Field Evaluation of Scheduling Proposals 2015-16

Rhuddgaer Early Medieval Settlement

Geophysical Survey and Excavation





Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust







Llywodraeth Cymru Welsh Government

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Geophysical Survey and Excavation

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FIELD EVALUATION OF SCHEDULING PROPOSALS 2015-16 (G2246) RHUDDGAER EARLY MEDIEVAL SETTLEMENT - GEOPHYSICAL SURVEY AND EXCAVATION Location SH44096363

Summary The 2015-16 season of the Rhuddgaer project completed an extensive geophysical survey of the area revealing the full extent of a 10.5ha early medieval field system and what appeared to be an associated nucleated settlement. An excavation examined one rectangular building, a field boundary and a fragment of field system. Radiocarbon dates indicated a probable 7th to 8th century date for the settlement. This was overlaid by the well-preserved ridge and furrow of a medieval field system which, in turn, had been buried by a major sand inundation, possibly in the 14th century. The land was subsequently brought back into cultivation; a field system depicted on an 18th century estate map was superseded by the current field system in the 19th century.

1. INTRODUCTION

This was the final phase of fieldwork investigating a number of settlement features discovered by geophysical survey at Rhuddgaer at the mouth of the Afon Braint in south-west Anglesey. Three earlier phases of the project identified an extensive field system and several buildings thought to be of early medieval character. The current phase extended the geophysical survey and carried out a community excavation that examined one of the buildings and its environs.

2. PREVIOUS WORK

The project was initiated by Matthew Jones of CR Archaeology, Llandudno. The first phase of work comprised a small area of geophysical survey and documentary research funded by a grant from the Cambrian Archaeological Association (Jones, Hopewell and Rees 2012). Further stages of survey were carried out by David Hopewell, Roland Flook and Macsen Flook of GAT with John Burman and Cliff 'Beaver' Hughes (Flook 2013) as part of a project grant-aided by Cadw (G2240). The third phase, including a trial excavation, was part-funded by a grant from the Anglesey Area of Outstanding Natural Beauty Sustainability Fund administered by Efan Milner for Anglesey County (Hopewell, Flook, McGuinness and Smith 2014: Project G2276). The current report will provide an overview of all work to date.

3. OUTREACH

(Anita Daimond)

Preparation for the festival community excavation began in April with volunteer opportunities being advertised in May. Widely advertising opportunities to participate in advance of the excavation enabled us to involve new audiences. A total of 27 volunteers, 2 Bangor University students on work-placement and 4 school work-experience students were actively involved in excavating the site. They received training in all aspects of the excavation process, including surveying and recording techniques from GAT staff allowing all volunteers to broaden their skill set. A questionnaire that was

devised with volunteer input was completed by 16 volunteers. The volunteers fed back positively regarding their experience and all indicated their interest in archaeology had increased.

Opportunity to visit the site was made available to 8 schools. Initially 8 groups booked but one cancelled prior to the pre-visit due to transport difficulties and another (located in a communities First area) received a pre-visit but was unable to visit the site at the last minute due to staffing issues. Two groups from the local special needs school visited the site together with their learning assistants. The other groups were Key Stage 2 primary school groups. In total 123 pupils and 12 staff were involved. Feedback from all teachers was positive.

The public open day attended by 130 people was held on Sunday July 13th as part of the Festival of British Archaeology. The narrow road to the site and lack of parking-space on, or close to, the site necessitated the need for a park and ride scheme for the day. Ysgol Brynsiencyn kindly allowed us to use their carpark and a local firm was used to transport visitors from there to Rhuddgaer. This required that tour times were agreed in advance and visitors were required to book onto a tour in advance. Controlling numbers in this manner proved to work very successfully as we had a manageable number of people on-site at any one time and visitors were presented with a clear narrative by their tour guide. It also enabled us to respond to demand and provide a fully Welsh language tour in addition to the four English tours. All the respondents felt the event was well organised, met their expectations and that they had enjoyed attending.

Bangor University students are currently in the final stages of completing two 'Vlogs' (video blogs) - one in Welsh and one in English about the excavation and the community involvement. A dig diary was put online. The project was also promoted through social media, e-mail and a mail-out to the Friends of GAT.

4. TOPOGRAPHIC AND HISTORICAL BACKGROUND

The study area lies at SH44096363 (centre) on level but slightly undulating land to the south-west of Rhuddgaer House and south of the village of Dwyran (Fig. 1). The southern side is bounded by the channel of the Afon Braint where it flows into the Menai Strait. The geophysical survey was carried out over an area of 17.85ha within three large arable fields along with an area of rough grazing along the coast edge. The land here is at an elevation of no more than 10m OD. The fields have been regularly ploughed and are flat and featureless. The coastal strip contains a degraded and vegetated sand-dune system.

The bedrock is part of the Clwyd Limestone Group, and variable limestone and sandy conglomerate outcrop on the shore to the north-east (Howells 2007 and the author's records). No blown sand is recorded by the geological or soil survey but soil test pits carried out during the previous phases of the project indicate up to a metre of clean blown sand. This is presumably an extension of the Newborough Warren dune field to the south-west (Fig. 1).

4.1 The Lead Coffin

The area was originally investigated in an attempt identify features related to the findspot of an inscribed lead coffin or ossuary discovered by workmen in the area in 1878. W. Wynn Williams reported the find in *Archaeologia Cambrensis*

Some stones near the hedge of a field now under cultivation, but which had formerly been part of the waste land called Cwningar (or Rabbit Warren), distant about five hundred yards from the camp, were so much in the way of the plough that it was determined to clear them off. In the course of their operations the workmen employed came upon three pieces of lead surrounded by stones, some of which were boulder-like, and of considerable size, but placed without any apparent order; while others, of slab-like form, had evidently been brought from an adjacent limestone quarry on the beach, below high water mark, and would serve well as ends or sides of a cistfaen. One thing seemed tolerably certain, viz., that both stones and lead had been previously disturbed (p. 137).....

There seem also seem to be indications that quicklime was used to fill up [the coffin] (p.138).

On examining the place where the leaden fragments were found, it was seen that the surrounding earth had that dark and greasy appearance indicative of the presence of decayed animal matter. Mixed up with it were also pieces of tile and pottery, together with ashes and calcined bones (p.140).

