

The Stones of Stonehenge Project

Investigations in the Nyfer (Nevern) valley in 2015



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Summary

The origins of Stonehenge are closely tied up with its bluestone monoliths, standing stones brought from Pembrokeshire in west Wales and thought to have been incorporated into Stonehenge in its first stage around 2900 BC in the Late Neolithic. We have now dated activities at two quarries that supplied bluestone monoliths to Stonehenge. The spotted dolerite quarry at Carn Goedog, recently identified as the dominant source of Stonehenge's bluestones, has produced radiocarbon dates of c.3300-3100 BC in association with quarry features. From the rhyolite bluestone monolith quarry of Craig Rhos-y-felin we have dates of c.3500-3300 BC. The quarries are thus several centuries earlier than Stonehenge's first stage. Their dates raise the possibility that they supplied monoliths for a local monument within their immediate environs, and that it was this monument that was dismantled and moved to Salisbury Plain.

The period of bluestone monolith extraction, in the Middle Neolithic, is before the time of henges and stone circles. Instead, this was the time of prestigious burial monuments known as passage tombs (such as Newgrange and Knowth in Ireland). Only two of these high-status monuments are currently known from Wales, both on the island of Anglesey over 100 miles to the north. We think we have discovered the remains of a hitherto undiscovered passage tomb at Pensarn in Pembrokeshire, in between the known sources of bluestones.

In September 2015, our geophysical survey team continued survey in the Cwmgloyne area and also started on a new area north of Carn Goedog and southeast of Craig Rhos-y-felin. Beneath a hitherto undiscovered round mound at Pensarn, their earth resistance scan revealed a 27m-diameter circle of stonework enclosing what we interpret as a 10m-long passage leading to a central chamber. Since the mound now stands to less than 1m in height, it is clear that these stones cannot be uprights but must be the remains of sockets and packing stones. The monument was thus evidently dismantled, though whether in prehistory or more recently remains to be established.

Excavations continued at Carn Goedog megalith quarry, revealing an 8m x 5m artificial stone platform at the foot of the recess from which bluestone monoliths were removed. 1.5m beyond the end of the platform we found a pair of stone 'trestles', 1m apart, that we interpret as supports for a monolith to load it onto its wooden sledge. Beyond it we found an artificially raised surface that we interpret as the exit ramp from the quarry.

At the northern foot of Carn Goedog, we excavated a rectangular house platform, one of nine that we surveyed in 2011. Although thought to date to the prehistoric period, this building was found to date to the medieval period.

We completed our excavations at Craig Rhos-y-felin quarry, finding a hollow way leading away from the stone-built jetty that we interpret as a 'loading bay' for transferring monoliths onto their wooden sledges. The narrow dimensions of the hollow way reveal that rollers cannot have been used; timbers laid in the direction of movement are the preferred interpretation.

A circular enclosure at Felindre Farchog, revealed by aerial photography in 2009, was excavated this year to establish whether it was a prehistoric enclosure. However, it was found to have been an early medieval cemetery, containing east-west aligned graves. The acidic soil conditions prevented the survival of any human remains.

Research objectives

The project's fifth season in 2015 completed one excavation – the Craig Rhosyfelin megalith quarry (SN117362) – and continued another at the megalith quarry of Carn Goedog, the dominant source of Stonehenge's bluestones. We also carried out excavations at a suspected henge at Felindre Farchog. Most significantly, our geophysical team discovered an unknown monument which we believe to be the site of the first Stonehenge.

Craig Rhosyfelin

The aims of investigation in 2015 were:

1. To extend the excavation trench at Craig Rhos-y-felin beyond the edge of the quarry where the preserved Neolithic ground surface might preserve traces of ruts, slots or other sub-surface features to provide evidence of what methods were used to move megaliths from the quarry to their next destination.
2. To complete excavation at Craig Rhos-y-felin of the various features within the area opened in 2014. This includes an occupation area and a lower artificial platform, with a drystone revetment wall.

Carn Goedog

The aims of investigation in 2015 were:

1. To excavate a house platform on the north side of the outcrop to establish its date and character, to find out if it might be related to the megalith quarrying.
2. To re-open and extend trenches excavated in 2014 to gather further evidence of Neolithic megalith quarrying and associated environmental data.

Felindre Farchog

The aims of investigation in 2015 were:

1. To excavate part of this circular enclosure to establish its date and character, to find out if it was formerly a Neolithic circle of standing stones.

