CourtneyDeery
ARCHAEOLOGY & CULTURAL HERITAGE



# Final Archaeological Testing Report

Maynetown, Co. Dublin

ITM 723575E / 741930N

Pre-Planning, Excavation Licence No.22E0509

For

Portmarnock Real Estate Developments Ltd

Gill McLoughlin

26/07/2023

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## EXECUTIVE SUMMARY



This final report describes the results of archaeological testing carried out by Gill McLoughlin of Courtney Deery Heritage Consultancy Ltd. (Licence No. 22E0509). The work has been carried out pre-planning on behalf of Portmarnock Real Estate Developments Ltd. and the results will be included with a planning application for Phase 1E of a housing development at Portmarnock South.

The proposed development site is located in Maynetown townland, Portmarnock South, adjacent to sub-surface ditched enclosure RMP DU015-055, which is due to be preserved in situ (ITM 723575E / 741930N) (Figure 1).

The archaeological testing follows a geophysical survey of the enclosure, DU015-055 and discussions with the National Monuments Service and Fingal County Council in relation to the preservation of the site. The purpose of the testing was to investigate the area surrounding the enclosure in advance of planning for Phases 1E and 1F to see if there were any associated archaeological features, and to investigate both the enclosure ditch and a pit within the interior of the enclosure with the aim of gathering information which would assist in the interpretation and future presentation of the site.

The testing took place over nine days from the 19th of July 2022 and the enclosure ditch and a large internal pit, as indicated in the geophysical survey, were identified in trench T1. A deposit of human remains was dumped in the fill of the internal pit after having been disinterred from elsewhere. The deposit of bones represents a minimum of ten individuals including at least five adults and a minimum of five non-adults ranging from 1.5-16 years and cranial trauma was noted in two individuals. The bones were present at 0.4m below current ground level and appeared to have been wrapped or contained somehow, resulting in a linear pattern of deposition (NE-SW) which did not relate to a cut. Animal bones were included within the deposit.

Dating of a sample of animal bone from the secondary fill of the enclosure ditch yielded a date range of cal AD 774-952 and a fragment of human bone yielded a date range of cal AD 674-876. These dates align well with a date retrieved from a previous phase of testing in 2008 (Moriarty, 2009) and with the dating of three other enclosures excavated nearby in Portmarnock townland (McLoughlin, 2019a, 2019b, 2022).

Cattle dominated the animal bone assemblage, and were likely brought to the site on the hoof and killed, butchered and eaten on site. A perforated cattle scapula appears to indicate a shoulder of beef suspended on a hook, possibly for smoking and may indicate a preserved joint of beef. A relatively high incidence of horse was also noted, and while the assemblage was too small to be statistically viable, a high incidence of horse was also noted at adjacent excavated sites in Portmarnock, so it may be significant.

Two linear ditches and two smaller linear features likely to be associated with sub-surface enclosure DU015-055 were identified in trenches T2 and T3 to the northeast of the enclosure. Ditch C19 was identified in T3 and was oriented WSW-ENE. It measured 3.3m wide, 1.05m deep and contained three fills, all of which contained seashell and animal bone. Ditch C15 was oriented E-W, measured 2.6m wide and in excess of 0.7m deep. The full depth of this ditch was not reached due to rapid water ingress from below. Three distinct fills were noted, which contained animal bone, seashell and charred environmental remains. The nature of the fills in both ditches suggests that these features were associated with the ditched enclosure.

It is recommended that the linear ditches and associated features to the northeast of the enclosure be fully excavated under licence, in advance of development.

It is also recommended that a plan for landscaping the area be agreed in advance with the archaeologist to ensure that the methodology proposed will allow suitable protection to the below ground archaeological remains.

# 1. INTRODUCTION

## 1.1. General

This final report describes the results of archaeological testing carried out by Gill McLoughlin of Courtney Deery Heritage Consultancy Ltd. (Licence No. 22E0509). The work has been carried out pre-planning on behalf of Portmarnock Real Estate Developments Ltd. and the results will be included with a planning application for Phase 1E of a housing development at Portmarnock South.

The proposed development site is located in Maynetown townland, Portmarnock South, adjacent to sub-surface ditched enclosure RMP DU015-055 (ITM 723575E / 741930N) (Figure 2). As part of the Masterplan process for the Portmarnock South lands, the preservation in situ and protection of this below ground enclosure has been secured by the establishment of a 20m buffer zone surrounding the monument defined by a temporary metal fence.

This monument will be retained within a Class 2 public open space, and as part of the Racecourse Park Development Project, Fingal County Council in consultation with Bernard Seymour Landscape Architects have designed an agreed scheme of landscaping that is sympathetic to the subsurface nature of the monument.

The testing took place over nine days from the 19th of July 2022. In total 18 test trenches were excavated to assess the area of Phase 1E and Phase 1F housing and roadways closest to enclosure DU015-055 to the west and north (14 trenches), one trench was placed to target the enclosure ditch and a substantial internal feature indicated on geophysical survey, in order to gather additional information that could be of use in interpreting the function of the site. A further three trenches were placed to target a proposed foul water route (Figure 10).

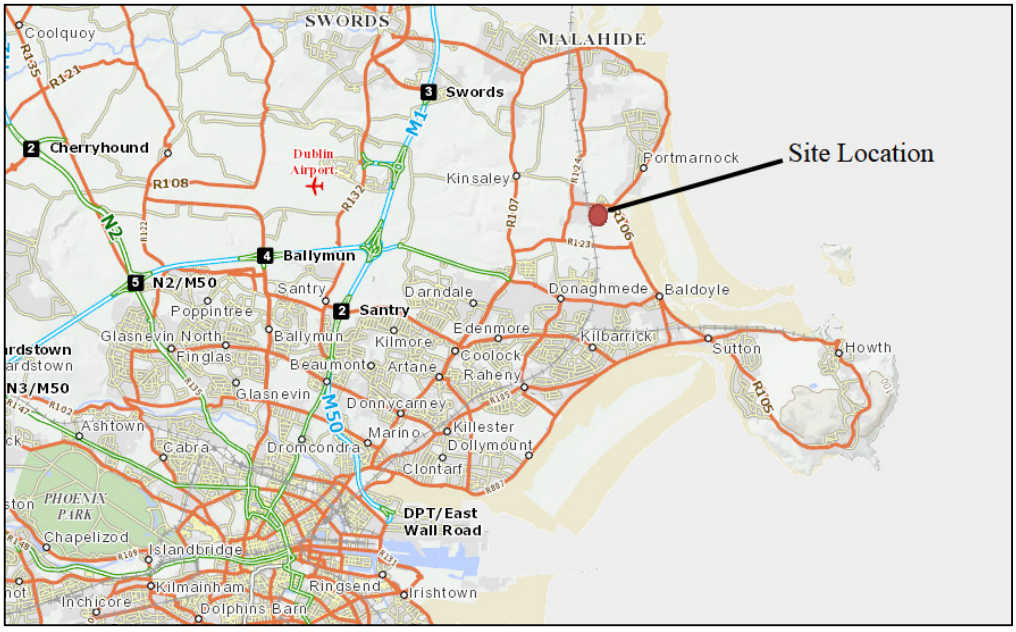


Figure 1 Site Location

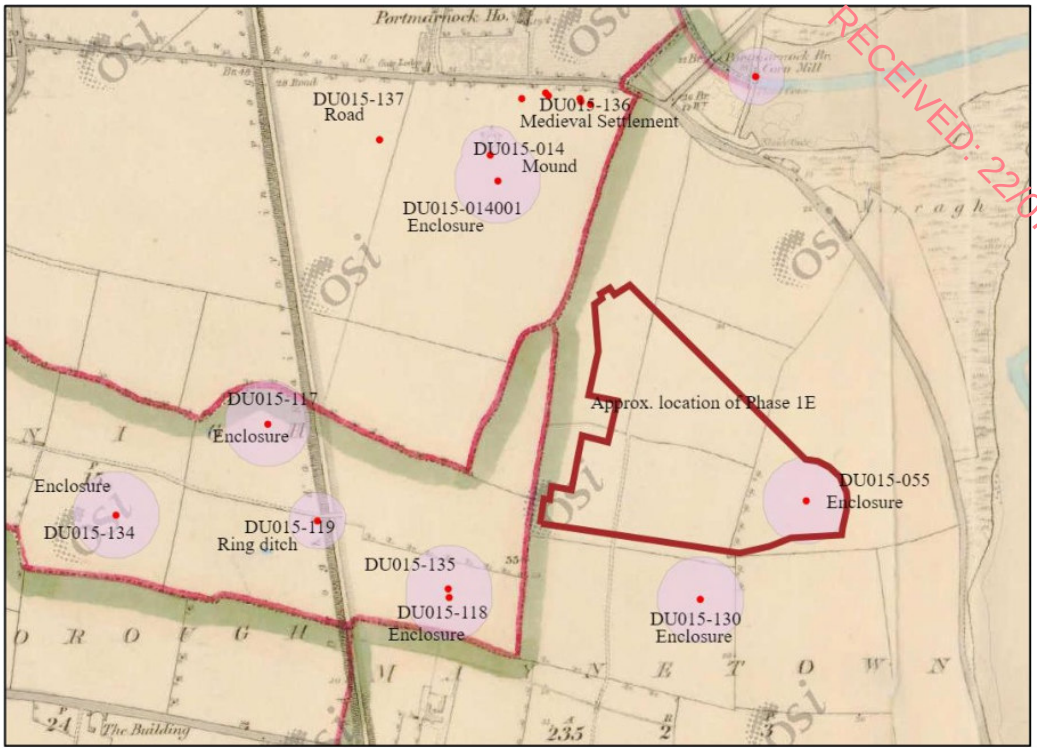


Figure 2 Approximate location of Phase 1E on the First Edition Ordnance Survey Map (1843)

## 1.2. Description of Proposed Development

The future Phase 1E development at Portmarnock South will comprise residential development and an upgrade of the existing temporary foul water pumping station and waste water storage tank as well as a foul drainage and surface water route extending northwards from the Phase 1E area towards the pumping station area (Figure 3, Figure 4).


Figure 3 Outline of Portmarnock South Phase 1E development

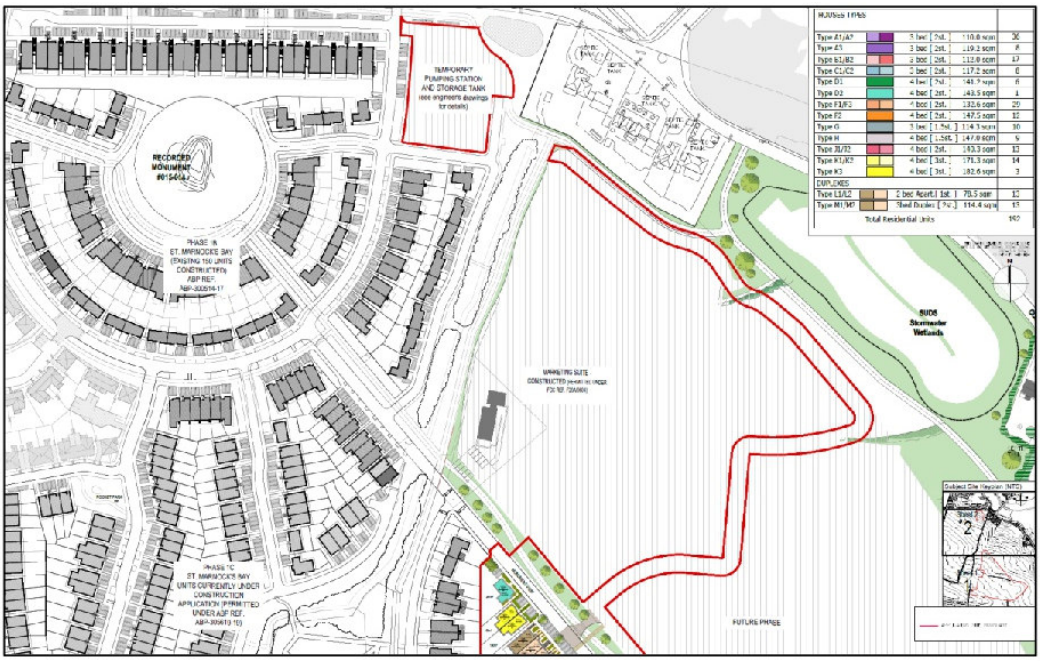


Figure 4 Upgrade of existing Pumping Station, foul drainage and water surface route Phase 1E

## 2. ARCHAEOLOGICAL BACKGROUND

A phased programme of archaeological investigations and resolution took place on the Portmarnock lands over the period from 2000 to 2008. As a result, two significant recorded monuments, the Portmarnock mound DU015-014 and the Maynetown enclosure DU015-055 have been preserved in situ in accordance with a multidisciplinary conservation plan which was agreed with the National Monuments Service of the Department of Environment, Heritage and Local Government (now the DHLGH) and Fingal County Council.

In addition to this, a medieval settlement containing six well defined property plots, previously identified by geophysical survey, aligning Station Road to the north of the development lands, was archaeologically excavated (Moriarty 2008 08E0376) (RMP DU015-0136001-006). The area of excavation was roughly rectangular in plan and measured c. 50–70m north–south by 110m. The remains of at least four truncated buildings were identified, along with metalled surfaces and wells. A possible medieval metalled road surface was also exposed and recorded and subsequently was placed on the archaeological record as DU015-137. During the summer of 2018, features associated with the medieval settlement site, such as linear ditches, foundations of a structure, two wells and a metalled surface were excavated to the east and west of the main settlement concentration. During the course of the excavation a large assemblage of medieval and late medieval pottery was collected as well as animal bone, iron objects and a number of lithics including a large assemblage of plough pebbles (Licence No 18E0016) (McLoughlin, 2020).

During the period 2000-2008, geophysical survey and test excavation of the lands assisted in defining the location and extent of below ground features of an archaeological origin throughout the wider development lands, including some of the lands for this application (Figure 5).

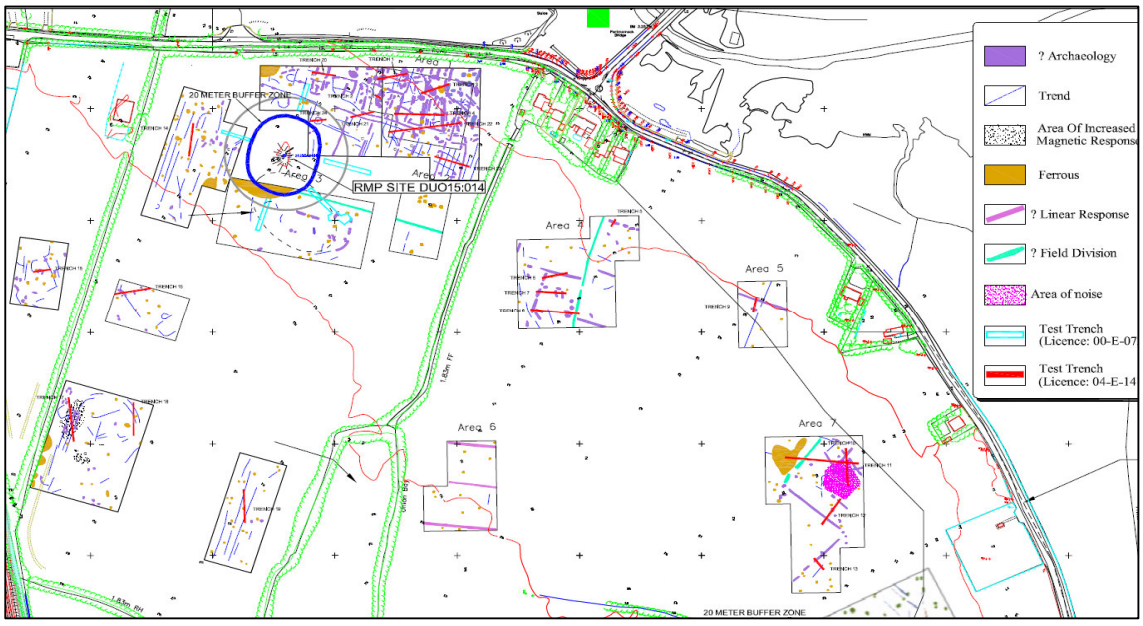


Figure 5 Summary of geophysical survey and archaeological testing on the Portmarnock lands 2000-2008.

Individual small-scale features such as the burnt mound/pit were identified in 2004 by testing (Phelan 2004) and these were resolved by excavation in 2018 (McLoughlin, 2020).

In 2012 archaeological monitoring was carried out of topsoil stripping for the establishment of a site compound and the carrying out of enabling works associated with the development permitted under planning permission register reference F07A/0947 (Walsh 2014, Licence Ref. 12E0358). No archaeological features were encountered during the course of the topsoil stripping.

In 2016 archaeological investigations revealed the presence of a sub-square ditched enclosure dating to the early medieval period with evidence of an internal ditched feature dating to the Iron Age. This site was fully excavated under licence 16E0101. A wooden artefact (hoop) found at the bottom of the external ditch provided a calibrated date of AD 686-876 and this along with several other secure dates retrieved from the ditch provided a firm early medieval context for the site. This area is now archaeologically resolved, the final report has been submitted to the NMS and the Phase 1A development is complete.

In January 2017, a 14-week excavation of an enclosure (DU0015-014001) (licence No. 16E0613) took place within the Phase 1B development area. The enclosure was slightly elliptical or sub-circular in plan and measured a maximum external diameter of 77m east-west x 70m north-south (68m east-west x 60m north-south internal diameter), with an entrance to the east. During the test excavation a wooden hoop artefact was recovered from close to the bottom of the ditch and this has been dated AD 641-763. Further dating and analysis of finds from the enclosure site confirmed this was a multi-phased site with the majority of activity taking place in the Late Iron Age/ Early medieval period. Phases represented on the site are Mesolithic, Late Bronze Age, Iron Age, Late Iron Age/ Early Medieval, Early Medieval – pre 800AD and Early Medieval – post 800AD.

Significant finds recovered from the ditch during the excavation include early medieval pottery imported from the eastern Mediterranean region (LRA 1/Bii ware, dated to c.450-600AD), E ware dated to the late 6$^{th}$ - mid 7$^{th}$ Centuries imported from western France, a wooden dish preserved in the base of the ditch, stone tools and worked antler artefacts. A huge volume of animal bone was recovered from the ditch, and this included whale/cetacean bones. Cereal drying (kilns) and metalworking activity were evident on site and there was one human burial (adult, male, approx. 40-45 years in age and 410-607AD in date) excavated within the enclosure.

In 2019 an excavation was carried out in the Phase 1C development area (licence ref 19E0303, pre-planning). The site comprised a large double ditched enclosure, with the eastern side of the outer enclosure corresponding with the upstanding boundary between Portmarnock and Drumnigh townlands. It is planned to preserve this boundary in situ. The inner enclosure was slightly sub-circular or oval in plan and measured 36m northeast-southwest x 29m northwest-southeast internally and the outer enclosure was an irregular oval measuring 105m northeast-southwest x an estimated 71m northwest-southeast internally (the eastern extent of the outer enclosure was beyond the limit of excavation). The course of the outer enclosure was irregular, and the depth of both ditches was variable.

Radiocarbon dating has indicated that the two enclosures were contemporary, with most of the dates ranging between the mid/late 7$^{th}$ – late 10$^{th}$ Centuries, although there was some evidence that the beginnings of the site may have been during the late Iron Age / early medieval transition. There was also evidence for some activity at the site in the early Bronze Age, in the form of a gully truncated by the outer enclosure ditch, and a late Bronze Age copper-alloy knife blade recovered from the outer ditch represents disturbance of an earlier phase of activity, either at or in the vicinity of the site.

There were also very few finds recovered from either enclosure, providing limited evidence for occupation, however a wooden bucket-type vessel made of yew recovered from waterlogged basal fills of the inner ditch returned a radiocarbon date range of AD 652-763. The wooden vessel,

along with two tiny bone comb fragments, an iron weaving tensioner, a small amount of iron slag and a tuyere fragment are indications of domestic and small-scale industrial activities at the site. Animal bone and seashell recovered from the site represents food waste and charred cereals indicate cereal processing at or near the site, further indicating some level of occupation.



## 3. SUMMARY OF PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

### 3.1. Geophysical Survey Phase 1E

Geophysical survey was carried out in this area in 2000 (Shiel et al) and based on the concentration of activity identified, additional geophysical survey was carried out in 2002 (Nicholls) (Figure 6). The intention of this survey was to record any other potential archaeology associated with enclosure DU015-055 that may have extended beyond the area of the previous survey to the north and west. The survey confirmed the sub-surface archaeological remains on the east side of the enclosure site. Two splayed linear features extend from an apparent entrance to the enclosure for a distance of up to 120m from the outer edge of the enclosure ditch.


Figure 6 Geophysical Survey (Nicholls 2002), Portmarnock South, Showing enclosure DU015-055

Further geophysical survey was carried out in 2022 (Leigh) in order to confirm the exact location of the enclosing elements of the enclosure due to a discrepancy between the geophysical information, the location recorded in the SMR and the temporary fencing that had been erected around the monument (Figure 7, Figure 8).