The coffin is now in *Storiel* (Gwynedd Museum). The inscription is cast into the two longer lead sheets but was not reversed in the mould resulting in mirror image lettering. The inscription reads CAMVLORIS HOI along with two unidentified symbols. The published reading of HOI is H(ic) O(ssa) I(acent) meaning 'Here lie the bones of Camuloris'. Edwards (2015) notes that

Patrick Sims-Williams has suggested that in CAMVLORIS HOI, meaning 'Camuloris here', HOI is a unique roman-letter spelling of the Primitive Old Irish XOI which is found on a group of ogam stones in Ireland where it has been interpreted as the equivalent of the common Latin Christian commemorative formula hic iacit ('here lies'). Some, but not all, lead coffins lined with plaster have been identified as Christian and most are dated to the fourth century, but the use of XOI does not appear to be found in Ireland before the fifth. Whatever its precise date, the Rhuddgaer coffin is significant since it provides the earliest testimony we have of both Christianity in north-west Wales and an Irish presence on Anglesey.

The reports of the exact location of the coffin are somewhat varied. Williams records it as being 500 yards from the camp but gives no direction apart from it being 20 yards away from the findspot of the neck of a red clay vase previously found beneath a small cairn. Harold Hughes recorded this finspot as being 300yds to the west of the camp at Rhuddgaer (Hughes 1925) and the coffin a few hundred yards from the house but on a lower level in the direction of the sea. (Hughes 1926). The Royal Commission record the findspot as 600 yards to the south-west of Rhuddgaer on P92 of the Anglesey Inventory and 660 yds to the south-west on p.lxxxix. The only site answering to the description of the "adjacent" limestone quarry on the beach, as noted by Williams (1878, 137), is 630 yds due south of Rhuddgaer. Perhaps the only conclusion that can be drawn from this is that the coffin was found on the level ground towards the coast to the south or south-west of the house. The reference to the waste ground/warren being brought into cultivation (*Cwningar*) could refer to the rough ground adjacent to the coast but it seems unlikely that the stones would have been close enough to the surface to have impeded the plough given the depth of sand in the area.

4.2 Other Sites and Background

A roughly rectangular defended enclosure with dimensions of about 90m x 60m was recorded by Wyn Williams in the location of the current house and farm buildings. Several Roman coins and sherds of pottery and querns were found at the site. It is presumed that this was a high status Romano-British site.

The first historical record of Rhuddgaer is in a charter granted to the Cistercian abbey of Aberconwy by the Welsh Prince Gruffydd ab Cynan between 1188 and 1199 (Carr 2011, 214). A windmill was also recorded at Rhuddgaer at the time of the dissolution (ibid. 84).

A major disaster struck the area on 6th December 1330 when 183 acres of the borough of Newborough were overwhelmed by sea and sand along with eleven cottages and 28 acres in Rhosyr (Lewis, 1912 p 53). This event was also thought to have buried the remains of the buildings of the Welsh Royal court or Ilys of Rhosyr (Johnstone 1999).

There are historical records of a medieval township called Aber-Braint (The Mouth of the Braint) (Richards 1969, 62) but its location is unclear.

5. GEOPHYSICAL SURVEY

5.1 Technical Detail

The survey was carried out in a series of 20m grids, which were tied into the Ordnance Survey grid using a Trimble GPS system. The survey was conducted using a Bartington Grad 601-2 dual fluxgate gradiometer. The surveys were carried out at standard resolution (1.0 m traverse interval by 0.25m sample interval).

5.2 Instrumentation

The Bartington Grad 601-2 dual fluxgate gradiometer uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies. The instrument detects variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetized iron oxides which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil, therefore contain greater amounts of iron and can therefore be detected with the gradiometer. This is a simplified description as there are other processes and materials which can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Strong readings are also produced by archaeological features such as hearths or kilns as fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the soil leading to a more generalized magnetic enhancement around settlement sites. Not all surveys can produce good results as results can be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material with in the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in undetectable features. The Bartington Grad 601 is a hand held instrument and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 500mm apart. Their mu-metal cores are driven

in and out of magnetic saturation by a 1,000Hz alternating current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them producing an electrical pulse proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output. The gradiometer can detect anomalies down to a depth of approximately one meter. The magnetic variations are measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT, typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The machine is capable of detecting changes as low as 0.1nT.

5.3 Data Collection

The gradiometer includes an on-board data-logger. Readings are taken along parallel traverses of one axis of a 20m x 20m grid. The traverse interval was 1.0 meter. Readings were logged at intervals of 0.25m along each traverse Data presentation The data is transferred from the data-logger to a computer where it is compiled and processed using ArchaeoSurveyor2 software. The data is presented as a grey-scale plot where data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed. This is supplemented by an interpretation diagram showing the main feature of the survey with reference numbers linking the anomalies to descriptions in the written report. It should be noted that the interpretation is based on the examination of the shape, scale and intensity of the anomaly and comparison to features found in previous surveys and excavations etc. In some cases the shape of an anomaly is sufficient to allow a definite interpretation e.g. a Roman fort. In other cases all that can be provided is the most likely interpretation. The survey will often detect several overlying phases of archaeological remains and it is not usually possible to distinguish between them. Weak and poorly defined anomalies are most 4 susceptible to misinterpretation due to the propensity of the human brain to define shapes and patterns in random background "noise". An assessment of the confidence of the interpretation is given in the text.

5.4 Data Processing

The data is presented with a minimum of processing although corrections are made to compensate for instrument drift and other data collection inconsistencies. High readings caused by stray pieces of iron, fences, etc. are usually modified on the grey scale plot as they have a tendency to compress the rest of the data. The data is however carefully examined before this procedure is carried out as kilns and other burnt features can produce similar readings. The data on some 'noisy' or very complex sites can benefit from 'smoothing'. Grey-scale plots are always somewhat pixellated due to the resolution of the survey. This at times makes it difficult to see less obvious anomalies. The readings in the plots can therefore be interpolated thus producing more but smaller pixels and a small amount of smoothing based on a low pass filter can be applied. This reduces the perceived effects of background noise thus making anomalies easier to see. Any further processing is noted in relation to the individual plot.

5.5 Geophysical Survey Results

Fig. 2 shows the total area of geophysical survey including the three earlier phases of work (Jones, Hopewell and Rees, 2012, Flook 2013 and Hopewell et al 2014). The 2015 survey comprised an area

with maximum dimensions of 320m x 260m at the south-eastern side of the previously surveyed areas. This included two regularly ploughed fields that had previously been unavailable for survey due to the presence of crops. A small area was also surveyed in the rough ground to the south but was limited due to widespread gorse.