Geophysical survey

The aims of investigation in 2015 were:

1. To carry out geophysical survey in the area of Cwmgloyne, north of the bluestone quarries.
2. To carry out geophysical survey in the area between the two bluestone quarries.



Figure 1. The research area in west Wales, showing the two excavated bluestone megalith quarries (red stars), the suspected ‘passage tomb’ of Pensarn, other Neolithic sites (red circles), and other ancient sites (blue circles)(from a drawing by George Nash).

Background

Stonehenge is the world’s most famous prehistoric stone circle. Its large ‘sarsen’ stones are thought to come from within 20 miles of Stonehenge (Parker Pearson in press), but its 43 ‘bluestones’ (2-ton monoliths of variously spotted dolerite, rhyolite, argillaceous tuffs and sandstone) are sourced by geologists to west Wales. Recent geological analysis has identified the impressive crag of Craig Rhosyfelin in Pembrokeshire, west Wales, as the source of one of Stonehenge’s rhyolites (Bevins *et al.* 2011; Ixer and Bevins 2011). Two miles south of Craig Rhosyfelin, Carn Goedog has been identified as the dominant source of Stonehenge’s spotted diorite monoliths, with a third lesser source west of Carn Goedog at Cerrigmarchogion (Bevins *et al.* 2014).

Theories abound about why Neolithic people brought bluestone monoliths over 140 miles to Stonehenge – were the stones sacred? Were they from sacred mountains? Were the stones considered to have special properties of healing? Our research, by contrast, has sought to investigate the Neolithic context of the monoliths’ production. When were they quarried?

What was special about Neolithic Pembrokeshire? What was the link between Pembrokeshire and Salisbury Plain in the Neolithic?

To answer these questions, we have excavated two of the megalith quarries and now have radiocarbon dates on charcoal from contexts associated with Neolithic quarrying. Intriguingly, they are 300-400 years earlier than the earliest possible date for the bluestones' erection at Stonehenge in 3000-2920 BC (Darvill *et al.* 2012: 1026). This raises the likelihood that the bluestones were quarried for the building of a local monument in Pembrokeshire, and that it was this monument, figuratively speaking, that was moved rather than simply a collection of stones.

Recent strontium isotope analysis on tooth enamel and cremated bone from Middle-Late Neolithic and Early Bronze Age burials from Stonehenge and Salisbury Plain has also revealed that many people migrated there from western Britain. Our working hypothesis is that the bluestones were taken from a prestigious monument in Pembrokeshire and transported as a symbol of these migrants' history and ancestral identity.

In September 2015 we found what we believe to be the remains of this prestigious monument. It was neither of the enclosures at Felindre Farchog (investigated this year) or Bayvil Farm (investigated in 2014). Instead, it is a hitherto unknown circular mound at Pensarn, in the immediate environs of Carn Goedog and Craig Rhos-y-felin. We believe its plan, recovered by geophysical survey is that of a dismantled 'passage tomb', a prestigious style of megalithic monument built in western Britain (and Ireland) in 3400-2900 BC. For almost a hundred years, scientists and archaeologists have been speculating that the bluestones were taken to Stonehenge from a dismantled stone circle in west Wales (Thomas 1923) but the dates for Carn Goedog and Craig Rhos-y-felin are too early for the period in which stone circles were built in Britain. Instead, they are from a period associated with an earlier form of megalithic architecture, the passage tomb.

Pensarn mound – a suspected ‘passage tomb’

In September 2015, our geophysical survey team started on a new area north of Carn Goedog and southeast of Craig Rhos-y-felin. They had previously focused on an area over 2 miles north of the bluestone quarries around Cwmgloyne where a complex of prehistoric and ancient sites (blue circles in Figure 1) was becoming revealed. However, most of these have now turned out to date to after the Neolithic. We turned our attention to the area between the two bluestone megalith quarries, on a flat-topped plateau between the Brynberian stream and the Nevern river. Whilst the hollow way leading out of the Craig Rhos-y-felin quarry heads north along the Brynberian stream, this route provides access onto the Pensarn plateau via a small tributary valley. Along this route, Pensarn mound is a mile from Craig Rhos-y-felin and 2 miles from Carn Goedog.

Beneath the hitherto undiscovered round mound at Pensarn, magnetometer and earth resistance survey revealed a 27m-diameter incomplete circle of high resistance (likely to be caused by buried masonry) surrounding further areas of high resistance, one of them in two parallel lines leading southeast from a major anomaly (Figure 2). We interpret the parallel lines of high resistance as a 10m-long passage leading to a central chamber (the major anomaly).

