Archaeology Wales

Harlech Castle Visitor Centre: Assessment of Site Archive

By

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Andrew Shobbrook

Report No. 1479

July 2016

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Prepared For: Cadw

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Date: 02.07.2016	Date: 04.07.2016

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Summary

Archaeology Wales undertook archaeological investigations at Harlech Castle, Harlech, Gwynedd (SH 58172 31229) between August 2012 and April 2014, on behalf of Cadw, in advance of and during the construction of new visitor facilities. The investigations comprised an initial phase of evaluation trenching, building recording, the excavation of a large area located immediately to the north of the Castle Hotel, and watching brief monitoring.

The excavations revealed seven phases of occupation: a sub-circular stone enclosure (Phase 1), a small group of features that either immediately pre-dated the construction of the castle or were associated with it (Phase 2), the remains of a possible medieval chapel and associated walls (Phase 3), inhumation burials from a cemetery located to the south of the chapel and domestic activity located further to the south-east (Phase 4), a later phase of inhumation burials (Phase 5), eighteenth and nineteenth century structural developments (Phase 6) and modern activity (Phase 7).

The aim of this report is to present an Assessment the value of the Site Archive (artefacts, ecofacts and site records) that resulted from the archaeological investigations and hence to establish recommendations for Analysis and Publication. Each material type is assessed both in relation to its intrinsic value (Section 7.1) and its potential to produce a better understanding the site (Section 7.2). The recommendations for analysis include further targeted study of: the site records, the small finds, the mortar samples, the animal bone, the human bone, the environmental samples and the documentary and cartographic sources. It is recommended that the results of these studies are published in a single site report, with contributions in specialist journals as appropriate.

1. Introduction

In August 2012, Archaeology Wales (Henceforth – AW) was commissioned to carry out an evaluation at Harlech Castle, Gwynedd (NGR: 58172 31229, Figure 1) to help inform Cadw about design decisions for a proposed new access bridge and associated visitor centre at the site. During this first stage of investigations, five trenches and a geotechnical borehole were opened and explored (Figure 2). These revealed the remains of a 15th century levelling deposit located directly above the natural bedrock and a medieval flooring deposit (Smith 2012).

The results of the evaluation helped to inform mitigation measures, which were subsequently recommended as a planning condition by the Snowdonia National Park Authority (SNPA). A Specification for the recording (EH Level 2) of a structure attached to the northeast of the Castle Hotel was prepared in July 2013 (AW Spec – 2173) and a Specification for recording within the Castle Hotel, a watching brief and an excavation within the basement area of hotel was prepared in September 2013 (AW Spec 2173a). Both documents were produced by AW

on behalf of Cadw and approved by John Roberts, the SNPA Archaeologist, prior to the start of groundworks. The excavation started on Monday 14th October and concluded in April 2014. The work undertaken in 2013 was supervised by Rob Backburn and the work undertaken in 2014 by Andy Shobbrook. Ian Davies assisted with the final phase of the excavation. Chris Smith was responsible for the initial building recording and Iestyn Jones undertook the documentary research. A brief period of emergency watching brief monitoring was undertaken by Tim Morgan in October 2013, prior to the start of the main excavation.

The following Assessment Report has been produced as a condition of Section 7 of AW Specification 2173a, which outlines the requirement for 'a summary report on the artefactual and ecofactual assemblage, and an assessment of its potential for further study, prepared by suitably qualified individuals or specialists.' This report offers a detailed account of the results obtained during the main stages of investigation, including those gained during the post-excavation assessment. The aim of the report is to assess the value of the excavated site and its associated finds, and to make recommendations for the Analysis and Publication of the results.

The historical background and methodology are summarised in Sections 2 and 3 respectively, Section 4 comprises a summary of the stratigraphic sequence, Section 5 contains specialist summaries of the artefactual, ecofactual and documentary evidence, and Section 6 a summary of the results of the building recording. Assessments of the value of all the materials comprising the Site Archive are made in Section 7. These are considered in terms of their intrinsic value, Section 7.1, and their potential contribution to better understanding the site, Section 7.2. The recommendations made as a result of these two types of assessment are summarised in Section 7.3.

2. Summary of the Geological, Archaeological and Historical Background

Harlech is located 7.8km south-southeast of Pothmadog and 20km north-west of Dolgellau in the historic county of Meirionethshire. The castle is located on a rocky crag (49m AOD) with a west facing cliff on the western side of the town overlooking Tremadog Bay. The main part of the older town is located to the immediate east of the castle, although Lower Harlech is located on reclaimed marshland and sand dunes (Morfa) at the base of the cliff, west of and below the castle (6m AOD). The castle is a Scheduled Ancient Monument (ME004) and World Heritage Site.

Two separate bands of natural substrata were encountered during the excavation works. The basal natural (Context 164) comprised a firmly compacted light greenish grey, sand-silt that was found to be more prevalent in the western and northern areas of the site. Overlying this, within the eastern/southern areas of the site, was a firmly compacted, yellowish orange, sand-clay (Context 005). Both types of deposit contained similar inclusions of small, sub-angular and sub-rounded stones. The underlying bedrock forms part of the Rhinog formation, which

is described (British Geophysical Survey 2015) as being partly formed of both sandstone and mudstone.

The archaeological background of the area can be dated back to prehistoric times**.** The uplands surrounding Harlech are dotted with evidence of prehistoric activity as shown by the presence of stone circles, standing stones, cairns and evidence of settlement on the nearby high ground of Moel Goedog. There is also a burial chamber at nearby Llanfair, while the chance discovery of finds includes high status items, namely a Bronze Age gold torque found in 1692 'in a garden somewhere near this castle of Harlech', a sword and a number of palstaves. Evidence for Roman-period activity consists of an enclosure, also near Llanfair, and chance finds including five engraved stones originally from the Roman fort at Tomen y Mur, and a collection of coins buried in an urn. By contrast, less evidence exists for early medieval settlement, with the apparent focus located to the south-east of the modern town, as represented by a pair of massive well preserved courtyard houses at Muriau Gwyddelod. It should be noted, however, that medieval activities dating from the construction of the Edwardian castle through to the Civil war are likely to have had a severe impact on buried and extant remains relating to earlier medieval settlement in the area of the modern town.

Harlech Castle was one of the four castles built by Edward I (1239-1307) to surround and control Gwynedd. Construction began in May 1283 at the instigation of Sir Otto de Grandison, a Savoy nobleman who led the central contingent of the English invasion army. Like the other royal castles it was designed by Otto's compatriot James of St George, Master of the King's Works in Wales. Levelling the summit and ditching the site seem to have occupied the first two years, but from 1285 progress was more rapid, records showing that approximately 950 workmen were engaged in the process. The castle was virtually complete by the end of 1289, the Pipe Rolls recording an expenditure of £8,184.00 (Pettifer, 2000).

The Gatehouse is the dominant feature of a square enclosure, which is defended by a strong curtain wall and circular corner towers. It is a formative example of the quadrangular plan that would become the standard for later English castles. It is surrounded by an outer curtain wall, which, according to Pettifer (2000), makes it '… one of that distinguished group of concentric castles'. Despite the grandeur of the castle, the surrounding town was one of the smallest of the Edwardian planned boroughs. Evidence from Subsidy Rolls suggest that the medieval settlement never exceeded 150 persons (Soulsby, 1983).

Harlech was subjected to siege on four occasions: the first in 1404, then again in 1408, both during the Glyndwr revolt. The third siege was as part of the Wars of the Roses in 1468, with the final action being seen in the Civil War when the castle held out for a creditable nine months until March 1647 (Pettifer, 2000). The later history of Harlech is poorly documented and seemingly uneventful. Decline appears to have set in early, with Speed's map of 1610 suggesting that the borough failed to recover from the ravages of Glyndwr, who held the castle for nearly five years. The map shows a mere handful of tenements lining Stryd Fawr, with the beginnings of a second street at right angles to it, the present Pen Dref. A contemporary description of the borough referred to 'a verye poore towne… having no traphicke or trade', and 200 years later Fenton was still able to observe that it was 'the most forlorn, beggarly place imaginable' (Soulsby, 1983).

3. Methodology

3.1 Archaeological Evaluation

The purpose of the excavation was to preserve, by record, detailed information on all archaeological deposits in the area of the proposed basement, prior to their likely destruction as a consequence of the development. Overburden and rubble deposits were removed by mechanical excavator equipped with a toothless bucket, in spits, under archaeological supervision.

The resulting surface was hand cleaned using hoes and/or pointing trowels, as appropriate, to prove the presence, or absence, of archaeological features and to determine their significance. All such, features were recorded and, where appropriate, excavated.

Where the archaeological horizon consisted of undifferentiated rubble, a mechanical excavator was used to remove this in spits. Each spit was removed across the entire area working from east to west. Individual spits were no more than 0.50m thick. The process continued until all the rubble was removed. Careful attention was made to record variations in both the composition of the rubble pieces and the associated soil matrix. All worked-stone pieces were individually numbered and their locations recorded 3-dimensionally. The worked stone was stored in a designated area, the location of which was agreed beforehand with the ground-works contractor. The area was secured with Herras-type fencing.

All archaeological deposits not consisting of undifferentiated rubble were hand excavated stratigraphically. Excavation proceeded to the top of the natural subsoil or to the formation level of the proposed development, whichever was encountered first.

Recording was carried out using AW recording systems (pro-forma context sheets etc.), using a continuous number sequence for all contexts. Written, drawn and photographic records of an appropriate level of detail were maintained throughout the course of the project. Digital photographs were taken using cameras with resolutions of 8 mega pixels or above. These were in RAW format, with copies made as JPEGs and TIFFs at highest resolution settings (for presentation and archive purposes respectively). Plans and sections were drawn to a scale of 1:50, 1:20 and 1:10 as required, and these were related to Ordnance Survey datum and published boundaries where appropriate.

3.2 Watching Brief

The watching brief was undertaken during all ground disturbances associated with the development, whether these were within the development area or in areas adjacent to it. The watching brief monitored:

- The demolition of the structure located to the northwest of the hotel fronting Ffordd Pen Llech. During this work some of the render was removed from the building's north-western buttress to help determine the original function of this part of the building.
- All work associated with the construction of the café building.
- Construction of the bridge pillar trenches.
- Construction the rain-water harvesting tank.
- Exposure and breach of the wall along N frontage of property (alongside footpath) for electric connection and associated equipment.
- All drainage works.
- Any impact on the wall at the NE of the property fronting Stryd Pen Llech.
- Service trenches across Stryd Pen Llech.
- Intermittent watching brief on alterations within the hotel.

The watching brief was intended to ensure that all archaeologically significant remains that were revealed during work associated with the development were investigated and recorded.

3.3 Archaeological Building Recording

The Building Recording described and recorded key internal components of the hotel Building. Particular attention was given to the floor of the hallway area (decorative 19th century tiles) and the windows in the front (west facing) rooms at ground and first floor levels.

The work was completed to the standards of an English Heritage Level 2/Level 3 Building survey as appropriate. It was undertaken by a suitably experienced Building Recording Archaeologist who was able to 'read' the structure and record the important details. The photographic record was a comprehensive record to archive standard of the existing buildings and structures, both externally and internally. Use was made of the architect's drawings of the structure as appropriate and the architectural photographs should form part of archive.

All photographs were taken with a high resolution (8+ Mega Pixel) digital SLR in RAW format (converted to TIFF and JPEG at highest resolution for archiving and presentation respectively). For both general and specific photographs, a photographic scale was included. The photographic record was accompanied by a photographic register detailing as a minimum, feature number, location and direction of shot.

In addition, work was undertaken to survey/record the stone-lined culvert that crosses the western part of the site.

4. Harlech Castle Visitor Centre: Stratigraphic Summary – prepared by Andrew Shobbrook

4.1 Summary of archaeological sequence

4.1.1 Phase 1: Early sub-circular enclosure and a later soil

The excavation identified 7 phases of activity at the site:

The earliest structure revealed during the excavation consisted of a low standing, sub-circular, stone enclosure located within the central area of the site. The remains of the structure were sealed by a soil layer. The date of both the structure and the soil are currently unknown, although the assumption is that they predate activities associated with the construction of the Edwardian castle.

4.1.2 Phase 2: Channel and associated postholes

A second phase of activity was recognised within the mid-area of the site and consisted of the remains of what was either a natural paleochannel or a man-made gully, along with a small posthole cut into the natural subsoil. Both features are thought to be medieval period and they may relate to a phase of activity associated with the construction of the castle.

4.1.3 Phase 3: Possible chapel building, revetment wall and 'cemetery' wall

A rectangular masonry building was uncovered within the mid-northern area of the site and is thought to be the remains of the chapel depicted on John Speed's map of Harlech dated 1610 (see Section 5.8). A length of east to west aligned revetment wall was also found, adjoining the eastern corner of the chapel. Due to the natural topography of the site, the builders who constructed the chapel and revetment wall cut a terraced platform into the natural clay, so that the building's southern wall, and the southern ends of its eastern and western walls, were cut into the natural ground surface, while the northern wall was constructed on an open flat area. A second length of wall, aligned north/south and constructed with minimal foundations on the higher ground to the south, probably dates to the same period. During Phase 4, this likely boundary wall defined the western edge of a cemetery that built up on the northern side of the chapel. However, there is no evidence of burials taking place during Phase 3. All of the Phase 3 structures are thought to post-date the construction of the medieval castle.

4.1.4 Phase 4: Central burials (Phase 4A) and hearth, wall and associated deposits (Phase 4B)

Ten inhumation burials (Phase 4A) were discovered within the central area of the site, some of which were intercutting, indicating an extended period of burial practice within this area. All of the burials were aligned east/west and had been laid with the head of the body pointing to the west.

An area of domestic activity (Phase 4B) was revealed within the south-eastern corner of the site, being represented by a series of postholes and the remains of a single hearth/oven. This area would have been located outside the boundary of the cemetery and, therefore, possibly defines its eastern limit. The group of burials and the area of domestic activity are thought to be contemporary, both dating to the later medieval period.

4.1.5 Phase 5: Eastern (Phase 5A) and western (Phase 5B) burial groups

A second phase of inhumation burials belonging to Phase 5 was discovered within the eastern and western areas of the site. The first set, which was found on the eastern side of the development, consisted of the remains of four separate individuals. A second row was located to the west of the Phase 4 western 'cemetery' wall, suggesting that the boundary of the cemetery expanded during this period. Within the central area of the site, a large amount of charnel remains were recovered, which roughly group into nine separate accumulations. These are likely to comprise the disturbed remains of earlier burials. Further to the south, in the central part of the site, a single length of east/west aligned dry stone wall was discovered. This feature may be the remains of a burgage plot boundary, as it is on roughly the same alignment as an existing property boundary located on the opposite, eastern, side of Pen Fford Lech Street. Phase 5 activities can be roughly dated to the seventeenth century.

4.1.6 Phase 6: Cellar rooms 1 and 2

During the penultimate phase, burial practice appears to have been replaced by domestic activities. These are characterised by occupation layers, hearths, cesspits and buildings. Structural evidence is represented by two rectangular masonry cellar buildings. The earliest was located within the western area of the site, positioned to the rear of the development's northern boundary. The second butted against the southern wall of the first and therefore was of a later construction. Both are thought to be early to mid-19th century, dateable by pottery found within construction deposits.

Two cesspits were found within close proximity to the rear of the 1860s castle hotel and are thought to be associated with an earlier building that may have been located along the frontage off Ffordd Pen Llech. A right-angled stretch of wall was also found within the central area of the site. It had been truncated by the later Victorian Castle Hotel on its south western side, indicating that it is of a pre-1860s build. Within the centre of the site, a shallow,

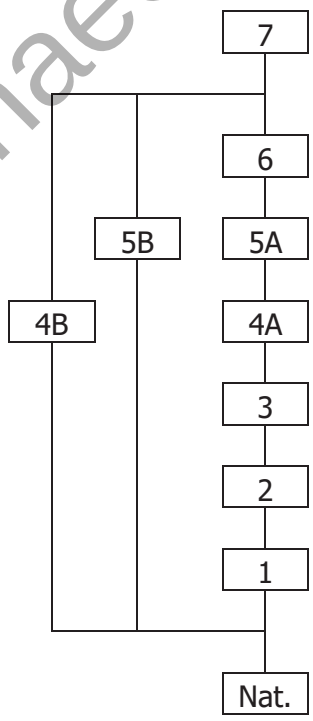
north/south aligned ditch of unknown function cut across the development area. A small hearth was also noted within this area.

Two separate stone surfaces or floors were found within the site, although it is not certain that they were contemporary with other Phase 6 features. The first was located 6.0m to the east of cellar 2 and was probably the remains of a metalled back-yard. The second, a cobbled surface, was discovered within the eastern side of the site and was of finer in construction. It could be the remains of the floor of a timber building. An extant 'pub' garden wall can possibly also be attributed to this phase. Phase 6 represents post-medieval activities.

4.1.7 Phase 7: Modern activity

The final phase consisted of a fire pit, located in the eastern central area of the site, which had been cut into the natural subsoil. Also within this area, a circular pit was present that contained a plastic drain tube. Overlying the pit, a wide 1.0m wall foundation was revealed, which could be the remains of a garden shed or other garden feature. The latest feature examined was the enclosing northern boundary wall, which may have been constructed sometime in the 1960s.

4.2 Stratigraphic account – description of key contexts



Matrix showing relationships of Phases / Sub-phases

4.2.1 Phase 1: Early sub-circular enclosure (193), stake hole (200) and a soil (153) (Figure 9)

The earliest excavated deposits comprised the remains of a sub-circular stone structure (193) (Plate 1). The structure measured roughly 2.40m north/south by 1.80m east/west and was of dry-stone construction, built using unshaped medium to large stones. It had been crudely constructed to form a low wall measuring, on average, 0.2m high and survived no more than two courses high. Some smaller stones had been placed to fill any gaps which had formed between the larger blocks. The total width of the enclosing wall varied between 0.6m and 0.4m. Within the south eastern side of the enclosure, two boulders were sited slightly apart from each; this could represent an entranceway (Plate 2). The southern larger boulder was set within the natural boulder clay, which suggests it was an *in situ* natural feature that had been incorporated into the structure.

A single stake hole (200) was located in the centre of the enclosure. It was circular, 0.06m in diameter, with straight cut sides, 0.08m deep, and a flat base, and had been cut into the natural clay. It contained a single fill (201) of a loose brown silty clay containing occasional inclusions of small charcoal pieces.

The structure and the stake hole were covered by a substantial heap of unworked stone mixed within a matrix of light brown silt clay (153). The deposit was found to be relatively sterile in nature, producing only one small piece of animal bone and a sherd of pottery that was certainly intrusive.

4.2.2 Phase 2: Channel (272), a large posthole (268) and a small posthole (270)

Feature (272) represented a crudely shaped channel or shallow ditch that could have been man-made or have formed through natural processes. It the latter, it might represent the original course of the small stream that now flows through the culvert located under the car park to the west of the site. Either way, the channel would have been made redundant when the Phase 3 revetment wall (147) was cut across its path. The cut for this wall (262) also truncated small posthole (270), which could, therefore, be contemporary with the channel. A larger posthole (268) found to the rear of the revetment wall provided no datable evidence within its fill, but its location tentatively suggests it was contemporary with the other Phase 2 features (Plate 7 and 8).

4.2.3 Phase 3: Possible chapel building (104), revetment wall (147) and western 'cemetery' wall (183)

Possible chapel building (104) (Figure 10)

The remains of a rectangular stone masonry building (104) and a length of associated revetment wall (147) were revealed within the northern mid area of the site, just to the south west of the proposed substation (Plate 3).

The building measured 7.8m east/west by 4.2m north/south and had an internal floor space measuring 5.4m east/west by 3.4m north/south. The builders of the structure had cut an artificial terrace into the hillside to create a level plateau to construct upon. The foundation cut (145) followed the southern part of the building and, in some places, cut into both the Phase 1 soil layer (153) and the natural ground surface (005). Subsequently, the construction cut was backfilled with soil mixed with masonry rubble (Plate 4).

The walls of the structure were built using roughly dressed stone blocks laid in a non-regular coursed fashion that survived in some places to around five or six courses high. No bonding material was visible on the inside face of the wall. However, slight traces of a light grey, lime mortar containing frequent fragments of mollusc shell and occasional small flecks of charcoal were contained within the wall's central core.

No evidence of any internal floors survived. However, a deposit of dark brown silt sand, up to 0.1m thick, was observed within the middle and eastern side of the building, which could have been bedding for a stone slab floor or the remains of an earthen floor. A small breech in the building's north western corner could represent the remains of an entrance, although this is not clear.

A rubble backfill deposit consisting of a blackish brown silt clay mixed with frequent amounts of small to medium sized sub-angular stone and occasional mortar fragments (135) had been deposited within the interior of building. No dateable artefacts were recovered.

The walls of the building had been removed to a surviving height of around 1.30m on the southern side of the structure, whereas the north wall of the building had been robbed out, leaving just the line of the 'robber' trench in preservation. A single piece of Buckley ware was found within this trench, dating the associated robbing to the post-medieval period or later.

Revetment wall (147) (Figure 11)

The revetment wall (147) was 2.80m long and ran in an east/west direction from the south-western corner of the chapel building, extending the line of the rear, southern, wall of that structure (Plate 5). It was cut by the cellar of a later building in the west. The surviving fabric comprised three large boulders, bonded with mortar lower down. The wall had been terraced into the hillside and sat within a cut (263), which appeared to be part of the same cut that had been made for the southern wall of the chapel. A blackish dark brown sandy silt mixed with small sub-angular stones soil (246) survived in the base of the cut, located between the base of the wall and the top of the natural subsoil, while two similar deposits (259 and 261) backfilled the construction cut at the rear of the wall.

Western 'cemetery' wall (183) (Figure 12)

A length of north/south aligned wall (183) was constructed at an angle of approximately 80 degrees from the mid-southern rear end of the revetment wall (147). It survived for 4.4m, to a point where it was truncated by the wall of a later cellar (Plate 25). No bonding material survived, indicating it may have been of dry-stone construction. The wall was roughly faced on its eastern side, whereas it was of rougher construction in the west. This suggests that the base of the western face was not visible above ground when originally constructed. Burials were located to the east of the wall, but not the west, so at some stage it probably formed the western boundary wall of the cemetery. However, it is not certain if it was originally constructed for this purpose. No foundation cut was found in association with the structure.

4.2.4 Phase 4A: Central burials (Sk.196, Sk.176, Sk.95, Sk.97, Sk.96, Sk.170 & Sk.212)

Seven inhumation burials, some complete, were excavated in the central area of the site. Following assessment, this was revised to ten, as Sk.95 included the remains of a second, probably earlier, individual (charnel burial 93), and context 158/159, which was recorded as charnel remains, included the partial remains of two further skeletons, both juveniles. The soils found in association with these contained few finds, although material was recovered from two associated pits. Some of the burials truncated earlier ones, demonstrating that a period of burial practice had occurred. Grave cuts associated with the central burials were difficult to identify, mainly due to the homogenous nature of the surrounding deposit.

Intercutting burials (Sk.196), (Sk.176)

The earlier burial, Sk.196, consisted of the remains of a lower left forearm. It is presumed that rest of the skeleton was removed during the cutting of the grave for the later burial, Sk.176 (Plate 10 and 11), which truncated it along its northern side. Both burials were east/west aligned with the head in the west. Sk.176 lay within a defined grave cut (177) and comprised the remains of an adult male. A metal object was also found by the right hand (small find no.9) of the skeleton. Its placement appears to respect the line of the 'cemetery' wall (183), which was located to the immediate west.

Intercutting burials (Sk.97), (Sk.96)

Burial Sk.96 (Plate 12) was found within a grave cut (98) and contained the partially intact remains of an adult female. The upper part of the skeleton was relatively intact, whereas the lower half below the thigh area was missing, possibly truncated by a later grave. The skeleton was located between two large bounders that may have been the remains of demolition rubble (213) originating from the destruction of the nearby 'cemetery' wall.

The remains of a second, earlier, burial (Sk.97) was uncovered below Sk. 96. This burial was heavily truncated by the upper grave and as a result only the pelvic area survived. No grave cut was found. Both burials were observed to have been laid on an east/west alignment, with the head in the west.

Charnel burial (93), Inhumation burial (Sk.95)

A large group of charnel remains (93) was located within the central area of the site. Below these, a further *in situ* burial (Sk.95 - Plate 13, 14 and 15) was found, parallel to, and 0.8m to south of, Sk.96 and at a similar level. No grave cut was identified. The burial had been laid on an east/west alignment with the head in the west. It was complete except for the left leg and the lower right leg, which are assumed to have been removed by either post-medieval development or later grave cuts. A pin (SF.98) was found in association with the burial.

Charnel burial (158/159), Inhumation burial (Sk. 170)

A deposit of charnel remains (158/159) (Plate 16) overlay burial Sk. 170 (Plate 17 and 18). The remains comprised two human disarticulated craniums and a number of other small bones, some of which were animal. Burial Sk.170 was laid within an east/west aligned grave (172), measuring 1.8m by 0.4m. The grave was cut through deposit (217). The skeletal remains were largely complete and showed no signs of truncation. Two slate pieces were found within the burial: the first lying over part of the skull and the second over the right side of the pelvis.

Inhumation burial (Sk.212)

Burial Sk.212 (Plate 19, 20) was east/west aligned with its head in the west. The skeletal remains were in a poor state of preservation due to the weight of overlying rubble, which had caused damage along the right hand side and to the head. No discernible cut was visible. The deposit around the skeleton (237) consisted of a dark brown, gravely sand mixed with occasional small fragments of charcoal and oyster shell. No datable artefacts were recovered.

Overlying Burial Sk.212 was a rubble deposit (213) that is thought to have formed as a result of the demolition of the western cemetery wall (183).

4.2.5 Phase 4B: Hearth and wall (54 & 50) and associated deposits (235, 184, 191, 39, 221, 49, 37, 228, 230, 227, 232, 233 & 225) (Figure 14)

A small concentration of domestic activity formed within the south-eastern corner of the site, consisting of a sub-oval hearth (54), a length of walling (50), several post holes and 54 associated stake holes. Subsequently, all of these features were sealed by a soil layer (49) (Plate 21) that contained post-medieval pottery fragments and one piece of lead window lining. This deposit may have formed as the result of post-medieval landscaping.

The hearth was constructed close to the frontage of Fford Pen Lech, presumably within a building. It (54) (Plate 22, 23) was sub-oval and measured 2.6m north/south by 2.0m east/west. It had no recognisable cut, apparently being located directly upon undisturbed natural clay, which in some places had been baked to a bright orange colour. Subsequently,

a small, sub-oval, pit (225) of unknown function was cut into the north-eastern corner of the feature.

The length of walling (50) was located immediately to the south of the hearth and probably formed part of the associated building. Also present was a number of post holes, surrounding the hearth area, the largest of which was a sub-oval in shape and measured 1.0m by 0.60m. At the base of the cut for this feature, a number of horizontally laid slates were discovered, presumably the remains of a post-pad. Numerous other smaller post holes were found within the same area (228, 230, 37, 49, 39, 184, 191 and 189). A separate group of 54 stake holes (227) forming a curving arc around the eastern side of the hearth probably represents the remains of associated superstructure. Further structural activity was represented by a possible beam slot (233) located east of the hearth. The remains a possible beaten earth floor were located between the south-east corner of hearth (54) and wall (50), which it appeared to abut. It had a maximum thickness of 0.05m.

4.2.6 Phase 5A: Eastern burials (Sk.75, Sk.74, Sk. 76 and Sk.148)

At approximately the same time, burials took place in the eastern side of the development area. The remains of four individuals survived. With the exception of Sk. 148, all four were heavily truncated, making it difficult to isolate each individual.

Inhumation Burial (Sk. 74)

Sk. 74 (Plate 24) was the earliest surviving inhumation located within the eastern area of the site. The skeletal remains were contained within a cut (56), the base of which penetrated the natural subsoil. While the burial was heavily truncated and the bone remains where mixed up with Sk. 75 (see below), it was possible to recover a cranium, an ulna and a number of feet bones. No grave goods were recovered. The soil surrounding the grave (57) consisted of dark brown silt clay. It was overlaid by a soil layer of post-medieval date (17).