The results are interpreted on Fig. 3. The survey identified a series of complex linear anomalies extending across all but the northern extremity of the survey. These are best interpreted as a series of overlapping field systems representing several phases of land-use. Their morphology allows some phasing to be estimated from the survey results.

Field system 01 (in red on Fig. 2) appears to be the earliest. The fields are roughly rectangular and of variable sizes and the boundaries are, in places, gently curvilinear rather than straight. The southern part of the system has been truncated by coastal erosion. A series of eight oval or sub-rectangular positive anomalies (6 and 7) are located at irregular intervals along, and integrated within, the main north-eastern boundary of this field system. These measure 14m long by 7m wide and are best interpreted as buildings. Building 6 appears to be enclosed within a rectangular enclosure defined by a faint negative anomaly that could indicate a stone wall.

A second series of fields adjoin these (Field system 2 in brown). These boundaries produced less pronounced anomalies. This could be interpreted in one of two ways:

The boundaries may be of a similar construction to those in system 01 but have been truncated or otherwise affected by ploughing and other agricultural activity. The sand cover could well be deeper close to the shore; the fields are slightly lower behind the coastal dunes and thus may have been more vulnerable to plough damage.

The alternative interpretation is that the field boundaries are differently constructed and were added to the existing boundaries of field system 1 at a later date.

The strength of the anomalies associated with these two phases of fields decreases towards the north and west and the shape of the fields remains constant suggesting that the former interpretation is likely, in particular in the central part of the survey. The anomalies on the eastern side are generally very fragmentary and cannot be interpreted with certainty.

The effect of the depth of sand on the results can be seen on the south-western end of the survey where parts of the survey are weak and indistinct. The sand is magnetically inert and up to 1m deep so the instrument is mainly detecting archaeology beneath this layer of sand. The maximum detection range for archaeological features is about 1m and it appears that in places the sand is deeper than this, leading to weak and diffuse anomaly detection. This should be contrasted with the results in the northern and western parts of the survey where the boundaries produced clearly defined but weak responses suggesting that they are relatively close to the surface but heavily truncated.

Field system 01 and parts of 02 are overlaid by multiple parallel anomalies typical of the ridge and furrow of a medieval open field system. This is aligned with the field boundaries, indicating that the boundaries were visible when the cultivation took place, but overlies the field boundaries in many places indicating that the medieval open field system and associated ridge and furrow superseded an earlier system and that the earlier boundaries were sufficiently denuded for a plough to cross them. The stratigraphic relationship was confirmed by excavation in the 2014 phase of the project.

More than one phase of ridge and furrow cultivation is visible in the south western corner of the system. There is evidence of further phases of ploughing further to the north, in system 02. Some of this is more closely spaced than the ridge and furrow, does not respect the orientation of the boundaries and is presumably later. Two oval negative anomalies (08) with similar dimensions to anomalies 06 and 07 could be interpreted as further buildings. Their different magnetic responses suggest a different method of construction to those in field system 1 (06-07).

There are at least two further phases of field boundaries. These do not, for the most part, respect the early system 01/02 boundaries and it seems likely that these post-date the sand inundation that buried the early fields and that the early boundaries were no longer visible when these were constructed.

Phase 3 (in green) is represented by a large rectangular enclosure that does not respect the orientation of any other fields. It seems likely that it post-dates the early boundaries but gradiometer survey does not usually allow stratigraphic relationships to be resolved. There are also fragments of linear features (shown in purple: 10 to 17) that appear to be later (i.e. post sand inundation) field boundaries but are fragmentary and cannot be resolved into a coherent pattern. The latest system (04) is shown in blue the surviving elements of which can be matched with field boundaries marked on The Rhuddgaer estate map of 1792 by J. Corris (Hughes 1792).

Feature 18 seems to have a different character to most of the other linear anomalies and its wandering form may suggest it is a natural channel. This appears to continue as areas of noise (19) leading to a pronounced channel, now dry, running through the rough ground to the south-west of the cultivated fields. The channel is currently visible as a low area in the cultivated fields. The boundaries of the early field system 1 and 2 coincide with those of the 18th century system (4) in this area. The depth of sand may have been lower along the line of the channel thus exposing the earlier boundaries which were then reused in the later system

Weak anomalies (20) and (21) are two similar looking rectangular anomalies about 14m long and 5m wide and are best interpreted as two ends of a wide linear feature perhaps a bank of some sort. Anomaly 22 is a sub-circular area of strong positive and negative signals just under 40m in diameter. This spot was noted when laying out the geophysics grid as it appears on the ground as a low mound covered with a concentration of medium angular stones some of which appear to be heat affected. A smaller area of stones (23) was noted to the N measuring about 20m in diameter. Anomaly 24 is a wide band of increased 'noise' running NE from the edge of the stony mound (20). It is about 25m wide and about 65m long. This probably represents a concentration of stones within the topsoil, perhaps plough-dragged from the stony mound (20). Features 25 to 28 are all strong positive/negative anomalies. This usually indicates a significant ferrous object. Three of these are on the line of anomalies interpreted as former field boundaries. These could be interpreted as pieces of broken iron ploughshare indicating that large stones survive in the boundaries and that they are relatively close to the surface.

The north and north-western part of the survey is, in contrast to the rest, almost completely featureless. The early phases of boundaries (1 and 2) seem to be restricted to the southern part of the project area and may never have extended further to the north. The estate map shows that the 18th century boundaries did, however, run through this area. The anomalies associated with these (Field System 04) seem to fade away. This could be a result of plough damage or even clearance of features when the current field system was established.

The south-easternmost two fields produced fairly uneven responses perhaps as a result of variation in the subsoil or dune formation. There are many weak linear and irregular anomalies in this area. The most obvious have been transcribed (e.g. 16 and 17) but others hint at further features but are too weak to allow interpretation. Very closely spaced linear anomalies that are nearly parallel to the current NE to SW boundaries can be distinguished in the background noise particularly at the north. This may indicate plough scarring on the underlying substrate indicating relatively shallow topsoil. This would perhaps explain the fragmentary nature of the geophysical anomalies in this area.

5.6 Summary

The survey detected two separate periods of activity. The first comprises field systems 1 and 2 and a group of 8 subrectangular buildings. The buildings appear to be incorporated into the boundaries of field system 1 and could be interpreted as a nucleated settlement. Field system 2 (including another two possible buildings) joins system 1 so both were roughly contemporary. Field system 2 produced anomalies with a different character to those in system one. This could indicate a different building style or could be the result of later agricultural activity. The latter is perhaps more likely and in either case they almost certainly functioned as a continuous field system for all or part of their history. This would have covered an area of over 10.5 ha; the southern edge has clearly been truncated by the sea. This was superseded by the ridge and furrow of a medieval open field system which appears to have existed for some time before the majority of the system was buried by wind-blown sand.