The earth resistance plot compares closely with the plans of the two Middle Neolithic ‘passage tombs’ (also known as ‘passage graves’) of Bryn Celli Ddu (Hemp 1930; Burrow 2010a; 2010b: 192) and Barclodiad y Gawres (Powell and Daniel 1956; both tombs are on the island of Anglesey in north Wales over 100 miles away; Figure 3). However, the orientation of the hypothesized passage at Pensarn is different, towards the southeast and potentially towards midwinter solstice sunrise (Clive Ruggles pers. comm.; the orientation of Bryn Celli Ddu’s passage is towards midsummer solstice sunrise; Pitts 2006).

Since the mound now stands to only 1m in height, it is clear that the masonry detected by the survey cannot be that of surviving stone uprights (other than any small kerb stones) but must be the remains of sockets and packing stones. The monument can be expected to have been dismantled, though whether in prehistory or more recently remains to be established.

The earth resistance plot shows further high-resistance anomalies that could be interpreted as a front façade within the circular kerb, and an earlier D-plan mound within the encircling kerb. Its central anomaly may be the remains of a transepted or cruciform-plan chamber similar to Barclodiad y Gawres. The possibility of multiple phases of construction could explain the different dates of extraction from Craig Rhos-y-felin and Carn Goedog quarries.

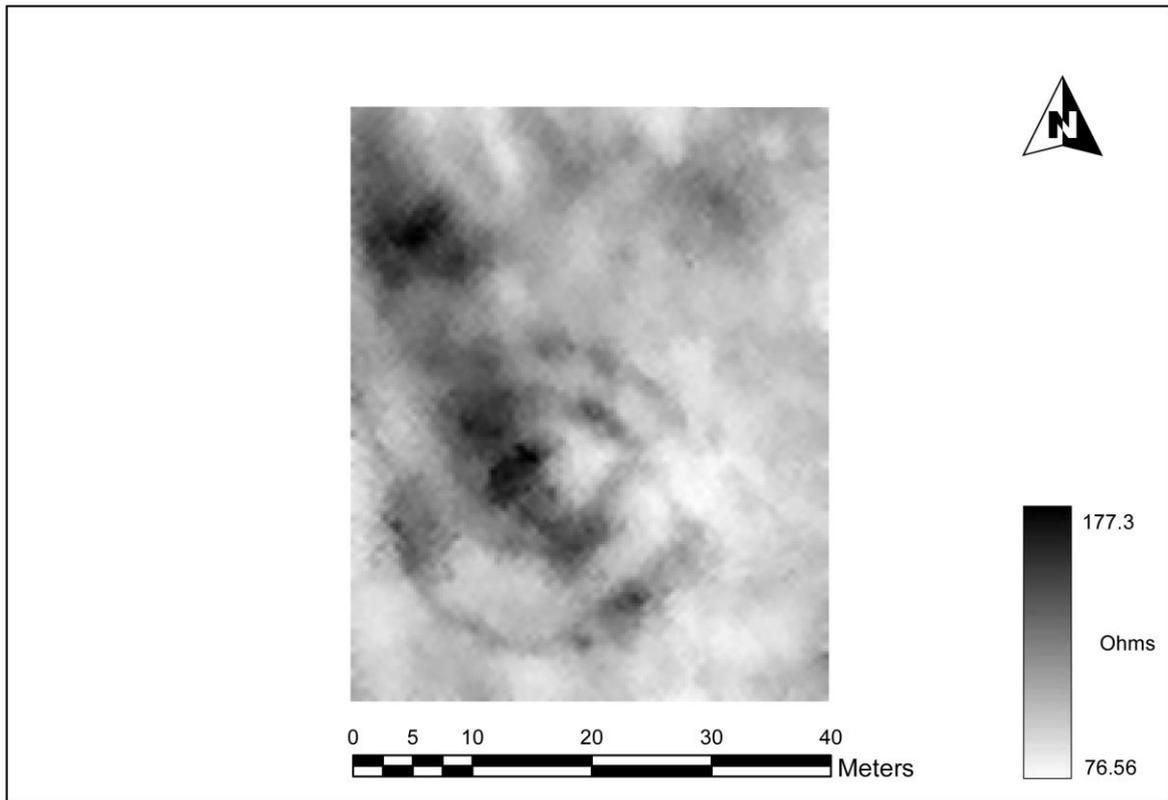


Figure 2. The earth resistance plot of the Pensarn mound. The 10m-long passage leading southeast from a possible chamber is visible in the centre of the mound.

