

# The Stonehenge bluestones did not come from Waun Mawn in West Wales

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### Abstract

This paper examines the hypothesis that Waun Mawn in West Wales provided the bluestone monoliths that were used at Stonehenge. Some archaeologists believe that the site supports the last remains of a giant stone circle or 'Proto Stonehenge' which was dismantled and transported to Salisbury Plain around 5000 years ago. It was claimed, after three excavation seasons at Waun Mawn in 2017, 2018 and 2021, that there is firm evidence of some standing stones which were later removed or broken up, but it has still not been demonstrated that there ever was a small stone circle here, let alone a 'giant' one. Furthermore, there have been no control studies in the neighbourhood which might demonstrate that the speculative feature has any unique characteristics. There is nothing at Waun Mawn to link this site in any way to Stonehenge, and this is confirmed by recent cited research. No evidence has been brought forward in support of the claim that 'this was one of the great religious and political centres of Neolithic Britain'. It is concluded that at Waun Mawn and elsewhere in West Wales there has been substantial 'interpretative inflation' driven by the desire to demonstrate a Stonehenge connection.

#### **Keywords**

archaeology, bluestones, glacial geomorphology, glacial sediments, Holocene, neolithic, quaternary, standing stones, stone circle, Stonehenge, Wales, Waun Mawn

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## Introduction

Waun Mawn (SN083345) is an expanse of open moorland on the northern flank of the Mynydd Preseli upland ridge in Pembrokeshire, near Tafarn-y-bwlch and c 5 km from the town of Newport (Figure 1). The moor is well drained and south-facing, looking down on the boggy depression that contains the headwaters of the Gwaun river. There are a number of gentle benches in the landscape, and the highest point is the summit of Cnwc yr Hydd (339 m). The whole of the moor is common land, and because of the dry heath vegetation it is easy to wander about and examine the abundant prehistoric features, only some of which are documented. The moor is protected within the Pembrokeshire Coast National Park and by an ancient monument designation.

The landscape featured in this article has not featured prominently in the archaeological literature because the megalithic and earthwork features, assumed to date from the Neolithic and the Bronze Age, are subtle rather than spectacular. By contrast, hillfort sites like Foel Drygarn and Carningli, and cromlechs (dolmens) like Pentre Ifan and Carreg Samson have attracted much greater research attention and are popular tourist attractions (Figgis, 2001; Rees, 1992).

Waun Mawn (Figure 2) has recently played a central role in discussions about the abundant non-sarsen monoliths (from many sources) at Stonehenge which are referred to as 'bluestones'.

More than a century ago Judd (1903) and other geologists suggested that the bluestones are derived from degraded glacial deposits on Salisbury Plain. This interpretation was later supported by Kellaway (1971), Briggs (1976) and Thorpe et al. (1991). The present author (John, 2018) pointed out that the bulk of the Stonehenge bluestone monoliths are not elegant and carefully selected pillars but abraded and weathered erratic boulders and slabs of more than 30 different rock types, probably collected from within the Stonehenge landscape (Field et al., 2015).

This version of events is fundamentally different from that proposed by Thomas (1923). Because many of the sampled Stonehenge bluestones have close geological matches in the Fishguard Volcanic Group which crops out in Mynydd Preseli, he proposed that they had been collected by our Neolithic ancestors from a very limited geographical area. Further, he stated (somewhat prematurely) that because glacier ice had never extended much further south than the South Pembrokeshire coast, this 'permanently disposes of the idea of glacial transport for the foreign stones of Stonehenge'. He proposed that the bluestones were first gathered together in West Wales and then carried over land and sea to Stonehenge, over 230 km away. This has subsequently been repeated by many others including Atkinson (1979) and Parker Pearson (2012) and is misrepresented as 'an academic consensus'.

The human transport hypothesis has recently been expanded to incorporate bluestone monolith quarrying at two supposed Neolithic stone quarries, at Craig Rhos-y-felin and Carn Goedog, both on the northern flank of the Mynydd Preseli

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Figure 1. Location of the Waun Mawn area of interest, also showing the single standing stone on the Waun Mawn 'lost circle' site. There are also three recumbent stones in a rough alignment.



**Figure 2.** Standing stone and one of the three recumbent stones on the site of the putative "giant stone circle" at Waun Mawn, looking eastwards.

upland ridge (Figure 1). The researchers have thus accepted the following hypotheses:

- 1. that the glacial transport of the bluestones from west to east was impossible;
- 2. that 80 or so bluestone monoliths were quarried from favoured localities rather than simply being gathered from a pre-existing ground surface litter of erratic boulders, slabs and pillars.
- 3. that the bluestones were carried by humans from West Wales to Stonehenge.

Almost a century ago, in developing his hypothesis about the human transport of the bluestones, Thomas (1923) sought to answer the question 'Why?'. He elaborated the idea that the Preseli district must have been special in some way to the Neolithic tribes of Britain. Bushell (1911) had already said that there were so many prehistoric remains in eastern Preseli that it was a

'prehistoric Westminster'. In the decades that followed others, including Fox, Grimes and Atkinson, also speculated that Preseli was a sacred territory or 'an enchanted land' – and on a number of occasions it was suggested that there might be a venerated stone circle somewhere on the eastern flanks of the uplands, waiting to be discovered. Thomas (1923) thought it might have been in the vicinity of Cilymaenllwyd (SN141265) near Efailwen, but no trace of such a feature has ever been found.

To provide a counterbalance to this line of thinking, Cook (2006) showed that there was no greater a concentration of prehistoric features in eastern Preseli than anywhere else; and this has been confirmed by map evidence in the *Pembrokeshire Historical Atlas* (Howell, 2019). Given large-scale land clearance, agricultural development and urban growth in south Pembrokeshire, the present-day distribution and density of prehistoric features cannot be considered an accurate reflection of past cultural activity or settlement history.

### Geology

Within the last 25 years, Bevins, Ixer and colleagues have been attempting to discover the provenances of the 43 bluestones remaining at Stonehenge, and of innumerable bluestone fragments found in the 'debitage' (Bevins et al., 2014, 2017, 2022; Ixer and Bevins, 2010, 2011, 2013, 2017; Ixer and Turner, 2006). Following Thomas (1923) and Thorpe et al. (1991) they have concentrated their efforts in Preseli to the task of finding sources for igneous rock samples, with searches further afield for the sources of sandstone fragments. Their work has been largely based upon laboratory analyses of slides and rock samples from existing collections.