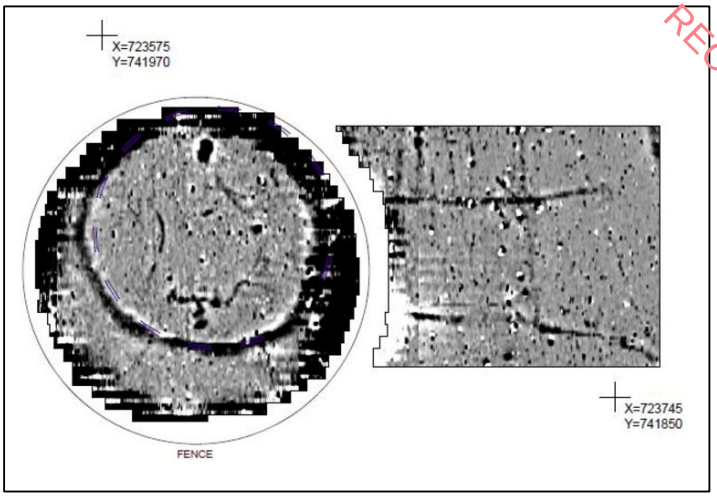


Figure 7 Geophysical survey greyscale, Leigh 2022

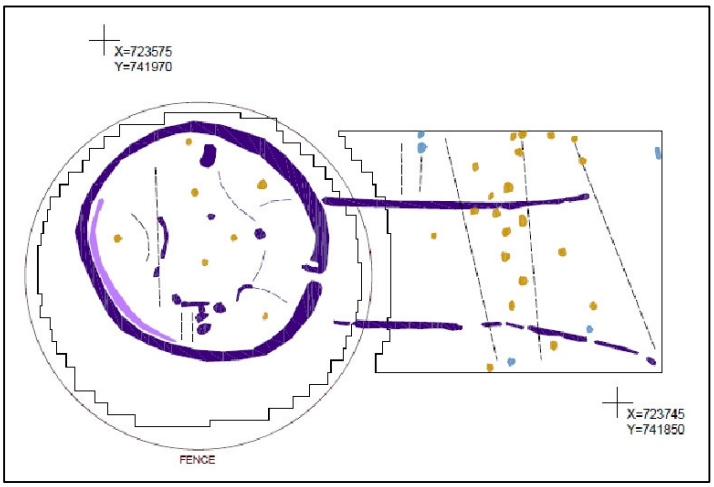


Figure 8 Geophysical survey interpretation, Leigh 2022

### 3.2. Testing

In June and July 2008, a small-scale test-excavation was carried out at the enclosure site (07E0574, Moriarty 2009). The excavation was designed to garner more information about the subsurface enclosure prior to its preservation in situ. Two trenches were opened at the enclosure site (DU015:055) (Figure 9). These revealed that the enclosure was defined by a very large and substantial ditch which measures approximately 7m in width by a maximum of 2m in depth. Finds recovered from the ditch included butchered animal bone and a ferrous nail shank. A charcoal sample recovered from the base of the ditch delivered a date of cal. AD 687-887, dating the site to the early medieval period.


Figure 9 Geophysical survey showing test trenches (1 and 2), Moriarty 2009

## 4. ARCHAEOLOGICAL TESTING RESULTS

### 4.1. General

Archaeological testing was carried out over nine days from the 19th of July 2022. This was carried out using a mini tracked machine for Trench 1, inside the protected area, and a larger tracked machine for the other trenches. Both machines were fitted with toothless grading buckets and the trenches were excavated under strict archaeological direction. In total 18 test trenches were excavated (Plate 1, Plate 2, Plate 3, Plate 4, Figure 10).

14 test trenches were excavated to assess the area of Phase 1E and Phase 1F housing and roadways closest to the enclosure to the west and north (T2-T15), one trench was placed to target the enclosure ditch and a substantial internal feature indicated on geophysical survey (T1) and three trenches were placed to target a proposed foul water route (T16-T18).

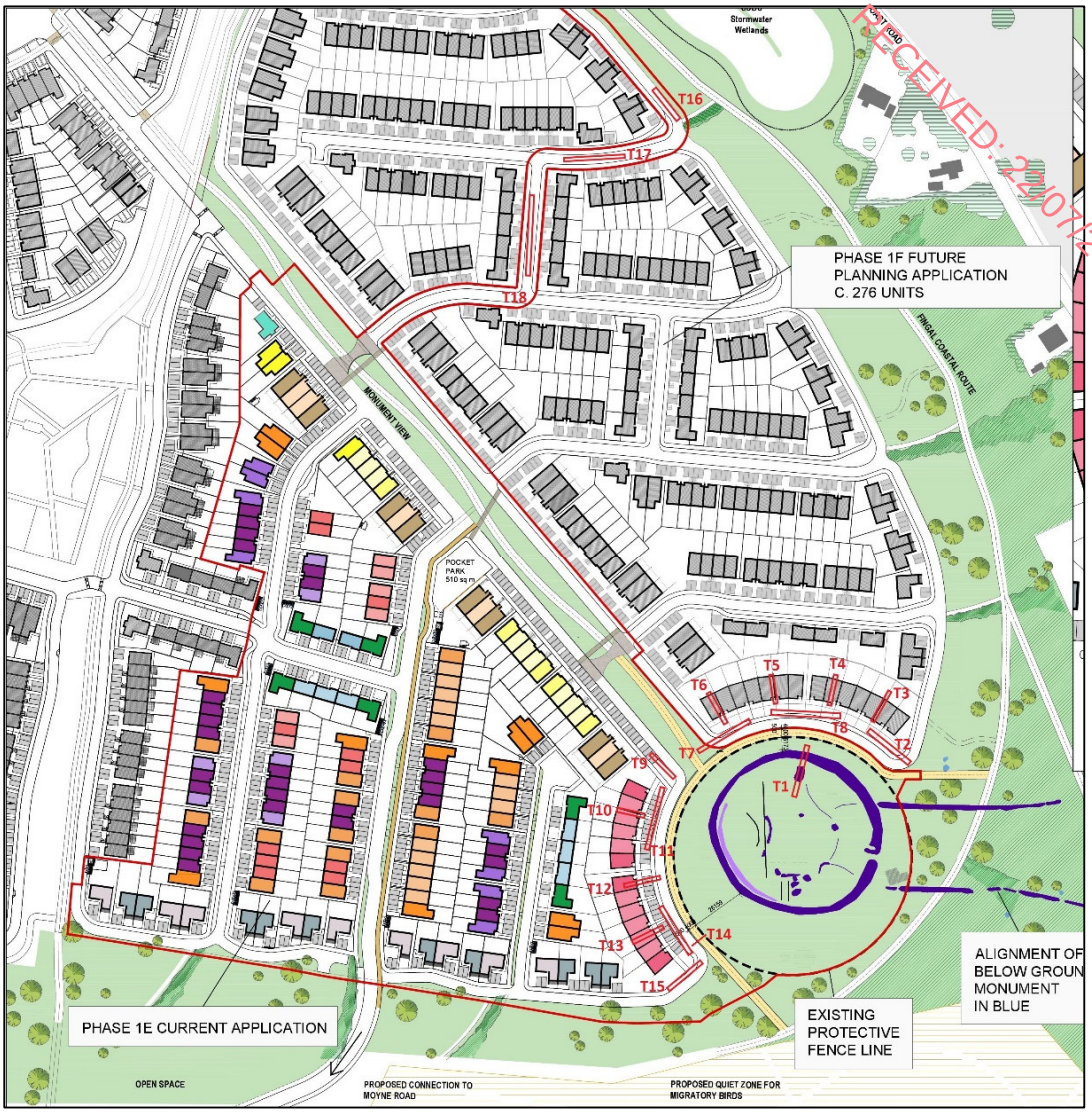




Figure 10 Testing layout, trenches T1 - T18

## 4.2. Methodology

All trenches were excavated to the surface of archaeological or potential archaeological deposits or to the underlying natural subsoil, whichever was encountered first. Any potential archaeological features were cleaned and sectioned where necessary, to establish their nature, extent and character. Photographs, plans and context recording sheets were used to record any features of potential archaeological interest.

## 4.3. Summary of Test Trenches T1-T18

The natural subsoil across the testing area generally comprised compact silty sand, varying from grey-yellow, to yellow-grey and brown-grey. Trench widths varied depending on which machine was used, from 1.5m (T1), to 2.1m (T6-T9), to 2.5m (T2-T4 and T10-T18).

Table 1 Summary of trench results T1 – T18

| Trench | Results | Interpretation |
|---|---|---|
| 1 | Ditch & pit | Enclosure ditch and large internal waste pit containing deposit of disarticulated human bones. |
| 2 | 2 shallow linear features & 1 large linear ditch | Linear ditch and shallow linear feature likely to be associated with enclosure DU015-055. Also a shallow linear that post-dates the ditch, but may also be of archaeological interest. |
| 3 | Ditch WSW-ESE | Linear ditch, likely to be associated with enclosure DU015-055. |
| 4 | No features | No features of archaeological interest |
| 5 | No features | No features of archaeological interest |
| 6 | Modern ditch | No features of archaeological interest |
| 7 | Modern drain | No features of archaeological interest |
| 8 | No features | No features of archaeological interest |
| 9 | Modern ditch & modern drain | No features of archaeological interest |
| 10 | No features | No features of archaeological interest |
| 11 | Modern ditch | Modern field boundary ditch oriented roughly N-S. Not of archaeological interest. |
| 12 | Modern ditch | Modern field boundary ditch oriented roughly N-S. Not of archaeological interest. |
| 13 | No features | No features of archaeological interest |
| 14 | No features | No features of archaeological interest |
| 15 | No features | No features of archaeological interest |
| 16 | Modern drain | No features of archaeological interest |
| 17 | Modern drains | No features of archaeological interest |
| 18 | Modern drains & modern disturbance | No features of archaeological interest |

Table 2 Summary of Trench 1

| General Description | | | |
|---|---|---|---|
| Oriented NNE-SSW, 23.5m long x 1.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.36m | Topsoil | Topsoil |
| C2 | 0.36m | Compact yellow-grey silty sand | Natural subsoil |
| C6 | 0.36 – 0.86m | Light yellow-grey clayey silt with occasional seashell, animal bone & slag inclusions, 0.6m deep. | Upper fill of enclosure ditch C7 |
| C7 | 0.36 – 2.12m | Substantial enclosure ditch, 7.1m wide x 1.76m deep with steep sides and a flat base. Filled with C6, C27-C30 | Enclosure ditch |
| C8 | 0.36m – 0.71m | Loose fine-grained sand, contains some seashell (cockles & mussels), charcoal, animal bone & slag | Upper fill of large waste pit C9 |
| C9 | 0.36 – 1.61m+ | Large pit, 8.3m long(N-S), sondage excavated from the centre to the south edge. The cut is shallow for c.2m at the south edge and then it drops away steeply. The base of the pit was not reached due to rising groundwater. Depth 1.25m+. Filled with C8, C21-C25 | Large waste pit which also contained human remains |
| C20 | 0.36 – 0.49m | Linear feature, oriented N-S, 0.5m wide x 0.13m deep, gradual sides, flat base, single mid brown fill | Modern linear, probable furrow |

| General Description | | | |
|---|---|---|---|
| Oriented NNE-SSW, 23.5m long x 1.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C21 | 0.71 – 0.88m | Very loose, grey-brown, fine silty sand with ash, charcoal, and abundant seashell (mostly cockle, also mussel & periwinkle). Iron find: 22E0509:1. | Upper fill of pit C9, under C8, over C22. Domestic waste / feasting |
| C22 | 0.88 – 1.06m | Very loose, mid grey fine silty sand, mottled with yellow sand. Inclusions of charcoal | Fill of pit C9, under C21, over C23. |
| C23 | 1.06 – 1.14m | Loose brown-grey clayey sand mottled with ashy(?) yellow-orange fine sand. Inclusions of charcoal and seashell | Fill of pit C9, under C22, over C24 |
| C24 | 1.14 – 1.44m | Compact brown-grey sandy clay with abundant inclusions of seashell (mostly mussel). Also occasional animal bone, charcoal & slag. Also mottled with orange staining – possibly mineral inclusions. This fill extends into the shallow south end of the pit where it contains a deposit of disarticulated human bones. Iron find: 22E0509:2. | Fill of pit C9, under C23, over C25. *contains disarticulated human bones |
| C25 | 1.44 – 1.61m | Loose mid-grey coarse clayey sand, with inclusions of animal bone, slag, timber & seashell. Waterlogged. | Fill of pit C9, under C24, possibly basal fill (base was not reached) |
| C27 | 0.86 – 1.26m | Compact mid-grey silty sand with some clay in it. Abundant seashell inclusions, mostly cockle, slumping into the ditch from the inner (south) edge. Also animal bone inclusions. | Upper fill of enclosure ditch C7, under C6, over C28 |
| C28 | 1.26 – 1.54m | Loose mottled orange-brown gravelly sand, occasional seashell & animal bone inclusions | Middle fill of enclosure ditch C7, under C27, over C29 |
| C29 | 1.54 – 1.98m | Dark red-brown peaty clay, organic layer, strong organic smell. Very occasional seashell and animal bone inclusions. Waterlogged. | Secondary fill of enclosure ditch C7, under C28, over C30 |
| C30 | 1.98 – 2.12m | Very compact dark grey marl clay with frequent inclusions of small stones. No other inclusions | Basal fill of enclosure ditch C7, under C29 |

Trench T1 was placed within the buffer zone surrounding enclosure DU015-055 to target both the enclosure ditch and a large internal anomaly, both of which were indicated on the geophysical survey of the site (Figure 11). The aim in testing these features was to recover any information that could assist in an understanding of the site which is to be preserved in situ. Both the enclosure ditch and the large pit were identified in the test trench and sections of both features were excavated by hand. The ditch (C7) was substantial, measuring 7.1m wide x 1.76m deep and contained several fills which contained inclusions of animal bone, seashell and slag (Plate 5, Figure 12).

A sample of a cattle mandible from the secondary fill of the enclosure ditch (C29) yielded a radiocarbon date range of 1176+/-24 BP, cal AD 774-952 (2 sigma) (UBA 49765, Appendix 5.5).

The large pit (C9), which appeared to be oval in plan in the geophysical survey measured 8.3m long (north-south). A test section was excavated from the centre of the pit to the southern edge, and it contained multiple fills with inclusions of animal bone, seashell, charcoal and slag. The test section was excavated to a depth of 1.25m and the base was not reached due to rising groundwater (Plate 6, Figure 13). The animal bone and seashell are evidence of food waste, and the slag, identified as smithing hearth cakes are evidence of blacksmithing contemporary with the enclosure (Rondelez, Appendix 5.4). A large annular iron ring was recovered from one of the upper

fills of pit C9 (22E0509:1) and may have been used as a pull handle or a suspension loop (Mac Dermott, Appendix 5.3)

An unusual inclusion in the shallow southern end of the pit was a deposit of disarticulated human bones (C24), which had been removed from elsewhere and re-interred in this pit. The skeletal remains were present at 0.4m below current ground level. A linear arrangement that did not relate to a cut may suggest that the bones were contained in a wrapping of some sort (Plate 7, Figure 14). Animal bones were also included with the deposit which was contained within a shell-rich soil that sloped down into the pit. An iron find, possibly a fragment of a knife blade was also recovered from this deposit (22E0509:2)(MacDermott, Appendix 5.3).

Analysis of the human bones revealed evidence for a minimum of 10 individuals, including at least five adults and a minimum of five non-adults ranging from 1.5 – 16 years. The adults included at least one male of 30-34 years, a male of 40+ years, and at least one female. Cranial trauma was noted in two individuals, with one of these having had a likely sharp force origin (Keating, Appendix 5.1).

A human femoral shaft fragment from the deposit (22E0509:3) yielded a radiocarbon date range of 1251+/-26 BP, cal AD 674-876 (2 sigma)(UBA 50542, Appendix 5.5).

The range of animal species recorded comprised the main domesticates of cattle, pig, sheep/goat, horse and red deer. All parts of the cattle were represented and butchery marks were noted indicating that cattle were probably brought to the site on the hoof and killed, butchered and eaten on site. The cattle bone assemblage also included a scapula that had a sub-circular perforation on the blade, indicative of a shoulder suspended on a hook for smoking suggesting a preserved joint of beef. Analysis was suggestive of the slaughter of animals across a range of ages and foetal cattle bones also indicate a pregnant cow on site. Analysis also suggested a relatively high occurrence of horse, although the assemblage was too small to be statistically viable, but the nearby excavated enclosures at Portmarnock also had a high incidences of horse, so it may be significant (Murray, Appendix 5.2).

Table 3 Summary of Trench 2

| **General Description** | | | |
|---|---|---|---|
| Oriented NW-SE, 23.5m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact grey-yellow silty sand | Natural subsoil |
| C10 | 0.4m – 0.5m | Linear feature, 0.5m wide x 0.1m deep, oriented E-W. Gradual sides & concave base. Fill is mottled grey-brown silty sand with inclusions of animal bone, charcoal & seashell | Shallow linear associated with enclosure DU015-055 |
| C11 | 0.4m – 0.66m | Linear feature, 0.6m wide x 0.22m deep, oriented NNE-SSW. Gradual sides and concave base. Fill is compact grey-brown silty sand with inclusions of charcoal, animal bone and seashell. Truncates the upper fill of ditch C15. | Shallow linear, post- dates backfilling of linear ditch C15, but possibly of archaeological interest |
| C12 | 0.4m – 0.65m | Loose, yellow- mid grey silty sand, inclusions of animal bone & charcoal | Upper fill of ditch C15 |
| C13 | 0.65 – 1.1m+ | Loose, dark yellow-grey silty sand with charred environmental remains (cereal & charcoal), seashell & animal bone | Main / lower fill of ditch C15 |
| C14 | 0.65 – 1.1m+ | Charcoal layer with charred cereals | Lower fill in ditch C15 |

| General Description | | | |
|---|---|---|---|
| Oriented NW-SE, 23.5m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C15 | 0.4m – 1.1m+ | Linear ditch, oriented E-W, 2.6m wide x 0.7m+ deep, stepped sides, base not reached due to groundwater. Contained fills C12-C14 | Linear ditch associated with enclosure DU015-055 |

Trench T2 was placed to test an area outside the buffer zone to the north of enclosure DU015-055. Three linear features were identified in the trench, all of which appear to be archaeological in nature. Linear ditch C15 was oriented roughly E-W and measured 2.6m wide and in excess of 0.7m deep (Plate 8, Figure 15). The nature of the fills which contained animal bone, seashell and charred environmental remains suggests that this feature was associated with the ditched enclosure to the south. A smaller linear feature with the same orientation (C10) measured 0.5m wide x 0.1m deep and also contained inclusions of animal bone, charcoal and seashell. The function of this feature was not apparent but based on the inclusions in the fill it is also likely to be associated with the enclosure to the south. Linear feature C11 truncated the upper fill of linear ditch C15 and therefore post-dated the backfilling of that feature, however this feature may also be of archaeological interest.

Table 4 Summary of Trench 3

| General Description | | | |
|---|---|---|---|
| Oriented NNE-SSW, 17m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.35m | Topsoil | Topsoil |
| C2 | 0.35m | Compact grey-yellow silty sand | Natural subsoil |
| C16 | 0.35m – 0.77m | Compact stony, yellow, grey silty sand, with animal bone and seashell inclusions | Upper fill in ditch C19 |
| C17 | 0.77m – 1.4m | Loose stony grey-yellow silty sand with inclusions of animal bone, seashell and land shell | Redeposited natural fill on edges of ditch C19 |
| C18 | 0.77m – 1.4m | Mixed fill of mid-dark grey silty clay and mid brown silty sand with inclusions of animal bone, seashell and land shell | Basal fill in ditch C19 |
| C19 | 0.35m – 1.4m | Linear ditch, WSW-ENE, 3.3m wide and 1.05m deep, steep sides and flat base. Contained fills C16-C18 | Linear ditch associated with enclosure DU015-055 |

Trench T3 was placed to test an area outside the buffer zone to the north of enclosure DU015-055. A linear ditch was identified in the centre of the trench, oriented west-southwest – east-northeast (C19) and contained three fills, all of which contained seashell and animal bone (Plate 9, Figure 16). Based on the substantial size of the ditch, inclusions and similarity of the fills to those identified in the enclosure ditch in T1, this feature is deemed to be of archaeological interest and is likely to be associated with the ditched enclosure.

Table 5 Summary of Trench 4

| General Description | | | |
|---|---|---|---|
| Oriented NNE-SSW, 17m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.3m | Topsoil | Topsoil |
| C2 | 0.3m | Compact yellow-grey silty sand | Natural subsoil |

Trench T4 was placed to test an area outside the buffer zone to the north of enclosure DU015-055 (Plate 10). No features or finds of archaeological interest were identified.

Table 6 Summary of Trench 5

| General Description | | | |
|---|---|---|---|
| Oriented NNW-SSE, 17m long x 2.1m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact yellow-grey silty sand | Natural subsoil |

Trench T5 was placed to test an area outside the buffer zone to the north of enclosure DU015-055. No features or finds of archaeological interest were identified.

Table 7 Summary of Trench 6

| General Description | | | |
|---|---|---|---|
| Oriented NNW-SSE, 17m long x 2.1m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact grey-yellow silty sand | Natural subsoil |
| C5 | 0.4m – 0.7m | Linear feature, oriented SW-NE, 1.5m wide x 0.3m deep. Contained a single fill of mid brown silty sand with modern inclusions. | Modern drainage ditch |

Trench T6 was placed to test an area outside the buffer zone to the north of enclosure DU015-055. A linear ditch was identified in the trench, oriented southwest-northeast and its fill contained modern inclusions. No features or finds of archaeological interest were identified.