Inhumation Burial (Sk. 75)

Sk. 75 (Plate 25) was disarticulated and intermixed with Sk. 74. It was found within a cut (21) made through Sk. 74 and the underlying natural subsoil. The skeleton was largely disarticulated and comprised feet and hand bones, a skull, a humerus and other bones (see appendix 5). A sample (sample 4) was kept from the area of the stomach for analysis. Loose charnel (Sk. 76) bones were located directly on top of Sk. 75, suggesting they were contained within the overlying backfill (Plate 26).

Charnel remains (Sk. 76)

Human bones were deposited in a mixed soil layer (22) located above Sk. 75. The soil contained two nails (SF 87). It is possible they were deposited within the Sk. 76 burial. Post-excavation analysis has shown that the skull does not belong to other bones in the group and

that some bones are associated with burial Sk 74, indicating post-depositional disturbance, presumably from later grave cutting. The absence of clearly defined grave cuts in this area made it difficult to determine which grave, if any, these bones were associated with (Plate 26).

Inhumation Burial (Sk. 148)

Sk. 148 (Plate 27) had a partly damaged skull but was otherwise nearly complete. The burial was aligned east/west and was found within a cut (111), the base of which had been made into the natural subsoil. The skeleton was associated with a series of objects, including mortar fragments and 2 iron nails (SF 90, 91). The nails were attached to the mineralised remains of wood fragments, suggesting that originally they had formed part of a coffin. The lower fill of the grave (134) was composed of mid-brown silty clay. A number of finds was found in this layer, including a clay pipe stem (SF 70), a fragment of green glass (SF57) a series of fragments of Midland Purple Ware and Buckley earthenware. The upper fill (112) was composed of dark brown silty clay and contained a series of pottery fragments dated to the 16th to the 19th century.

4.2.7 Phase 5B: Western Burials (Sk. 239, Sk. 203, Sk. 243 and Sk. 254) and a length of wall (85)

During a period that post-dated the deposition of the burials of Phase 4A, a row of four burials was cut to the west of the western 'cemetery' wall, suggesting that the cemetery was expanded during this period. A short length of an east/west aligned wall (85) was constructed at about the same time. The wall contained no evidence of mortar bonding material, so it may have been of dry-stone construction. It may have formed part of a property boundary, being parallel to a wall of similar function located on the eastern side of Ffordd Pen Llech.

Inhumation Burial (Sk. 239)

Burial Sk. 239 (Plate 28) was a supine inhumation, with the head in the west and the hands placed over the pelvis. A foot bone associated with some of the charnel bones in Sk. 247 was found within the burial. The skull was partly damaged, possibly during the construction of the adjacent wall (85). The burial appeared to be located within a cut (240), although it was difficult to distinguish this from the remains of a second cut (248) found in the same area; the two cuts may have been part of the same entity. The fill (241) surrounding the burial was composed of dark-brown sandy silt mixed with occasional inclusions of small rounded pebbles and grey sandy mortar. A pin (SF. 12) was recovered from the same deposit.

Inhumation Burial (Sk. 243)

This burial contained a supine inhumation orientated east/west (Plate 30). It was surrounded by a fill (248) of grey-brown silty sand, from which a pottery sherd and mortar fragments, but no other finds, were recovered. The grave was truncated by burial 203.

Inhumation Burial (Sk. 203)

This burial contained a supine inhumation of a juvenile orientated east/west (Plate 29). Charnel remains, but no finds, were recovered from the surrounding fill. This burial was located on the outer side of wall (183).

Inhumation Burial (Sk. 254)

This burial comprised an adult inhumation orientated east/west (Plate 31). It was cut through a rubble layer (258) associated with the collapse of the cemetery wall.

4.2.8 Phase 6: Cellar room1 (46) and cellar room 2 (215) (Figure 13)

Cellar room 1 (46)

The remains of a rectangular room (cellar room 1) was revealed in the north-western corner of the site during ground reduction.

The floor, southern wall, and parts of the eastern and western walls of the room had been constructed by terracing into the sides of the sharply sloping contemporary ground surface, whereas the northern wall was exposed on its exterior side. The walls, which survived to a maximum height of 2.2m (Plate 32), were constructed of roughly coursed undressed stone and were bonded with a fine beige lime mortar that contained fragments of shell and occasional small flecks of charcoal. The internal floor space of the room measured 6.8m along its east/west axis by 4.60m along its north/south axis. Four large postholes were cut on the outside of the cellar's eastern wall, possibly to support scaffolding used during the construction of the building.

Primary features are likely to have included a brick fireplace/range (92) and a window, both located on the eastern side of the room. A floor comprising square-cut slate pieces (118) had been laid within the interior of the building, although it is not clear if any of this was original. The sides of the pieces raged in size from 2.0m to 0.50m and they had an average thickness of 0.05m.

Three features were sealed by the floor: a stone lined drain (Plate 33), which lead from the south-eastern corner of the cellar, and two square pits, both located in the western part of the room. Both pits measured roughly 1.0m by 0.80m in plan by 0.70m in depth and had been sealed by the laying of the slate floor (118). The may have been used to store consumables.

Secondary activities included the blocking of the window (91), repairs to the floor and several phases of fireplace renovation, the latest being represented by the addition of a brick range.

After the associated building had been demolished a the upper parts of all four walls partially demolished, the room was filled with a rubble-rich soil deposit (102) that contained frequent amounts of medium to large sized sub-angular stone blocks, frequent inclusions of lime mortar, post-medieval pottery, roofing slates and one modern brick. Some of the stone blocks

had red painted lime plaster adhering to one side. The pottery was identified as Buckley ware and white china.

Cellar room 2 (215)

A second cellared or semi-basemented room (cellar room 2 - 215) was constructed adjacent to cellar room 1 (46) (Plate 35), with its northern wall abutting the southern wall of the earlier structure. Its eastern wall was built over the head of an earlier burial (239), while the large amount of loose charnel bones located next to it presumably comprised the remains of earlier burials had been disturbed during the construction process.

Internally, the structure measured 4.20m east/west by 6.40m north/south. The average width of the eastern, western and southern walls was around 0.8m, whereas the northern wall was generally thicker, having a maximum thickness of 1.40m. It had number of large boulders incorporated within it. The walls of the building survived to a maximum height of 1.40m and were constructed using roughly shaped medium to large stone blocks bonded with a lime mortar. A window opening was built in the eastern wall of the structure, measuring 0.8m wide and surviving to a height of 0.4m from the inside sill. No evidence of doorways or other windows was found, although these may have been removed by later truncations. It is assumed that the room, being semi-basemented, would have been accessed internally.

The inside faces of the walls of the building were rendered with a cream coloured lime mortar, patches survived on the interior surfaces of all four walls, and the floor was cobbled; the remains of a small area of cobbling flooring (216) was excavated in south-western corner of the room.

At a later date, after cellar room 2 and the building associated with it had gone out of use, a large stoned-line culvert was cut across the centre of the structure, running from the cellar of the later Castle Hotel and cutting through the southern and western walls of the now abandoned room.

5. Specialist reports

5.1 Small finds – prepared by Lynne Bevan

5.1.1 Introduction

The excavations at Harlech Castle produced a small finds assemblage of 147 items. These comprised: 7 copper alloy objects; 12 iron objects and 33 iron nails; 2 lead objects; 35 clay pipe fragments; 29 worked stone objects; and 29 glass fragments. A further object was identified by the excavators as being of iron was examined (SF 4, unstratified) (see Appendix 2 and 3). However, it was found to be a piece of ironstone rather than an artefact, and therefore this item has not been included in this report. The analysis also excluded 3 pieces of worked stone which, once examined, were found to be unworked (SF 3, unstratified; SF 5, unstratified; SF 6, Context 43). A modern EPNS spoon handle stamped with 'Sheffield' (SF 83, Context 89) was also excluded from this assessment.

For the purposes of this assessment, context numbers have been used, combined with individual small finds numbers when available. The more identifiable and significant of the finds have been discussed in detail in the assessment, but large groups of less significant finds, i.e. iron nails; clay pipe stem fragments; slate roof tiles; glass fragments, for which no further action is recommended have been listed by context in Appendix 2.

5.1.2 Copper Alloy Objects

There were seven identifiable copper alloy objects recovered from the site. These comprised: part of a spur (SF 7, Context 36), a lace chape (SF 94, Context 163), a buckle (SF 93, Context 162), two pins (SF 9, Context 93; SF 88, Context 114), a button (Context 89), and a perforated disc, probably a large pin or rivet head (SF 12, Context 241).

Of most interest in the copper alloy assemblage was part of a small rowel spur with an elaborately decorated rowel box, the terminals and rowel of which were missing. This unusual spur probably dates to the 17th century, though it may be earlier in date. Other identifiable finds included a lace chape of probable 16th- to 17th-century date (Oakley 1979, 262-3), and a small rectangular buckle which may date to the latter half of the 14th century, though it may be later in date. One of the pins (SF 9, Context 93) was described as a 'shroud pin' by the excavators due to its circumstances of recovery in a burial but both pins were of common utilitarian types used during the medieval and post-medieval periods. The button was probably of 19th- to 20th-century date and the possible pin-head was un-datable.

5.1.3 Iron Objects

The iron assemblage consisted of 12 iron objects and 33 nails, all of which were very corroded and the majority of which were fragmentary. No x-rays were available.

Of most interest in the assemblage were three large fragments from iron cauldrons or other vessels (SF 72, Context 18; SF 80, Context 61; SF 25, Context 112). Though very corroded, the shape of a complete handle of a handle/neck fragment from a cauldron (SF SF 80, Context 61) is very similar in style and shape to that of a copper alloy cauldron from London dating to the later fourteenth century (Egan 1998b, Fig. 131: 446, 163). A neck/body fragment from a large vessel (SF 72, Context 18), again almost certainly a second cauldron, is decorated with a series of intersecting lines which run around the rim and down the outside of the vessel. A large curving body fragment (SF 25, Context 112) was less diagnostic but also probably originated from a third cauldron. While the handle fragment may be of medieval date, the other two fragments may be later.

The only other identifiable iron find was a broken handle, possibly from a key (SF 100, Unstratified), the end of which was missing. Other iron finds consisted of three fragments of strip/binding (SF 77, Context 42 x 1; SF 97, 2173A, 895E 910 N x 2), a corroded hollow rod-like object (SF 73, Context 18), a hollow tube and perforated disc (SF 87 Context 114), a fragment of plate with folded ends (SF 98, Unstratified), a heavy fragment with a fluted edge (SF 96, Context 182) and 33 nails.

None of the fragments of strip and unidentifiable objects were in any way significant or datable, and most of the 33 nails were very corroded and fragmentary – either lacking heads or broken across the shafts. However, a few of the nails were of interest, including one well-preserved nail, unfortunately an unstratified find, which had a large domed head, the shape of which was suggestive of a medieval date. A large corroded nail, one of two nails from Context 89 (SF 82), had a copper alloy head with machine-turned linear grooved decoration around its outer edge. This was probably of quite recent date, probably the 19th or 20th century. One nail was obviously modern (SF 97, 2173A, 895E 910 N) and came from the same context as two fragments of iron strips/binding. Most of the other nails were probably also of later, possibly modern, date due to there being very little change in the morphology of nails from the Roman period up to the present time.

5.1.4 Lead

Two fragments of lead strip (SF 11, Context 178; SF 78 Context 49) were recovered, one of which (SF 78, Context 178) was found in association with a skeleton (Sk.176) and the other (SF 78, Context 49) had a twisted, forked end.

5.1.5 Clay Pipe

Clay pipe finds comprised a complete bowl and part of a second (SF 71, unstratified) and 31 undiagnostic stem fragments from various contexts, mainly recovered as single finds, with the

largest amounts coming from Context 18 (seven fragments, SF 61) and Context 42 (five fragments, SF 63). The general shape of the almost-complete bowl is suggestive of a date in the range of c. 1580-1610 (Oswald 1975, Fig. 3G: 3, 37), although the presence of a small pictorial stamp on the base of the bowl may indicate a later date.

5.1.6 Worked Stone

Worked stone finds consisted of two fragments of worked building stone (SF 1 and SF 2, unstratified), a large semi-circular slate object with an internal groove and a perforation at one end (SF 114, Context 102), and 26 fragments from slate roof tiles, some of which were very large and others much smaller in size. A full listing of slate roof tiles is provided in Appendix 2.

The two fragments of worked stone – a hard grey micaceous stone – were both very similar in appearance and may possibly have originated from the same object The larger piece (SF 2) was roughly-triangular in shape, with two dressed surfaces, and the smaller was thicker, but also triangular-shaped, having been deliberately cut on three faces and with the remains of one worked surface (SF 1). These fragments appear to have been used as building stone in the past, possibly during the medieval period, and the smaller one was cut on three faces presumably during a later phase of site usage prior to both fragments being discarded.

The semi-circular slate object with an internal groove may have been used for a finishing or drainage purpose in roofing, along with the tiles. None of the tiles was in any way unusual or significant, although several were very large in size and some had nail holes in them.

5.1.7 Glass

Glass finds consisted of 29 items, including a fragment of mirror glass and three fragments of clear window glass, two of which appeared to be modern in appearance and one of which was thicker than the others and probably therefore older (SF 50, Context 42). The remainder of the glass mainly comprised small fragments from wine, beer, and medicine bottles of 19th- to 20th-century date, though one or two fragments may be earlier. However, a lack of diagnostic features precludes closer identification. No fragments of medieval window glass or early bottle or vessel glass were identified in the assemblage. A full listing of glass fragments is provided in Appendix 2.

5.2 The pottery – prepared by Paul Blinkhorn

The pottery assemblage comprised 322 sherds with a total weight of 9,095g (see Appendix 4 for details). It comprised a mixture of medieval and later wares, with the following fabric types noted:

BEW: Buckley-type Earthenware, 17th – 19th century (Crossley 1990, 252). Hard red earthenware, usually with a black or dark purple glaze. 130 sherds, 5910g.

BSW: Buckley-type Slipware, late 17th – 18th century (Crossley 1990, 253). As BEW, with slip decoration. 14 sherds, 305g.

CSTN: Cistercian Ware, late 15th – 17th century. Hard, smooth fabric, usually brick-red, but can be paler or browner. Few visible inclusions, except for occasional quartz grains. Range of vessel forms somewhat specialized, and usually very thin-walled cups. Rare white slip decoration. Manufactured at numerous centres in England and Wales (Crossley 1990, 245). 4 sherds, 31g.

DGTW: Dyfed Gravel-Tempered Wares, ?late 12th-early 16th century Moderate, rounded to sub-rounded and ill-sorted quartz up to 0.5 mm, and abundant, flattened siltstone rock fragments up to 3mm.occur. Similar wares found across Dyfed and multiple kiln sites are likely (O'Mahoney 1995, 9). 3 sherds, 25g.

EST: Salt-Glazed Stoneware, late 17th – 18th century. Hard, grey fabric, often with an external brown iron wash. A range of utilitarian wares, manufactured at numerous centres (Crossley 1990, 267). 6 sherds, 242g.

GRE: Glazed Red Earthenware, 16th – 19th century. Fine sandy earthenware, usually with a brown or green glaze, occurring in a range of utilitarian forms. Such 'country pottery' was first made in the 16th century, and in some areas continued in use until the 19th century (Brears 1969). 1 sherd, 12g.

MA: Sandy Red Ware, 13th – 14th century (Owen 1994, 192). Hard, sandy orange-buff fabrics, often with an olive-green glaze. Found across a wide area of Cheshire and north Wales. Probably from a number of sources, including Rhuddlan Castle. 4 sherds, 51g.

MD: Coal Measures Wares, 13th – 14th century (Owen 1994, 192). Hard, white or off white iron-free fabric, with moderate quartz and rare rock inclusions. External green glaze. Occurs across the west midlands and north Wales. 2 sherds, 76g.

MOD: Miscellaneous Modern Wares, 19th – 20th century. Stonewares, white earthenwares, etc. 131 sherds, 2087g.

MPUR: Midland Purple Ware, 15th – 17th century. Hard-purplish grey ware, purple to black glaze (McCarthy and Brooks 1988, 427). Manufactured at a number of centres, including Staffordshire. 6 sherds, 86g.

NDGT: North Devon Gravel-tempered Ware, 16th–19th century (McCarthy and Brooks 1988, 467). Moderate to dense sub-angular quartz up to 2mm. A wide range of utilitarian glazed wares. 2 sherds, 30g.

SAN: Saintonge Monochrome Ware, mid-13th – 15th century. White, slightly micaceous fabric with the occasional quartz grain. Rich, copper-green glaze (Barton 1964). Found at numerous coastal and castle sites in Wales. 1 sherd, 67g.

SMW: Staffordshire Manganese-glazed Earthenware, late 17th – 18th century (Crossley 1990, 254). Hard buff earthenware with mottled brown glaze. 1 sherd, 3g. 5 sherds, 57g.

STSL: Staffordshire/Bristol Slipware, mid-17th – mid 18th century. Fine cream fabric with white slip and pale yellow lead glaze, commonest decoration is feathered dark brown trailed slip. Chiefly press-moulded flat wares, although small bowls and mugs etc are known. 11 sherds, 88g.

SWSG: Staffordshire White Salt-Glazed Stoneware, AD1720-1780 Hard, white fabric with a distinctive white 'orange peel' textured glaze. Range of fine tablewares such as mugs, tea bowls and plates (Mountford 1971). 1 sherd, 22g.

TGW: Anglo-Dutch Tin-glazed Earthenware 17th – early 18th century (Orton 1988). Fine white earthenware, occasionally pinkish or yellowish core. Thick white tin glaze, with painted cobalt blue or polychrome decoration. Range of table and display wares such as mugs, plates, dishes, bowls and vases. 1 sherd, 6g.

The pottery occurrence by number and weight of sherds per context by fabric type is shown in Table 1 (Appendix 4). The range of fabric types is fairly typical of high-status sites in Wales. The small medieval assemblage comprises a mixture of local wares and regional and foreign imports which can be paralleled at such places in the north as Rhuddlan Castle (Owens 1994) and in the south at Carmarthen Greyfriars (O'Mahoney 1995). Most of the medieval sherds appear to be fragments of glazed jugs, other than the sherd of DGTW from context 227, and the late medieval Cistercian Wares, which are fragments of cups, a typical product of the tradition. The sherd of Saintonge Ware is from the rim of a typical jug, as is the sherd of MD from context 169, although the latter is rather abraded.

The post-medieval assemblage is dominated by Buckley-type wares, mainly the utilitarian earthenwares, but also smaller quantities of the finer slip-wares. A few Staffordshire-type wares are also present, with the 19th century material being the refined white earthenwares and developed stonewares typical of the period.

5.3 The archaeometallurgical residues – prepared by Dr Tim Young

5.3.1 Methodology

The material described here derives from excavations around the Castle Hotel, Harlech, Gwynedd (SH 5817231229), during the construction by Cadw of a new visitor facility for Harlech Castle. 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.

5.3.2 Results

Description of residues

The submitted materials amounted to approximately 3kg in weight. Of this material, just 1.4kg was actually archaeometallurgical residue, probably representing two original pieces, one now fragmented.

Smithing slags

There were two examples of smithing hearth cakes (SHCs). One of the cakes (from spread (113) comprise fragments of at least 570g, mainly formed of a dark glass, locally bearing coarse olivine and quartz grains and with a partially reddened surface. These features are common characteristics of coal-fuelled smithing, but no associated coal residues were observed and other interpretations are possible. The cake was represented by fragments of 455g and 165g, together with 15g of fine debris. It was unclear what proportion of the original cake was present, but it was probably only approximately half, implying the original cake would have weighed approximately 1kg.

The second (from fill (169)) was an 820g of a large, charcoal-fuelled, SHC, with evidence for having been deformed (torn and twisted) during removal from the forge when hot. The top of the cake locally showed a glassy veneer, where melted hearth lining had flowed from the wall. The top was also deeply dimpled through contact with the fuel. The interior of the cake was a conventional crystalline iron slag. The base of the cake was rough, ashy and showed abundant inclusions of fine to medium sized charcoal.

Other

The majority of the remainder of the submitted material was formed by fragments of ferruginous concretions. Three of these pieces contained the remains of highly degraded metallic iron.

One of the iron-bearing concretions, from layer (49), contained what appears to be three links of chain, each approximately 35mm long. A further concretion contained a small block of iron of c.40x15x15mm; it is unclear if this is an object or if it is an offcut or waste piece of iron from a smithy. The third iron-bearing concretion weighs 205g, but the nature of the iron within is unknown.

Other concretion fragments either do not contain iron objects or are very small fragments of concretions.

Distribution of residues

The residues are not associated with metallurgical features and presumably represent either residual material or a low level of causal disposal. The SHC fragments occur within post-medieval contexts.

5.3.3 Interpretation

The amount of archaeometallurgical waste recovered from the site was very low, making it unlikely that the smithing activity was conducted in the immediate area.

Both SHCs were relatively large. Charcoal-fuelled smithing, particularly where a ceramic tuyère or blowhole was employed, may generate large SHCs, even where blacksmithing was being undertaken, rather than iron processing as part of the process of the working of raw bloom into finished iron. The maximum weight of SHCs in assemblages from medieval smithies ranges from approximately 500g from rural smithies such as that at Exminster (Young 2014), up to 1800g at some later medieval urban sites (e.g Worcester Deansway Period 9, McDonnell & Swiss 2004).

5.3.4 Discussion

The limited archaeometallurgical residue from the site implies the existence of a smithy nearby, but not within the site limits.

Despite the moderately large size of the SHCs recovered, it is likely that they represent the residue from blacksmithing. Blacksmithing was a widespread craft activity in medieval and post-medieval settlements, so little can be read into the occurrence of sporadic iron working waste on urban sites.

5.4 The Mortar – prepared by Ned Schärer

Twenty mortar samples were examined for initial visual inspection. This analysis identified three different types of mortar: (1) a floor mortar that is lightweight and weak in consistency, (2) a bedding mortar of roughly graded coarse aggregates for rubble walls, and (3) a finer bedding mortar for dressed and cut masonry and possibly plasterwork. There was also a sample of 20th Century mortar.

All the samples appeared to be a mix of both shell and stone aggregate. The ratios varied and generally the colour was light buff, with a slight pinkish tinge. The obvious assumption is that they were using sand from or close to the beach.

The samples suggested that different mixes were being made for different purposes. There is a deliberate choice of what size aggregates to use, and the weaker mortars that were found

in the floors suggests that the builders were possibly using the lime more sparingly. Where it really mattered however, like on the masonry, they seem to have been sieving their aggregates and using plenty of lime to make a nice lime rich mortar that they knew would stand the test of time. It could equally be that the lime in the floor mixes has simply washed out over time in the damp subterranean conditions.

Individually, some samples can be linked with specific structural elements. For example, mortar residues found on the walls of the postulated chapel were recorded and stored as sample 128.

As a group, the samples are interesting for visual inspection and comparison because they show a variety of different consistencies and mixes used within the same building. For example, samples no.123 (Context 18, Phase 3) & 134 (Context 169, Phase 3) show the indentation of the stone that they were bedded in. The consistency of this mortar at the time of use was probably quite stiff, but still soft enough to bed stone. There are no signs of shrinkage cracks and it feels quite dense suggesting a well-mixed doughy consistency. The mortars on the other hand are airy in consistency and suggest quicker, wetter, more rudimentary mixes.

5.5 The Animal bone – prepared by Jane Richardson

In total, 575 animal bone fragments were recovered from hand-excavated features, most likely of medieval and post-medieval date. Bones were identified to taxa wherever possible, although lower-order categories (e.g. cattle-sized) were also used. As the assemblage was relatively small, all fragments were quantified at this assessment stage. The data is summarised by context in Appendix 6.

The assemblage is of questionable value due to its relatively small size, its fragmented nature and the frequency of eroded bone surfaces. Few bones are measureable, although a number of sheep/goat metapodials are complete or near-complete and would provide some metrical data. Gnawing by dogs is apparent (albeit rare) and butchery marks are present on cattle, sheep/goat, pig and chicken bones.

Cattle, horse, sheep/goat, pig, chicken, hare and fish are present. Age data, based on ephipyseal fusion, indicate that adult, sub-adult and juvenile cattle are represented, as well as adult and sub-adult horse, sheep/goat and pig. The presence of young cattle, sheep/goat and pig may indicate that animals were utilised specifically for the production of prime meat. Wear stages on mandibular teeth (after Grant 1982) confirm the presence of sub-adult cattle.

Two deposits, 169 (Phase 3) and 217 (Phase 3), contained assemblages dominated by sheep/goat metacarpals, metatarsals and phalanges. These tend to be more complete than the other bones, and are in better condition. The presence of foot bones might indicate the disposal of primary butchery waste (i.e. the discard of low-utility parts), or alternatively waste

associated with processing skins as certain bones (typically horns and/or feet) will tend to be carried with the hide to the tanner (Serjeantson 1989, 136).

5.6 The Human remains – prepared by Malin Holst

The excavations at Harlech Castle produced a total of 18 burials recorded *in situ* and a large assemblage of mixed human and animal bone from 30 contexts. The assemblage comprised 10 from Phase 4A (the 7 recorded during the excavation, plus 3 identified during p/x assessment), 4 from Phase 5A and 4 from Phase 5B. A summary of the results obtained during post-excavation analysis is presented below.

5.6.1 Methodology

The human remains were assessed following English Heritage guidelines (Mays et al. 2002). The potential of the remains to supply osteological information on age, sex, stature and metrics was assessed, and a note was made of any obvious pathological conditions that would require more detailed recording.

5.6.2 Summary of Results

The preservation of the human remains was good to moderate, with one articulated skeleton being less well-preserved (see Appendix 5 for details). Completeness of the articulated skeletons varied from 10% to almost complete. Skeletons 74, 75 and 76 were intermixed and Skeleton 93 was a disarticulated bone assemblage consisting of at least 4 individuals and was treated and recorded as disarticulated bone.

The minimum number of individuals based on a count of the maximum number of long bone joints and specific other larger bone elements as well as age was 20 (including the disarticulated and articulated remains together), with 13 adults, 3 adolescents, 3 juveniles, one infant and one neonate represented. Notably, infants and neonates did not derive from the articulated skeletal assemblage, but were all recovered from the disarticulated bone assemblage (see Appendix 5).

The articulated bone assemblage consisted of 16 graves, as well as Grave 93, which contained charnel, but the minimum number of individuals represented in these burials was only 11 (8 adults, 1 adolescent, 2 juveniles), as none of the skeletons were complete. The disarticulated bone assemblage was large, containing 1,300 bones or bone fragments (Appendix 5). This included a minimum of 13 individuals (6 adults, 2 adolescents, 3 juveniles, 1 infant, and 1 neonate). Adding all the bone elements together provided the MNI of 20 individuals.

Individuals of both sexes and all ages were represented, with a predominance of mature adults, aged 46 years old or older.

Pathology was noted in a number of the remains. This took the form of common ailments, such as degenerative joint disease in some individuals, but also very unusual conditions, such as very severe venereal syphilis lesions (from the tertiary stage of the disease) in two adolescents, whose bones were spread across a number of the disarticulated bone contexts (Contexts 153, 154, 158, 159, 163, 247; Phase 5). Venereal syphilis lesions as such are very rare, but to see them in such young individuals is exceptional.

There was also a tibia with a fracture that was well healed, but at a severe angle to the usual alignment of the shaft, suggesting the lack of medical care in the form of splinting.

5.7 Environmental soil sample processing and assessment of the plant macrofossils- prepared by Wendy J. Carruthers

5.7.1 Processing methods

The sample sizes varied from around 160 litres (16 bags) to less than 0.5 litre (see Appendix 7). Being mainly post-medieval in date, and having a range of possible types of remains preserved within them, three slightly different methods of processing were used in order to ensure that the maximum information was recovered:

1) Where only charred plant remains were likely to be present in very large volumes of soil, floatation using a standard floatation tank was used.
2) For small soil samples (less than 10 litres in volume) bucket floatation is usually the most cost-effective and controlled method of recovery.
3) Where mineralised and/or semi-waterlogged un-charred plant remains were possibly present in small volumes of soil, as in the cess pit sub-samples, stack sieving is the most effective, carefully controlled method.

