Bishops Palace, Bangor

Archaeological Mitigation: Assessment of Potential for Analysis (MAP2 Phase 3)

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Bishop's Palace, Bangor

Archaeological Mitigation: Assessment of Potential for Analysis (MAP2 Phase 3)

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SUMMARY

Gwynedd Archaeological Trust was commissioned by Atkins Ltd on behalf of STORIEL to undertake a programme of archaeological mitigation during the re-development of the former Bishop's Palace/Town Hall, located in Bangor, Gwynedd (NGR SH58007215). The present building is a Grade II listed, multi-phased structure, the earliest components of which date to the 16th century, although the site is known to have been occupied for significantly longer. The current report contains the post-excavation assessment results from the archaeological watching brief and targeted investigation completed between March 2014 and September 2015 during external landscaping works.

The ground works included the excavation of several service trenches to accommodate new lighting, drainage and electric cabling; these were located to the north, west and south of the building. In addition two archaeological trenches were excavated in order to target specific features, a walkway or 'processional way' and L-shaped wall foundations.

Ecofacts and artefacts and were recovered during the mitigation from across the entire site, with the majority located in the archaeological trenches at the southern end of the site. The artefacts included worked stone, metal and ceramic objects as well as faunal remains. All were processed and archived by GAT and then submitted for assessment to nominated specialists. Based on the assessment results, recommendations for further analysis have been made in specific circumstances.

The ecofacts were recovered from 12 selected deposits and the post-excavation assessment identified charred macroplant and charcoal suitable for radiocarbon dating.

The metal artefacts comprised 26 objects, including items made of copper alloy, iron and lead or lead alloy. Due to the small size of the assemblage it was deemed to have only very limited potential to contribute to the chronological and functional analysis of the activities at the Bishop's Palace.

The archaeometallurgical residue assessment found no indication that the assemblage was derived from metalworking: the fired clay and fuel ash slag was more typical of that found in cereal-drying kilns and semi-permanent domestic hearths, though other similar types of fire would also be capable of their generation.

The ceramic artefacts comprised a mix of medieval and post-medieval tablewares and those for serving and storing liquids and food as well as flower pots. The major part of the assemblage consists of common types of post-medieval pottery produced in North Wales,

the north west of England and the English Midlands. Three medieval sherds were also identified.

The faunal deposits, obtained from several extensive midden deposits have produced evidence of a wide range of species including wild and domestic mammals, fish and shellfish

The assemblage has for the most part yielded evidence compatible with a site of this period and status, and offers potential for the dating and better understanding of some of those features identified during the excavation stage.

Recommendations have been made for further post-excavation analysis of the ecofacts

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by *Atkins Ltd* to undertake a programme of archaeological mitigation during the re-development of the former Bishop's Palace/Town Hall, located in Bangor, Gwynedd (NGR SH58007215) (see figure 1).

This post-excavation report is focused on the archaeological watching brief and targeted investigation completed during external landscaping works undertaken between March 2014 and September 2015. The results of the archaeological mitigation during the structural development of the Bishop's Palace/Town Hall will be discussed in a separate report (Davidson, J. *forthcoming*).

The redevelopment works to the exterior of the Bishop's Palace included the excavation of several service trenches to accommodate new lighting, drainage and electric cabling; these were located to the north, west and south. Additional works included limited excavation to the west of the building in order to create the 'café breakout area', and more extensive works to the south in order to create a new path running southeast from the main entrance, surrounded by paving and car parking bays (see figure 2).

The area to the south of the Bishop's Palace lies in front of the principal façade and most recently featured a large grassed oval planting area surrounded by tarmac. This oval layout dated back to at least the early 19th century and is depicted on the John Wood's map of 1834. No previous archaeological investigation had been undertaken within this area, however, the Archaeological Management Plan prepared for the project by GAT (Davidson, J., 2014, GAT report 1155) identified 'unprecedented potential for the survival of evidence not only pertaining to the present structure, but also to possibly earlier medieval phases of construction and to unrelated prehistoric remains'.

GAT report 1314 should be consulted in tandem with this report for further information on the mitigation works.

GAT is undertaking this project in accordance with guidelines specified in *Management of Archaeological Projects – MAP2* (English Heritage, 1991), and relevant guidelines from *Management of Research Projects in the Historic Environment* (English Heritage 2015).

Five stages are specified in *Management of Archaeological Projects – MAP2* (English Heritage, 1991):

- MAP2 Phase 1: Project Planning
- MAP2 Phase 2: Fieldwork
- MAP2 Phase 3: Assessment of Potential for Analysis
- MAP2 Phase 4: Analysis and Report Preparation
- MAP2 Phase 5: Dissemination

The project design for the watching brief was undertaken as part of MAP2 Phase 1; the watching brief and targeted investigation were undertaken as part of the MAP2 Phase 2. The *assessment of potential for analysis* encompassed by the current report has been undertaken as part of MAP2 Phase 3. Any subsequent analysis/report preparation and dissemination will be undertaken as part of MAP2 Phases 4 and 5.

Reference has also been made to the following guidelines:

- Campbell, G., Moffett, L. and Straker, V. Environmental Archaeology: A guide to the theory and practise of methods, from sampling and recovery to post-excavation (2nd edition). (English Heritage Publications. Swindon, 2011).
- *Standard and Guidance for Archaeological Excavation* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- *Standard and Guidance for Archaeological Watching Brief* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives (Chartered Institute for Archaeologists, 2009 and 2014).
- Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Chartered Institute for Archaeologists, 2008 and 2014).

NB. All phases of this project are being monitored by the Gwynedd Archaeological Planning Services (GAPS). The content of this report and any future project designs and reporting must be approved by GAPS prior to final submission.

1.1 Research Aims

Site specific research aims taken from the Archaeological Management Plan (GAT report 1155):

- Identify evidence for pre-medieval activity surviving below ground.
- Identify evidence for medieval occupation which pre-dates the 16th century building programme.
- Establish the presence, form and location of the 16th/17th century outbuildings.
- Increase the understanding of the developments of the grounds and formal gardens.

Wider research aims taken from The Research Framework for the Archaeology of Wales:

- The identification and architectural development of medieval town buildings.

2 MAP2 PHASE 2 RESULTS

(Abridged and reproduced from GAT Report 1314)

This section provides a summary of the features identified during the excavation phase of this project. For the purposes of this section, context numbers within square brackets (e.g. [05]) represent cut features and features, such as pits, ditches etc. and context numbers within round brackets (e.g. (08)) represent deposits and fills.

2.1.1 Cobbled Surface

A cobbled surface (assigned feature no. [110]) was identified across multiple working areas to the south of the Bishop's Palace, primarily within the large central oval area which measured 28m x 15m. Recent planting and service trenches have caused localised disturbance but preservation on the whole was remarkable. The full extent of the surface is unknown; no defined edge was identified, though the surface was somewhat disturbed towards the eastern edge of the excavation area, likely associated with the development of the adjacent site in 2004. The surface did not appear in the majority of section A of the lighting trench, or any other work areas to the west of the central area, although some of these excavations were perhaps too shallow.

No contemporary footings for features or ornaments were identified cutting through the cobbled surface indicating that the area was left open, with no planting areas or subdivisions. The date for this surface is unknown; however it predates the most recent oval layout, which is shown on consecutive cartographic depictions of the site dating back to at least the early 19th century, John Wood's map of 1834 being the earliest. An 18th century date may therefore be posed.

The cobbles were set into a levelling layer (Context (083)/(085)), which measured 0.12m in depth and consisted of a dark grey-brown clay-silt containing stone inclusions as well as occasional fragments of mortar, animal bone and marine shell. A small copper artefact possibly a button or nail head (find no. 05) was found within this deposit towards the northern edge of the area.

2.1.2 Stone Flagged Surface

The removal of the majority of the cobbled surface revealed an underlying intact stone flagged surface (assigned feature no. [111]), which covered a similar area to the cobbles and again survived in remarkable condition. The slabs measured <0.05m thick and <1.0m across and were fitted closely together, but were not bonded. No contemporary footings for features were identified within this surface either, indicating the change from flagstones to cobbles did not represent a significant change of use. The replacement was therefore likely a stylistic move, perhaps coinciding with the arrival of a new Bishop at Bangor. It is recorded that renovations to the house and grounds were numerous, as the high status property was kept up to date with contemporary fashions, and new Bishop's made their presence felt. The decision not to lift and recycle the stone paving prior to the laying of the cobbles may reflect a degree of affluence, though may also have been due to the rather wet ground conditions. The precise date of this surface is unclear, though it may confidently be ascribed to the 18th century, though likely somewhat earlier.

2.1.3 Processional Way

A linear break in the cobbled and stone flagged surface (feature no. [144]), some 3.15m wide was observed running northwest/southeast, lining up with the main door of the Bishop's Palace and an existing path leading up towards the Cathedral. This walk way or 'processional way' appears to represent the principal route the Bishop would have followed from the Palace to the Cathedral; the exposed section follows a direct course between the two sites. This route is contemporary with both the stone and cobbled surfaces, but was replaced with a more circuitous one when the cobbles were covered over, most likely in the 18th century.

This feature was targeted by archaeological Trench 1, which sought to investigate the construction of the walkway. Excavation revealed a notable absence of any real surfacing; a deposit of yellow sandstone had more of the appearance of a hard-core layer; given the quality of the surrounding surfaces it is likely that the main surface was removed prior to the resurfacing of the site. The continuation of the walkway was not found within the lighting trench to the south, but this is likely because the relevant trench section (B) was not excavated to a sufficient depth.

2.1.4 Structures

2.1.4.1 Wall Foundation to the West of the Bishop's Palace

The foundations of a probable wall (Context [003]) were identified to the west of the Bishop's Palace at the southwest end of the cable trench. This feature was 1.88m wide and 0.25m high and was constructed from un-bonded irregular sized cobbles and orientated northwest/southeast. Several artefacts were recovered from within the fabric of the wall including two sections of a clay pipe stem (find no. 21), the tooth of a large mammal (find no. 23) and two small sherds of pot, one of which featured a yellow glaze (find no. 22). The wall lay within a possible foundation cut [004], though this feature was not fully investigated as it extended beyond the limit of excavation. The wall was sealed by a rubble deposit (002) that comprised poorly sorted cobbles within a compact grey-brown silt matrix. Fragments of bone from a large mammal (find no. 20); a pottery sherd from the rim of a large vessel (find no. 19) and a piece of dressed stone (find no. 24) were all obtained from this deposit, which was sealed by the topsoil.

2.1.4.2 Northeast/southwest Orientated Wall to the south of the Bishop's Palace

The foundations of a second wall (Context [077]), were found towards the northern end of section E of the lighting cable trench, to the south of the Bishop's Palace. This feature was covered by a sequence of modern levelling and surfacing deposits and a slightly disturbed cobbled deposit (Context (069)), which did not comprise a properly laid surface, though it is presumed part of feature no. [110]. The cobble deposit sealed associated levelling deposits (Context (070)) to the north and (Context (080)) to the south. The wall was orientated northeast/southwest and was rubble built of mixed rough blocks and bonded using a coarse lime mortar. In the west facing section of the trench the wall measured 0.87m wide and >0.40m high; the masonry was observed continuing across the base of the trench, but did not appear in the opposing section, indicating a possible doorway. This wall did however appear in the drainage trench excavated to the immediate west.

2.1.4.3 L-shaped wall foundation to the South of the Bishop's Palace

The stone surface (feature no [111]) was for the most part left in situ, however in the southwest corner of the oval area to the south of the Palace the slabs had subsided and these were lifted during the machining process to reveal the corner of a presumed building foundation. This area was targeted by archaeological Trench 2.

The removal of the stone flags (Context (116)) and the underlying levelling deposit (Context (117)) revealed an L-shaped section of wall [109] which continued beyond the edge of excavation to the northeast and southeast. It is probable that wall [076] recorded in Lighting Cable Trench E was a continuation of this structure. The rubble built wall was c. 0.80m wide and randomly coursed of roughly hewn poorly sorted stone bonded using a coarse lime mortar. It had a double skin construction with some core material and clear facing to either side. This wall was not excavated and was preserved in situ.

The deposits enclosed within the wall comprised a thin patch of midden deposit (Context (118)), which contained a variety of marine shell and animal bone. Below this was a sequence of five intercutting pits: two of these (Contexts [122] and [126]) were small and sub-circular and were excavated in their entirety, the first measured 0.25m wide and was 0.25m deep whilst the second measured 0.4m across and 0.07m deep. The remaining cut features (Contexts [128], [134] and [135)] where larger, relatively shallow and appeared to be somewhat amorphous in shape, though none were seen in their entirety. The function of these pits was unclear, their fills were for the most part characterised by demolition material, stone and mortar in varying quantities, with minimal occupation waste.

The pits truncated a 0.2m thick deposit (Context (124)) comprising lenses of brightly coloured burnt clay and dense charcoal, apparently representing a phased episode of burning. This deposit partially overlay the wall [109] in the southern corner of the trench and the stones of the wall in this area were fractured indicating in situ burning. This deposit overlay a small patch of shale and animal bone (137) which was the last deposit to be excavated. It is understood that all the deposits described above post-date the demolition of the structure as they overlie the top of the wall.

2.1.5 Midden Deposits

2.1.5.1 Midden to the south of the Bishop's Palace

At the base of section E of the Lighting Cable Trench a rich midden deposit (Context (062)) was identified, built up against the southern face of a wall foundation (Context [077]), this continued along the base of the trench for *c.*8.10m and was >0.18m thick. The midden comprised a soft dark brown silt-clay deposit with numerous whole and broken marine shells, including frequent oyster and mussel shells and less frequent smaller bi-valves including cockles and occasional gastropods such as winkles. Occasional whole and broken mammal and bird bones were also noted along with small to medium sub-angular cobbles. Two sherds of a coarse glazed pot (find no.1) of a possible late medieval date were obtained from this deposit.

Within the lamp post footing (no.5) at the northern end of this trench a second midden deposit (Context (073)) was observed at the base of the trench, 1.00m below the surface level; it was not possible to fully record this due to significant water table ingress.

2.1.5.2 Midden to the west of the Bishop's Palace

A third midden deposit (Context (001)) was observed at the base of the drainage trench located 4.7m west of the Bishop's Palace. This deposit was sealed by the topsoil and measured >0.35m in width and 1.2m in length and comprised a firm black silt-clay containing frequent charcoal inclusions. Sherds of a fine, handled vessel, with combed slipware decoration (find no. 018) were found in the top of this deposit, indicating a possible 18th century date. The full extent of the midden was not identified within the confines of the trench.

2.1.6 Stone Built Culvert

A northwest/southeast orientated stone culvert (Context [154]) was observed to the west of the Bishop's Palace. This feature, which cuts the subsoil, was 0.3m deep and 0.6m wide and had a dry stone lining [155] with slate slabs forming a cap which was sealed by the topsoil. It is presumed to be of a post-medieval date.

2.1.7 Paleochannel

A substantial paleochannel [091] was identified running below the walkway in archaeological Trench 1, and is presumed to be a former tributary to the now culverted Afon Adda. It measured >0.75m deep and >0.95m wide. Based on its northwest/southeast orientation it appears to run directly beneath the Bishop's Palace. The lower layers within this channel appeared to be the product of natural alluvial deposition however the upper deposits contained demolition and occupation material and thus represent deliberate backfilling. This indicates the channel was still active immediately prior to the construction of the Bishop's Palace; the water was presumably diverted along a different course during the development of the site and the channel filled in.

3 METHODOLOGY: ECOFACT ASSESSMENT

3.1 Introduction

The sampling strategy for bulk soil samples was based on the perceived character, interpretational importance and chronological significance of the strata under investigation. This ensured that only significant deposits were sampled. The aim of the sampling strategy was to recover carbonised macroscopic plant remains and faunal remains. The samples simultaneously enabled the recovery of any small artefacts not recovered during excavation.

A total of 13 bulk samples were initially taken, 12 of which were assessed during this phase of work (sample no. 2 could not be processed). The samples were recovered from Trenches 1 and 2 and lighting cable trench (Trench E), as indicated in Figure 02.

Table 1: bulk soil sample register

Sample No.	Context No.	Sub area	Context Description
1	(062),	Lighting cable Trench E	Midden deposit
2	(096),	Trench 1	Wood
3	(117),	Trench 2	Possible levelling deposit
4	(118),	Trench 2	Midden deposit
5	(119),	Trench 2	Fill of truncated feature [128]
6	(123),	Trench 2	Sole fill of pit [122]
7	(125),	Trench 2	Pink clay deposit
8	(127),	Trench 2	Fill of small pit [126]
9	(131),	Trench 2	Stony fill of cut feature [134]
10	(132),	Trench 2	Secondary fill of [135]
11	(124),	Trench 2	Lensed burnt deposit - taken from a lense of burnt clay
12	(124),	Trench 2	Lensed burnt deposit - taken from a lense of charcoal
13	(137),	Trench 2	Stony deposit containing animal bone

3.2 Methodology

The bulk soil samples were assessed in two stages, based on the following methodology:

1. The samples were initially processed in house by GAT. This consisted of flotation and wet sieving using a 250 micron mesh for flotation. The residues were subsequently dried and sorted to recover finds and non-floating ecofacts. All residues were also tested for magnetic metalworking debris and this was collected where it was present. Once sorted the residues were discarded. Finds recovered were

included within the site finds register and submitted to appropriate specialists for analysis and further recommendations (cf. para. 6).

2. The flots were weighed, catalogued and sent in their entirety for specialist assessment by *AOC Archaeology*. The flots were sieved using a 4mm, 2mm and 1mm system of stack sieves and subsequently examined under magnification (x10 and up to x100). Macroplant identifications were completed using modern reference material and seed atlases stored at AOC Edinburgh. Taxonomic and nomenclature for plants were based on Stace,C. 2010. *New Flora of the British Isles*. 3rd Edition. Cambridge University Press. Charcoal fragments 4mm and larger were collected for species identification and recommendations were made for any subsequent analysis and radiocarbon dating.

A copy of the assessment report by AOC Archaeology is included within Appendix II.

Recommendations for post-excavation analysis and radiocarbon dating will be defined in detail in a separate MAP2 Phase 4 project design prepared by GAT.

4 METHODOLOGY: ARTEFACT ASSESSMENT

4.1 Introduction

All artefacts recovered for post-excavation assessment were initially processed in house by GAT and were catalogued and grouped by material type; selected artefacts were then cleaned and prepared for specialist assessment.

4.2 Petrological Assessment of Stone Artefacts

The assemblage included two pieces of dressed stone, recovered from Trench 2 and lighting cable trench A (Figure 02, these were assessed by Andrew Haycock, Curator of Mineralogy and Petrology at the National Museum Wales.

Table 2: dressed stone artefacts

Find no.	Sub division	Context	Context Description	Object Description	Weight (g)
15	Trench 2	(116).	Stone flagged surface	Sample piece of a stone flag	817
24	Lighting Cable trench A	(003).	Foundations of a probable wall located to the west of the Bishop's Palace	Dressed stone	20

4.2.1 Methodology

A petrological examination of the archaeological finds was undertaken following standard methodology detailed in British Standard EN 12407(2007); initial observation was made with the naked eye followed by use of a x10 Gowllands lens and x20 Gem-A lens. Observations were restricted to visual identification.

During visual examination, the colour of the stone was estimated using standard Munsell colour charts and is presented thus (Munsell number [colour name]), and the grain size characterised using standard terminology (very-fine grained < 187µm, fine-grained 187 – 250µm, medium-grained 250 – 500µm, coarse 500 – 1000µm, very coarse 1 – 2mm, granules 2 – 4mm, pebbles > 4mm). The petrological samples were all imaged using a Canon EOS 5D with 24 – 105mm lens. A copy of the report is included in Appendix III.

4.3 Metal Artefact assessment

The assemblage included 14 metal finds (a total of 26 individual items, some of which were grouped together under a single find no.). Of these 10 were initially sent to Phil Parkes, Senior Conservator at Cardiff University to be x-rayed. The artefacts and accompanying x-rays were then submitted to Jörn Schuster, Metal Object Specialist at ARCHÆOLOGICALsmallFINDS (AsF) for assessment. The metal artefacts were recovered from Trench 2, lighting cable trench E and the Oval shaped area (Figure 02).