Table 8 Summary of Trench 7

| General Description | | | |
|---|---|---|---|
| Oriented NE-SW, 30.7m long x 2.1m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.45m | Topsoil | Topsoil |
| C2 | 0.45m | Compact grey-yellow silty sand | Natural subsoil |

Trench T7 was placed to test an area outside the buffer zone to the north of enclosure DU015-055. A linear drain was identified in the trench, oriented north-south. No features or finds of archaeological interest were identified.

Table 9 Summary of Trench 8

| General Description | | | |
|---|---|---|---|
| Oriented E-W, 35m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact yellow-grey silty sand | Natural subsoil |

Trench T8 was placed to test an area outside the buffer zone to the north of enclosure DU015-055 (Plate 11). No features or finds of archaeological interest were identified.

Table 10 Summary of Trench 9

| General Description | | | |
|---|---|---|---|
| Oriented SW-NE, 16.5m long x 2.1m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact grey-yellow silty sand | Natural subsoil |
| C3 | 0.4m – 0.7m | Linear feature, oriented NW-SE, 1.5m wide x 0.3m deep, steep sides & flat base, stony fill | Modern drain |
| C4 | 0.4m – 0.8m | Linear feature, 2.2m wide x 0.4m deep, oriented roughly N-S, single fill – loose mid brown silty sand with modern inclusions | Modern field boundary ditch |

Trench T9 was placed to test an area outside the buffer zone to the west of enclosure DU015-055. Two linear features were identified; a drain oriented NW-SE (C3) and a field boundary ditch (C4) oriented roughly north-south. Ditch C4 was also identified in T11 and T12. Both features contained modern inclusions. No features or finds of archaeological interest were identified.

Table 11 Summary of Trench 10

| General Description | | | |
|---|---|---|---|
| Oriented E-W, 17m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.38m | Topsoil | Topsoil |
| C2 | 0.38m | Compact brown-grey silty sand | Natural subsoil |

Trench T10 was placed to test an area outside the buffer zone to the west of enclosure DU015-055 (Plate 12). No features or finds of archaeological interest were identified.

Table 12 Summary of Trench 11

| General Description | | | |
|---|---|---|---|
| Oriented NNE-SSW, 29.3m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact yellow-grey silty sand | Natural subsoil |

Trench T11 was placed to test an area outside the buffer zone to the west of enclosure DU015-055. A modern field boundary ditch oriented north-south was identified in the trench and contained modern inclusions. This ditch was also identified in Trenches T12 and T9. No features or finds of archaeological interest were identified.

Table 13 Summary of Trench 12

| General Description | | | |
|---|---|---|---|
| Oriented WSW-ENE, 17m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact brown-grey silty sand | Natural subsoil |

Trench T12 was placed to test an area outside the buffer zone to the west of enclosure DU015-055. A modern field boundary ditch oriented north-south was identified in the trench and contained modern inclusions. This ditch was also identified in Trenches T11 and T9. No features or finds of archaeological interest were identified.

Table 14 Summary of Trench 13

| General Description | | | |
|---|---|---|---|
| Oriented SW-NE, 17m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.43m | Topsoil | Topsoil |
| C2 | 0.43m | Compact brown-grey silty sand | Natural subsoil |

Trench T13 was placed to test an area outside the buffer zone to the southwest of enclosure DU015-055. No features or finds of archaeological interest were identified.

Table 15 Summary of Trench 14

| General Description | | | |
|---|---|---|---|
| Oriented NW-SE, 25m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.34m | Topsoil | Topsoil |
| C2 | 0.34m | Compact brown-grey silty sand | Natural subsoil |

Trench T14 was placed to test an area outside the buffer zone to the southwest of enclosure DU015-055. No features or finds of archaeological interest were identified.

Table 16 Summary of Trench 15

| General Description | | | |
|---|---|---|---|
| Oriented SW-NE, 20.2m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.4m | Topsoil | Topsoil |
| C2 | 0.4m | Compact brown-grey silty sand | Natural subsoil |

Trench T15 was placed to test an area outside the buffer zone to the southwest of enclosure DU015-055 (Plate 13). No features or finds of archaeological interest were identified.

Table 17 Summary of Trench 16

| General Description | | | |
|---|---|---|---|
| Oriented NW-SE, 20.3m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.45m | Topsoil | Topsoil |
| C2 | 0.45m | Very compact yellow-grey stony silty sand | Natural subsoil |

Trench T16 was placed to test the route of a proposed pipeline to the north of the proposed Phase 1E development area. A linear drain oriented northeast-southwest was present in the trench (Plate 14). No features or finds of archaeological interest were identified.

Table 18 Summary of Trench 17

| General Description | | | |
|---|---|---|---|
| Oriented east-west, 29m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.55m | Topsoil | Topsoil |
| C2 | 0.55m | Compact grey-yellow stony silty sand | Natural subsoil |

Trench T17 was placed to test the route of a proposed pipeline to the north of the proposed Phase 1E development area. A series of linear drains oriented north-south were present in the trench, as well as one oriented northwest-southeast. No features or finds of archaeological interest were identified.

Table 19 Summary of Trench 18

| General Description | | | |
|---|---|---|---|
| Oriented north-south, 20.5m long x 2.5m wide | | | |
| **Context No.** | **Depth** | **Description** | **Interpretation** |
| C1 | 0.00 – 0.55m | Topsoil | Topsoil |
| C2 | 0.55m | Compact grey-yellow silty sand | Natural subsoil |

Trench T18 was placed to test the route of a proposed pipeline to the north of the proposed Phase 1E development area. Two modern drains were present in the trench, oriented NE-SW and roughly E-W, as well as an area of modern disturbance in the north of the trench. No features or finds of archaeological interest were identified.

## 5. SUMMARY OF FINDS AND ENVIRONMENTAL MATERIAL

The assemblage consists of human bone comprising the remains of a minimum of 10 individuals including at least 5 adults, animal bone (10.5kgs), two iron finds, metallurgical waste (1.436kgs) and environmental remains including charcoal and charred plant remains.

### 5.1 Human Bone (Keating, D. Appendix 5.1)

The disarticulated remains presented evidence of a minimum of 10 individuals. Within the assemblage, there was evidence for at least 5 adults. These included at least 1 male of 30-34 years, a male of 40+ years, and at least 1 female. A minimum of five non-adults were represented within the assemblage and these ranged in age from 1.5 to 16 years.

Despite their disarticulated and disorganised deposition, the remains were well preserved. Dental pathology revealed indications of developmental stress which had been suffered during childhood. Metabolic stress was observed in both the adult and non-adult cohort, in the form of cribra orbitalia, and likely indicates a type of anaemia. Cranial trauma was also noted in two individuals, with one of these having had a likely sharp force origin.

### 5.2 Animal Bone (Murray, E. Appendix 5.2)

The range of species recorded comprised the main domesticates of cattle (72% NISP), pig (14%), sheep/goat (7%), horse (6%) and red deer (1%). This pattern of relative frequency, cattle followed by pig and then sheep/goat, is replicated across the features excavated.

### 5.3 Metal finds (MacDermott, J. Appendix 5.3)

2 iron objects were recovered from different fills of a large pit within the interior of the enclosure – a large iron ring and a fragment of an iron knife-blade.

### 5.4 Metallurgical waste (Rondelez, P. Appendix 5.4)

A small assemblage of metalworking waste (1436g) comprising smithing hearth cakes was recovered during testing. The material consisted of blacksmithing debris and indicates that forging activities took place within and associated with the enclosure.

### 5.5 Radiocarbon dating (Chrono Lab, QUB), Appendix 5.5)

Three samples of bone were selected for radiocarbon dating and the results are consistent with the early medieval radiocarbon date obtained by Moriarty in a previous phase of testing (Moriarty, 2009).

Sample 15, a cattle mandible fragment from a lower fill of the enclosure ditch (C29) returned a date range of 1176+/- 24 BP which was calibrated to 774-952 cal AD (2 sigma, QUB 49765).

A sample of a human femur (22E0509:3) from C24 returned a date range of 1251+/-26 BP, which was calibrated to 674-876 cal AD (2 sigma, QUB 50542).

A cattle radius fragment from pit fill C25 failed (QUB 49764).

## 6. CONCLUSIONS AND FURTHER RECOMMENDATIONS

The aims of the testing were threefold. Trenches T2 – T15 were placed to assess the area closest to ditched enclosure DU015-055, to establish if there were any associated features in this area. Trenches T16-T18 were placed to assess the route of a pipeline to the north of the phase 1E development area and T1 was placed within the protected area surrounding the enclosure and aimed to test the enclosure ditch and a large internal pit as indicated in the geophysical survey of the monument. The purpose of testing the ditch and pit in T1 was to attempt to gather any information which could assist in an understanding of the site which is to be preserved *in situ* and to inform interpretive signage which will be placed at the site.

Archaeological remains were identified in trenches T1, T2 and T3 and no features, deposits or finds of archaeological interest were identified in any of the other trenches.

### 6.1. Summary of T1 results

The enclosure ditch (C7) was substantial, measuring 7.1m wide x 1.76m deep and contained several fills which contained inclusions of animal bone, seashell and slag.

The large pit in the interior of the enclosure (C9) measured 8.3m long (north-south). It contained multiple fills with inclusions of animal bone, seashell, charcoal and slag. The test section was excavated to a depth of 1.25m and the base was not reached due to rapid ingress of water from below. The animal bone and seashell are evidence of food waste, and the slag, identified as smithing hearth cakes is evidence of blacksmithing activity at the site.

An unusual inclusion in the shallow southern end of the pit was a deposit of disarticulated human bones, which had been removed from elsewhere and re-interred in this pit. A linear arrangement (NE-SW) that did not relate to a cut may suggest that the bones were contained in a wrapping of some sort. The deposit of bones represents a minimum of ten individuals including at least five adults and a minimum of five non-adults ranging from 1.5-16 years and cranial trauma was noted in two individuals. The bones were present at 0.4m below current ground level and animal bones were included within the deposit.

Dating of a sample of animal bone from the secondary fill of the enclosure ditch yielded a date range of cal AD 774-952 and a fragment of human bone yielded a date range of cal AD 674-876. These dates align well with a date retrieved from a previous phase of testing in 2008 (Moriarty, 2009) and with the dating of three other enclosures excavated nearby in Portmarnock townland (McLoughlin, 2019a, 2019b, 2022).

Cattle dominated the animal bone assemblage, and were likely brought to the site on the hoof and killed, butchered and eaten on site. A perforated cattle scapula appears to indicate a shoulder of beef suspended on a hook, possibly for smoking and may indicate a preserved joint of beef. A relatively high incidence of horse was also noted, and while the assemblage was too small to be statistically viable, a high incidence of horse was also noted at adjacent sites in Portmarnock, so it may be significant.

### 6.2. Summary of T2 & T3 results

Two linear ditches and two smaller linear features likely to be associated with sub-surface enclosure DU015-055 were identified in trenches T2 and T3 to the northeast of the enclosure. Ditch C19 was identified in T3 and was oriented WSW-ENE. It measured 3.3m wide, 1.05m deep and contained three fills, all of which contained seashell and animal bone. Ditch C15 was oriented

E-W, measured 2.6m wide and in excess of 0.7m deep. The full depth of this ditch was not reached due to rapid water ingress from below. Three distinct fills were noted, which contained animal bone, seashell and charred environmental remains. The nature of the fills in both ditches suggests that these features were associated with the ditched enclosure.

### 6.3. Impacts

**Trenches T2 & T3**

The area containing the linear ditches identified in trenches T2 and T3 is within an area of proposed housing in future Phase 1F of a larger phased development. If housing proceeds in this area as planned, the archaeological features in this area will be removed.

**Trench 1 (Enclosure DU015-055)**

Enclosure DU015-055 is scheduled for preservation *in situ*, so there are no anticipated direct impacts from the proposed development.

### 6.4. Recommendations

**Trenches T2 & T3**

It is recommended that the linear features thought to be associated with the ditched enclosure be fully archaeologically resolved in advance of development. This should entail the full archaeological excavation of an area measuring approximately 40m SW-NE x 30m NW-SE under licence to the DHLGH.

**Enclosure DU015-055**

While there are no anticipated direct impacts from the proposed development, the buffer zone currently surrounding the monument should be maintained during construction, and no construction related activity or storage of materials should take place within this area.

A plan for landscaping the area should be agreed in advance with the archaeologist to ensure that the methodology proposed will allow suitable protection to the below ground archaeological remains, with particular emphasis on human skeletal remains which were identified at 0.4m below the current ground level.

*Please note that all recommendations are subject to approval by the National Monuments Service in the Department of Housing, Local Government and Heritage.*

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### 7.1. Online Sources

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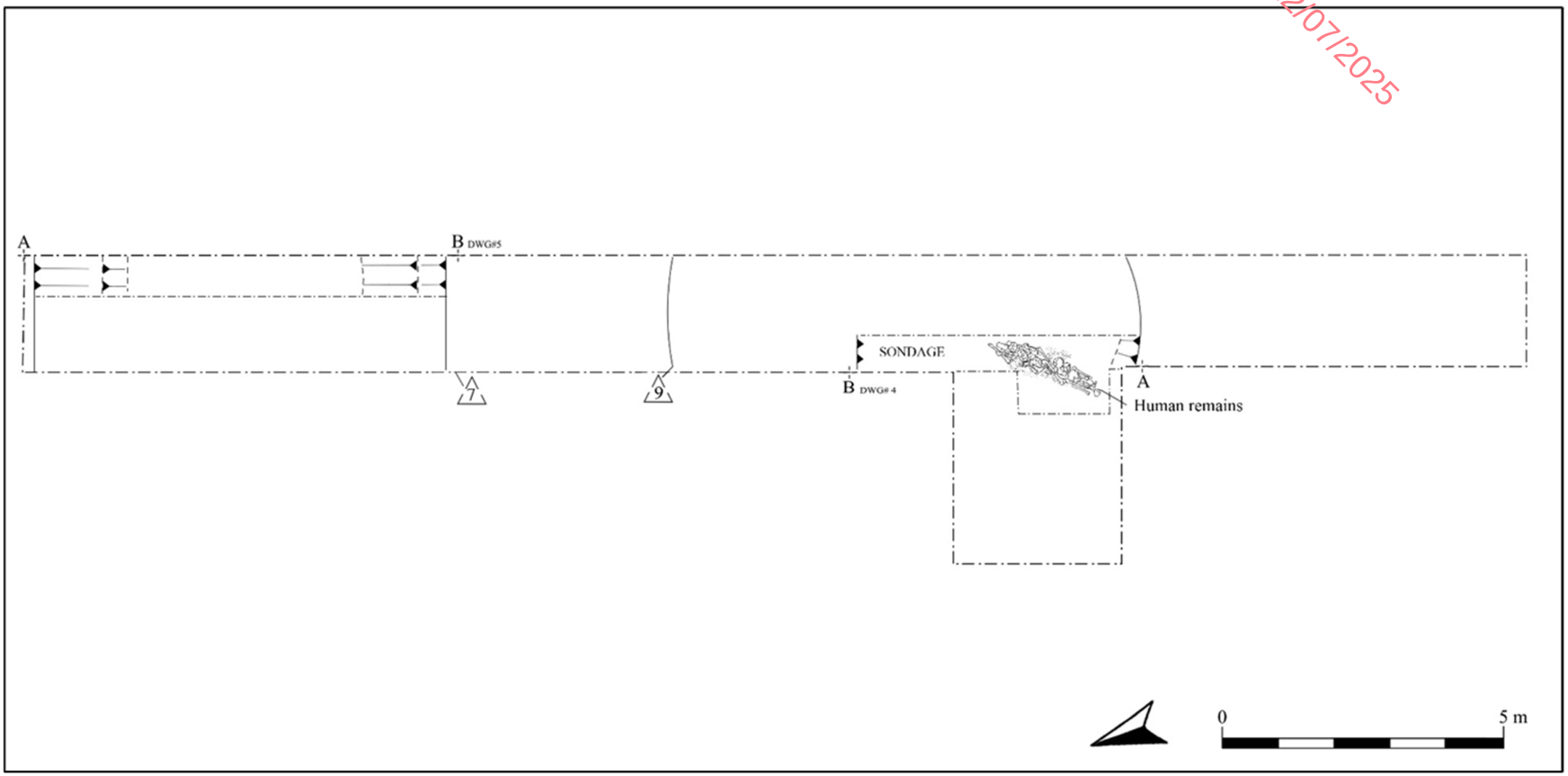


Figure 11 Trench T1 showing enclosure ditch C7, pit C9 and human skeletal remains