For all of these methods the same, fine mesh size was used for the recovery of charred plant remains = 250 microns. In the non-mineralised floatation samples 1mm mesh was used to retain the residues, and where mineralization was a possibility (i.e. cess pit samples) 500 micron mesh was used to retain the residues. The stack of sieves ranged from 250 microns, to 1mm and 3.5mm. Therefore, even though the processing apparatus were different, the results from all of the soil samples are comparable.

Because the soils were sandy/silty and not cohesive chemicals were not required to help to disaggregate them. However, from the author's past experience of soil processing in Wales it is likely that silt and mineral encrustation of charred remains may have made a proportion of the charred plant remains (CPR) sink close to the heavy residue, rather than float off on the surface of the water. For this reason bucket floatation is often more efficient, allowing all except the heavy residue to be poured off through the fine sieve. Unfortunately bucket floatation is impractical with very large samples. The alternative is the drying and re-floatation

of residues to help the encrusted CPR float at the second floatation. This double-floatation method is also required when soils are very wet at the time of excavation (a common problem in Wales). For this site the second floatation was not undertaken at the assessment stage, but all of the residues were retained, apart from large stones which were weighed prior to being discarded. Some of the residues were scanned as a check on recovery, and this is commented on below.

Whilst all of the samples of around 20 litres or less in volume were processed for the assessment, for the largest samples only 20 litres was processed at this stage. These large samples included four grave fills, a fire pit and cess pit 19. Because all of the bones from the graves will need to be recovered, and because the fire pit and cess pit have further potential, these seven samples (amounting to 53 bags/tubs) will probably need to be processed to provide detailed information for the final report.

5.7.2 Assessment Methods

Floats and residues were slowly dried in trays before being scanned under an Olympus SZX7 stereoscopic microscope. No plant remains were removed from the flots at this stage but some were put into tubes within the flot bags for protection. Where stack sieving was undertaken on small samples all of the residues (containing all items larger than 250 microns) were scanned. For other samples the residues of six samples were scanned to determine how efficient the first floatation had been. Small fragments of charcoal were found to remain in most of the residues but they were rare in four of the residues and common in two. No identifiable plant macrofossils were observed but there is clearly the possibility of charred plant remains being present, particularly small dense fragments of items such as hazelnut shell (hazelnut shell). Because of the variation in recovery, it is recommended that all residues of the samples selected for full analysis are scanned microscopically.

5.7.3 Intestinal Parasites

Because several of the samples were taken from the stomach area of skeletons within graves and from cess pits there was a possibility that parasite ova might be present, providing information about the health of the population. Advice was sought from colleagues concerning this possibility and the following information was obtained from Simon Mays, human bone specialist at English Heritage;

"Waterlogging, saline conditions or rapid phosphatisation are needed to preserve parasite eggs. Sampling the pelvic area in skeletonised remains won't normally produce anything in a NW European environment. A number of projects have tried this and failed (eg St Mary Spitalfields, London). Really you need to look in cess pits if you want to find parasite ova (Coppergate cess pits produced c50,000 eggs per gram of sediment!). It may be worth doing a pilot study on a few burials to see if there is anything, but unless conditions are highly unusual they are likely to be unsuccessful."

Nevertheless, the following sub-samples have been retained in case a parasite specialist is able to take this project on;

- Sample 4, context 22 – stomach area skeleton 75/76 – 300ml whole soil.
- Sample 6, context ? – stomach area skeleton 95 – 300ml whole soil.
- Alternate sub-samples (odd numbers) from column through cess pit (19) – c. 300ml whole soil.
- Alternate sub-samples (odd levels) from column through cess pit (26) – c. 300 ml whole soil.

5.7.4 Results

The results of the assessment are presented in Appendix 7, with indications as to the further potential of samples and suggested future analysis provided in the final columns of the table. It should be noted that the plant species noted in the table are provisional identifications only, and it is likely that a wider range of items will be recovered on full sorting and analysis. Nomenclature follows Stace (2010) and Zohary and Hopf (2000) for cereal remains.

State of preservation

Preservation was primarily by charring, although some samples from probable cess pits (19) and (26) produced frequent uncharred fruits/seeds that did not appear to be modern. It is possible that these remains were partially mineralised, or enclosed in soils that were sufficiently moist to prevent rapid decomposition. Since the cess pits were thought to be C19th century in date and most of the seeds were fairly robust it is quite likely that they would have survived in moist soils for around 200 years. In addition traces of mineralisation were observed, but these were limited to occasional fly puparia in sample 8 (soil surrounding skeleton 96) and some mineralised indeterminate stems from sample 15 (charcoal deposit at the base of cess pit 26). It is possible that a few more mineralised remains might be recovered from the cess pit residues, but the absence of other indicators such as mineralised 'nodules' (Carruthers 1989) and fawn, clinker-like concretions in the residues suggest that full mineralisation has not taken place at this site.

The charred plant remains were often poorly preserved, being silt encrusted and so hard to identify. However, in some cases fine detail such as long hairs on the sides of oat grains were visible. As is typical of medieval and post-medieval samples, virtually no cereal chaff was found, though this may change when full microscopic sorting is undertaken.

Uncharred hatched fly puparia fragments were abundant in some of the cess pit samples (e.g. level 20cm, pit (26)) providing information about the foul nature of the deposits in the top of pits (19) and (26) (see discussion below). It is possible that some insect analysis might be worthwhile for the top few samples of pits (19) and (26), providing details of the nature of the cessy deposits.

Frequency of charred plant remains (CPR)

Almost all of the samples contained some CPR (not including charcoal fragments); only five of the forty-three samples produced no plant remains, even though several of the soil samples were small (<1 litre in volume). In no cases were CPR or uncharred plant remains abundant, although they were sometimes frequent. It is likely that most of the CPR represent low levels of background domestic waste scattered around the site and redeposited in a range of features, although features such as hearths are likely to contain primary deposits. In the case of the uncharred (possibly slightly mineralised) plant material the remains most likely represent sewage spread into the top layers of the two cess-type pits.

5.7.5 Discussion

Because the full phasing has not yet been completed it is not possible to discuss the assessment results in terms of distribution through time or distribution spatially at this stage. However, the samples can be roughly grouped according to the broad type of context and probable period:

A) Medieval contexts: stake hole fill (sample 24) from early sub-circular enclosure (Context 193; Phase 1), possible medieval Chapel wall foundation cut (sample 34) and gully (sample 35) (Contexts 267 Phase 3 & Context 266 Phase 2 respectively)

Only traces of possible oat grain (cf. *Avena* sp.) and a grass seed (Poaceae) were recovered from sample 35 (Phase 2) and sample 34 (Phase 3). Other samples from the Harlech Phase 2 excavation also produced just traces of oat and hazelnut shell from moderate-sized soil samples. The first sample (Phase 1) produced only a few small charcoal fragments, one of which (cf. Pomoideae) may be radiocarbon dated. The only further work recommended is scanning the residues to make sure that all of the evidence has been recovered. Sample 35 produced sufficient large charcoal to be used for radiocarbon dating.

B) Hearth, sample 27 (Context 218; Phase 3)

Four small fragments of hazelnut shell were recovered from this very small soil sample, in addition to a few fragments of charcoal. A single diffuse porous, small-pored, thin rayed charcoal fragment (possibly *Salix/Populus* sp.) was examined.

C) Probable cess pits (Contexts 19 and 26; Phase 6)

Specific layers from two pits and sub-samples from an associated column sample were assessed. Although no mineralisation was observed (probably because conditions within the pit were not suitable for mineralisation to take place, see McCobb *et al* 2003) uncharred plant remains were frequent, particularly in upper layers (sub-sample 2, pit 19; sample 5, context

20 pit 19; level 20cm pit 26). The fact that these taxa consisted primarily of fruit seeds (*Ficus carica*), bramble (*Rubus* sect. *Glandulosus*), raspberry (*Rubus idaeus*), strawberry (*Fragaria* sp.) and tomato (*Solanum lycopersicum*)) demonstrate that sewage was the likely source of the remains. The presence of tomato confirms the post-medieval dating of the deposits in pit (26). Evidence from the Netherlands and sites in Britain indicate that although tomatoes were introduced into Europe in the C16th they only became popular as a food (rather than an ornamental plant) in the C18th and C19th (Houchin 2010). There appears to have been a deposit of sewage in the tops of the two pits. Although the assemblages appear to be very similar the results at present suggest that tomato was only present in pit (26), but more detailed investigation is needed to confirm this. Full analysis may provide more details about the diet of the population from which it was derived, particularly if residues are sorted. Charred remains from both the upper and lower samples produced small numbers of bread-type wheat grains, barley and oat grains, as well as several small weed seeds such as corn marigold (*Chrysanthemum segetum*). If these features can be dated they are worth investigating in full. Sub-samples from the sample columns have been retained for parasite ova analysis, and this is recommended considering the survival of uncharred plant remains and the confirmation of sewage. It would be useful to submit charred cereal grains for radiocarbon dating from each pit if the finds analysis does not produce clear dates for these features, particularly if tomato is only present in one of the features, perhaps indicating differences in dates.

Other environmental remains that could be examined by specialists include fish bones (sample 15, pit (26)) and insects (sub-sample 20cm, pit (26)).

D) Grave fills (Phases 4 & 5)

Fourteen samples from grave fills were assessed, including soil from the stomach areas (samples 4 and 6) and surrounding the skeletons (samples 7, 8, 9, 12, 16, 19, 20, 26, 29). Since full analysis has not yet been undertaken the following information is based on presence of charred cereal grains only, rather than total frequency;

Grave samples containing oat grain	10 samples
Grave samples containing barley grain	2 samples
Grave samples containing free-threshing wheat grain	2 samples
Grave samples containing weed seeds	6 samples

Occasional finds of charred HNS, bracken and gorse indicate that burnt hearth sweepings may well be the source of the cereals and weed seeds, having been spilt during food preparation or burnt as rubbish. No large concentrations were found, representing deliberate deposits and the two small stomach area samples did not contain a different type of assemblage. The information from the grave fills, therefore, probably reflects the frequency of cereals being consumed by the population living close to the area, or perhaps those living there prior to use as a cemetery. This needs to be investigated by radiocarbon dating.

In addition to plant remains, the grave samples obviously contained frequent small human bones. Because this was an assessment only 20 litre subsamples of the largest samples were processed (see above) in order to reveal the further potential of the deposits. Prior to the full bone analysis it will be important to process the remaining tubs/bags of soil in order to recover all of the small bones, as well as other possible finds. A red glass bead (sample 8, skeleton 96) was the only obvious artefact recovered from the graves so far, in addition to iron nails, but other items might be recovered from the remaining soil. Other environmental materials present in the samples are charcoal fragments and a range of large mollusc shell fragments. Mollusc shell fragments were frequently found embedded in lumps of mortar so their presence in the graves may not relate to the deposition of food waste, but building waste. However, Caseldine (1990, p.110) has noted that it may be worth considering whether this type of assemblage might be representative of the original site, since mollusc and bone evidence is scarce in the acidic soils of Wales.

E) Samples from fire pit (sample 13; Context 27; Phase 7), hearth of post medieval dwelling (sample 10; Context 103; Phase 6), cooking pit (sample 33; Context 226; Phase 4)

The first two of these samples were very productive, containing food remains and weed seeds indicative of burnt food preparation debris (frequent hazelnut shell, apple pip, *Prunus* sp. fragment, traces of grain). The third was more similar to hearth sample 28 (see section B) above) in that it contained just a few very small hazelnut shell fragments with an uncharred *Rubus* sp. seed (possibly later contamination). However, the third sample was very small (0.8 litres) whilst the first two were ten to twenty times larger. It may be worth dating a grain/seed from each feature if other dating evidence is not available, as the plant remains provide little dating information.

F) Stakehole fill (sample 30; Context 193; Phase 1), post hole fill (sample 36; Context 269; Phase 2), drain fills (sample 31, CP2; Context 118; Phase 6) and unidentified contexts (samples 1, 11, 37, 57, 65, CP1, CP3)

Samples 11, 30, 31, 36, 37, CP1, CP2 and CP3 all produced only traces of CPR. The occasional cereal grains, hazelnut shell fragments and weed seeds recovered from these samples are of little interpretative value, and since no more soil is available to process for any of them the only potential is in scanning the residues to look for material that failed to float.

Samples 1, 57 and 65 were slightly more productive (several oat grains in each, some bread-type wheat, weeds and hazelnut shell) but unless context information is recovered they will have to be omitted.

5.8 The radiocarbon samples – prepared by Dr M.A. Tamers and Mr. D.G. Hood

5.8.1 Methodology

All results (excluding some inappropriate material types) which fall within the range of available calibration data are calibrated to calendar years (cal BC/AD) and calibrated radiocarbon years (cal BP). Calibration was calculated using the one of the databases associated with the 2013 INTCAL program (cited in the references on the bottom of the calibration graph page provided for each sample.) Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Looking closely at the calibration graph provided and where the BP sigma limits intercept the calibration curve will help you understand this phenomenon.

Conventional Radiocarbon Ages and sigmas are rounded to the nearest 10 years per the conventions of the 1977 International Radiocarbon Conference. When counting statistics produce sigmas lower than +/- 30 years, a conservative +/- 30 BP is cited for the result. All work on these samples was performed in our laboratories in Miami under strict chain of custody and quality control under ISO-17025 accreditation protocols. Sample, modern and blanks were all analyzed in the same chemistry lines by qualified professional technicians using identical reagents and counting parameters within our own particle accelerators.

5.8.2 Results

Context 275; Phase 2? (pre-dating chapel/revetment wall)
1 Sigma Calibration – 68% probability: Cal AD 1280 to 1295
2 Sigma Calibration – 95% probability: Cal AD 1270 to 1305, and Cal AD 1365 to 1385

Context 267; Phase 3 (immediately underlying south wall of Chapel)
1 Sigma Calibration – 68% probability: Cal AD 1300 to 1330, Cal AD 1340 to 1370, and Cal AD 1380 to 1395
2 Sigma Calibration – 95% probability: Cal AD 1290 to 1410

Context 218; Phase 4 (deposit associated with hearth)
1 Sigma Calibration – 68% probability: Cal AD 1325 to 1345, and Cal AD 1395 to 1415
2 Sigma Calibration – 95% probability: Cal AD 1310 to 1360 and Cal AD 1385 to 1425

5.9 The written and cartographic sources – information supplied by Dr Iestyn Jones

In order to further understand the historic circumstances that produced the material remains revealed during the excavation and building survey, a primary phase of research was conducted into cartographic and documentary sources. This was augmented by information retrieved from bibliographic and archive sources, although a more comprehensive study of available evidence has not yet been undertaken.

5.9.1 Sources

Three different cartographic sources were used in an attempt to shed light into the different phases of activity revealed during the excavations at Harlech Castle. These are (1) the Speed map of 1610, (2) the Mostyn Estate Map of 1771 and (3) the Llandanwg tithe map and apportionment of 1841.

Pertinent information came from a number of other sources, in particular 'The book of Harlech' (Lloyd 1986), which mentions that the Rev Ellis Wynne wrote in 1706 that there were three chapels at one time in Harlech: the Constable's Chapel (within the Gatehouse), Garrison Chapel (Inner Ward), and Magdalene's chapel nearby, which was used by the burgesses and their families (pg. 43). He goes on to state that the stones from the chapel had long been demolished and the stone carried away into other buildings in the town (Pg. 44). Lloyd suggests that Ty Eiddew (Ivy Cottage) now occupies the site and he notes that there seemed originally to be an ethnic split between burials at the chapel, who were town burgesses originally from elsewhere and locals who would have attended, and been buried at, Llandanwg Church a few miles away. Gradually this division became social rather than ethnic.

5.9.2 Speed Map, 1610 (Figure 5)

John Speed map of 1610 is revealing in that it documents the existence of a church or chapel located in the general area of the excavated site at Harlech. This is likely to be the Phase 3 building encountered during the excavation. Although Lloyd (1986) believes it was located further to the north, given the location and dating of the remains of the excavated building and its associated burials, it is likely that this was Magdalene's Chapel, one of three located in and around the castle. The chapel presumably dates from sometime between 13th century and the late 16th century and may have been destroyed in 1647 during the Civil War siege by Parliamentary forces loyal to Cromwell. According to the Speed's map, the building was in disuse by 1610.

5.9.3 Mostyn Estate Map, 1771 (Figure 6)

The 1771 Mostyn Estate Map, typical of its date and cartographic context, shows the mill pond and buildings along what is possibly now Ffordd Pen Llech. These appear to be workshops or small buildings within possible burgage tenements. Some of these structures may correspond to the evidence gathered during the excavation and belonging to Phase 6.

5.9.4 Tithe map, Llandanwg Parish 1841

The tithe map of Llandanwg Parish of 1841 is of particular importance in locating the former millpond's relation to the structures found during the excavation. Soulsby (1983, 139) denotes that the area of the later Castle Hotel car park is named in the apportionment as 'Chapel Yard'. Unfortunately, much of the area where cellar room 1 and 2 were discovered falls within plan number 962, which is missing from the tithe map apportionment documents.

6 Harlech Castle Hotel Building Recording

6.1 Introduction

The Building Recording described and recorded key internal components of the hotel Building. Particular attention was given to the floor of the hallway area (decorative 19th century tiles) and the windows in the front (west facing) rooms at ground and first floor levels. The work was completed to the standards of an English Heritage Level 2/Level 3 Building survey as appropriate.

The OS grid references for the corners of the structure were: NW Corner – 258,190.077, NE Corner – 258,192.807, SE Corner – 258,191.795 and SW Corner – 258,188.853. The structure surveyed was at c. 56m AOD.

6.2 Building description

At the time of the survey, the building measured approximately 5m long by 3m wide (Figure 8). The structure was rectangular in plan with steeply pitched roof, finished in likely Penrhyn slate (Figure 9, Plate 35). The ground plan shows that the north wall (Plate 36) is up to one third thicker than the south, east and west walls. The reason behind this difference is difficult to assess, however it is noteworthy that the adjacent wall (east) has had a flying buttress added to its north end (Plates 37 to 39).

The walls were composed of roughly faced, irregular sized, limestone blocks and pointed with lime mortar (Plates 32 to 34). The external face of the northern wall was covered in pebbledash render. Contrastingly, the external face of the east wall was covered in plaster and formed the inner face of a modern structure (Plate 35). At the time of recording, the west wall was partially obscured by scaffolding. However, it was observed to be mainly un-rendered, with modern cement pointing in some places. A small vent was present low down on the west wall (Plate 36).

The external face of the southern wall was partially obscured by a metal stairway. This wall was un-rendered (Plates 45 and 46). Two modern frosted glass windows were evident within areas of modern blocking masonry. Windows appeared to be located within a possible original doorway and larger window/hatch location. Modern blocking was composed of the same material as rest of building, though with poorly executed cement pointing (Plate 47). Three pipes were located within this external face of this wall, though do not appear on the internal face, suggesting they were redundant. Remnants of a lean-to roof against this wall could be seen as a cement trace left on the wall, equal in height to the bottom of the fascia boards.

The north and south gable ends were characterised by the presence of angled wooden slats located beneath the apex of the roof, presumably acting as ventilation louvres (Plate 48). The contemporary external ground surface located around the west and south of the structure

was finished in large slate slabs. Most of the floor on the inside of the structure was finished in similar slabs though there were also areas of concrete.

Two cemented-over drains showed the likely previous locations of two toilet cubicles, beneath a frosted glass windows (Plate 49).The structure's internal walls were finished in lime render (gone in places). Evidence of modern fittings remained in places.

Viewed from below, the majority of the roof beams appeared to be relatively modern, suggesting that the structure had been re-roofed within living memory. Modern scree material was visible between the roof beams confirming this (Plate 50 to 51). The door and the door frame of the structure were modern.

It is uncertain if the entranceway examined during the survey is the original one. The edges of the stones that form the entrance appeared un-weathered compared to elsewhere, while all the pointing was new. The threshold was composed of worn, modern cement. The original door is more likely to have been that located in the south gable end wall. This was subsequently blocked and a window inserted for a toilet cubicle. The structure was used as a toilet facility, likely serving the bar of the Castle Hotel. However, the toilets were subsequently removed and the drains cemented over, suggesting a possible change in use.

The structure is shown as largely unchanged throughout the historical OS map sequence 1890-1973.

7. Assessment of value

This section offers an assessment of the value of the evidence gathered during the site investigations. The assessment has been defined following two distinct parameters: (1) an assessment of the intrinsic value of the assemblages recovered (2) an assessment of their value in addressing site-specific questions. The former has been defined and organised following the advice offered by specialists after a primary phase of analysis and the latter has been structured following the different phases of activity evidenced at the site.

Small Finds	Lynne Bevan
Pottery	Paul Blinkhorn
Archaeolometalurgy	Dr Tim Young
Mortar	Ned Scharer
Animal Bone	Jane Richardson
Human Bone	Martin Holst
Environmental	Wendy J. Carruthers
Radiocarbon dates	Dr M. A. Tamers and Mr D. G. Hood
Written Resources	Dr Iestyn Jones

7.1 Assessment of intrinsic value

7.1.1 Small Finds

An assessment of the finds assemblage (Section 5.1) was undertaken to provide both a quantification of the assemblage and a qualitative overview of its potential for further analysis. Various finds reference works (e.g. Oswald 1975; Egan and Pritchard 1991; Margeson 1993; Egan 1998a) were consulted to provide preliminary identification and dating.

The assemblage is composed largely of undiagnostic and unremarkable objects, with the exception of several chronologically-diagnostic finds among the copper alloy, iron, clay pipe, and worked stone. When examined into context, this assemblage provides interesting sets of information with regards to the activities carried out at the site (see section 7.2). However, this small assemblage is of local significance only. As such, only very limited further work is recommended on a small selection of the more complete and identifiable of the finds, notably analysis of three fragments of iron cauldron (SF 72, Context 18, Phase 3; SF 80, Context 61, Phase 6; SF 25, Context 112 Phase 5). In addition, full cataloguing, and illustration are required for the following items: copper alloy spur, lace chape, buckle, and pins; iron cauldron fragments and a few of the iron nails; the two clay pipe bowls; and three items of worked stone.

One day will be required to undertake the further research and one day to undertake the compilation of a short report and a summary listing the undiagnostic material. Two days are required to illustrate the objects selected in advance of the publication of a monograph.

7.1.2 Pottery Assemblage

A contextual analysis of the pottery assemblage has evidenced that the majority of the medieval and post-medieval pottery encountered at the site is redeposited in modern contexts and is fairly fragmented. All the ware types are well-known in the region, and while noting and quantifying the range of types presented in Section 5.2 represents a useful enhancement of the understanding of the somewhat under-researched ceramics of the area, there seems to be little potential for further work beyond that contained in this report.

7.1.3 Archaeometallurgical Assemblage

The archaeometallurgical residues (see Section 5.3) imply the existence of a smithy nearby, but not within the site limits. Further study of this material is unlikely to produce further useful information. A sparse collection of poorly-dated material found with no association to metalworking structures is of limited value and retention of these archaeometallurgical residues with the site archive is of low priority.

7.1.4 Mortar Assemblage

Further analysis of sample 123 (Context 18, Phase 3) has been suggested by the specialist (Section 5.4) in order to explore whether any pozzolanic additives have been used to gain a hydraulic set. This information would not only be of interest for the history of the site would be used as guidance to how lime should be used in mortar today. This study and a subsequent report would be completed in a maximum of 7 days and its results published in relevant peer reviewed journals.

7.1.5 Animal Bone Assemblage

The study of the animal bone (see Section 5.5) noted that two deposits, 169 (Phase 3) and 217 (Phase 4), contained assemblages dominated by sheep/goat metacarpals, metatarsals and phalanges, which might indicate the disposal of primary butchery waste or waste associated with processing skins. However, this material would be unlikely to produce further useful information from additional analysis. It is recommended that for the final monograph, the assemblage is recorded onto a database to facilitate the quantification of diagnostic zones and allow for a minimum number of bone zones to be calculated. It is expected that this task can be finalised in 1 day.

7.1.6 Human Bone Assemblage

From the evidence (Section 5.6) it seems likely that parts of the articulated skeletons can be found in the disarticulated skeletal assemblage and that remains of one individual can be recovered from several different disarticulated bone contexts. Considering this and the unusual pathology of at least two of the individuals (tertiary stage syphilis), it is recommended that an attempt should be made to reunite as many of the skeletal elements as possible.

It is likely that a refitting exercise will be successful in increasing the number of bone elements from each articulated individual and, possibly, in identifying full skeletons from the non-adult bones.

To match skeletal remains from the disarticulated bone assemblage with articulated skeletons, properly sort out the intermixed skeletons 74 and 75 (Phase 5), the additional bones with Skeletons 170 and 203 (Phases 4 & 5) and to re-assemble the two syphilitic adolescents (Phase 4) will take four days.

It is also recommended that the articulated skeletons undergo full osteological analysis. This will take 11.5 days.

Unusual pathology of intrinsic interest was noted in a number of individuals. In particular, two adolescents with tertiary stage syphilis (Phase 4), the bone legions on which were indicative of the venereal rather than the congenital form of the disease - i.e. they were not born with it. Evidence for advanced syphilis in skeletal remains from individuals so young is extremely rare and further study of the two found at Harlech has the potential to be of international importance. The potential is greater if teeth from the individuals can be securely identified, as this will facilitate DNA analysis of the dental plaque and allow techniques such as strontium and oxygen isotope analysis to be performed. The early date of these burials is also of interest, because as yet there is no definitive evidence of syphilis before 1492, leading some to believe the disease may have originated in America.

An analysis of the two syphilitic adolescents (Phase 4) has the potential to greatly contribute to current understanding of the pathology of the disease. It also has the potential to contribute to our understanding of the history of arrival and spread of this disease in the British Isles. The results should be presented in a relevant peer reviewed journal. It is recommended that the syphilitic individuals are subjected to AMS dating. At least one tooth from each individual should be subject to DNA, strontium isotope and oxygen isotope analysis, as these techniques have significant potential in contributing to on-going studies of this particularly pathology.

Finally, it is recommended that a small sample of the bones undergoes carbon and nitrogen isotope analysis to examine diet. This is particularly important since preservation of Welsh skeletal remains is generally poor and thus only limited research has been undertaken on dietary information from Welsh skeletons.

7.1.7 Environmental Assemblage

The intrinsic value of the environmental assemblage recorded in Section 5.7 is significantly less than its value in answering site related questions, such as those related to function, to the contemporary environment or to the health and diet of those living there.

Samples taken from the stomach area of skeletons within graves were identified as having a potential in this regard. However, this potential is considered very low.

Sampling of skeletonised remains for evidence of parasites does not normally produce anything in NW European environments, although if successful the resulting study would represent pioneering research within the context of NW Europe. Following the advice of Simon Mays, however (Section 5.7.3), further study is not recommended.

7.1.8 Documentary and cartographic research and building survey

The potential value of the documentary and cartographic evidence (Section 5.9) and the results of the building survey (Section 6) lie solely with their potential to answer questions related to the development and use of the site.

7.2 Assessment of Site Value

7.2.1 Phase 1

Summary

Phase 1 was the earliest phase excavated. It comprised a dry-stone, sub-circular structure (193) with an internal stake hole (200). Environmental analysis determined that the material backfilling the hole (201) contained traces of oak and *Pomoidae* charcoal. A sample was kept for possible future dating.

The structure (193) was sealed by a relatively clean, mixed soil and rubble layer (153) that contained a fragment of animal bone and an intrusive sherd of pottery. Stratigraphically, the deposit predates those associated with Phase 2 and Phase 3, the former being dated by a C14 sample to AD 1280 to AD 1295 (68% probability).

Assessment

While it is possible to state that the structure, the post-hole and the soil date to the late 13th century or earlier, it is difficult to determine their function or significance. The structure was of crude, dry-stone construction and it appears to have respected the contours of a naturally occurring rocky outcrop. At present, it is not possible to suggest whether the remains pre-

date the Edwardian period or whether they are in some way associated with the construction or early use of the castle (constructed AD 1283-1295). Either way, they represent important evidence for the early use of the site.

Recommendations

The fill of stake hole (200) was sampled and processed for environmental analysis (Section 5.7). It is recommended that the charcoal recovered during this process is sent for C14 dating. The stake hole was sealed by context (153), so the carbon is not likely to have been introduced by post-depositional processes.

Further interpretation of the function of this structure and its significance within the wider landscape of Harlech has a potential to be better addressed once a date has been produced. This information should be combined with a further study of the structure and its associated deposits.