Table 3: metal artefact register

Find No.	Sub area	Context	Context description	Object Description	Weight (g)	X-ray?	Analysis?
5	Oval area	(085).	Levelling layer for cobble surface	Copper nail/button	3	No	Yes
7	Trench 2	(117).	Possible levelling deposit for stone flagged surface	Fe object	7	Yes	Yes
12	Trench 2	(131).	Demolition/levelling deposit within possible medieval structure	Fe object	14	Yes	Yes
13	Trench 2	(119).	Possible levelling deposit for stone flagged surface	Fe object	15	Yes	Yes
29	Lighting cable Trench E	(062).	Midden deposit	3 small corroded iron objects	12	Yes	Yes
30	Lighting cable Trench E	(062).	Midden deposit	1 dress making pin, copper	1	No	Yes
37	Trench 2	(117).	Possible levelling deposit	1 round corroded iron stud	3	Yes	Yes
48	Trench 2	(119).	Fill of truncated feature [128]	3 small iron fragments	1	Yes	Yes
59	Trench 2	(125).	Pink clay deposit	1 small possible nail	1	Yes	Yes
68	Trench 2	(131).	Stony fill of cut feature [134]	2 small corroded iron objects	17	Yes	Yes
73	Trench 2	(132).	Secondary fill of [135]	Occasional corroded Iron fragments	17	Yes	Yes
76	Trench 2	(132).	Secondary fill of [135]	Occasional lead fragments	5	No	Yes
89	Trench 2	(137).	Stony deposit containing animal bone	1 small corroded iron object	8	Yes	Yes
3	Unstrat.	N/A	N/A	Possible coin fragment	<1	No	Yes

4.3.1 Methodology

Those objects that required x-raying were x-rayed using a Faxitron 43805 cabinet system. X-ray films were digitised using an Array Corporation 2905 Laser Film Digitiser.

The objects were then examined visually and, where required, with hand lenses (x4, x8 magnification). Basic type identifications such as ‘pin’ or ‘nail’ were recorded. Broad period dates attributed to the finds are based on the intrinsic dates of the finds established by comparison to known parallels and typologies. X-radiographies prepared of all iron objects by Cardiff Conservation Services aided identification of further details where necessary. Object identification, measurements, including weight, and detailed descriptions as well as contextual details were entered into an Excel spreadsheet (available in the archive). Recommendations for mineral remains analysis, additional x-raying and conservation treatment (cleaning/ stabilisation/ reconstruction) as well as illustration have been considered and, where deemed necessary, noted in the spreadsheet. A copy of the report is included in Appendix IV.

4.4 Archaeometallurgical Residue Assessment

The assemblage included 2 samples of possible archaeometallurgical residue. These were submitted to Tim Young at GeoArch for analysis. The archaeometallurgical residue was recovered from Trench 2 as indicated in Figure 02:

Table 4: Archaeometallurgical Residue register

Find No.	Sub area	Context	Context description	Object Description	Weight (g)
80	Trench 2	(124).	Lensed burnt deposit - taken from a lense of burnt clay	Possible slag/hammerscale	180
84	Trench 2	(124).	Lensed burnt deposit - taken from a lense of charcoal	Possible slag/hammerscale	12

4.4.1 Methodology

All materials were examined visually with a low powered binocular microscope where required.

A copy of the report is included in Appendix V.

4.5 Ceramic Artefact Assessment

The assemblage included 12 ceramic finds (a total of 41 individual pottery sherds, some of which were grouped together under a single find number). These were submitted to Julie Edwards, a specialist in medieval ceramics, for assessment. The ceramic artefacts were recovered from four key areas as indicated in Figure 02:

Table 5: Ceramic Artefact Residue register

Find No.	Sub area	Context	Context description	Object Description	Weight (g)
1	Lighting Cable trench E	(062).	within midden deposit	2 sherds of possibly late medieval pottery	30
2	Lighting Cable trench E	(039).	Levelling layer below cobbled surface (039)	C20th pot fragments	6
6	Trench 2	(112).	Cobbled surface	Buckley ware sherd	14
8	Trench 2	(117).	Possible levelling layer below the stone flagged surface	4 sherds of black glazed post-medieval pottery	23
9	Trench 2	(123).	Fill of a small pit	1 sherd of black glazed post-medieval pottery (handle section)	8
10	Trench 2	unstrat.	Unstratified pot sherds from above the level of stone surface [111]	Pot sherds	99
11	Trench 2	unstrat.	Unstratified pot sherds from below the stone flagged surface	1 sherd of partially glazed pottery	17
14	Trench 2	(117).	Possible levelling layer below the stone flagged surface	1 sherd of black glazed post-medieval pottery	7
17	Drainage trench	(107).	Disturbed cobble deposit	1 large sherd of red-black glazed pottery	142
18	Lighting Cable trench A	(001).	Charcoal rich deposit	15 sherds from a single, handled, yellow combed slipware ceramic vessel (18th century?)	151
19	Lighting Cable trench A	(002).	Rubble deposit overlying wall	Pottery sherd	84
22	Lighting Cable trench A	(003).	Wall foundation	Pot sherds	7

4.5.1 Methodology

The pottery was recorded to basic record level as defined by *A Standard for Pottery Studies in Archaeology* (PCRG, SGRP, MPRG 2016) it has therefore been quantified by sherd

count, weight and EVEs by ware type and form within context groups. The terms used to identify wares are those employed in the Cheshire West and Chester Council fabric reference collection, modified for the post-medieval wares with terms recommended by the Potteries Museum, Stoke on Trent during English Heritage (now Historic England) sponsored training courses, run in conjunction with the Medieval Pottery Research Group. The weights given are to the nearest gram. The data has been recorded in an Excel spreadsheet that accompanies the report; this report summarises the data and discusses the assemblage from each trench on the site. Fabric descriptions are given for the two unidentified wares. Recommendations are given for further work and archiving.

A copy of the report is included in Appendix VI.

4.6 Animal Bone and Mollusc shell Assessment

The assemblage included twelve samples of mixed animal bone and mollusc shell. These were submitted to James Rackham and Alison Foster of the Environmental Archaeology Consultancy (EAC) for assessment. The animal bone and mollusc shell were recovered from five key areas as indicated in Figure 02:

Table 6: Animal bone and mollusc shell register

Find no.	Sub division	Context	Context Description	Description	Weight (g)
4	Trench 1	(081).	Uppermost backfilled deposit within paleochannel [091]	Animal bone	5
16	Drainage trench	(108).	Levelling layer	Animal Bone	20
20	Lighting Cable trench A	(002).	Rubble deposit	Animal bone	122
23	Lighting Cable trench A	(003).	Wall	Animal tooth	18
25	Lighting cable Trench E	(062).	Midden deposit	Frequent fragments, ranging from large mammal to rodent & fish	266
33	Trench 2	(117).	Possible levelling deposit	Occasional fragments of mixed animal bone	5
41	Trench 2	(118).	Midden deposit	Frequent fragments of mixed animal bone, ranging from large mammal to rodent	320
45	Trench 2	(119).	Fill of truncated feature [128]	Frequent fragments, ranging from large mammal to rodent	112
51	Trench 2	(123).	Sole fill of pit [122]	Occasional fragments of mixed animal bone	4
55	Trench 2	(125).	Pink clay deposit	Occasional fragments of mixed animal bone	1
60	Trench 2	(127).	Fill of small pit [126]	Occasional fragments of mixed animal bone	1
64	Trench 2	(131).	Stony fill of cut feature [134]	Occasional fragments of mixed animal bone	2
69	Trench 2	(132).	Secondary fill of [135]	Occasional fragments of mixed animal bone	12
77	Trench 2	(124).	Lensed burnt deposit - taken from a lense of burnt clay	Moderately frequent fragments of mixed animal bone	34
81	Trench 2	(124).	Lensed burnt deposit - taken from a lense of charcoal	Frequent fragments, ranging from large mammal to rodent	83
85	Trench 2	(137).	Stony deposit containing animal bone	Moderately frequent fragments of mixed animal bone	55

4.6.1 Methodology

All fragments of bone and shell over 2mm in diameter were counted and weighed and an archive catalogue of the animal bone was produced, this includes:

- the number of fragments in the entry;
- from which side a bone comes, i.e. left side/right side/ fragment;
- the fused/unfused condition of the epiphyses;
- the part of the bone present;
- whether a bone has been chopped, cut, worked or burnt;
- whether a bone has been gnawed by dogs, cats or rodents;
- tooth wear;
- measurements;
- pathological evidence and
- condition.

A copy of the report is included in Appendix VII.

5 RESULTS: ECOFACT ASSESSMENT

5.1 Bulk Sample Processing

GAT processed 12 samples from across the site. The samples were taken with a view to recovering charred macroplant for assessment and dating and were processed in accordance with the methodology defined in para. 4.1. A summary of the results from the flotation process and subsequent coarse residue sorting are presented below.

5.1.1 Floatation Results

Table 7: Flotation results

Sample No.	Context	Sub area	Context Description	Weight (Kg)	Volume (L)	No. trays	No. flots	Notes
1	(062),	Lighting cable Trench E	Midden deposit	11.5	8.5	4	1	Charcoal, shell & bone
2	(096),	Trench 1	Wood	*	*	*	*	NOT PROCESSED
3	(117),	Trench 2	Possible levelling deposit	11.2	9	4	1	Shell & Charcoal
4	(118),	Trench 2	Midden deposit	9.7	9	3	1	Bone, Shell & Charcoal
5	(119),	Trench 2	Fill of truncated feature [128]	11.4	9	4	1	Bone, Shell & Charcoal
6	(123),	Trench 2	Sole fill of pit [122]	5.5	4	2	1	Bone, Shell & Charcoal
7	(125),	Trench 2	Pink clay deposit	10.9	8	2	1	Roots & Clay
8	(127),	Trench 2	Fill of small pit [126]	2.69	3	1	1	Charcoal & very little coarse material
9	(131),	Trench 2	Stony fill of cut feature [134]	14	9	7	1	Shell, mortar
10	(132),	Trench 2	Secondary fill of [135]	9	9	4	1	Charcoal, shell & roots
11	(124),	Trench 2	Lensed burnt deposit - taken from a lense of burnt clay	10.7	9.5	2	1	Some charcoal & root material
12	(124),	Trench 2	Lensed burnt deposit - taken from a lense of charcoal	9	10	2	4	Large amount of charcoal, some root material
13	(137),	Trench 2	Stony deposit containing animal bone	13.7	9.5	5	1	shell, slate - flot very small

5.1.2 Coarse Residue Results

Table 8: Coarse residue processing results

Sample No.	Bone	Carbonised plant remains	Shell	Pottery	Glass	Metal	Mortar and CBM	Coal
1	Frequent, ranging from large mammal to rodent & fish	Modrately frequent charcoal fragments	Frequent marine (various)	N/A	1 Fragment (green)	3 corroded Fe., 1 copper pin	Moderate	N/A
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Occassional mixed	Modrately frequent charcoal fragments	Moderate marine (various)	4 sherds of black glazed pot	N/A	Small Fe. Nail/stud	Moderate	Moderatly frequent
4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	Infrequent	Charcoal	Infrequent marine (various)	N/A	N/A	N/A	Infrequent	N/A
9	Infrequent	Charcoal	Frequent marine (various)	N/A	N/A	2 corroded Fe. Pieces (Nails?)	Frequent	N/A
10	Occasional, ranging from large mammal to rodent, inc burnt	Charcoal	Moderately frequent marine (various)	N/A	1 Fragment (green)	1 lead strip, several possible rusted fragments	Moderate	N/A
11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	Frequent, ranging from large mammal to rodent, occassionally burnt	Frequent charcoal	Occassional oyster shell	N/A	N/A	Occassional spheroidal hammerscale & slag fragments	N/A	N/A
13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5.2 Environmental Assessment

5.2.1 The macroplant assemblage

A small charred macroplant assemblage of 20 remains was recovered from across seven samples. Preservation of these remains ranged from poor to good. The macroplant assemblage was dominated by cereal caryopses and the species. Eleven oat (*Avena* sp), one hulled barley (*Hordeum vulgare* L), two barley (*Hordeum* sp), two bread club wheat (*Triticum aestivum*-type) and one wheat (*Tritium* sp) were recovered. The remaining two cereal caryopses could not be identified further due to poor preservation. In addition to the cereal caryopses a single fragment of hazelnut shell (*Corylus avellana* L) was recovered. There is no evidence of either selective or deliberate disposal of these remains within particular features.

Table 9: Reproduction of table 2 Charred macroplant results (AOC, 2016):

Sample			1	3	5	7	10	11	13
Find			26	34	46	56	70	78	86
Context			62	117	119	125	132	124	137
Area			TR E	TR 2	TR 2	TR 2	TR 2	TR 2	TR 2
Flot Vol (ml)			30	30	200	20	50	25	10
Weight (g)			21	20	109	7	43	9	10
% Sort			100	100	100	100	100	100	100
Hordeum vulgare L.	Hulled barley	Caryopsis/es		1					
Hordeum sp.	Barley	Caryopsis/es		1		1			
Triticum aestivum-type	Bread/club wheat	Caryopsis/es	1			1			
Triticum sp.	Emmer/spelt	Caryopsis/es							
Triticum sp.	Wheat	Caryopsis/es	2					1	
Avena sp.	Oat	Caryopsis/es		1	1	3	3		1
Cerealia sp.	Cereal	Caryopsis/es		1					1
Corylus avellana L.	Hazel	Nutshell (frags)	1						

A copy of the assessment report by AOC Archaeology is included within Appendix II.

5.2.2 The charcoal assemblage

Charcoal fragments suitable for species identification were recovered from eleven samples. The identifiable assemblage totalled 131.6g. Charcoal fragments smaller than 4mm were noted in sample 8 from context [127] but these were unsuitable for species identification and radiocarbon dating. The species identified comprised alder (*Alnus glutinosa* L) which formed 37% of the assemblage followed by oak (*Quercus* sp) 28%, apple/pear/hawthorn/quince (*Maloideae* sp) 18%, birch (*Betula* sp) 7%, ash (*Fraxinus* sp) 5% and hazel (*Corylus avellana* L) 5%. These remains were concentrated in samples 5

[119] and 12 [124]. Sample 5 described as a truncated feature contained 49.1g of mixed species including roundwood. Sample 12 recorded as a burnt deposit had 51.6g of mixed species. The next largest concentrations of charcoal were observed in sample 1 [62] (9.3g), sample 4 [118] (8.8g), sample 10 [132] (6.6g) and sample 3 [117] (3.8g), All six of these contexts had two or more species which is normally an excellent indicator of the presence of fuel debris rather than for the burning of a structure or artefact. The charcoal from the remaining five contexts was present only in very small quantities and none exceeded 1g.

Table 10: Reproduction of table 2 the charcoal species results (AOC, 2016):

Sample	Find	Context	Area	Species	Name	No	RW	Weight (g)
1	26	62	Tr E	*Fraxinus* sp.	Ash	1		
1	26	62	Tr E	*Alnus glutinosa* L.	Alder	3		
1	26	62	Tr E	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
1	26	62	Tr E	*Quercus* sp.	Oak	3		9.3
3	34	117	Tr 2	*Fraxinus* sp.	Ash	1		
3	34	117	Tr 2	*Alnus glutinosa* L.	Alder	3		
3	34	117	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
3	34	117	Tr 2	*Quercus* sp.	Oak	3		3.8
4	42	118	Tr 2	*Alnus glutinosa* L.	Alder	4		
4	42	118	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
4	42	118	Tr 2	*Betula* sp.	Birch	1		
4	42	118	Tr 2	*Quercus* sp.	Oak	2		8.8
5	46	119	Tr 2	*Alnus glutinosa* L.	Alder	5		
5	46	119	Tr 2	*Fraxinus* sp.	Ash	1		
5	46	119	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
5	46	119	Tr 2	*Quercus* sp.	Oak	1	1	49.1
6	52	123	Tr 2	*Alnus glutinosa* L.	Alder	1		0.2
7	56	125	Tr 2	*Fraxinus* sp.	Ash	1		
7	56	125	Tr 2	*Alnus glutinosa* L.	Alder	3		0.5
9	65	131	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	1		
9	65	131	Tr 2	*Quercus* sp.	Oak	1		0.4
10	70	132	Tr 2	*Alnus glutinosa* L.	Alder	4		
10	70	132	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	1		
10	70	132	Tr 2	*Corylus avellana* L.	Hazel		2	
10	70	132	Tr 2	*Quercus* sp.	Oak	2	1	6.6
11	78	124	Tr 2	*Betula* sp.	Birch	2		0.8
12	82	124	Tr 2	*Alnus glutinosa* L.	Alder	5		
12	82	124	Tr 2	*Betula* sp.	Birch	2		
12	82	124	Tr 2	*Corylus avellana* L.	Hazel	2		
12	82	124	Tr 2	*Quercus* sp.	Oak	2		51.6
13	86	137	Tr 2	*Quercus* sp.	Oak	5		0.5

5.2.3 Recommendations

The main objective of this environmental assessment was to isolate material for radiocarbon dating. Material suitable for dating was noted in 10 samples. Given the small amounts of macroplant present, charcoal where possible, has been selected for dating, and samples other than oak have been isolated. Oak is a slow growing species and unless bark edge material is present it can prove unreliable in dating. Sample 8 [127] did not contain any charred macroplants nor was the charcoal within this context suitable for dating. The only material from sample 13 (context (137)) was oak charcoal, one oat caryopsis and one cereal. None of this material appears promising as given the preservation of the cereal it is unlikely the caryopses will provide sufficient carbon for dating. The recommendations for the remaining 10 samples are presented below and suitable material has been isolated from each sample.

Table 11: material for radiocarbon dating:

Sample No.	**Context No.**	**Species**
1	(62)	Alder, apple/pear/hawthorn/quince or ash charcoal
3	(117)	Alder, apple/pear/hawthorn/quince or ash charcoal
4	(118)	Alder, apple/pear/hawthorn/quince or birch
5	(119)	Alder, apple/pear/hawthorn/quince or ash charcoal
6	(123)	Alder
7	(125)	Alder or ash charcoal
8	(127)	Not suitable
9	(131)	Apple/pear/hawthorn/quince
10	(132)	Alder, Apple/pear/hawthorn/quince or hazel roundwood
11	(124)	Birch
12	(124)	Alder, birch or hazel
13	(137)	Not suitable

6 RESULTS: ARTEFACT ASSESSMEMT

6.1 Stone Artefacts

The two dressed stone artefacts were assessed by Andrew Haycock. The first, find no. 15, a sample piece of the stone flagged surface (116) was identified as an extremely fine grained, homogeneous, reddish-grey laminated mudstone. The nature of the laminations perpendicular to jointing and the rock's ability to be split into large slabs (whether naturally or by hand) would have made it an ideal choice as a flooring slab. It is deemed highly likely that these slabs were sourced from the local bedrock.

The second stone artefact, find no. 24, a piece of dressed stone obtained from the foundations of a probable wall located to the west of the Bishop's Palace (003) was identified as a very quartz-rich, well-sorted sandstone. The sample shows obvious evidence of having been worked by hand, and represents a fragment of a larger piece of worked stone. The fabric matches the less pebbly component of the 'Anglesey Grits', sandstone horizons within the Carboniferous Loggerheads Limestone Formation which crops out to the north-east and north-west of Penmon, Anglesey.

A copy of the report is included in Appendix III.

6.1.1 Recommendations

No further recommendations for these items were made at this stage. However it is recommended that the entire assemblage is retained for archival reference and will be offered to the regional museum accordingly.

6.2 Metal Artefacts

The assemblage comprised 26 objects, including items made of copper alloy, iron and lead or lead alloy. One item, a copper nail or button, was not present for assessment and has not been included in the subsequent quantification. The small finds in this report are arranged in groups of functional categories following Crummy (1983, 5–6). A breakdown by material and category of all finds is shown in Table 1. The objects were recovered from seven contexts, predominantly located in Trench 2; two iron nails and a copper alloy pin were found in lightning cable Trench E, the above-mentioned nail or button came from the oval area, and a lead/tin alloy token was recorded as unstratified.

Table 12: Reproduction of Table 1. Number of objects per material and functional category (ASF 2016)

Functional category	**Copper alloy**	**Iron**	**Lead alloy**	**Grand Total**
Personal	1	0	0	1
Construction	0	0	1	1
Fitting	0	13	0	13
Commerce	0	0	1	1
Uncertain	0	0	9	9
Grand Total	**1**	**13**	**11**	**25**

A copy of the report is included in Appendix IV.

6.2.1 Recommendations

No further recommendations for these items were made at this stage. However it is recommended that the entire assemblage is retained for archival reference and will be offered to the regional museum accordingly.

6.3 Archaeometallurgical Residues

Based on the findings of the archaeometallurgical residue assessment the assemblage comprised approximately 190g of material, dominantly fired clay and fuel ash slag. The fuel ash slag included both small accumulations in a thin sheet and, in one sample, abundant small spheroidal particles. Fragments of fuel ash in sheet form commonly had adhering spheroidal particles. Many of the fuel ash particles showed a variegated khaki to maroon surface colour, typical of clinkers. In this instance, no certain coal-residue particles were observed, and the slaggy materials were probably derived from melting of wood ash and clay-rich substrate.

There is no indication that the assemblage was derived from metalworking. Fuel ash slags of this general type occur widely in the ashes of large hearths and kilns. Considerable periods of time may be required for the generation of significant build-ups of this class of fuel ash in wood fires, and they appear to preferentially occur in association with cereal-drying kilns and semi-permanent domestic hearths, but other similar types of fire would also be capable of their generation.

A full copy of the report is included in Appendix V.