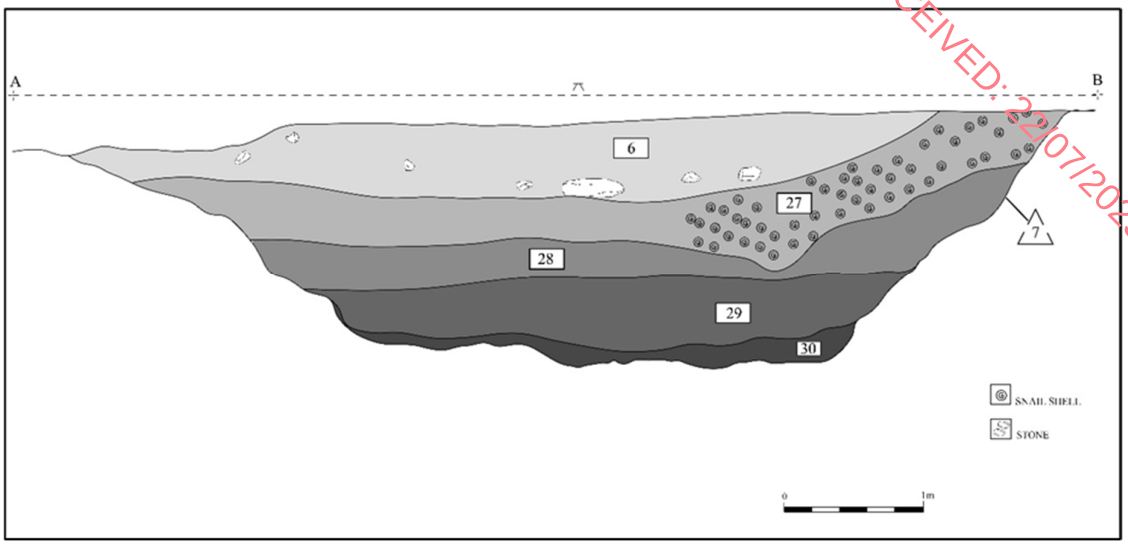


Figure 12 West facing section of enclosure ditch C7

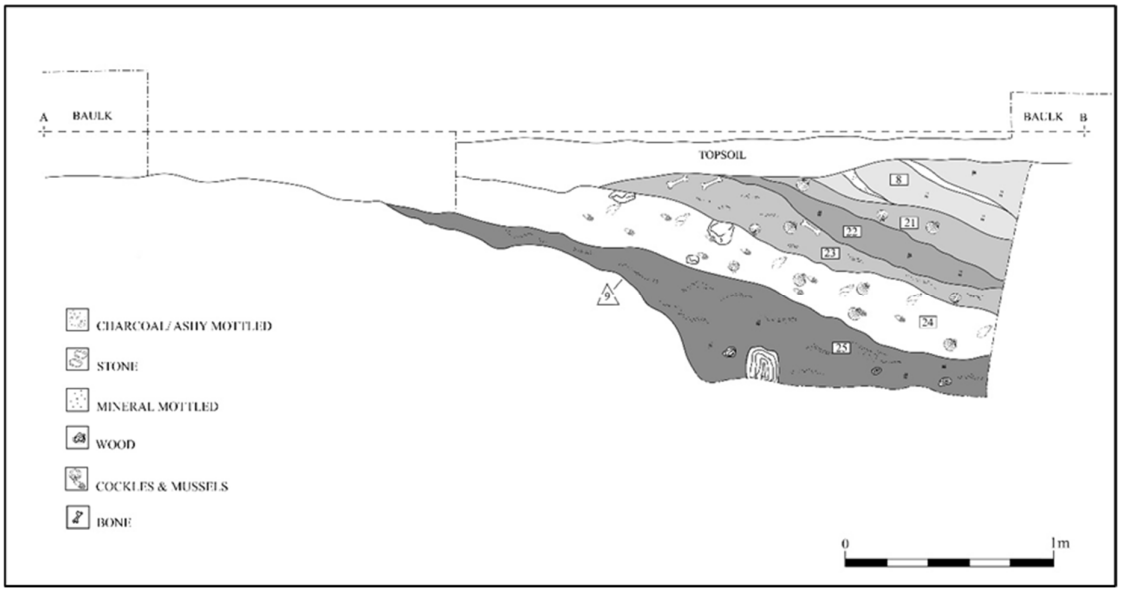


Figure 13 East facing section of pit C9

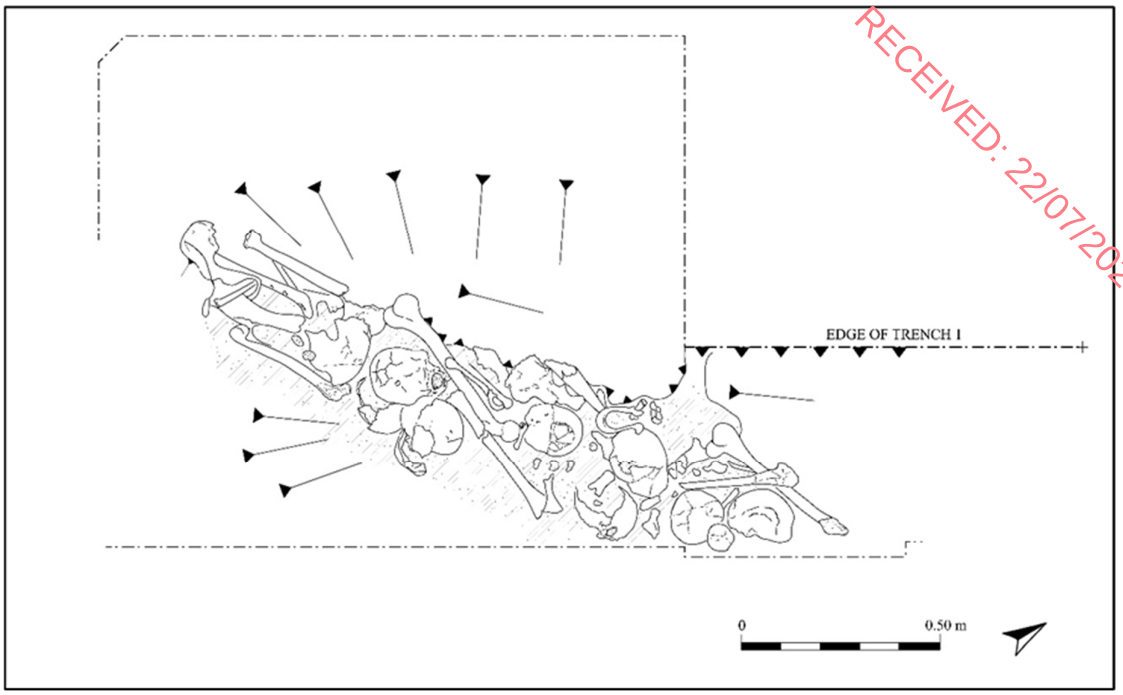


Figure 14 Human skeletal remains in T1

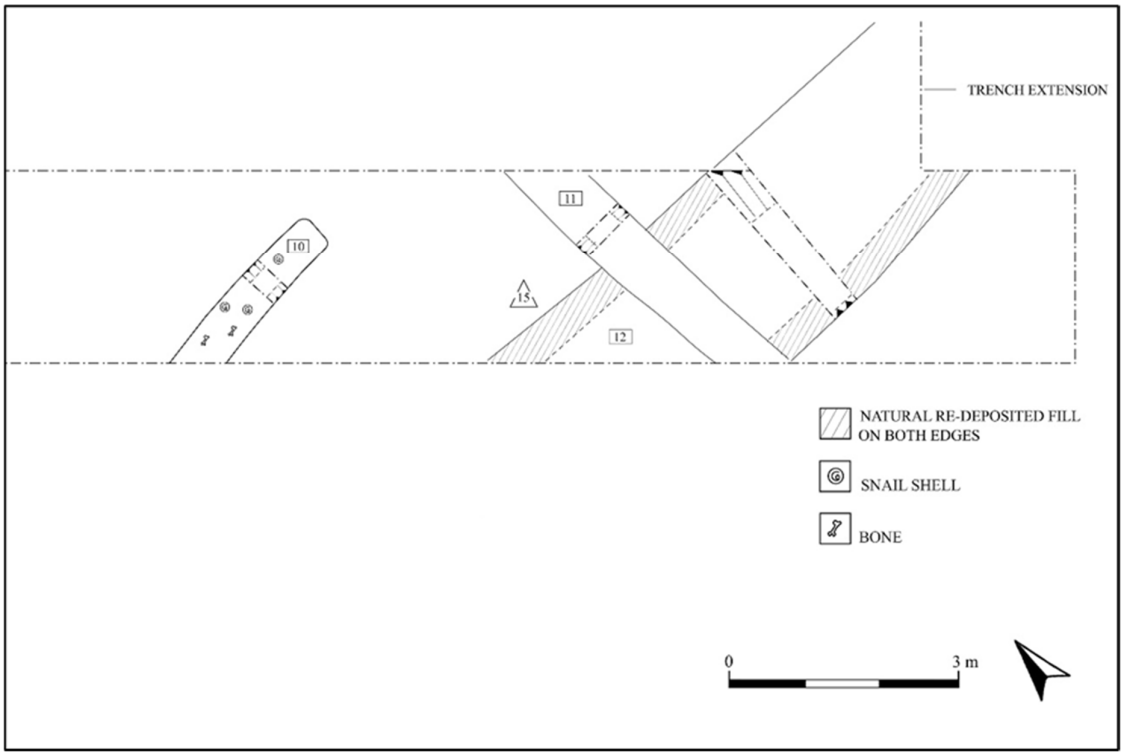


Figure 15 Trench T2 showing linear ditch C15 and shallow linear features C10 & C11

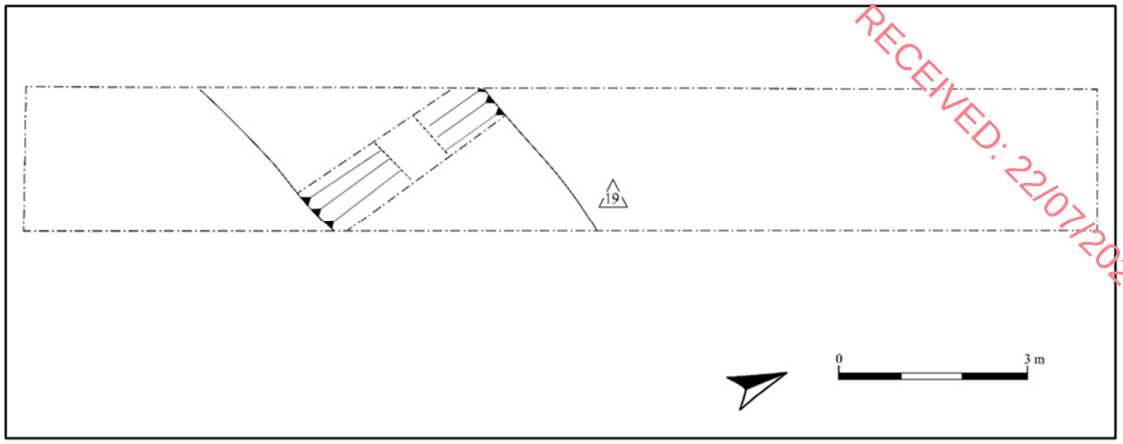




Figure 16 Trench T3, showing linear ditch C19

**Plates**



Plate 1 Drone view of testing within and around enclosure DU015-055

Plate 2 Drone view of Trench 1, within buffer zone around enclosure DU015-055

Plate 3 Drone view of testing at enclosure DU015-055, with view of Portmarnock Estuary, Howth and Ireland's Eye

Plate 4 Drone view of testing at enclosure DU015-055, with view of Portmarnock Estuary and Lambay Island

Plate 5 Trench 1, section of enclosure ditch C7, looking NE

Plate 6 Trench 1, section of pit C9, looking SW

Plate 7 Trench 1, deposit of human skeletal remains, section of pit C9 in the background

Plate 8 Trench 2, section of linear ditch C15, looking SE

Plate 9 Trench 3, section of linear ditch C19, looking SW

Plate 10 Trench 4, looking SSW

Plate 11 Trench 8, looking E

Plate 12 Trench 10, looking W

Plate 13 Trench 15, looking SW

Plate 14 Trench 16, looking NW

## APPENDIX 1 CONTEXT RECORD



| Context No. | Cut / fill/ other | Description | Trench |
|---|---|---|---|
| C1 | Layer | Topsoil | All |
| C2 | Layer | Natural subsoil | All |
| C3 | Fill | Linear feature, oriented NW-SE, 1.5m wide x 0.3m deep, steep sides & flat base, stony fill. Modern drain. | T9 |
| C4 | Fill | Linear feature, 2.2m wide x 0.4m deep, oriented roughly N-S, single fill – loose mid brown silty sand with modern inclusions. Modern field boundary ditch. | T9 |
| C5 | Fill | Linear feature, oriented SW-NE, 1.5m wide x 0.3m deep. Contained a single fill of mid brown silty sand with modern inclusions. Modern drainage ditch. | T6 |
| C6 | Fill | Light yellow-grey clayey silt with occasional seashell, animal bone & slag inclusions, 0.6m deep. Upper fill of enclosure ditch C7. | T1 |
| C7 | Cut | Substantial enclosure ditch, 7.1m wide x 1.76m deep with steep sides and a flat base. Filled with C6, C27-C30. | T1 |
| C8 | Fill | Loose, fine-grained sand, contains some seashell (cockles & mussels), charcoal, animal bone & slag. Upper fill of large waste pit C9, also contained human remains. | T1 |
| C9 | Cut | Large pit, 8.3m long(N-S), sondage excavated from the centre to the south edge. The cut is shallow for c.2m at the south edge and then it drops away steeply into the centre of the pit. The base of the pit was not reached due to rising groundwater. Depth 1.25m+. Filled with C8, C21-C25. | T1 |
| C10 | Fill | Linear feature, 0.5m wide x 0.1m deep, oriented E-W. Gradual sides & concave base. Fill is mottled grey-brown silty sand with inclusions of animal bone, charcoal & seashell. Shallow linear associated with enclosure DU015-055. | T2 |
| C11 | Fill | Shallow linear feature, 0.6m wide x 0.22m deep, oriented NNE-SSW. Gradual sides and concave base. Fill is compact grey-brown silty sand with inclusions of charcoal, animal bone and seashell. Truncates the upper fill of ditch C15. Post-dates backfilling of linear ditch C15, but possibly of archaeological interest. | T2 |
| C12 | Fill | Loose, yellow- mid grey silty sand, inclusions of animal bone & charcoal. Upper fill of ditch C15. | T2 |
| C13 | Fill | Loose, dark yellow-grey silty sand with charred environmental remains (cereal & charcoal), seashell & animal bone. Main / lower fill of ditch C15. | T2 |
| C14 | Fill | Charcoal layer with charred cereals. Lower fill in ditch C15. | T2 |
| C15 | Cut | Linear ditch, oriented E-W, 2.6m wide x 0.7m+ deep, stepped sides, base not reached due to groundwater. Contained fills C12-C14. Associated with enclosure DU015-055. | T2 |
| C16 | Fill | Compact stony, yellow, grey silty sand, with animal bone and seashell inclusions. Upper fill in ditch C19. | T3 |
| C17 | Fill | Loose stony grey-yellow silty sand with inclusions of animal bone, seashell and land shell. Redeposited natural fill on edges of ditch C19. | T3 |
| C18 | Fill | Mixed fill of mid-dark grey silty clay and mid brown silty sand with inclusions of animal bone, seashell and land shell. Basal fill in ditch C19. | T3 |
| C19 | Cut | Linear ditch, 3.3m wide and 1.05m deep, steep sides and flat base. Contained fills C16-C18. Associated with enclosure DU015-055. | T3 |
| C20 | Fill | Linear feature, oriented N-S, 0.5m wide x 0.13m deep, gradual sides, flat base, single mid brown fill. Modern linear, probable furrow. | T1 |
| C21 | Fill | Very loose, grey-brown, fine silty sand with ash, charcoal, and abundant seashell (mostly cockles, also mussel & periwinkle). Upper fill of pit C9, under C8, over C22. Domestic wate / feasting. | T1 |
| C22 | Fill | Very loose, mid grey fine silty sand, mottled with yellow sand. Inclusions of charcoal. Fill of pit C9, under C21, over C23. | T1 |
| C23 | Fill | Loose brown-grey clayey sand mottled with ashy(?) yellow-orange fine sand. Inclusions of charcoal and seashell. Fill of pit C9, under C22, over C24. | T1 |

| Context No. | Cut / fill/ other | Description | Trench |
|---|---|---|---|
| C24 | Fill | Compact brown-grey sandy clay with abundant inclusions of seashell (mostly mussel). Also occasional animal bone, charcoal & slag. Also mottled with orange staining – possibly mineral inclusions. This fill extends into the shallow south end of the pit where it contains a deposit of disarticulated human bones. Fill of pit C9, under C23, over C25. | T1 |
| C25 | Fill | Loose mid-grey coarse clayey sand, with inclusions of animal bone, slag, timber & seashell. Fill of pit C9, under C24, possibly basal fill (base was not reached). Waterlogged. | T1 |
| C26 | | void = C6 | |
| C27 | Fill | Compact mid-grey silty sand with some clay in it. Abundant seashell inclusions, mostly cockle, slumping into the ditch from the inner (south) edge. Also animal bone inclusions. Upper fill of enclosure ditch C7, under C6, over C28. | T1 |
| C28 | Fill | Loose mottled orange-brown gravelly sand, occasional seashell & animal bone inclusions. Middle fill of enclosure ditch C7, under C27, over C29. | T1 |
| C29 | Fill | Dark red-brown peaty clay, organic layer, strong organic smell. Very occasional seashell and animal bone inclusions. Waterlogged. Secondary fill of enclosure ditch C7, under C28, over C30. | T1 |
| C30 | Fill | Very compact dark grey marl clay with frequent inclusions of small stones. No other inclusions. Basal fill of enclosure ditch C7, under C29. | T1 |

## APPENDIX 2 FINDS RECORD

| Find No. | Context No. | Description | Trench |
|---|---|---|---|
| 22E509:1 | C21 | Iron, annular ring, from fill of pit C9 | T1 |
| 22E509:2 | C24 | Iron, knife blade fragment, from under human remains in pit C9 | T1 |
| 22E509:3 | C24 | Human remains representing a minimum of 10 individuals | T1 |

## APPENDIX 3 SAMPLE RECORD

| Sample No. | Context No. | Type | Description | Trench |
|---|---|---|---|---|
| 1 | C12 | Bone | Animal bone from upper fill of ditch C15 | T2 |
| 2 | C13 | Cereal & charcoal | Retrieved from processed bulk soil sample from lower fill of ditch C15 | T2 |
| 3 | C13 | Bone | Animal bone from lower fill of ditch C15 | T2 |
| 4 | C18 | Bone | Animal bone from basal fill of ditch C19 | T3 |
| 5 | C8 | Bone | Animal bone from upper of pit C9 | T1 |
| 6 | C21-24 | Bone | Animal bone from mixed fills of pit C9 | T1 |
| 7 | C6 | Bone | Bone from upper fill of enclosure ditch C7 | T1 |
| 8 | C27 | Bone | Bone from seashell rich fill of enclosure ditch C7 | T1 |
| 9 | C28 | Bone | Bone from lower fill of enclosure ditch C7 | T1 |
| 10 | C24 | Bone | Bone from seashell rich lower fill of pit C9 (in the vicinity of human remains) | T1 |
| 11 | C24 | Slag | Slag from soil under skull within central cluster of human remains in pit C9 | T1 |
| 12 | C24 | Wood | Wood from lower fill of pit C9 | T1 |

| Sample No. | Context No. | Type | Description | Trench |
|---|---|---|---|---|
| 13 | C25 | Bone | Bone from basal fill of pit C9 | T1 |
| 14 | C24 | Slag | Slag from lower fill of pit C9 | T1 |
| 15 | C29 | Bone | Animal bone from lower fill of ditch C7, dark, peaty organic fill | T1 |
| 16 | C28 | Slag | Slag from middle fill of enclosure ditch C7 | T1 |
| 17 | C24 | Slag | Slag from lower shell layer of pit C9 | T1 |
| 18 | C8 | Slag | Slag from upper layer in pit C9 | T1 |
| 19 | C24 | slag | found inside skull (#15) (Pit C9) | T1 |
| 20 | C24 | charcoal | beneath pelvis (#3) (Pit C9) | T1 |
| 21 | C24 | seed | from skull (#17) | T1 |
| 22 | C24 | charcoal | from skull (#24) north cluster of human remains in pit C9 | T1 |
| 23 | C24 | Bone | Animal bone found within human remains, south cluster, in pit C9 | T1 |
| 24 | C24 | Bone | Misc. animal bone found within human remains, north cluster, in pit C9 | T1 |

## APPENDIX 4 ARCHIVE RECORD



The archive is currently stored at Lynwood House, Ballinteer Road, Dublin 16.

| | | |
|---|---|---|
| **Site Name: Maynetown, Co. Dublin (Portmarnock Phase 1E)** | COURTNEY • DEERY ARCHAEOLOGY & CULTURAL HERITAGE | |
| **Licence Number: 22E0509** | | |
| **Site Director: Gill McLoughlin** | | |
| **FIELD RECORDS** | **ITEMS / QUANTITY** | **COMMENTS** |
| **Site drawings (plans & sections)** | 6 | 4 plans & 2 sections (on 5 sheets) |
| **Site Registers** | 3 | Context, sample & drawing register |
| **Trench record sheets** | 18 | |
| **Digital photographs** | 197 | Includes 16 drone shots |
| | | |
| **Finds and environmental archive** | | |
| **Metal finds (iron)** | 2 | Large annular ring & a knife blade fragment (conserved) |
| **Human bone** | Disarticulated remains of at least 10 individuals | |
| **Animal bone** | 1.5kg weight / approx. 42 litres volume | |
| **Metallurgical waste** | 1436g | Blacksmithing debris |
| | | |
| **Security copy of archive** | yes | Digital backup & CDHC server |

## APPENDIX 5 SPECIALIST ANALYSIS OF FINDS AND ENVIRONMENTAL MATERIAL



| | |
|---|---|
| Appendix 5.1 | Human bone – Denise Keating |
| Appendix 5.2 | Animal bone – Emily Murray |
| Appendix 5.3 | Metal finds – Jacqueline Mac Dermott |
| Appendix 5.4 | Metallurgical waste – Paul Rondelez |
| Appendix 5.5 | Radiocarbon dating – Chrono Lab, QUB |

# THE DISARTICULATED HUMAN REMAINS FROM MAYNETOWN, CO. DUBLIN 22E0509

D Keating feb 2023

**Contents**

# 1 Materials

A total of 522 fragments of bone were analysed from the site of Maynetown. These derived from a narrow deposit of disarticulated remains, within which the bone was deposited in a seemingly haphazard and unsorted manner. The majority of bone fragments were of human origin, with just 33 fragments (6.3%) deriving from animal remains. The animal remains are not discussed here but can be found detailed in the accompanying catalogue (see section 6.1).

# 2 Methods

The analysis of disarticulated human remains differs somewhat from that of articulated burials in that each bone or bone fragment must be recorded individually, and the specific part of the surviving bone described as precisely as possible (McKinley, 2004: 14). The side of the bone (left, right or axial/midline) is recorded and, where it is feasible, details of age, sex, stature, metrics and non-metrics are attributed. Joins between fragments (where one fragment can be refit to another), and any taphonomic evidence (e.g. fragmentation, surface erosion) is also recorded as standard (*ibid.).* The minimum number of individuals represented by the group as a whole is shown and any evidence of pathological processes is also noted and described in detail. Details of the processes undertaken in the current assemblage are detailed below.

## 2.1 Preservation

Bone surface condition was recorded by grading the remains according to McKinley's (2004: 16) guidelines. These guidelines describe the effects of taphonomic conditions on the bones. This represents the processes that affect the skeleton after deposition; processes which cause such features as chipping, flaking, abrasion or fragmentation of the bone. It also includes other exogenous factors such as animal activity (digging, gnawing etc).

## 2.2 Sex

Anatomical sex was determined in the case of individuals of full skeletal adulthood. The lack of reliable sexually dimorphic traits prior to the completion of puberty makes the determination of sex in the juvenile skeleton inappropriate (Lewis, 2007). While some methods have been devised for the determination of sex of non-adult skeletons (Loth and Henneberg, 2001; Molleson et al., 1998; Schutkowski, 1993), these are not widely used as they have had varying degrees of success with regard to repeatability and predictive accuracy.

Sex in the adult skeleton was determined using a number of sexually dimorphic physiological traits of the skull and pelvis (Buikstra and Ubelaker, 1994; White, 2000). Dimorphism, or the morphological differences between the sexes, is most pronounced in these locations and therefore these are typically used as the primary determinants of biological sex. However, as each bone fragment in a disarticulated assemblage must be assessed for the possibility of determining sex, these locations cannot solely be relied upon. In some bones, it is possible to take metric measurements from certain landmarks and compare them to the standard measurements of known-sex individuals (Bass, 1995; Brothwell, 1981). Whilst the relative robustness or gracility of individuals can vary both inter- and intra-population, this can serve as a useful tool in assessing sex in fragmented or poorly preserved populations and was therefore employed in this assemblage.

Sex determination resulted in a skeleton being placed in one of five categories. These were: male, female, unsexed adult, ?male and ?female. The final two categories refer to individuals whose remains indicated the probability of sex, but, due either to poor preservation or simple individual dimorphism, could not be placed definitively in either the male or female category.

## 2.3 Age

The mostly commonly used technique for age estimation in this assemblage was Brothwell's (1981) dental attrition method. With this method, the occlusal (biting) surfaces of the permanent molars are examined for evidence of age-related wear, and the accompanying schematic of dental attrition is consulted for estimation of age category (see Table 1). Brothwell's (*ibid*.) drawings are intended for use with all of the permanent molars intact. Therefore, where all three of the molars from each quadrant are not available, such as in disarticulated and fragmented assemblages, it must be noted that this may affect the accuracy of age estimation.