7.2.2 Phase 2

Summary

The second phase of activity is defined through the remains of channel / feature (272). This feature could have been natural or man-made, but either way would have been made redundant by the construction of the chapel (104) and the revetment wall (147). Two post holes of unknown functions located in the same area (268 & 270) were broadly contemporary with the channel.

Assessment

Evidence for the Phase 2 environment (Section 5.7) came from oat grains and grass seeds retrieved from the channel (Sample 35), while similar evidence recovered from the fill of a foundation cut for the chapel wall (Phase 3, Sample 34) evidenced the environment immediately prior to the onset of Phase 3. Although this evidence is important, it is not likely that further study of the samples will enhance our understanding of the contemporary environment.

In general, the stratigraphic and artefactual evidence related to Phase 2, although limited in scope, enables us to identify the surroundings within which the Phase 3 structure (104) and the revetment wall (147) were built. As with the Phase 1 features, however, it will be difficult to infer the purpose of the excavated remains. While it may be assumed that the postholes and the channel are roughly contemporary and related with regards to use, they are not associated stratigraphically. Diagnostic material was not recovered from these deposits and it is unlikely that further study will result in a better understanding of their function.

Recommendations

No further study is recommended, beyond that necessary to discuss and interpret the stratigraphic sequence.

7.2.3 Phase 3

Summary

The third phase comprised a rectangular stone masonry building (104) that had been constructed on an artificial terrace cut into sloping ground at the northern limit of the site. The rear, southern, wall of the structure shared a construction cut with an associated revetment wall (147), which extended the line of the wall in a westerly direction from the building's southwestern corner. A less substantial wall, with no discernible foundations, ran at an angle of approximately 80 degrees to the revetment wall, occupying the higher ground to the south of the building.

The masonry building – possible chapel

The building was preserved to a height of 1.3m on the southern side, while in the north it had been completely removed. No internal features such as floors survived. However, within the soil matrix covering the truncated ground surface, a single piece of Buckley earthenware (Section 5.2) was found, suggesting that the internal components were robbed sometime during the post-medieval period. Documentary and cartographic research (Section 5.9) suggest that the building is likely to be part of St Magdalene's chapel. This structure was probably built during the 14th century and largely destroyed in 1647 during the Civil War siege by Parliamentary forces loyal to Cromwell, having gone out of use prior to 1610.

A C14 sample taken from a deposit near the southern wall of the chapel provided three possible date ranges for its construction (AD 1300 to 1330, AD 1340 to 1370, and AD 1380 to 1395 - 68% probability), all within the 14th century, while a second sample taken from construction deposits associated with the revetment wall (147) provided a date of AD 1280 – 1295 (68% probability).

The revetment wall & 'cemetery' wall

The revetment wall (147) survived to a height of c. 1.0m. The wall commenced against the southwest corner of the masonry building and sat within a cut (263) contiguous with the foundations of the building (145).

A wall (183) with no discernible foundations, aligned at an angle of approximately 80 degrees to the revetment wall, was constructed on the raised ground above the terrace. During Phase 4, the wall appeared to define the limit of the burial ground. However, it is not certain if it had this function when first constructed.

Assessment

Phase 3 evidences one of the most significant discoveries made during the excavations, as it revealed a previously unknown structure identified through documentary sources as a chapel, possibly that dedicated to St Magdalene. Apart from their intrinsic interest, the revetment and 'cemetery' walls are also significant in that they establish a stratigraphic link between the postulated chapel and the burials of Phases 4 and 5. Although it is not certain if burials were contemporary with the earliest use of the 'cemetery' wall, it is clear that both of the walls and the chapel building were extant when the earliest of the burials were interred.

The C14 dating (Section 5.8) indicates that the possible chapel was built during the early life of Harlech Castle (constructed between 1282 and 1289), very likely within a hundred years of its construction. Documentary sources testify that modifications to the castle occurred in 1319, and that by 1321 the Chapel Tower needed considerable repair. By 1343, the Prisoners Tower was modified due to its bad condition (Peers 1936: 5-6) and it's likely that other episodes of construction took place throughout the fourteenth century. A re-examination of the known documentary evidence for the early constructional history of the castle, combined with a study of the archaeological evidence relating to the building and the two walls, has the potential to refine the dating and better understand the Phase 3 activities within the context of the early life of the castle. Of particular interest would be a comparison of the mortars used (Section 5.4). Mortar residues found on the walls of the postulated chapel were recorded and stored as sample 128.

Apart from the mortar samples, artefactual and environmental evidence relating to Phase 3 activities was generally poor. One deposits (Context 169), provided evidence for the contemporary disposal of primary butchery waste or waste associated with skin processing (Section 5.5). However, there are no reasons to assume that these activities were taking place within the masonry building or its vicinity, so further analysis is not recommended. Another deposit (Context 218, Sample 27) produced four fragments of hazelnut shell (Section 5.7).

Study of known documentary sources may shed further light on St Magdalene's chapel and its relationship to the castle and town. If the chapel had links with local monastic institutions, it could be mentioned in local monastic cartularies (the codices that deal more with the everyday transactions of religious houses), while information on potential links with the castle could be obtained in the Assize records, for the period when while the castle was under the control of the English crown. If the chapel came under the direct management of the castle, Pipe Rolls may provide information on the financial records maintained by the treasury.

Further knowledge of the postulated chapel is likely to result from an examination of the associated cemetery. Evidence quoted by Lloyd (1986) suggests that documentary sources (Section 5.9) have a potential in this regard, with the excavated skeletal remains (Section 5.6) providing significant opportunities to learn more about the individuals buried therein (see Sections 7.2.4 & 7.2.5 below).

Recommendations

A number of recommendations exist to further knowledge of the structures evidenced in Phase 3. Firstly, a re-examination of the known documentary evidence for the early constructional history of the area, in particular the castle and the chapel, should be undertaken, and the results considered in combination with the archaeological evidence. The aim would be to better understand the construction of the postulated chapel building and the two walls associated with it, within the context of the early life of the castle. It is estimated that this will take 7 days.

The mortars used in the walls of the Phase 3 structures should be compared with mortar from contemporary parts of the castle. This work is likely to take 3 days and can be combined with the study recommended in Section 7.1.4.

7.2.4 Phase 4

Summary

Phase 4 is characterised by the establishment and use of a cemetery (Phase 4A) in a central part of the site and by activities undertaken within part of a domestic building (Phase 4B) located further to the southeast. The burials and the building were located in adjacent areas, but it is not provable that they were in use at the same time.

Central burials

Phase 4A comprises ten inhumations, the seven identified during the excavation (Sk 196, Sk 176, Sk 95, Sk 97, Sk 96, Sk 170 and Sk 212), plus three that were identified during the initial post-excavation process (an additional one from Sk.95, one identified as part of charnel burial 93, and two from a group of contexts that included 158 &159). They are listed below as being part of a single phase of activity. However, a number were intercutting and the fills associated with two of them contained demolition rubble, suggesting that these post-dated the demolition of the adjacent 'cemetery' wall.

Domestic area

Contexts from Phase 4B included evidence for a sub-oval hearth (54), a length of walling (50), several post holes and 54 stake holes, which were found in the south-east corner of the site. It is very likely that they represent internal features found within a building that would have fronted Ffordd Pen Llech to the east. The features were overlaid by a layer (49) that contained material probably derived from the demolition of the building. Radiocarbon dates from the hearth indicate that the last firing episode occurred either AD 1325 to 1345 or AD 1395 to 1415 (68% probability).

Assessment

The importance of the group of 10 burials assigned to Phase 4A lies in its association with the adjacent building (the probable chapel) and the 'cemetery' wall, both of which were constructed during Phase 3. This association has a potential to be particularly interesting if documentary sources confirm the likelihood that the building is St Magdalene's chapel, and thereby establish relationships between the chapel, local burgesses, and Harlech Castle itself (Section 5.9.1). In this respect there is significant potential to address questions relating to the function and use of the chapel and its broader political, social and religious relationships with the castle and the town.

A cursory inspection into the stratigraphic position and character of the burials suggests that use of the cemetery was near-continuous during this period. Its use may have been characterised by successive burial practices, therefore inhibiting the possibility to distinguish well-defined phases of activity. However, during the excavation it was clear that at least some of the individuals were buried while the 'cemetery' wall was still standing, while others probably have post-dated it.

Because it only contains the remains of ten individuals, the skeletal assemblage has limited value in making statements about any postulated larger population from which it may have been drawn. Indeed, the cemetery itself could have been the burial place for a disparate population, with little in common other than a vague association with the castle or the town.

None-the-less, further study of the skeletal remains has a significant potential to enhance our understanding of the use of the chapel and its relationship with the castle. The studies already recommended as a consequence of the intrinsic importance of the assemblage (7.1.6), namely AMS dating, DNA analysis, and strontium, oxygen, carbon and nitrogen isotope analysis, all have the potential to contribute in this way. However, with the exception of carbon and nitrogen analysis, these studies only relate to the two syphilitic individuals, so it is recommended that these studies are extended to include at least one individual in the remaining population.

Evidence retrieved from environmental samples associated with the burials (Section 5.6) evidenced the contemporary environment (bracken and gorse) and likely diet (hazelnut shells, large mollusc shells and cereals). Frequent amounts of small human bones were also retrieved.

The importance of the structural evidence of the Phase 4B building excavated in the south-eastern part of the site resides in the building's apparent domestic function and the contrast between this and the Phase 4A cemetery. C14 dating (Section 5.8) from the hearth of the building has already provided suggested ranges of either AD 1325 to 1345 or AD 1395 to 1415 (68% probability) for the use of the associated building.

One deposits (Context 217), provided evidence for the contemporary disposal of primary butchery waste or waste associated with skin processing (see Section 5.5). However, it is not necessarily the case that these activities were taking place within masonry building itself. Further analysis is not recommended.

Environmental evidence retrieved from deposits in the hearth area of the building was poor (a few small fragments of hazelnut shell), so further analysis is not recommended here either.

Recommendations

In addition to the scientific analysis already proposed as a consequence of the intrinsic importance of the two syphilitic adolescents (see 7.1.6), the following is recommended on at least one individual from the remaining population (in some cases this has to be from a tooth):

- AMS dating, because it is likely to refine the dating of the Phase 4A burial sequence and stratigraphically associated events
- DNA analysis, because of its potential in making broad statements about ethnicity (Anglo/Saxon or Welsh)
- Strontium and oxygen isotope analysis, as they have a potential to identify where an individual spent their childhood.

The carbon and nitrogen isotope analysis already proposed (7.1.6) will provide information on diet.

Full processing is recommended for all remaining samples taken from deposits associated with the burials. This will ensure the retrieval of any remaining evidence for the contemporary environment, and for the diet of the individuals represented by the skeletal remains, but also ensure that as many small human bones as possible are recovered. This work is likely to take 10 days.

Our understanding of both the cemetery and the area of domestic use could be significantly enhanced by targeted documentary research. Such work would form part of the recommendations made for Phase 3 (7.2.3)

7.2.5 Phase 5

Summary

Phase 5A comprises four burials located in the eastern part of the development area. All four were heavily truncated, making it difficult to isolate each individual. It appears that the cemetery was extended in an easterly direction at this time.

Phase 5B comprised a separate group located in the west. These are important as they evidence the expansion of the cemetery during this period. They may also signify a period of abandonment and reuse, as the presence of a possible yard is indicated lying between the Phase 4 and Phase 5 sequences.

Assessment

The finds associated with these burials indicate that the graves were inserted in the area during the 17th century or soon after. However, more precise AMS dating will be required if the group are to be understood in relation to the wider historic narrative of the area.

The date of the demolition/abandonment of the chapel is particularly important in this regard.

As with Phase 4, the skeletal assemblage is too small to make statements about any larger population from which it may have been drawn. However, further study of the remains has a significant potential to enhance our understanding of the use of the associated chapel and its relationship with the castle. As with the Phase 4 burials, AMS dating, DNA analysis, and strontium, oxygen, carbon and nitrogen isotope analysis, all have the potential to contribute in this way. Furthermore, detailed analysis of at least one skeleton from Phase 5 will allow direct comparisons to be made with those from Phase 4. In this regard, Phase 5B is preferable to Phase 5A, as there is a potential here to establish a direct stratigraphic link between the two groupings.

Evidence retrieved from environmental samples associated with the burials evidenced the contemporary environment (bracken and gorse) and likely diet (hazelnut shells, large mollusc shells and cereals). Frequent amounts of small human bones were also retrieved.

Recommendations

It is recommended that AMS dating, DNA analysis, and strontium, oxygen, carbon and nitrogen isotope analysis in undertaken on at least one individual from Phase 5B. This will facilitate comparisons with the Phase 4 group and, hopefully, provide evidence for the later use of chapel and its relationship with the castle and the town.

Full processing is recommended for all remaining samples taken from deposits associated with the burials. This will ensure the retrieval of any remaining evidence for the contemporary environment, and for the diet of the individuals represented by the skeletal remains, but also ensure that as many small human bones as possible are recovered. This work is likely to take 4 days.

Understanding of this later phase of use of the cemetery could be significantly enhanced by targeted documentary research. Such work would form part of the recommendations made for Phase 3 (7.2.3)

7.2.6 Phases 6 & 7

Summary

During Phase 6 the area is characterised by a range of domestic activities represented by occupation layers, hearths, cesspits and buildings.

In the west of the site, activity is defined by the remains of two large masonry buildings. With the exception of the north wall of the more northerly structure, all the basal elements of these had been cut into the extant ground surface, making them semi-basemented. Ceramic evidence recovered from construction deposits indicates that both were built during the early to mid-19th century.

Two cess pits were found within close proximity to the rear of the 1860's Castle Hotel and are thought to be associated with an earlier building that may have been located along the frontage off Ffordd Pen Llech. A right angled stretch of wall found in the same area had been truncated by the hotel on its south western side, identifying it as predating the 1860s.

In a more central location, a shallow ditch of unknown function, aligned roughly north/south, cut across the site. Elsewhere, a small hearth and parts of two separate stone surfaces/floors evidenced further structural activity. The first surface was located 6m to the east of cellar 2 and probably represents the remains of a back yard metalled surface. The second, which was located in the east, was cobbled and of a finer construction, so could have been externally or internally located. The pub garden wall was the last structure attributable to this phase.

All deposits and features attributed to Phase 7 date to the C20th.

Assessment

The excavated evidence from Phase 6, combined with the results of the building recording undertaken within the Castel Hotel (See Section 5), define an important period in the transformation of the area. These 18th and 19th century developments relate to a period of relative prosperity during which many elements of the modern town were established. The excavated sequence includes structural elements that pre-date the construction of the Castle Hotel in the 1860s, in particular the two semi-basemented structures in the west, as well as elements that formed subsequently. In addition, material recovered from two waste pits provides valuable evidence for the diet of those living in the area at the time.

The structural evidence, which includes several sub-phases of development identified within the north-western building, is best considered in relation to the less-detailed but more complete understanding of the area presented by the cartographic and documentary sources (Section 5.9). As such, the excavated and surveyed evidence has a useful role in forming a better record of topographic development of the surrounding part of the town.

Apart from the structural remains, Phase 6 provided three important sources of information for the diet of those living in the area: two large assemblage recovered from waste pits located in the central-southern area and an assemblage associated with a fireplace located in the north-western masonry building. The pits contained a wide variety of material including evidence of fruit and grain, and consequently results of unusual quality and importance. This importance will be greater if more precise structural provenance or more accurate dating can be established. Documentary and cartographic records might help to establish the plot of land in which the pits were cut and, therefore, the building with which they were associated, while more precise dating could result from further stratigraphic and ceramic analysis. If this does not help, C14 analysis of some of the charred remains should be considered. In regards to dating, it may be significant that one of the pits contained evidence for the consumption of tomatoes (not normally earlier than the 18th century) whereas the other did not.

None of the modern deposits ascribed to Phase 7 are considered worthy of further analysis.

Recommendations

A full study of documentary and cartographic sources relating to the post-medieval and modern development of the site, from John Speed map of 1610 through to the second edition O.S. mapping is recommended. This will help to create a greater understanding of the broader topographic and historic background relating to the abandonment and demolition of the postulated chapel, as well as to subsequent structural developments, including the construction of the two western building attributed to Phase 6 and the Castel Hotel. This work will take approximately 5 days.

Full analysis of the environmental remains from the two pits and the hearth is recommended. This work is likely to take 4 days. The results should be considered in conjunction with the documentary and cartographic evidence for land holdings in the area, and from a full study of the stratigraphic and ceramic evidence. If these studies fail to produce a closer date range for the deposition of deposits in the pits, then C14 analysis should be considered.

7.3 Analysis, Publication and Archiving

An assessment of the results obtained during the site investigations and the initial post-excavation processes has helped to define a number of tasks, which collectively represent all the work necessary to complete the final Analysis, Publication and Archiving of project.

These tasks, which are set out below, are recommended either because they have an intrinsic value to a particular field of specialist investigations or because they have a potential to better understand the site itself.

It is recommended that the final results of the all tasks undertaken at the Analysis stage are published as a single report. In addition, however, the intrinsic studies will probably result in contributions to a number of specialist publications (see section 7.1). The most important of these is likely to be the study of the two syphilitic adolescents from Phase 4A, the results of which are potentially of international importance.

All the tasks summarised in the following sections include the time required for analysis and publication of the results. It is recommended that an additional 4 days are allowed for Project Management and consultations with specialists, 2 days for quality assurance and editing, and 1 day for archiving.

7.3.1 Context Sheets, Plans, Sections and Site Photographs

Site Value

A fully cross-referenced and checked Site Archive has already been created as part of the Assessment process. To initiate the Analysis phase, however, detailed Stratigraphic examination is recommended for Phases 1 to 6, to better discuss and interpret the site sequences. It is recommended that a full site matrix is drawn and phased, that all contexts are assigned to site specific Groups and Phases, and that each of these stratigraphic units is fully described and discussed. The resulting Stratigraphic Narrative will then be made available to the other specialists working on the project.

Compilation of site matrix – 1 day
Group descriptions and discussions – 6 days
Phase descriptions and discussions – 3 days
Preparation of publication text – 8 days
Preparation of figures and plates for publication – 5 days

7.3.2 Small Finds (See 7.1.1)

Intrinsic Value
Further work on a small selection of finds, in particular the three fragments of iron cauldron – 1 day.
The compilation of a short report and a summary listing of the undiagnostic material – 1 day.
Illustration of objects for publication – 2 days.

Site Value
No further work is recommended.

7.3.3 Pottery Assemblage (See 7.1.2)

No further work is recommended.

7.3.4 Archaeometalurgical Assemblage (See 7.1.3)

No further work is recommended.

7.3.5 Mortar Assemblage (See 7.1.4)

Intrinsic Value
Detailed analysis of sample 123 – 4 days

Site Value
Comparison of the mortars used in the walls of the Phase 3 structures with mortar from extant parts of the castle – 3 days

7.3.6 Animal Bone Assemblage (See 7.1.5)

Intrinsic Value
Recording of the assemblage into a database and a final qualification, by zone – 1 day.

Site Value
No further work is recommended.

7.3.7 Human Bone Assemblage (See 7.1.6)

Intrinsic Value

Matching skeletal remains from the disarticulated assemblage with the articulated skeletons, and full re-assembly of the two syphilitic adolescents – 4 days.
Full osteological analysis of the articulated skeletons – 11.5 days.
Analysis of the two syphilitic adolescents:

- AMS dating
- DNA analysis (at least one tooth)
- Strontium isotope and oxygen isotope analysis (at least one tooth)

Carbon and nitrogen isotope analysis from a sample of bones to examine diet

Site Value
The studies recommended above should be extended to include at least one individual in the Phase 4A assemblage, one in the Phase 5A assemblage and one in the Phase 5B assemblage.

7.3.8 Environmental Assemblage (See 7.1.7)

Intrinsic Value
No further work is recommended.

Site Value
Full processing of all the samples taken from deposits associated with the burials (Phase 4A, Phase 5A and Phase 5B) and the two waste pits (Phase 6), including analysis and reporting – 18 days.

AMS dating of the carbon recovered from Phase 1 to aid interpretation

7.3.9 Documentary Assemblage (See 7.1.8)

Intrinsic Value
No further work is recommended.

Site Value
A study of documentary sources relating to the construction of the castle and the chapel (Phase 3), and to subsequent medieval developments to the castle, and potentially to the chapel and surrounding areas of the town (Phases 3, 4 & 5) – 7 days

A full study of documentary and cartographic sources relating to the post-medieval and modern development of the site, from John Speed map of 1610 through to the second edition O.S. mapping – 5 days

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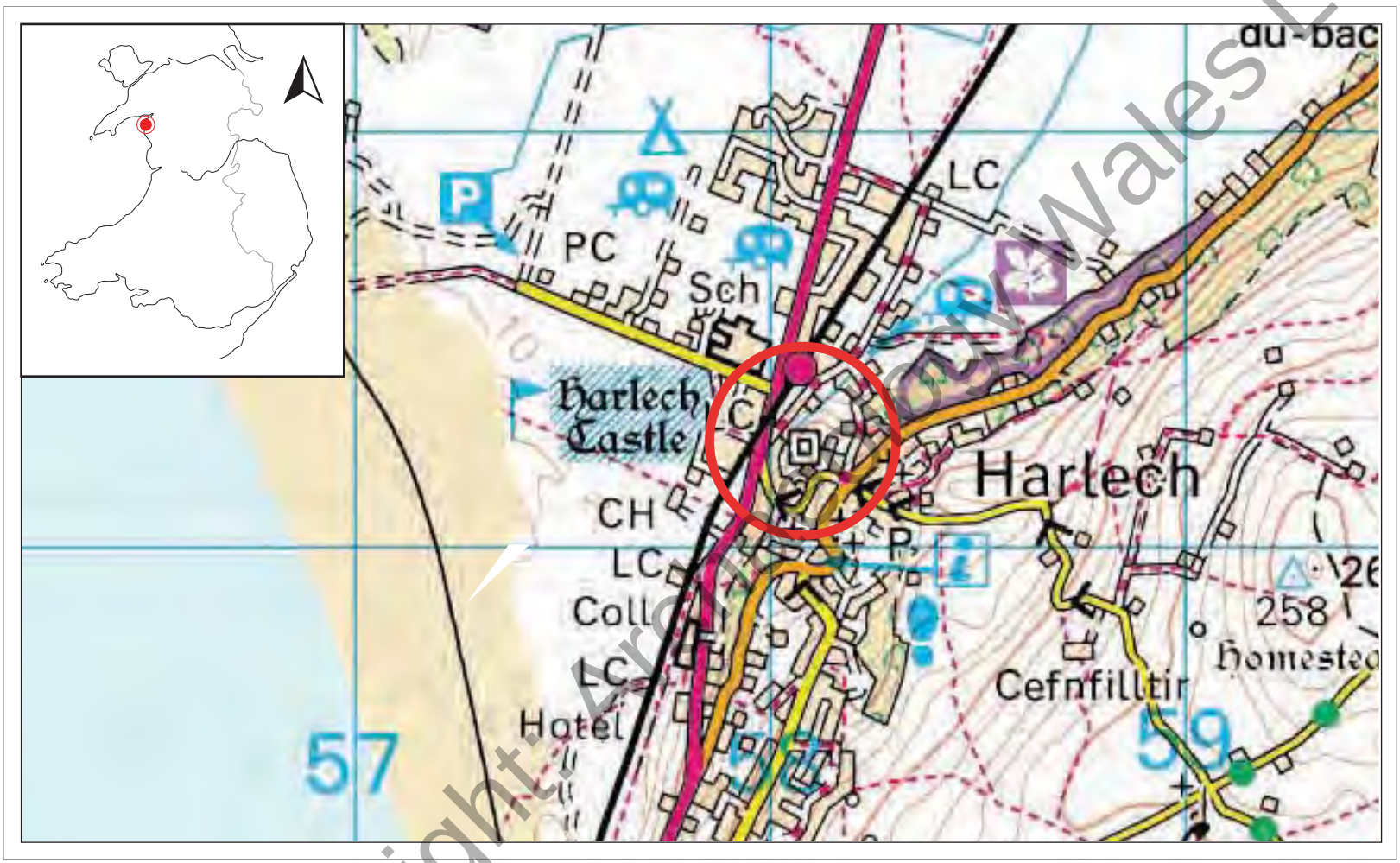


Fig. 1: Location of 2012 works at Harlech Castle.

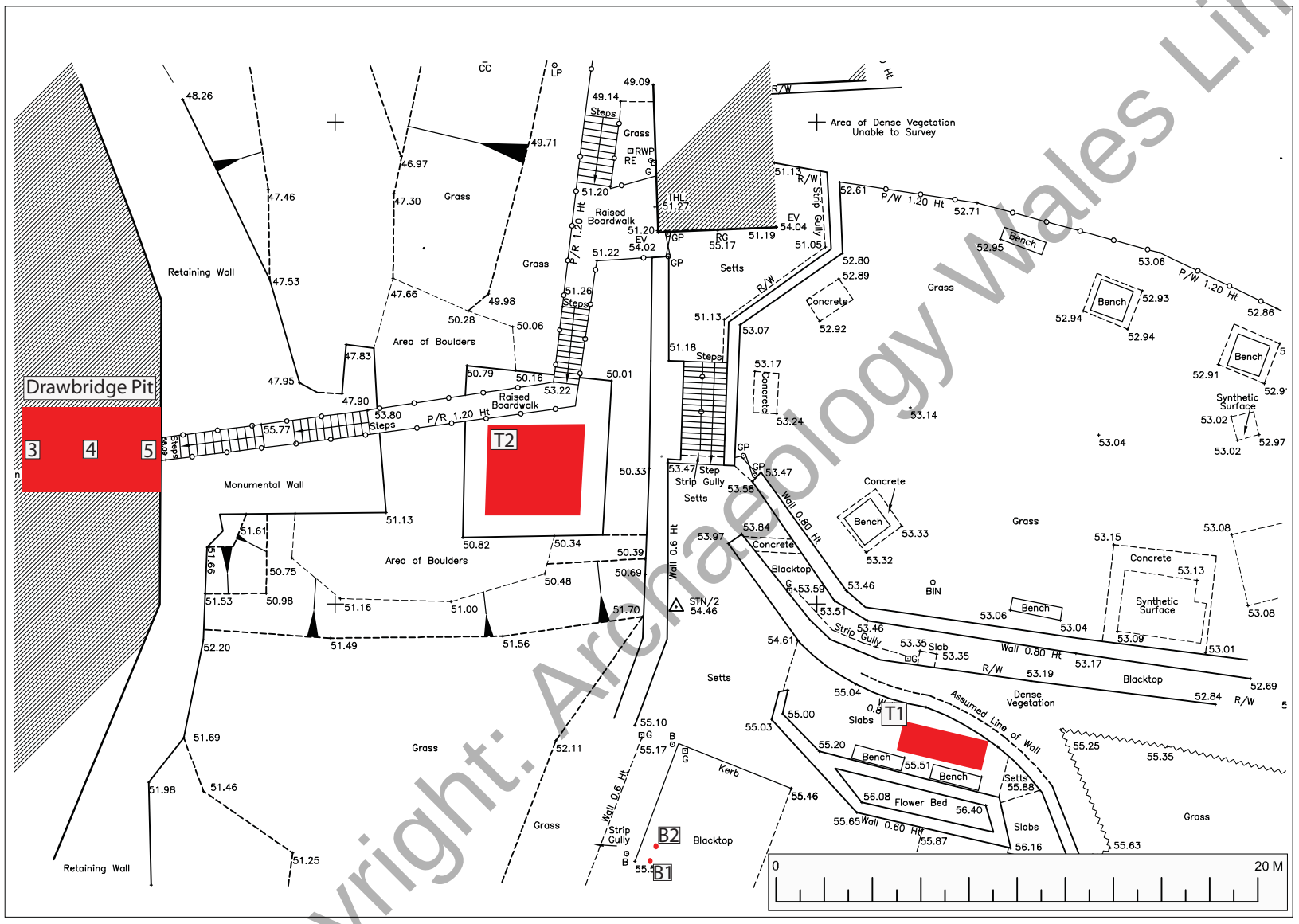
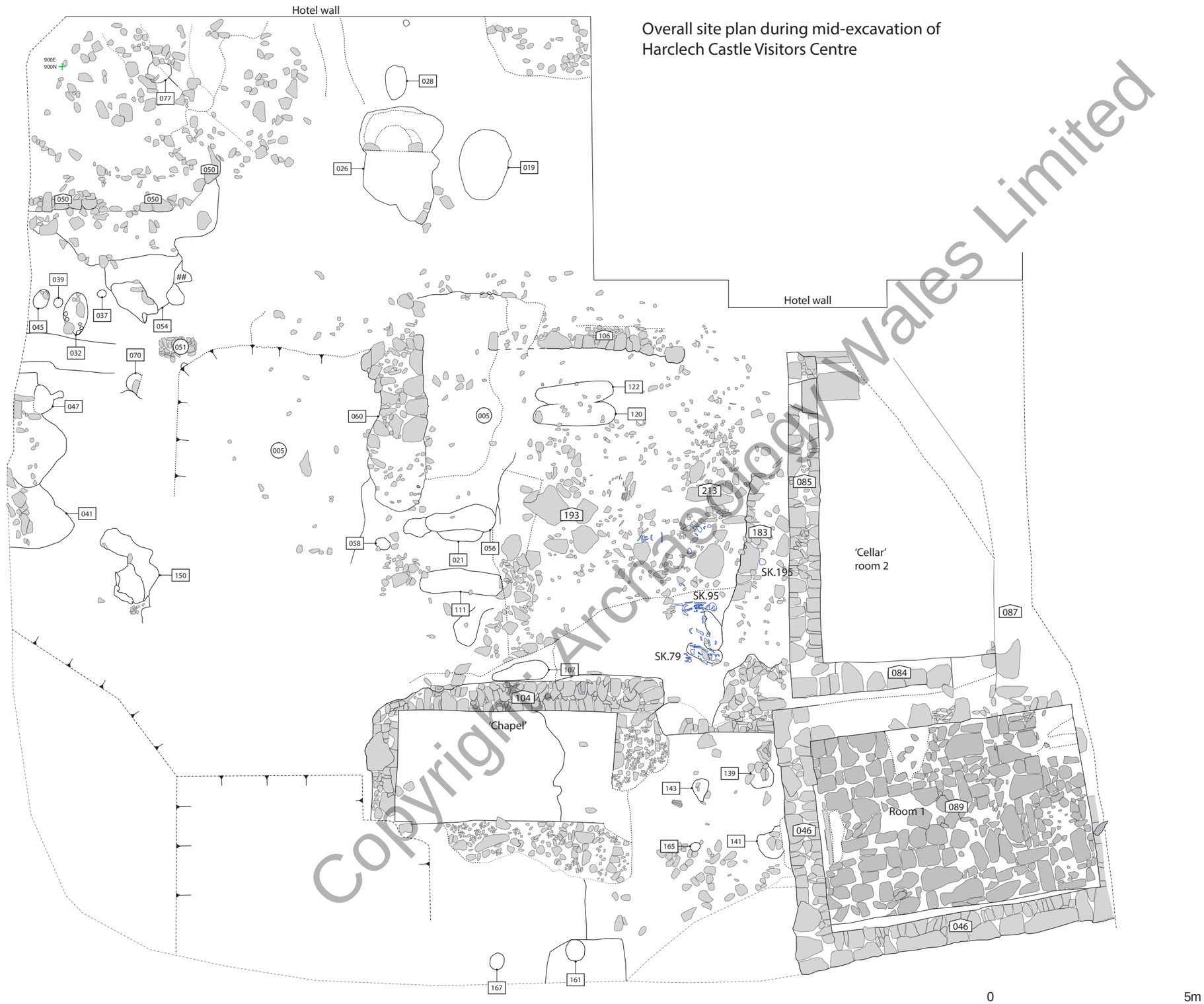


Fig. 2: Location of trenches at Harlech car park area, 2012.