Ixer and Bevins claim to have narrowed down potential provenance sites to just two key locations, whilst admitting that very few of the Stonehenge monoliths have been directly sampled and accepting that the full assemblage of 43 bluestones must have come from multiple locations (Parker Pearson et al., 2019a). The claimed 'detailed provenancing' of spotted dolerites to Carn Goedog and foliated rhyolites to Craig Rhos-y-felin has in the



Figure 3. Extract from the Geological Survey map, showing main rock types and faults around Waun Mawn and Tafarn-y-bwlch. Note the proximity of dolerite outcrops. (Courtesy BGS©UKRI 2024).

view of the present author not been adequately established (John, 2019b). Working with a number of geologists, Parker Pearson (2012) has resurrected the idea of some special link between Preseli and Stonehenge as an explanation for the presence of bluestones from north Pembrokeshire at the monument on Salisbury Plain. He has also claimed that 'bluestone quarries' existed at the two sites identified by Ixer and Bevins as having the best (but not perfect) petrological matches with some Stonehenge igneous fragments (Parker Pearson, 2018; Parker Pearson et al., 2015, 2016). The evidential basis of the quarrying claims has been challenged by John et al. (2015a, 2015b), for reasons also laid out by the present author in *The Stonehenge Bluestones* (2018).

The bedrock geology of Waun Mawn is relatively simple (Figure 3). Ordovician mudstones and meta-mudstones of the Aber Mawr Formation crop out over most of the moor, with a number of linear sill-like dolerite intrusions. These belong to the Fishguard Volcanic Group (Bevins, 1982). There are also limited outcrops of rhyolites and volcanic ashes incorporated into the sediments. Rhyolite is seen to crop out near the prehistoric gallery grave of Bedd yr Afanc, just over 2 km to the east. Dolerites crop out in all compass directions within a kilometre or so of the site of the putative 'stone circle' site described by Parker Pearson and his team. Most of the dolerites are unspotted but some are speckled. For some reason the archaeologists make no mention of these bedrock outcrops in their project publications.

Superficial deposits are generally less than 1 m thick, and exposures along the track to Gernos-fach farm (SN076344) show an ubiquitous poorly sorted diamicton with faceted stones mostly of local origin, overlain on steeper slopes by slope breccia or broken shale bedrock debris (sometimes churned by periglacial processes). This in turn is overlain by colluvial hillwash with a sandy or silty texture, and a thin modern soil. The lower diamicton is interpreted, here and elsewhere, as till (Figure 4) associated with the Late Devensian glaciation event (John, 1970, 2018).

### The Proto-Stonehenge hypothesis

The motivation for finding 'proto-Stonehenge' on the northern flank of the Preseli upland arose from the geographical proximity



**Figure 4.** Stony clay-rich diamicton exposed in many locations in the Waun Mawn – Bwlchgwynt area, up to an altitude of 425 m. This is interpreted as a Devensian till, mostly of local origin.

of the two so-called 'quarries' (Figure 1) and from the fact that widely scattered radiocarbon dates from those two sites did not fit the timescale required for quarrying operations or for the human transport of bluestones around 5000 years ago (Parker Pearson, 2016; Parker Pearson et al., 2017, 2019c; Parker Pearson, 2017, 2018). McCarroll (2018) claimed that the radiocarbon dating evidence from Rhos-y-felin is so erratic that it 'conclusively falsifies' the quarrying hypothesis. Nevertheless, Parker Pearson et al. (2019a) developed an hypothesis that a 'venerated stone circle' must have been built somewhere in the vicinity at an early date, to have been later dismantled and shipped off to Stonehenge.

In 2011 Parker Pearson *et al* embarked upon an examination of a Waun Mawn stone 'setting' which comprised of one standing stone and three recumbent stones, roughly aligned east-west. They sought to demonstrate that these were part of the circumference of a former 'giant stone circle' of which they are the last remnants. However, magnetometer and earth resistance studies failed to identify any sub-surface features that might be former



Figure 5. Location map, showing main features mentioned in the text. (Based upon OS six-inch map 1908, reproduced with permission).

stone sockets. On this basis the research team initially dismissed Waun Mawn as a candidate site for a bluestone circle (Parker Pearson et al., 2019b). Nevertheless, the archaeologists speculated that somewhere there must be a feature associated with reverence for the ancestors, and formerly built of bluestones, waiting to be discovered. They wondered whether this might have been thought of as a 'tangible history of a Welsh Neolithic tribe ..... carried to a new homeland in one of the most extraordinary journeys of prehistoric times'. Following fruitless investigations of at least seven other potential sites they returned to Waun Mawn in 2017 and 2018.

Fresh electro-magnetic induction, ground-penetrating radar and earth resistivity work failed to uncover any significant anomalies that might be interpreted as the stone sockets of a dismantled stone circle. Parker Pearson et al. pressed on, and announced a series of excavations specifically designed to find stone holes. They soon claimed in the media that they had found what appeared to be a 'giant stone circle' (Figure 5). Initially the only written description of this research which was available for scrutiny was carried in an online interim report issued by the local Bluestone Brewery (Parker Pearson et al., 2019b), and the 2021 Antiquity article by Parker Pearson and his team contains no new detailed field observations. There was no fieldwork in 2019 or 2020, but then there was considerable media coverage (including a heavily promoted TV documentary) of the 'astonishing discoveries' at Waun Mawn, in which Parker Pearson et al. (2021a) elaborated a narrative of Stonehenge bluestones initially set into a 'giant stone circle' at Waun Mawn and then, 500 years later, taken away and transported to Stonehenge as tributes or embodiments of the spirits of the ancestors. It is fair to say that there were many expressions of concern from other archaeologists and from the present author about an increasingly extravagant narrative inadequately supported by field evidence.

Excavations were resumed in September 2021 in anticipation of making exciting new finds. The results were disappointing for the research team, and this is apparent in the 2021 interim Field Report (Parker Pearson et al., 2021b). The report contains some ambiguous field observations, but there is nothing in it to enhance the 'lost circle' hypothesis.