In just two instances, age determination was based on the morphological changes of the auricular surface. The auricular surface represents a largely immovable joint in the pelvis. The Lovejoy et al. (1985) technique utilises the relatively predictable rate of degeneration of the structure over time in order to estimate age.

Epiphyseal fusion sites, which complete as late as 25-28 years, were also observed in order to estimate adult age (Scheuer and Black, 2000).

Techniques for age estimation in non-adults vary depending on the individual's stage of development. Whilst the long bone ageing technique of Scheuer *et al.* (1980) is typically used to estimate age for

neonates and early infants; in older (juvenile) individuals, the Maresh (1970) technique is more appropriate. Analysis of dental development can also be applied to juvenile remains (Moorrees *et al*. 1963a, 1963b) but, as there were no loose teeth in which growth could be examined, dental analysis relied solely on Ubelaker's (1989) emergence and developmental schematics.

Estimation of age in the adult and juvenile skeleton resulted in each individual being placed in one of the categories listed below in Table 1.

| **Adult Age Categories** | | **Juvenile Age Categories** | |
|---|---|---|---|
| | | ~0 years | Neonate |
| 18 – 25 years | Young adult | <1 year | Infant |
| 26 – 35 years | Early middle adult | 1 – 4 years | Early childhood (juvenile) |
| 36 – 45 years | Late middle adult | 5 – 8 years | Middle childhood (juvenile) |
| 46 + years | Older adult | 9 – 12 years | Late childhood (juvenile) |
| | | 13 – 17 years | Adolescent |

*Table 1 Age categories used in the analysis of the Maynetown assemblage.*

## 2.4 Stature

In order to determine stature (standing height) in adult skeletons, the Trotter (1970) regression equations for the long bone lengths of 'white males and females' are often used (Mays 2016). This was applied in this assemblage. This method was applied in this assemblage. It is noted however that the determination of sex in each case is based on a single isolated bone.

## 2.5 Metrics

Sets of measurements were taken from the adult remains, where preservation allowed. The anatomical landmarks used for taking measurements were in accordance with those presented by Buikstra and Ubelaker (1994).

## 2.6 Non-metrics

Non-metric traits are minor variants of phenotypic expression (Tyrrell, 2000: 290). These can be genetically produced or occur as a result of one's interaction with the environment. The recording of these discontinuous traits, within human populations, began as a means of studying bio-distance (the relatedness/divergence among groups across time or region). However, much controversy exists with regard to individual trait development and the undetermined level of trait heritability (*ibid.*). A small number of traits were sought in this population, some of which are heritable and others mechanically

modified morphologies. Twenty-one traits of the skull and 27 postcranial traits were sought. They were recorded by noting them present, absent or unobservable. The latter denotes the absence or poor preservation of the bone on which the trait is sought.

## 2.7 Pathology

Much of the recording of pathological processes relies on detailed and accurate notation. In all cases where pathology or trauma was noted, detailed descriptions of the bone and associated lesions were taken. Some pathological processes lend themselves more readily to systematic recording and these are presented below.

In recording dental calculus and periodontal disease, the Brothwell (1981) classification system was used in conjunction with the pictorial guides for description of severity. For dental enamel hypoplasia, the 'Field method' (Hassett, 2012: 561), which involves identifying defects macroscopically, was employed. The Smith system was used for recording dental attrition, and caries were recorded by their location and on a four-point scale for cavity size: 1) Pinpoint, 2) Small, 3) Medium and 4) Large. Abscesses were identified macroscopically by the appearance of draining cloacae, and ante mortem tooth loss was only confirmed where a degree of alveolar resorption was visible, thereby ensuring cases of post mortem loss were not erroneously counted. All dental results are presented as crude prevalence rates (CPR) or true prevalence rates (TPR) where appropriate, with the former representing the number of individuals affected and the latter the number anatomical structures affected both expressed as a percentage of the observable whole.

In recording the manifestation of cribra orbitalia and porotic hyperostosis, the Stuart-Macadam (1991) recording method was used. Stuart-Macadam (1991) noted that the lesion reflects two elements. These are the appearance of porotic lesions caused by the thinning and/or destruction of the outer table of compact bone, and hyperostosis caused by an increase in the diploic layer of the bone. In this project, lesions of the skull vault are referred to as porotic hyperostosis, while those of the orbits are termed cribra orbitalia. Although some observers term both lesions as porotic hyperostosis (Lewis, 2007: 114), the distinction is retained here for ease of description of lesion location and because cribra orbitalia, being usually more common, is regarded as a more sensitive marker of the underlying stimulating influence (Aufderheide and Rodrígues-Martín, 1998). Only skull bones (parietals, frontal and occipitals) that were deemed sufficiently complete for examination for porotic hyperostosis were included. Cribra orbitalia was sought in individuals where at least one orbit survived. Where both survived, each one was scored separately for presence/absence, grade of severity, and degree of

healing. With regard to healing, sharp edges and woven bone denoted an active lesion while remodelling, and lack of microporosity denoted healing (Buikstra and Ubelaker, 1994: 121; Mensforth et al., 1978).



## 2.8 Minimum Number of Individuals

In order to calculate MNI for this assemblage, a count of the main bones of the skull and appendicular skeleton was taken. The most frequently occurring skeletal element was deemed to represent the minimum number of individuals.

# 3 Results



Each bone fragment was examined and, where possible, identified to part. As Table 2 shows, skull fragments far outweigh those of any other part of the skeleton. However, as many of the delicate bones of the skull are more susceptible to breakage, they can therefore contribute more to the sample size by virtue of total number of fragments. Furthermore, whilst the number of upper limb bones was comparatively fewer, the majority of these were complete or near complete.

| Region | No. Fragments | % of assemblage |
|---|---|---|
| **Skull (22)** | 236 | 57.0 |
| **Thorax (48)** | 22 | 5.3 |
| **Upper limb (64)** | 18 | 4.3 |
| **Lower limb (61)** | 54 | 13.0 |
| **Unidentified** | 84 | 20.3 |
| **TOTAL** | 414 | 100% |

*Table 2 Number of human bone fragments that were identified to skeletal region and the percentage of the assemblage this represents. Number is brackets gives details of the number of bones that normally composes each anatomical region (left and right combined)*

## 3.1 Preservation

At 96.1% of fragments, the most commonly occurring grade of bone surface taphonomy was Grade 0 (McKinley, 2004: 16). This describes a fragment in which the morphology is clearly visible with no apparent modifications. The remaining 3.9% of bone fragments exhibited slight and patchy surface erosion (Grade 1). Overall, therefore, it could be said that bone surface preservation was good, with bone fragments appearing fresh, and small features or defects readily observable in most cases.

## 3.2 Sex

In the determination of sex across the skeleton, a multivariate approach would normally be taken, whereby measurements of dimorphic dimensions and observation of morphological features are combined to form a more closely reliable estimation of sex (Buikstra and Ubelaker, 1994: 16). Within this assemblage, identification of possible/probable anatomical sex was made in 13 cases. However,

it should be noted that, in all of these cases, a single bone only was assessed. Whilst a single bone may present multiple assessable traits, the nature of disarticulated assemblages may preclude all of those from being assessed. However, should these results, scant as they are, be deemed reliable, the resulting identification presents a minimum of 2 adult males and 1 adult female.

## 3.3 Age

The process of ageing identified the presence of at least 10 individuals: 5 adults and 5 non-adults. Overall, the majority of fragments (75%) from Maynetown, where identifiable, were classified as adult. A small number of these could be placed within an age range. A left male os coxa (hip bone) was aged at 30-34 years, a right male os coxa was identified as being 40+ years, and three right unsexed maxillae were aged at 36-45 years (see Table 3).

| | | Bone | Record/Catalogue number | Age Estimation | Age Category |
|---|---|---|---|---|---|
| **Adult** | 1 | Left (male) os coxa | 10 | 30-34 years | EMA |
| | 2 | Right (male) os coxa | 7 | 40+ years | LMA-OA |
| | 3 | Right maxilla | 14 | 36-45 years | LMA |
| | 4 | Right maxilla | 109 | 36-45 years | LMA |
| | 5 | Right maxilla | 132 | 36-45 years | LMA |
| | | | | | |
| **Non-Adult** | 6 | Left maxilla | 37 | 1.5-2 years | EC |
| | 7 | Right femur | 31 | c.6 years | MC |
| | 8 | Left humerus<br>Right humerus<br>Left femur | 26<br>100<br>21 | 7-8 years | MC |
| | 9 | Mandible | 140 | 10-12 years | MC |
| | | Left femur | 101 | | |
| | | Right maxilla | 85 | | |
| | | Right humerus | 102 | | |
| | | Left humerus | 12 | | |
| | 10 | Right os coxa | 131 | 13-16 | Ado |
| | | Occipital | 130 | | |

*Table 3 Instances of age estimation in isolated bones. Details of age estimation methods are detailed in the catalogue under the relevant record number.*

There were 35 instances (totalling 79 fragments) where remains were identified as non-adult. It was possible to calculate approximate age in 12 cases. These combined to identify a minimum of 5 individuals where age was known. The youngest, an individual of 1.5 to 2 years, was represented by a single left maxilla fragment (Table 3).

At least 2 further individuals of approximately middle childhood (MC) age were identified. The first was represented by a single right femur aged to approximately 6 years. The other was represented by a left and right humerus and a left femur, all of which were aged to approximately 7- 8 years.

Five fragments, detailed in Table 3 (item 9), were estimated to be approximately 10-12 years old, while a further 2, an occipital and an ischium, were aged to 13-16 years.

## 3.4 Stature

There were just 2 instances of stature estimation available from the assemblage. A right femur, in which metric measurement suggested male proportions, produced a stature estimate of 167.8cm. In a left tibia of female proportions, an estimate of 159.5cm was reached.

## 3.5 Non-Metrics

### 3.5.1 Cranial

All of the 21 cranial non-metric traits that were sought were observable in at least one individual. Just 5 traits were expressed, however. The supraorbital foramen was bilaterally expressed in two cases (see record number #79 and 107 in appendix) and unilaterally expressed in one case (#133). The supraorbital notch was bilaterally expressed (#107) in one case and unilaterally in another (#133). The parietal foramen was bilaterally expressed in three cases (#35, #107 & #110) and at least unilaterally expressed (left side missing) in another (#79). The mastoid foramen was observed in 5 temporals (#13, #43, #58, #129, #134). In only 1 case (#134) was the counterlateral mastoid observable. In that case, the trait was found to be unilateral. One lamdoid ossicle was observed (#35). The counterlateral bone was not observable (see Table 4).

| Trait | Number observable | Number expressed | TPR (%) |
|---|---|---|---|
| Metopic suture | 6 | 0 | 0.0 |
| Left Supraorbital foramen | 5 | 3 | **60.0** |
| Right Supraorbital foramen | 5 | 2 | **40.0** |
| Left Supraorbital notch | 5 | 1 | **20.0** |
| Right Supraorbital notch | 6 | 2 | **33.3** |
| Left Accessory infraorbital foramen | 2 | 0 | 0.0 |
| Right Accessory infraorbital foramen | 2 | 0 | 0.0 |
| L Parietal foramen | 6 | 4 | **66.7** |
| R Parietal foramen | 6 | 4 | **66.7** |
| L Epipteric ossicle | 2 | 0 | 0.0 |
| R Epipteric ossicle | 2 | 0 | 0.0 |

| | | | |
|---|---|---|---|
| L Ossicles in coronal suture | 2 | 0 | 0.0 |
| R Ossicles in coronal suture | 2 | 0 | 0.0 |
| Ossicle at bregma | 3 | 0 | 0.0 |
| Ossicles in sagittal suture | 2 | 0 | 0.0 |
| Ossicle at lambda | 3 | 0 | 0.0 |
| L Ossicles in lambdoid | 2 | 0 | 0.0 |
| R Ossicles in lambdoid | 4 | 1 | **25.0** |
| L Asterionic ossicle | 2 | 0 | 0.0 |
| R Asterionic ossicle | 2 | 0 | 0.0 |
| L Parietal notch ossicle | 2 | 0 | 0.0 |
| R Parietal notch ossicle | 2 | 0 | 0.0 |
| Inca bone | 4 | 0 | 0.0 |
| L Condylar canal | 2 | 0 | 0.0 |
| R Condylar canal | 2 | 0 | 0.0 |
| L Auditory torus | 2 | 0 | 0.0 |
| R Auditory torus | 3 | 0 | 0.0 |
| L Mastoid foramen | 5 | 3 | **60.0** |
| R Mastoid foramen | 4 | 1 | **25.0** |
| L Multiple mental foramina | 3 | 0 | 0.0 |
| R Multiple mental foramina | 4 | 0 | 0.0 |
| L Palatine torus | 2 | 0 | 0.0 |
| R Palatine torus | 3 | 0 | 0.0 |
| L Maxillary torus | 2 | 0 | 0.0 |
| R Maxillary torus | 3 | 0 | 0.0 |
| L Mandibular torus | 4 | 0 | 0.0 |
| R Mandibular torus | 4 | 0 | 0.0 |

*Table 4: Cranial non-metric traits in the assemblage.*

### 3.5.2 Postcranial

Twelve postcranial traits were observable in the remains (see Table 5). Just two were expressed. A left unilateral double atlas facet was observed as was a right hypotrochanteric fossa.

| | Left | | Right | |
|---|---|---|---|---|
| **Trait** | Number observable | Number expressed | Number observable | Number expressed |
| Double atlas facet | 1 | 1 | 1 | 0 |
| Atlas trans. foramen bipartite | 1 | 0 | 1 | 0 |
| Posterior atlas bridging | 1 | 0 | 1 | 0 |
| Lateral atlas bridging | 1 | 0 | 1 | 0 |
| C7 accessory trans. foramen | 0 | 0 | 0 | 0 |
| Sternal foramen | 0 | 0 | - | - |
| Os acromiale | 0 | 0 | 0 | 0 |
| Acromial articular facet | 0 | 0 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| Suprascapular foramen | 0 | 0 | 0 | 0 |
| Septal aperture | 1 | 0 | 2 | 0 |
| Supracondyloid process | 1 | 0 | 2 | 0 |
| Acetabular crease | 0 | 0 | 1 | 0 |
| Accessory sacral facet | 0 | 0 | 0 | 0 |
| Allen's fossa | 0 | 0 | 1 | 0 |
| Poirier's facet | 0 | 0 | 0 | 0 |
| Femoral plaque | 0 | 0 | 0 | 0 |
| Hypotrochanteric fossa | 2 | 0 | 2 | 1 |
| Third trochanter | 1 | 0 | 1 | 0 |
| Vastus notch | 0 | 0 | 0 | 0 |
| Vastus fossa | 0 | 0 | 0 | 0 |
| Emarginate patella | 0 | 0 | 0 | 0 |
| Med. tibial squatting facet | 1 | 0 | 0 | 0 |
| Lat. tibial squatting facet | 1 | 0 | 0 | 0 |
| Calcaneal double facet | 0 | 0 | 0 | 0 |
| Anterior calcaneal facet absent | 0 | 0 | 0 | 0 |
| Talus squatting facet | 0 | 0 | 0 | 0 |
| Os trigonum | 0 | 0 | 0 | 0 |

*Table 5: Postcranial non-metric traits in the assemblage*

## 3.6 Metrics

Craniometrics were available in just two cases. A mandible (#115) presented measurements of 27.9mm (min) and 28.5mm (max) for the breadth of the right ramus and 87.3mm for the mandibular length (right). The breadth of the mandibular body (right) was 12.2mm. The breadth of the mandibular body (right) in a second mandible (#42) measured 14mm.

A summary of the adult and non-adult post-cranial metrics is presented below in Table 6 and Table 7.

| ADULT | #24 | #27 | #28 | #32 | #97 | #99 |
|---|---|---|---|---|---|---|
| Left Clavicle length | - | - | - | - | - | - |
| Right Clavicle length | - | - | - | - | - | - |
| Left Glenoid length | - | - | - | - | - | - |
| Right Glenoid length | - | - | - | - | - | - |
| Left Glenoid breadth | - | - | - | - | - | - |
| Right Glenoid breadth | - | - | - | - | - | - |
| Left Humerus length | - | - | - | - | - | - |
| Right Humerus length | - | - | - | - | - | - |
| Left Humerus head | - | - | - | - | - | - |
| Right Humerus head | - | - | - | - | - | - |
| Left Humerus max. diam. | - | - | - | - | - | - |
| Right Humerus max. diam. | - | - | - | - | - | - |
| Left Humerus min. diam. | - | - | - | - | - | - |
| Right Humerus min. diam. | - | - | - | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| Left Humerus epiphysis | - | - | - | - | - | - |
| Right Humerus epiphysis | - | - | - | - | - | - |
| Left Radius length | - | - | - | - | - | - |
| Right Radius length | - | - | - | - | - | - |
| Left Radius head | - | - | - | - | - | - |
| Right Radius head | - | - | - | - | - | - |
| Left Ul- length | - | - | - | - | - | - |
| Right Ul- length | - | - | - | - | - | - |
| Sacrum length | - | - | - | - | - | - |
| Sacrum breadth | - | - | - | - | - | - |
| Left Femur max. length | - | - | - | - | - | - |
| Right Femur max. length | - | - | - | - | **447** | - |
| Left Femur oblique length | - | - | - | - | - | - |
| Right Femur oblique length | - | - | - | - | 446 | - |
| Left Femur head | - | - | - | - | - | - |
| Right Femur head | - | - | - | - | 48 | - |
| Left Femur prox. Shaft (ant.-post.) | - | - | 24.5 | - | - | - |
| Right Femur prox. Shaft (ant.-post.) | - | - | - | 22.5 | 24 | - |
| Left Femur prox. Shaft (med.-lat.) | - | - | 27.5 | - | - | - |
| Right Femur prox. Shaft (med.-lat.) | - | - | - | 32 | 33.5 | - |
| Left Femur mid-shaft (ant.-post.) | - | - | 28 | - | - | - |
| Right Femur mid-shaft (ant.-post.) | - | - | - | 28 | 31 | - |
| Left Femur mid-shaft (med.-lat.) | - | - | 28 | - | - | - |
| Right Femur mid-shaft (med.-lat.) | - | - | - | 26.5 | 28 | - |
| Left Femur epiphysis | - | - | - | - | - | - |
| Right Femur epiphysis | - | - | - | | 87 | - |
| Left Tibia length | - | 338 | - | - | - | - |
| Right Tibia length | - | - | - | - | - | - |
| Left Tibia (ant.-post.) | - | 30.5 | - | - | - | 32 |
| Right Tibia (ant.-post.) | - | - | - | - | - | - |
| Left Tibia (med.-lat.) | - | 20.5 | - | - | - | 21 |
| Right Tibia (med.-lat.) | - | - | - | - | - | - |
| Left Tibia epiphysis | 79 | 66 | - | - | - | - |
| Right Tibia epiphysis | - | - | - | - | - | - |
| Left Fibula length | - | - | - | - | - | - |
| Right Fibula length | - | - | - | - | - | - |
| Left Calcaneus length | - | - | - | - | - | - |
| Right Calcaneus length | - | - | - | - | - | - |
| Left Talus length | - | - | - | - | - | - |
| Right Talus length | - | - | - | - | - | - |

*Table 6: Adult postcranial metrics*

| NON-ADULT | #19 | #20 | #31 | #100 | #101 |
|---|---|---|---|---|---|
| Left Clavicle length | - | - | - | - | - |
| Right Clavicle length | - | - | - | - | - |
| Left Glenoid length | NA | - | - | - | - |
| Right Glenoid length | - | - | - | - | - |
| Left Glenoid breadth | - | - | - | - | - |
| Right Glenoid breadth | - | - | - | - | - |
| Left Humerus length | 263 | - | - | - | - |
| Right Humerus length | - | - | - | 212 | - |
| Left Humerus head | - | - | - | - | - |
| Right Humerus head | - | - | - | - | - |
| Left Humerus max. diam. | - | - | - | - | - |
| Right Humerus max. diam. | - | - | - | - | - |

| NON-ADULT | #19 | #20 | #31 | #100 | #101 |
|---|---|---|---|---|---|
| Left Humerus min. diam. | - | - | - | - | - |
| Right Humerus min. diam. | - | - | - | - | - |
| Left Humerus epiphysis | - | - | - | - | 68.5 |
| Right Humerus epiphysis | - | - | - | - | - |
| Left Radius length | - | - | - | - | - |
| Right Radius length | - | - | - | - | - |
| Left Radius head | - | - | - | - | - |
| Right Radius head | - | - | - | - | - |
| Left Ul- length | - | - | - | - | - |
| Right Ul- length | - | - | - | - | - |
| Sacrum length | - | - | - | - | - |
| Sacrum breadth | - | - | - | - | - |
| Left Femur max. length | - | - | 270* | - | 360 |
| Right Femur max. length | - | - | - | - | - |
| Left Femur oblique length | - | - | - | - | - |
| Right Femur oblique length | - | - | - | - | - |
| Left Femur head | - | - | - | - | - |
| Right Femur head | - | - | - | - | - |
| Left Femur prox. Shaft (ant.-post.) | - | - | - | - | - |
| Right Femur prox. Shaft (ant.-post.) | - | - | - | - | - |
| Left Femur prox. Shaft (med.-lat.) | - | - | - | - | - |
| Right Femur prox. Shaft (med.-lat.) | - | - | - | - | - |
| Left Femur mid-shaft (ant.-post.) | - | - | - | - | - |
| Right Femur mid-shaft (ant.-post.) | - | - | - | - | - |
| Left Femur mid-shaft (med.-lat.) | - | - | - | - | - |
| Right Femur mid-shaft (med.-lat.) | - | - | - | - | - |
| Left Femur epiphysis | - | - | - | - | - |
| Right Femur epiphysis | - | - | - | - | - |
| Left Tibia length | - | - | - | - | - |
| Right Tibia length | - | - | - | - | - |
| Left Tibia (ant.-post.) | - | - | - | - | - |
| Right Tibia (ant.-post.) | - | - | - | - | - |
| Left Tibia (med.-lat.) | - | - | - | - | - |
| Right Tibia (med.-lat.) | - | - | - | - | - |
| Left Tibia epiphysis | - | - | - | - | - |
| Right Tibia epiphysis | - | - | - | - | - |
| Left Fibula length | - | - | - | - | - |
| Right Fibula length | - | - | - | - | - |
| Left Calcaneus length | - | 73 | - | - | - |
| Right Calcaneus length | - | - | - | - | - |
| Left Talus length | - | - | - | - | - |
| Right Talus length | - | - | - | - | - |