A further one or two phases of fields developed, presumably bringing the sand dunes, at least partially, into cultivation. The last field system (4) is shown on the estate map of 1792 but was removed when the current large rectangular fields were established during 19th century estate improvements.

6. EXCAVATION

6.1 Methodology

A trial excavation was carried out in 2014 comprising a trench 11m by 7m which examined one end of the possible building identified in the geophysical survey just to the south-west of the current boundary between the cultivated land and the rough grazing. It also examined part of an adjoining field boundary and its associated ridge and furrow cultivation (Hopewell, Flook, McGuinness and Smith 2014). The overlying sand was removed and three small areas were investigated. The area was re-excavated as part of the current excavation and the results have been integrated into the current report. The only dating evidence was from two charcoal samples of possible holly wood from the soil within the building. These were taken from an assumed floor level but no hearths, post-holes or other features associated with the use of the building were identified within this deposit. The charcoal produced two almost identical radiocarbon dates. One was 1179+/-30 (SUERC- 51980), 769-902 cal AD (87.5%) or 920-953 cal AD (7.9%) at 2 s.d. The other was 1183+/-27 BP, 769-899 cal AD (91.0%) or 924-945 cal AD (4.4%) at 2 s.d. The radiocarbon dates supported but did not prove the hypotheses that the settlement dated from the early medieval period. The possible floor deposit could not conclusively be shown to relate to the main use of the building so the dating evidence could not be regarded as secure.

The 2016 excavation was designed to uncover the complete building along with an area alongside the former field boundary to the south-east. Excavations at the early medieval settlement at South Hook in Pembrokeshire (Crane and Murphy 2010) suggested that features such as corn-driers may be sited away from the immediate surroundings of the houses in a settlement. Several small geophysical anomalies that could represent this kind of activity were recorded alongside the former boundary and were included in the excavated area (Fig. 4)

An area of 40m x 20m was stripped of turf using a small mechanical excavator (Fig. 5). The overlying sand was also removed using the excavator but was found to be very variable in depth varying from 0.2m at the western end of the excavation to about 1.0m at the north-eastern end. A narrow access point limited the size of excavator that could be used and it was found that the removal and reinstatement of the entire area of the deeper sand was beyond the resources of the project. An area of 17m x 8m was therefore left unexcavated.

The project was carried out as a community excavation over three weeks between the 29th June and the 10th July 2015 in partnership with Bangor University. The excavations were supervised by the writer and Jane Kenney of Gwynedd Archaeological Trust along with Professor Nancy Edwards from the University. The outreach elements of the project were organised and provided by Anita Daimond, GAT's Education and Outreach Archaeologist.

The main excavated area was recorded as a high resolution 3D model using Agisoft PhotoScan. This allowed the major features to be drawn from an orthographic projection (plates 1 and 2) thus avoiding parallax errors (Figs 5 and 6). Smaller details were hand drawn at 1:20 scale. The sections were hand drawn at 1:10 scale.

6.2 Results

The excavations uncovered 5 principal phases of activity:

Phase 1 - Early medieval or earlier agricultural activity.

Phases 2 and 3 - An enclosed field system with integrated rectangular buildings, probably of early medieval date

- Phase 4 The ridge and furrow of a medieval open field system.
- Phase 5 Inundation by wind-blown sand
- Phase 6 Post-medieval agriculture
- Phase 7 Modern ploughing, probably during WWII

6.2.1 Phase 1 – Early agriculture

The earliest activity on the site was represented by a layer of buried soil (532/546) sitting directly on the yellow-grey glacial substrate (514). This was a dark grey-brown loamy sand, typically 0.3 to 0.4m deep containing occasional flecks of charcoal. This was not investigated in any detail but was found to underlie the boundaries and buildings of the phase 2/3 enclosed field system. Its depth was determined by two small test-pits dug in the 2014 excavation (TP1 and TP2 Fig 5) and on sections investigating the building 530 wall and the field boundary 512 (Figs 9, 10, 12 and 13). No datable material was recovered from this phase but it is presumably early medieval or earlier.

6.2.2 Phases 2 and 3 – Building and field system

An extensive field system and eight buildings were detected by the geophysical survey (Field system 1, above). The excavation confirmed the interpretation of the geophysical survey.

Building 530.

The excavation revealed the stone-built base of a roughly rectangular building (Fig. 6, Plate 3) aligned with its longest axis south-west to north-east. It had external dimensions of 12.2m x 7.4m and internal dimensions of 9.5m x 4.4m narrowing to 3.8m at the south-west end. The external corners were rounded. The corners in the interior varied. All but the western were close to right-angled with sharp corners. The facing in the westernmost corner was partly collapsed but must have been greater than 90 degrees given the general line of the wall.

The walls were about 1.4m wide with a clearly defined inner and outer face that was generally wellpreserved but had collapsed in places. The majority of the surviving basal course of both the inner and outer facing consisted of sub-angular glacial boulders, perhaps derived from field clearance, set upright to form a neat face (Plate 4). A section was excavated through the ground surface in front of the inner face (Fig. 9) and a possible foundation cut was identified. The level of the base of the upright stones was, however, variable. The base of the inner face close to the northern corner was close to the assumed floor level. The outer face was partly buried by later ploughsoil. A section was excavated through this in the 2014 excavation (Fig. 8) and the facing stones appeared to be sitting directly on the old ground surface (546). The basal course may have been built in a somewhat ad hoc manner with more unstable stones being set in a foundation trench while others were set on the ground surface. The wall core consisted of an infill of smaller boulders cobbles and sandy soil. The basal course was topped two or three courses of flat stones laid horizontally (see Plate 4) usually with their long axis running into the wall. The inner end of many of these stones had slumped into the body of the wall causing the upper courses to tip back into the wall. This was probably a result of the loss of wall core after the building fell out of use. The core may have contained a high proportion of earth which weathered out once the roof had been lost. A build up of earth around the walls particularly in the interior (534) could have been, at least partly, a result of this process. The upper courses consisted of fairly small stones and could be interpreted as a levelling layer, perhaps raising the stonework to the height of the top of the largest stones in the very variable basal course. This would have produced a wide flat wall, perhaps no more than 0.5m high. This hypothesis is supported by the relatively small amount of rubble was encountered around the walls. Stone could, of course, have been removed from the building after abandonment for reuse elsewhere although the survival of the most useful large stones in the basal courses suggests that this was not the case.