So how well founded is this claimed discovery of a 'giant lost circle' directly linked to Stonehenge? Before answering this question, the landscape and prehistoric context must be considered in more detail.

### Landscape and geology

Waun Mawn, as part of the Mynydd Preseli region (John, 2019a), is a gently-sloping upland with a south-facing aspect (Figure 5). It is better drained than the floor of the depression to the south of the Gernos-fach farm track, and much of the land surface is covered with acid heath and grassland with boggy areas and extensive gorse which is periodically burned. There is a broad bench or platform which breaks the slope on the southern flank of Cnwc yr Hydd, at SN083340. Parker Pearson (2017) claims that 'blanket bog has created a continuous surface layer of peat over severely gleyed podzol soils in which the old ground surface beneath the peat has become demineralised, leading to migration of iron and other minerals downwards to the top of the subsoil where it forms layers of iron panning. Today, the peat has been largely removed, presumably during peat-cutting in previous centuries. . ...' However, there is actually very little evidence of blanket peat bog or peat-cutting here, and where peat is exposed it is seen to be patchy and thin.

On the lower part of the slope, adjacent to the cattle grid and the B4329 road, the surface topography is distinctly hummocky, leading to the conclusion that the col at Tafarn-y-bwlch is occupied by a substantial moraine (SN083333). The slope on the



**Figure 6.** Litter of dolerite blocks and rock outcrops on the hillside near Banc Llwydlos. The bedrock here is unspotted dolerite belonging to the Fishguard Volcanic Group.

eastern flank, overlooking the head of the Brynberian catchment, is so steep that it appears to be an ice-contact slope. Less than 4km away from Waun Mawn there are moraines with hummocky surface terrain near Bedd yr Afanc and Glanyrafon. To the west of Tafarn-y-bwlch surface till is intermittently exposed, and this is best described as a till plain. There is another moraine with very prominent surface boulders (mostly of local provenance) just upstream of Gernos-fawr (SN072340). There is also a till plain at a lower altitude on Brynberian Moor, with occasional exposures of lacustrine silts and clays up to 30 cm thick. Field research has not, thus far, revealed any extensive glaciofluvial accumulations in the Waun Mawn landscape; but there are some spreads of sands and gravels on Banc Llwydlos, sometimes seen in association with thin lacustrine layers dating from the Last Glaciation (John, 2018).

This is a landscape covered in glacial deposits (John, 2019a), and there are thousands of dolerite blocks and slabs littering the landscape within a kilometre or so of the 'stone circle' site (Figure 6). They are highly visible, resting on the ground surface and sticking out of the turf, at Tafarn-y-bwlch, west of Cnwc yr Hydd, and at Gernos-fawr. In places this litter is so abundant that the use of the term 'blockfield' would be appropriate. It is noteworthy that Parker Pearson and his colleagues have failed to mention these prominent land surface or sedimentary features in any of their relevant publications, in spite of the fact that two geologists are members of the research team.

### Archaeological features

There are abundant traces of prehistoric, medieval and later occupation of the Waun Mawn landscape. This stone complex is mentioned by Nora Figgis in her book (2001), and many features are described with reference numbers in publications by the Dyfed Archaeological Trust (Murphy and Wilson, 2012). There are five standing stones on the moor, within a few hundred metres of each other. Close to Tafarn-y-bwlch, to the south of the farm track, there is a pair of small leaning stones at SN081336. One prominent standing stone can be seen further up the track, on its northern side at SN081337. At 2.3 m in height, this is the most spectacular stone in the area. As mentioned above, on the hillside bench higher up the slope there is another standing stone 1.6 m high, flanked by three other stones which are recumbent (Figure 2). These are often referred to as 'the Waun Mawn stones' (SN083340) and they are not obviously on the circumference of a circle (Darvill, 2022). There are also two small recumbent stones in the turf about 50m to the NE of the putative 'giant circle'" and several other pillars incorporated into hedges along the minor

road leading to Newport and Nevern. A further large recumbent stone (estimated to weigh about six tonnes) lies in the turf on the dolerite plateau to the west of the Cnwc yr Hydd summit. Finally there is a roadside standing stone just up the hill to the south of the cattle grid, on the east side of the B4329 road, and built into a modern embankment.

In addition to the scattered Waun Mawn monoliths referred to above, there are many other traces of prehistoric activity in the landscape. On the Banc Llwydlos side of the Tafarn-y-bwlch col there are several listed features (Murphy and Wilson, 2012) including what appears to be a gallery grave (SN087332), a possible passage grave, at least one possible ruined dolmen or cromlech, several circular features that might mark hut sites, one large enclosure on the moorland beneath Foel Fach, and an earth mound interpreted as the site of a chambered tomb. The most spectacular feature is a cluster of connected circular hut remains, on a similar scale to those of Skara Brae on the Orkney Mainland, at SN089329.

There are also abundant features on the Waun Mawn moor itself, particularly to the west of the Cnwc yr Hydd summit. There is a substantial feature assumed to be a ring cairn with a diameter c 30 m near Gernos-fach (SN077345) (Figure 7). It is located in a wilderness of gorse patches, boggy areas and stony litter. It is well known to local field workers, and was discussed on social media in 2014; but Parker Pearson et al. (2021b) wrongly claims that this feature was 'discovered' by a colleague early in 2021, prior to his archaeological investigation. The embankment of the feature is relatively dry and grass-covered, whereas the centre is more boggy with rushes and sphagnum. The southern part of the bank is more or less intact, a metre or so wide, about 50 cm high, and with abundant stones breaking the surface. At the 'entrance' on the eastern rim there are two larger dolerite stones or gatekeepers, and a rough arrangement of smaller stones that seem to suggest a passage running up to the entrance from the east. To the south of this stone setting there appears to be a double bank, partly removed. The northern semi-circle is largely absent, but a few traces of it can still be seen some 20 cm above the general level of the turf. Parker Pearson et al. (2021b) suggest that there might have been a ring of c 24 standing stones at Gernos-fach, but no clear evidence has been produced in support of that contention. There appear to have been modifications at the site over many thousands of years.