*Table 7: Non-adult postcranial metrics. *Estimated length*

## 3.7 Minimum Number of Individuals

There were a minimum of 5 adults and 5 non-adults in this assemblage. Within the adult remains, there was evidence for 1 female and 2 males. Evidence from ageing illustrated the presence of at least one male of 30-34 years and another of 40+ years. Among the non-adult remains, evidence for at least

5 individuals, aged between 1.5 year and 16 years was apparent (Table 8**Error! Reference source not found.**).



| | Adult | | | Non-Adult | | | | |
|---|---|---|---|---|---|---|---|---|
| | F | M | ? | Juve: 1.5-2 yrs | Juve: c.6 yrs | Juve: 7-8yrs | Juve: 10-12yrs | Juve: Ado |
| Frontal | 1 | 1 | **5** | 0 | 0 | 0 | 0 | 0 |
| L. Maxilla | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 |
| R. Maxilla | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 |
| L. Mandible | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| R. Mandible | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Occipital | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 1 |
| L. Petrous portion | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| R. Petrous portion | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| L. Medial clavicle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Medial clavicle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Lateral clavicle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Lateral clavicle | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Glenoid | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| R. Glenoid | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Prox humerus | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| R. Prox humerus | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 |
| L. Dist humerus | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| R. Dist humerus | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 0 |
| L. Prox radius | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Prox radius | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Dist radius | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Dist radius | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Prox ulna | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| R. Prox ulna | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Dist Ulna | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| R. Dist ulna | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Prox Femur | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 0 |
| R. Prox Femur | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| L. Dist Femur | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| R. Dist Femur | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| L. Patella | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Patella | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Prox Tibia | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| R. Prox Tibia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Dist Tibia | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Dist Tibia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Prox Fibula | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Prox Fibula | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Dist Fibula | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Dist Fibula | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Adult | | | Non-Adult | | | | |
|---|---|---|---|---|---|---|---|---|
| | F | M | ? | Juve: 1.5-2 yrs | Juve: c.6 yrs | Juve: 7-8yrs | Juve: 10-12yrs | Juve: Ado |
| L. Talus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R.Talus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L. Calcaneus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R. Calcaneus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*Table 8: Minimum number of individuals. F=Female, M=Male, ?=Unsexed, Ado=adolescent.*



## 3.8 Pathology

## 3.9 Dental

There were 7 adult and 1 non-adult partial dental sets in this assemblage and all exhibited at least one pathological process. A summary of the adult dental pathology is presented in Table 9. Just one non-adult dental set was retrieved, and no pathology was recorded.

| | No. Teeth Obs | Affected | No. Individuals Obs | Affected | CPR | TPR |
|---|---|---|---|---|---|---|
| Calculus | 22 | 22 | 6 | 6 | **100%** | **100%** |
| Caries | 23 | 5 | 6 | 3 | **50.0%** | **21.7%** |
| Abscess | 44 | 1 | 7 | 1 | **14.3%** | **2.3%** |
| Periodontitis | 15 | 15 | 6 | 6 | **100%** | **100%** |
| AM loss | 65 | 13 | 7 | 4 | **57.1%** | **20%** |
| DEH | 15 | 4 | 5 | 2 | **40%** | **26.6%** |

*Table 9: Adult dental pathology. Obs=Observable, CPR=Crude prevalence rate, TPR=True prevalence rate, AM=Ante mortem*

### 3.9.1 Caries

Three of the six adult partial dental sets that were available for analysis were affected by caries. On a true prevalence rate, 5 of the 23 (21.7%) observable teeth were affected overall.

Dental caries is a disease process characterised by the progressive destruction of enamel, dentine and cement, leading to the formation of a cavity in the crown or root surface (Hillson, 1996: 269). They are formed as a result of the fermentation of food sugars in the mouth by bacteria in dental plaque (*ibid.*). Lesions most often appear in areas where food is allowed to build up, such as between the teeth or in fissures between the cusps on occlusal (biting) surfaces. Caries is relatively commonly seen in

archaeological populations, albeit with increased incidence through time, with a low prevalence in earlier periods to the rapid rise seen through the Medieval (Hillson, 1996: 282).



### 3.9.2 Abscess

Just one of the 7 individual dental sets exhibited an abscess (Figure 1. There were 44 observable positions across the assemblage meaning that the true prevalence rate for abscesses was 2.3% in the assemblage.


*Figure 1 Abscess apparent at the location of the root of the left third maxillary molar. Note also the reactive new bone surrounding the cloaca. See record #109 in appendix.*

The process of abscess formation begins with the invasion of bacteria into the pulp chamber (tooth interior). This may occur via a carious lesion, severe wear, or exposure of the pulp through a trauma or fracture in the tooth crown. When bacteria, or the toxins related to them, enter the central pulp cavity of the tooth, they cause localised inflammation. The pressure exerted by the inflamed tissues causes death of the pulp and subsequent pus production (Hillson, 1996: 285). The structure of the tooth itself, proving an efficient conductor for the transmission of the pus, allows it to travel down the root canal, where it exits the foramen at the apex of the root and enters the bone of the jaw (alveolus). The subsequent build-up of pus within the alveolus causes pressure, which in turn causes pain that is only alleviated through the formation of a cloaca (a passage or opening). The cloaca is formed when the infected mass forces its way out of the confined space and through the bone, creating an outlet through which the pus can drain. It is this outlet that is observable in skeletal remains.

### 3.9.3 Calculus

In this assemblage, all 6 adult dental sets were affected. In all 6 cases, every observable tooth was affected. The single observable non-adult tooth did not exhibit any evidence of calculus formation. Calculus is a frequently occurring feature of past populations, and is formed as a result of the mineralisation of dental plaque. Micro-organisms, together with proteins in the saliva, combine to create plaque deposits (Hillson, 1996: 255). Failure to remove these deposits, through activities such as regular brushing, results in their eventual mineralisation and the subsequent build-up of calculus.

### 3.9.4 Periodontitis

The process of periodontitis begins with inflammation of the gingiva (gums). This is usually caused by the proliferation of dental plaque/calculus (Aufderheide and Rodrígues-Martín, 1998: 401). With time, this inflammation in the gingiva can be transmitted to the surrounding alveolus (the bony tooth socket)and it is the subsequent resorption, or gradual breakdown, of that bone that can be seen in archaeological skeletons. In severe cases the resorption is so great that it results in tooth exfoliation (*ibid.*).

Periodontitis was observed in all 6 of the isolated dental sets and in all 6 cases, all of the tooth positions were affected.

### 3.9.5 Ante mortem tooth loss

Four of the 7 preserved dental sets exhibited ante mortem tooth loss. It is not always clear what causes tooth loss. Periodontitis is one possible causal factor, as is localised trauma or the presence of carious cavities or dental abscesses (Hillson, 1996: 265).

### 3.9.6 Developmental Stress

Four of the 15 observable teeth (2 individuals) exhibited developmental stress in the form of hypoplasias. Hypoplasias occur in the dentition during youth when the teeth are still forming. When the individual experiences a period of developmental stress, the body lays down less of the protein matrix of which the tooth is composed, causing a narrowing of the tooth crown (Hillson and Bond, 1997). When normal growth recommences, a depression can be seen where enamel deposits were lessened. Once formed, teeth, unlike bone, do not remodel and therefore the defect is preserved permanently.

The precise cause of dental enamel hypoplasia (DEH) is unknown. It is generally agreed that this signature of developmental stress can be related to a variety of local and systemic disturbances (Goodman and Rose, 1990; Hillson, 1996; Hillson and Bond, 1997). Ogden *et al*. (2007) note that almost one hundred systemic conditions have been linked with DEH, with some of these likely to have been severe malnutrition, fever, diarrhoea, rickets or tuberculosis (*ibid*).



## 3.10 Infections

A fragment of right maxilla (#14), from an individual of 36-45 years, exhibited periosteal new bone in the nasal sinus indicative of active infection. There are two likely aetiologies for this. The first concerns the presence of an upper respiratory tract infection or sinus irritation from allergies, pollution or dust (Boocock et al., 1995). The second may relate to the carious lesions apparent in the teeth adjacent to the sinus. In this case, although it is not readily observable in bone #14, the infection would have tracked its way from the infection site in the tooth through a perforation in the sinus floor and into the sinus space (*ibid*).


*Figure 2 Right maxilla (#14) from an individual of 36-45 years, displaying periosteal new bone in the nasal sinus.*

## 3.11 Trauma



A healed sharp force injury is apparent on the posterior aspect of the frontal (#34) and across the coronal suture, on the anterior part of the left parietal. The bones are fragmented and the true posterior extent of the lesion is not visible therefore. The lesion presents as a well-defined, linear depression in the bone surface and runs anterolateral to postero-medial (Figure 3). It measures 36mm in preserved extent and 1mm in depth. The bone at the edges of the lesion is well healed, being rounded and well-integrated. No disorganised bone is apparent around the lesion and there was no indication of the lesion on the endocranial aspect.

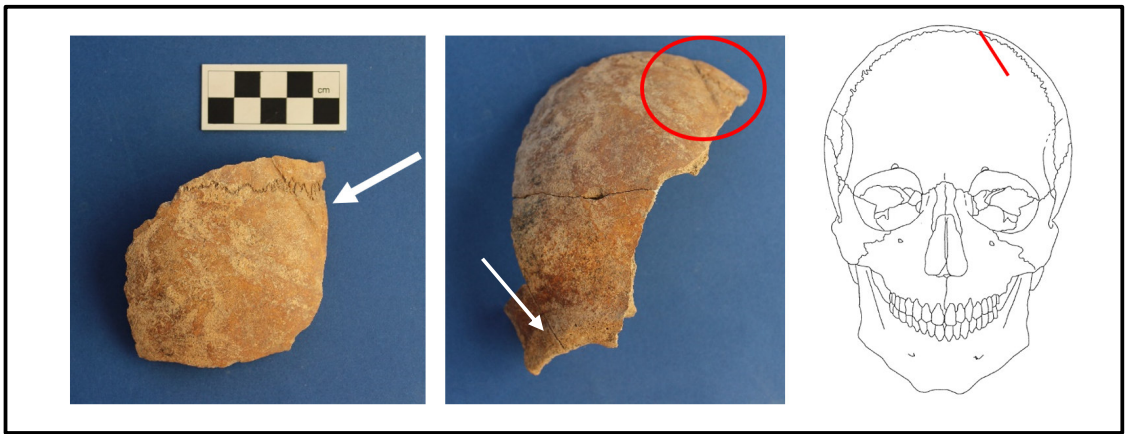

*Figure 3 Left: Sharp force linear lesion; Middle: Lesion in anatomical position (right orbit is arrowed); Right: Approximate location of lesion.*

One isolated cranial vault fragment (parietal/frontal?) exhibited a healed depressed lesion (see record #53). The lesion appears linear in nature, although its full extent is unknown, as the bone is fractured (post-deposition) in this area. The lesion measures 10mm x 5mm with a depth of 0.3mm. The endocranial aspect is not affected and, whilst the base of the lesion is somewhat darker in colour than the surrounding bone (Figures 3-5), no reactive bone is apparent, thereby suggesting that it was well healed.




*Figure 4 (left) Well healed depressed lesion on a cranial vault fragment in bone fragment #53*

*Figure 5 (right) Oblique cross-section view of depressed lesion in bone fragment #53.*

## 3.12 Periosteal reactions

Periosteal reactions or "periostoses" (Grauer 2008: 62) describe a reaction in the periosteum – a connective tissue that covers all bones – which results in new bone formation on the original bone surface (Weston 2008: 48). Whilst the term periostitis (-itis meaning inflammation) is often used, the aetiology of these lesions is not always inflammatory since "anything that breaks, tears, stretches, or even touches the periosteum" can stimulate it into initiating bone formation (Weston 2008: 49).

The type of bone that a lesion is composed of can help determine whether it was active or healing/healed during life. In its unhealed form the lesion is composed of osseous plaques of loosely organised woven bone (Larsen 1999: 83) but when healed becomes incorporated into the normal cortical bone surface (ibid). For that reason, when it is visible in macroscopic examinations of bone it can be said to represent an active lesion or, in cases where reintegration has begun, thereby giving the bone a smooth but undulating and somewhat inflated appearance, it can be determined to be in the process of healing (ibid.: 83).

These lesions can occur in any bone. However, there is a tendency for the tibia to be most commonly affected (Lewis 2007: 135, 139; Ribot & Roberts 1996: 74; Larsen 1999: 85; Ortner 2003; Weston 2008: 48). A periosteal reaction was noted in bone fragment #99, a left tibia fragment, where the anterior half of the medial face exhibited reintegrating striated compact bone . There was slight porosity at its proximal extent (just distal to the tibial tuberosity) and the lesion covered the full extent of the preserved bone.

A further bone fragment (#54), a left parietal, exhibited dispersed islands of thick (0.5mm) plaque-like woven bone around the area of the parietal boss (Figure 6). The islands were small, typically measuring no more than 5mm in extent. Medial and posterior to the boss, the bone surface exhibits patches of somewhat disorganised compact striated bone and this extends to the sagittal and lambdoid sutures. There was less activity anterior to the boss and the bone in this region appears relatively normal. It was not possible to accurately assess the bone lateral to the boss as erosion has removed much of the outer surface of the outer table.


*Figure 6 Bone fragment #54 displaying small dispersed plaque-like islands of woven bone.*

## 3.13 Metabolic

Cribra orbitalia and porotic hyperostosis are two of the most commonly reported pathological conditions in the palaeopathological literature (Walker et al., 2009: 109). Cribra orbitalia, which was observed in this assemblage, is recognisable by small pores in the orbital roofs of the cranium, which appear as a result of expansion in the diploic space (Ortner, 2003: 106). Although infectious, neoplastic and metabolic disease may also be implicated in lesion formation (Ortner, 2003: 106), most interpretations of these lesions in the palaeopathological literature have cited iron deficiency anaemia (Goodman and Armelagos, 1989; Mensforth et al., 1978; Stuart-Macadam, 1991). More recently, others (Sullivan, 2005; Walker et al., 2009) have suggested that other types of anaemia such as megaloblastic and haemolytic anaemia, may provide a more likely explanation for these lesions, and Walker *et al*. (2009) highlight vitamin $B_{12}$ (cobalamin) and $B_9$ (folic acid) deficiencies as the most common of megaloblastic anaemias. There were three instances of cribra orbitalia recorded in this assemblage. These occurred in bone fragment #67 , #103 and #107. In each case the lesion occurred

bilaterally. Whilst #67 (non-adult) and 103 (adult) (Figure 7) were examples of active lesions, #107 (adult) (Figure 8) exhibited evidence of healing.



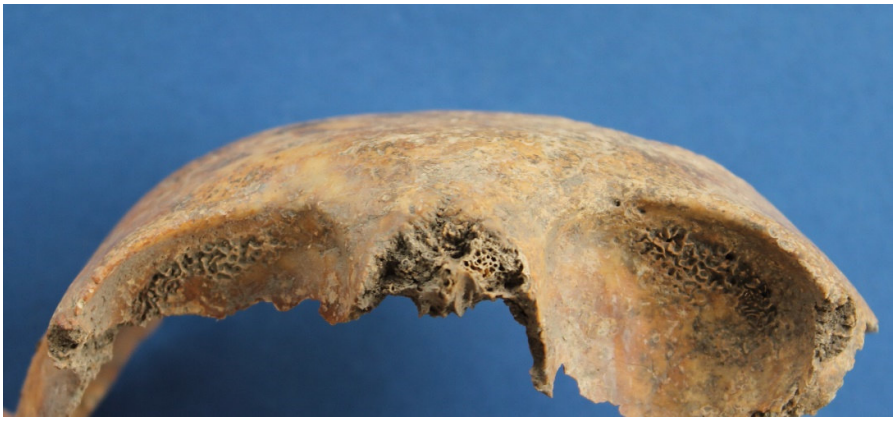

*Figure 7 Bone fragment #103 displaying bilateral cribra orbitalia*


*Figure 80 Bone fragment #107 displaying bilateral healing cribra orbitalia lesions. Note the smoother, rounded edges to the reforming pores.*

# 4 Summary and Conclusions



The disarticulated remains at Maynetown presented evidence of a minimum of 10 individuals. Within the assemblage, there was evidence for at least 5 adults. These included at least 1 male of 30-34 years, a male of 40+ years, and at least 1 female. A minimum of five non-adults were represented within the assemblage and these ranged in age from 1.5 to 16 years.

Despite their disarticulated and disorganised deposition, the remains were well preserved, with the majority exhibiting a fresh appearance and very occasional patchy surface erosion. Although stature and non-metrics were recorded, it was not possible to truly contextualise these findings given their scant intra-population representation and their unknown temporal provenance.

Perhaps the most elucidatory evidence was that which derived from the analysis of pathology. Dental pathology was represented by a range of processes frequently observed in archaeological populations and presented evidence not only for issues such as calculus, caries, periodontitis and abscesses, but revealed indications of developmental stress which had been suffered during childhood. Metabolic stress was observed in both the adult and non-adult cohort, in the form of cribra orbitalia, and likely indicates a type of anaemia.

Infectious processes were also observed, with nasal sinusitis being identified in one individual and periostitis, which may possibly have been of infective origin, in a further two case. Cranial trauma was also noted in two individuals, with one of these having had a likely sharp force origin.

A programme of dating of the remains is advised for greater contextualisation of the results and the elucidation of this unusual deposit, which represents a narrow snapshot of what is likely a significant element of the larger archaeological landscape.