A notable variation in the wall construction was identified around the eastern corner of the building. A length of presumably earlier wall (523), running on a different alignment to the rest of the building had been incorporated into the south eastern wall. This was relatively lightly built with an earthen core. The inner face was buried in the later wall core while the outer formed the outer face of the building. The line of the inner face had been corrected by the addition of a roughly triangular (in plan) section of walling (549). The curving corner was also anomalous. The outer face (Figs 10 and 11 and Plate 5) was constructed from small rounded cobbles with some larger stones towards the base but without the upright large basal course seen elsewhere in the building. This was a lightly built, acting as a revetment to the earthen wall core (546) which, in contrast to the rubble core in the rest of the building, contained very few stones. The inner face was similar to that encountered elsewhere in the building albeit with a very square corner. An additional earthen bank (545, 546 526) with a revetment of roughly piled stones (527), built against the outer face, extended around the eastern corner of the building. This was 1.3m to 1.5m wide and extended from the off-line wall 523 to the field boundary joining from the north east (551). A large piece of willow or poplar charcoal was recovered from within the earthen bank which produced radiocarbon date of 535-646 cal AD at 93.2% prob. (see appendix 1 for full results). The anomalous corner of the building and the off-line wall appear to be aligned with each other and have a similar construction with lightly built facing and an earthen core and were presumably part of the same structure. This is particularly noticeable on the outer face; the inner may have been modified. The inner face of the off line wall was buried in the core of the main building showing that south-eastern corner was part of an earlier structure (phase 2) that was incorporated into building 530 (phase 3). This is discussed further in relation to field boundary 512 below. The bank built against the corner presumably acted as a buttress providing additional stability for the rather flimsy wall. A layer of firm brown silty earth (525 Fig. 11) was recorded on top of the wall and associated bank in this area. This may have been a soil horizon that built up over top of the wall after the building fell out of use but could alternatively be interpreted as the remains of a turf wall built on top of the stone-faced lower wall. This type of construction would also be consistent with the low and wide stone wall elsewhere in the building.

Initial clearance did not reveal an entrance into the building but removal of collapsed stone and sand revealed two opposing entrances, centrally placed in the longest wall of the building (Plates 6 and 7). The walls of both entrance passages were built out of thick, sub-rounded, slabs, set on edge and standing to a maximum height of 0.7m. The passages were 0.6m to 0.75m wide. The inner and outer end of the north-western entrance and the inner end of the south-eastern were defined by long and narrow threshold stones set into the floor of the building. Both entrances were blocked with rubble. The outer end of the north-western passage contained a large 0.7m-long boulder; the rest was blocked with a randomly orientated pile of stones. The stones had either fallen from the wall to either side or had been deliberately dumped, possibly during field clearance after the abandonment of the building. The south-eastern entrance was slightly less regular, splaying out slightly at the outer end due to the asymmetry in the wall caused by the Phase 2 facing (523). The blocking was not built to a face but was roughly laid and contained an upright stone close to the centre of the passage. One of the upright slabs forming the inner end of the entrance had also tipped sideways into passage. The blocking appeared to be slightly less random than in the other entrance so could have been deliberate (Fig. 12). If this was the case it was very casually built suggesting it was associated with a secondary use of the building, perhaps as an animal pen after abandonment and loss of the roof. The floor of the passage beneath the blocking stones was covered with a layer of slightly reddish sandy-silt which in turn sealed a small patch of charcoal and reddened heat-affected soil. Cereal grains from this deposit (species unidentified) produced a radiocarbon date of 661 to 770 cal AD (95.4% probability, see appendix 1). This material was laying directly on a dark grey brown loamy sand, possibly context 546 the old ground surface underlying the building (see discussion below).

The excavation produced a good plan of the building but deposits associated with the use of the building, as in the 2014 excavation, proved difficult to identify. The deposit beneath the wind-blown sand in the interior of the building was a friable dark-brown silty sand (534) containing stones that appeared to be tumble from the building's walls. The surface was uneven sloping up towards the

walls and with a hump in the middle of the building. This context appeared to be a build-up of soil that occurred after the abandonment of the building. Beneath this was a firm grey-brown silty sand containing occasional flecks of charcoal and fairly extensive iron panning (535). The top of this deposit was level with the threshold stones in the entrances so it seems likely that this was a floor level of some kind. The radiocarbon (c. 770-900 cal AD) dates from the 2014 excavation came from charcoal from this context. The deposit was, however, fairly homogenous and contained no identifiable features apart from a collection of randomly orientated stones protruding from the surface along the line of the south western wall, that could be interpreted as tumble, and a few roughly laid stones by the north-west entrance. The deposit proved to be very difficult to distinguish from both the deposit above (534 post abandonment soil) and the former agricultural soil underlying the walls (532/546). Some of the differential colouring may have been a result of gleying and iron panning; at this level the soil was wet and in places waterlogged. The section (Fig 9) investigating the cut for the wall of the building, was excavated down to the glacial substrate and failed to distinguish any variation with depth. In this case the possible foundation trench was cut from the assumed level of the floor through what was more likely to be a pre-existing former agricultural soil (532/546) than a specific floor deposit.

There was not time to further excavate the deposits in the interior of the building. Several soil samples were taken and it was noted that there were stones buried in the deposits at the north-eastern end of the building. It seems likely that lack of any identifiable features such as a hearth, post-holes, or any distinguishable floor surface are a result of the post-abandonment use of the building. No paving apart from a few stones around the north-west entrance was uncovered suggesting that building had an earthen floor, possibly nothing more than the compacted surface of the underlying plough-soil (532/546) which was observed to be very hard when dry. It seems likely that secondary use of the structure, perhaps as an animal pen, after the roof had been lost would have resulted in trampling and mixing of the deposits resulting in the observed homogenous deposits.

There were few finds from the building. Several flint flakes were found in the soil build up within the building 534. These were presumably residual and indicate either post abandonment trampling or mixing of the floor deposits or the washing out of soil from the wall core. A large black chert flake found on the wall top during the 2014 excavations was presumably from the soil in the wall-core.