There is another ring cairn with a diameter of c 11 m about 50 m to the SE of the Cnwc yr Hydd summit. It has a smaller circular feature on its flank. The embankment, only about 50 cm high, is made of broken shale and meta-mudstone, and it is partly destroyed. Two further circular features are listed on the Coflein (Welsh Government) database of protected sites, one with a diameter of about 30 m. Other minor features, including stone extraction pits, ruined stone settings, and 'modern' meta-mudstone quarries used for building materials, are described by the author at https://www.researchgate.net/publication/345177590\_Waun\_ Mawn\_and\_the\_search\_for\_Proto-\_Stonehenge. Across the moor on the dolerite plateau there are a number of pits in the turf, too small to be quarrying excavations and generally about 2 m across and up to 50 cm deep. They are most likely to be stone extraction pits from which suitable dolerite boulders or stumpy pillars might have been removed for use in the neighbourhood. Some of these pits might actually be standing stone sockets; and in two or three cases there are 'leaning stones' with pits around them. On previous visits these pits have been full of water, but after a spell of dry weather it was revealed that they are full of rounded and subrounded clasts - varying in size from pebbles through cobbles to boulders on the Wentworth scale. These are mostly made of dolerite, and they look as if they have been picked out from glacial deposits and maybe used as packing stones. Interestingly enough, in the pits there are relatively few fragments or shards of the



Figure 7. Gernos-fach ring cairn. Drone image courtesy Dave Maynard.

meta-mudstone found on the hill summits of Banc Du and Cnwc yr Hydd.

A small but quite prominent 'hut circle' is seen to the right of the track leading up to Gernos-fach, not far from the biggest standing stone at SN080341. This is shown on old OS maps. There is a recorded rectangular hut setting not far to the south of the Gernos-fach farm track, and another 'stone-founded rectangular structure' with dimensions  $15 \text{ m} \times 5 \text{ m}$ . Finally there was a medieval chapel (referred to as 'Eglwys Fair' on the east-facing slope of Banc Du; only the slightest traces now remain.

Historical records show that there was a deer park on the common at Waun Mawn, estimated to have been in use between 1550 and 1750 (Figure 5). It is described in a Dyfed Archaeological Trust (2015) publication. It was never fully enclosed like the deer parks associated with the grand estates of West Wales, but it appears simply to have been a favourite place for hunting deer. There must have been dense wooded cover. It is possible that the man-made features (including embankments and walls) adjacent to the lower part of the Gernos-fach track on the open moor were related to deer hunting.

Research continues. Waun Mawn is close to Banc Llwydlos, a landscape with many Neolithic or Bronze Age stone settings, and later features, as described by Murphy and Wilson (2012) and by Darvill (2019). Other features, including a 'sheepfold' on Waun Maes and a 'prehistoric village' at Banc Llwydlos, are also recorded but inadequately studied.

It is intriguing that in the 2017 and 2018 field reports by Parker Pearson et al, and in their 2021 article, there is no reference to these abundant prehistoric features, which must be closely associated in age and origin to the putative 'giant stone circle' which has been given exclusive attention. The 2021 Interim Report on Waun Mawn and Gernos-fach refers to this area as 'a major ceremonial complex' – but that is unsupported by the evidence. As noted by the Dyfed Archaeology field surveyors, it is actually a landscape full of prehistoric utilitarian features of many types, with the addition of some that may have had ritual or ceremonial importance (Murphy and Wilson, 2012).

# The search for the 'venerated stone circle'

As pointed out above, the idea that there might have been a stone circle on the hillside bench at Waun Mawn is not new. Indeed, the official Coflein record goes along with the idea that there might have been a 'dismantled stone circle' here, while admitting that the evidence is very scanty.

However, as mentioned above, Parker Pearson and his colleagues have, over the past decade, been developing the idea that Waun Mawn was the site of a giant stone circle related in some way to Stonehenge. While their geophysical work has been fruitless, they have nonetheless developed the hypothesis of a large scale megalithic structure built here, first used for ritual purposes, and later dismantled for shipment to Salisbury Plain (Parker Pearson et al., 2019a). The idea that Waun Mawn might have had something to do with Stonehenge arises from the 'mythos' in which Stonehenge is deemed to be the focal point of British Neolithic and Bronze Age culture (Barclay and Brophy, 2021). It is one of the principles of scientific study that extraordinary claims require extraordinary supporting evidence. So – does such evidence exist? This question is addressed in the paragraphs that follow.

# Waun Mawn: Field evidence

In three digging seasons in 2017, 2018 and 2021, excavation pits were opened up at key locations on the circumference of a putative giant stone circle, where stone sockets were predicted to be present. In three 'interim reports' by Parker Pearson (2017), Parker Pearson et al. (2019a, 2021b) many slight depressions are assumed to be empty sockets without any consideration of alternative explanations (Parker Pearson et al., 2021a). However, it was possible for independent observers to inspect the digs without interference while the pits were still open on the common, and the brief descriptions that follow are offered in the hope that they may assist in interpretation.



**Figure 8.** The locations of the shallow excavations of 2017, 2018 and 2021. The 2017 and 2018 excavations are shown in black. The locations of the 2021 excavations are shown in red. Red dots: proposed stone holes. Green dots: pits. Purple dots: existing stones. Black dots: other features. (Source: 2021 Interim Report) Note that there have been no control digs beyond the proposed circumference of the 'Lost Giant Circle.'

In 2017 six shallow excavations involved the stripping away of the surface peat and soil layer (Figure 8). The large recumbent (westernmost) pillar-shaped stone was seen to be resting on an undulating surface of stony till with a sandy and silty matrix, with a small pit close to one end of the stone. This contained a number of stones, but so did the spoil thrown out of the pit by the excavators - so it was not possible to ascertain whether these stones were in their natural or in situ positions or whether they had been placed there by human agency. The current standing stone (Figure 2) and another large elongated recumbent stone to the east (Figure 9) were not excavated in 2017. The easternmost recumbent stone was revealed as a small boulder about 1 m in diameter, embedded in an undulating stony till surface. It is clearly just a part of what was once a much larger boulder; the 'breakage' face is quite easy to recognise. Near one end of the boulder the excavators cleared a narrow and shallow trench (shown on photos by its rich brown colour, as distinct from the grey-brown colour of the till surface). Parker Pearson (2017) claimed that this depression (considerably smaller than the base of the boulder) was filled with brown loam.