6.3.1 Recommendations

No further recommendations for this material were made at this stage. However it is recommended that the entire assemblage is retained for archival reference and will be offered to the regional museum accordingly.

6.4 Ceramic Artefacts

The ceramic assemblage comprised forty-one sherds, 16 of which were from a single vessel. The assemblage was found to be domestic in character, representing a mix of medieval and post-medieval tablewares and those for serving and storing liquids and food as well as flower pots. The major part of the assemblage consists of common types of post-medieval pottery produced in North Wales, the north west of England and the English Midlands.

6.4.1 Medieval

Three sherds were identified as being of a medieval date. The earliest is identified as a piece of 13th century Saintonge ware (find no. 11); the principle type of Continental medieval pottery in the North Wales and Chester region, generally linked to the trade in wine between France and the west coast ports of Britain. Its occurrence locally in archaeological assemblages tends to be restricted to sites of relatively high status e.g. castles and ecclesiastical establishments or to areas with close contact with maritime ports; the association of this piece with the Bishop's Palace is therefore appropriate. This fragment, the medieval Cheshire type pottery from (022) (find no. 3) and the potential late medieval ware from (062) (find no. 01) adds to the small amount of medieval pottery found in recent years in the centre of medieval Bangor associated with the Bishop's Palace.

Table 13: Medieval ceramic artefacts

Find no	**Context**	**Context type**	**Ware**	**Date range**	**Comments**
22a	3	Wall	Medieval	13th/14th?	Two joining sherds, abraded, very small spot of glaze survives
1	62	Midden deposit	Late medieval/ Transitional glazed ware	15th/16th?	2 sherds of sandy ware with reduced glaze similar to Merseyside transitional types
11	Unstratefied	N/A	Saintonge - smooth grgl	c.1270-1300	1 jug sherd of smooth green glaze, abraded

6.4.2 Post-Medieval

The 17th to 18th century blackwares make up the majority of the assemblage. This pottery type provided a wide range of vessel forms for eating, drinking, serving, food preparation and storage functions and proportionally they are the most common ware in assemblages of this period. The white salt-glazed stoneware (find no.10) however is a relatively fine tableware which would not be out of place in a prosperous 18th century household.

The overall condition of the assemblage suggests that it is not in its original place of deposition and is derived from disturbed deposits and therefore it is difficult to draw any conclusions on the nature of occupation represented by the deposits in which the pottery was found, the types of post-medieval wares would not have been out of place in a high status home where a variety of wares would have been in use in both the householder and servants quarters.

Table 14: Post-Medieval ceramic artefacts

Find no	Context	Context type	Ware	Date range	Comments
18	(01)	Black silty clay deposit	Slipware	late 17th - early 18th	16 sherds from a smashed vessel, complete profile; 'combed' slip decoration; wide shallow cup with a height of 54mm
19	(02)	Rubble above wall [003]	Blackware	18th-19th	1 sherd, heavy square rim, kiln scar on rim, abraded
22b	(03)	Wall	Yellow	17th	1 abraded sherd
17	(107)	Fill of modern disturbance	Blackware	17th-18th	1 large base fragment
6	(112)	Cobbled surface	Blackware	17th-18th	1 sherd from a possible jar
14	(117)	Possible levelling layer for stone surface [116]	Blackware	17th-18th	1 base sherd, no perimeter surviving but possibly from a large cup
8a	(117)	Possible levelling layer for stone surface [116]	Blackware	17th-18th	1 base sherd
8b	(117)	Possible levelling layer for stone surface [116]	Blackware	17th-18th	1 rounded foot, round bodied form

Find no	Context	Context type	Ware	Date range	Comments
8c	(117)	Possible levelling layer for stone surface [116]	Blackware	17th-18th	1 sherd
8d	(117)	Possible levelling layer for stone surface [116]	Blackware	17th-18th	1 small rim sherd, glaze bubbled, burnt or high fired
36	(117)	Possible levelling layer for stone surface [116]	Blackware	17th-18th	4 sherds
9	(123)	Pit fill	Blackware	17th-18th	narrow strap handle from a cup or jug
10b	Unstratefied	N/A	Blackware	17th-18th	base edge and sherd from centre of a base
10c	Unstratefied	N/A	White salt-glazed stoneware	c.1720-c.1780	1 shard, high footring from a bowl

6.4.3 Recommendations

The slipware vessel (find. No 1) and the Saintonge jug fragment (find no. 10) should be drawn. It is recommended that the entire ceramic assemblage is retained for future study; and will be offered to the regional museum accordingly.

6.5 Animal Bone and Mollusc shell

Twelve samples of mixed animal bone were assessed. The deposits have produced such a wide range of species that it seems likely that this reflects the status of the site. A broad range of domestic animals are shown to have been exploited whilst the tentative identification of species such as of heron, teal, partridge and hare suggest hunting or trapping, while the fish and shellfish, including a crustacean claw, indicate the exploitation of the locally available marine resources.

6.5.1 Animal and Bird Bone

Twenty three species of animal and bird (including rodents and amphibians) were identified, however, because the bulk of the material derives from samples most of the material was very fragmented and although 2992 bone fragments have been recorded relatively few fragments have been specifically identified, with less than 22% of the assemblage being classified more precisely than ‘unidentified’.

There is a distinct lack of cattle, cattle size and pig bones across all the sampled deposits, and surprisingly few sheep/goat and sheep sized bone fragments. There is a dominance of the bones of small animals such as birds and fish and it seems that this might reflect the character of the deposit rather than the relative importance of the different species. It seems likely that the larger bones of cattle, pig and sheep have been dumped elsewhere on site and that these assemblages reflect disposal of post-cooking waste, rather than butchery or food preparation waste, perhaps dumped directly from the kitchens.

6.5.2 Fish Bone

Fish bones were examined from 9 samples, and 13 different species were identified; herring occurred in the largest number of samples followed by flatfishes in general and the small gadid category

6.5.3 Shellfish

The shellfish are dominated by four species, common mussel, cockle, oyster and periwinkle, with occasional shells of dog whelk, venus clam?, scallop, rough winkle and tellen, although the latter two may have been brought in with the catch rather than collected for consumption. By weight the shells are relatively more abundant than the animal bone (Table3) but their relative food weight is much less than the same weight of mammal, bird or fish bone.

6.5.4 Recommendations

If dating is available then a more detailed analysis of the material, degree of fragmentation and possible processing involved, and further identification of the bird bone and the one or two shells not yet identified may be warranted. Within the scope of this project this further analysis is not currently recommended. However, it is recommended that the entire assemblage is retained for archival reference and will be offered to the regional museum accordingly.

7 CONCLUSIONS

The results of the archaeological works undertaken during the external renovations to the former Bishops Palace in Bangor have produced a wealth of information pertaining to several phases in the history of this site. The findings offer an insight into the usage of the area and an unprecedented understanding of how the site would have looked at certain points in the past, as well as a good indication of the potential for further preservation.

In this most recent phase of the mitigation work GAT has completed a post-excavation assessment of ecofacts and artefacts recovered during the excavation phase. The artefacts and ecofacts were processed and archived in house and then submitted for assessment to nominated specialists. Based on the assessment results, recommendations for further analysis have been made in specific circumstances.

Ecofact samples were taken from 12 key deposits, one of which was a midden deposit located to the immediate southeast of the Palace (Lighting cable trench E), whilst the rest derived from the L-shaped wall foundation (archaeological trench 2). The ecofact assessment identified 10 samples with charcoal suitable for radiocarbon dating.

The artefact assemblage comprised a mixture of stone, metal and ceramic artefacts as well as faunal remains, predominantly derived from midden deposits. Of the two stone artefacts, the first, find no. 15, a sample piece of the stone flagged surface (116) was identified as being of the local bedrock. The second stone artefact, find no. 24, a piece of dressed stone obtained from the foundations of a probable wall located to the west of the Bishop's Palace (003) was identified as showing obvious evidence of having been worked by hand, and represents a fragment of a larger piece of worked stone. It was identified as stone from a Limestone Formation located at Penmon, Anglesey.

The metal artefacts comprised 26 objects, including items made of copper alloy, iron and lead or lead alloy. These primarily came from Trench 2, with several more from the midden deposits in Lighting cable Trench E and 1 item from below the cobbled surface on the central oval area. Due to the small size, the metal assemblage was deemed to have only very limited potential to contribute to the chronological and functional analysis of the activities carried out in and around the Bishop's Place. No further recommendations for the analysis of this material were made.

The archaeometallurgical residue was recovered from a lensed burnt deposit within the L-shaped wall foundation (archaeological trench 2). The assessment found no indication that the assemblage was derived from metalworking, the fired clay and fuel ash slag was more

typical of that found in cereal-drying kilns and semi-permanent domestic hearths, though other similar types of fire would also be capable of their generation. No further recommendations for the analysis of this material were made.

The ceramic artefacts comprised a mix of medieval and post-medieval tablewares and those for serving and storing liquids and food as well as flower pots. The major part of the assemblage consisted of common types of post-medieval pottery produced in North Wales, the north west of England and the English Midlands. Three medieval sherds were also identified. The most notable of which being a piece of 13th century Saintonge ware (find no. 11).

Mixed samples of animal bone, fish bone marine shells were obtained primarily from the midden deposits in lighting cable trench E and Trench 2. The assessment identified a wide range of species: domestic animals were shown to have been exploited whilst the presence of heron, teal, partridge and hare suggest hunting or trapping. The fish and shellfish included a crustacean claw, indicating the exploitation of the locally available marine resources. This assemblage is identified as having the potential for further analysis, but none is recommended within the scope of this project.

It is recommended that all artefacts are accessioned to a suitable museum for archiving. A nominated museum will be confirmed as part of the MAP2 Phase 4 process.

The results of the excavation offered an unprecedented view of successive phases of landscaping of the grounds to the south of the main façade of the Palace. Based on pottery types obtained from below the earlier stone flagged surface this may now be dated to at least the 18th century and possibly the 17th century. Thus it postdates the completion of the U-shaped plan of the present building (the final wing having been added in the mid-16th century), though possibly predates or is contemporary with some of the improvements to the rear of the building, such as the mid-18th century staircase block added by Bishop Zachary Pearce.

The discovery of features predating the stone flagged surface to the south of the Palace is particularly exciting. The identification of late medieval or early post-medieval pottery fragments within the midden offers a rough date range and indicates it predates the construction of Bishop Bulkley's mid-16th century eastern wing, if not the entire present Palace. Future radiocarbon dating may allow us to tighten that date range. In addition to the datable evidence, the midden material provides a wealth of information regarding the breadth of the diet of the inhabitants of the Palace, and has the potential to reveal much about subsistence strategies and cooking techniques of the period.

The structural features, the wall to the west and the two sections of walling to the south, one of which is L shaped and most likely represents the corner of a building, are the stratigraphically earliest features. These have proved the most difficult to date, in part due to the limitations of the excavation, although dating of the overlying deposits will aid this process. At present however the structural remains may be said to be either remnants of outbuildings associated with the earliest phases of the present Bishops Palace, or evidence of settlement of the site prior to that phase of construction.

The Research Framework for the Archaeology of Wales: Medieval (2011-14) concluded that 'Buried archaeology is our best hope for the identification of pre-1400 town houses, and for identifying the early morphology, growth and development of towns.' The identification of areas of high archaeological potential is therefore a priority. Unstratified pot fragments, obtained from this excavation, in particular the piece of 13th century Saintonge ware, contribute to the growing body of evidence of early settlement of this site. This evidence also includes a number of historical references as well as the results of excavations to the east of the current site which included the discovery of 12th century timbers which are thought to have been part of a wharf or bridge (Smith, G. 2005, 3).

Assessment of the assemblage of ecofacts and artefacts obtained from across the site has helped to establish dates for the features identified during the excavation phase of this project and thus augment the existing stratigraphic sequence. The pottery has proved most useful in this respect to date; however future radiocarbon dating will seek to enhance that time framework. This future work should increase our knowledge of the development of this site and help to understand its significance at a local through to national level.

8 SOURCES CONSULTED

Atkins Ltd drawing **4140** Existing Site Plan

Atkins Ltd drawing **4151** Proposed External Works Plan

Atkins Ltd drawing **6008** External Services Layout

Chartered Institute for Archaeologists 2014 [Online] *Standard and Guidance: Archaeological Excavation*, Chartered Institute for Archaeologists, Reading. Available from: http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GExcavation.pdf

Chartered Institute for Archaeologists 2014 [Online] *Standard and Guidance: Archaeological watching brief*, Chartered Institute for Archaeologists, Reading. Available from: http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GWatchingbrief.pdf

Davidson, J. 2013 Bishop's Palace, Deiniol Road, Bangor: Archaeological Management Plan, GAT Report **1155** [Gwynedd Archaeological Trust: Unpublished Report]

English Heritage, 2015, Management of Research Projects in the Historic Environment (MoRPHE);

English Heritage, 1991, Management of Archaeological Project;

English Heritage (2002) Environmental Archaeology: A guide to the theory and practise of methods, from sampling and recovery to post-excavation. English Heritage Publications. Swindon.

Johnstone, N. 1996. Excavations at the Bishop's Palace, Bangor 1996. GAT Report 370

Smith, G. 2005 The Bishop's Palace, Bangor Archaeological Excavation 2003 and 2004. GAT Report 619

Smith, G. Forthcoming. Afon Adda Refurbishment, Bangor

Standard and Guidance for Archaeological Excavation (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).

Standard and Guidance for Archaeological Watching Brief (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).

Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives (Chartered Institute for Archaeologists, 2009 and 2014).

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http://www.archaeoleg.org.uk

Figure 1: Location of the Bishops Palace
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Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

CYNGOR GWYNEDD COUNCIL

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Gwynedd Archaeological Trust

Figure 2: Location of working areas.

Extent of excavation over flower bed area

1 Excavation trench

A Lighting trench

1 Lampost excavation

Drainage trench

Electricity cable trench

Topsoil stripped area

Date: 22/10/2015

Author: NMC

Office:

Drawing: G2358/F1

Scale: 1:250@A3

Background map after Atkins Drg No: 5116694/4140

0 2.5 5 10

metres

11 APPENDIX I

11.1 Reproduction of Gwynedd Archaeological Trust project design for MAP2 Phase 3

BISHOP'S PALACE, BANGOR

EXTERNAL WORKS

PROJECT DESIGN FOR AN ASSESSMENT OF POTENTIAL FOR ANALYSIS (MAP2 PHASE 3) (G2538)

Prepared for

Atkins Ltd

April 2016

Ymddiriedolaeth Archaeolegol Gwynedd

Gwynedd Archaeological Trust

BISHOP'S PALACE, BANGOR, EXTERNAL WORKS

PROJECT DESIGN FOR AN ASSESSMENT OF POTENTIAL FOR ANALYSIS (MAP2 PHASE 3)

Prepared for Atkins Ltd, April 2016

Contents

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Approvals Table				
	Role	**Printed Name**	**Signature**	**Date**
Originated by	Document Author	J DAVIDSON	J DAVIDSON	19/04/16
Reviewed by	Document Reviewer	J ROBERTS		19/04/16
Approved by	Principal Archaeologist	J ROBERTS		19/04/16

Revision History			
Rev No.	**Summary of Changes**	**Ref Section**	**Purpose of Issue**

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by *Atkins Ltd* to undertake a programme of archaeological mitigation during the re-development of the former Bishop's Palace/Town Hall, located in Bangor, Gwynedd (NGR SH58007215).

This post-excavation design is focused on the archaeological watching brief and targeted investigation completed during external landscaping works undertaken between March 2014 and September 2015. The results of the archaeological mitigation during the structural development of the Bishop's Palace/Town Hall will be discussed in a separate report (Davidson, J. 2016 *forthcoming*).

The redevelopment works to the exterior included the excavation of several service trenches to accommodate new lighting, drainage and electric cabling; these were located to the north, west and south of the Bishop's Palace. Additional works included limited excavation to the west of the building in order to create the 'café breakout area', and more extensive works to the south in order to create a new path running southeast from the main entrance, surrounded by paving and car parking bays.

The area to the south of the Bishop's Palace lies in front of the principal façade and most recently featured a large grassed oval planting area surrounded by tarmac. This oval layout dated back to at least the early 19th century and is depicted on the John Wood's map of 1834. No previous archaeological investigation had been undertaken within this area, however, the Archaeological Management Plan prepared for the project by GAT (Davidson, J., 2014, GAT report 1155) identified 'unprecedented potential for the survival of evidence not only pertaining to the present structure, but also to possibly earlier medieval phases of construction and to unrelated prehistoric remains'.

GAT report 1314 should be consulted in tandem with this design for further information on the mitigation works.

GAT is undertaking this project in accordance with guidelines specified in *Management of Archaeological Projects – MAP2* (English Heritage, 1991), and relevant guidelines from *Management of Research Projects in the Historic Environment* (English Heritage 2015).

Five stages are specified in *Management of Archaeological Projects – MAP2* (English Heritage, 1991):

- MAP2 Phase 1: Project Planning
- MAP2 Phase 2: Fieldwork
- MAP2 Phase 3: Assessment of Potential for Analysis
- MAP2 Phase 4: Analysis and Report Preparation
- MAP2 Phase 5: Dissemination

The project design for the watching brief was undertaken as part of MAP2 Phase 1; the watching brief and targeted investigation were undertaken as part of the MAP2 Phase 2. The current design, for the *assessment of potential for analysis* of small finds and environmental samples will be undertaken as part of MAP2 Phase 3. Any subsequent analysis/report preparation and dissemination will be undertaken as part of MAP2 Phases 4 and 5.

Reference has also been made to the following guidelines:

- Campbell, G., Moffett, L. and Straker, V. Environmental Archaeology: A guide to the theory and practise of methods, from sampling and recovery to post-excavation (2nd edition). (English Heritage Publications. Swindon, 2011).
- *Standard and Guidance for Archaeological Excavation* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- *Standard and Guidance for Archaeological Watching Brief* (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).
- Standard and Guidance for the Creation, Compilation, Transfer and Deposition of Archaeological Archives (Chartered Institute for Archaeologists, 2009 and 2014).
- Standard and Guidance for the Collection, Documentation, Conservation and Research of Archaeological Materials (Chartered Institute for Archaeologists, 2008 and 2014).

NB. All phases of this project are being monitored by the Gwynedd Archaeological Planning Services (GAPS). The content of this and any future project designs must be approved by GAPS.

6

2 BACKGROUND

(reproduced from GAT report 155)

2.1 Topography

The city of Bangor occupies the narrow, steep sided valley of the Adda which runs parallel to the Menai Strait and opens out at its northeastern end onto the sheltered Penrhyn Bay. The River Adda has been variously canalised and culverted and is no longer visible, though its influence on the development of the City is apparent. Over the centuries Bangor evolved from an early Christian settlement to a significant commercial centre, which saw considerable growth in the late 18th century. A decline in industry in recent years has been balanced in part by the growth of the educational institutions (Davidson, 2007). The Bishop's Palace is located in the centre of the modern city, on the former northern bank of the Adda, with the Cathedral to the south and the University to the north.

2.2 Archaeology

The grounds of the Bishop's Palace hold great significance as, despite their location at the centre of the city, they have remained for the most part undisturbed by development, having been used as gardens since the medieval period. There is therefore unprecedented potential for the survival of evidence not only pertaining to the present structure, but also to possibly earlier medieval phases of construction and to unrelated prehistoric remains.

Several phases of excavation have been undertaken by Gwynedd Archaeological Trust (GAT) in recent years, targeting the area to the east and southeast of the Bishop's Palace (see fig.). This work was undertaken in advance of the construction of a new police station. The excavations revealed the foundations of outbuildings associated with the palace from the late 18th to early 19th century, as well as 16th and 17th boundaries. The excavations also recovered a wealth of information indicating 'considerable activity and probably occupation on this site before the 15th century' (Smith, G. 2005, 3). The areas to the south and west of the Bishop's Palace have not been investigated, however work to date has demonstrated 'that there exists a considerable build-up of soils, including rubbish layers with well-preserved waterlogged material' (Smith, G. 2005, 3).

3 AIMS AND OBJECTIVES

The original aim of the programme of work was to identify any archaeological remains revealed prior to their disturbance by the construction works. Appropriate mitigation measures were developed for all archaeological remains revealed.

The current objective is to prepare an archaeological archive of the site to ensure the long-term curation of the recovered data. This is to include the treatment and preservation of any finds, deposition of the archive at an agreed repository or repositories, and the detailed analysis and publication of results to an appropriate level in line with nationally defined guidelines.

4 ARCHAEOLOGICAL RESULTS

(Abridged and reproduced from GAT Reports (1314)

For the purposes of this section, context numbers within square brackets (e.g. [05]) represent cut features and features, such as the grave, pits, ditches etc., and context numbers within round brackets (e.g. (08)) represent deposits and fills.