ARCHAEOLOGY WALES
Revealing the past, informing the future

Fig. 3: Area of Archaeological excavation, Harlech Castle, Phase II.

Overall site plan during mid-excavation of Harclech Castle Visitors Centre



Job Title: Harlech Castle Visitors Centre

Drawing Title: Overall site plan during mid-excavation

Date: April 2014

Drawn By: I.L. Bernardus

Scale: 1 : 100 @ A3

Figure 4

ARCHAEOLOGY WALES
Revealing the past, informing the future

Fig. 5: John Speed map of Harlech 1610.

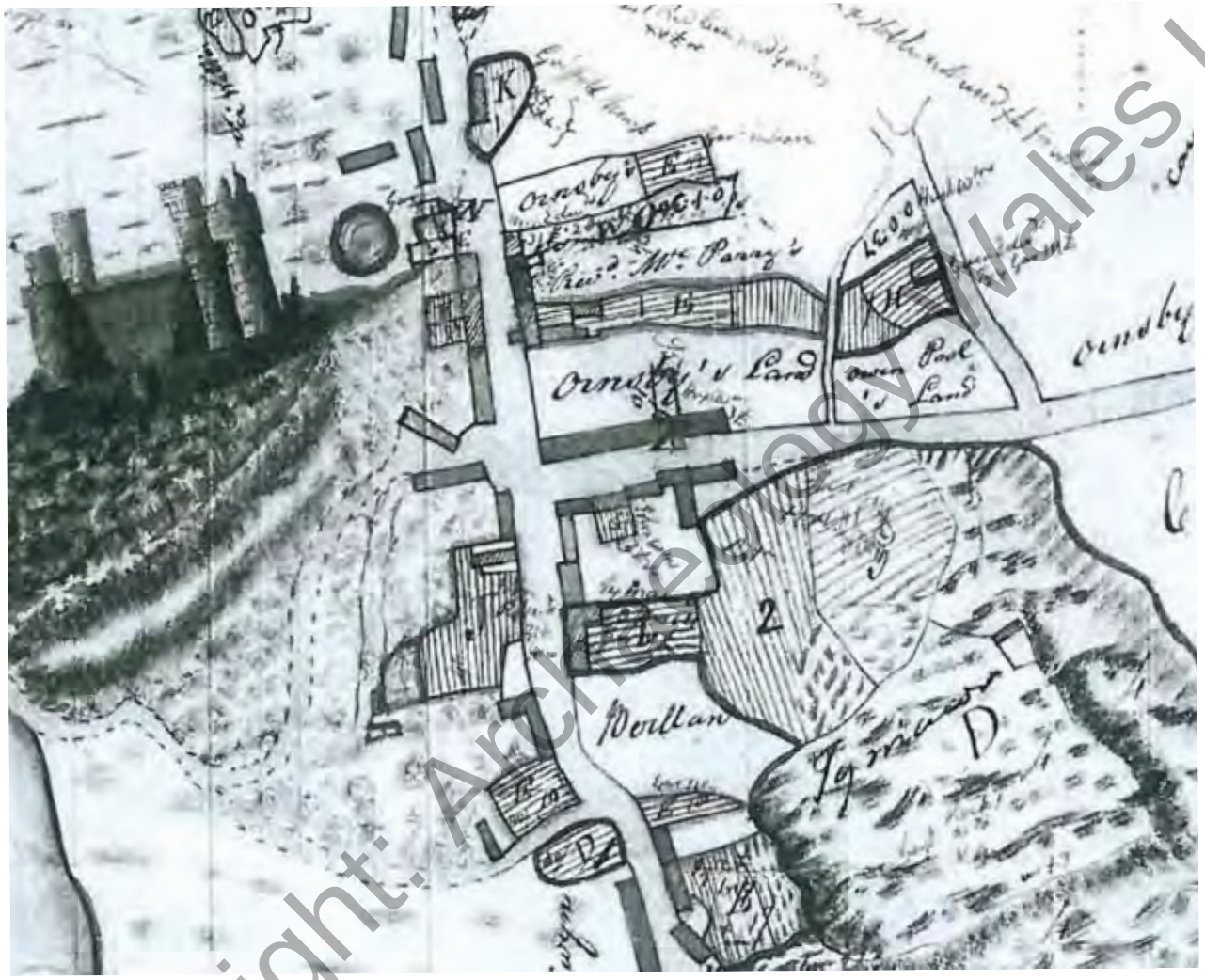
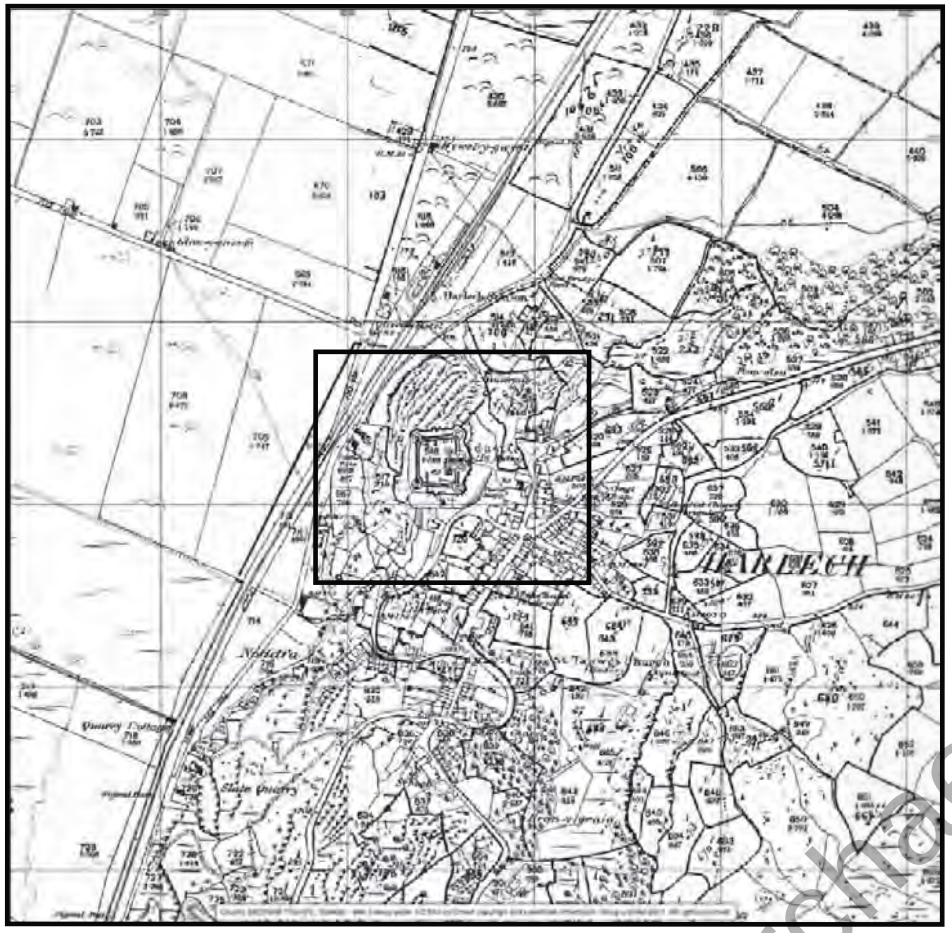


Fig. 6: Mostyn 1771 map.

Fig. 7: Tithe map, Llandanwg Parish 1841



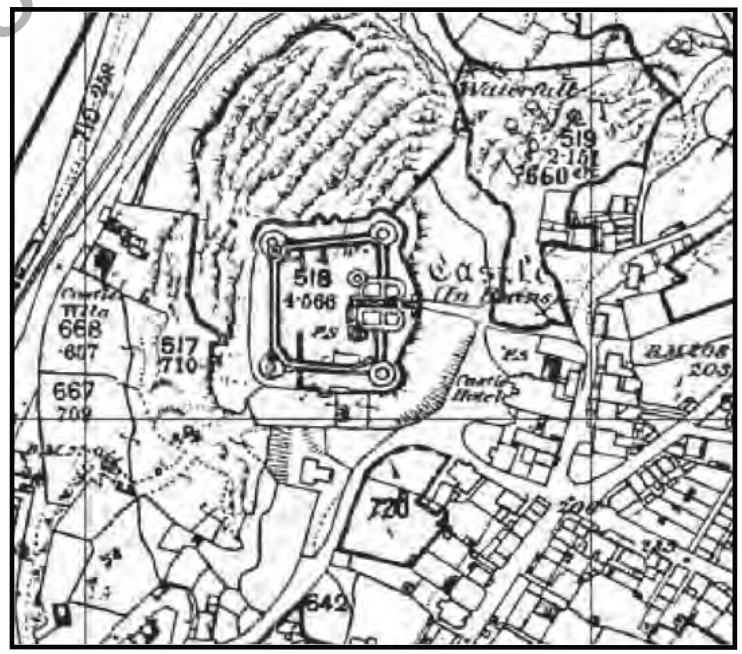


Fig. 8: 1889 1st edition OS map and detail of Harlech

Figure 10. Section of Chapel Wall (104)

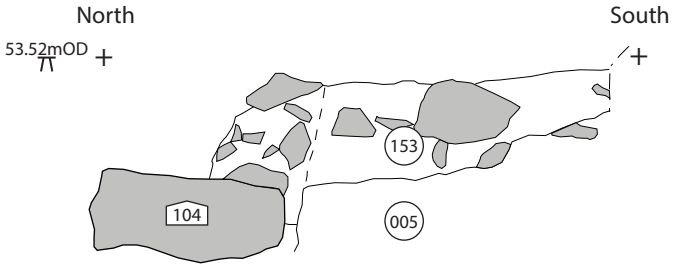


Figure 11. Section of Posthole [044]

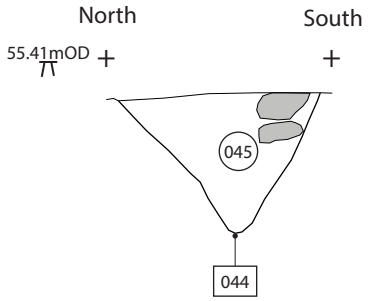


Figure 14. Section of cut [062] of Revetment Wall butting against Wall (050)

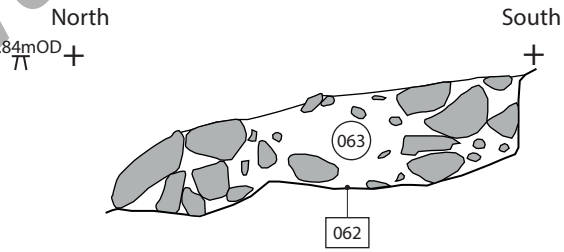
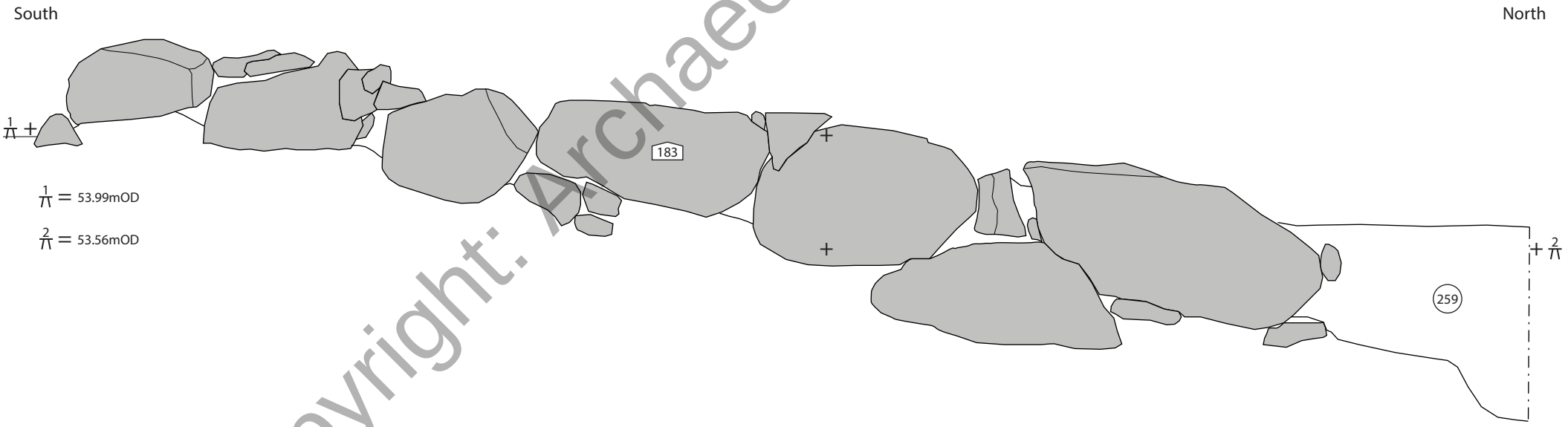


Figure 12. Section of Cemetery Wall (183)



0 1m

1:20 @ A4

Figure 10-12 & 14

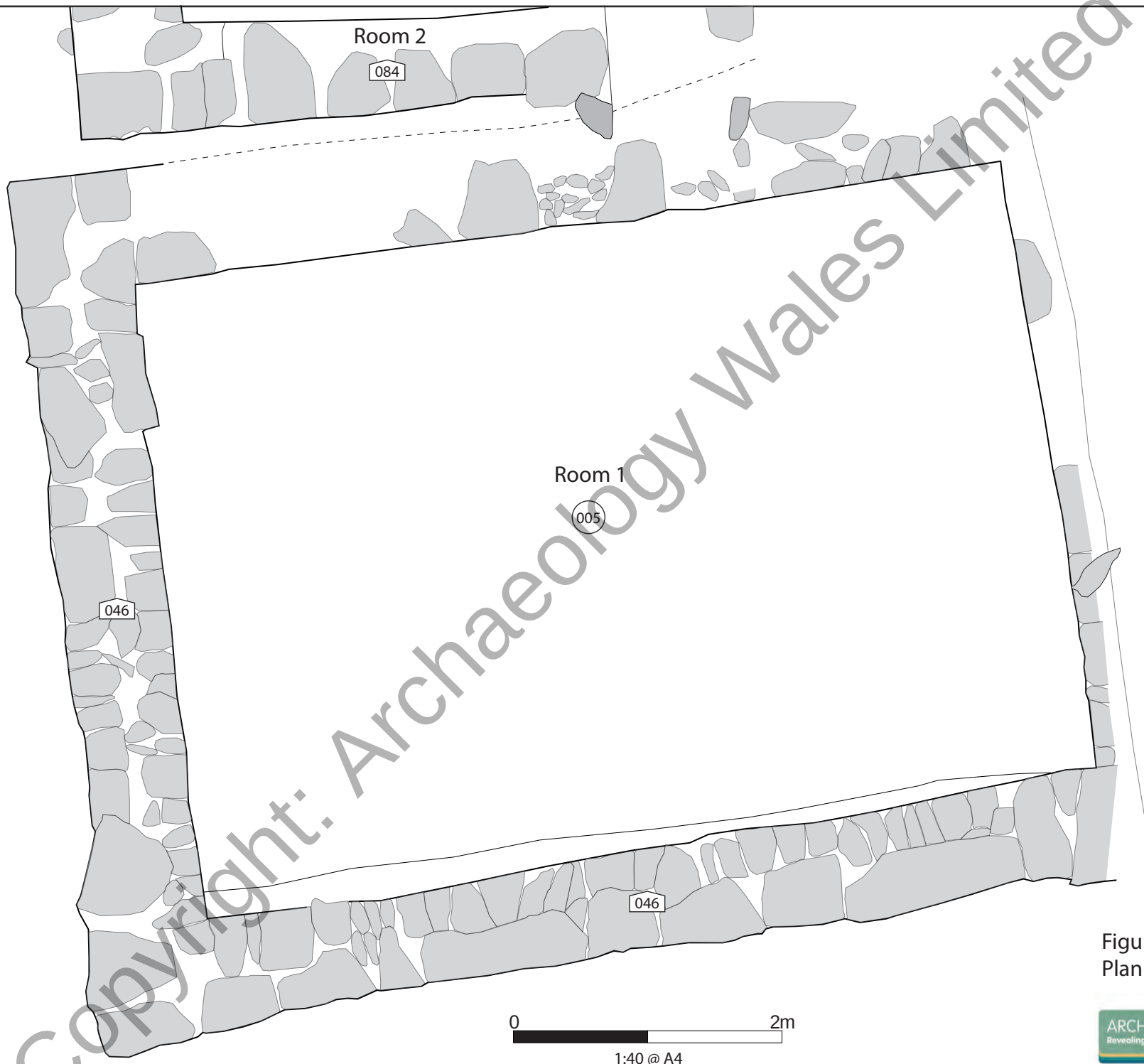


Figure 13
Plan of Room 1

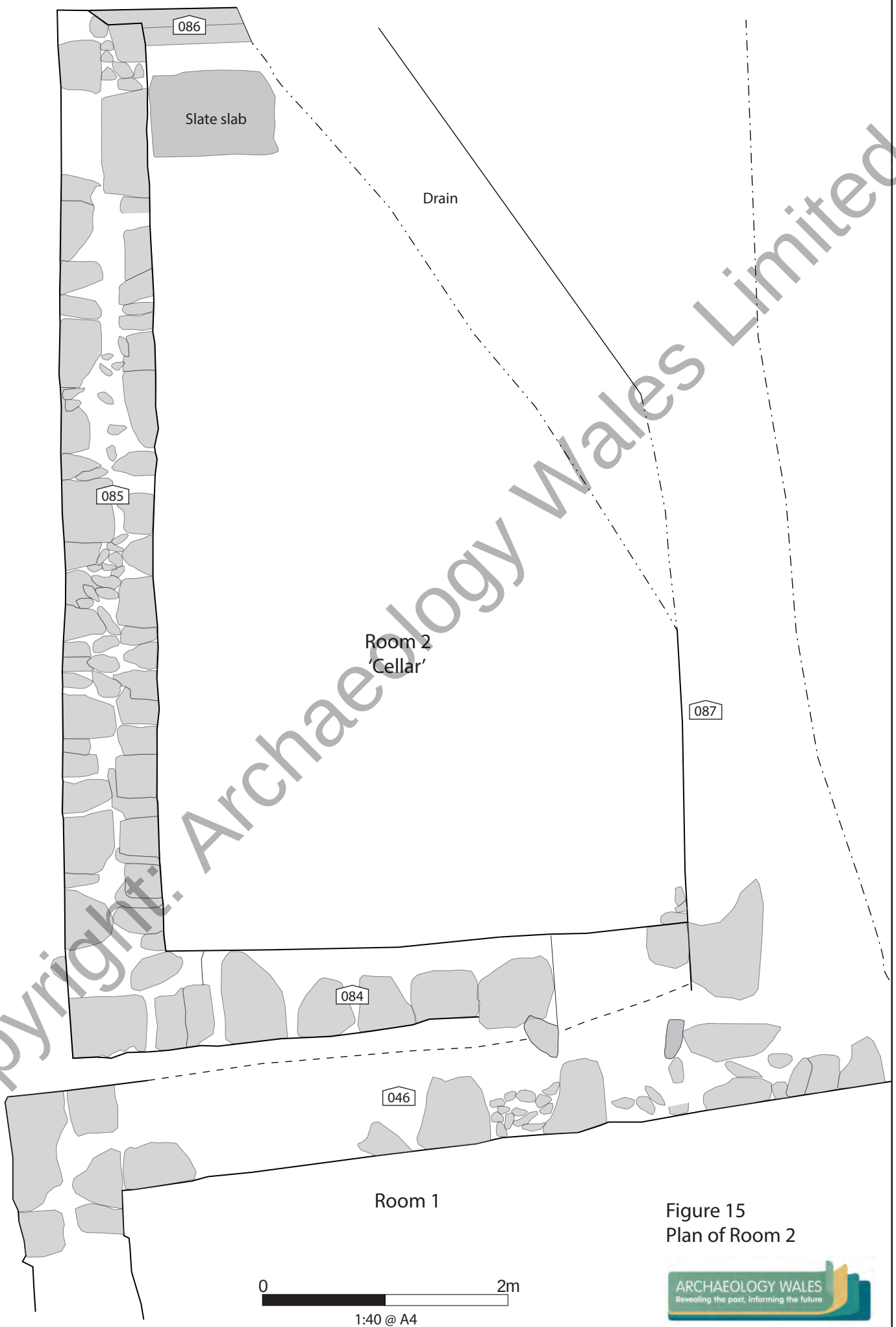


Figure 15
Plan of Room 2

Plate 1 (above): Sub-circular stone structure [193].

Plate 2 (below): Probable entranceway.

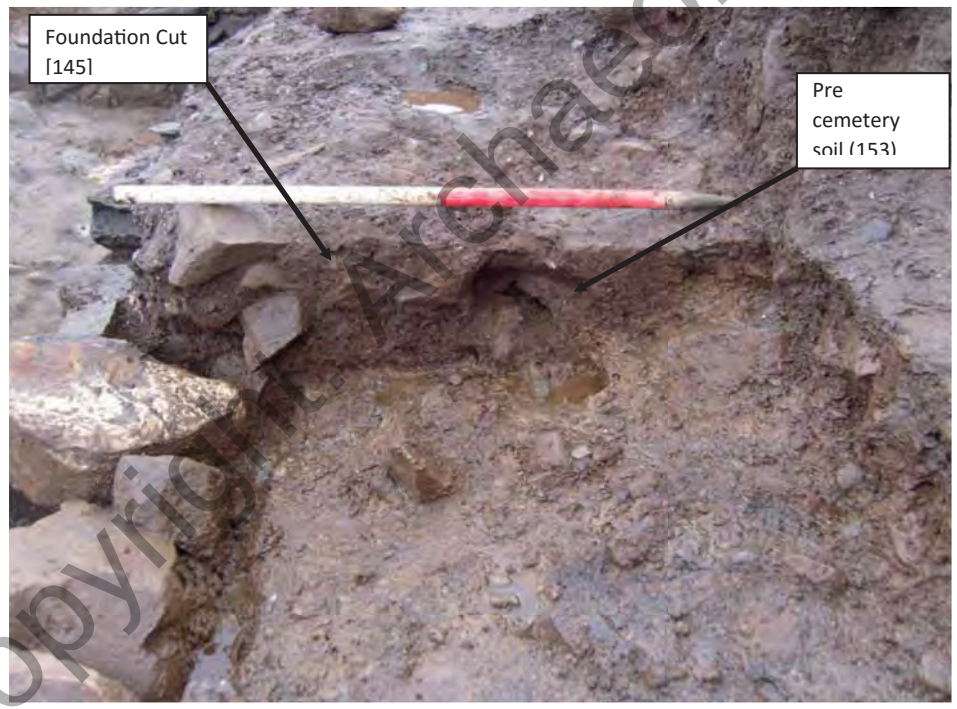


Plate 3 (above): Stone masonry building [104] and revetment wall [147].

Plate 4 (below): Foundation cut [145].

Plate 5 (above): Revetment wall (147).

Plate 6 (below): Features to the rear of revetment wall.

Plate 7 (above): Posthole [268] and associated features.

Plate 8 (below): Detail of post-hole [268].

Plate 9 (above): western wall [183].

Plate 10 (below): Skeleton 176.