A rounded schistose stone 0.3m x 0.25m x 0.12m with a pecked or ground circular hollow 7cm across in one of its flat surfaces was recovered from the top of the south-eastern wall. This appeared to have been part of the upper facing. The hollow resembles a prehistoric cup mark which are usually found on outcrops or very large stones. Given the relatively small size of the stone an alternative origin is likely, possibly a door pivot. This could have originated from an earlier phase of the building or have been placed on the wall post-abandonment.

Field Boundary 512

The field boundary detected by the geophysical survey conjoined the south-western corner of the building and extended as far as the southern limit of the excavation. It had been built on top of the phase 1 plough soil. It was somewhat variable but its basic structure consisted of a line of edge-set stones up to 0.6m long set in a single line (Plate 8). Some stones were set along the line of the wall and some across it and most had slumped over. Occasional medium sized stones were packed in between the edge-set stones with variable amounts of small cobbles and earth incorporated at

different places (Figs 13 and 14). There was a scatter of loose stones along its north-eastern edge that had probably been eroded from the boundary by later agriculture. It was not built to a face apart from at the northern end (see below). The boundary may have evolved over time; its core appeared to be the edge-set uprights along with some roughly piled stones. The smaller stones may have been a secondary addition from field clearance. The section at the southern end indicates an earthen component perhaps indicating that it existed as an earth and stone bank with a core (or earlier phase) of larger stones. This had almost certainly been damaged and eroded by later agriculture.

The boundary was noticeably different where approached the building. A double-faced wall with an earth and stone core could be traced for approximately two metres to the south-east of the building. The south-western face was continuous with the outer face of the building. The north-eastern face was less clear (see Figs 5 and 6). It was concluded at the end of the 2014 excavation that it ran up to the outer face of the south-eastern wall of the building, indicating that the boundary had been built to neatly abut the building. The preservation of the masonry was not good in this area but the removal of some loose stone from the walls suggested a continuation of the boundary face into the core of the building wall, possibly connecting to the inner face of its south-western wall. The wellpreserved length of north-eastern facing does seem to impinge on the projected line of the outer face of the building. The abrupt change in the character of the boundary and its possible relationship with the building wall could indicate that part of a pre-existing structure had been incorporated into southern corner of the building. It is possible that the earlier wall (523) incorporated into the eastern corner of the building could be part of the same structure, perhaps a similar-shaped building on a different alignment. The projected line of the early facing and the end of the anomalous length of field boundary are in a fairly convincing alignment but further excavation would be required in order to test this hypothesis.

6.2.3 Phase 4 Medieval ridge and furrow

The ridge and furrow detected by the geophysical survey was well preserved beneath the windblown sand. The ploughsoil consisted of a dark-brown slightly-silty humic sand representing a marked change from the overlying clean sand above. The surface of the soil still retained slightly irregular parallel scoring from the last time that it had been ploughed forming a slight ridge between pronounced c.1.0 m wide and 0.15m deep furrows (519, 520, 552-4 – Plates 9 and 10). The furrows were the features that had been detected in the geophysical survey.

A single linear hollow (518) alongside the north-west wall of building 530 was slightly deeper and wider than the other furrows and marked the end of a field detected as a line of ridge and furrow on the geophysical survey. This extended to the north-east and south-east of the building and included furrows 552-4. A single linear feature resembling a deep but intermittent plough scar or series of slightly elongated hollows ran 0.5m to the north west of hollow 518 (522). It clearly marked the edge of this field although its origin was not clear, being too slight to mark a hedge-line or noticeable boundary. The plough marks extended right up to the wall of the building. There was a build-up of ploughsoil against its walls, blocked entrances and areas of tumbled masonry indicating that building was ruinous during this phase of cultivation. The lines of the ridge and furrow detected by the geophysical survey also closely skirt the building to the north-east suggesting that this was in a similar condition.

Boundary 512 continued to act as a division between fields with furrow 519 running parallel to it in an NW-SE alignment and 552-4 running up to it in a SW-NE alignment. The two sections through the boundary (Figs. 13 and 14) show that there was a considerable build-up of ploughsoil over it. There were several sharp plough-scars cut into both the north-east and south-west sides of the bank. These were initially thought to be modern, the sand cover being relatively shallow here. Those on the south-eastern side respect the line of the medieval ploughing so may be from the last ploughing of this period. Those on the north-east side could be modern (see phase 7 below) although there are possible indications of plough-scars turning at the end of the medieval runs.

6.2.4 Phase 5 Sand inundation

The surface of the ploughed fields, the building and the field boundary were sealed by a layer of homogenous clean yellow sand (503 and 504) that varied in depth from a minimum of 0.15m in places along the south-western edge of the excavation to a maximum of 0.62m at its eastern extremity (Fig. 7). In some places the horizon between the ploughsoil was sharp; in others there was a somewhat mixed interface. This appeared to be a result of slight weathering perhaps mixed with a small amount of blown sand indicating that there was a short time, probably no more than a few weeks, between the last ploughing and the sand inundation. Elsewhere, particularly in the building the mixing appeared to be a result of animal burrowing, probably rabbits.

The dating of the sand inundation is circumstantial. It directly overlies what appears to be medieval agriculture and the furrows of a recently ploughed field associated with this. This is dated by morphology and alignment to the phase 2/3 boundaries as opposed to any direct dating evidence. The ridge and furrow is not a modern style of agriculture and is not aligned with, and clearly underlies and predates, the fourth phase of field system that went out of use in the late 18th/early 19th century. This therefore indicates a medieval origin is very likely.

The inundation overlies fields that were actively being cultivated and contains no consolidated turf horizons and so appears to have been a major event. This could well have been the documented inundation of 6th December 1330 (Lewis, 1912 p 53). Documentary evidence also suggests that this was an ongoing problem at Newborough; in 1561, an order was made to forbid 'pulling up of morhesg (marram grass)' to 'stave off further encroachment' by the sand (Soulsby 1983 p.195).