In another large 2017 excavation in the NW quadrant, an undulating till surface was again revealed, and the excavators reported a circular pit 85 cm in diameter and 30 cm deep, filled with brown soil. Several large stones were revealed, the largest standing almost vertically and the other two leaning. These are most likely in situ stones contained within the till matrix. A pit dug to the SE of the smallest recumbent stone simply revealed an undulating till surface with no major irregularities, but in a further pit to the SSE an elongated depression was found, almost 1 m across and c 35 cm deep. Two large stones were found, and the southern edge of the pit was shallower than the other flanks.

The 2018 dig at Waun Mawn was much more extensive, and no less than 15 shallow excavations were opened up, covering a



**Figure 9.** The two recumbent stones to the east of the standing stone at Waun Mawn. The one in the foreground weighs about 6 tonnes. Note the considerable mismatch in size, suggesting that they were not components of a carefully planned circle. They may never have stood upright.

surface area of c 198 sq m. The diggers targetted locations on the circumference of their putative stone circle, with standing stone placements also predicted. The results were haphazard, and following visits it was difficult to match the evidence on the ground with the texts of Parker Pearson et al. (2019a, 2021a), since the archaeologists involved frequently interpreted features before describing them. They claimed to have investigated 10 stone holes, six other 'cut features' and a slight mound on which a monolith supposedly once stood.



**Figure 10.** Abraded glacial erratics and broken bedrock slabs in a sandy till matrix. Here there is no convincing evidence of stone sockets or any other human disturbance.



**Figure 11.** An excavated surface showing a litter of broken dolerite bedrock slabs typical of a frost-shattered blockfield, with a veneer of sandy till and some sub-rounded and abraded erratic boulders. Note the abundant natural hollows and pits.

From examinations of the opened pits in 2018, the following observations are offered. Some of the 'sockets' referred to by the archaeologists are relatively shallow hollows up to 30 cm deep with irregular shapes, no contained packing stones, and jagged stone edges projecting out from the pit sides. Some appeared to be artifices created by the diggers, excavating into soft and stony surfaces more or less where (on the basis of careful surveying) they assumed that sockets might be located. The 'sockets' did not appear to be located with any degree of accuracy in the places where they should be. Most were away from the circumference of the proposed giant circle, irregularly spaced, and separated in places by very large gaps. On one visit to the site half a dozen shallow pits that might be interpreted as sockets were visible, but the terrain beneath the stripped-off colluvium and soil layer was stony and undulating, and all of the pits, hollows and elongated depressions examined appeared to be entirely natural (Figures 10 and 11).

The stones exposed in the open pits are of all shapes and sizes, as one would expect in this area of glacial deposits and periglacial slope accumulations. They are mostly made of local dolerite (c 85%), meta-mudstones (c 10%), and ashes, rhyolites and some sedimentary rocks of local origin (c 5%). In spite of a careful search, no fragments of spotted dolerite, foliated rhyolite, or Palaeozoic sandstone could be found. However, Parker Pearson et al. (2019a) claimed that one of the embedded or recumbent stones is made of speckled dolerite; this small boulder, which only just breaks the surface, appears to be in a natural position.

The largest 2018 excavation was cut just beyond the SW quadrant of the putative giant stone circle. After stripping the turf from an irregular area which was at least  $10 \text{ m} \times 25 \text{ m}$  in extent, a very typical surface of what appears to be local till was revealed, full of rounded, sub-rounded, faceted and subangular boulders and cobbles of all shapes, sizes and lithologies. The surface of the till is gleyed, with a red, buff and bluish colouring, and in places there is a distinct foxy-red crust or iron pan where minerals have been precipitated out. This is typical of soils in the Preseli region. In places there appear to be traces of ash and bits of charcoal, and samples were collected, analysed, and submitted for radiocarbon dating by Parker Pearson et al. (2019b).

During the 2021 dig, team members claim to have found one additional stonehole beyond the end of the 'eastern arc' of putative stoneholes as discussed above; but there is no description of its characteristics. Another so-called stonehole adjacent to a small recumbent stone (or broken section) was found on re-excavation to be a later feature. A number of smaller pits deemed to be postholes were also discovered. A pit in the SW quadrant assumed to be a stonehole was re-examined and found to have a dolerite slab 'placed' over part of it. The evidence is unconvincing, and it has not been demonstrated that the slab is in anything other than a natural position.

Near, but not on, the postulated centre of the circle, a small hollow was found that appears to have been used as a fireplace, with 'disturbed sediment' on top of it that is deemed to have come from the fall of a large tree. There is speculation that the tree was a prominent feature used as a 'visible marker for the circle's centre' – but no evidence is presented that might suggest any link at all between tree, fireplace and circle of stones.

The most important thing to have come from the 2021 fieldwork is that an intensive and determined search for new sockets or stone-holes around the perimeter of the putative 'giant stone circle' proved to be fruitless. A number of slight hollows in the surface of the underlying till are interpreted by Parker Pearson et al. (2021a) as 'marking out pits' or holes that were dug but never contained stones. No evidence is presented in support.

### Discussion

In the three interim publications by Parker Pearson et al, and in the 2021 Antiquity article, the Waun Mawn 'features' are assumed to belong to a circle, with no discussion or analysis of the strength of the evidence. There are copious references to sockets, ramps, packing stones, infills, imprints and so on, with particular emphasis concentrated on the stoneholes numbered 007, 015, 021, 030, 017, 037 and 091. After examinations of all of these, they appear to be natural and unremarkable – and no attempt is made by the authors to demonstrate that the 'sockets' and associated features are in any substantial way different from a multitude of other slight pits and depressions across this moorland. Indeed other surface irregularities in the 'wrong' places were exposed but ignored during the 2017 and 2018 digs. Some of the 'stoneholes' have flattish metamudstone clasts projecting into them; but if these holes had held standing stones these packing or filling stones would have been lying with their flat faces resting on the pit walls. At Waun Mawn there is an undulating till and broken bedrock interface with traces here and there of small-scale stone extraction and rearrangement in a locality rich in prehistoric features. There have been no control digs in the neighbourhood, and there has as yet been no reasoned argument pointing to any of the selected features being man-made.