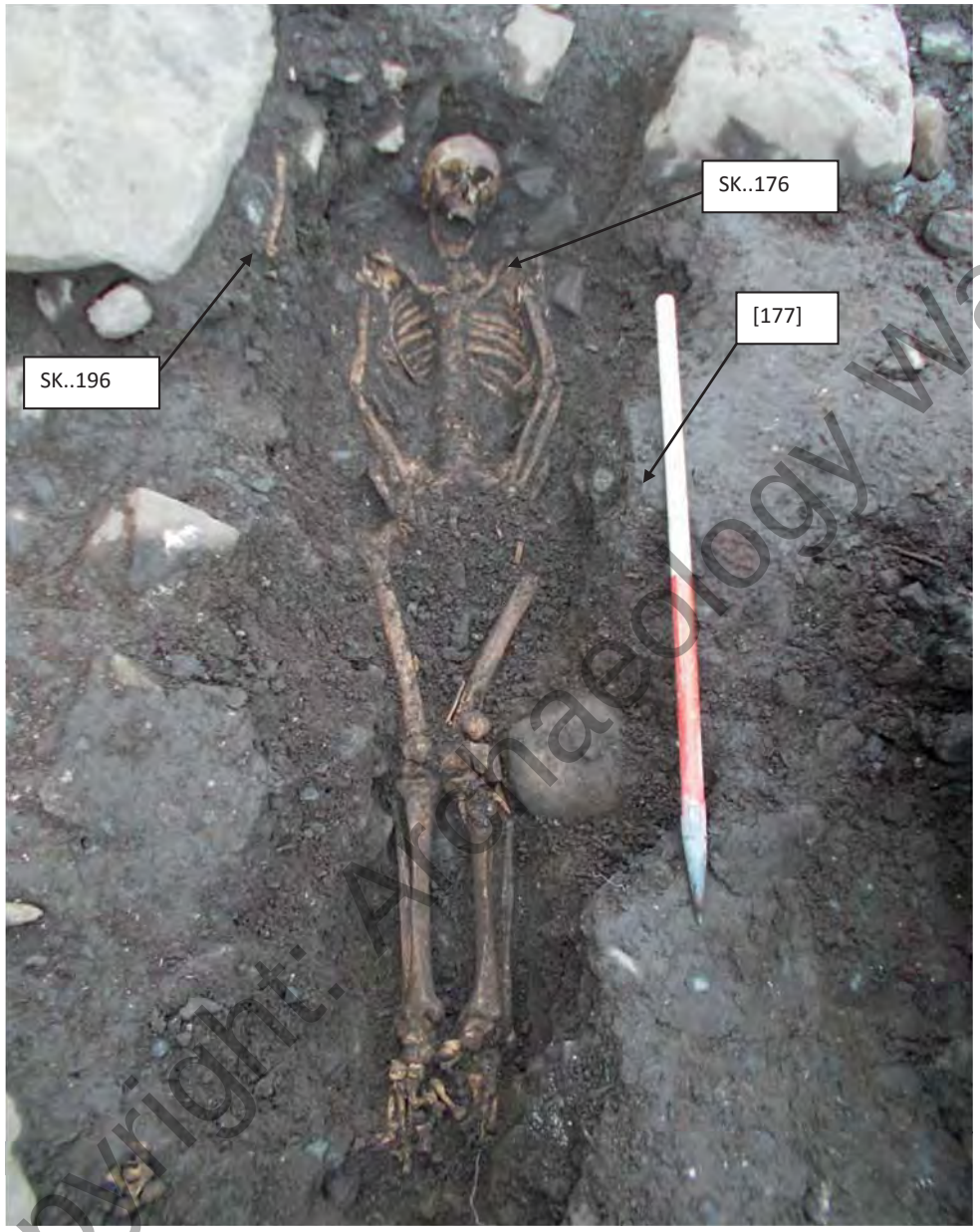


Plate 11: Skeleton 176 and 196.

Plate 12: Skeleton 96.

Plate 13: Skeleton 95.

Plate 14: Skeleton 95. and 96.

Plate 14: Skeleton 95.

Plate 16: Overlying charnel burial (159).

Plate 17: Sk. 170 prior to lifting slate.

Plate 18: Sk. 170 cleaned.

Plate 19: Skeleton 212 under rubble (213).

Plate 20: Skeleton 212.

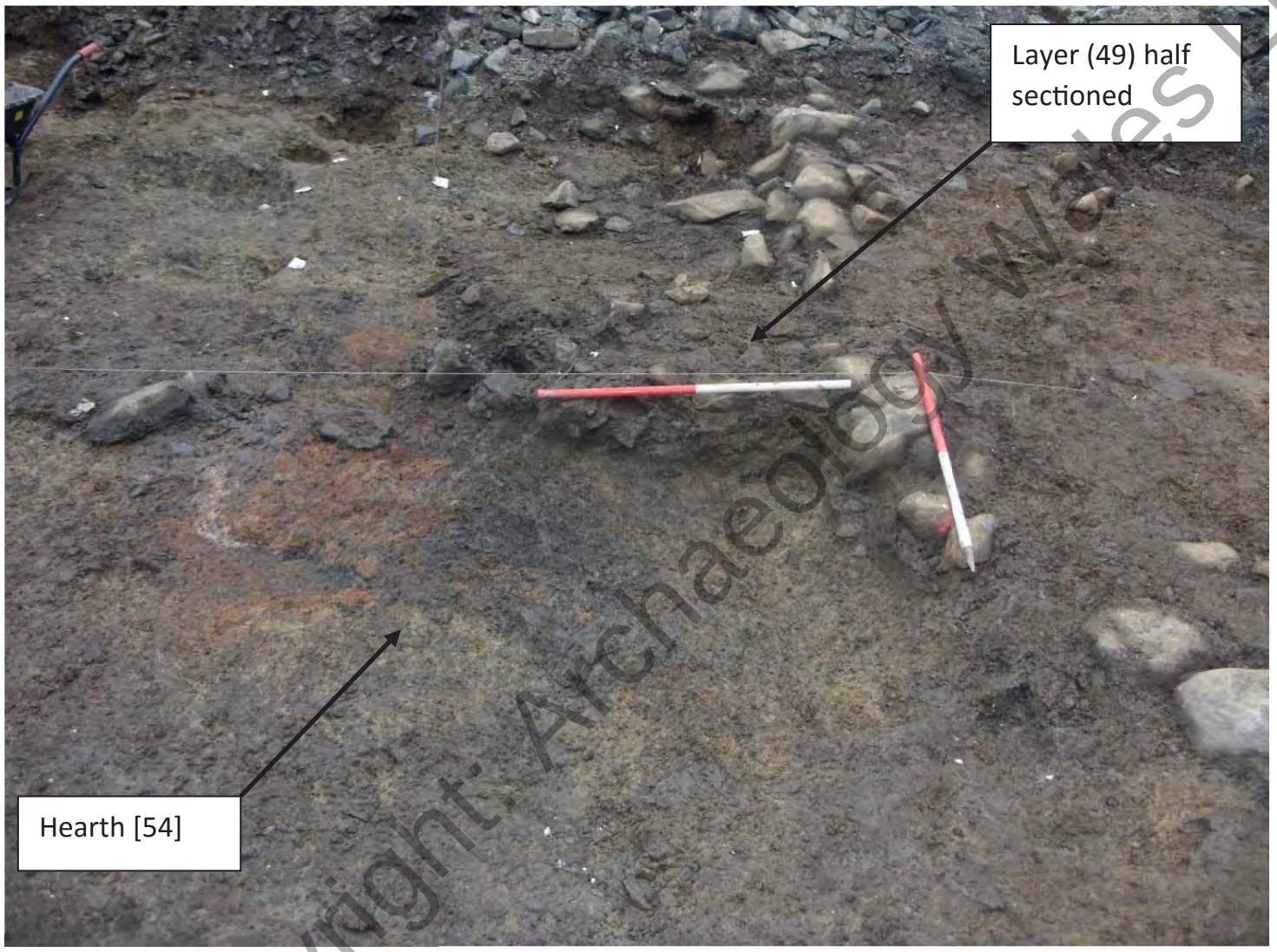


Plate 21: Layer (49) half sectioned and hearth [54].

Plate 22: hearth 54.

Plate 24: Pit [225] half sectioned.

Plate 24 (above): Skeleton 74 and 75

Plate 25 (below): Skeleton 75.

Plate 26 (above): Skeleton 76.

Plate 25 (below): Skeleton 148.

Plate 28 (above): Skeleton 239.

Plate 29 (below): Skeleton 203.

Plate 30 (above): Skeleton 243.

Plate 31 (below): Skeleton 254.

Plate 32 (above): cellar room 1.

Plate 33 (below): atone lined drain.

Plate 34: Cellar room 2.

Plate 35 (above): Detail of roof pitch and slates, looking NE.

Plate 36 (below): View of internal face of north end wall.

Plate 37 (left): E face of adjacent flying buttress looking SW.
Plate 38 (right): Front view of adjacent buttress looking S.
Plate 39 (below): W face of adjacent flying buttress looking E.

Plate 40 (above): Oblique view of wall fronting street, looking SW.

Plate 41 (below): Oblique view of wall fronting street, looking SE.

Plate 42 (above): Detail of wall fronting onto Ffordd Pen Lech, looking W.

Plate 43 (below): View of rendered outside face of E wall of structure.

Plate 44 (above): Architectural detail of vent in W wall.

Plate 45 (below): Oblique view of S wall, looking N.

Plate 46 (above): View of internal face of southern wall.

Plate 47 (below): View of modern blocking above entrance in W wall.

Plate 48 (above): Detail oblique view of ventilation louvres in southern gable end wall, looking N.

Plate 49 (below): Detail of slate slab floor and cemented over toilet drains.

Plate 50 (above): View of roof structure looking N.

Plate 51 (below): View of roof structure looking S.

Archaeology Wales

APPENDICES:

Appendix 2: Summary of small finds

Iron Nails: SF 8 x 1; SF 13, Context 217 x 1 (attached to wood fragment); SF 74, Context 18 x 1 (very large); SF 76, Context 36 x 1; SF 75, Context 22 x 1; SF 87 Context 114 x 2 (with hollow tube and perforated disc); SF 81, Context 82 x 1; SF 82, Context 89 x 1 (very large); SF 86, Context 113 x 2; SF 89 x 9, broken corroded, some attached to wood; SF 95, Context 169 x 2; SF 99, Unstratified x 2 (one has domed head, looks Medieval); Context 57, SK 74 x 1 (attached to wood fragment); SF 93, Context 162 x 1; SF 97, 2173A, 895E 910 N x 4 (including one modern, with two iron strips/binding); SF 90, SF 91, SK 148 x 2 (attached to wood fragments).

Clay pipe stem fragments: SF 61, Context 18 x 7; SF 62, Context 36 x 6; SF 63, Context 42 x 5; SF 64, Context 65 x 1; SF 65, Context 81 x 1; SF 66, Context 112 x 1; SF 67, Context 113 x 1; SF 68, Context 114 x 3; SF 69, Context 134 x 1; SF 70, Context 169 x 2; SF 71, unstratified x 3.

Slate rooftiles: SF 109, Context 18 x 2; SF 110, Context 49 x 2; SF 111, Context 82 x 2; SF 112, Context 82 x 3; SF 113, Context 83, 2173A x 1 (very large); SF 115, Context 102 x 3; SF 116, Context 104 x 1; SF 117, Context 112 x 2; SF 118, Context 113 x 2; SF 120, Context 182 x 3 (very large); SF 119, Context 135 x 3 (very large); SF 121, Context 1011 x 1; SF 122, unstratified, 2173A x 1.

Glass Fragments: SF 49, Context 18 x 5 (green bottle x 1, brown bottle x 1, clear vessel x 1, ridged glass x 1, window x 1); SF 54, Context 69 x 1 (clear vessel, modern); SF 50, Context 42 x 2 (1 x green bottle, 1 x thick old window glass); SF 51, Context 43 x 3 (1 x green bottle, 2 x other vessel including modern clear glass); SF 55, Context 110 x 1 (green bottle); SF 56, Context 113 x 3 (1 x clear bottle, 1 x green bottle, 1 x window); SF 57, Context 134 x 1 (green bottle); SF 58, Context 156 x 1 (green bottle); SF 59, Context 169 x 1 (green bottle); SF 60, Unstratified x 5 (2 x green bottle bases, 1 x light green bottle, 1 x base of blue bottle, 1 x mirror fragment); SF 52, Context 51 x 5 (neck and body fragments from brown bottle); SF 53, Context 61 x 1 (green bottle).

Appendix 3: Archaeology Wales Ltd.
Finds cataloque Harlech Castle Visitors Centre

Site code: 2173 - HCVC/13/PX

Context	Description	Amount	Weight in grams	Kept/disc.	
Small finds					
U/S		Worked stone (small find 1)	1	275	Kept
U/S	Worked stone (small find 2)	1	1024	Kept	
U/S	Worked stone (poss. hammerstone)	1	105	Kept	
	(Small find 3)				
U/S	Fe iron object found on top (05) (Small find 4)	1	110	Kept	
U/S	Worked stone (poss. wetstone) (Small find 5)	1	123	Kept	
[43]	Poss. reused worked step stone (Small find 6)	1	212	Kept	
36	Gilded heal spur (Small find 7)	1	32	Kept	
	Small nail found near grave [56] (Small find 8)	1	14	Kept	
93	Shroud pin (Small find 9)	1	1	Kept	
178	Lead object in assoc. with SK176 (Small find 10)	1	2	Kept	
241	Head of shroud pin (Small find 11)	1	< 1	Kept	
217	Possible key (Small find 12)	1	9	Kept	

		12			
Small finds (ferrous)					
18		Cauldron?	1	701	Kept
18	Fe object	1	9	Kept	
18	Nail	1	19	Kept	
22	Nail	1	4	Kept	
36	Nail	1	5	Kept	
42	Fe object	1	8	Kept	
49	Lead	1	12	Kept	
57	Broken nail with small piece of wood	1	2	Kept	
61	Cauldron?	1	662	Kept	
82	Nail	1	6	Kept	
89	Nail	2	62	Kept	
89	Pewter spoon: 'knop'	1	7	Kept	
89	Button	2	2	Kept	
112	Cauldron?	1	474	Kept	
113	Nail (bend)	1	41	Kept	
114	Fe objects	4	103	Kept	
114	Pin	1	< 1	Kept	
134	Nails + stone with Fe	10	168	Kept	
148	Nail + wood found in soil within skull	1	2	Kept	
148	Fe objects found in soil within skull	3	2	Kept	
162	Buckle	1	3	Kept	
162	Nail	1	1	Kept	
163	Copper alloy pin	1	< 1	Kept	
169	Nail + Fe object	2	17	Kept	
182	Fe object	1	143	Kept	

U/S	Outside west of wall Room 2, 3 nails + 2 Fe objects	5	129	Kept	
U/S	Fe object	1	42	Kept	
U/S	Nail	2	15	Kept	
U/S	Possible key	1	15	Kept	
	7 ferrous Small Finds no. 4, 5-12	**58**			
Other stone items	5				
18		Slate roof tiles	2	345	Kept
49	Slate roof tiles	3	2.5kg	Kept	
82	Slate roof tiles	3	1.9kg	Kept	
82	Slate roof tiles	2	1.5kg	Kept	
83	Slate	1	3.2kg	Kept	
102	Slate object	1	1.53kg	Kept	
102	Slate roof tiles	3	1.77kg	Kept	
104	Slate	1	334	Kept	
112	Slate roof tiles	2	468	Kept	
113	Slate roof tiles	2	585	Kept	
135	Slate roof tiles	3	4.5kg	Kept	
182	Slate	3	6.8kg	Kept	
1011	Slate roof tile	1	81	Kept	
U/S	Outside west of wall Room 2, slate roof tile	1	36	Kept	
		33			
Pottery					
18	Post medieval	61	2.378	Kept	
22	Post medieval	2	60	Kept	

24	Post medieval	2	26	Kept	
36	Post medieval	12	44	Kept	
42	Post medieval	35	658	Kept	
43	Post medieval	4	40	Kept	
49	Post medieval	1	17	Kept	
61	Post medieval	12	430	Kept	
65	Post medieval	1	4	Kept	
78	Post medieval	3	230	Kept	
81	Post medieval	5	30	Kept	
82	Post medieval, incl. poss. foreign pottery	4	96	Kept	
83	Post medieval	3	34	Kept	
89	Post medieval	6	77	Kept	
102	Post medieval	4	488	Kept	
110	Post medieval	3	37	Kept	
112	Post medieval	3	60	Kept	
113	Post medieval	19	791	Kept	
114	Post medieval	9	98	Kept	
132	Post medieval	3	147	Kept	
134	Post medieval	3	40	Kept	
137	Post medieval	1	136	Kept	
153	Post medieval	1	9	Kept	
154	Post medieval	1	2	Kept	
155	Post medieval	1	83	Kept	
169	Post medieval	4	79	Kept	
182	Post medieval	3	73	Kept	
186	Post medieval	1	20	Kept	
197	Post medieval	2	107	Kept	
199	Post medieval	2	25	Kept	
227	Post medieval?	1	5	Kept	

248	Post medieval	1	5	Kept	
U/S	Outside west of wall Room 2	12	187	Kept	
U/S	From sondage through [84]	9	254	Kept	
U/S	Post medieval	35	1.394	Kept	
		269			
Glass					
18		5	54	Kept	
42		2	35	Kept	
43		3	29	Kept	
51		5	91	Kept	
61		1	16	Kept	
69		1	4	Kept	
110		1	20	Kept	
113		4	36	Kept	
134		1	3	Kept	
156		1	7	Kept	
169		1	2	Kept	
U/S		5	213	Kept	
		30			
Clay pipe					
18		Stem	7	17	Kept
36	Stem	6	14	Kept	
42	Stem, 1 green glazed	5	5	Kept	
65	Stem	1	1	Kept	
81	Stem	1	2	Kept	
112	Stem	1	4	Kept	
113	Stem	1	1	Kept	
114	Stem	3	11	Kept	
134	Stem	1	4	Kept	

169	Stem	2	4	Kept	
U/S	Bowls 2, Stem 3	5	24	Kept	
		33			
Slag					
49		1	63	Kept	
113	Bottom furnace?	3	352	Kept	
156		1	7	Kept	
162		2	96	Kept	
169		3	617	Kept	
182		1	156	Kept	
U/S	Outside west of wall Room 2	1	132	Kept	
1004	Post hole finds	3	24	Kept	
		15			
Mortar / plaster					
18		Plaster	1	119	Kept
69	Mortar	1	433	Kept	
85	Interior lime mortar	4	112	Kept	
91	Mortar - south blocked window	1	77	Kept	
97	Exterior mortar / floor layer	5	127	Kept	
104	Mortar - sample 17	1	16	Kept	
113	Mortar	1	12	Kept	
135	Mortar - sample 18	3	76	Kept	
147	Mortar / floor layer	3	87	Kept	
148	Mortar found in soil within skull 148	1	16	Kept	
163	Mortar	1	14	Kept	
169	Mortar	1	27	Kept	
179	Mortar / floor layer	1	32	Kept	

199	Mortar	3	6	Kept	
SK212	Mortar found in soil from disturbed charnel	1	8	Kept	
248	Mortar	5	42	Kept	
259	Mortar (lime?)	1	16	Kept	
1001	Mortar from chapel wall	9	47	Kept	
1004	Mortar, posthole finds	8	42	Kept	
1008	Mortar from revetment wall	3	176	Kept	
		54			
Miscellaneous					
18		Oyster shell	1	37	Kept
114	Shell	1	3	Kept	
65	Charcoal	2	8	Kept	
U/S	Charcoal + 1 coal	5	36	Kept	
18	Plastic	1	2	Disc.	
42	Bakelite	1	46	Disc.	
42	Plastic drain pipe	1	85	Disc.	
114	Plastic button	1	2	Disc.	
42	Stone drain pipe	11	897	Disc.	
U/S	Stone drain pipe	3	279	Disc.	
69	Modern bathroom/kitchen tiles	6	132	Disc.	
83	Wood - modern poss. from a palet	1	2	Disc.	
102	Brick - modern	1	595	Disc.	
Amendment					
Harlech Castle Car Park 2013 finds					
Site code: HCCP/13/WB					
Pottery					

104	Post-medieval	4	99	Kept	
112/115	Post-medieval	54	1.277	Kept	
119	Post-medieval	4	149	Kept	
Ferrous objects					
112/115		Ferrous objects	2	16	Kept
Clay Pipe					
112/115		Clay pipe bowl	1	3	Kept
Miscellaneous					
104		Modern CBM	6	491	Disc.
112/115	Drainage pipe	1	179	Disc.	
112/115	Shells	5	49		
	Total amount of finds (kept)	**count**	**HCCP finds**		
	Small finds	12			
	Small finds (ferrous)	58	2		
	Other stone items	33			
	Pottery	269	62		
	Glass	30			
	Clay pipe	33	1		
	Slag	15			
	Mortar / plaster	54			
	Shell & coal/carbon	9	5		

	Total	**513**	**70**		

Appendix 4: Pottery occurrence by number and weight (in g) of sherds per context by fabric type

	DGTW		MA		MD		SAN		MPUR		CSTN		GRE		NDGT		TGW		BEW		BSW		STSL		SMW		EST		SWSG		MOD		
Cntxt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	Date
U/S									2	20									2	488	2	76	2	10			3	124			23	650	U/S
W Wall									1	10	2	7							5	117	1	30			1	6					3	14	U/S
18															1	20			35	1825	6	74	1	32	2	36					15	362	19thC
22																											1	62					L17thC
24																			2	26													17thC
36																			5	26	1	6	3	8							2	4	19thC
42																			6	221									1	22	28	391	19thC
43																			2	21											2	19	19thC
49											1	18																					L15thC
61																			8	398			2	13	1	12					1	3	19thC
65																			1	4													17thC
78																			2	219											1	9	19thC

	DGTW		MA		MD		SAN		MPUR		CSTN		GRE		NDGT		TGW		BEW		BSW		STSL		SMW		EST		SWSG		MOD		
Cntxt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	Date
81																															5	31	19thC
82	1	9	1	9			1	67			1	6																					L15thC
83			1	13											1	10			1	10													17thC
89																											1	9			5	66	19thC
102																			2	238							1	47			1	176	19thC
104																			1	64											3	36	19thC
110																			3	36													17thC
112																			1	54											2	5	19thC
112/115													1	12			1	6	27	951			2	23							27	244	19thC
113									1	29									14	719					1	3					3	16	19thC
114																			3	69											6	28	19thC
119																			1	31	3	111											L17thC
132					1	14													2	124													17thC
134									1	12									2	28													17thC

	DGTW		MA		MD		SAN		MPUR		CSTN		GRE		NDGT		TGW		BEW		BSW		STSL		SMW		EST		SWSG		MOD		
Cntxt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	No	Wt	Date
137	1	11																															13thC
153																			1	5													17thC
154																							1	2									M17thC
155																			1	82													17thC
169					1	62			1	15																					1	3	19thC
182																			1	56											2	16	19thC
186			1	19																													13thC
197																			1	86	1	8											L17thC
199																			1	12											1	11	19thC
227	1	5																															L12thC
248			1	10																													13thC
Total	3	25	4	51	2	76	1	67	6	86	4	31	1	12	2	30	1	6	130	5910	14	305	11	88	5	57	6	242	1	22	131	2087	

Appendix 5: Human bone catalogue

Skeleton No	Preservation	Completeness	Potential for Age	Potential for Sex	Potential of pathology	Other
74	Moderate	25-50%	Possible	-	Moderate	Intermixed with Sk75 – attempted to separate the two, but could not separate all of the bones
75	Poor	25-50%	Possible	Possible	Moderate	Intermixed with Sk74 – attempted to separate the two, but could not separate all of the bones
76	Moderate	25-50%	Yes	Possible	Moderate	Some bone belonged to Sk74, skull does not belong to this individual
93	Charnel – see disarticulated bone	-	-	-	-	-
95	Good	50-75%	Yes	Yes	Good	-
96	Moderate	50-75%	Yes	Yes	Good	-
97	Moderate	1-25%	Yes	Non-adult	Moderate	-
148	Moderate	75-100%	Yes	Yes	Good	-
158A	Good	1-25%	Yes	Non-adult	Moderate	One of 2 skulls
158B	Good	1-25%	Yes	Non-adult	Moderate	One of 2 skulls

170	Good	75-100%	Yes	Yes	Good	Possibly some bone with charnel from (154); includes 3 non-adult bones
176	Moderate	75-100%	Yes	Yes	Good	-
203	Good	75-100%	Yes	Non-adult	Good	Adult bones are present with this in separate bag
212	Moderate	50-75%	Yes	Yes	Moderate	-
239	Good	75-100%	Yes	Yes	Good	-
243	Good	50-75%	Yes	Yes	Good	-
254	Good	50-75%	Yes	Yes	Good	-

Table 1: Catalogue of articulated skeletons

SP = Surface preservation: grades 0 (excellent), 1 (very good), 2 (good), 3 (moderate), 4 (poor), 5 (very poor), 5+ (extremely poor) after McKinley (2004); C = Completeness; F = Fragmentation: min (minimal), slight, mod (moderate), sev (severe), ext (extreme)

Context	Bone Element	Bone	Side	% of Bone	SP	No. Of Fragments	Age	Sex	Other
18	5th metatarsal	All	R	100	1	1	A	-	
22	Skull	5 generic skull fragments	-	5	1	1	A	-	
22	Long bone	Shaft Fragments	-	-	1	4	A?	-	

22	Vertebra	Body fragment	-	10	3	1	A	-	
22	Ulna	Partial fragment of ulna	-	10	3	1	A	-	
22	Vertebra	Axis	-	80	2	1	A	-	
22	Tarsal	Navicular	-	25	3	1	A	-	
22	Carpals	Capitate	L	100	2	1	A	-	
22	Phalanges	Proximal phalanx	-	50	2	1	A	-	
22	Cranium	Temporal bone	L	10	2	1	A	-	
22	Scapula	Scapula fragments	-	10	2	1	A	-	
22	Femur	Femoral head	-	10	2	1	A	-	
22	Rib	Rib fragments	-	10	2	1	A	-	
22	Long bones	Long bone fragments	-	-	2-3	13	A	-	
43	Hand	Intermediate phalanx	-	100	1	1	A	-	
57	Radius	¼ radial shaft	-	25	2	1	A	-	
57	Sacrum	Sacrum	-	10	3	1	A	-	

57	Vertebra	Cervical fragment	-	10	2	1	A	-	
57	Scapula	Scapula fragments	-	10	2	2	A	-	
57	Humerus	Right distal epiphysis	-	5	2	1	A	-	
57	Ribs	5 rib fragments	-	10	4	5	A	-	
57	Clavicle	Clavicle shaft	-	25	2	1	A	-	
57	Clavicle	Clavicle	-	25	3	1	J	-	
57	Cranium	Small skull fragments	-	20	2	7	A	-	
57	Long bones	Long bone fragments	-	-	3	4	A	-	
65	Rib	Shaft Fragments	-	10	1	1	-	-	
65	Skull	Petrous temporal	R	2	1	1	-	-	
99	Pelvis	Ilium	R	80	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Ulna	Distal 1-2	L	50	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile

99	Vertebra	Lumbar - All	-	100	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Ulna	Proximal 1-3	R	40	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Vertebra	Lumbar - All	-	100	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Rib	Right Lower Central	R	70	1	2	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Rib	Sternal End	-	20	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Rib	Sternal End	-	20	1	1	J	-	All same juvenile. Pelvis unfused, but relatively big - older Juvenile
99	Vertebra	All	-	90	1	1	A		
99	Rib	Vertebral End	R	25	1	1	A		DJD at tubercle
99	Rib	Vertebral End	L	10	1	1	A		
99	Rib	1st - All	R	100	1	1	A		
99	Unidentified	-	-	-	-	1	-	-	
104	Skull	Parietal	-	25	1	1	N	-	
104	Tarsal	Talus	L	100	2	1	A	-	
125	Foot	Lateral cuneiform	R	60	5	1	A	-	

125	Skull	5 generic skull fragments	-	5- 20	2	5	N	-	Part of same skull
125	Skull	Frontal left orbit	L	10	2	1	N	-	"
126	Femur	Distal Epiphysis	L	10	1	1	A	-	
126	Femur	Distal Shaft	-	30	1	1	A	-	
126	Tibia	Shaft	R	40	1	8	A	-	
126	Tibia	Distal Shaft	-	1	2	1	A	-	
126	Foot	Medial Cuneiform	R	70	2	1	A	-	
126	Skull	Occipital	-	30	1	1	N	-	
126	Skull	Generic Skull Frags	-	1	1	1	N	-	
126	Rib	1st Rib	L	100	1	1	J-Ad	-	
126	Long Bone	16 Shaft Frags	-	-	-	16	-	-	
126	Unidentified	10 Unidentified Frags	-	-	-	10	-	-	
126	Fibula	Shaft Frag	-	25	3	1	Inf	-	
135	Rib	All	R	100	1	1	N	-	

138	Vertebra	Thoracic spinous process	-	40	1	1	A	-	
153	Femur	Shaft	L	70	1	1	N	-	Covered in thick woven bone
153	Skull	Left frontal	L	5	1	1	N	-	
153	Radius	Shaft	R	90	1	1	N	-	Covered in thick woven bone
153	Ulna	Shaft Fragments	-	50	1	1	N	-	Covered in thick woven bone
153	Long bone	Shaft Fragments	-	-	-	-	A?	-	
154	Fibula	¾	L	75	2	4	A	-	
154	Clavicle	Full	R	100	2	1	A	-	
154	Patella	Partial	L	80	2	1	A	-	
154	Tarsal	Medial cuneiform	L	100	3	1	A	-	
154	Tarsal	Lateral cuneiform	L	100	3	1	A	-	
154	Tarsal	Intermediate cuneiform	L	100	3	1	A	-	
154	Tarsal	Cuboid	L	100	3	1	A	-	