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# 6 Catalogue

## 6.1 Bone Catalogue

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | South | Long bones | Femur | L | Proximal three-quarters of shaft | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 2 | South | Long bones | Humerus | R | Near-complete: head missing | NA | NA | Adult | NA | None | NA | Yes | 3 | NA |
| 3 | South | Long bones | Femur | R | Proximal two-thirds of diaphysis | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 4 | South | Long bones | Fibula | ? | Shaft segment of fibular diaphysis | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 5 | South | Long bones | 18 small bone fragments | ? | NA | NA | NA | NA | NA | None | NA | 0 | 18 | NA |
| 6 | South | Pelvis (1) | Os coxa | R | Acetabulum, ilium and partial pubis | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 7 | South | Pelvis (1) | Os coxa | R | Partial ilium displaying auricular surface and partial greater sciatic Notch | M | Greater sciatic Notch | 40+ years | Auricular | None | NA | 0 | 1 | NA |
| 8 | South | Pelvis (1) | Os coxa | ? | Part of iliac crest | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | South | Pelvis (1) | 10 small bone fragments | ? | NA | NA | NA | NA | NA | NA | NA | 0 | 10 | NA |
| 10 | South | Pelvis (2) | Os coxa | L | Partial ilium, complete ischium, acetabulum and greater sciatic Notch | M | Greater sciatic Notch | 30-34 yrs | Auricular | None | NA | 0 | 3 | NA |
| 11 | South | Pelvis (2) | Os coxa | ? | Partial ilium | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 12 | South | Pelvis (2) | 9 small fragments of os coxa | ? | Os Coxa | NA | NA | Adult | NA | None | NA | 0 | 9 | NA |
| 13 | South | Skull frag | Temporal | R | Near-complete temporal. Proximal third of squama missing | ?M | Mastoid size | Adult | NA | None | NA | 0 | 1 | NA |
| 14 | South | Teeth & skull fragments | Maxilla | R | Maxilla is preserved in 2 fragments: one composed of the alveolus surrounding the I1-PM1 and the other containing M2 and M3 | NA | NA | 36-45 yrs | Dental attrition | Dental & Infectious | NA | 0 | 2 | Note that the loss of the M3 crown may contribute to an overageing of the arcade |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | South | Teeth & skull fragments | Zygomatic | R | Fragment is composed of the lateral half and orbital margin | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 16 | South | Teeth & skull fragments | Sphenoid | Axial | 3 fragment of sphenoid composed of greater wings and partial body | NA | NA | Adult | NA | None | NA | 0 | 3 | NA |
| 17 | South | Teeth & skull fragments | Maxilla | L & R | Fragment composed of partial left and right palatines and partial maxilla roof | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 18 | South | Teeth & skull fragments | Tooth 14 | L | Complete left maxillary 1st premolar | NA | NA | Adult | NA | Dental | NA | 0 | 1 | NA |
| 19 | North | Juvenile humerus | Humerus | L | Complete diaphysis | NA | NA | Juvenile (12 years) | Maresh long bone | None | NA | YES | 2 | NA |
| 20 | North | Sample 24 | Calcaneus | L | Complete unfused calcaneus | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 21 | North | Juvenile femur | Femur | L | Femoral diaphysis: proximal two-thirds | NA | NA | Juvenile (estimated length) 7-8 years | Maresh long bone | None | NA | 0 | 1 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | North | Juvenile femur | Femur | ? | 10 small fragments of juvenile femur | NA | NA | NA | NA | None | NA | 0 | 10 | NA |
| 23 | North | Ribs | Rib | ? | 2 small rib fragments (juvenile) | NA | NA | Juvenile | NA | None | NA | 0 | 2 | NA |
| 24 | North | Tibia (22) | Tibia | L | Proximal third | M | Metric mm | Adult | NA | None | NA | 0 | 1 | NA |
| 25 | Pit C9 | Pit C9 Sample #13 C25 | Tibia | R | Mid third of shaft | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 26 | North | Juvenile humerus | Humerus | L | Near-complete diaphysis. Proximal sixth missing | NA | NA | Juvenile (7 years) | Maresh long bone | None | NA | 0 | 1 | NA |
| 27 | North | Adult tibia/Femur | Tibia | L | Complete | F | Metric mm | Adult | NA | None | NA | 0 | 1 | NA |
| 28 | North | Adult tibia/Femur | Femur | L | Complete shaft including lesser trochanter | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 29 | North | Juvenile radius & ulna | Ulna | L | Proximal half | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 30 | North | Juvenile radius & ulna | Fibula | ? | Distal half segment of fibular shaft | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | North | Juvenile femur (18) | Femur | R | Near-complete femoral diaphysis (distal-most aspect damaged) | NA | NA | Juvenile (6 years) | Maresh long bone | None | NA | 0 | 1 | NA |
| 32 | North | Leg bones (19) | Femur | R | Near-complete right femur: head and trochanters missing | NA | NA | Adult | NA | None | NA | 1 | 2 | NA |
| 33 | North | Long bone (25) | Humerus | R | Near-complete humerus: head and neck missing | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 34 | North | Skull fragments | Frontal | Axial | Frontal represented by the medial third of the bone approximately. Small portion of the coronal suture (left side) is retained, as is right orbit | ?M | Glabellar rugosity | Adult | NA | Sharp force cranial trauma | 0 | YES | 3 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35 | North | Skull fragments | Cranium | Axial | Cranial remains composed of partial occipital, partial right parietal and a narrow island of left parietal. | NA | NA | Adult | NA | None | NA | Yes | 6 | NA |
| 36 | North | Skull fragments | Cranium | Axial | 9 Small fragments from the skull | NA | NA | Adult | NA | None | NA | 0 | 9 | NA |
| 37 | North | Skull fragments | Maxilla | L | Left maxilla fragment composed of the hard palate and palatine and the alveolar structure enclosing the dm1 and dm2. An unerupted I2 is also present (developmental stage: Cr1/2) | NA | NA | Juvenile (18mo-2 years) | Ubelaker dental devel | None | NA | 0 | 1 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | T1 | Misc bones from ??? Of human remains | Rib | ? | 2 juvenile rib shaft fragments | NA | NA | Juvenile | NA | None | NA | 0 | 2 | NA |
| 39 | T1 | Misc bones from ??? Of human remains | Occipital | Axial | 1 fragment of occipital condyle, 1 fragment of basilaris portion | NA | NA | Adult | NA | NA | NA | 0 | 2 | NA |
| 40 | T1 | Misc bones from ??? Of human remains | Animal | ? | 4 animal bone fragments | - | - | - | - | - | - | - | 4 | - |
| 41 | T1 | Misc bones from ??? Of human remains | 12 small bone fragments | ? | - | - | - | - | - | - | - | - | 12 | - |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42 | North | Mandible | Mandible | Axial | Mandible composed of mental eminence , right horizontal ramus and partial left horizontal ramus (preserved from Ii to PM1 socket) | ?M | Mandibular morphology (mental eminence) | Adult | NA | None | NA | 0 | 1 | NA |
| 43 | North | Skull fragments (23) | Cranium | Axial | Left temporal. Anterior squama damaged | NA | N | Adult | NA | None | NA | 0 | 1 | This bag contains numerous individuals |
| 44 | North | Skull fragments (23) | Cranium | Axial | 9 Cranial fragments | - | - | - | - | - | - | - | 9 | Bag contains numerous individuals |
| 45 | North | Skull fragments (23) | Cervical vertebra | Axial | Complete cervical vertebra | NA | NA | Adult | NA | None | NA | 0 | 1 | This bag contains numerous individuals |
| 46 | North | Skull fragments (23) | Cranium | Axial | 7 Juvenile cranial fragments | NA | N | Juvenile | NA | None | NA | 0 | 7 | This bag contains numerous individuals |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | North | Skull fragments (23) | Occipital | Axial | Occipital condyles and basilar part | NA | NA | Adult | NA | None | NA | 0 | 1 | This bag contains numerous individuals |
| 48 | North | Skull fragments (23) | Frontal | Axial | Left orbital roof & orbital margin and partial glabellar region | M | Glabellar rugosity | Adult | NA | None | NA | YES | 2 | This bag contains numerous individuals |
| 49 | North | Skull fragments (23) | Temporal | R | Complete right juvenile temporal | NA | NA | Juvenile | NA | None | NA | 0 | 1 | This bag contains numerous individuals |
| 50 | North | Skull fragments (23) | Temporal | L | Petrous portion, mastoid and EAM | NA | NA | Juvenile | NA | None | NA | 0 | 1 | This bag contains numerous individuals |
| 51 | North | Skull fragments (23) | Parietal | L | Near-complete left parietal. Medio-inferior third missing | NA | NA | Adult | NA | None | NA | 0 | 1 | This bag contains numerous individuals |
| 52 | North | Skull fragments (23) | Maxilla | L | Small fragment of maxilla housing tooth M2 | NA | NA | Adult | NA | Dental | NA | 0 | 1 | This bag contains numerous individuals |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53 | North | Skull fragments (23) | Cranium | ? | Parietal/Frontal fragment | NA | NA | Adult | NA | Healed trauma | NA | 0 | 1 | This bag contains numerous individuals |
| 54 | North | Skull B#21 | Parietal | L | Left parietal | NA | NA | Adult | NA | Periosteal reactions | NA | 0 | 1 | NA |
| 55 | North | Skull B#21 | Parietal | L | Left parietal | NA | NA | ?Juvenile | NA | None | NA | 0 | 1 | NA |
| 56 | North | Skull B#21 | Parietal | R | Partial right parietal | NA | NA | ?Juvenile | NA | None | NA | 0 | 1 | NA |
| 57 | North | Skull B#21 | Zygomatic | R | Complete right zygomatic | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 58 | North | Skull B#21 | Temporal | L | Near-complete temporal. Proximal third of squama missing | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 59 | North | Skull B#21 | Cranium | Axial | 16 small cranial vault fragments | - | - | - | - | - | - | - | 16 | - |
| 60 | North | Vertebrae | Vertebra | Axial | Complete cervical vertebra | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 61 | North | Vertebrae | Vertebra | Axial | Thoracic vertebra arch | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 62 | North | Vertebrae | Rib | Axial | Rib shaft fragment | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 63 | North | Vertebrae | 6 small bone fragments | ? | 6 small bone fragments | - | - | - | - | - | - | - | 6 | - |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64 | North | Vertebrae | Scapula | L | 4 joining fragments representing the coracoid, acromion, gleNoid and partial lateral border | NA | NA | Adult | NA | None | NA | YES | 4 | NA |
| 65 | North | Vertebrae | Clavicle | L | Medial third of juvenile diaphysis | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 66 | North | Vertebrae | Rib | ? | Shaft fragment of juvenile rib shaft | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 67 | North | Juvenile skull (24) | Frontal | Axial | Near-complete juvenile frontal. The distal quarter of the squama (and coronal suture) are missing | NA | NA | Juvenile | NA | Cribra orbitalia | P | 0 | 1 | NA |
| 68 | North | Skull fragments | Frontal | Axial | Fragment of right orbit and partial glabellar region | NA | NA | Adult | NA | None | 0 | 0 | 1 | NA |
| 69 | North | Skull fragments | Occipital | Axial | 3 (Non-joining) fragments of occipital | NA | NA | Adult | NA | None | NA | 0 | 3 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | North | Skull fragments | Parietal | L | Near-complete left parietal. Displays the left lambdoid and partial sagittal suture | NA | NA | Adult | NA | None | NA | YES | 2 | NA |
| 71 | North | Skull fragments | Cranium | ? | 15 fragments of cranial vault | NA | NA | Adult | NA | NA | NA | 0 | 15 | NA |
| 72 | North | Skull fragments | Tooth 33 | L | Complete left mandibular canine | NA | NA | Adult | NA | Dental | NA | 0 | 1 | NA |
| 73 | North | Skull fragments | Tooth 44 | R | Complete right mandibular PM1 | NA | NA | Adult | NA | Dental | NA | 0 | 1 | NA |
| 74 | North | Vertebrae & Misc (8) | Cervical vertebra | Axial | Complete Atlas | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 75 | North | Vertebrae & Misc (8) | Cervical vertebra | Axial | Complete Axis | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 76 | North | Vertebrae & Misc (8) | Thoracic vertebra | Axial | Near-complete thoracic: transverse processes and neural arch tip missing) | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 77 | North | Vertebrae & Misc (8) | Lumbar vertebra | Axial | 2 fragments of lumbar vertebrae | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 78 | North | Vertebrae & Misc (8) | Vertebra | Axial | 5 fragments of unidentified vertebrae | NA | NA | Adult | NA | None | NA | 0 | 5 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 79 | North | Skull #21 | Cranium | Axial | Cranial remains composed of near-complete frontal, right parietal and occipital squama | F | Glabella region & frontal slope | Adult | NA | None | 0 | YES | 8 | NA |
| 80 | North | Skull #21 | Temporal | R | Near complete temporal: anterior squama missing | F | Mastoid size | Adult | NA | None | NA | YES | 2 | NA |
| 81 | North | Skull #21 | Occipital | Axial | Left and right condyles represented by 2 fragments | NA | NA | Adult | NA | None | NA | 0 | 2 | NA |
| 82 | North | Skull #21 | Zygomatic | L | Complete zygomatic | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 83 | North | Skull #21 | Cranium | Axial | 36 Fragments of cranium | NA | NA | Adult | NA | None | NA | 0 | 36 | NA |
| 84 | North | Juvenile cranium #20 | Cranium | Axial | 6 joining fragments composed of a left parietal and an occipital (left third missing) | NA | NA | Juvenile | NA | None | NA | YES | 6 | Record 84-86 likely comprise 1 individual |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 85 | North | Juvenile cranium #20 | Maxilla | R | Near-complete maxilla (frontal process missing) | NA | NA | Juvenile (c12 years) | Dental development | Dental | NA | 0 | 1 | Record 84-86 likely comprise 1 individual |
| 86 | North | Juvenile cranium #20 | Sphenoid | Axial | Sphenoid body and left wing | NA | N | Juvenile | NA | None | NA | NA | 2 | Record 84-86 likely comprise 1 individual |
| 87 | North | Juvenile cranium #20 | Cranium | Axial | 20 small fragments of juvenile cranial vault | NA | NA | Juvenile | NA | None | NA | 0 | 20 | NA |
| 88 | North | Juvenile cranium #20 | Occipital | Axial | Juvenile sized occipital fragment composed of the right half of the squama | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 89 | North | Juvenile cranium #20 | Maxilla | L | Small fragment of antero-lateral aspect of the maxilla containing I2 and PM1 | NA | NA | Adult | NA | Dental | NA | 0 | 1 | NA |
| 90 | North | Juvenile cranium #20 | Vertebra | Axial | Partial vertebral body/possible sacral body | NA | NA | Adult | NA | NA | NA | 0 | 1 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91 | North | Juvenile cranium #20 | Rib | R | Right rib fragment: medial quarter | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 92 | North | Misc from soil sieving | Unidentified | ? | 20 Small fragments of human origin | - | - | - | - | - | - | - | 20 | - |
| 93 | North | Misc from soil sieving | Unidentified | ? | 6 Small fragments of animal origin | - | - | - | - | - | - | - | 6 | - |
| 94 | Central | Adult cranium (17) | Cranium | Axial | Cranial remains composed of a partial frontal (No orbital or supra-orbital regions)and near-complete left and right parietals | NA | NA | Adult | NA | None | NA | Yes | 6 | NA |
| 95 | Central | Adult cranium (17) | Cranium | Axial | c30 small cranial vault fragments | - | - | - | - | - | - | - | 30 | - |
| 96 | Central | Adult cranium (17) | Animal | ? | Animal vertebra | - | - | - | - | - | - | - | 1 | - |
| 97 | Central | Long bones 6, 10, 11, 12 | Femur | R | Complete right femur | M | Metric mm | Adult | NA | None | NA | YES | 2 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 98 | Central | Long bones 6, 10, 11, 12 | Ulna | L | Distal third | NA | NA | Adult | NA | None | NA | NA | 1 | NA |
| 99 | Central | Long bones 6, 10, 11, 12 | Tibia | L | Proximal two-thirds of shaft with partial medial plateau preserved | NA | N | Adult | NA | Periosteal reactions | NA | 0 | 1 | NA |
| 100 | Central | Long bones 6, 10, 11, 12 | Humerus | R | Complete diaphysis | NA | NA | Juvenile (7-8 years) | Maresh long bone | None | NA | 0 | 1 | NA |
| 101 | Central | Long bones 6, 10, 11, 12 | Femur | L | Complete diaphysis | NA | NA | Juvenile (11 Years) | Maresh long bone | None | NA | YES | 2 | NA |
| 102 | Central | Long bones 6, 10, 11, 12 | Humerus | R | Proximal two-thirds of diaphysis | NA | NA | Juvenile (c11 - 12 years) | Maresh long bone | None | NA | 0 | 1 | NA |
| 103 | Central | Skull fragments | Frontal | Axial | Inferior third of bone | NA | NA | Adult | NA | Cribra orbitalia | Bilateral | 0 | 1 | NA |
| 104 | Central | Skull fragments | Occipital | Axial | Squama only: the lateral half of the left side is missing | NA | NA | ?Adult | NA | None | NA | 0 | 1 | Join with frag 105 Not confirmed |
| 105 | Central | Skull fragments | Occipital | Axial | Basilar part of occipital | NA | NA | Juvenile | Epiphyseal fusion | None | NA | 0 | 1 | Join with frag 104 Not confirmed |
| 106 | Central | Skull fragments | Cranium | Axial | 3 cranial vault fragments | - | - | - | - | - | - | - | 3 | - |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | Central | Skull (15) | Cranium | Axial | Fragmentary remains of the cranium composed of the frontal and parietals | NA | NA | Adult | NA | Healing Cribra | P | YES | 12 | 107 & 109 appear as 1 individual |
| 108 | Central | Skull (15) | Cranium | Axial | c40 small fragments of skull, including partial Sphenoid | - | - | - | - | - | - | - | 20 | - |
| 109 | Central | Skull (15) | Maxillae & zygomatics | L & R | Near-complete right maxilla, partial fragmentary left maxilla. Both zygomatics | NA | NA | 36-45 yrs | Dental attrition | Dental | NA | YES | 3 | Ageing: third molar missing |
| 110 | Central | Skull fragments (13) | Cranial vault | Axial | Superior most aspect of the cranial vault consisting of partial parietals, occipital and frontal | NA | NA | Adult | NA | None | NA | YES | 13 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | Central | Skull fragments (13) | Zygomatic | R | Complete right zygomatic with partial sphenoid greater wing attached at the suture | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 112 | Central | Skull fragments (13) | Mandible | Axial | Left mandibular condyle fragment | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 113 | Central | Skull fragments (13) | Vertebra | Axial | Spinous process tip | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 114 | Central | Skull fragments (13) | Mandible | Axial | Anterior two thirds of the bone (left ) and anterior third of the bone (right). The anterior plate of the mandible is missing at the anterior aspect | NA | NA | Adult | NA | Dental | NA | 0 | 1 | NA |
| 115 | Central | Skull fragments (13) | Mandible | Axial | Complete mandible | F | Reclining rami, anterior mental eminence | Adult | NA | Dental | NA | YES | 3 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 116 | Central | Pelvis (15) | Os coxa | L | Partial ilium (proximal half missing), complete ischium. Auricular and pubis are missing. | F | Greater sciatic Notch | Adult | NA | None | NA | 0 | 1 | NA |
| 117 | Central | T1 humerus | Humerus | L | Inferior quarter of left humerus | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 118 | Central | Pelvis #3 | Ilium | R | Complete but fragmentary immature ilium | NA | NA | Juvenile | NA | None | NA | YES | 4 | NA |
| 119 | Central | Pelvis #3 | Os coxa | R | £ fragments of acetabulum & 1 fragment of greater sciatic Notch | NA | NA | Juvenile | NA | None | NA | 0 | 4 | NA |
| 120 | Central | Skull & misc frags from E of skulls 15 | Parietal | R | Lateral half of the right parietal | NA | NA | Adult | NA | None | NA | YES | 3 | NA |
| 121 | Central | Skull & misc frags from E of skulls 15 | Animal | ? | 12 animal bone fragments | - | - | - | - | - | - | - | 12 | - |
| 122 | Central | Skull & misc frags from E of skulls 15 | Unidentified (human) | ? | 13 small unidentified human bone fragments | - | - | - | - | - | - | - | 13 | - |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 123 | Central | Skull & misc frags from E of skulls 15 | Humeral/Femoral head | ? | Partial Humeral/Femoral head | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 124 | Central | Skull fragments | Cranium | Axial | 8 fragments of cranial vault | NA | NA | Adult | NA | None | NA | 0 | 8 | NA |
| 125 | Central | Skull fragments | Cranium | Axial | 4 fragments of (infant?) cranial vault | NA | NA | Juvenile | NA | None | NA | 0 | 4 | NA |
| 126 | Central | Skull fragments | Parietal | L | partial left parietal (anterior half) | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 127 | Central | Skull fragments | Scapula | L | Partial glenoid (prox half) and coracoid of left scapula | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 128 | Central | Skull fragments (9) | Frontal | Axial | Central third of the frontal squama | NA | N | Adult | NA | None | NA | 0 | 1 | NA |
| 129 | Central | Skull fragments (9) | Temporal | L | Near complete temporal. | ?M | Mastoid size | Adult | NA | None | NA | 0 | 1 | NA |
| 130 | Central | Skull fragments (9) | Occipital | Axial | Basilar part of occipital | NA | NA | Juvenile (Ado) | Epiphyseal fusion | None | NA | 0 | 1 | NA |
| 131 | Central | Skull fragments (9) | Os coxa | R | Ischium only | NA | NA | Juvenile (>13, <16 years) | Epiphyseal fusion | None | NA | 0 | 1 | NA |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 132 | Central | Skull fragments (9) | Cranium | R | Right maxilla, zygomatic & sphenoid | NA | NA | 36-45 yrs | Dental attrition | | NA | 0 | 1 | NA |
| 133 | Central | Skull frags found within skull 17 | Fontal | Axial | Frontal fragment comprised of the medial third of the orbital margins and the glabellar region | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 134 | Central | Skull frags found within skull 17 | Temporal | R | Complete right temporal | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 135 | Central | Skull frags found within skull 17 | Occipital | Axial | Occipital squama | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 136 | Central | Skull frags found within skull 17 | Parietal | R | Anterior half | NA | NA | Adult | NA | None | NA | YES | 2 | NA |
| 137 | Central | Skull frags found within skull 17 | Cranium | Axial | 20 fragments of cranial vault | - | - | - | - | - | - | - | 20 | - |

| No | Cluster | Bag Notes | Bone | Side | Part | Sex Result | Sex Method | Age | Age method | Pathology | Cribra | Joins | No. of Frags | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 138 | Central | Skull fragments | Temporal | R | Temporal fragment comprised of the mastoid, EAM, petrous and zygomatic arch root | M | Massive mastoid | Adult | NA | None | NA | 0 | 1 | NA |
| 139 | Central | Skull fragments | Temporal | R | Temporal fragment comprised of the mastoid, EAM, petrous and partial squama | NA | NA | Juvenile | NA | None | NA | 0 | 1 | NA |
| 140 | Central | Skull fragments | Mandible | Axial | Right half of the mandible (right condyle is missing) | NA | NA | Juvenile (10-11 years) | Dental development | Dental | NA | 0 | 1 | NA |
| 141 | Central | Skull fragments | Maxilla | L | Complete left maxilla | NA | NA | Adult | NA | Dental | NA | 0 | 1 | NA |
| 142 | Central | Skull fragments | Thoracic vertebra | Axial | Neural arch (with all 4 apophyseal facets)and partial left transverse process | NA | NA | Adult | NA | None | NA | 0 | 1 | NA |
| 143 | Central | Skull fragments | Incus | R | Complete | - | - | - | - | - | - | - | 1 | - |

