, the bivallate enclosure 99385 contains round barrow 1143 within its circuit, possibly incorporating it within its defences. What

is unusual at Crugiau Cemmaes is to have two substantial Iron Age defended settlements—if indeed that's what they are—in such close proximity to each other and to earlier round barrows.

No artefacts or material suitable for radiocarbon dating came from the small square enclosure/barrow (102835) and related features. There are clear parallels for square ditched enclosures in Wales surrounding what are (or often assumed to be) graves, and associated with other graves. Radiocarbon determination is the only dating evidence from these sites, and where carried out indicates an early medieval date for these type of sites, between the fifth and ninth centuries AD, although a late Roman date cannot be ruled out for some. The evidence for this type of site has been recently reviewed (Jones *et al.* 2012), but it is worth emphasising that, as at Crugiau Cemmaes, many square ditched enclosures are associated with prehistoric funerary and ritual sites, indicating continuity of location over several millennia. Commonly, as at Crugiau Cemmaes, no, or very little, skeletal remains survive in the graves, but linear stains or streaks, similar to the one in pit 5019, have been recorded at Plas Gogerddan in Ceredigion (Murphy 1992) and Tandderwen in Denbighshire (Brassil *et al.* 1991) and interpreted as the remains of coffins. Overall, the Crugiau Cemmaes square enclosure fits in with the increasingly recognised tradition of early medieval cemeteries in Wales. The enclosure lies on what is assumed to be the location of the defensive bank of the Iron Age oval enclosure, with the presumed grave to the north excavated in the top of the silted-up ditch. Clearly, the Iron Age defences had been largely flattened and erased from the landscape by the early medieval period, but perhaps low earthworks of the banks survived into which the builders excavated the enclosure and central grave.

Recent and current research indicates that the region around Crugiau Cemmaes was more important from the Neolithic through to the medieval period than previously suspected; perhaps helping to explain the complex, multi-period aspects of the archaeology discovered at the site. At the time of writing, survey by Professor Mike Parker Pearson close to Bayvil Church and survey and excavation by Professor Geoffrey Wainwright and Professor Tim Darvill at Dryslwyn, both approximately 2.3 kilometres south-west of Crugiau Cemmais, have produced evidence for extensive and important Neolithic and Bronze Age ritual and funerary sites. Excavations at Caer, Bayvil, 1.2 kilometree to the west, revealed evidence for the reuse of an small Iron Age defended enclosure as a cemetery in the early medieval period (James 1987), and Rhiannon Comeau's recent research (2014) has convincingly argued for an early medieval assembly site at Bayvil, with both Crugiau Cemmaes and Caer key symbolic points underpinning territorial rights.

To sum up, the investigations have demonstrated the presence of important, extensive multi-period archaeology at Crugiau Cemmaes. They have also shown that the archaeological deposits are fragile, and continue to be damaged by agricultural practices. Data from the investigations will allow for an informed decision to be made on extending the scheduled areas.

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## NOTES

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2. School of Archaeology, History and Anthropology, University of Wales Trinity Saint David, Lampeter Campus, SA48 7ED.
3. Letter from Lewis Morris thought to be of 1757 published in the *Cambrian Register* 1796, vol. 2, 496).

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