154	Radius	Distal ½	R	50	2-3	1	A	-	
154	Ulna	Proximal 1-3	L	33	3	1	A	-	
154	Vertebra	Cervical vertebra	-	100	3	1	A	-	
154	Tibia	Full	L	95	2	1	A	-	Poorly healed fracture at distal end
154	Fibula	¾	L	75	2	1	J?	-	Evidence of syphilis- severe infection
154	Femur	¾	R	75	2	3	A	-	
154	Femur	Distal end	L	10	2	1	A	-	
154	Pelvis	Ilium	R	90	2	1	J	-	
154	Pelvis	Ischium	R	90	3	1	J	-	
154	Skull	Petrous bone	R	100	2	1	N	-	
154	Sternum	Manubrium	-	100	2	1	N	-	
154	Metacarpal	1st metacarpal	-	80	2	1	J	-	
154	Metacarpal	4th metacarpal	-	80	2	1	J	-	
154	Metatarsal	1st metatarsal	R	100	2	1	A	-	
154	Metatarsal	1st metatarsal	R	100	2	1	A	-	Pair
154	Metatarsal	1st metatarsal	L	100	2	1	A	-	"
154	Metatarsal	2nd metatarsal	R	100	2	1	A	-	Pair

154	Metatarsal	2nd metatarsal	L	100	2	1	A	-	"
154	Metatarsal	3rd metatarsal	R	100	2	1	A	-	Pair
154	Metatarsal	3rd Metatarsal	L	100	2	1	A	-	"
154	Metatarsal	4th metatarsal	R	100	2	1	A	-	Pair
154	Metatarsal	4th metatarsal	L	100	2	1	A	-	"
154	Metatarsal	5th metatarsal	R	100	2	1	A	-	Pair
154	Metatarsal	5th metatarsal	L	100	2	1	A	-	"
154	Metatarsal	2nd metatarsal	R	100	2	1	A	-	
154	Metatarsal	3rd metatarsal	R	100	2	1	A	-	
154	Foot	1st proximal foot phalanx	L	100	2	1	A	-	
154	Foot	1st proximal foot phalanx	R	100	2	1	A	-	
154	Carpals	4th metacarpal	R	100	2	1	A	-	
154	Carpals	3rd metacarpal	R	100	2	1	A	-	
154	Tarsals	4th metatarsal	L	90	2	1	A	-	
154	Carpals	Hamate	L	100	2	1	A	-	
154	Tarsal	2nd metatarsal	R	80	2	1	J	-	
154	Carpals	2nd metacarpal	R	25	3	1	A	-	

154	Sacrum	Sacral arch and 1st sacral body	-	30	4	19	A	-	
154	Ribs	Rib fragments	-	5	3	5	A	-	
154	Scapula	Acromion	R	5	3	2	A	-	
154	Tibia	Proximal tibia fragments	-	5	2	3	A	-	
154	Metatarsal	4th metatarsal	R	25	2	1	A	-	
154	Foot	Proximal foot phalanges	-	100	2	7	A	-	
154	Hand	Proximal hand phalanges	-	100	2	1	A	-	
154	Hand	Intermediate hand phalanges	-	100	2	1	A	-	
154	Skull	Non adult skull fragments	-	5	2	2	A	-	
154	Skull	Left maxilla and tooth	L	50	2	1	A	-	
154	Skull	Infant skull fragments	-	30	2	2	I	-	
154	Tooth	Loose tooth	-	100	1	8	J	-	

154	Ribs	2 non adult ribs	R+L	75	2	1	J	-	
155	Tarsal	Navicular	R	100	2	1	A	-	Probable Pair
155	Tarsal	Navicular	L	100	2	1	A	-	Probable Pair
155	Carpal	Capitate	L	100	2	1	A	-	
155	Foot	2nd Metatarsal	L	100	2	1	A	-	
155	Vertebra	Thoracic	-	100	2	1	A	-	
155	Vertebra	Vertebral Arch	-	40	2	1	Inf	-	
155	Rib	1st Rib	L	100	2	1	Inf	-	
155	Foot	Distal Phalanx	-	100	3	1	A	-	Osteophytes
155	Foot	Distal 1st Phalanx	R	100	3	1	A	-	Osteophytes
155	Vertebra	Cervical	-	95	3	1	A	-	Slight DJD
155	Rib	7 Rib Shafts	-	5-15	2	7	A	-	
155	Rib	Rib Head	L	10	2	1	A	-	
155	Radius	All	R	100	2	1	Inf	-	
155	Tarsal	Cuboid	R	100	3	1	A	-	
155	Tarsal	Lateral Cuneiform	R	100	3	1	A	-	

155	Tarsal	Cuboid	L	100	3	1	A	-	
155	Tarsal	Intermediate Cuneiform	R	100	3	1	A	-	
155	Femur	Proximal Femur	L	10	2	1	A	-	
155	Misc	4 Unidentified Frags	-	5	2	4	-	-	
155	Foot	Proximal 1st Phalanx	L	100	2	1	A	-	
155	Femur	Femoral Head	-	5	2	1	A	-	
155	Skull	Basion	-	2	2	1	Inf	-	
155	Hand	Proximal Phalanx	-	100	2	1	Inf	-	
155	Hand	Proximal Phalanx	-	100	2	1	A	-	
155	Foot	Proximal Phalanx	-	100	2	1	A	-	
155	Hand	1st Metacarpal - Proximal End	R	25	2	1	A	-	
155	Hand	1st Metacarpal - Prox-Mid	R	75	2	1	J	-	
156	Rib	Shaft	R	50	1	1	N	-	

156	Vertebra	Thoracic Vertebral Body	-	50	2	1	OMA	-	DJD - 36+
156	Rib	17 Rib Shafts	-	5-30	1	17	A	-	
156	Rib	3 Sternal Rib Ends	-	10-30	1	3	A	-	Ossification at sternal end
156	Rib	5 Rib Heads	R	5-15	2	5	A	-	Slight ossification on vertebral facets
156	Rib	5 Rib Heads	L	5-10	2	5	A	-	Slight ossification on vertebral facets
156	Vertebra	Axis	-	60	1	1	A	-	
156	Vertebra	Cervical Bodies (3)	-	50-60	2	3	OMA	-	DJD
156	Vertebra	11 Articular Facet Frags	-	5-10	2	9	A	-	
156	Vertebra	3 Vertebral Bodies	-	20	2	2	OMA	-	DJD
156	Vertebra	2 Lumbar	-	80-90	2	2	OMA	-	DJD
156	Vertebra	3 Thoracic	-	90	2	3	OMA	-	DJD
156	Tooth	Upper Pre-Molar	L	80	2	1	J	-	Around 8-10 years old
156	Carpal	Scaphoid - All	L	100	1	1	A	-	
156	Carpal	Scaphoid - All	R	100	1	1	A	-	
156	Hand	2nd Metacarpal	L	100	1	1	A	-	

156	Hand	Proximal 1st Phalanx	R	100	1	1	A	-	
156	Carpal	Trapezium	L	100	1	1	A	-	Ossification and eburnation
156	Pelvis	19 Fragments	L	20	2	19	A	-	Evidence of DJD on acetabulum, and concentrated area of porosity
156	Humerus	Distal 1-2	R	50	3	2	A	-	
156	Humerus	Distal 1-2	L	50	2	1	A	-	
156	Radius	Proximal 1-2	R	50	2	1	A	-	
156	Humerus	1-4 Shaft	R	25	2	1	A	-	
156	Humerus	Humoral Head	-	60	2	1	A	-	
156	Humerus	Frag of Humoral Head	-	20	2	1	A	-	
156	Scapula	Left Frag Scapula	L	20	2	2	A	-	Possible scapula foramen
156	Scapula	6 Scapula Frags	-	20	2	6	A	-	
156	Scapula	Left Scapula Notch	L	10	2	1	A	-	
156	Misc Bone	11 Bone Frags	-	-	3	11	A?	-	
156	Carpal	Capitate	L	100	2	1	NA	-	Non adult

156	Hand	Proximal Phalanx	R	100	2	1	A	-	
158	Tarsal	Calcaneus	L	100	2	1	A	-	Pair
158	Tarsal	Calcaneus	R	100	2	1	A	-	Pair
158	Fibula	Fibula Shaft	R	70	2	1	J	-	Syphilis (infection)
158	Tarsal	Talus	L	100	2	1	A	-	Pair
158	Tarsal	Talus	R	100	2	1	A	-	Pair
158	Tarsal	Calcaneus	L	100	2	1	J	-	
158	Patella	All	R	100	2	1	A	-	
158	Humerus	All	L	100	2	4	A	-	
158	Rib	Rib Heads	R	10-30	2	2	A	-	
158	Rib	Rib Shafts (4)	-	10-40	2	4	A	-	
158	Femur	Distal Femur	R	80	2	2	A	-	
158	Radius	Distal Radius	R	40	2	3	A	-	
158	Vertebra	Cervical	-	100	1	1	A	-	
158	Hand	3rd Metacarpal	R	100	1	1	A	-	
158	Hand	4th Metacarpal	L	100	1	1	A	-	
158	Vertebra	Lumbar	-	80	3	1	A	-	
158	Vertebra	Thoracic	-	95	3	1	A	-	

158	Vertebra	Thoracic	-	100	3	1	J	-	
158	Humerus	-	R	90	3	1	Inf	-	
158	Sacrum	Coccyx	-	30	3	1	A	-	
158	Vertebra	2 x Vertebral Arches	-	40-50	2	2	A	-	
158	Vertebra	Atlas	-	10	3	1	A	-	
158	Femur	Frag	-	5	3	1	A	-	
158	Foot	4th Metatarsal	R	100	2	1	A	-	
158	Vertebra	Vertebral Body	-	30	2	1	A	-	
158	Hand	5th Metacarpal	L	100	2	1	A	-	
158	Hand	Proximal 1st Phalanx	L	100	2	1	A	-	
158	Foot	3rd Metatarsal	L	90	2	1	J	-	
158	Hand	5th Metacarpal	L	90	2	1	J	-	
158	Hand	1st, 2nd, or 3rd Metacarpal	-	90	2	1	J	-	
158	Misc	Unidentified Frags	-	5-15	3	12	-	-	
158	Skull	Temporal	L	5	2	1	Inf	-	
158	Skull	Mandible	-	30	3	1	Inf	-	

158	Rib	2 x Ribs	R	70-100	3	3	Inf	-	
158	Foot	Proximal Phalanx	L	100	2	1	A	-	
158	Foot	Intermediate Phalanx	R	100	2	1	A	-	
158	Misc	Poss. Skull and Rib Frags	-	5	3	3	Inf	-	
158	Vertebra	Vertebral Arch	-	10	2	1	Inf	-	
158	Hand	Proximal Phalanx	-	100	2	1	Inf	-	
158	Hand	Distal Phalanx	-	100	2	1	Inf	-	
159	Humerus	All	R	100	3	1	A	-	
159	Femur	All	R	100	3	3	J	-	Infection (woven bone) on distal end
159	Humerus	All	R	100	3	3	J	-	Infection in the mid-distal shaft
159	Ulna	Near complete ulna	R	95	3	1	J	-	Infection on mid-shaft , Probable pair
159	Ulna	Proximal end shaft	L	80	3	1	J	-	Infection on proximal mid-shaft "
159	Radius	All	R	100	3	2	J	-	Woven bone, Probable pair
159	Radius	All	L	100	3	1	J	-	Infection on mid-shaft "

159	Rib	Rib heads	-	10- 20	3	8	A	-	
159	Rib	Sternal ends	-	10- 40	3	3	A	-	
159	Rib	Shafts (17 fragments)	-	5- 40	3	17	A	-	
159	Pelvis	Ilium, pubis and fragments	L	40	3	8	J	-	
159	Sacrum	Sacrum	-	30	3	3	J	-	
159	Skull	Cranium fragments	-	10	3	4	J	-	Woven bone
159	Sternum	Manubrium	-	20	3	1	A	-	
159	Clavicle	Clavicle	R	95	3	1	A	-	
159	Mandible	Mandible shaft (right end)	R	30	3	1	J	-	
159	Vertebra	Atlas	-	95	3	1	J	-	
159	Vertebra	Axis	-	100	3	1	J	-	
159	Vertebra	Thoracic x3	-	80-95	3	3	A	-	
159	Vertebra	Cervical x3	-	95	3	3	J	-	
159	Vertebra	Thoracic x5 vertebral body x2	-	10-100	3	6	J	-	

159	Vertebra	Lumbar vertebra	-	95	3	1	J	-	
159	Tarsal	Navicular	L	100	3	1	A	-	
159	Metatarsal	1st metatarsal	R	80	3	1	A	-	
159	Metatarsal	2nd metatarsal	L	95	3	1	A	-	
159	Foot	Distal 1st foot phalanx	R	100	3	1	A	-	Osteophyte formation
159	Hand	Proximal phalanges x5	-	100	3	5	A	-	
159	Hand	Intermediate hand phalanx	-	100	3	1	A	-	
159	Metacarpal	2nd metacarpal	L	100	3	1	A	-	
159	Metacarpal	1st metacarpal head	R	20	3	1	A	-	
159	Foot	Proximal phalanges x3	-	95	3	3	A	-	
159	Hand	Proximal phalanx	-	100	3	1	J	-	
159	Metacarpal	5th metacarpal	R	100	3	1	J	-	
159	Metacarpal	2nd metacarpal	L	100	3	1	J	-	
159	Metacarpal	3rd metacarpal	L	100	3	1	J	-	

159	Metacarpal	4th metacarpal	R	100	3	1	J	-	
159	Metatarsal	2nd metatarsal head	L	20	3	1	A	-	
159	Tibia	Distal epiphysis	R	10	3	1	J	-	Not yet fused
159	Tarsal	Intermediate cuneiform	R	95	3	1	-	-	
159	Humerus	Humeral head	L	5	3	1	J	-	Not yet fused
159	Scapula	Scapula fragments	-	5- 10	3	4	A	-	
159	Tarsal	Navicular	-	100	3	1	J	-	
159	Metatarsal	1st metatarsal base	L?	5	3	1	J	-	Fusing
159	Misc	Unidentified fragments (including epiphyses)	-	5	3	7	JA	-	
159	Foot	Proximal foot phalanges	-	100	3	2	A	-	
159	Foot	Intermediate foot phalanx	-	100	3	1	A	-	
159	Hand	1st distal hand phalanx	-	100	2	1	A	-	

159	Cranium	Skull fragments	-	1	2	1	A	-	
159	Ribs	Rib head- shaft	-	50-100	3	4	I	-	
159	Ribs	Shaft	-	50-100	3	1	I	-	
159	Vertebra	Thoracic	-	100	2	3	I	-	
159	Vertebra	Cervical	-	100	2	1	I	-	
159	Clavicle	All	R	100	2	1	I	-	
159	Femur	All	L	100	3	1	I	-	Pair
159	Femur	All	R	100	3	2	I	-	"
159	Radius	All	L	100	2	2	I	-	
159	Ulna	Proximal ½	L	50	2	1	I	-	
159	Metatarsal	1st metatarsal	R	100	2	1	I	-	Pair?
159	Metatarsal	1st Metatarsal	L	100	2	1	I	-	"
159	Carpals	Capitate	R	100	2	1	I	-	Same hand?
159	Carpals	Trapezoid	R	100	2	1	I	-	"
159	Carpals	Pisiform	R	100	2	1	I	-	"
159	Carpals	Capitate	L	100	2	1	I	-	

159	Metacarpal	Proximal metacarpal	-	10	2	1	I	-	
159	Hand	Proximal hand phalanges	-	100	2	6	I	-	
159	Hand	Distal hand phalanx	-	100	2	1	I	-	
159	Metatarsal	2nd metatarsal	-	100	2	1	I	-	
159	Foot	Proximal phalanx	-	100	2	1	J	-	
159	Metatarsal	1st metatarsal	R	100	2	1	I	-	
159	Foot	1st proximal metatarsal	R	100	2	1	I	-	
159	Foot	Distal foot phalanges	-	50-100	3	2	A	-	
159	Metatarsal	1st metatarsal	L	100	1	1	A	-	
159	Metatarsal	2nd metatarsal	R	100	3	1	A	-	
159	Metatarsal	4th metatarsal	R	100	3	1	A	-	
159	Foot	1st proximal phalanx	-	100	2	1	A	-	
159	Foot	2nd proximal phalanx	-	100	2	1	A	-	

159	Tarsals	Navicular	L	100	3	1	A	-	Pair
159	Tarsals	Navicular	R	100	3	1	A	-	"
159	Tarsals	Lateral cuneiform	L	100	3	1	A	-	Pair
159	Tarsals	Lateral cuneiform	R	100	3	1	A	-	"
159	Patella	All	L	100	2	1	A	-	
159	Cranium	Skull fragments	-	10	2	18	A	-	Fragments possibly from the same skull
159	Metatarsal	Distal 1st metatarsal	-	10	2	2	A	-	
159	Metatarsal	Proximal 1st metatarsal	-	10	2	2	A	-	
159	Rib	Rib fragments	-	10	2	1	A	-	
159	Ribs	8 heads	-	25- 50	2-3	8	A	-	
159	Ribs	1 rib sternal end	-	50	2-3	1	A	-	
159	Ribs	11 rib shaft fragments	-	20- 50	3	11	A	-	
159	Long bones	Long bone fragments x2	-	-	2	2	A?	-	

159	Scapula	Left scapula	L	40	3	1	A	-	
159	Pelvis	Right Pelvis	R	80	2	2	A	-	
159	Pelvis	Non adult ishium	R	100	2	1	J	-	
159	Vertebra	Thoracic fragments x3	-	50-100	4	3	A	-	
159	Vertebra	Lumbar vertebra	-	50	3	5	A	-	
159	Vertebra	Thoracic vertebra x3	-	70-100	3	3	J	-	
159	Vertebra	Lumbar vertebra	-	80	3	1	J	-	
159	Clavicle	All	L	100	3	1	J	-	
159	Cranium	Infant skull fragments	-	5	2	2	I	-	
159	Tarsals	Cuboid	L	100	2	1	A	-	
159	Tibia	Proximal tibial epiphyses	L	10	2	1	J	-	
159	Carpals	3rd metacarpal	L	100	2	1	A	-	
159	Hand	1st metacarpal	-	50	3	2	A	-	

159	Foot	3rd metatarsal	R	75	2-3	1	A	-	
159	Mandible	Juvenile mandible (½)	L	50	2-3	3	J	-	
159	Teeth	12 loose teeth	-	100	1	12	J	-	
163	Vertebra	Lumbar	-	80	1	1	A	-	Porosity & DJD
163	Vertebra	Lumbar Body	-	60	1	1	A	-	Porosity & DJD
163	Vertebra	Thoracic - All	-	90	1	1	A	-	Osteophytes - DJD
163	Vertebra	C1	-	100	1	1	A	-	Osteophytes at dues facet - DJD
163	Vertebra	Lumbar Inferior Process	L	20	1	1	A	-	
163	Vertebra	Lumbar Spinous Process	-	10	2	1	A	-	
163	Pelvis	All but Pubis	L	90	2	5	MA	F	
163	Hand	Proximal Phalanx	-	100	1	1	A	-	
163	Ribs	5 Rib Shaft Frags	-	5-30	2	5	A?	-	
163	Ribs	2 Sternal Ends	-	5-30	1	2	-	-	

163	Rib	Vertebral End (3rd)	R	30	1	1	-	-	
163	Rib	Vertebral End (Lower Rib)	R	15	1	1	A	-	
163	Tibia	All	L	90	1	2	A	-	Fusion line just visible at prox end. Lamellar bone at medial shaft
163	Ulna	All	L	100	1	4	A	-	Pair?
163	Ulna	Distal 1-2	R	50	1	2	A	-	Pair?
163	Calcaneus	All	L	100	1	1	A	-	
163	Foot	5th metatarsal	L	100	1	1	A	-	
163	Unidentified	12 Frags	-	-	-	12	-	-	
163	Vertebra	Rim of Lumbar	-	5	2	1	-	-	
163	Rib	2nd - All	L	100	0	1	J-Ad	-	
163	Rib	Sternal End	R	90	0	1	-	-	
163	Navicular	-	R	100	0	1	J-Ad	-	
163	Fibula	Distal Epiphysis	R	1	0	1	J-Ad	-	Unfused
163	Foot	Medial Cuneiform	R	100	0	1	J-Ad	-	
163	Foot	Lateral Cuneiform	R	100	0	1	J-Ad	-	

163	Foot	2nd metatarsal	R	100	0	1	J-Ad	-	
163	Foot	1st Proximal Phalanx	-	100	0	1	J-Ad	-	
163	Clavicle	All	R	100	1	1	J-Ad	-	Large gummata at lateral superior surface, [309-322] All one Individual?
163	Femur	Neck	L	5	1	1	J-Ad	-	Small patch of woven bone at inferior neck, [309-322] All one Individual?
163	Foot	Calcaneus	R	100	1	1	J-Ad	-	All one Individual?
163	Foot	Talus	R	100	1	1	Ad	-	All one Individual?
163	Foot	1st metatarsal	L	100	1	1	Ad	-	Fusing 13-18 years old, All one Individual?
163	Humerus	Head - Unfused	L	3	1	1	Ad	-	All one Individual?
163	Rib	Vertebral 1-2	R	30	1	1	Ad	-	All one Individual?
163	Rib	Vertebral End	L	5	1	1	Ad	-	All one Individual?
163	Hand	Proximal Phalanx	-	100	1	1	Ad	-	All one Individual?
163	Scapula	Coracoid	R	2	1	1	Ad	-	All one Individual?
163	Foot	Distal Phalanx	-	100	1	1	Ad	-	All one Individual?
163	Tibia	All	R	100	1	1	Ad	-	Very severely affected by gummata, osteitis, and periosteal reactions, all one Individual?

163	Tibia	Proximal 3-4	L	95	1	1	Ad	-	As above, probable pair, but the left bone is much larger, all one Individual?
163	Humerus	All	L	100	1	1	Ad	-	Same pathology as Tibiae above - also destructive lesion in distal metaphysis, all one Individual?
163	Teeth	Upper Left M2	L	100	1	1	A	-	OMA according to wear
163	Teeth	Upper Right First Incisor	R	100	1	1	A	-	Severe wear, slight calculus, DEH
163	Pelvis	Ilium	L	80	1	1	N	-	
163	Skull	Sphenoid	-	5	1	1	N	-	
163	Skull	Sphenoid	-	5	1	1	N	-	
163	Humerus	All	L	100	2	2	N	-	65.4mm long
163	Skull	2 Generic Skull Frags	-	5	2	2	N	-	
163	Pelvis	Ischium	L	5	1	1	N	-	
163	Ulna	Proximal 2-3	R	70	1	1	N	-	
163	Vertebra	Right Spinous Process	-	30	1	1	N	-	
163	Skull	Sphenoid	-	1	1	1	N	-	
163	Ribs	3 Right Ribs	R	50	1	3	N	-	
163	Ribs	2 Left Ribs	L	50	1	2	N	-	

163	Foot	Metatarsal - 2nd??	L?	100	1	1	N	-	
171	Rib	2 Rib Shafts	-	15	2	2	-	-	
171	Hand-Foot	Distal 1st Phalanx	-	100	2	1	A	-	
171	Hand-Foot	Proximal Phalanx	-	100	2	1	A	-	
171	Hand-Foot	4 Intermediate Phalanges - All	-	100	2	4	A	-	
171	Skull	Sphenoid - 1 Small Frag	-	5	2	1	-	-	
171	Hand	4th Metacarpal - Proximal 1-2	R	50	2	1	A	-	
172	Ribs	7 ribs shaft fragments	-	5- 10	3	7	A	-	
172	Ribs	3rd ribs (left and right) x2	L+R	20	2	2	A	-	
172	Ribs	Central rib (vertebral end)	R	70	2	1	A	-	
172	Clavicle	All	L	100	1	1	N	-	
196	Patella	All	R	95	2	1	A	-	Lipping
196	Vertebra	Thoracic	-	60	3	1	A	-	

196	Rib	3 Rib Shafts	-	5-40	2	3	A	-	
196	Radius	All	L	95	3	2	A	-	
196	Ulna	Distal	R	30	2	1	A	-	
196	Fibula	Proximal Fibula	R	30	3	2	A	-	
196	Fibula	Proximal Fibula	R	80	3	1	A	-	
196	Hand	Proximal Phalanx	R	100	2	1	A	-	
196	Foot	2nd Metatarsal	R	70	2	1	A	-	
196	Tibia	Proximal Tibia	L	40	3	1	A	-	} Possibly same bone
196	Tibia	Distal Tibia	L	10	3	1	A	-	} Possibly same bone
196	Tarsal	Medial Cuneiform	-	100	3	1	A	-	
196	Misc	Unidentified Bone Frags	-	5	2	8	A	-	
196	Scapula	Glenoid	L	10	2	1	A	-	
196	Foot	Intermediate Phalanx	-	50	3	1	A	-	
197	Metatarsal	1st proximal phalanx	R?	100	2	1	J	-	
197	Femur	Fragment of femur	-	10	2	1	A	-	

197	Scapula	Fragments of scapula	-	15	2	4	A	-	
197	Rib	Rib fragments	R	25	2	1	A	-	
197	Long bone	Long bone fragment	-	-	2	1	A?	-	
199	Fibula	All	L	100	1	1	N	-	
217	Ribs	2 shaft fragments	L	30	1	2	A?	-	
217	Pelvis	Tiny ilium fragment	-	1	1	1	-	-	
242	Tibia	Proximal 1-2	L	50	2	4	A	M?	Pair; Medial surface lamellar bone
242	Tibia	Proximal Epiphysis	R	10	2	1	A	M?	Pair
242	Radius	All	L	100	2	3	A	M?	
242	Radius	Distal 1-4	R	25	2	1	A	M?	
242	Femur	Proximal 3-4	R	75	2	2	A	M?	53mm femoral head
242	Ulna	Complete	L	100	2	1	A	M?	
242	Ulna	Complete	R	100	2	1	A	M?	
242	Humerus	Distal 3-4	L	90	2	2	A	M?	
242	Vertebra	Lumbar	-	80	2	1	A	-	Small Schmorl's node on inferior body

242	Ribs	17 Shaft Frags	-	5-30	2	17	A	-	
242	Vertebra	T11 - All	-	100	2	1	A	-	
242	Vertebra	Lumbar Superior Facet	R	10	2	1	A	-	
242	Vertebra	C2	R	20	2	1	-	-	Osteochondritis dissecans in superior facet
242	Vertebra	Lumbar Superior Facet	-	5	2	1	-	-	
242	Vertebra	Thoracic Spinous Process	-	5	2	1	-	-	
242	Hand	2nd metacarpal x2	R+L	100	2	1	A	-	} Pair
242	Hand	3rd metacarpal	L	100	2	1	A	-	
242	Hand	4th metacarpal	R	90	2	1	A	-	
242	Hand	5th metacarpal	R	100	4	1	A	-	
242	Hand	1st metacarpal	L	100	4	1	A	-	
242	Hand	1st metacarpal	R	100	2	2	A	-	
242	Hand	1st metacarpal	R	90	4	1	A	-	
242	Hand	5th metacarpal	R	100	3	1	A	-	
242	Hand	5th metacarpal	L	100	2	1	A	-	

242	Hand	3 Proximal Phalanges	-	100	1	3	A	-	2 bones
242	Ribs	2 Shaft Frags	-	20	1	2	A	-	
242	Foot	MT? Distal Epiphysis	-	5	1	1	A	-	
242	Foot	Distal Phalanx	-	100	1	1	A	-	
242	Skull	Frontal	-	25	1	1	A?	M?	Arachnoid granulations
242	Skull	Temporal 1-8	-	3	3	1	A?	-	
242	Skull	Nasal	-	1	1	1	-	-	
242	Skull	6 Generic Skull Frags	-	1	1	6	-	-	
242	Skull	Nasal Conchae	L+R	1	1	2	-	-	
242	Unidentified	10 Frags	-	-	-	10	-	-	
242	Tarsal	Calcaneus	L	100	2	1	A	-	Also 1 small unsided frag of calcaneus with associated enthesopathy
242	Tarsal	Navicular	L	100	2	1	A	-	
242	Tarsal	Cuboid	L	100	2	1	A	-	
242	Tarsal	Medial Cuneiform	L	100	2	1	A	-	
242	Tarsal	Intermediate Cuneiform	L	100	2	1	A	-	