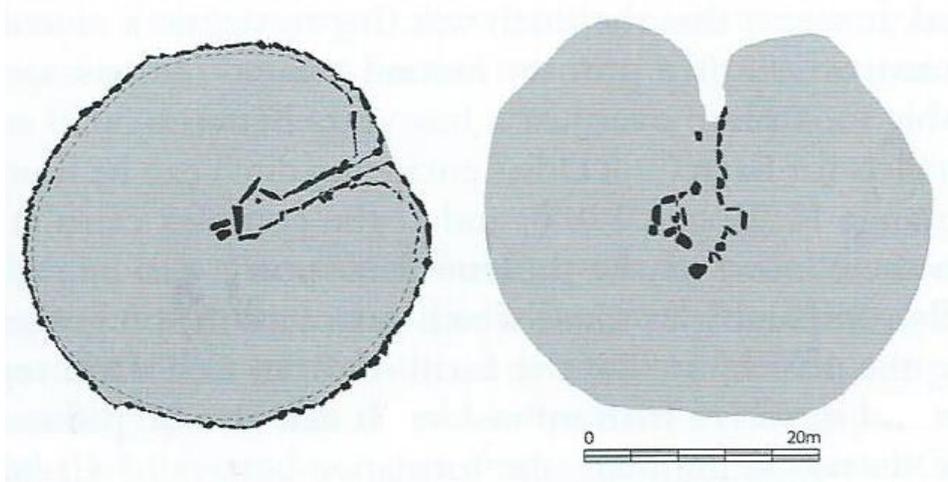


Figure 3. Plans of the two known Welsh passage graves: Bryn Celli Ddu (left) and Barclodiad y Gawres (both on Anglesey in north Wales). Bryn Celli Ddu was built in at least two stages and only its second stage is shown here. (From Burrow 2010b: fig. 11.3).



Figure 4. Excavations at Carn Goedog in 2015, viewed from the south-southwest. The quarry's exit ramp is in the foreground.

Carn Goedog megalith quarry

Excavations continued in September 2015 at Carn Goedog megalith quarry (Figure 4), located on the south side of the outcrop where the diorite forms natural pillars. Scars remain where many have been detached. We have identified and excavated a variety of quarry features in this location: a quarried-out recess, a stone platform constructed below it, a pair of stone 'trestles' (set into the top of a stone-packed ditch) and an earthen exit ramp..

The recess formed by removed monoliths

Beyond the area affected by early modern quarrying (dated by a stratified coin to *c.*1760–1780) one part of the outcrop preserves the remains of much more ancient quarrying. A large niche or recess has been formed by the removal of 4-5 large pillars of the size of the largest diorite bluestones at Stonehenge (4m long). Four detached monoliths remain in place in the recess. The recess was filled with 0.9m of sediment that had formed since the pillars were removed. A sample of *Corylus avellana* (hazel) charcoal from this sediment, obtained in 2014 but dated in 2015, produced a radiocarbon date of 2130–1900 cal BC (OxA-31681; 3629±29 BP), indicating that the pillars were removed at least by 4,000 years ago.

The 3m-high drop between these pillar sockets and the stone platform (see below) is strewn with large pillars with human-made sharp facets (i.e. previously detached pillars. A 2.5m-long block lies horizontally above the base of the outcrop, forming a wide ledge 2m above the ground; this block also has a V-shaped notch left by making a primitive pre-modern wedge hole. Two of the strewn pillars rest perpendicularly at an angle on top of this block. The monoliths could thus have been lowered over this block and somersaulted onto the stone platform.



Figure 5. Vertical view of the stone platform (centre and lower right of photo). North is to the right.

The stone platform

The most impressive quarry feature was an 8m x 5m artificial stone platform (Figure 5) at the foot of the recess from which bluestone monoliths were removed. This platform was formed of 28 large slabs, many of them from split boulders, with the split side laid upwards. They ranged in size from less than 1m across to over 4m long and lay within a deposit of sediment containing carbonised wood remains. Two samples of *Pomoideae* roundwood charcoal and one of *Corylus avellana* roundwood charcoal from layer 113 produced dates of 3350–3100 cal BC (OxA-31820; 4502±31 BP), 3350–3040 cal BC (OxA-31821; 4490±31 BP) and 3350–3040 cal BC (OxA-31822; 4491±31 BP) respectively.