4.1 Cobbled Surface

A cobbled surface (assigned feature no [110]) was identified across multiple working areas to the south of the Bishop's Palace, including the large central oval area which measured 28m x 15m. Recent planting and service trenches have caused localised disturbance but preservation on the whole was remarkable. The full extent of the surface is unknown; no defined edge was identified, though the surface was somewhat disturbed towards the eastern edge of the excavation area, likely associated with the development of the adjacent site in 2004. The surface did not appear in the majority of section A of the lighting trench, or any other work areas to the west of the central area, although some of these excavations were perhaps too shallow.

No contemporary footings for features or ornaments were identified cutting through the cobbled surface indicating that the area was left open, with no planting areas or subdivisions. The date for this surface is unknown; however it predates the most recent oval layout, which is shown on consecutive cartographic depictions of the site dating back to at least the early 19th century, John Wood's map of 1834 being the earliest. An 18th century date may therefore be posed.

The cobbles were set into a levelling layer (Context (083)/(085)), which measured 0.12m in depth and consisted of a dark grey-brown clay-silt containing stone inclusions as well as occasional fragments of mortar, animal bone and marine shell. A small copper artefact possibly a button or nail head (find no. 05) was found within this deposit towards the northern edge of the area.

4.2 Stone Flagged Surface

The removal of the majority of the cobbled surface revealed an underlying intact stone flagged surface (assigned feature no [111]) which covered a similar area to the cobbles and again survived in remarkable condition. The slabs measured <0.05m thick and <1.0m across and were fitted close together, but were not bonded. No contemporary footings for features were identified within this surface either, indicating the change from flagstones to cobbles did not represent a significant change of use. The replacement was therefore likely a stylistic move, perhaps coinciding with the arrival of a new Bishop at Bangor. It is recorded that renovations to the house and grounds were numerous, as the high status property was kept up to date with contemporary fashions, and new Bishop's made their presence felt. The decision not to lift and recycle the stone paving prior to the laying of the cobbles may reflect a degree of affluence, though may also have been due to the rather wet ground conditions. The precise date of this surface is unclear, though it may confidently be ascribed to the 18th century, though likely somewhat earlier.

4.3 Processual Way

A linear break in the cobbled and stone flagged surface, some 3.15m wide was observed running northwest/southeast, lining up with the main door of the Bishop's Palace and an existing path leading up towards the Cathedral (feature no. [144]). This walk way or processual way appears to represent the principal route the Bishop would have followed from the Palace to the Cathedral; the exposed section follows a direct course between the two sites. This route is contemporary with both the stone and cobbled surfaces, but was replaced with a more circuitous one when the cobbles were covered over, most likely in the 18th century. This walkway was notable for an absence of any real surfacing; the yellow sandstone had more of the appearance of a hard-core layer; given the quality of the surrounding surfaces it is likely that the main surface was removed prior to the resurfacing of the site. The continuation of the walkway was not found within the lighting trench to the south, but this is likely because the relevant trench section (B) was not excavated to a sufficient depth.

4.4 Structures

4.4.1 Wall Foundation to the West of the Bishop's Palace

The foundations of a probable wall (Context [003]) were identified to the west of the Bishop's Palace at the northern end of the lighting cable trench. This feature was 1.88m wide and 0.25m high and was constructed from un-bonded irregular sized cobbles and orientated northwest/southeast. Several artefacts were recovered from within the fabric of the wall including two sections of a clay pipe stem (find no. 21), the tooth of a large mammal (find no. 23) and two small sherds of pot, one of which featured a yellow glaze (find no. 22). The wall lay within a possible foundation cut [004], though this feature was not fully investigated as it extended beyond the limit of excavation. The wall was sealed by a rubble deposit (002) that comprised poorly sorted cobbles within a compact grey-brown silt matrix. Fragments of bone from a large mammal (find no. 20); a pottery sherd from the rim of a large vessel (find no. 19) and a piece of dressed stone (find no. 24) were all obtained from this deposit, which was sealed by the topsoil.

4.4.2 Northeast/southwest Orientated Wall to the south of the Bishop's Palace

The foundations of a second wall (Context [077]), were found towards the northern end of section E of the lighting cable trench, to the south of the Bishop's Palace. This feature was covered by a sequence of modern levelling and surfacing deposits and a slightly disturbed cobbled deposit (Context (069)), which did not comprise a properly laid surface, though it is presumed part of feature no. [110]. The cobble deposit sealed associated levelling deposits (Context (070)) to the north and (Context (080)) to the south. The wall was orientated northeast/southwest and was rubble built of mixed rough blocks and bonded using a coarse lime mortar. In the west facing section of the trench the wall measured 0.87m wide and >0.40m high; the masonry was observed continuing across the base of the trench, but did not appear in the opposing section, indicating a possible doorway (see Plate 14). This wall did however appear in the drainage trench excavated to the immediate west.

4.4.3 L-shaped wall foundation to the South of the Bishop's Palace

The stone surface (feature no [111]) was for the most part left in situ, however in the southwest corner of the oval area to the south of the Palace the slabs had subsided and these were lifted during the machining process to reveal the corner of a presumed building foundation. This area was targeted by archaeological Trench 2.

The removal of the stone flags (Context (116)) and the underlying levelling deposit (Context (117)) revealed an L-shaped section of wall [109] which continued beyond the edge of excavation to the northeast and southeast. It is probable that wall [076] recorded in Lighting Cable Trench E was a continuation of this structure. The rubble built wall was c. 0.80m wide and randomly coursed of roughly hewn poorly sorted stone bonded using a coarse lime mortar. It had a double skin construction with some core material and clear facing to either side. This wall was not excavated and was preserved in situ.

The deposits enclosed within the wall comprised a thin patch of midden deposit (Context (118)), which contained a variety of marine shell and animal bone. Below this was a sequence of five intercutting pits: two of these (Contexts [122] and [126]) were small and sub-circular and were excavated in their entirety, the first measured 0.25m wide and was 0.25m deep whilst the second measured 0.4m across and 0.07m deep. The remaining cut features (Contexts [128], [134] and [135)] where larger, relatively shallow and appeared to be somewhat amorphous in shape, though none were seen in their entirety. The function of these pits was unclear, their fills were for the most part characterised by demolition material, stone and mortar in varying quantities, with minimal occupation waste.

The pits truncated a 0.2m thick deposit (Context (124)) comprising lenses of brightly coloured burnt clay and dense charcoal, apparently representing a phased episode of burning. This deposit partially overlay the wall [109] in the southern corner of the trench and the stones of the wall in this area were fractured indicating in situ burning. This deposit overlay a small patch of shale and animal bone (137) which was the last deposit to be excavated. It is understood that all the deposits described above post-date the demolition of the structure as they overlie the top of the wall.

4.5 Midden Deposits

4.5.1 Midden to the south of the Bishop's Palace

At the base of section E of the Lighting Cable Trench a rich midden deposit (Context (062)) was identified, built up against the southern face of a wall foundartion (Context [077]), this continued along the base of the trench for *c.*8.10m and was >0.18m thick. The midden comprised a soft dark brown silt-clay deposit with frequent whole and broken marine shells, including frequent oyster and mussel shells and less frequent smaller bi-valves including cockles and occasional gastropods such as winkles. Occasional whole and broken mammal and bird bones were also noted along with small to medium sub-angular cobbles. Two sherds of a coarse glazed pot (find no.1) of a possible late medieval date were obtained from this deposit.

Within the lamp post footing (no.5) at the northern end of this trench a second midden deposit (Context (073)) was observed at the base of the trench, 1.00m below the surface level; it was not possible to fully record this due to significant water table ingress.

4.5.2 Midden to the west of the Bishop's Palace

A third midden deposit (Context (001)) was observed at the base of the drainage trench located 4.7m west of the Bishop's Palace. This deposit was sealed by the topsoil and measured >0.35m in width and 1.2m in length and comprised a firm black silt-clay containing frequent charcoal inclusions. Sherds of a fine, handled vessel, with combed slipware decoration (find no. 018) were found in the top of this deposit, indicating a possible 18th century date. The full extent of the midden was not identified within the confines of the trench.

4.6 Stone Built Culvert

A northwest/southeast orientated stone culvert (Context [154]) was observed to the west of the Bishop's Palace. This feature, which cuts the subsoil, was 0.3m deep and 0.6m wide and had a dry stone lining [155] with slate slabs forming a cap which was sealed by the topsoil. It is presumed to be of a post-medieval date.

4.7 Paleochannel

A substantial paleochannel [091] was identified running below the walkway, and is presumed to be a former tributary to the now culverted Afon Adda. It measured >0.75m deep and >0.95m wide. Based on its northwest/southeast orientation it appears to run directly beneath the Bishop's Palace. The lower layers within this channel appeared to be the product of natural alluvial deposition however the upper deposits contained demolition and occupation material and thus represent deliberate backfilling. This indicates the channel was still active immediately prior to the construction of the Bishop's Palace; the water was presumably diverted along a different course during the development of the site and the channel filled in.

5 METHODOLOGY - ASSESSMENT OF POTENTIAL FOR ANALYSIS:

The sampling strategy for bulk soil samples was related to the perceived character, interpretational importance and chronological significance of the strata under investigation. This ensured that only significant features were sampled. The aim of the sampling strategy was to recover carbonised macroscopic plant remains, and faunal remains. However, the samples will have simultaneously enabled the recovery of any small artefacts not recovered during excavation.

The bulk soil samples will be processed GAT. This will consist of flotation and wet sieving using a 250 micron mesh for flotation. The residues will be sorted to recover finds and nonfloating ecofacts. All residues will be tested for magnetic metalworking debris and this will be collected where it is present. Once sorted the residues will be discarded. The flots will be weighed, catalogued and assessed and their potential established in relation to charcoal and other plant macrofossils. The presence of suitable dating material will also be recorded. Specific samples may be recommended for further work.

A total of 13 bulk samples were collected during this phase of work:

No	Context	Sub area	Description
1	(062),	Lighting cable Trench E	Midden deposit
2	(096),	Trench 1	twigs from the basal deposit of the paleochannel
3	(117),	Trench 2	Possible levelling deposit
4	(118),	Trench 2	Midden deposit
5	(119),	Trench 2	Fill of truncated feature [128]
6	(123),	Trench 2	Sole fill of pit [122]
7	(125),	Trench 2	Pink clay deposit
8	(127),	Trench 2	Fill of small pit [126]
9	(131),	Trench 2	Stony fill of cut feature [134]
10	(132),	Trench 2	Secondary fill of [135]
11	(124),	Trench 2	Lensed burnt deposit - taken from a lense of burnt clay
12	(124),	Trench 2	Lensed burnt deposit - taken from a lense of charcoal
13	(137),	Trench 2	Stony deposit containing animal bone

In the event of any artefact recovery from the bulk samples, these will be sent to specialists nominated below. Any additional specialist will need to be approved by GAPS in advance but cannot be identified at present until artefact type is confirmed. The specialist will provide further identification and assessment, with recommendations provided for any further analysis, including dating.

In the event of any ecofact recovery from the bulk samples including charcoal and other plant macrofossils, as well as animal bones and shell obtained from the bulk samples, these will be submitted to appropriate specialists for analysis and further reccomendations.

The nominated specialist for faunal remains will be Ian Smith a specialist in archaeozoology at Oxford Archaeology North. The nominated specialist for plant remains will be Roz McKenna an independent paleoenvironmentalist.

Details of further research and radiocarbon dating will be outlined in the MAP2 Phase 4 project design prepared by GAT.

5.1 Small Find Analysis

Finds have been catalogued and grouped by material type. All finds, where appropriate, have been cleaned and then described to create a basic record. All finds will be packaged in suitable containers and conditions for long-term storage. Where appropriate finds are to be submitted to appropriate specialists for analysis. This should entail classifying the objects fabric, form and decoration and where possible establishing its date and provenance.

The assessment report will established what comparative and research work will be required to place the assemblage within its national and international context. Any pieces worth illustrating will be identified and any appropriate further analysis will be proposed. The illustration and analysis will be carried out in the next phase of work.

When the residue from the wet sieving has been sorted (see below) any finds will be incorporated into the above process and assessed by the specialists. In particular if metal-working had occurred on the site evidence is likely to come from the fine wet sieving residues. Similarly small fragments of burnt bone will be recovered and these will require assessment. Potential costs for the assessment of artefacts that might be recovered from the residues are included in the costs below, but obviously will not be required if none of these items are found.

5.1.1 Masoned Stone Analysis

Find no.	Sub division	Context	Context Description	Object Description	Weight (g)
15	Trench 2	(116).	Stone flagged surface	Sample piece of a stone flag	817
24	Lighting Cable trench A	(003).	Foundations of a probable wall located to the west of the Bishop's Palace	Dressed stone	20

The 2 worked stones will be examined by Jana Horak, head of Mineralogy and Petrology at the National Museum of Wales. A report will be produced assessing the petrology of the stones, the likely origin of the material, and the characteristics of the working on the stones.

5.1.2 Metal Artefact Analysis

Find No.	Sub area	Context	Context description	Object Description	Weight (g)
3	Unstrat	N/A	N/A	Possible coin fragment/post medieval token	<1
5	Oval area	(085).	Levelling layer for cobble surface	Copper nail/button	3
7	Trench 2	(117).	Possible levelling deposit for stone flagged surface	L-shaped Fe. object	7
12	Trench 2	(131).	Demolition/levelling deposit within possible medieval structure	Fe object	14
13	Trench 2	(119).	Possible levelling deposit for stone flagged surface	Fe object	15

The 5 Metal artefacts will initially be sent to Phil Parkes, Senior Conservator at Cardiff University to be x-rayed. The artefacts and accompanying x-rays will then be submitted to Quita Mould, Metal Object Specialist at Barbican Research Associates for analysis.

5.1.3 Ceramic Artefact Analysis

Find No.	Sub area	Context	Context description	Object Description	Weight (g)
1	Lighting Cable trench E	(062).	within midden deposit	2 sherds of possibly late medieval pottery	30
2	Lighting Cable trench E	(039).	Levelling layer below cobbled surface (039)	C20th pot fragments	6
6	Trench 2	(112).	Cobbled surface	Buckley ware sherd	14
8	Trench 2	(117).	Possible levelling layer below the stone flagged surface	4 sherds of black glazed post-medieval pottery	23
9	Trench 2	(123).	Fill of a small pit	1 sherd of black glazed post-medieval pottery (handle section)	8
10	Trench 2	unstrat.	Unstratified pot sherds from above the level of stone surface [111]	Pot sherds	99
11	Trench 2	unstrat.	Unstratified pot sherds from below the stone flagged surface	1 sherd of partially glazed pottery	17
14	Trench 2	(117).	Possible levelling layer below the stone flagged surface	1 sherd of black glazed post-medieval pottery	7
17	Drainage trench	(107).	Disturbed cobble deposit	1 large sherd of red-black glazed pottery	142
18	Lighting Cable trench A	(001).	Charcoal rich deposit	15 sherds from a single, handled, yellow combed slipware ceramic vessel (18th century?)	151
19	Lighting Cable trench A	(002).	Rubble deposit overlying wall	Pottery sherd	84
22	Lighting Cable trench A	(003).	Wall foundation	Pot sherds	7

The 12 ceramic finds will be submitteted to Julie Edwards, a specialist in Medieval ceramics for analysis.

6 SOURCES CONSULTED

Atkins Ltd drawing **4140** Existing Site Plan

Atkins Ltd drawing **4151** Proposed External Works Plan

Atkins Ltd drawing **6008** External Services Layout

Chartered Institute for Archaeologists 2014 [Online] *Standard and Guidance: Archaeological Excavation*, Chartered Institute for Archaeologists, Reading. Available from: http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GExcavation.pdf

Chartered Institute for Archaeologists 2014 [Online] *Standard and Guidance: Archaeological watching brief*, Chartered Institute for Archaeologists, Reading. Available from: http://www.archaeologists.net/sites/default/files/node-files/CIfAS&GWatchingbrief.pdf

Davidson, J. 2013 Bishop's Palace, Deiniol Road, Bangor: Archaeological Management Plan, GAT Report **1155** [Gwynedd Archaeological Trust: Unpublished Report]

English Heritage, 2015, Management of Research Projects in the Historic Environment (MoRPHE);

English Heritage, 1991, Management of Archaeological Project;

English Heritage (2002) Environmental Archaeology: A guide to the theory and practise of methods, from sampling and recovery to post-excavation. English Heritage Publications. Swindon.

Johnstone, N. 1996. Excavations at the Bishop's Palace, Bangor 1996. GAT Report 370

Smith, G. 2005 The Bishop's Palace, Bangor Archaeological Excavation 2003 and 2004. GAT Report 619

Smith, G. Forthcoming. Afon Adda Refurbishment, Bangor

Standard and Guidance for Archaeological Excavation (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).

Standard and Guidance for Archaeological Watching Brief (Chartered Institute for Archaeologists, 1995, rev. 2001, 2008 and 2014).

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12 APPENDIX II

12.1 Ecofact Assessment Report

Neuadd y Dref, Bishop's Palace, Bangor

AOC Project no:23460

Site Code: G2358

Date: June 2016

AOC Archaeology Group

ARCHAEOLOGY | HERITAGE | CONSERVATION

Neuadd y Dref, Bishop's Palace, Bangor

On Behalf of: Gwynedd Archaeological Trust (GAT)

National Grid Reference (NGR):

AOC Project No: **23460**

Prepared by: **Jackaline Robertson**

Date of Report: **June 2016**

This document has been prepared in accordance with AOC standard operating procedures.

Author: Jackaline Robertson	**Date: 9 June 2016**
Approved by: Ciara Clarke	**Date: 13 June 2016**
Report Stage: Final	**Date:**

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Factual data

Twelve samples were submitted for environmental assessment by Gwynedd Archaeological Trust (GAT) from the excavation at Bishop's Palace, Bangor. Eleven samples were collected from trench 2 and one from trench E. The contexts were a mix of lensed burnt deposits, pits, levelling deposits and middens some of which had been truncated. The primary objective of this assessment was to recover and identify ecofacts suitable for radiocarbon dating.

Methodology

The samples were comprised of 12 flots ranging from 7g to 343g in weight. These were dry sieved using a 4mm, 2mm and 1mm system of stack sieves. The sieved flots were analysed under magnification (x10 and up to x100). Macroplant identifications were confirmed using modern reference material and seed atlases stored at AOC Edinburgh (Cappers *et al* 2006; Jacomet 2006). Taxonomic and nomenclature for plants follows Stace (2010). Charcoal fragments 4mm and larger were collected for species identification.

Results

The macroplant assemblage

A small charred macroplant assemblage of 20 remains was recovered from across seven samples. Preservation of these remains ranged from poor to good. The macroplant assemblage was dominated by cereal caryopses and the species. Eleven oat (*Avena* sp), one hulled barley (*Hordeum vulgare* L), two barley (*Hordeum* sp), two bread club wheat (*Triticum aestivum*-type) and one wheat (*Tritium* sp) were recovered. The remaining two cereal caryopses could not be identified further due to poor preservation.

In addition to the cereal caryopses a single fragment of hazelnut shell (*Corylus avellana* L) was recovered.

There is no evidence of either selective or deliberate disposal of these remains within particular features.

The charcoal assemblage

Charcoal fragments suitable for species identification were recovered from eleven samples. The identifiable assemblage totalled 131.6g. Charcoal fragments smaller than 4mm were noted in sample 8 from context [127] but these were unsuitable for species identification and radiocarbon dating. The species identified comprised alder (*Alnus glutinosa* L) which formed 37% of the assemblage followed by oak (*Quercus* sp) 28%, apple/pear/hawthorn/quince (*Maloideae* sp) 18%, birch (*Betula* sp) 7%, ash (*Fraxinus* sp) 5% and hazel (*Corylus avellana* L) 5%. These remains were concentrated in samples 5 [119] and 12 [124]. Sample 5 described as a truncated feature contained 49.1g of mixed species including roundwood. Sample 12 recorded as a burnt deposit had 51.6g of mixed species. The next largest concentrations of charcoal were observed in sample 1 [62] (9.3g), sample 4 [118] (8.8g), sample 10 [132] (6.6g) and sample 3 [117] (3.8g), All six of these contexts had two or more species which is normally an excellent indicator of the presence of fuel debris rather than for the burning of a structure or artefact. The charcoal from the remaining five contexts was present only in very small quantities and none exceeded 1g.

Other finds

Other finds comprised small fragments of marine shell and industrial waste such as coke, coal and vitrified charcoal.

Modern Contamination

Modern contamination was noted in all 12 samples and consisted of roots, leaf fragments, seeds, spores and insect eggs. There were also rodent remains in six samples and these animals are probably intrusive and burrowed into the archaeological features at a later date. This may have undermined the archaeological security of the small numbers of charred macroplant and charcoal particularly within samples 6, 7,9,11 and 13. The larger concentrations of charcoal within samples 1, 3, 4, 5, 10 and 12 are much more likely to represent *in situ* disposal and therefore provide more reliable material interpretation and dating.