242	Tarsal	Lateral Cuneiform	L	100	2	1	A	-	
242	Foot	1st Metatarsal	L	100	2	1	A	-	
242	Foot	2nd Metatarsal - Proximal 3-4	L	75	2	1	A	-	
242	Foot	5th Metatarsal	L	100	2	1	A	-	
242	Foot	3rd Metatarsal	L	100	2	1	A	-	
242	Foot	4th Metatarsal	L	100	2	1	A	-	
242	Hand-Foot	Proximal 1st Phalanx	L	100	2	1	A	-	Pair
242	Hand-Foot	Proximal 1st Phalanx	R	100	2	1	A	-	Pair
242	Hand-Foot	Distal 1st Phalanx	R	100	2	1	A	-	Ossification
242	Hand	3rd Metacarpal - Distal 1-4	R	25	2	1	A	-	
242	Hand-Foot	Proximal 3rd Phalanx	R	100	2	1	A	-	
242	Hand-Foot	Proximal 2nd Phalanx	R	100	2	1	A	-	
242	Foot	1st Metatarsal	R	100	2	1	J	-	Still fusing

242	Foot	4th Metatarsal	L	100	2	1	A	-	
242	Foot	4th Metatarsal - Proximal 3-4	L	75	2	1	A	-	
245	Fibula	Distal epiphysis	L	10	1	1	A	-	
245	4th metatarsal	All	L	100	1	1	A	-	
245	Scapula	Coracoid	L	10	1	1	A	-	
245	Talus	All	L	100	1	1	A	-	
245	Vertebra	Left part	L	20	2	1	A	-	
245	Skull	Small generic fragments	-	1	1	1	-	-	
245	1st metatarsal	Proximal epiphysis fragment	-	20	1	1	-	-	
245	Clavicle	Lateral 1-3	L	30	1	1	A	-	
245	Clavicle	Medial epiphysis	-	5	2	1	A	-	
245	Vertebra	Thoracic body fragment	-	10	3	1	A	-	
245	Ribs	1 shaft fragment	-	1	-	-	-	-	

245	Ribs	5 sternal ends	-	20	2	5	A	-	
245	Ribs	3 heads	L	5	1	3	A	-	
245	Unidentified	4 fragments	-	-	-	4	-	-	
247	Tibia	All	R	95	2	1	A	-	Probable Pair
247	Tibia	Distal 1-3 + 1 Proximal Frag	L	30	2	3	A	-	Probable Pair
247	Calcaneus	All	L	100	2	1	A	-	
247	Tarsal	Medial Cuneiform	R	100	2	1	A	-	
247	Foot	1st Metatarsal - Distal 1-2	L	50	2	1	A	-	
247	Misc	6 Unidentified Frags	-	5	2	6	-	-	
247	Foot	3rd Metatarsal - All	R	100	2	1	A	-	
247	Foot	Proximal Phalanx - All	L	100	2	1	A	-	
247	Fibula	All	R	95	3	2	A	-	Fracture
247	Fibula	3-4 Shaft	L	75	2	2	A	-	
247	Navicular	All	L	100	2	1	A	-	

247	Tarsal	Medial Cuneiform	R	100	2	1	A	-	
247	Femur	Distal Femur Ends	-	70	3	5	A	-	
247	Foot	4th Metatarsal - All	R	100	3	1	A	-	
247	Foot	1st Metatarsal	-	100	2	1	A	-	
247	Hand-Foot	Proximal Phalanx - Distal 3-4	-	80	2	1	A	-	
247	Tibia	All - except unfused epiphyses	R	100	2	1	NA	-	Possible Syphilis
247	Hand	1st Metacarpal - All	R	100	2	1	NA	-	
247	Hand	2nd Metacarpal - All	R	100	2	1	NA	-	
247	Foot	4th Metatarsal - All	L	100	2	1	NA	-	
255	Calcaneus	All	R	100	1	1	A	-	Double anterior calcaneal facet
255	Vertebra	T11	-	100	1	1	A	-	
255	Skull	Zygomatic	R	1	1	1	A	-	

255	Foot	1st distal foot phalanx	-	100	1	1	-	-	
255	Ribs	4 shaft fragments	-	30	1	4	A	-	
255	Ribs	2 heads	R	5	1	2	A	-	
255	Ribs	12th rib vertebral end	R	50	1	1	-	-	
255	Long bone	Shaft fragments	-	-	4	1	-	-	
255	Hand	Intermediate hand phalanx	-	80	4	1	-	-	
255	3rd metatarsal	Proximal 3-4	R	80	1	1	J	-	
257	Cranium	Skull fragments	-	10	1	1	A	-	
10 (in triangle)	Skull	Mastoid process	R	1	1	1	A	M	
10 (in triangle)	Skull	2 small fragments	-	0.1	1	2	-	-	
10 (in triangle)	Long bone	7 small long bone fragments	-	-	-	7	-	-	

10 (in triangle)									
Charnel (U-S)	Vertebra	L1	-	100	2	1	A	-	DJD- osteophytes and porosity at body
Charnel (U-S)	Skull	Zygomatic	L	2	1	1	A	-	
Charnel (U-S)	Tibia	Proximal epiphysis	R	2	1	1	A	-	
Charnel (U-S)	Tibia	15 small shaft fragments	-	0.5-2	1	15	A	-	All one tibia (?)
Charnel (U-S)	2nd metacarpal	Proximal epiphysis and shaft	R	60	1	1	A	-	
Charnel (U-S)	Hand	Distal 1st hand phalanx	-	100	1	1	A	-	
Charnel (U-S)	Ribs	5 shaft fragments	-	10	1	5	A	-	
Charnel (U-S)	Clavicle	Shaft	R	50	1	1	A	-	
Charnel (U-S)	Rib	Sternal end	-	50	1	1	A	-	
Charnel (U-S)	Rib	Sternal end of rib 1	L	60	1	1	A	-	Includes ossified cartilage

Charnel (U-S)	Rib	Head and neck (lower rib)	L	30	1	1	A	-	DJD- osteophytes and porosity at head.
Charnel (U-S)	Pelvis	Small acetabulum	-	1	1	1	A	-	
Charnel (U-S)	Vertebra	Spinous process	-	10	1	1	A	-	
Charnel (U-S)	Unidentified	1 fragment	-	-	-	1	-	-	
Charnel (U-S)	Ulna	Proximal ¾	R	80	2	3	A	-	
Charnel (U-S)	Radius	Distal epiphysis	L	2	1	1	A	-	
Charnel (U-S)	Scapula	Small blade fragment	-	5	2	1	-	-	
Charnel (U-S)	Ulna	Shaft fragments	R	20	1	1	A	-	
Charnel (U-S)	Sternum	Small fragment	-	5	1	1	A	-	
Charnel (U-S)	Hamate	All	R	100	1	1	A	-	
Charnel (U-S)	Capitate	All	R	100	1	1	A	-	

Charnel (U-S)	Capitate	All	L	100	1	1	A	-	Not pair with above
Charnel (U-S)	5th metacarpal	All	R	100	1	1	A	-	
Charnel (U-S)	4th metacarpal	All	R	100	1	1	A	-	
Charnel (U-S)	3rd metacarpal	All	R	100	1	1	A	-	
Charnel (U-S)	Hand	4 intermediate hand phalanges	-	100	1	4	A	-	
Charnel (U-S)	Hand	3 distal hand phalanges	-	100	1	3	A	-	
Charnel (U-S)	Skull	Small maxilla fragment	R	5	1	1	-	-	
Charnel (U-S)	Ribs	5 shaft fragments	-	10- 30	1	5	A	-	
Charnel (U-S)	Ribs	Sternal ends	-	20	1	1	-	-	
Charnel (U-S)	Ribs	Neck x2	-	5	1	2	A	-	
Charnel (U-S)	Rib	11th Rib vertebral end	-	80	1	1	A	-	DJD- osteophytes and porosity at head.

Charnel (U-S)	Vertebra	C1(3 fragments)	-	100	2	3	A	-	
Charnel (U-S)	Vertebra	5 spinous process fragments	-	10- 20	2	5	A	-	
Charnel (U-S)	Vertebra	Cervical body	-	40	2	1	A	-	DJD- porosity and osteophytes at inferior body
Charnel (U-S)	Vertebra	Thoracic bodies x2	-	30	3	2	A	-	
Charnel (U-S)	Femur	Distal epiphysis (3 fragments)	-	10	1	3	A	-	
Charnel (U-S)	Femur	11 small shaft fragments	-	1- 5	1	11	A	-	
Charnel (U-S)	Femur	Shaft fragments	-	10	1	1	A	-	
Sk93	Clavicle	All	R	100	2	1	A	-	DJD- porosity at lateral epiphysis
Sk93	Clavicle	Lateral 1-3	L	30	1	1	A	-	
Sk93	Clavicle	Medial ¼	L	20	1	1	A	-	
Sk93	Clavicle	All (2 fragments)	R	100	1	2	J	-	Pair
Sk93	Clavicle	Lateral ½	L	60	1	1	J	-	"
Sk93	Humerus	All	L	100	1	1	A	-	Pair

Sk93	Humerus	Distal 1-3	R	30	1	1	A	-	"
Sk93	Humerus	All (4 fragments)	L	95	1	1	A	F?	
Sk93	Humerus	All (2 fragments)	L	100	1	1	J	-	Pair
Sk93	Humerus	¾ (not central fragments)	R	80	1	3	J	-	" Includes proximal epiphysis
Sk93	Humerus	Head	-	3	3	1	A	-	
Sk93	Humerus	Neck	-	1	2	1	-	-	
Sk93	Humerus	Neck	L	3	1	1	A	-	
SK93	Skull	50 generic skull fragments	-	1-20	1	50	JA	-	
Sk93	Skull	24 sphenoid fragments	-	1- 5	1	24	JA	-	
Sk93	Skull	Basion	-	2	1	1	A	-	
Sk93	Skull	Basion	-	2	1	2	J	-	
Sk93	Skull	Occipital	-	5	2	1	A	-	
Sk93	Skull	6 generic skull fragments	-	30	2	6	N	-	All one skull
Sk93	Skull	Zygomatic	L	2	1	1	A?	-	
Sk93	Skull	Zygomatic	L	2	1	1	J?	-	

Sk93	Skull	Frontal	-	10	1	2	J	-	Cribra Orbitalia
Sk93	Skull	Right frontal	R	5	1	1	A	-	
SK93	Skull	Temporal	L	5	1	1	A	F?	Pair
Sk93	Skull	Temporal	R	2	1	2	A	F?	"
Sk93	Skull	Petrous temporal	R	1	1	1	-	-	
Sk93	Skull	Mandibular fossa	R	1	1	1	-	-	
Sk93	Skull	Parietal (2 fragments)	-	1	1	2	A	-	
Sk93	Skull	Mandible	-	100	1	3	A	-	M3 root forming (left M3, M1, M2, RM1, I2, C, M3)
Sk93	Skull	Mandible condyle	R	3	1	1	A	-	
Sk93	Skull	Tooth Right 1st molar	R	100	1	1	A	-	
Sk93	Skull	Mandible condyle	R	2	1	1	-	-	
Sk93	Ribs	12 shaft fragments	-	5- 30	1	12	-	-	
SK93	Ribs	Head and neck	R	20	1	1	A	-	

Sk93	Ribs	Head and neck x2	R	10- 40	1	2	J	-	
Sk93	Ribs	Sternal ends x3	-	10- 40	1	3	A	-	
Sk93	Ribs	Sternal ends x3	-	30	1	3	J-A	-	
Sk93	Fibula	Distal epiphysis	L	1	2	1	A	-	DJD- porosity at lateral epiphysis
Sk93	Fibula	Distal shaft	-	10	1	2	J	-	
Sk93	Radius	All but distal 1-8	R	90	1	2	J	-	
Sk93	Radius	Proximal ¼	L	20	1	1	A	-	
Sk93	Ulna	All (2 fragments)	R	100	1	2	A	-	
Sk93	Ulna	Proximal epiphysis and shaft	L	30	2	1	A	-	Not pair with above
SK93	Ulna	All (2 fragments)	L	95	3	2	A	-	
Sk93	Ulna	Distal shaft	L	10	2	1	A	-	
Sk93	Ulna	Proximal ¾ (2 fragments)	L	90	2	2	J	-	

Sk93	Vertebra	Body of lower thoracic	-	60	2	1	A	-	
Sk93	Vertebra	C1	-	100	2	1	A	-	
Sk93	Vertebra	Cervical	-	95	2	1	A	-	Porosity and osteophytes om right inferior and superior facet
Sk93	Vertebra	Cervical	-	80	2	1	A	-	Osteophytes at inferior body
Sk93	Vertebra	Thoracic x2 body	-	30	2	2	A	-	
Sk93	Vertebra	Thoracic spinous process	R	20	1	1	A	-	
Sk93	Vertebra	Thoracic traverse process	-	10	1	1	A	-	
SK93	Vertebra	Thoracic lower (T11?)	-	100	1	1	J	-	
Sk93	Vertebra	Thoracic body	-	50	1	1	J	-	
Sk93	Vertebra	Thoracic body and part of spinous process	-	60	1	1	J	-	
Sk93	Vertebra	Body fragment	-	5	1	1	J	-	
Sk93	Femur	Upper ¾	L	70	2	4	A	M?	Could be one bone

Sk93	Femur	Distal epiphysis	L	10	2	1	A	M?	"
Sk93	Femur	Proximal ¼	R	20	3	1	A	F?	
Sk93	Femur	Proximal shaft	L	25	3	1	A	-	
Sk93	Femur	Distal shaft	-	30	2	1	A	-	
Sk93	Femur	Central shaft	R	50	1	1	J	-	
SK93	Femur	10 shaft fragments	-	1- 5	2	10	A?	-	
Sk93	Femur	Neck fragments	-	5	2	1	A?	-	
Sk93	Femur	Greater trochanter	-	1	2	1	-	-	
Sk93	Talus	All	R	100	1	1	A	-	
Sk93	5th metatarsal	All	L	100	1	1	A	-	
Sk93	2nd metatarsal	All	L	100	1	1	A	-	
Sk93	Pelvis	4 small ilium fragments	-	2	1	4	-	-	
Sk93	1st metacarpal	Proximal ½	R	50	1	1	A	-	One hand (?)

Sk93	2nd metacarpal	All	R	100	1	1	A	-	"
Sk93	3rd metacarpal	All	R	100	1	1	A	-	"
Sk93	4th metacarpal	All	R	100	1	1	A	-	"
Sk93	4th metacarpal	All	R	100	1	1	J	-	One hand (?)
Sk93	2nd metacarpal	All	R	100	1	1	J	-	"
Sk93	Hand	Proximal phalanges x3	-	100	1	3	A	-	
SK93	Hand	Intermediate phalanx	-	100	1	1	A	-	
Sk93	Hand	Distal phalanges x2	-	100	1	2	A	-	
Sk93	Scapula	Coracoid x2	R	5	1	2	A	-	
Sk93	Scapula	Blade fragment	-	5	1	1	A	-	
Sk93	Scapula	Glenoid	L	10	1	1	A	-	
Sk93	Scapula	Glenoid	R	20	1	1	J	-	
U-s topsoil	Metacarpal	5th metacarpal	R	50	2	1	A	-	

U-S W. Wall Rm 2	Rib	Rib head	L?	20	3	1	A	-	

Table 2: Catalogue of disarticulated remains

SP = Surface preservation: grades 0 (excellent), 1 (very good), 2 (good), 3 (moderate), 4 (poor), 5 (very poor), 5+ (extremely poor) after McKinley (2004); C = Completeness; F = Fragmentation: min (minimal), slight, mod (moderate), sev (severe), ext (extreme); A – Adult (18+); Adol – Adolescent (13-18); YA – Young Adult (18-25); YMA – Young Middle Adult (26035); OMA – Old Middle Adult (36-45); MA – Mature Adult (46+); J – Juveile (1012); I – Infant (3 months – 1 year); N – Neonate (around the time of birth); DJD – degenerative joint disease

Appendix 6: Animal bone catalogue

Context	Cattle	Horse	Sheep/goat	Pig	Cattle-size	Sheep-size	Pig-size	Chicken	Hare	Fish	Notes
18	3		2		4	2					Long bone fragment (cattle-size) butchered. Cattle FM not fused, SC fused
23					1						
24			1		2						Sh/gt prox. RD fused, cattle-size rib cremated
36	3		5	2	7						Eroded.
42						2					
43			8		1						Loose sh/gt teeth, bone eroded
49	3		1		5						Eroded. Cattle M3=f
61	2			1					1		Cut to cattle PL cattle dP4=e
65			3	1	1	1					Gnawing x1
69			1								
82	2		5		5	1					Highly eroded with flaking surfaces
83							2				Eroded
99							1				
102					2						Long bone sawn, rib cut

Context	Cattle	Horse	Sheep/goat	Pig	Cattle-size	Sheep-size	Pig-size	Chicken	Hare	Fish	Notes
113	11	2	11	8	22	8					Eroded, pig prox. RD fused, pig distal RD not fused and gnawed, male pig tusk, pig M3=b, sh/g M3=e, cattle TB sawn shaft, cattle MT fused x2
114	5	1	6	1	9		1		4		Cattle juvenile RD (not fused), juvenile atlas butchered. Pig prox. RD fused. Horse distal HM fused. Sh/gt distal TB fused, MC fused, MT not fused, PH1 not fused, PH2 fused. Cattle-size long bone pathological, abscess and pus draining channel
126			3		7	7					Sh/gt PL fused, sh/t MT gnawed
135		1	1		6	1					Horse + sh/gt distal HM fused, sh/gt HM dismember cuts
138			1		2						
153			1		1		1				Fused sh/gt MT. Cattle dP4=f
154	2		5	1	6	3	2				Sh/gt M3=g, sh/gt M2=e,M1=g, sh/gt distal TB fused, cattle PH1 fused
155	9		5	2	8	10	2	1			Cattle PL fused, pig mandible M2 c
157	2				6						Fused cattle distal RD
158	1										

Context	Cattle	Horse	Sheep/goat	Pig	Cattle-size	Sheep-size	Pig-size	Chicken	Hare	Fish	Notes
159	1		6		7	3	1				Eroded. Sh/gt distal HM fused, sh/gt PH2 fused
163			2		1						
168					12						
169	7		15		76						Eroded apart from sh/gt foot bones (mainly MT). One MT pathological (spavin-like bone changes) Cattle distal TB fused. Sh/gt M3=g
171	1		1	1							Pig mandible M3b, M2g chop to buccal side down from M2. Male
172										1	Ray tooth?
183	1		1								Cattle prox. MT gnawed
186			1								Eroded, sh/gt distal TB fused
196	1										Eroded
197						1					
217	3		16		9	5	1				Eroded. Midshaft chop sh/gt TB. Dominated by sh/gt MT x7 - 2 fused, 1 not fused. Also 2 sh/gt PH1, 1 fused, 1 not fused. 2 sh/gt PH2 both fused. Cut to sh/gt TB

Context	Cattle	Horse	Sheep/goat	Pig	Cattle-size	Sheep-size	Pig-size	Chicken	Hare	Fish	Notes
242	3		7	1	4	9		1			Cattle distal SC fused, PH1 fused, sh/gt MC fused, sh/gt RD gnawed. Chicken FM cut
248	1				7						
255					2						
257			1		1	1					
259	1		1								Sh/gt RD shaft gnawed
266					3						
1004	1		1			1					Cattle PH2 fused
1008	1		2		2	1					Eroded, sh/gt distal HM fused, sh/gt distal RD not fused and gnawed
U/S	5	3	47	4	18	5					Cattle PH1 fused. Many sh/gt MT, MC (fused and not fused) and PH1 and 2. Horse FM juvenile
Total	**69**	**7**	**160**	**22**	**237**	**61**	**11**	**2**	**5**	**1**	

Table 1. Summary of the animal bones by context

Key : dP4=deciduous fourth premolar, M1=first molar, M2=second molar, M3=third molar, SC=scapula, HM=humerus, RD=radius, MC=metacarpal, PL=pelvis, FM=femur, TB=tibia, MT=metatarsal, PH1=first phalanx, PH2=second phalanx. Dental wear stages (b-g) after Grant 1982.

Appendix 7: Environmental samples catalogue

Sample No.	Context	Feature	sample volume (litres)	unproc soil remaining	method of processing	soil & flot descriptions
HARLECH PHASE 1						
1	33	Charcoal rich deposit from sub oval shaped pit. Thought to be the remains of a post pad	4	0	bucket	grey/brown, moist, stones, gritty. Large flot (100ml), frequent large & small charcoal (15ml extracted).
2	22	grave fill from grave cut [21] Sk.75	2	0	bucket	brown soil with frequent soft bone frags, slate, stone, burnt bone. Small flot, little charcoal flecks, poor bone.
3	57	grave fill from grave [56]. Surrounds disturbed sk.174	8	0	bucket	dark brown, wet, silty clay, mineralised wood, poor bone. Small flot, blobby slag. Occ charcoal.
4	22	stomach sample from sk.75	2	0.3 kept for parasites	bucket	burnt bone, small flot (8ml), a few frags large charcoal
5	20	From ?cess pit [19]	15	0	bucket & 500 microns for residue	grey/brown, moist, slate, bone, stones. Lge flot, mainly small char & uncharred (?mineralised) material
6		Abdomial area of skeleton 95	1	0.3 kept for parasites	bucket	chocolate brown, loamy, stone, slate. C.10ml flot, some lge charcoal
7		Fill surrounding Skel.95	15	0	tank	Dark brown loamy soil, bone, shell, glass. Small flot, occ lge charcoal, bone. Freq bone & shell in residue.
8		Fill surrounding skel. 96	20	0	bucket	chocolate brown, loamy, stones, coal, bone, slag, shell, red glass bead. Lge flot, frequent charcoal.

9		Fill surrounding skel.97	9	0	bucket	Mid brown, shell, bone, freq charcoal. Fairly large flot (c.100ml) with several bones, frequent lge (10ml) & small charcoal. Some slaggy material.
10	103	Charcoal rich sample from within hearth [103] of post med dwelling (Cellar room 1)	8	0	bucket	brown/black, moist, clinker, mortar, frequent finds, glass, iron, button. Lge flot, frequent charcoal.
11	101	Charcoal rich fill of [100] (Small indentation in natural. Uncertain whether this is a feature	8	0	bucket	dark & light brown mottled, ashy patches, 15% by weight large stone discarded, 15% fine residue retained (<6.7mm). Large flot - frequent large charcoal bagged.
12		Grave fill around SK.148	24	7 bags & 6 tubs	tank	Moist light brown mottled, charcoal flecked. Stony. Small flot. Several large charcoal frags from flot & residue.
13	151	Charcoal fill of fire pit [150]	20	4 bags	tank	wet, mottled black and red burnt clay, frequent large charcoal. Large charcoal in medium sized flot & residue. Some roundwood.
15		Charcoal found at base of ?cess pit [26]	0.4	0	bucket with 500 microns for residue	wet brown/black silt, occ charcoal. Small flot. Several fish bones in residue and MINERALISED stems
16	170	Soil surrounding skl.170	20	2 bags	tank	mid-brown soil, bone & charcoal. Small flot, bone frags, oyster?, occ lge charcoal.
19	178	100% sample of fill surrounding skeleton 176	20	14 bags	tank	dark brown gravelly, large stones & slate, bone. 31% by weight large stones (discarded), 24% fine residue. V. small flot.

20	171	grave fill around SK.170	20	4 bags	tank	Freq fibrous white material in small flot and small charcoal; stones, slate, bone, teeth, mortar. 10% of whole earth by weight = lge stones (discarded), 22% = fine residue (kept)
21	181	Initially thought to be the remains of a grave. However, further investigation proved that this deposit was an accumulation of soils and not an archaeological cut feature.	8	0	bucket	Dark brown, stony, very gravelly, damp. Few finds. 38% by weight lge stones (discarded), 23% fine residue (kept). Large flot with frequent charcoal (large extracted)
22	83	From pit [19] (cess pit?)	20	10 tubs	tank	14% of whole earth by weight = lge stones (discarded), 21% = fine residue (kept). Small flot, occ black slaggy blobs
23	188	Burnt layer from ?cess pit 19	6	0	bucket with 500 microns for residue	Mottled black & orange with visible charcoal lumps. 17% lge stones (discarded), 23% fine residue (kept). Fairly lge flot, frequent lge charcoal extracted, mainly oak-type.
24	200	Stake hole fill	0.2	0	stack sieved to 250 microns	Stack sieved so as to extract charcoal for dating. Pale brown fine silt & occasional stones.
26	205	Grave fill around skeleton 203	5	0	bucket	mid brown, stony, moist. 30% lge stones (disc), 18% fine residue. Medium sized flot, frequent charcoal extracted. Occ blobby slag.
27	218	Charcoal sample taken from hearth [54]. Subsequent C14 dating of this charcoal sample has	0.6	0	bucket	Black mottled (wet) lumps of silt. Lge flot for sample size. Charcoal extracted for dating 30.4.14

		proved that the feature has a calibration date of AD 1405				
29	237	Fill surrounding skel.212	20	0	tank	dark brown, gravelly, sandy wet. Visible bone. Small fibrous flot (oyster?). Several small charcoal frags not yet sorted.
30	193	Stake hole [210] fill	0.2	0	stack sieved to 250 microns	red brown loamy. Only traces of charcoal in medium residue. Stack sieved so no flot.
31	118	Fill from interior drain of post medieval dwelling	12	0	bucket, 500 microns used for residue	dark brown, sandy, mortar, glass, pot. Small flot with unch rootlets, trace of charcoal only.
33	226	Fill of cooking pit	0.8	0	bucket	mottled brown/black moist silty clay. Several small/medium charcoal frags in small flot including one ?Salix/Populus sp. and one oak frag.
57	57	No sample number given to sample	11	0	bucket	Crumbly red/brown soil. Large flot with poor bone, burnt bone & charcoal. Occasional slaggy frag.
65	65	No sample number given to sample	20	6 tubs	tank	brown/black loamy, stony. 24% lge stones (discarded). Small flot. Blobby slag, coal, charcoal, occasional bone, several nails.
subs 2		PIT 19	0.2	0	stack sieved	dark brown, wet.
subs 6		PIT 19	0.2	0	stack sieved	dark brown, slate and stone, shell, pot, bone
subs 8		PIT 19	0.2	0	stack sieved	dark brown, sandy, frequent small stones, slate, coal +, small charcoal +++
subs 10		PIT 19	0.2	0	stack sieved	black slaggy frags, large charcoal ++ extracted
level 20cm		PIT 26	0.3	0	stack sieved	dark brown silty, occ stone and slate, clinker/slag ++

level 60cm		PIT 26	0.15	0	stack sieved	dark brown silty, occ stone and slate, frequent charcoal, burnt bone, coal
level 100cm		PIT 26	0.15	0	stack sieved	dark brown, stone, slate, charcoal ++
HARLECH CAR PARK 2013						
CP1	115		1	0	bucket	brown, lots of shells, small flot, rare charcoal
CP2	118	drain upper fill	0.8	0	bucket	chocolate brown, clayey, charcoal, small flot
CP3			0.9	0	bucket	pale brown sandy, very small flot, rare charcoal
HARLECH PHASE 2						
34 (was 1)	267	Fill from foundation cut of Chapel wall (Poss Med)	16	0	tank	Very large stones (40% by weight) and medium brown silty (moist). 19% fine residue retained. Occasional mortar, shell, bone. Very little flot with no identifiable charcoal.
35 (2)	266	Silt from gully (Poss Med)	12	0	bucket	mid brown, large stones, bone. Frequent (c.25) charcoal frags. Slaggy frags.
36 (3)	269	Large post hole fill	20	0	tank	Small fibrous (oyster?) flot. Occasional lge charcoal.
37 (4)	271	Small stake hole	0.6	0	bucket	Mid brown loamy, small stones. Charcoal extracted for dating 30.4.14
KEY : CPR = charred plant remains; HNS = hazel nut shell						

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