The most likely scenario is that there was a sufficiently serious inundation to result in the abandonment of the agricultural land, possibly but not necessarily in 1330, and that the sand cover eventually became sufficiently consolidated for the area to be taken back into cultivation in the post-medieval period. In the intervening period there may have been a period where the dunes were unconsolidated and mobile and no stable horizons were formed. The variability of dune systems is highlighted by recent changes in the dune system on the north side of the Afon Braint at Newborough Warren. Aerial photographs from 1951 show the area consisted almost entirely of unvegetated mobile dunes, this has changed considerably and it currently has over 90% vegetation cover. The coastal strip at Rhuddgaer appears to have been well consolidated semi-improved grazing in the 1951 photographs. (http://www.angleseynature.co.uk/sanddunes.html)

6.2.5 Phase 6 - Post-medieval to 20th century agriculture

Cartographic evidence and geophysical survey show that there were two or more phases of field system that post-date the burial of the medieval field system along with the current 18th or early 19th century boundaries. The burial of a large draught horse at the south-eastern end of the site (509)

probably dates from the 19th century when they were bred on the Rhuddgaer Estate. This was cut into field bank 512 but its stratigraphic relationship with the upper windblown sand was not established due to its position at the access point for the machinery used in the stripping of overburden during the excavation and the disturbance of the upper contexts. There was no other evidence of activity from this period in the excavation

6.2.6 Phase 7 - Modern ploughing, probably during WWII

A metal detector survey carried out during the 2013 and 2014 phases of the project recovered rubbish in the topsoil that dated from the 1940s. It is thought that the field was brought into cultivation during WWII and that this material was a result of manuring in this period. A patch of closely spaced plough-scars (521), parallel with the current field boundary, at the western end of the site where the blown sand was very shallow may date from this phase of agriculture. A series of burials of fallen stock (550) including cows and a horse also date from recent agriculture.

7. DISCUSSION

The scope of the excavation was limited to what could be excavated and recorded in 15 days. There is clearly potential for much further work but this would fall outside the remit of the current project, the primary aim of which was to identify the nature and significance of the site, and allow appropriate scheduling recommendations to be made. This section summarises the evidence of the work undertaken to date, and the potential for further research.

The phase 1 earth underlying the building and field wall was not investigated to any great extent but it is stratigraphically the earliest layer, and is indicative of agricultural activity pre-dating the Early medieval period. Residual finds of flint and chert from the area suggest the possibility of prehistoric occupation, and the Roman finds reported from Rhuddgaer suggest activity in the area within that period also.

Systematic investigation of this layer using soil micromorphology palaeobotanical sampling (particularly in the low-lying and waterlogged areas of the currently cultivated fields) and radiocarbon dating has the potential to provide more information. The dates from the building (phase 2-3) covered a likely date range from the mid-6th to the 9th century but none could be stratigraphically related to a closely datable event such as the use of a hearth. The 6th to 7th century date from the bank gives a terminus post quem for its construction but the charcoal could have been residual in the soil it was constructed from. The patch of burnt material (661 to 770 cal AD at 95.4% probability) in the entrance was a small discrete deposit, as opposed to a single object mixed into an existing horizon, and appeared to overly the pre-existing buried soil horizon and is therefore likely to relate to some kind of activity during the life of the building or shortly afterwards, preceding the blocking of the entrance. This gives a fairly strong indication that the building was in use in the 7th or 8th century but further, more securely stratified, evidence would be useful. The charcoal samples from the possible floor layer recovered in the 2014 excavations, giving a terminus post quem for the context of c. 770- 900 cal AD, are less stratigraphically secure and could be derived from either the buried soil horizon 532/546, the floor of the building or a later re use of the building (depending on the origin of "floor" context 535). This context was not extensively investigated and its homogenous nature along with the presence of possible tumble from the walls embedded in parts of it suggests that it may be a product of post abandonment trampling. Further investigation of this context

should be seen as a priority; lower levels may contain closely datable features or material, the base of post holes or other constructional features and elements of the earlier phase of construction identified in the south-east wall of the building.

The building was sub-rectangular with rounded outer corners, double faced stone walls with a rubble and earth core and included opposing narrow entrances in its longest side. The walls were up to 1.4m wide and not much more than 0.5m high and possibly flat topped. The morphology of the roof and upper walls cannot be established with any certainty due to the lack of preservation of features such as post-holes in the house floor. The wide low walls may have formed the base for a turf wall. Smith draws parallels with the tradition of wide Iron Age roundhouse walls and medieval turf walled houses in Scotland in the 2014 report (Hopewell, D., Flook, R., McGuinness, N., and Smith, G. 2014, 12). The curving corners almost certainly indicate a hipped roof. A construction similar to a Scottish black-house with a timber and turf roof sitting on a low wide wall would be a possibility. The parallel entrances are narrow, perhaps indicating that the building was a dwelling as opposed to a barn.

There are no direct parallels for buildings of this type in Wales from this period. The example in South Hook Pembrokeshire has curving end walls but was a wooden construction possibly with a central ridge-pole (Crane and Murphy 131-2). The closest parallel may be in the large round-ended rectangular building at Graeanog, Clynnog (Kelly 1998). This and a smaller subrectangular roundhouse annexe originated in the fourth century and were reoccupied in the early medieval period. The walls here were wide and low possibly with a roof pitched on rafters anchored into the top of the walls (ibid 154). A rectangular building lies within the enclosed round-house settlement at Pant y Saer, Benllech, Anglesey, where a 7th century brooch was found, however the date of the structure is uncertain, and the corners are square, not rounded (Phillips 1934). Clearly the tradition of rectangular building in the area was well established by the end of the Roman period. The nearby Roman settlement at Tai Cochion contained nothing but rectangular buildings. These were occupied for several generations, until the mid-4th century, and are likely to have influenced building styles within the area. One of the excavated buildings had curving end-wall although used a very different constructional style.

Parallels with later buildings from the medieval period where rectangular buildings were the norm are perhaps more obvious. Longley notes that buildings with rounded external corners and squared internal angles have been recorded at several sites in north-west Wales (Longley 2006, 66). The house at Rhuddgaer is larger than most recorded medieval long huts but its low walls and proportions are similar to many examples. At Rhossili, West Glamorgan, a large round cornered structure was excavated measuring 17m x 7m. It is thought to be of early 12th century date (Davidson *et al*, 1987).

The walls of the building are unlikely to have stood to full height. A timber roof may have sat directly on the wall tops or alternatively they may have acted as a foundation or plinth to support a turf or earth/clay wall. There is evidence for clay-walled buildings being built on Anglesey from at least Roman times and up to the 18th century. It is perhaps worth noting that a tradition of earth-walled building on Anglesey was recorded by the 15th century poet from north-east Wales Dafydd ab Edmwnd who said that Anglesey was characterised by earth-walled houses with rush-thatch roofs (Wiliam 2010).

The plan of the building may be seen as an intermediate stage between the round-house traditions of the Iron Age and Romano-British periods, and the rectangular houses of the medieval period. The lack of any domestic artefacts such as pottery or coinage is to be expected; early medieval sites, with the exception of high status settlements, such as royal courts, or monastic sites, tend to be aceramic and without coinage.