Recommendations

The main objective of this environmental assessment was to isolate material for radiocarbon dating. Material suitable for dating was noted in 10 samples. Given the small amounts of macroplant present, charcoal where possible, has been selected for dating, and samples other than oak have been isolated. Oak is a slow growing species and unless bark edge material is present it can prove unreliable in dating. Sample 8 [127] did not contain any charred macroplants nor was the charcoal within this context suitable for dating. The only material from sample 13 context [137] was oak charcoal, one oat caryopsis and one cereal. None of this material appears promising as given the preservation of the cereal it is unlikely the caryopses will provide sufficient carbon for dating. The recommendations for the remaining 10 samples are presented below and suitable material has been isolated from each sample.

Sample 1 context [62] : Alder, apple/pear/hawthorn/quince or ash charcoal
Sample 3 context [117] : Alder, apple/pear/hawthorn/quince or ash charcoal
Sample 4 context [118]: Alder, apple/pear/hawthorn/quince or birch
Sample 5 context [119]: Alder, apple/pear/hawthorn/quince or ash charcoal
Sample 6 context [123]: Alder
Sample 7 Context [125]: Alder or ash charcoal
Sample 8 Context [127]: Not suitable
Sample 9 Context [131]: Apple/pear/hawthorn/quince
Sample 10 context [132]: Alder, Apple/pear/hawthorn/quince or hazel royndwood
Sample 11 context [124]: Birch
Sample 12 context [124]: Alder, birch or hazel
Sample 13 context [137]: Not suitable

Further recommendations:

Given the small size of both the macroplant and charcoal assemblage recovered from the 12 samples from Bishop's Palace in Bangor no further work is recommended. If required a short summary report can be

produced once the radiocarbon results have been completed detailing what was found so it can be used as a comparison for other archaeological sites in this area of Wales.

References

Cappers R.T.J., Bekker R.M. and Jans J.E.A. (2006) *Digital seed atlas of the Netherlands* (Barkhuis Publishing and Groningen University Library, Groningen).

Jacomet. S. 2006. *Identification of cereal remains from archaeological sites*. (2nd ed) Archaeobotany Lab IPAS, Basel University.

Stace,C. 2010. *New Flora of the British Isles*. 3rd Edition. Cambridge University Press

Table 1. The charcoal species

Sample	Find	Context	Area	Species	Name	No	RW	Weight (g)
1	26	62	Tr E	*Fraxinus* sp.	Ash	1		
1	26	62	Tr E	*Alnus glutinosa* L.	Alder	3		
1	26	62	Tr E	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
1	26	62	Tr E	*Quercus* sp.	Oak	3		9.3
3	34	117	Tr 2	*Fraxinus* sp.	Ash	1		
3	34	117	Tr 2	*Alnus glutinosa* L.	Alder	3		
3	34	117	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
3	34	117	Tr 2	*Quercus* sp.	Oak	3		3.8
4	42	118	Tr 2	*Alnus glutinosa* L.	Alder	4		
4	42	118	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
4	42	118	Tr 2	*Betula* sp.	Birch	1		
4	42	118	Tr 2	*Quercus* sp.	Oak	2		8.8
5	46	119	Tr 2	*Alnus glutinosa* L.	Alder	5		
5	46	119	Tr 2	*Fraxinus* sp.	Ash	1		
5	46	119	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	3		
5	46	119	Tr 2	*Quercus* sp.	Oak	1	1	49.1
6	52	123	Tr 2	*Alnus glutinosa* L.	Alder	1		0.2
7	56	125	Tr 2	*Fraxinus* sp.	Ash	1		
7	56	125	Tr 2	*Alnus glutinosa* L.	Alder	3		0.5
9	65	131	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	1		
9	65	131	Tr 2	*Quercus* sp.	Oak	1		0.4
10	70	132	Tr 2	*Alnus glutinosa* L.	Alder	4		
10	70	132	Tr 2	*Maloideae* sp.	Apple/pear/hawthorn/quince	1		
10	70	132	Tr 2	*Corylus avellana* L.	Hazel		2	
10	70	132	Tr 2	*Quercus* sp.	Oak	2	1	6.6
11	78	124	Tr 2	*Betula* sp.	Birch	2		0.8
12	82	124	Tr 2	*Alnus glutinosa* L.	Alder	5		
12	82	124	Tr 2	*Betula* sp.	Birch	2		
12	82	124	Tr 2	*Corylus avellana* L.	Hazel	2		

12	82	124	Tr 2	*Quercus* sp.	Oak			2	51.6
13	86	137	Tr 2	*Quercus* sp.	Oak			5	0.5

Table 2. Charred macroplant

Sample			1	3	5	7	10	11	13
Find			26	34	46	56	70	78	86
Context			62	117	119	125	132	124	137
Area			TR E	TR 2	TR 2	TR 2	TR 2	TR 2	TR 2
Flot Vol (ml)			30	30	200	20	50	25	10
Weight (g)			21	20	109	7	43	9	10
% Sort			100	100	100	100	100	100	100
Hordeum vulgare L.	Hulled barley	Caryopsis/es		1					
Hordeum sp.	Barley	Caryopsis/es		1		1			
Triticum aestivum-type	Bread/club wheat	Caryopsis/es	1			1			
Triticum sp.	Emmer/spelt	Caryopsis/es							
Triticum sp.	Wheat	Caryopsis/es	2					1	
Avena sp.	Oat	Caryopsis/es		1	1	3	3		1
Cerealia sp.	Cereal	Caryopsis/es		1					1
Corylus avellana L.	Hazel	Nutshell (frags)	1						

13 APPENDIX III

13.1 Stone Artefacts Assessment Report

A Petrological Examination of archaeological finds from Bishop's Palace, Bangor

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Mineralogy & Petrology Section: Department of Natural Science

Amgueddfa Cymru – National Museum Wales

1. Introduction

This short report was commissioned by the Gwynedd Archaeological Trust (GAT) to provide a petrological characterisation of 2 archaeological finds excavated from Bishop's Palace, Bangor (Ordnance Survey grid reference SH 58023 72132) in addition to the examination of finds from the St Iestyn's Church, Llanddona,. The report was undertaken by Andrew Haycock, Curator of Mineralogy and Petrology, Geology Section, Department of Natural Sciences, Amgueddfa Cymru – National Museum of Wales.

2. Methodology

A petrological examination of the archaeological finds was undertaken following standard methodology detailed in British Standard EN 12407(2007); initial observation was made with the naked eye followed by use of a x10 Gowllands lens and x20 Gem-A lens. Observations were restricted to visual identification.

During visual examination, the colour of the stone was estimated using standard Munsell colour charts and is presented thus (Munsell number [colour name]), and the grain size characterised using standard terminology (very-fine grained < 187μm, fine-grained 187 – 250μm, medium-grained 250 – 500μm, coarse 500 – 1000μm, very coarse 1 – 2mm, granules 2 – 4mm, pebbles > 4mm).

The petrological samples were all imaged using a Canon EOS 5D with 24 – 105mm lens. Images of the samples are included.

3. Petrological assessment of archaeological finds

Sample G2358: (UB02) 24

A very quartz-rich, well-sorted sandstone composed predominantly of medium-grained to granule size (<2mm) grains. The lithology is Munsell 10R 6/4 – 6/6 (pale red to light red), 10YR 7/2 (light grey) on weathered surfaces. No fresh surface was present to permit the colour to be measured, it was approximated as cream/grey. The sub-rounded to rounded clasts have a grain-supported structure, and red iron staining is present throughout the rock. The sample shows obvious evidence of having been worked by hand, and represents a fragment of a larger piece of worked stone.

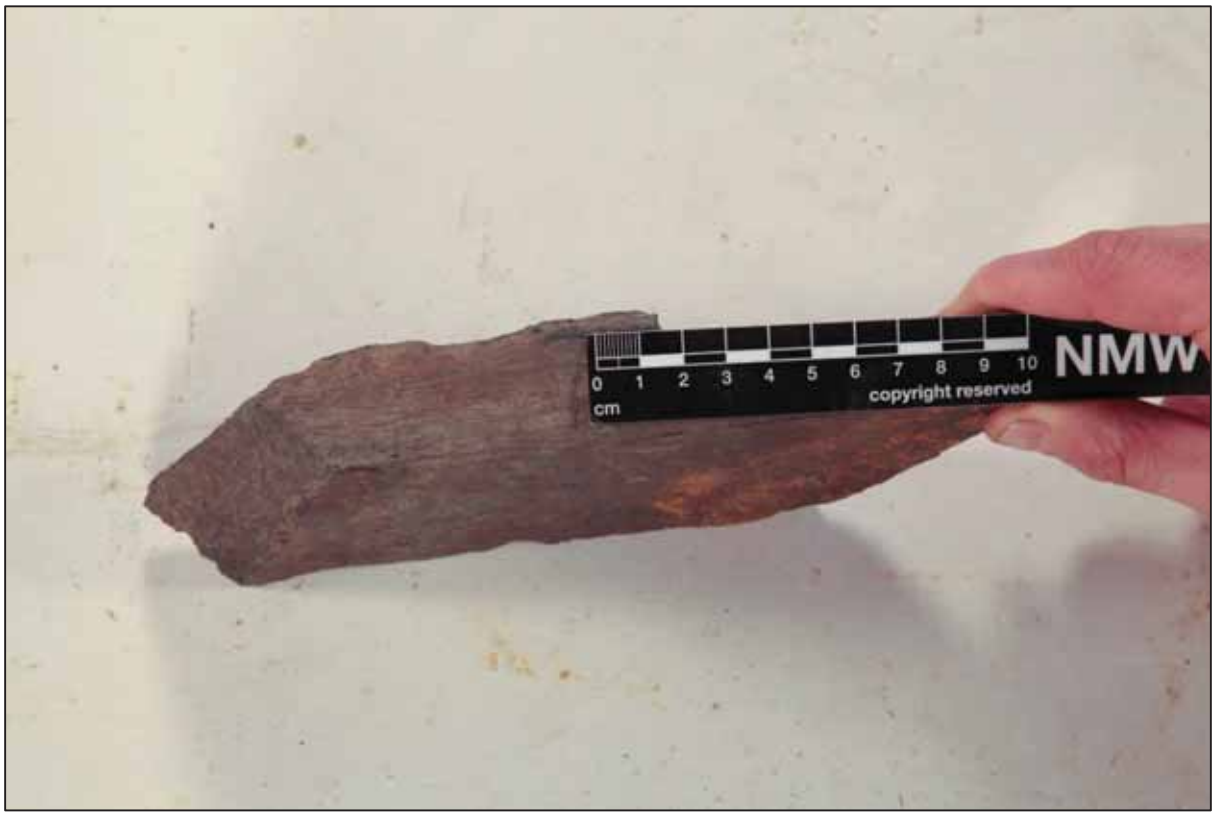
The sandstone (quartz arenite) matches the less pebbly component of the 'Anglesey Grits', sandstone horizons within the Carboniferous Loggerheads Limestone Formation. This crops out to the north-east and north-west of Penmon. Anglesey.

The Loggerhead Limestone (consisting mainly of pale, thickly-bedded, skeletal and peloidal packstones) on Anglesey is interbedded with distinctive sheet and channel sand bodies (Davies 2011). These coarse-grained and pebbly sandstones are commonly referred to as the 'Anglesey Grits'. The sandstones (quartz arenties) are extremely quartz rich (more than 95 %), with grains lightly cemented by quartz. Pebbles of quartz and jasper are common throughout. It is therefore reasonable to conclude it has a source in this lithology.

Sample G2358: (UB02) 24

An extremely fine grained, homogeneous, reddish-grey [Munsell 2.5YR 3/1 – 4/1 (dark reddish grey)] laminated mudstone (grains too small to see with the naked eye), showing much iron discolouration. The rock splits readily along laminations and the largest faces of the block are oriented parallel to them, and represent a natural bedding surface. It is not possible to state whether this block has been spilt by hand or has split naturally along these planes. The sides of the block whilst perpendicular to bedding, appear to have quite a strong, straight and smooth edge. This would suggest fracturing along a natural plane of weakness e.g. jointing. No obvious tool marks were observed.

The nature of the laminations perpendicular to jointing and the rock's ability to be split into large slabs (whether naturally or by hand) would have made it an ideal choice as a flooring slab. The bedrock at the Bishop's Palace site comprises mudstones and silty mudstones of the Ordovician, Nant Ffrancon Subgroup (Arenig to Cadadoc in age) and this matches the lithology of the specimen described here. It is therefore highly likely that these slabs were sourced from the local bedrock.



4. Bibliography

British Geological Survey: The BGS Lexicon of Named Rock Units: http://www.bgs.ac.uk/lexicon/home.cfm (14/07/2016)

British Standards Institution, (2007). *Natural Stone Test Methods – Petrographic Examination:* BS EN 12407, BSI, London

Davies, J. R. Somerville, I. D. Waters, C. N. and Jones, N. S. (2011) In: *A Revised Correlation of Carboniferous Rocks in the British Isles.* Geological Society, London, Special Publications Volume 26. pp 49 - 56.

Geological Survey of England and Wales1:50,000 geological map series, New Series. Anglesey Sheets 92 & 93 and parts of sheets 94,105 & 106. Drift edition. 1980.

Geological Survey of England and Wales1:50,000 geological map series, New Series. Anglesey Sheets 92 & 93 and parts of sheets 94,105 & 106. Drift edition. 1974.

Geological Survey of England and Wales1:50,000 geological map series, New Series. Bangor Sheet. Solid edition. 1985.

Waters, C.N. Somerville, I.D. Jones, N.S. Cleal, C.J. 2011*. A revised correlation of Carboniferous rocks in the British Isles.* Geological Society special report; 26.

14 APPENDIX IV

14.1 Metal Artefact Assessment Report

ARCHÆOLOGICALsmallFINDS

BISHOP'S PALACE
BANGOR
ASSESSMENT REPORT
OF METAL SMALL FINDS

for

Gwynedd Archaeological Trust

AsF Report: 0024.01
October 2016

www.smallfinds.org.uk

BISHOP'S PALACE
BANGOR
ASSESSMENT REPORT
OF METAL SMALL FINDS

Prepared for
Gwynedd Archaeological Trust
Craig Beuno
Ffordd y Garth
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by
Jörn Schuster

AsF Report: 0012.01
October 2016

DOI: ###

Cover image: Lead/tin alloy token (SF 3; 11.9x12.1mm)

T 01963 371536 E info@smallfinds.org.uk

1. Introduction

ARCHÆOLOGICALsmallFINDS (AsF) was commissioned by Gwynedd Archaeological Trust to provide an assessment report for an assemblage of metalwork found in the course of archaeological investigations in the grounds of the Bishop's Palace, Bangor (Gwynedd Archaeological Trust Project Number G 2358), between March 2014 and September 2015.

2. Methodology

The objects were examined visually and, where required, with hand lenses (x4, x8 magnification). Basic type identifications such as 'pin' or 'nail' were recorded. Broad period dates attributed to the finds are based on the intrinsic dates of the finds established by comparison to known parallels and typologies. X-radiographies prepared of all iron objects by Cardiff Conservation Services aided identification of further details where necessary. Object identification, measurements, including weight, and detailed descriptions as well as contextual details were entered into an Excel spreadsheet (available in the archive). Recommendations for mineral remains analysis, additional x-raying and conservation treatment (cleaning/ stabilisation/ reconstruction) as well as illustration have been considered and, where deemed necessary, noted in the spreadsheet.

3. Quantification and Provenance

The assemblage comprises 26 objects, including items made of copper alloy, iron and lead or lead alloy. One item, a copper nail or button, was not present for assessment and has not been included in the subsequent quantification. The small finds in this report are arranged in groups of functional categories following Crummy (1983, 5–6). A breakdown by material and category of all finds is shown in Table 1. The objects were recovered from seven contexts, predominantly located in Trench 2; two iron nails and a copper alloy pin were found in lightning cable Trench E, the above-mentioned nail or button came from the oval area, and a lead/tin alloy token was recorded as unstratified.

Table 1. Number of objects per material and functional category (after Crummy 1983, 5–6).

Functional category	Copper alloy	Iron	Lead alloy	Grand Total
Personal	1			1
Construction			1	1
Fitting		13		13
Commerce			1	1
Uncertain			9	9
Grand Total	**1**	**13**	**11**	**25**

4. The Small Finds Assemblage

There is only one object in the category personal adornment, comprising one pin. Most of the pin's surface and its Z-twisted wound-wire head have been lost due to corrosion, making it impossible to ascertain whether it had originally been coated in white metal; equally the shape of the wire wound around the head can no longer be determined. Consequently, it can only be assigned a broadly later medieval or early post-medieval date (Biddle and Barclay 1990, 560–1; Goodall 2005, 367).

A triangular-sectioned length of lead is the only item belonging to the category building and construction. It is most likely a piece of window came or possibly an openwork window- or ventilator grille. As such it would be commensurate with a building of a slightly elevated status.

All 13 objects in the category fittings are iron nails or nail fragments. Most nails are missing their heads, two have sub-circular, flat heads, one has a slightly domed head and one with a large, sub-square, flat head could have been a decorative nail for a door or chest (cf. Schuster *et al.* 2012, 155–6, fig. 47, 111).

A fragment of a lead/tin alloy token was recorded as unstratified. It is decorated on one face with what might be a stylised fleur de lis with a pellet in one corner (see cover). A possibly comparable object, a lead uniface token of probable 17th- or 18th-century date, was found on the bank of the Thames in Lambeth (Tyacke 2015).

Of uncertain purpose are nine small fragments of amorphous lead run-off from the secondary fill of pit 135.

5. Potential of the Assemblage

Due to its small size, the assemblage has only very limited potential to contribute to the chronological and functional analysis of the activities carried out in and around the Bishop's Place.

6. Recommendations for further Work

No further analysis is proposed. It would be sufficient to include a summary paragraph of the results of this assessment in any potential publication.

7. Archive

The archive will be deposited at National Museum of Wales. A spreadsheet and digital scans of all x-radiographs will be made available online at https://independent.academia.edu/JoernSchuster

8. Bibliography

Biddle, M. and Barclay, K., 1990 'Sewing pins' and wire, in M. Biddle (ed) *Object and economy in medieval Winchester: artefacts from medieval Winchester*, 560-71. Winchester studies 7.ii. Clarendon, Oxford.

Crummy, N., 1983 *The Roman small finds from excavations in Colchester 1971-9*, Colchester Archaeological Report 2. Colchester Archaeological Trust, Colchester.

Goodall, A., 2005 Copper-alloy objects, in M. Biddle (ed) *Nonsuch Palace: the material culture of a noble restoration household*, 359-70. Oxbow, Oxford.

Schuster, J., Saunders, P. and Algar, D., 2012 Objects of iron, in P. Saunders (ed) *Salisbury Museum medieval catalogue. Part 4*, 143-99. Salisbury and South Wiltshire Museum, Salisbury.

Tyacke, A., 2015 CORN-952B1A: a post-medieval token. Web page available at: https://finds.org.uk/database/artefacts/record/id/726612 [Accessed: 17.10. 2016]

Find No	Sub area	Context	Context description	Material	Material JS	Object descriptioin	Count	Object type	Functional category	Weight (g)	Nail Lmin (mm)	Nail Lmax (mm)	Length (mm)	Width/Diam (mm)	Thickness/Height (mm)	Object description JS	Intrinsic Date
3	Unstrat	N/A	N/A	Metal	Pb/Sn Alloy	Possible coin fragment/post medieval token	1	Token	Commerce	0.8			12.1	11.9	0.7-1.6	Token. Fragment of uniface token with stylised ?fleur de lis and pellet in corner. Cf. CORN-952B1A (https://finds.org.uk/database/artefacts/record/id/726612)	?Post-med ?C17-18
5	Oval area	(085).	Levelling layer for cobble surface	Metal	not seen by JS	Copper nail/button	1										
7	Trench 2	(117).	Possible levelling deposit for stone flagged surface	Metal Fe.	Iron	Fe object	1	Hook or nail	Fitting	5.2	32.4					L-shaped hook or bent nail without head.	?
12	Trench 2	(131).	Demolition/levelling deposit within possible medieval structure	Metal Fe.	Iron	Fe object	1	Nail	Fitting	8.1	59.2			10.8		Nail. Subcircular-sectioned shank, tip bent, head missing	?
13	Trench 2	(119).	Possible levelling deposit for stone flagged surface	Metal Fe.	Iron	Fe object	1		Fitting	11.3	48.1					Nail. Subcircular-sectioned shank, tip slightly bent, head missing. Completely covered in soil accretions.	?
29	Lighting cable Trench E	(062).	Midden deposit	Metal Fe.	Iron	3 small corroded iron objects	2	Nail	Fitting	9.9	41	42				2x nails. One with subcircular flat head, subrectangular-sectioned shank (2 fragments) and missing tip; the other with head missing and subrectangular-sectioned shank tapering tto rounded tip.	?
30	Lighting cable Trench E	(062).	Midden deposit	Metal	Cu Alloy	1 dress making pin, copper	1	Pin	Personal	<0.1			26.2	1		Pin with wound wire head. Z-twisted wire with 1 1/4 coils, outer surface and core of wire missing, obscuring treatment of spiral head. Circular-sectioned shaft, surface largely corroded, no obvious signs of wire drawing.	Late med/early post-med
37	Trench 2	(117).	Possible levelling deposit	Metal Fe.	Iron	1 round corroded iron stud	1	Nail	Fitting	2.3				16.3		Nail head with beginning of shank. Subcircular, flat head with subrectangular-sectioned shank.	?
48	Trench 2	(119).	Fill of truncated feature [128]	Metal Fe.	Iron	3 small iron fragments	3	Nail	Fitting	0.6	14.2					3x Nail shank fragments,no obvious join but probably from same nail. Subrectangular section.	?
59	Trench 2	(125).	Pink clay deposit	Metal Fe.	Iron	1 small possible nail	1	Nail	Fitting	0.6	16.4					Nail shank, subsquare section, tip coiled making it appear almost like nail head.	?
68	Trench 2	(131).	Stony fill of cut feature [134]	Metal Fe.	Iron	2 small corroded iron objects	1	Nail	Fitting	13.9	46.7					Nail with subcircular domed head, subsquare-sectioned shank, separate tip from ?same nail.	?
73	Trench 2	(132).	Secondary fill of [135]	Metal Fe.	Iron	Occasional corroded Iron fragments	1	Nail	Fitting	13.2				29/06/1935		Nail head with beginning of shank. Large, subsquare, flat head with beginning of subsquare-sectioned shank. Nail for door or large chest?	?
76	Trench 2	(132).	Secondary fill of [135]	Metal Pb.	Pb Alloy	Occasional lead fragments	1	Window came	Building	2			34.5	4.5	1.8	Window came. Triangular-sectioined slightly twisted length of came, one end with straight cut, the other broken.	Med/Post-med
76	Trench 2	(132).	Secondary fill of [135]	Metal Pb.	Pb Alloy	Occasional lead fragments	9	Spill	Uncertain	2.6						9x amorphous fragments of lead run-off or spill.	?
89	Trench 2	(137).	Stony deposit containing animal bone	Metal Fe.	Iron	1 small corroded iron object	1	Nail	Fitting	6.4	38.2					Nail shank, subsquare section, tip and head missing; large soil accretions.	?