Parker Pearson et al. (2021a) claim to have discovered some artefacts in the pits, but these have not been carefully described in print. Without adequate evidence as to their age or significance, these 'artefacts' can be accepted as unexceptional in a long-occupied landscape. With respect to stone hole 091, the authors say it contained a sequence of secondary fills containing over 40 struck dolerite flakes. One of these was a large stone flake ( $22.9 \text{ cm} \times 8.4 \text{ cm}$ ) aligned longitudinally along the eastern side of the extraction ramp. There are no images or anything else in the published texts to demonstrate that the flakes had anything to do with human agency, rather than simply being an assortment of small fragments associated with till or frost shattering processes.

With regard to two of the recumbent stones, Bevins initially expressed the view that the largest one (of unspotted dolerite) is likely to have come from Cerrigmarchogion (Bevins et al., 2022). He then said that the smallest recumbent stone (stone 013, of speckled dolerite) might have come from Mynydd-bach. He appears not to have considered the possibility that that this 'speckled dolerite' stone came from known exposures on the hillside near Cnwc yr Hydd or from some other outcrop nearby.

Other attempts to demonstrate human involvement in the creation of micro-features include reference to an 'artificial mound' and a 'sunken trackway.' But these are not adequately described, and they are no more convincing than the 'engineering features' described at Rhos-y-felin and Carn Goedog by Parker Pearson et al. and then heavily criticised by John et al. (2015a, 2015b). The 'mound' is no larger than many of the other mounds in the neighbourhood, and has no archaeological significance. Careful observation by the present author revealed no trace of a sunken trackway.

Parker Pearson et al. (2021a) also referred to the 'pentagonalsided imprint' of one of the 'sockets' (numbered 091) in the putative circle. They claimed that this was highly unusual and that it could be matched in size and shape to just two bluestones at Stonehenge. They said: 'One of these, Stone 62, is also of unspotted dolerite. Quite possibly, Stone 62 is the stone that stood originally in stonehole 091 at Waun Mawn.' In the view of the present author, this was another example of interpretative inflation (Barclay and Brophy, 2021). The imprint was not pentagonal, and neither is the base of stone 62 at Stonehenge.

The four monoliths investigated in the excavations are all local dolerites, heavily abraded and weathered. They look like glacial erratics, although they have probably not travelled far from their places of origin (John, 2018). The two big recumbent stones weigh around 6 tonnes each - much bigger than any of the igneous bluestones at Stonehenge. They may just be resting where they were left by glacier ice at the end of the last glacial episode. No strong evidence has been produced to show that they ever were standing vertically. The smaller recumbent stone is a broken part of something that was much larger, and it is likely that the larger part has been taken away and used somewhere else - possibly in historic time. There is no reason to think that any of the Waun Mawn monoliths has been 'quarried' from rock outcrops or tors in the vicinity, let alone from locations several kilometres away. In general, Welsh megalithic monuments were simply built with stones of suitable size from the immediate vicinity (Burrow, 2006). Other stones found in the till, and thrown out of the excavation pits by the research team, are a mixture of dolerites, metamudstones and softer and more friable mudstones and shales derived from the Abermawr Formation. Many of these stones are faceted and abraded by glacial action, but no striations were seen.

Parker Pearson et al. (2019a) made the following claim for this site: 'Six of these features (the discovered "pits" or "sockets") were holes for standing stones removed in antiquity. Together with the four remaining monoliths, they were part of a former stone circle with a diameter of 110m. This makes Waun Mawn the third largest stone circle known in Britain'. The essential problem is that there are only four stones that might be interpreted as part of an arc, and they are irregularly spaced and hard to place on any chosen circumference (Darvill, 2022). In his 2012 book Parker Pearson said (on p 283): 'Andrew (Chamberlain) pointed out that the diameter and spacing of this possible former circle would have been almost exactly the same as that of the Aubrey Hole Circle at Stonehenge.' This is not the case, since the Aubrey Holes circle has a diameter of about 87 m. In 2017 Parker Pearson stated that the Waun Mawn circle had a diameter of 115 m, and in 2018 he said it was 110m. Other estimates are that a circle on this site might have had a diameter of 140 m, although that would have taken the southernmost stones over the lip of the Waun Mawn 'platform.'

Then there was this claim: 'The fact that Waun Mawn stone circle has the same diameter as the perimeter ditch of Stonehenge is also highly suggestive of a close link between these two monuments. No other Neolithic monument in Britain shares this same diameter'. (Parker Pearson et al., 2019a)

The matching of the Waun Mawn 'stone circle' with the circumference and diameter of the outer ditch at Stonehenge is intriguing. Parker Pearson *et al* are not referring to two stone circles that might be related, but to one speculative stone circle and one earthwork which probably did not involve any stones. The outer ditch at Stonehenge was dug at a very early stage, at least 5000 years ago. The stone settings came much later, and if, as suggested by Parker Pearson (2012), the Aubrey Holes held bluestones, then the diameter of that circle must have been c 87 m.

The stone circles of the British Isles are nearly all dated to the Late Neolithic and the Bronze Age. If there really was a link between an Early Neolithic earthwork at Stonehenge and a much later standing stone setting at Waun Mawn, the 110m diameter must have been significant enough to have been recorded (Parker Pearson et al., 2019a). They implied that the outer ditch measurement was somehow transmitted from Stonehenge to Waun Mawn and used for the setting of a 110m stone circle, which was then dismantled and taken to Stonehenge, where the bluestones were later used in a stone setting that was much smaller. Alternatively, the archaeologists might have assumed that the measurement was first used at Waun Mawn in the Early Neolithic, and transmitted to Stonehenge prior to the excavation of the outer ditch. But there is no trace at Waun Mawn of any circular earthwork, with a diameter of 110m or any other diameter. In the view of the current author, none of this makes any sense. In short, there is no reason to refer to any 'matching' between the Aubrey Hole Circle and the speculated circle at Waun Mawn, and no reason to propose any link between this site and Stonehenge.