Figure 6. The two 'trestle' stones set into the top of the stone-filled ditch, viewed from the south.

The stone platform was set into the top of a shallow bedding trench, on top of a layer of packing stones together with the sediment with carbonised wood remains. This platform is itself a monumental structure which would have allowed monoliths to be lowered onto it and moved across it using the uneven stone surface as pivot points.

The pair of stone 'trestles'

1.5m beyond the end of the platform we found a pair of stone 'trestles' (Figure 6), positioned 1m apart and set into a carefully packed deposit of stones, themselves placed in a 2m-wide x 0.4m deep ditch (Figure 7). We interpret these two large slabs set on edge as supports for a monolith to load it onto its wooden sledge.



Figure 7. North-south section through the stone-packed ditch, viewed from the west.

The earthen exit ramp

The southernmost stone ‘trestle’ is set partly into the ditch’s stone packing and partly into a humanly deposited layer, 0.2m thick, of re-deposited stone-free sediment. We interpret this artificially raised surface as the exit ramp from the quarry. On its east side we found a fallen orthostat of volcanic ash placed with stone packing in a small pit. This small standing stone may have been a marker post for the quarry entrance but more investigation beyond the excavation’s southern edges is needed in 2016 to establish this for certain.

Overview of Carn Goedog quarry excavations

The Carn Goedog quarry has produced compelling evidence of quarrying in the Middle Neolithic period, with the entire suite of stone features revealed: a niche left by removed monoliths (with other monoliths detached but left *in situ*), a drop to the impressive stone platform at the base of the outcrop, a pair of prop stones to sit monoliths on while attaching the wooden sledge (a V-shaped sledge made from a fork in a large tree would work well here), and an earthen exit ramp.

Carn Goedog medieval house

This building is one of 14 hut platforms located at the base of the north-facing slope of Carn Goedog, on the opposite side of the megalith quarry, at 240m above sea level (SN12833328; PRN 11506). They were first recorded in 1976 and were also reported on by Peter Drewett (Drewett 1983–85) and latterly Dyfed Archaeology (Murphy *et al.* 2010). Geophysical and topographic surveys were carried out on this small settlement in 2011, identifying nine as rectangular and possibly Neolithic in date.

A small excavation was carried out to investigate one of the small rectangular house platforms (House C). This was one of nine identified in 2011 as rectangular (as opposed to circular) and thought to be either Neolithic or medieval. Our excavation in September 2015 revealed that it is medieval. We can thus rule out the possibility that this was a settlement for Neolithic quarry workers.

All of the artefacts and pottery from the excavation of House C derive from layers immediately outside it and are presumably the remains of refuse discarded from its interior. They point to the house being occupied in the medieval period. There were no artefacts that could be considered to be either earlier or later in date, suggesting that House C was built, used and abandoned within the medieval period rather than being reoccupied at different periods in the past.



Figure 8. House C at the end of excavation, viewed from the south.

Craig Rhos-y-felin megalith quarry

In September 2015 we completed our excavations at Craig Rhos-y-felin quarry (Figure 8), finding a hollow way leading away from the stone-built jetty that we interpret as a 'loading bay' for transferring monoliths onto their wooden sledges.

Radiocarbon dates received in autumn 2014 and summer 2015 confirmed the Middle Neolithic date of the occupation area beside the niche created by the monolith that ended up at Stonehenge. Two carbonised hazelnut shells from this layer date to 3500–3120 cal BC at 95.4% probability (SUERC-46205; 4590±30 BP) and 3620–3360 cal BC (OxA-30502; 4667±30 BP). Whilst one of these overlaps with the dates from Carn Goedog, they raise the possibility that monolith quarrying was carried out slightly earlier than at Carn Goedog.



Figure 9. Excavations at Craig Rhos-y-felin in 2015, viewed from the north.

Another radiocarbon date received in 2015 was on charcoal recovered from the artificial platform on which a prone 4m-long monolith sits, removed from the rock face but never having left the quarry. Two determinations on *Corylus* charcoal from this platform fill date to 2140–1950 cal BC (OxA-31779; 3665±28 BP) and 2200–1980 cal BC (OxA-31780; 3700±30 BP), indicating that this monolith was extracted in the Bronze Age, sometime after 2000 BC. Since the bluestones were in place at Stonehenge some centuries before this, the prone monolith must be the remains of a later episode of quarrying.