15 APPENDIX V

15.1 Archaeometallurgical Residue Assessment Report

GeoArch

Report 2016/12

Assessment of archaeometallurgical residues from the Bishops' Palace, Bangor, G2358

Dr Tim Young
6th May 2016

Assessment of archaeometallurgical residues from the Bishops' Palace, Bangor, G2358

Dr T.P. Young

Abstract

This assemblage comprised approximately 190g of material, dominantly fired clay and fuel ash slag. The fuel ash slag included both small accumulations in a thin sheet and, in one sample, abundant small spheroidal particles. Fragments of fuel ash in sheet form commonly had adhering spheroidal particles. Many of the fuel ash particles showed a variegated khaki to maroon surface colour, typical of clinkers. In this instance, no certain coal-residue particles were observed, and the slaggy materials were probably derived from melting of wood ash and clay-rich substrate.

There assemblage also contained a corroded iron object, possibly a small nail.

There is no indication that the assemblage was derived from metalworking. Fuel ash slags of this general type occur widely in the ashes of large hearths and kilns. Considerable periods of time may be required for the generation of significant build-ups of this class of fuel ash in wood fires, and they appear to preferentially occur in association with cereal-drying kilns and semi-permanent domestic hearths, but other similar types of fire would also be capable of their generation.

Contents

Methods

The material described here derives from excavations at the Bishops' Palace, Bangor, conducted by Gwynedd Archaeology (Project Number G2358). This project was commissioned by Jess Davidson.

All materials were examined visually with a low-powered binocular microscope where required. As an evaluation, the materials were not subjected to any high-magnification optical inspection, not to any form of instrumental analysis. The identifications of materials in this report are therefore necessarily limited and must be regarded as provisional.

Results

Description of residues

The submitted materials amounted to approximately 190g in weight and derived from two samples taken from a single context (C124).

Burnt clay

The burnt clay fragments ((124) <11>) were mostly small and irregular fragments. Several pieces show and indurated (probably fired) sub-planar surface, sometimes with attached fuel ash slag. The clay was pinkish, with abundant white inclusions, probably including both small stone fragments and ashy particles. The clay also locally contained darker slaggy material, possibly suggesting reworking of the clay.

Fuel ash slags

There were several particles in sample <11> of crudely tabular form, suggesting broken fragments of an irregular sheet. The same sample also produced a few particles of elongate, prill-like, form, up to about 3mm in diameter, suggesting some limited generation of more fluid melts.

Microresidues

There were abundant spheroidal and sub-spheroidal particles within sample <12>. Some of these were very close to spheroidal, up to 2mm in diameter, and with a metallic lustre, most however showed variation from this, with multiple conjoined spheroids, irregular shapes and dull grey, maroon or green glassy colours. This indicates that the particles are mostly not spheroidal hammerscale, and probably all not spheroidal hammerscale. Instead they can be interpreted as fine slag droplets generated inside the fuel bed of a hearth.

Iron
Sample <11> item 80 contained a single small fragment of corroded iron (possibly a small nail) and approximately six pieces of rust-stained concretion.

Distribution of residues
The residues were recovered from ashy, and charcoal-rich, lenses within a probably medieval building (although potentially post-dating its demolition). The material appears unlikely, therefore, to have been in situ within a hearth, but more likely within a hearth clearance deposit.

Three samples were provided:
(124) <11>: this was presented as two subsamples, one large fired clay and associated fuel ash slag, the other smaller sample was of darker fuel ash slag particles and charcoal.

(124) <12> included ashy particles, charcoal, a few larger particles of fuel ash slag, but many spheroidal and sub-spheroidal droplets.

Interpretation

Small accumulations of fuel ash slag in an ashy matrix are typical, not of metallurgical processes, but of settings such as cereal-drying kilns, in which long periods at high temperature permit interaction of the fuel ash (rich in alkalis and alkali earth elements) and the hearth substrate (or any included sediment within the fuel). The interaction (fluxing) lowers the melting point of the sediment, permitting both the slagging of surfaces and the generation of slag within the fuel bed.

The generation of spheroidal droplets of fuel ash slag has been noted at Bornais (Young 2005) and the incorporation of droplets to form a sheet described at Llandeilo (Young 2015). In both instances, these occurrences were in residues from cereal-drying kilns, although it is likely that other forms of hearth/kiln might produce similar particles.

Very similar particles were recovered from a burnt mound near Caernarfon (Young 2016).

Further work

The material is unlikely to be able to provide further useful information through detailed investigation, although trace element studies of similar assemblages elsewhere have provided clues to their origin. In particular a potential chemical signature acquired from burnt grain has been proposed (Young 2015, 4). In this instance, the lack of direct connection between a physical structure and the ash deposits limits the potential for calculating a mass-balance description of the slag, in turn limiting the benefits of detailed investigation. No further work on this material is proposed.

References

YOUNG, T. 2005. Site Activities: slag and related materials. pp. 174-176. *In:* Niall Sharples (ed.), *A Norse Farmstead in the Outer Hebrides. Excavations at Mound 3, Bornais, South Uist*. Oxbow Books, Oxford.

YOUNG, T.P. 2015. Fuel ash slags from Ysgol Bro Dinefwr, Llandeilo, Carmarthenshire. *GeoArch Report 2014-32.* 20pp.

YOUNG, T.P. 2016. Assessment of archaeometallurgical residues from Caernarfon, G2454. *GeoArch Report 2016/11*. 2pp.

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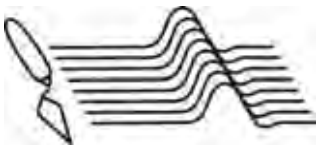

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16 APPENDIX VI

16.1 Ceramic Artefact Assessment Report

Pottery Report for Neuadd y Dref Bishop's Palace, Bangor GAT Project G2358

Methodology

The pottery was recorded to basic record level as defined by *A Standard for Pottery Studies in Archaeology* (PCRG, SGRP, MPRG 2016) it has therefore been quantified by sherd count, weight and EVEs by ware type and form within context groups.The terms used to identify wares are those employed in the Cheshire West and Chester Council fabric reference collection, modified for the post-medieval wares with terms recommended by the Potteries Museum, Stoke on Trent during English Heritage (now Historic England) sponsored training courses, run in conjunction with the Medieval Pottery Research Group. The weights given are to the nearest gramme. The data has been recorded in an Excel spreadsheet that accompanies the report; this report summarises the data and discusses the assemblage from each trench on the site. Fabric descriptions are given for the two unidentified wares. Recommendations are given for further work and archiving.

Condition

The assemblage is very fragmentary, sherd size is not large and levels of abrasion vary. There are no complete vessels but one vessel can be partly reconstructed a slipware cup or porringer found in the midden deposit (001) in Lighting cable trench A.

Quantity

Forty-one sherds (539 g) were retrieved, 16 of these were from a single vessel , the slipware cup or Staffordshire-type porringer. Table 1 shows how the pottery was distributed across the site and within each trench.

Table 1 Quantity by trench

Trench	Context	Sherd count	Weight (g)
2	112	1	12
2	117	9	24
2	123	1	5
2	u/s	6	107
A	1	16	126
A	2	1	76
A	3	3	6
E	39	1	5
E	2	2	29
Drainage trench	107	1	139

Description by trench

Trench 2

A total of 17 sherds (148 g) were found in this trench from the cobbled surface (112), the possible levelling deposit (117) and the fill of a pit (123), six sherds were found unstratified.

The stratified pottery consists of post-medieval blackwares most of these are featureless fragments from the body or central area of the base of vessels therefore their form is generally not evident. A small fragment of rim from context (117) is from a cup or mug and part of a base in the same context represents a jug or large cup. A small fragment of a narrow strap handle from the fill, (123), of a small pit is from a blackware mug or jug. A fragment of a blackware jar was also found in the cobble surface (112). The small size and lack of distinctive features prevents close dating of the sherds however the forms represented and fabrics suggests that they are all of 17th or 18th century date.

The unstratified pottery is a varied group consisting of part of the base of a late 13th century Saintonge jug with a smooth green glaze, pieces of 19th or 20th century unglazed earthenware flower pot, part of the base of a blackware jar and part of the base of an 18th century white salt-glazed stoneware bowl or dish.

Lighting cable trench A

The midden deposit (001) produced 16 sherds (126 g) from a single smashed slipware cup with a single vertical loop handle; the sherds join to make an almost complete vessel which is squat and shallow with rounded sides that flare out from below the rim (radius 47 mm) to a wide base (radius 50 mm). The cup is made from a buff coloured clay which has been decorated on the exterior with feathered/combed red and white slips under a clear glaze resulting in a yellow and brown colour scheme. The vessel is similar in shape to those termed porringers in Staffordshire (Barker & Crompton 2007, 42) used for eating liquid foods. With a height of 54mm it is smaller than the Staffordshire examples but the wide shallow shape may be more suitable for eating from with a spoon than drinking from and it could perhaps have been intended for a child. The style of decoration and form is late 17th or early 18th century in date.

The rubble deposit (002) contained a single fragment from the rim of a large 18th or 19th century blackware bowl with a heavy square sectioned rim. Wall (003) produced an abraded fragment of 17th century yellow ware and two joining pieces of very abraded medieval pottery (Fabric 1). A small trace of glaze survives on the latter and the fabric (see Appendix) is similar to late 13th/early 14th century types from Cheshire.

Lighting cable trench E

The midden deposit (062) produced two body fragments in a red sandy ware (Fabric 2) with a dark reduced glaze. It has not been possible to identify the ware-type but the glossy almost black glaze with the relatively coarse fabric suggests it is a late medieval or early post-medieval type. It has some similarity to wares noted on Merseyside (Edwards 1999 a and b) of a similar transitional date but the clay fabric is similar to wares produced from Cheshire Boulder clay therefore it is difficult to suggest a provenance for the pieces.

A rim sherd from a facetted cup with painted decoration and a fine white earthenware body of 19th or early 20th century date was found in the levelling layer for the cobbled surface (039).

Drainage trench

The base of a blackware jar or bowl was found in the disturbed cobble layer (107),it is in better condition and survives as a larger fragment than the other blackwares in the assemblage.

Discussion

The assemblage is domestic in character representing a mix of medieval and post-medieval tablewares and those for serving and storing liquids and food as well as flower pots. The major part of the assemblage consists of common types of post-medieval pottery produced in North Wales, the north west of England and the English Midlands.

During the 17th and 18th centuries blackwares provided a wide range of vessel forms for eating, drinking, serving, food preparation and storage functions and proportionally they are the most common ware in assemblages of this period. Production continued into the early 20th century but with competition from other types of ceramics their predominant role became food preparation and storage. The closest source for these wares is Buckley, Flintshire but they were also produced in Staffordshire and also on Merseyside at Prescot, similar clays outcrop in each of these areas and a similar range of blackware products were produced therefore it is hard to identify a provenance for small sherds. Whilst slipwares were made at Buckley the slipware vessel on the basis of its form is more likely to have an origin in Staffordshire although it cannot be ruled out as a Buckley product as a similar range of wares were made at potteries in both areas. Yellow wares tend to be a 17th century type (Edwards 2008) and were produced at various centres. The white salt-glazed stoneware is a relatively fine tableware which would not be out of place in a prosperous 18th century household.

Saintonge wares are the principle type of Continental medieval pottery in the North Wales and Chester region and they tend to be linked to the trade in wine between France and the west coast ports of Britain. Their occurrence locally in archaeological assemblages however tends to be restricted to sites of relatively high status e.g. castles and ecclesiastical establishments or to areas with close contact with maritime ports; the association of this piece with the Bishop's Palace is therefore appropriate. This fragment, the medieval Cheshire type pottery from (002) and the potential late medieval ware from (62) adds to the small amount of medieval pottery found in recent years in the centre of medieval Bangor associated with the Bishop's Palace.

The overall condition of the assemblage suggests that it is not in its original place of deposition and is derived from disturbed deposits and therefore it is difficult to draw any conclusions on the nature of occupation represented by the deposits in which the pottery was found, the types of post-medieval wares would not have been out of place in a high status home where a variety of wares would have been in use in both the householder and servants quarters .

The size of the assemblage also detracts from its potential however when viewed in relation to other assemblages from the vicinity of the Bishop's Palace in Bangor it could be used to contribute to discussions on the range and extent of pottery use in the medieval and early post-medieval city.

It is difficult to comment on the significance of the assemblage in relation to archiving without information on any associated finds or more detailed information on stratigraphic relationships. Retention for archiving is a matter for discussion with the project manager and receiving depository, however given the relatively sparse quantity of medieval pottery found in this area it is advised that

from a ceramic point of view the assemblage should be retained for future reference. The slipware vessel and the Saintonge jug fragment should be drawn.

Appendix: Fabric descriptions

The terms and descriptions used are those employed in the DUA Pottery Archive Users Handbook (DUA 1984).

Fabric 1 Find no. 22 (003)

A pale red/pink soft fabric with a rough feel and an irregular texture. Inclusions: moderate, ill-sorted fine to coarse sub-angular quartz grains that are grey, opaque white or colourless; sparse coarse (<1.5 mm) fine-grained red/pink rock fragments that are lentoid in shape; sparse coarse sub-angular granite fragments; fine iron rich red and black particles. The surfaces are so abraded that only a very small spot of glaze material survives and its extent, colour and finish cannot be determined. The pot appears to have been wheelthrown but little survives to indicate the method of manufacture.

The fabric is similar to that of wares made from the Boulder clays found in Cheshire and the West Midlands and on the basis of finds from North Wales castle sites, notably Dyserth and Deganwy, were in use from c.1250 (Talbot 1977; Hewitt and Morgan 1977) and possibly until sometime in the first half of the fourteenth century.

Fabric 2 Find no. 1 (62)

A very hard orange/red fabric with dark grey interior and exterior surfaces, a harsh feel and irregular texture. Inclusions: abundant sub-angular well-sorted, medium quartz grains that are white, iron-stained or colourless; sparse coarse (1 mm) sub-angular white quartz grains; sparse moderate sized red iron rich lenses and pellets. A glossy reduced glazed covers the interior of one sherd and partially the interior of another where it thins to a lustrous sheen. Wheel throwing lines are present on the interior surfaces the exterior have a pimply appearance.

Bibliography

Barker, D & Crompton, S 2007 Slipware in the collection of the Potteries Museum & Art Gallery. London: A&C Black.

Davey, P J ed 1977 Medieval pottery from excavations in the North West. University of Liverpool

DUA 1984 Pottery Archive Users Handbook extracted from the DUA Finds Processing Manual. Museum of London.

Edwards, J 1999a Eccleston Hall, Eccleston St Helens, medieval and post-medieval pottery assessment report for Gifford and Partners

Edwards, J 1999b Report on pottery from excavations by LUAU at Fazakerley, Merseyside. Unpublished.

Edwards JEC 2008 Post Roman Pottery. In: Garner & others 2008 Excavations at Chester 25 Bridge Street 2001 Two thousand years of urban life in microcosm. Archaeological Service Excavation and Survey Report 14. Chester City Council. 187-242.

Hewitt, N E & Morgan, D E M 1977 Dyserth. In: Davey 1977. 34-41

Talbot, E 1977 Deganwy. In: Davey 1977. 30-33.

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August 2016

Trench	Context	Find no	Phase	Ware	Form		date range	Rim EVE	Rim rad mm	Base EVE	Base rad mm	Sherd count	Weight (g)	Comments eg condition, decoration etc
A	1	18		Slipware	cup		lt 17th - early 18th	46	47	65	50	16	126	smashed vessel, complete profile;'combed' slip decoration; wide shallow cup; ht 54 mm; *draw
A	2	19		Blackware	bowl		18th-19th	6	150			1	76	heavy square rim, kiln scar on rim, abraded
A	3	22		Yellow			17th					1	2	abraded
A	3	22		Medieval		Fabric 1	13th/14th?					2	4	joining sherds, abraded, very small spot of glaze survives
E	39	2		19th/20th century whiteware	cup		19th-20th	11	45			1	5	facetted, foliage and berry decoration - green, black, red/pink
E	62	1		Late medieval/Transitional glazed ware		Fabric 2	15th/16th?					2	29	sandy ware with reduced glaze similar to Merseyside transitional types
Drainage trench	107	17		Blackware			17th-18th			22	70	1	139	large base fragment
2	112	6		Blackware	Jar?		17th-18th					1	12	
2	117	14		Blackware			17th-18th					1	4	base sherd no perimeter surviving but possibly from a large cup
2	117	8		Blackware			17th-18th					1	10	base sherd
2	117	8		Blackware	jug/cup		17th-18th			6	45	1	7	rounded foot, round bodied form
2	117	8		Blackware			17th-18th					1	1	
2	117	8		Blackware	cup		17th-18th	3	55			1	2	glaze bubbled, burnt or high fired; small fragment rim measurement approximate
2	117	36		Blackware			17th-18th					4	10	
2	123	9		Blackware	jug/cup		17th-18th					1	5	narrow strap handle
2	u/s	11		Saintonge - smooth grgl	jug		c.1270-1300			17	50	1	14	smooth green glaze, abraded
2	u/s	10		unglazed redware	flowerpot		lt 18th - 20th			15	40	2	39	
2	u/s	10		Blackware	jar		17th-18th			20	50	2	46	base edge and sherd from centre of a base
2	u/s	10		White salt-glazed stoneware	bowl		c.1720-c.1780			19	30	1	8	high footring
Total												41	539	

17 APPENDIX VII

17.1 Animal Bone and Mollusc Shell Assessment Report

Bishops Palace, Bangor – G2358
Animal Bone and Mollusc shell

Twelve samples from the excavations at the Bishops Palace, Bangor were processed by the Gwynedd Archaeological Trust and the animal bone and shell extracted by hand sorting from the residues. This material and a few bones collected by hand from four contexts were submitted to the Environmental Archaeology Consultancy (EAC) for identification and analysis. All fragments of bone and shell over 2mm in diameter were counted and weighed and an archive catalogue of the animal bone produced (see Appendix). The bone was recorded following the normal procedures of the EAC (see attached Key) and the marine shell was identified and weighed, and largely intact shells or valves counted. Material from the following contexts was studied.

Table 1. Contexts that produced animal bone and shell.

Sample	context	description	date
	002	rubble deposit	
	003	wall	
<1>	062	midden deposit	Late medieval
	081	uppermost backfilled deposit within palaeochannel	
	108	cobble layer	
<3>	117	possible levelling deposit	Post-med
<4>	118	midden deposit	Post-med
<7>	125	pink clay deposit	Med-PM?
<5>	119	fill of truncated feature 128	Med-PM?
<10>	132	secondary fill of 135	Med-PM?
<11>	124	lens burnt deposit	Medieval
<12>	124	lens burnt deposit	Medieval
<13 >	137	stoney deposit containing animal bone	Medieval

Although the contexts broadly date from the medieval to the post-medieval period, the specific date of the individual contexts was not available for this report so the material has been presented by context for re-evaluation when all the dating is available.