The relative scarcity of early medieval settlement, particularly when contrasted with the more abundant evidence from cemeteries, has been discussed by Longley (2012), who suggests that the evidence should be sought in the round-house settlements of the earlier periods which may have continued in use into the early medieval period. The prolonged use of the settlements may not have been recognised because of the lack of dating evidence. It may also be the case that earlier origins of medieval rectangular houses have not been recognised for the same reason. The field system associated with the building predates the medieval ridge and furrow and therefore does not conform to the usual pattern of long curving fields formed from the amalgamation of quillets that is usually associated with a medieval field system. The rectangular and sub-rectangular fields more closely resemble the prehistoric "celtic fields" that tend to survive in the uplands and marginal areas away from intensive agriculture. Another parallel can be seen in the rectangular fields around the Roman civilian settlement at Tai Cochion 4.2km to the north-east (Hopewell 2016 forthcoming, Kenney 2015). The field pattern could have originated in the prehistoric or Roman period; Kenney's overview of medieval field systems (ibid) contains many examples of prehistoric field systems that either continued in use or were reused in the medieval period, and an early origin may explain the nature of the fields at Rhuddgaer.

The ridge and furrow of the phase 4 open field system appears to post-date the abandonment of the building and is not closely datable. The ridge and furrow is not on the scale of the classic English "Midland System". Welsh open fields tended to be on a smaller scale and their use is described in the Welsh laws prior to the Edwardian conquest in 1283 (ibid and Edwards 1997, 6, 8). The relationship between the ploughsoil created by the cultivation of the fields and the building was not investigated in detail during the excavation. The ploughing ran close to the building and probably disturbed surface deposits contemporary with its use in most areas but there is potential for datable stratified deposits in the area where ploughsoil has built up against the walls of the building.

The end of the open field system was defined by the sand inundation. This is assumed to be associated with a climatic downturn in the 14th and 15th centuries (Griffiths 2015). As noted above, the fields may have been buried during the documented storm of 1330 but again hard dating evidence is lacking. There may be potential for optical luminescence dating here.

The history of the sand dunes on the coastal edge to the south east of the Afon Braint is not known. It is clear that much of the area was brought back into cultivation probably in the post-medieval period. The later fields were not aligned with the medieval system, apart from along the line of a former drain or stream in a low area in the field. It therefore seems that the accumulated sand became stable enough for basic soil formation, which overlay and buried the earlier fields.

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APPENDIX 1 - THE RADIOCARBON DATING RESULTS





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RADIOCARBON DATING CERTIFICATE

09 November 2015

Laboratory Code	SUERC-63635 (GU39201)
Submitter	Jane Kenney Gwynedd Archaeological Trust Craig Beuno, Ffordd y Garth Bangor Gwynedd LL57 2RT
Site Reference Context Reference Sample Reference	G2246 Rhuddgaer 526 - revetment bank G2246Rh/01
Material	charcoal : willow / poplar
δ ¹³ C relative to VPDB	-25.3 ‰

N.B. The above ¹⁴C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

 1486 ± 31

The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email <u>Gordon.Cook@glasgow.ac.uk</u> or telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- E Durbar

Date :- 09/11/2015

Checked and signed off by :-

Glasgow

Radiocarbon Age BP

P. Nayonto

Date :- 09/11/2015





The University of Glasgow, charity number SC004401

Calibration Plot



Calibrated date (calAD)





Rankine Avenue, Scottish Enterprise Technology Park, East Kilbride, Glasgow G75 0QF, Scotland, UK Director: Professor R M Ellam Tel: +44 (0)1355 223332 Fax: +44 (0)1355 229898 www.glasgow.ac.uk/suerc

RADIOCARBON DATING CERTIFICATE

09 November 2015

Laboratory Code	SUERC-63636 (GU39202)
Submitter	Jane Kenney Gwynedd Archaeological Trust Craig Beuno, Ffordd y Garth Bangor Gwynedd LL57 2RT
Site Reference Context Reference Sample Reference	G2246 Rhuddgaer 547 - patch of burning in entrance G2246Rh/02
Material	charred plant remains : cereal (species unidentifiable)
δ ¹³ C relative to VPDB	-24.8 ‰

 1296 ± 31

N.B. The above ¹⁴C age is quoted in conventional years BP (before 1950 AD). The error, which is expressed at the one sigma level of confidence, includes components from the counting statistics on the sample, modern reference standard and blank and the random machine error.

The calibrated age ranges are determined from the University of Oxford Radiocarbon Accelerator Unit calibration program (OxCal4).

Samples with a SUERC coding are measured at the Scottish Universities Environmental Research Centre AMS Facility and should be quoted as such in any reports within the scientific literature. Any questions directed to the Radiocarbon Laboratory should also quote the GU coding given in parentheses after the SUERC code. The contact details for the laboratory are email <u>Gordon.Cook@glasgow.ac.uk</u> or telephone 01355 270136 direct line.

Conventional age and calibration age ranges calculated by :- E Durbar

Date :- 09/11/2015

Checked and signed off by :-

Radiocarbon Age BP

P. Nayonto

Date :- 09/11/2015



The University of Glasgow, charity number SC004401



Radiocarbon determination (BP)



Calibrated date (calAD)



Fig. 1 Location map - Rhuddgaer geophysical survey





Fig. 3 Geophysical survey - interpretation plan



Fig. 4 Detail of geophysical survey and location of the 2015 excavation









Fig. 7 Profile across building 530 showing wind-blown sand (from 2014 excavation, context numbers updated)



Fig. 8 Section through medieval ploughsoil against outer face of building 530 (from 2014 excavation, context numbers updated)





Fig. 11 SE facing section across SE wall of building and bank



Plate 1 - Orthographic image of the excavation from 3D model

Plate 2 - Orthographic image of the building from 3D model

Plate 3 - Building 530 after excavation

Plate 4 - Basal course of building 530; inner face of NW wall

Plate 5 - Building 530; NE corner and off-line facing (523 beneath 1m scale)

Plate 6 - Building 530; NW entrance

Plate 7 - Building 530; opposing entrances

Plate 9 - Medieval ploughing to NE of building, including furrow 518

Plate 10- Close-up of medieval ploughing to NE of building, including furrow 518 and 522 in foreground

Gwynedd Archaeological Trust Ymddiriedolaeth Archaeolegol Gwynedd

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