The stone jetty and revetment wall

In 2014 we discovered a stone-built platform constructed beside a palaeochannel that runs past the outcrop. There was insufficient time to fully investigate it that season so this work was completed in 2015. We discovered that the surface of this jetty had been built up by digging out two inter-connecting pits, levering two large flat-topped stones into them and then raising the ground level with imported sediment and stones pitched on edge.



Figure 10. Section through the revetment wall, showing the grey clay bonding matrix beneath the left end of the horizontal scale.

This imported sediment was then held in place by a coarse revetment wall bonded in place with a clay matrix. This jetty would have worked well as a ‘loading bay’ for lowering monoliths onto the floor of the palaeochannel below.

The hollow way exiting the quarry

Leading from the remains of the stone jetty and cutting into the Late Mesolithic alluvium beneath it, a flat-bottomed hollow, up to 0.2m deep on its steep-sided western edge, runs eastwards before turning north and running for 7m to beyond the edge of the excavated area. The hollow varies in width between 1.6m and 2.2m but is mostly about 1.8m wide. It is generally free of stones although single stones lie along its edges and form a small cluster within its north end.

The spatial and chronological association of the hollow way with the revetment wall is evident; both lie on top of the same layer and below another layer, and the hollow way starts in front of the jetty’s revetment wall. The hollow way’s flat profile and its orientation along the contour demonstrate that it is not a water-formed natural feature such as a palaeochannel.

Since the revetment wall would have inhibited easy access by foot into the quarry from this hollow way, its purpose is not that of a pedestrian trackway. Instead, it is more convincingly interpreted as an exit route for removing megalithic stones from the quarry. Having been lowered onto a wooden sledge from the revetted platform, the monolith could then be dragged on wooden rails (timbers laid in the direction of movement) along the hollow way.

The relatively narrow width of the hollow way rules out the use of wooden rollers for moving megaliths along it. There were no traces of any impressions into the underlying Late Mesolithic alluvium that might have been made by timbers laid within the hollow way, although faint straight lines recorded in the mixed, potentially churned-up fill of the hollow way could have been left by decaying timber beams laid in the direction of movement as 'rails' for a wooden sledge to move along.



Figure 11. The hollow way (stone-free area in left centre of picture) leading from the stone jetty, viewed from the north.

Felindre Farchog circular enclosure

This 25m-diameter circular enclosure was found by aerial photography in the winter of 2009 and thought to be prehistoric. Earthwork survey and geophysical investigation revealed that it encircled a mound but the relationship between the circular enclosure the mound, off-centre within it, could not be established without excavation.

Excavation of two trenches in 2015 revealed that the circular enclosure was that of an early Christian cemetery, probably dating to the early medieval period about a thousand years ago. Twenty-one east-west graves were identified, some of them lined and covered with Welsh slate, in what may once have been a cemetery for over 50 burials. No remains of the dead have survived in this acidic soil and the only grave good found was a small blue glass bead. The mound was revealed to be a wholly natural feature. Once it was clear that this was not a prehistoric site, excavation was ended, recording completed and the site backfilled.