Because the bulk of the material derives from samples most of the material is very fragmented and although 2992 bone fragments have been recorded (and a number of uncounted unidentifiable fish bones) relatively few fragments have been specifically identified, with less than 22% of the assemblage being classified more precisely than ‘unidentified’. Most of the animal bone is unburnt but in context 124 burnt bone is particularly abundant, and of the two samples collected, 11 and 12, the latter is dominated by small fragments of burnt bone, suggesting a dump of material from a hearth. Contexts 062, 118 and 124 are particularly dominated by small fragments. In fact there is a distinct lack of cattle, cattle size and pig bones across all the sampled deposits, and surprisingly few sheep/goat and sheep sized bone fragments (Table 2). There is a dominance of the bones of small animals such as birds and fish and it seems that this might reflect the character of the deposit rather than the relative importance of the different species. It seems likely that the larger bones of cattle, pig and sheep have been dumped elsewhere on site and that these assemblages reflect disposal of post-cooking waste, rather than butchery or food preparation waste, perhaps dumped directly from the kitchens.

Table 2. Number of fragments, shells or valves of animal bone and shell

species	002	003	062	081	108	117	118	119	123	124	124A	125	127	131	132	137
Sample no.			**1**			**3**	**4**	**5**	**6**	**11**	**12**	**7**	**8**	**9**	**10**	**13**
Cattle	2	1	3				2									1
Cattle size			3	1		2	27	3	1	6	10					1
Sheep/goat			1		1			3		1	3				1	
Sheep size			14			1	50	11		4	7				2	4
Pig							2			1	2				1	1
Lagomorph			1												1	
Hare							1	1								
Rabbit											4					
Rodent						1									2	
Vole															1	
Small animal			7			3	1			4	7					
Chicken			4				11	4								3
Chicken size			1				4	1								
Goose			1				1				1					
Goose size			1					1								
Duck							1									
Teal?						1										
Heron?							1									
Partridge?																2
Passerine			4				2								1	
Bird			2													
Bird not identified			34			1	86	8		7	7	1		1	4	8
Frog/toad													1			
Unidentified bone			193			18	1185	74	6	118	629	6	9	6	51	50
Roker			2													
Ray			1				2									
Eel							2					1				
Herring			8				9			1	14	5			3	
Salmonid							2				4					
Cod															2	
Haddock							5									
Whiting			8				9				1					
Small gadid							10				4	1			1	
Sea bass			*				3*				*					
Plaice/flounder							11	3			7					
Dab										1						
Flatfish			2				5				1					
Fish							2				103				1	
Indeterminate fish			+			+	+	+		+	+	+			+	+
Crustacean							1									
Common mussel			9			1	19	13	+	+		+		12	2	1
Cockle			9			+	5	9	1	+		+		5	1	2
Oyster			15			+	6	10	1	+	1	+		1	+	+
Periwinkle			7			6	2	3		+				1	+	2
Rough winkle							2									
Dog whelk						1										
Scallop							1									
Venus clam?								1	+							+
Whelk																+
Tellen			1													
Shell – not identified			2													
Indeterminate shell			+			+				+	+	+	+	+	+	+

+ uncounted bone or shell present but no intact valves recorded; * fish scales present

Table 3. Weight of fragments of bone and shells

species	002	003	062	081	108	117	118	119	123	124	124A	125	127	131	132	137
Sample no.			1			3	4	5	6	11	12	7	8	9	10	13
Cattle	72	15	200				10									21
Cattle size			5	3		1.8	69	19	3	13	16					0.7
Sheep/goat			0.1		16			26		1	9.7				0.2	
Sheep size			12.5			1	45.8	26		1.5	4.3				3	3
Pig							7			1	0.6				0.1	4
Lagomorph			0.1												0.1	
Hare							2	0.1								
Rabbit											0.7					
Rodent						0.1									0.2	
Vole															0.1	
Small animal			0.7			0.1	0.3			0.5	0.2					
Chicken			3.3				13	2.9								3.1
Chicken size			1				1	1								
Goose			1				1				1					
Goose size			0.2					1								
Duck							0.3									
Teal?						0.8										
Heron?							2									
Partridge?																0.7
Passerine			0.4				0.2								0.1	
Bird			1.2													
Unidentified bird			2.1			0.1	11.5	1.4		1.1	2.2	0.1		0.2	0.5	4.1
Frog/toad													0.1			
Fish			1			0.1	18	1		0.1	3.1	0.3			0.9	0.1
Unidentified bone			17.2			1.2	104.2	8	0.5	11	35	0.3	0.1	0.4	3.5	7
Crustacean							2									
Common mussel			51			4	171	87	2	0.2		0.5		32	7	1
Cockle			54			18	61	41	6	1		0.2		87	19	17
Oyster			275			5	86	343	6	1	10	0.5		4	8	4
Periwinkle			22			13	2	5		0.5				2	1	3
Rough winkle							0.4									
Dog whelk						0.5										
Scallop species							2									
Venus clam?								2	0.2							0.2
Whelk																0.2
Tellen			0.2													
Shell-not identified			19													
Indeterminate shell			51			23	52	59	8	7	1	3	0.8	60	18	23

The deposits have produced such a wide range of species that it seems likely that this reflects the status of the site. Further work on the bird bones should establish further species, and the presence of small passerines suggests that small song birds were probably being consumed at the site. Heron, teal, partridge and hare suggest hunting or trapping, while the fish and shellfish, including a crustacean claw, indicate the exploitation of the locally available marine resources.

The fish (*Alison Locker*).
Fish bones were examined from 9 samples, dating from a late medieval midden deposit (62) and 8 samples from Trench 2 sealed by 18th century flagstones.

The following species were identified; roker (*Raja clavata*), ray indet (Rajidae), eel (*Anguilla anguilla*), herring (*Clupea harengus*), Salmonidae, cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*), Gadidae, sea bass (*Dicentrarchus* labrax), plaice\flounder (*Pleuronectes platessa/Platichthys flesus*), dab (*Limanda limanda*) and indeterminate flatfish.

The condition of the bone was variable, with some concretion, typically occurring in conditions of waste, cess or midden deposits as in contexts 62 and 118. Samples 11 and 12 from context 124 were burnt. The non quantified indeterminate bones were largely non specific fragments of fin ray and a few broken pieces of vertebrae. The majority of the identified bones were vertebrae. The scales were large and all of the same type, most closely resembling sea bass, which was also represented by three vertebrae. The flatfishes, plaice and/or flounder included some vertebrae from good sized plaice from the late midden deposit 118 around 45-50 cms in length. A single maxillary was identified as dab in 124, a small inshore flatfish.

Other marine fish were represented by cod, in sample 10 by 2 caudal vertebrae and haddock from 3 skull fragments and 2 vertebrae. The sea bass caudal vertebrae were from probably the same fish of over 40 cms total length and the scales were also from large fishes and may represent the only evidence of status. Sea bass can be found both off and inshore and are sought after by sea anglers in the area today.

Local fisheries would have been on the Menai Strait opening on to Colwyn Bay. The fish here are typical of line catches from boats fishing inshore for seasonal cod, haddock, whiting, sea bass and netting for herring. From the shore both lines and traps could be used for rays and flatfishes. Eels and small young salmonids may have been caught in freshwater while migratory salmon and sea trout and also eels in estuarine conditions.

The small number of samples and fish bones, together with limited dating information, precludes any suggestion of changes through time in the fisheries. Herring occurred in the largest number of samples followed by flatfishes in general and the small gadid category.

The shellfish
The shellfish are dominated by four species, common mussel, cockle, oyster and periwinkle, with occasional shells of dog whelk, venus clam?, scallop, rough winkle and tellen, although the latter two may have been brought in with the catch rather than collected for consumption. By weight the shells are relatively more abundant than the animal bone (Table3) but their relative food weight is much less than the same weight of mammal, bird or fish bone.

Discussion
Perhaps the most interesting aspect of these assemblages is the small proportion of relatively unfragmented domestic mammal bone, which contrasts with most sites where these dominate. Although it is probable that most of the unidentifiable bone must derive from such animals the absence of recognisable fragments reflects the fact that most of the assemblages derive from processed samples rather than hand collecting, but also because the debris in these deposits has been well broken up suggesting intensive processing or considerable trampling.

A relative absence of teeth, which would normally survive trampling, indicates a general absence of skulls and mandibles (the latter often the most abundant element on a site) and perhaps the larger bones were never deposited here. These midden deposits may be the debris from post-consumption and cooking fires with all the primary butchery and un-reduced bones being dumped elsewhere. The concentration of burnt bone in sample <12>, as distinct from sample <11> from the same context (including all the fish bones), suggests a specific dump of material from a fire upon which the bone was thrown. The range of species, including the presence of a number of wild bird bones, suggests that this debris might derive from the Bishop's kitchen.

Recommendations

With more detailed dating for the deposits and further identification of the bird bones and one or two shells the material from this site can tell a story reflecting both the character of the deposits, the food being eaten at the site and the resources exploited. All the finds identified so far could be obtained locally so there is no evidence for any exotic species, although these are more typical of the plant rather than animal assemblages. If the charred plant remains were collected from the samples this will add to the information on the diet at the site, and may include imported foodstuffs.

If dating is available then a more detailed analysis of the material, degree of fragmentation and possible processing involved, and further identification of the bird bone and the one or two shells not yet identified would be warranted.

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December 2016

THE ENVIRONMENTAL ARCHAEOLOGY CONSULTANCY

Key to codes used in the cataloguing of animal bones and marine shells

SPECIES:

SPECIES CODE			SPECIES CODE	
MAN	human		DOVE	Dove species
EQU	Horse		FER	Feral dove
EQSZ	Horse size		PART	Partridge
BOS	Cattle		SWAN?	Swan?
BOSL	Cattle-large		WOOD	Woodcock
CSZ	cattle size		CURL	Curlew
SUS	Pig		WADE	wader
OVCA	sheep or goat		CROK	Crow or rook
OVI	Sheep		CORV	Crow or rook
CRA	Goat		JACK	Jackdaw
SSZ	sheep size		OWL	Owl indet.
FEL	Cat		BUZZ	Buzzard
CAN	Dog		GULL	Gull sp.
AUR	Aurochs			
AUR?	Aurochs?		TURD	Turdidae
CER	red deer		BIRD	Identifiable but not id'd
DAM	Fallow deer		PASS	Passerine
CLS	roe deer		LBIRD	Large bird
LEP	Hare		UNIB	Bird indet
ORC	Rabbit			
LAG	Lagomorph		FROG	Frog
CARN	Carnivore		FRTO	Frog or toad
FOX	Fox			
POLE	Polecat/ferret			
WEA	weasel		GAD	Gadid, cod family
BADG	Badger		LING	Ling
SEAL	seal		HADD	Haddock
SQU?	Squirrel?		RAY	ray
BEAV	Beaver		FISH	Fish
ROD	Rodent		UNIF	Fish indet
RAT	Rat			
AGR	Field vole		OYS	oyster
ARV	Water vole		COK	Cockle
MUS	House mouse		MUSS	Common Mussel
SORA	Common shrew		WHELK	Common whelk
MOLE	Mole		HEL	Helix aspersa
SMA	Small mammal		HELIX	Helix sp.
UNI	Unknown		HELN	Helix nemoralis
			SNAIL	snail
CHIK	Chicken			
CHKZ	Chicken size		FOSS	Fossil bone
GOOS	Goose, dom			
GOOS?	Goose, dom.?			
GSSZ	Goose size			
GSSP	Goose species			
GOSZ	Goose, poss. Wild			
DUCK	Duck, domestic sp.			
DUCK?	Duck?			
DKSP	Duck species			
DSP	Duck species indet			
MALL	Duck, dom.			
TURK	Turkey			

BONE ELEMENT:

BONE CODE		BONE CODE	
SKEL	skeleton	SCP	scapula
SKL	skull	HUM	humerus
ANT	antler	RAD	radius
ANT?	antler?	ULN	ulna
ATT	antler tine	RUL	radius and ulna
HC	horn core	C/T	carpus/tarsus
TEMP	temporal	C23	carpus 2+3
FRNT	frontal	CAR	carpus
PET	petrous	CPA	accessory carpal
PAR	parietal	CPI	intermediate carpal
OCIP	occipital	CPR	radial carpal
ZYG	zygomatic	CPU	ulnal carpal
NAS	nasal	MTC	metacarpus
PMX	premaxilla	MC1-5	metacarpus 1-5
MAN	mandible	MTP	metapodial
MNT	mandibular tooth	MPL	lateral metapodial
DLI	deciduous lower incisor	INN	innominate
DLPM1-4	deciduous lower premolar 1-4	ILM	ilium
LI	lower incisor (and 1-3)	PUB	pubis
LC	lower canine	ISH	ischium
LPM1-LPM4	lower premolar 1-4	FEM	femur
LM1-LM3	lower molar 1 - molar 3	PAT	patella
MAX	maxilla	TIB	tibia
DUI	deciduous upper incisor	FIB	fibula
UI	upper incisor (1-3)	LML	lateral malleolus
UC	upper canine	AST	astragalus
DUPM	deciduous upper premolar	CAL	calcaneum
DUPM1-4	deciduous upper premolar 1-4	CQ	centroquartal
UPM1-UPM4	upper premolar 1-4	TAR3	tarsus 3
UM1-UM3	upper molar 1 - molar 3	T4	tarsus 4
MXT	maxillary tooth	TAR	tarsus
TTH	indeterminate tooth	MTT	metatarsus
INC	incisor	MT1-5	metatarsus 1-5
HYD	hyoid	MTL	lateral metatarsus
ATL	atlas	SES	sesamoid
AXI	axis	PH1	1st phalanx
CEV	cervical vertebra (and 3-7)	PH2	2nd phalanx
TRV	thoracic vertebra (and 1-13)	PH3	3rd phalanx
LMV	lumbar vertebra	PHL	lateral phalanx
SAC	sacrum	LBF	long bone
CDV	caudal vertebra	UNI	unidentified
VER	vertebra		
STN	sternum	CLV	clavicle
CC	costal cartilage	COR	coracoid
RIB1	first rib (2 etc)	CMP	carpo-metacarpus
RIB	rib	CMC	carpo-metacarpus
		WPH1-3	wing phalanges 1-3
URO	urostyle	WPH	wing phalanx
		LSA	lumbosacrale
DENT	dentary		
CLEI	cleithrum		
RAY	fin ray		
SHELL	shell		
UV	upper valve		
VAL	valve		

NUMBER: number of fragments in the entry

SIDE: W - whole L - left side R - right side F - fragment

FUSION: records the fused/unfused condition of the epiphyses
P - proximal; D - distal; E - acetabulum; N - unfused; F - fused; C - cranial; A - posterior

ZONES: records the part of the bone present.
The key to each zone on each bone is on page 4

BUTCHERY: records whether a bone has been chopped (CH), cut (KN), worked (W), burnt (C)

GNAWING: records if a bone has been gnawed by dogs (DG), cats (FEL) or rodents (RG)

TOOTH WEAR - Codes are those used in Grant, A. 1982 The use of tooth wear as a guide to the age of domestic animals, in B.Wilson, C.Grigson and S.Payne (eds) *Ageing and sexing animal bones from Archaeological sites*, 91-108.

Teeth are labelled as follows in the tooth wear column:

Deciduous	Permanent
f ldpm2/dupm2	F lpm2/upm2
g ldpm3/dupm3	G lpm3/upm4
h ldpm4/dupm4	H lpm4/upm4
	I lm1/um1
	J lm2/um2
	K lm3/um3

MEASUREMENTS :Any measurements are those listed in A.Von den Driesch (1976*) A Guide to the Measurement of Animal Bones from Archaeological Sites*, Peabody Museum Bulletin 1, Peabody Museum, Harvard, USA
Some measurments have been taken on juveniles. Measurements marked L1 are the greatest length of long bones lacking one unfused epiphysis – the measurement being taken from the epiphyseal junction. Measurements marked L2 are the greatest length of the long bones between epiphyseal junctions when both epiphyses are unfused.

PATHOLOGICAL: A 'P' indicates that the bone fragment carries a pathology

COMMENTS: This may include a short description of the fragments, any pathologies, butchery or gnawing evidence

PRESERVATION: records the condition of the bone in the following manner

1- enamel only surviving
2- bone very severely pitted and thinned, tending to break up; teeth with surface erosion and loss of cementum and dentine
3- surface pitting and erosion of bone, some loss of cementum and dentine on teeth
4- surface of bone intact, loss of organic component, material chalky, calcined or burnt
5- bone in good condition, probably with some organic component

ZONES - codes used to define the zones on each bone

SKULL	1. paraoccipital process	METACARPUS	1. medial facet of proximal articulation, MC3
	2. occipal condyle		2. lateral facet of proximal articulation, MC4
	3. intercornual protuberance		3. medial distal condyle, MC3
	4. external acoustic meatus		4. lateral distal condyle, MC4
	5. frontal sinus		5. anterior distal groove and foramen
	6. ectorbitale		6. medial or lateral distal condyle
	7. entorbitale		
	8. temporal articular facet	FIRST PHALANX	1. proximal epiphysis
	9. facial tuber		2. distal articular facet
	0. infraorbital foramen		
		INNOMINATE	1. tuber coxae
MANDIBLE	1. Symphyseal surface		2. tuber sacrale + scar
	2. diastema		3. body of illium with dorso-medial foramen
	3. lateral diastemal foramen		4. iliopubic eminence
	4. coronoid process		5. acetabular fossa
	5. condylar process		6. symphyseal branch of pubis
	6. angle		7. body of ischium
	7. anterior dorsal acsending ramus posterior M3		8. ischial tuberosity
	8. mandibular foramen		9. depression for medial tendon of rectus femoris
VERTEBRA	1. spine	FEMUR	1. head
	2. anterior central epiphysis		2. trochanter major
	3. posterior central epiphysis		3. trochanter minor
	4. centrum		4. supracondyloid fossa
	5. neural arch		5. distal medial condyle
			6. lateral distal condyle
SCAPULA	1. supraglenoid tubercle		7. distal trochlea
	2. glenoid cavity		8. trochanter tertius
	3. origin of the distal spine		
	4. tuber of spine	TIBIA	1. proximal medial condyle
	5. posterior of neck with foramen		2. proximal lateral condyle
	6. cranial angle of blade		3. intercondylar eminence
	7. caudal angle of blade		4. proximal posterior nutrient foramen
			5. medial malleolus
HUMERUS	1. head		6. lateral aspect of distal articulation
	2. greater tubercle		7. distal pre-epiphyseal portion of the diaphysis
	3. lesser tubercle		
	4. intertuberal groove	CALCANEUM	1. calcaneal tuber
	5. deltoid tuberosity		2. sustentaculum tali
	6. dorsal angle of olecranon fossa		3. processus anterior
	7. capitulum		
	8. trochlea	METATARSUS	1. medial facet of proximal artciulation, MT3.
	9. coronoid fossa		2. lateral facet of proximal articulation, MT4
	0. teres tubercle		3. medial distal condyle, MT3
RADIUS	1. medial half of proximal epiphysis		4. lateral distal condyle, MT4
	2. lateral half of proximal epiphysis		5. anterior distal groove and foramen
	3. posterior proximal ulna scar and foramen		6. medial or lateral distal condyle
	4. medial half of distal epiphysis		
	5. lateral half of distal epiphysis		
	6. distal shaft immediately above distal epiphysis		
ULNA	1. olecranon tuberosity		
	2. trochlear notch- semilunaris		
	3. lateral coronoid process		
	4. distal epiphysis		

Appendix – Archive Catalogue of animal bone from the Bishops Palace, Bangor – G2358