On the matter of local geology, the map which purported to show the geological context is wholly inadequate and indeed misleading (Parker Pearson et al., 2019a). It contains carefully selected information designed to give the impression that spotted dolerite monoliths from Carn Goedog, foliated rhyolite monoliths from Rhos-y-felin, and Palaeozoic sandstone monoliths from the Nevern headwaters were all taken to Waun Mawn and incorporated into a great stone circle. However, even a cursory look at the local geology and the local standing stones shows that:

- spotted dolerite has not been used preferentially in standing stone settings either at Waun Mawn or anywhere else;
- rhyolite has only been used for standing stones in the immediate vicinity of the source outcrops, and at Bedd yr Afanc six or seven small boulders of rhyolite are used indiscriminately in the stone setting along with other rock types;
- during the Neolithic there was an abundant scatter of unspotted dolerite boulders, pillars and slabs from local outcrops within a couple of hundred metres of the 'proto-Stonehenge' site, available for use;

 all of the standing stones at Waun Mawn and Tafarn y Bwlch appear to be made of unspotted dolerite, used more or less where found.

In other words, there is no indication that either the stones found locally, or the locality that we now call Waun Mawn, were deemed sacred or special in any way. According to Figgis (2001), there is no reason here to talk about any 'arrangement' or planned stone setting. It is perfectly feasible that the people who put up the single standing stone of the suggested 'giant circle' simply did it because (like the other three) it was here, in a very convenient position, on a gently sloping shelf of land.

To further quote from Parker Pearson et al. (2019a):

'Around 3000 BC, there was further activity both at the bluestone megalith quarries of Craig Rhos-y-felin and Carn Goedog as well as at the Banc Du causewayed enclosure where its ditch was re-cut in 3105–2915 cal BC, coinciding with the ending of megalith-quarrying at Carn Goedog and with the erection of bluestones in the Aubrey Holes at Stonehenge. The recognition that Britain's third largest stone circle was built here in Preseli, a stone's pull from two bluestone quarries, leaves us in no doubt that this was one of the great religious and political centres of Neolithic Britain when the bluestones were taken to Stonehenge. Whether Waun Mawn stone circle was left unfinished may give us a major clue to the social circumstances that led to the remarkable decision to move up to 80 bluestones to Stonehenge'.

None of the claims made in this extract with regard to Waun Mawn, Rhos-y-felin or Carn Goedog is adequately supported by evidence in the field. As indicated by John et al. (2015a, 2015b) natural features at Rhos-y-felin and Carn Goedog have been misinterpreted as man-made quarrying features. The radiocarbon dating evidence essentially falsifies the quarrying hypothesis. There may have been human activity (including intermittent occupation over millennia) at the two investigated sites, but that does not mean that Stonehenge bluestone monoliths were extracted from a rock face at either site. And if there were no quarries, the rationale for a 'giant stone circle' at Waun Mawn or anywhere else disappears. In any case, while there might have been a small stone setting at Waun Mawn similar to those at Castlerigg or Swinside, it does not appear to have been finished, and there is no reason to think it was well constructed, spectacular, or revered.

Both Darvill (2022) and Pitts (2022) have drawn attention to the irregular spacing and the very shallow depth of the Waun Mawn 'stone-holes,' and have questioned the existence of a spectacular Stonehenge-related stone circle. Pitts has reproduced a diagram on social media demonstrating that the Waun Mawn 'stone holes' as a group are smaller than any of the stone holes or post holes in the Stonehenge neighbourhood (Figure 12).

Parker Pearson et al. (2019a) claim as follows:

'The confirmation of Waun Mawn as one of Britain's former great stone circles changes our understanding of the considerable significance of the Preseli region during the Middle–Late Neolithic. The importance of north Pembrokeshire in the Early Neolithic has long been recognised on the basis of the extraordinary concentration of portal dolmens and other megalithic tombs in this area. ....."'

As indicated above, the work of Parker Pearson *et al* at Waun Mawn falls short of confirming anything about the supposed significance of the Preseli region of the middle and late Neolithic (Darvill, 2019). The research does not confirm the presence of a stone circle here, although it is possible that some of the 'sockets'



**Figure 12.** Stone-holes at Stonehenge (coloured dots) and postholes in the Durrington area (black dots) compared with the field covered by the supposed stone-holes at Waun Mawn (Courtesy: Mike Pitts, based on data provided by Prof Mike Parker Pearson). The pits in the latter field are very shallow, and could only have held small monoliths up to 1.5 m high – similar to those of Bedd Arthur and Gors Fawr.

described might, temporarily, have held small standing stones in a setting not yet elucidated. Also, as pointed out above, there is no 'extraordinary' concentration of Neolithic features in this area as compared with other parts of Pembrokeshire. Parker Pearson et al. (2021b) claim that the features around Waun Mawn belong to a 'major ceremonial complex' in western Preseli; but it is clear from the evidence presented above that this was not a ritual or ceremonial landscape in prehistoric times, but one dominated by dwellings and structures related to land management and animal husbandry. This is confirmed over many years of work by Dyfed Archaeology (Murphy and Wilson, 2012).

The radiocarbon and other dating results obtained from Waun Mawn samples show a very wide scatter (Parker Pearson et al., 2021). Around 43 radiocarbon dates have been obtained from carbonised fragments of oak and hazel, and some OSL dates are also on the record, from the sediment fills of supposed stone sockets. The seven dates chosen as being significant do not confirm that there ever was a stone setting at Waun Mawn. It would not be surprising, given the wide spread of archaeological features across this landscape, to find evidence of occupation over many centuries, extending from the Mesolithic to the Iron Age. If the age determinations had been clustered around 5000 years BP that would demonstrate Late Neolithic and Early Bronze Age activity. But that is already established, from all of the other features now recorded from the neighbourhood. And in the ongoing absence of radiocarbon dating evidence from control sites at Waun Mawn and Tafarn y Bwlch, with a view to demonstrating the special nature of the putative stone circle site, no conclusions can be drawn from the dating exercise about its significance or any links with Stonehenge.

In their Interim Report, Parker Pearson et al. (2021b) finally acknowledged that there never was a 'lost giant stone circle' at Waun Mawn, since a determined search over three digging seasons simply confirmed the findings of the initial geophysical survey: namely that there is nothing exceptional on the site. The later suggestion that a giant stone circle was planned but not completed was, and remains, unsupported by hard evidence. The suggestion that c 30% of the putative circle was completed was also speculative, as was the idea that 'between 8 and 13 stones were taken away in prehistory.'