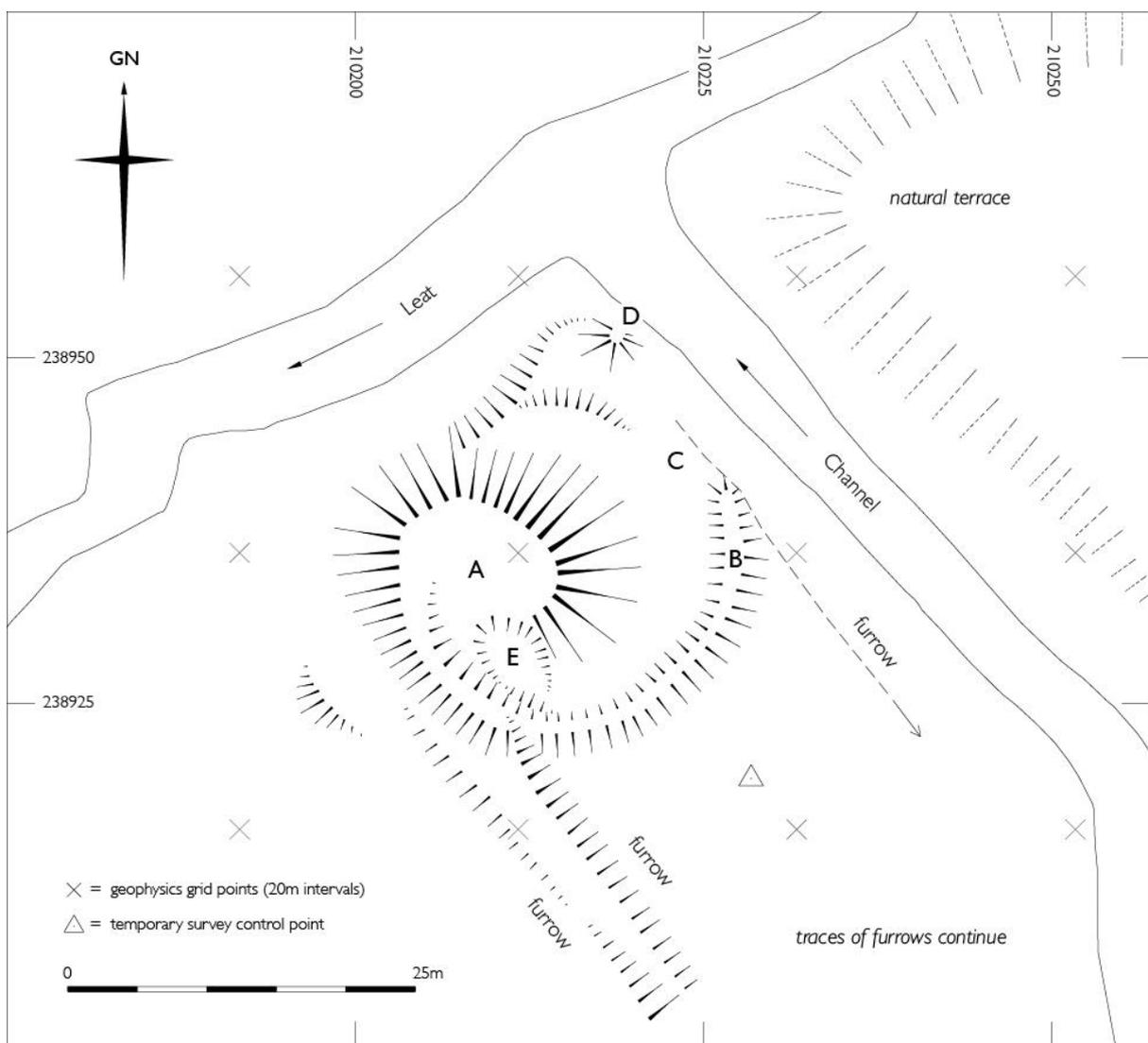


Figure 12: Survey drawing of earthworks at Felindre Farchog



Figure 13. Trenches 1 (left) and 2 (right). North is to the upper left



Figure 14. Graves 204, 207 and 210, viewed from the west-southwest

Other investigations

Geological samples were collected from gateposts and other large pillars in the Pensarn area to see if any might be re-used prehistoric monoliths taken from bluestone quarries. Inspection of their surfaces revealed that none of the diorite pillars had sharp facets like those within the Carn Goedog quarry recess. In contrast, they all had heavily weathered surfaces, suggesting that they were probably collected from loose stones lying around the area of moorland immediately south of Pensarn. In addition, several rock outcrops half a mile north of Pensarn mound were sampled and are currently being analyzed to see if any match Stonehenge bluestones.

Conclusion

The discovery of a potential Middle Neolithic passage tomb within the area between identified bluestone outcrops raises two exciting possibilities. First, a hitherto undiscovered megalithic tomb of this type would demonstrate that this otherwise remote part of west Wales was indeed a central place of some importance within Neolithic Britain. The fact that its various uprights have been removed (otherwise they would poke up through the low mound) raises the possibility that this was the monument – or one of the monuments – that was dismantled and taken to Stonehenge. The chances of the monument having been dismantled in more recent times are relatively low, since most instances of stone-robbing appear not to have taken place before the 17th century and are normally documented to some degree by antiquarian accounts. Of course, the only way to be sure whether Pensarn is indeed the first Stonehenge is through excavation. Should it be the case, Stonehenge's ultimate origin as components of a Welsh megalithic tomb would be a very significant piece of evidence for evaluating the hypothesis that Stonehenge was built for the ancestral dead.

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