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
002	BOS	FEM	1	24	L								MIDSHAFT THIRD- 2 PIECES-SMALL-IMM?	3
002	BOS	RAD	1	48	R		3	CH					PROX THIRD SHAFT- CHOPPED	3
003	BOS	LM3	1	15	R					K12			LAST COLUMN BROKEN	4
062	BIRD	RAD	1	0.4	F								PROX END	4
062	BIRD	ULN	1	0.8	L								PROX END	4
062	BOS	MTC	1	183	R	DF	12345				GL-182 Bp-59.7 Dp-37.4 SD-35.6	P	SWOLLEN LATERAL DISTAL SHAFT-SL DAMAGE TO DISTAL END	4
062	BOS	SCP	1	13	L		7						POST PROX BLADE FRAGMENT	4
062	BOS	TIB	1	4	R	DF							FRAGMENT DISTAL END	4
062	CHIK	FIB	1	0.5	W								COMPLETE	4
062	CHIK	HUM	1	1	R						Bd-14.8		DISTAL END	4
062	CHIK	HUM	1	1	R						Bd-16.5		DISTAL END	4
062	CHIK	ULN	1	0.8	R								PROX END	4
062	CKSZ	TMT	1	1	F								DISTAL SHAFT	4
062	CSZ	RIB	1	2	F								SHAFT FRAGMENT- 2 PIECES	4
062	CSZ	RIB	2	3	F									
062	GOOS	PH1	1	1	F								PROX END AND SHAFT-LARGE	4
062	GSSZ	HUM	1	0.2	F								SHAFT FRAGMENT	4
062	LAG	TTH	1	0.1	W								RABBIT SIZE	4
062	OVCA	LPM2	1	0.1	W								UNWORN	4
062	PAS	VER	1	0.1	F								SMALL VERTEBRUM	4
062	PASS	CMC	1	0.1	F								VERY SMALL PROX END	4
062	PASS	ULN	1	0.1	F								PROX END-SMALL PASSERINE	4
062	PASS	VER	1	0.1	W								VERY SMALL VERTEBRUM	4
062	SMA	RIB	1	0.5	F								INDET SHAFT	4
062	SMA	RIB	1	0.1	R								PROX SHAFT	4
062	SMA	UNI	5	0.1	F								INDET	4
062	SSZ	LBF	1	2	F								MIDSHAFT FRAGMENT	4
062	SSZ	LBF	4	2	F								INDET SHAFT FRAGMENTS	4
062	SSZ	RIB	6	6	F								MIDSHAFT FRAGMENTS	4
062	SSZ	SKL	2	2	F								DORSAL FRAG CRANIUM-POSS JUVENILE	4
062	SSZ	VER	1	0.5	F								INDET VERTEBRUM FRAG	4
062	UNI	UNI	140	6	F								INDET SMALL FRAGMENTS MAINLY SSZ AND BIRD	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
													WITH A LITTLE FISH	
062	UNI	UNI	31	4	F								INDET FRAGMENT	4
062	UNI	UNI	4	0.2	F			C					INDET BURNT BONE	4
062	UNI	UNI	14	5	F								INDET FRAGMENTS	4
062	UNI	UNI	4	2	F								INDET	4
062	UNIB	FURC	1	0.1	F								?SMALL GALIFORMES	4
062	UNIB	LBF	9	0.5	F								INDET SHAFT FRAGMENTS	4
062	UNIB	LBF	2	0.3	F								INDET SHAFT FRAGMENT	4
062	UNIB	PH1	1	0.1	W								TINY-INDET	4
062	UNIB	PHAL	1	0.1	F								DISTAL END	4
062	UNIB	RIB	1	0.3	F								RIB SHAFT	4
062	UNIB	RIB	1	0.1	F								PROX SHAFT FVRAGMENT	4
062	UNIB	UNI	16	0.3	F								INDET FRAGMENTS	4
062	UNIB	VER	1	0.2	F								INDET SMALL BIRD	4
062	UNIB	WPH	1	0.1	F								SMALL WING PHAL-PASS?	4
081	CSZ	RIB	1	3	F								MIDSHAFT FRAGMENT	3
108	OVCA	MTC	1	16	R	DN	125				L1-110 SD-14.5		COMPLETE EXCEPT FOR DISTAL EPI	4
117	CSZ	RIB	1	0.8	F								INDET SHAFT FRAGMENT	4
117	CSZ	UNI	1	1	F								INDET	4
117	ROD	TIB	1	0.1	F								SHAFT	4
117	SMA	LBF	3	0.1	F								INDET SHAFT	4
117	SSZ	LBF	1	1	F								INDET SHAFT FRAGMENT	4
117	TEAL?	ULN	1	0.8	R								COMPLETE- 2 PIECES	4
117	UNI	UNI	14	1	F								IN DET FRAGMENTS	4
117	UNI	UNI	4	0.2	F			C					INDET BURNT FRAGMENTS	4
117	UNIB	UNI	1	0.1	F								SMALL BIRD	4
118	BOS	HUM	1	2	L	DF							MED FRAG DISTAL CONDYLE	4
118	BOS	HUM	1	8	L	DF							FRAGMENT DISTAL END	4
118	CHIK	FEM	1	5	R						GL-87 Bp-17.8 SD-7.6 Bd-17.3		COMPLETE	4
118	CHIK	FURC	1	0.3	F								PROX END ONE HALF	4
118	CHIK	FURC	1	0.5	F								DISTAL HALF	4
118	CHIK	HUM	1	4	L						GL-71.2 Bp-18.7 SD-7.4 Bd-14.6		COMPLETE	4
118	CHIK	HUM	1	1	R								PROX END	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
118	CHIK	RAD	1	0.4	F								PROX HALF	4
118	CHIK	SCP	1	0.5	R								PROX END	4
118	CHIK	SCP	1	0.2	R								PROX END-SMALL	4
118	CHIK	SCP	1	0.5	R								SHAFT AND PART PROX END	4
118	CHIK	SKL	1	0.4	F								UPPER BEAK	4
118	CHIK	STN	1	0.2	F								ANT STERNUM	4
118	CKSZ	LSA	1	0.3	F								FRAGMENT WITH PART ACETAB	4
118	CKSZ	MAN	1	0.2	F								ONE SAIDE MANDIBLE	4
118	CKSZ	PH3	1	0.1	F								CLAW	4
118	CKSZ	RAD	1	0.4	R								DISTAL THIRD	4
118	CRUST	CLAW	1	2	F								CLAW 2 PIECES-	4
118	CSZ	CC	1	1	F								COSTAL CARTILAGE	4
118	CSZ	LBF	5	8	F								INDET SHAFT FRAGMENTS	4
118	CSZ	RIB	1	7	F			CH					MIDSHAFT FRAGMENT- 2 PIECES CHOPPED	4
118	CSZ	RIB	1	13	F								MIDSHAFT FRAGMENT	4
118	CSZ	UNI	2	1	F								INDET	4
118	CSZ	UNI	14	28	F								INDET FRAGMENTS	4
118	CSZ	UNI	1	5	F								INDET	4
118	CSZ	UNI	1	1	F								PART OF UNFUSED EPIPHYSIS	4
118	CSZ	VER	1	5	F	CN		CH					FRAGMENT VERTEBRAL CENTRUM-CHOPPED	4
118	DUCK	FURC	1	0.3	F								FRAGMENT OF SHAFT	4
118	FISH	UNI	2	1	F								NOT IDENTIFIED	4
118	GOOS	MAN	1	1	F								MIDDLE 2 THIRDS	4
118	HERON	TMT	1	2	F								DISTAL 2 THIRDS-SMALL HERON/	4
118	LEP	CAL	1	2	R	PF	123				GL-32.5		COMPLETE	4
118	PASS	CMC	1	0.1	W								LARGELY COMPLETE -TINY-PASSRERNE?	4
118	PASS	ULN	1	0.1	F								COMPLETE--TINY - PASSERINE? 2 PIECES	4
118	SMA	RIB	1	0.3	F								MIDSHAFT	4
118	SSZ	LBF	4	7	F								MIDSHAFT FRAGMENT	4
118	SSZ	LBF	14	8	F								INDET SHAFT FRAGMENTS	4
118	SSZ	LI	6	1	W								? DEC SHEEP/GOAT?	4
118	SSZ	LMV	1	1	F								POST ZYGA	4
118	SSZ	LMV	1	0.5	F								ANT ZYGA	4
118	SSZ	LPM3	1	0.3	L								COMPLETE-UNWORN	4
118	SSZ	RIB	13	9	F								MIDSHAFT FRAGMENTDS	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
118	SSZ	RIB	4	6	F								SHAFT FRAGMENTS	4
118	SSZ	RIB	2	5	F								MIDSHAFT	4
118	SSZ	RIB	2	4	L								PROX AND MIDSHAFT	4
118	SSZ	RIB	2	4	R								PROX AND MIDSHAFT	4
118	SUS	SCP	1	1	R	DN	235						GLENOID-NECK AND DISTAL BLADE-GLENOID UNFUSED-TINY-PIGLET	4
118	SUS	TIB	1	6	R	DN	56						DISTAL EPIPHYSIS	4
118	UNI	CC	2	1	F								FRAG COSTAL CARTILAGE	4
118	UNI	LBF	1	1	F	DN							UNFUSED DISTAL SHAFT FRAGMENT	4
118	UNI	PH2	1	0.1	F	PN							DISTAL PART-EPI LOST-VERY SMALL	4
118	UNI	SKL	2	1	F								INDET	4
118	UNI	UNI	130	6	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	98	5	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	1	0.1	F								INDET	4
118	UNI	UNI	189	8	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	1	1	F								INDET	4
118	UNI	UNI	170	8	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	109	6	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	119	6	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	230	47	F								INDET SMALL FRAGMENTS	4
118	UNI	UNI	124	7	F								INDET TINY FRAGMENTS	4
118	UNI	UNI	3	2	F								INDET	4
118	UNI	UNI	5	5	F								INDET	4
118	UNIB	CDV	1	0.2	W								INDET-CHICKEN SIZE	4
118	UNIB	HUM?	1	0.1	F								SHAFT-SMALL-POROUS-POSS JUV	4
118	UNIB	LBF	12	2	F								INDET SHAFT FRAGMENTS	4
118	UNIB	LBF	1	0.1	F								INDET SHAFT FRAGMENT	4
118	UNIB	LBF	1	0.1	F								INDET SHAFT FRAGMENT	4
118	UNIB	LBF	1	0.2	F								SHAFT-POSS DOABLE	4
118	UNIB	LBF	1	0.2	F								SHAFT-SMALL-POSS DOABLE	4
118	UNIB	LSA	1	0.2	F								VERTEBRAE OF LSA-SMALL BIRD	4
118	UNIB	LSA	1	0.1	F								SMALL BIRD - FRAG LUMBOSACRALE WITH ACETAB	4
118	UNIB	MAN	1	0.1	F								FRAGMENT-GOOSE	4
118	UNIB	MAN	1	0.1	F								PART OF MANDIBLE -= SMALL	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
118	UNIB	PH1	1	0.1	W								TINY PHALANX	4
118	UNIB	PH2	1	0.1	W								CKSZ PHAL	4
118	UNIB	PHAL	1	0.2	F								PROX END	4
118	UNIB	RAD	1	0.1	F								DISTAL END VERY SMALL-POROUS	4
118	UNIB	RAD	1	0.2	F								MIDSHAFT-SMALLISH	4
118	UNIB	RAD	3	0.3	F								SMALL-SHAFTS	4
118	UNIB	RAD	1	0.4	F								COMPLETE- 2 PIECES-POROUS-JUV	4
118	UNIB	RIB	1	0.1	F								PROX END-SMALLISH BIRD	4
118	UNIB	RIB	2	0.2	F								FRAGMENTSOF TWO DIFFERENT SIZED BIRDS-INDET	4
118	UNIB	SHELL	15	0.1	F								INDET SHELL FRAGMENTS- ? CHICKEN	4
118	UNIB	TIB	1	0.2	L								PROX END-POSS IDENTIFIABLE - SMLL	4
118	UNIB	TIB	1	1	L								PROX HALF SHAFT-POSSIBLY IDENTIFIABLE - SMALL	4
118	UNIB	TMT	1	0.1	F								FRAGMENT OF DISTAL CONDYLE	4
118	UNIB	TMT	1	1	F								MIDSHAFT CHICKEN SIZE	4
118	UNIB	TMT	1	0.2	F								SMALL-FRAGMENT OF DISTAL END	4
118	UNIB	ULN	1	0.2	F								PROX END - THRUSH SIZE	4
118	UNIB	ULN	1	1	L								PROX HALF SHAFT-PROBABLY DOABLE	4
118	UNIB	UNI	16	0.5	F								NOT IDENTIFIED SMALL BIRD FRAGMENTS	4
118	UNIB	VERF	12	2	F								VERTEBRAE OF SL DIFFERENT SIZE -POROBABLY INDET	4
118	UNIB	WPH	2	0.1	W								NOT IDENTIFIABLE	4
119	CHIK	CMC	1	0.6	L						GL-41.5		COMPLETE	4
119	CHIK	FURC	1	0.3	F								ONE END	4
119	CHIK	ULN	1	1	L								PROX END DAMAGED	4
119	CHIK	ULN	1	1	R								DISTAL HALF	4
119	CKSZ	TIB	1	1	F								SHAFT FRAGMENT	4
119	CSZ	LBF	1	12	F								INDET SHAFT FRAGMENT	4
119	CSZ	RIB	1	3	F								INDET SHAFT FRAGMENT	4
119	CSZ	UNI	1	4	F	PN							POSS PROX ULNA FRAGMENMT	4
119	GSSZ	HUM	1	1	F								MIDSHAFT-SMALLGOOSE? WILD	4
119	LEP	TTH	1	0.1	W								TOOTH	4
119	OVCA	FEM	1	2	F								MIDSHAFT FVRAGMENT	4
119	OVCA	FEM	1	14	L		4						MID AND DISTAL SHAFT	4
119	OVCA	TIB	1	10	L								PROX THIRD OF SHAFT	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
119	SSZ	LBF	6	5	F								INDET SHAFT FRAGMENT	4
119	SSZ	RIB	3	11	F								SHAFTS	4
119	SSZ	RIB	2	10	L								PROXIDSHAFT	4
119	UNI	UNI	37	2	F								TINY INDET FRAGMENT	4
119	UNI	UNI	37	6	F								INDET SMALL FRAGMENTS	4
119	UNIB	LBF	4	0.7	F								INDET SHAFT FRAGMENTS	4
119	UNIB	LBF	2	0.2	F								INDET SHAFT FRAGMENT	4
119	UNIB	PHAL	1	0.2	W								SMALL CHICKEN SIZE	4
119	UNIB	UNI	1	0.3	F								INDET	4
123	CSZ	UNI	1	3	F								POSS VERT FRAGMENT	4
123	UNI	UNI	1	0.1	F								INDET-POSS BIRD	4
123	UNI	UNI	5	0.4	F								TINY INDET FRAGS	4
124	CSZ	UNI	6	13	F			C					BURNT INDET FRAGS	4
124	OVCA	MTP	1	1	F	DN		C					DISTAL CONDYLE-BURNT	4
124	SMA	LBF	4	0.5	F			C					BURNT SHAFT FRAGMENTS	4
124	SSZ	LBF	3	1	F			C					BURNT INDET SHAFT FRAGMENT	4
124	SSZ	RIB	1	0.5	L			C					BURNTPROX END	4
124	SUS	UC	1	1	F			C					MALE CANAINE-NBURNT	4
124	UNI	UNI	95	7	F			C					INDET BURNT FRAGMENTS	4
124	UNI	UNI	23	4	F			C					TINY INDET BURNT FRAGMENTS	4
124	UNIB	PHAL	6	1	W			C					BURNT PHALANGES- CKSZ AND SMALLER	4
124	UNIB	TMT	1	0.1	F			C					DISTAL SHAFT FRAGMENT-CKSZ OR SMALLER	4
124A	CSZ	LBF	4	7	F			B					INDET BURNT SHAFT FRAGMENT	4
124A	CSZ	RIB	2	3	F								SPLIT SHAFT FRAGMENTS	4
124A	CSZ	RIB	2	5	F								SPLIT SHAFT FRAGMENTS	4
124A	CSZ	RIB	2	1	F								SHAFT FRAGMENT	4
124A	FISH	RAYS	100	1	F								LOTS TINY FIN RAYS FRAGMENTS	4
124A	FISH	VER	3	0.1	F									4
124A	GOOS	MAN	1	1	F								MIDSHAFT	4
124A	ORC	RAD	1	0.1	L								PROX END	4
124A	ORC	SKL	2	0.4	F								FRAGMENTS	4
124A	ORC	ULN	1	0.2	L								PROX END-SAME LIMB AS ABOVE	4
124A	OVCA	CAR	1	0.2	W			C					CALCINED	4
124A	OVCA	SKL	1	0.5	F								NASAL FRAGMENT	4
124A	OVCA	TIB	1	9	R	DF	567	B					DISTAL TIBIA HEATED	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
124A	SMA	UNI	7	0.2	F								INDET	4
124A	SSZ	HYD	1	0.3	F								SHAFT	4
124A	SSZ	LBF	4	2	F			B					INDET SHAFT FRAGMENT-BURNT OR CHRREDC	4
124A	SSZ	SCP	1	1	F								BLADE FRAGMENT	4
124A	SSZ	TRV	1	1	F		1						PART SPINE	4
124A	SUS	MTP	1	0.2	F	DN							DISTAL EPI	4
124A	SUS	PH2	1	0.4	W	PF	12	B					COMPLETE-LATERAL CHARRED	4
124A	UNI	UNI	58	10	F								INDET FRAGMENTS - BURNT, CHARRED OR HEATED	4
124A	UNI	UNI	32	7	F			B					INDET BURNT FRAGMENTS-MANILY BLACK	4
124A	UNI	UNI	71	3	F			C					INDET TINY FRAGMENTS-BURNT OR CHARRED	4
124A	UNI	UNI	63	2	F								INDET TINY FRAGMENTS	4
124A	UNI	UNI	54	3	F			C					INDET TINY FRAGMENTS- BURNT OR CHRRED	4
124A	UNI	UNI	77	2	F								INDET TINY FRAGMENTS	4
124A	UNI	UNI	111	4	F			C					INDET TINY FRAGMENTS - BURNT OR CHARRED	4
124A	UNI	UNI	163	4	F								INDET TINY FRAGMENTS	
124A	UNIB	PH3	1	0.1	F								VERY SMALL CLAW	4
124A	UNIB	RIB	2	0.1	F								PROX END	4
124A	UNIB	RIB	1	0.4	F								PROX END - LARGE	4
124A	UNIB	TMT	1	0.4	F								PROX SHAFT-POROUS-JUV	4
124A	UNIB	VER	1	1	F								BROKEN-BIGGER THAN CHICKEN?	4
124A	UNIB	WPH	1	0.2	F								CHICKEN SIZE	4
125	UNI	UNI	1	0.2	F								INDET CHIP	4
125	UNI	UNI	5	0.1	F			C					TINY BURNT BONE	4
125	UNIB	PHAL	1	0.1	F								TINY PHALANX-PROX END	4
127	FRTO	ILM	1	0.1	F								ACETAB FRAGMENT	4
127	UNI	UNI	9	0.1	F								TINY INDET FRAGMENTS	4
131	UNI	UNI	6	0.4	F								INDET	4
131	UNIB	VER	1	0.2	F								PART VERTEBRUM-CHICKEN SIZE OR SMALLER	4
132	FISH	VER	1	0.1	F								INDET TINY CENTRUM	4
132	LAG	TTH	1	0.1	F								PROB HARE	4
132	OVCA	UPM	1	0.2	F								ONE CUSP UNWORN	4
132	PASS	TMT	1	0.1	F								TINY DISTAL END	4
132	ROD	TIB	1	0.1	F								PART SHAFT	4
132	ROD	TIB	1	0.1	F								WHOLE SHAFT	4

context	species	bone	no.	weight	side	fusion	zone	butchery	gnawing	toothwear	measurement	path	comment	preserve-ation
132	SSZ	LBF	1	2	F								MIDSHAFT FRAGMENT	4
132	SSZ	RIB	1	1	L								PROX MIDSHAFT	4
132	SUS	PM1	1	0.1	W								1ST PREMOLAR	4
132	UNI	UNI	30	1	F								INDET TINY FRAGMENTS	4
132	UNI	UNI	11	1	F			C					TINY BURNT FRAGMENTS	4
132	UNI	UNI	9	0.5	F								INDET TINY FRAGMENTS	4
132	UNI	UNI	1	1	F			CH					FRFAGMENT CHOPPED AXIALLY	4
132	UNIB	LBF	4	0.5	F								INDET SHAFT FRAGMENT	4
132	VOLE	LI	1	0.1	W								INCISOR	4
137	BOS	FEM	1	21	F			C					BURNT MIDSHAFT FRAGMENT	4
137	CHIK	COR	1	0.5	L								PROX END	4
137	CHIK	FIB	1	0.6	F								PROX DAMAGED	4
137	CHIK	HUM	1	2	L						Bp-20.6		PART PROX END	4
137	CSZ	RIB	1	0.7	F								SPLIT SHAFT FRAGMENT	4
137	PART?	TMT	1	0.2	F								PROX ENMD	4
137	PART?	TMT	1	0.5	W								CHECK PARTRIDGE	4
137	SSZ	CDV	1	0.5	F								CAUDAL VERT	4
137	SSZ	LBF	2	0.5	F								INDET SHAFT FRAGMENT	4
137	SSZ	LBF	1	2	F			C					CALCINED SHAFT FRAGMENT	4
137	SUS	SCP	1	4	F								CAUDAL MARGIN OF BLADE	4
137	UNI	UNI	11	2	F								SMALL INDET FRAGMENTS	4
137	UNI	UNI	3	3	F								INDET FRAGMENTS	4
137	UNI	UNI	36	2	F								TINY INDET FRAGMENTS	4
137	UNIB	LBF	2	1	F								SHAFT FRAGMENT	4
137	UNIB	PH3	2	0.1	W								TINY CLAWS	4
137	UNIB	TIB	2	2	F								SHAFT FRAGMENTS-POSS DOABLE	4
137	UNIB	VER	2	1	F								LARGER FRAGMEWNTS-GOOSE SIZE	4

Gwynedd Archaeological Trust
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