In 2022 several new papers were published, confirming the current author's view that Waun Mawn has nothing to do with

Stonehenge. In the first (Bevins et al., 2022), it was acknowledged that none of the outcrops presumed to have supplied bluestone monoliths to Stonehenge had any link with Waun Mawn, and that the Waun Mawn stones and unspotted dolerite fragments had most likely come from Cerrig Lladron. This is a significant shift in opinion. However, the proposed link with Cerrig Lladron was no more reliable than a proposed link with Cerrig Marchogion, since the authors of the paper had not sampled the dolerite outcrops in the immediate vicinity of Waun Mawn. At the end of the paper the authors embarked on a statistical probability analysis designed to determine the likelihood of human beings hauling away all of the 'useful' stones to Stonehenge, while leaving behind the four local stones made of unspotted dolerite. This analysis proved to be futile.

Pearce et al. (2022) attempted (using pXRF methods) to determine whether there was any link between stone hole 091 at Waun Mawn and stone 62 at Stonehenge. Unsurprisingly, they discovered that there was no link, and that stone 62 had probably come from Carn Ddu-bach, near the eastern end of the Preseli upland ridge. Once again, the work demonstrated that the importance of Waun Mawn had been inflated in an unsustainable narrative.

Finally Darvill (2022) stated that he could see no trace of a 'giant stone circle' in the evidence collected by the Parker Pearson team, and he suggested instead that the standing and recumbent stones on the site were remnants of small monolith alignments. He questioned the presumption that a number of slight pits were ever used as the sockets for standing stones. He also questioned the idea of an astronomically-aligned 'entrance' and criticised the very selective use of radiocarbon and OSL dates in order to reinforce the desired narrative. As for the geological work that underpins some of the Waun Mawn assumptions, he also questioned its reliability.

In a published riposte, Parker Pearson et al. (2022) cited the finding of traces of a hearth and a fallen tree near the centre of the putative circle, and claimed that this (with further stone holes) reinforces the idea that there was a 'partial circle' here, abandoned before the completion of the monument. Nonetheless, they were forced to row back significantly from their earlier narrative, while still insisting that there were bluestone quarries from which stones were taken, and that the bluestone transport expeditions did happen. They did not consider the possibility that in the Middle Ages, at the time of the local deer park, there were substantial trees right across this landscape. They concluded: 'Even if Waun Mawn was not the source of any of Stonehenge's Bluestones, however, it must still be considered as a place of significance in the Stonehenge story. The abandonment of the Waun Mawn circle before its completion suggests either some form of breakdown in community/cooperation or external disruption of what was intended to be a major monument. The stones of the Preseli Hills are integral to Stonehenge and understanding the local use of Bluestones near to their quarries and prior to their use at Stonehenge widens our knowledge of the Neolithic of southern Britain, particularly the relationship between Wales and Wessex'. In the view of the present author almost none of that recently articulated narrative is supported by hard evidence.

Since the hypothesis involving monolith quarrying, stone storage at Waun Maun and human long-distance transport cannot any longer be sustained, the most parsimonious explanation of the bluestones at Stonehenge is (as it was prior to the intervention of Thomas in 1923) that the monoliths and related debris were transported by ice (Figure 13). There is no doubt about the efficacy of the Irish Sea Ice Stream, which flowed across Pembrokeshire and up the Bristol Channel to affect the coasts of Devon and Somerset on at least three occasions (Gibbard et al., 2022). This ice stream carried abundant large erratics broadly from west to east (Gibbard et al., 2017; Kellaway, 1971). Some are associated with ancient glacial deposits, and others are scattered along the coasts (e.g. at Saunton and Ilfracombe) up to an altitude of at least 175 m (Keene and Cornford, 1995; Stephens,



**Figure 13.** Generalised directions of ice flow in the Bristol Channel arena during the greatest British glaciation. This was probably either the Anglian (MIS12) or Wolstonian (MIS6) glaciation. The red arrow shows the postulated direction of flow of the segment of the Irish Sea Ice Stream which probably transported the bluestone erratics. The position of the easternmost ice edge is currently not known.

1998). The bluestone erratic boulders may well have been carried in the contact zone between two ice masses, flowing in parallel (John and Jackson, 2009). It is still not known where the easternmost ice edge was located, but in view of the fact that the Greatest British Glaciation may have occurred around 450,000 years ago, it is likely that the associated glacial and glaciofluvial sediments have been almost entirely degraded (Thorpe et al., 1991). It is reasonable to suggest that the Stonehenge bluestones were found littering the landscape within striking distance of Stonehenge, and were gathered up by our ancestors for incorporation into the stone monument around 5000 years ago (John, 2018).

# Conclusions

The claim that Waun Mawn was the site of a 'giant stone circle' made of bluestone monoliths that was later dismantled and removed to Stonehenge is found to be unsupported by evidence in the field. The recent geological work reveals that there are no links between Waun Mawn and Stonehenge. Bluestone 62 was never located in a socket at Waun Mawn. There are no links between Waun Mawn and the proposed bluestone 'quarries' at Rhos-y-felin and Carn Goedog. There was no monolith quarrying at these two sites, and there is no evidence that pillars or slabs taken from them have ever been selectively used in stone settings in Pembrokeshire or anywhere else.

In postulating the presence of the stone circle Parker Pearson et al. (2021a) have ignored the details of local geology, geomorphology and archaeology in order to develop the thesis that the site was in some way special. While there may have been a small standing stone setting on the moor, the other prehistoric features in the neighbourhood are inherently far more interesting, in spite of being largely ignored by Parker Pearson and his research team. Further, the claim that 'this was one of the great religious and political centres of Neolithic Britain' cannot be sustained.

The story invented by Thomas in 1923 and elaborated by many others since then has acquired mythical status. But it is not adequately supported by field evidence, and must be abandoned in favour of the glacial transport thesis. It is concluded that at Waun Mawn and elsewhere in West Wales there has been substantial 'interpretative inflation' driven by the desire to demonstrate a Stonehenge connection.

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