## 6.2 Dental Catalogue



**Key:**

| | | | | | |
|---|---|---|---|---|---|
| **-** | Alveolus missing | **E** | Erupting | **Shed** | Deciduous tooth has been shed |
| **~~28~~** | Tooth missing | **car** | Carious cavity | **AM** | Tooth lost ante mortem |
| **c** | Calculus | **H** | Hypoplasia | | |
| **Pd** | Periodontitis | **Ab** | Abscess | | |

Note: All dental charts below follow the FDI (Fédération Dentaire Internationale) tooth numbering system

**#14**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| car | car | | H | | H | | H | | | | | | | | |
| | c | c | c | c | c | c | c | - | - | - | - | - | - | - | - |
| RO | 27 | 26 | PM | 24 | 23 | 22 | 21 | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**#37**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | | | | | E |
| ~~55~~ | ~~54~~ | ~~53~~ | ~~52~~ | ~~51~~ | ~~61~~ | ~~62~~ | ~~63~~ | 64 | 65 |
| ~~85~~ | ~~84~~ | ~~83~~ | ~~82~~ | ~~81~~ | ~~71~~ | ~~72~~ | ~~73~~ | ~~74~~ | ~~75~~ |
| - | - | - | - | - | - | | - | - | - |
| | c | | | | | | | | |

**#42**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~PM~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| | | | | | | | | | | | | - | - | - | - |

**#52**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | car, Pd | |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | c | |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~PM~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | 17 | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**#85**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | c | c | | | | | - | - | - | - | - | - | - | - |
| UE | ~~27~~ | 26 | **54** | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**#89**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | c | | | c | - | - | - | - |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~25~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | 11 | ~~12~~ | ~~13~~ | 14 | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**#109**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pd carc | Pd c | Pd c | | | | | | | | - | - | - | Pd carc | Ab |
| ~~28~~ | 27 | 26 | 25 | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | 17 | AM |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**#114**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~25~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| AM | AM | AM | ~~45~~ - | ~~44~~ - | ~~43~~ - | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | AM | AM | AM | AM | AM |

**#115**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~25~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| AM | AM | 46 c | ~~45~~ | 44 c Pd | 43 c Pd H | ~~42~~ | ~~41~~ | 31 c | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | 36 c | ~~37~~ | ~~38~~ |

**#132**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pd c | Pd c | Pd c | | | | | - | - | - | - | - | - | - | - |
| PM | 27 | 26 | 25 | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

**#140**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - |
| ~~55~~ | ~~54~~ | ~~53~~ | ~~52~~ | ~~51~~ | ~~61~~ | ~~62~~ | ~~63~~ | ~~64~~ | ~~65~~ |
| shed | 84 - c, Pd | shed - | shed - | shed - | ~~71~~ - | ~~72~~ - | ~~73~~ - | ~~74~~ - | ~~75~~ - |

**#140**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~25~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | ~~14~~ | ~~15~~ | ~~16~~ | ~~17~~ | ~~18~~ |
| UE | ~~47~~ | 46 c | UE | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ - | ~~32~~ - | ~~33~~ - | ~~34~~ - | ~~35~~ - | ~~36~~ - | ~~37~~ - | ~~38~~ - |

**#141**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Pd c | Pd c | | | |
| ~~28~~ | ~~27~~ | ~~26~~ | ~~25~~ | ~~24~~ | ~~23~~ | ~~22~~ | ~~21~~ | ~~11~~ | ~~12~~ | ~~13~~ | 14 | 15 | AM | AM | ~~18~~ |
| ~~48~~ | ~~47~~ | ~~46~~ | ~~45~~ | ~~44~~ | ~~43~~ | ~~42~~ | ~~41~~ | ~~31~~ | ~~32~~ | ~~33~~ | ~~34~~ | ~~35~~ | ~~36~~ | ~~37~~ | ~~38~~ |

# The Animal Bones from an enclosure (DUO15-055) in Maynetown townland, Portmarnock South, Co. Dublin (22E0509)

Emily Murray

*1st October 2022*

***Introduction***

Archaeological testing was undertaken in Maynetown townland in north Co. Dublin in 2022 to investigate a circular enclosure (DUO15-055) and the area and features surrounding it. These included a large internal pit (C9) and two linear ditches (C15 and C19). The bottom of ditch C19 was not reached due to rising water levels but the similarity of the fills from the two linear ditches with that of the circular enclosure ditch (C7) suggested the probability that they are related and contemporary. The internal pit was associated with a deposit of human remains that were disarticulated and had been disinterred from elsewhere. C14 dating following testing at the site in 2008 returned a C14 date of 687-887 AD for the enclosure (Moriarty 2009) indicating that it is contemporary with the other circular enclosure ditches - 1A, 1B and 1C - excavated in the adjacent fields in the townland of Portmarnock (McLoughlin 2019a & b, 2020).

Hand-collected animal bones recovered from test excavations of the four features in Maynetown in 2022 comprised around 42 litres, or, 10.5kg. Given this relatively small size of the assemblage and the probability that the features are contemporary, the material is considered here collectively as one early medieval assemblage.

***Methodology***

The method of quantification employed for the faunal assemblage follows that used for the Knowth Early Christian animal bone assemblage described in full in McCormick and Murray (2007, Chapter 1.4). The codes used in the tables and database follow those used for Knowth (*ibid*., 176-7). In brief, all of the recovered faunal material was examined in detail but only a selective range of clearly defined bone elements or zones were counted (countable specimens) and these represent the 'number of identifiable specimens' totals (NISP). Antler burrs (shed and unshed) and horncores were counted if they had a complete transverse section. The closely related taxa of sheep and goat are difficult to distinguish but were separated when possible, using the criteria of Boessneck *et al.* (1964). The tooth eruption and wear stages for the deciduous and permanent fourth premolars ($dP_4$s and $P_4$s) and molars ($M_1$, $M_2$ and $M_3$) of cattle, caprines (sheep and goats) and pig, both isolated and in mandibles, were

recorded after Grant (1982) for cattle and pig, and Payne (1973 and 1987) for sheep, and mandibles were assigned to the mandibular wear stages (MWS) of Higham (1967). The state of fusion of post-cranial bones was recorded for all species and the estimated ages are based on Silver (1969). Measurements were taken on all fused and unburnt bones. The majority of measurements follow the criteria of von den Driesch (1976) with measurements of the distal humerus taken after Payne and Bull (1988). For all countable bones evidence of gnawing, butchery, burning and palaeopathological lesions was recorded.



***Results***

The quantified assemblage from Maynetown yielded a total NISP of 113 (Table 1). The largest quantity of animal bones was recovered from the internal pit C9 (54% NISP) followed by the fills of the sub-circular enclosure ditch C7 (37% NISP), and the fills of the two linear ditches C15 (8%) and C19 (1%). The range of species recorded (Table 2) comprised the main domesticates of cattle (72% NISP), pig (14%), sheep/goat (7%), horse (6%) and red deer (1%). This pattern of relative frequency, cattle followed by pig and then sheep/goat, is replicated across the features excavated (Table 2). Cattle also dominated the early medieval assemblages from the nearby enclosures of Portmarnock 1A, 1B and 1C where pig and then sheep/goat followed in importance. Sheep was positively identified in the Maynetown assemblage but not goat. There were also no fish or bird bones present. Although no dog or cat bones were recorded either, carnivore gnawing, most probably caused by dogs, was recorded on eleven of the countable bones. These were recorded on bones from a range of species and from different features indicating that dogs were also present on site. A couple of disarticulated human bones were found mixed-in with the animal remains from C25, S#13 (a longbone shaft fragment) and from T1 S#24 (calcaneum, immature). These contexts were both lower fills of pit C9, stratified below the upper pit-fill C24 which comprised a deposit of disarticulated human bones, removed from elsewhere and re-interred this pit.

| Feature | Context | NISP | *% of total NISP by feature* |
|---|---|---|---|
| C15 ditch | 12 | 4 | |
| C15 ditch | 13 | 5 | |
| **C15 ditch** | **Total** | **9** | ***8*** |
| C19 ditch | 18 | 1 | |
| | **Total** | **1** | ***1*** |
| C7 ditch | 6 | 11 | |
| C7 ditch | 27 | 6 | |
| C7 ditch | 28 | 20 | |
| C7 ditch | 29 | 5 | |
| **C7 ditch** | **Total** | **42** | ***37*** |
| C9 pit | 24 | 25 | |
| C9 pit | 21 24 | 17 | |
| C9 pit | 25 | 18 | |
| C9 pit | 8 | 1 | |
| **C9 pit** | **Total** | **61** | ***54*** |
| | TOTAL | 113 | |

**Table 1** Frequency of countable specimens (NISP) by context and feature rom Maynetown.

| Feature/Species | Cattle | Sheep/Goat | Pig | Horse | Red deer | NISP |
|---|---|---|---|---|---|---|
| C7 | 33 | 2 | 5 | 2 | - | 42 |
| C9 | 44 | 4 | 8 | 4 | 1 | 61 |
| C15 | 4 | 1 | 3 | 1 | - | 9 |
| C19 | - | 1 | - | - | - | 1 |
| NISP | 81 | 8 | 16 | 7 | 1 | 113 |
| *% NISP* | *72* | *7* | *14* | *6* | *1* | |

**Table 2** Frequency of countable specimens by species and feature from Maynetown.

***Cattle***

All parts of the cattle skeleton were represented including teeth, skull, horn cores (two), bones of the fore and hind limbs and torso. The majority of these were incomplete (there were just four complete cattle bones: three phalanges and a metacarpal) and ten displayed specific signs of butchery, mostly chop marks. These characteristics are typical of cattle bone assemblages from early medieval sites and indicate that cattle were probably brought to site on the hoof and killed, butchered and eaten on site. The cattle bone assemblage also included a scapula that had a sub-circular perforation on the blade (Plate 1 – the scapula blade was also freshly broken across the blade and perforation). This is indicative of a shoulder suspended on a hook for smoking suggesting a preserved joint of beef. No perforated scapulae were noted in the large assemblages of cattle bones from any of the three Portmarnock enclosures (1A, 1B and 1C). No signs of burning were noted in the countable

assemblage but several bones were darkly stained (from C29 and C21/24), probably due to waterlogging. Two foetal cattle bones, a metatarsal (length 99mm) and ulna were recovered from C28 (a fill of the enclosure ditch C7), possibly from the same animal. This indicates the presence of a pregnant cow on site. There was limited toothwear data (Table 3), but this included two worn deciduous fourth premolars indicating cattle killed in their second or third years. Fusion data was also limited (Table 4) but suggests the presence and slaughter of animals across a range of ages. Three pathologies were noted, all cattle. These comprised two mandibular condyles that were flattened (from C8 and C24) and a metatarsal (C21/24) in which the distal condyle was abnormally splayed out - a fairly common pathology in older animals due to weight bearing. All four pathologies probably derive from older cattle. Animal bone measurements for all animals, including cattle, are given in Table 5.

| Context | Species | Element | C | dp4 | P3 | P4 | M1 | M2 | M12 | M3 | Est age |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | B | LMT | 0 | j | 0 | 0 | 0 | 0 | 0 | 0 | - |
| 13 | B | LMT | 0 | 0 | 0 | 0 | 0 | 0 | f | 0 | - |
| 13 | B | LMT | 0 | k | 0 | 0 | 0 | 0 | 0 | 0 | - |
| 8 | O | MN | 0 | 0 | P | 7A | 9A | 8A | 0 | 7G/6G | mature (3rd yr) |
| 25 | S | MN | F | 0 | P | b | j | c | 0 | X | 19-21 mths |
| 8 | S | MN | 0 | 0 | x | b | g | c | 0 | C | 19-21 mths |
| 24 | S | MN | 0 | 0 | P | b | g | d | 0 | X | 19-21 mths |

**Table 3** Cattle (B), sheep/goat (O) and pig (S) age-slaughter data based on mandibular tooth eruption and wear, by context, after Grant (1982) for cattle and pig, and Payne (1973 and 1987) for sheep/goat. The estimated ages are after Higham (1967). MN = mandible; LMT = loose mandibular molar

| Cattle | Maynetown | Age in months | Fused | Unfused |
|---|---|---|---|---|
| **Early fusing** | humerus d., radius p. | 12-18 | 6 | 1 |
| | phalanx 1 & 2 p. | 18-24 | 3 | - |
| | TOTAL | | 9 | 1 |
| | *%* | | *90* | *10* |
| **Middle fusing** | tibia d., metapodium d. | 24-36 | 10 | 2 |
| | calcaneus p. | 36-42 | - | - |
| | *%* | | *83* | *17* |
| **Late fusing** | humerus p., radius d., ulna p., femur p., femur d., tibia p. | 42-48 | 4 | 5 |
| | *%* | | *44* | *56* |

**Table 4** Number of fused (including fusing) and unfused epiphyses grouped into early, middle and late stages for the Maynetown cattle bone assemblage (after Silver 1969). P = proximal; d = distal



**Plate 1** Perforated cattle scapula (S#24, T1)

***Pig and sheep/goat***

Just 16 pig bones/teeth were recorded and these included three age-able mandibles (Table 3) indicating the slaughter of animals, including one sow, towards the end of their second year. This is typical for pig bone assemblages as they are only kept for meat and do not provide secondary resources. Several of the pig long bones were also unfused (proximal humeri, ulnae and a femur), indicating immature animals which concurs with the toothwear data.

Eight sheep/goat specimens were recorded with two (a humerus and tibia) positively identified as sheep. One immature metacarpal was represented indicating a sheep killed at less than two years of age. There was also just one age-able mandible (Table 3).

***Horse***

Horse comprised 6% NISP at Maynetown which suggests a relatively high occurrence though the assemblage is too small to be statistically viable. Horse was represented at the Portmarnock enclosures 1A and 1C by 8% NISP which is notably high for the period for which 2% NISP is the norm (McCormick 2007). The Maynetown sample here is small (NISP 7) but given the high incidences of horse at adjacent sites it may be significant. The equid assemblage includes cranial and post-cranial elements, all mature with a femur and metatarsal both displaying cut marks. The latter were fine knife marks running medio-laterally around the bone at the metaphyseal juncture (distal femur and proximal metatarsal) indicating disjointing. Both of these attributes, butchery and ageing, are typical of horse bone assemblages from the period (McCormick 2007) and were common in the horse bone assemblages from the Portmarnock enclosures.

***Red deer***

Red deer was represented by a metatarsal along with a section of worked antler ('non-countable') both from C21/24 (fill of the pit, C9). The piece of antler (Plate 2) appears to comprise the crown, at the head of the main beam, with the two tines cut off and the main beam also cut through, partly sawn and then broken or snapped off. No other pieces of antler were represented in the assemblage. The single deer metatarsal indicates that some hunting took place. The red deer remains from Portmarnock enclosures 1A and 1B comprised antler and postcranial elements (NISPs of 3 and 4) indicating the practice of some limited hunting. None of these sites provide evidence for significant antler or bone working, apart from incidental domestic working and use.


**Plate 2** Worked red deer antler from C21/24.

***Summary and recommendations***

The Maynetown assemblage is small but this is as would be expected given that it was recovered from an evaluative excavation. The nature of the assemblage is fairly typical for the early medieval period with one or two features of note (a perforated cattle scapula and a possible high incidence of horse). It is recommended that the assemblage is retained as the site forms part of a large complex of enclosures all of which have produced large animal bone assemblages presenting a good overview for animal husbandry and exploitation in this area. There is also the possibility that further excavations will take place at the site and it may be of interest to revisit this assemblage for comparative purposes.

| C | S# | Sp | Elem | GL | GLl | GLm | Bp | SD | Bd | BT | HTC | B@F | GLP | SLC | Wmin | Wmax | Circ | L (HC) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | 15 | B | AS | 0 | 59.2 | 55 | 0 | 0 | 34.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | HC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36.1 | 47.6 | 0 | 145 |
| 6 | 7 | B | HC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 42.4 | 120 | >100 |
| 25 | 13 | B | HU | 0 | 0 | 0 | 0 | 0 | 0 | 65.5 | 28.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | 8 | B | HU | 0 | 0 | 0 | 0 | 0 | 0 | 76.3 | 33.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | MC1 | 179.5 | 0 | 0 | 52.4 | 26.7 | 51.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 9 | B | MC1 | 0 | 0 | 0 | 59.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | MT1 | 0 | 0 | 0 | 0 | 0 | 48.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | MT1 | 0 | 0 | 0 | 0 | 0 | 60.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | MT1 | 0 | 0 | 0 | 42.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| T1 | 24 | B | MT1 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 45.7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | 9 | B | RA | 0 | 0 | 0 | 73.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | SC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53.3 | 44.7 | 0 | 0 | 0 | 0 |
| T1 | 24 | B | SC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 43.2 | 0 | 0 | 0 | 0 |
| 25 | 13 | B | TI | 0 | 0 | 0 | 0 | 0 | 55.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | TI | 0 | 0 | 0 | 0 | 0 | 57.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | B | TI | 0 | 0 | 0 | 0 | 0 | 54.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 24 | 6 | CEE | MT1 | 0 | 0 | 0 | 34.6 | 22.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 9 | EQ | MT1 | 259.3 | 0 | 0 | 48.7 | 30.8 | 47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18 | 4 | O | AS | 25.2 | 0 | 0 | 0 | 0 | 15.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 7 | O | SC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26.2 | 16.4 | 0 | 0 | 0 | 0 |
| 25 | 13 | O | TI | 0 | 0 | 0 | 0 | 0 | 22.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 10 | OVA | HU | 0 | 0 | 0 | 0 | 13 | 0 | 25.4 | 12.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 1 | OVA | TI | 0 | 0 | 0 | 0 | 0 | 20.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 9 | S | HU | 0 | 0 | 0 | 0 | 0 | 0 | 29.7 | 19.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 5** Animal bone measurements in millimetres after von den Driesch (1976). Sorted by animal and element: B (cattle), O = sheep/goat, OVA = sheep, CEE = red deer, EQ = horse, S = pig. C = context number and S# = sample number

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**Appendix 5.3** **Metal finds – Jacqueline Mac Dermott**



**Report on the metal finds from Maynetown, Co. Dublin 22E0509**

**Jacqueline Mac Dermott MA MIAI**

Archaeological testing at Maynetown, Co. Dublin produced 2 iron objects – a large iron ring and a fragment of an iron knife-blade.

**Iron ring.**

A large annular iron ring (22E0509:1) was recovered from one of the upper fills (C21) of a large pit (C9) within the enclosure ditch of DU015-055 revealed in Trench 1. The ring was found within a layer of food waste material containing ash, charcoal and an abundance of sea-shells. It is circular with a rectangular section, a flat obverse and slightly rimmed reverse. A badly corroded mass of iron with a short knop on the reverse side may be the remains of a loop or plate of some kind (plate 1).

The deterioration of the attachment makes exact identification difficult, but the size and shape of the ring implies it was used either as a pull-handle on a small door or as a suspension loop. The corroded area may be the remains of a loop that secured the ring to a door or similar wooden object and allowed the ring to rotate within the loop. It this is the case, the short shank of the knopped nail or pin and relatively narrow thickness of the ring suggests it was attached to a narrow-walled object, such as a small gate, thin door or possibly even a light wooden chest.

Alternatively, it may be a suspension ring with a badly corroded looped and knopped swivel hook attached as illustrated in Geoff Egan's *The Medieval Household* (1998, 170) and similar to a 13th century example found at South Witham, Lincolnshire and a 15th century example from Newbury in Berkshire (Goodall 2011, 335-336). The ring also calls to mind medieval and post medieval snaffle-bit rings, but seems a little large for this function. At the time of writing, the date of pit C9 or layer C21 had not been established, and the generic nature of the ring makes dating based on typology unsound.

**Iron knife blade.**

Pit C9 in Trench 1 also produced a fragment of what appears to be a small iron knife blade (22E0509:2). The fragment was recovered from a deposit of re-interred disarticulated human bones (C24) within the pit. Very little remains, but the triangular section and curved back is suggestive of early medieval and medieval knife blades, categorised by Ian Goodall as Type E knives (1990, 836), although the fragmentary nature of the object means this is a tentative suggestion only (plate 2).

If it is a type E knife blade, they have been found in abundance on Irish early medieval sites of the 7th to 10th centuries. In analysing the blade shapes of knives found at Deer Park Farms, Co. Antrim, Lynn and McDowell (2011, 281) found that the type E knife was most prolific in the earlier phases of the site (7th to 8th centuries). This is echoed at the 7th – 8th century site of Dunadd, Argyllshire, Scotland, where the majority of knives found were Type E (Lane and Campbell 2000, 162-3). On most other Irish early medieval sites however they tend to occur more equally in all phases. They also feature in lesser numbers on Viking-age and medieval sites in both Ireland and the UK - in 10th century and later levels at Winchester (Goodall 1990, 836), and 11th-12th century levels at Waterford (Scully 1994, 454).

| Find No | Context | Name | Material | Description | Type | Dimensions (cm) | Context Description |
|---|---|---|---|---|---|---|---|
| 2022E509:1 | 21 | Iron annular ring | Iron | Iron annular ring, thin rectangular section. Flat on obverse side, slight rim on reverse. Badly corroded loop or fixing with spherical knop or nail on reverse. Short shank of knop or nail indicates it was attached to a narrow-framed object. Alternatively, a suspension ring with badly corroded looped and knopped suspension hook. Date unknown. Conserved. | | L 10.97, D ring 9.96, W ring 1.09, T ring 0.73, T attached fragment 2.83. | Upper fill of pit C9, under C8, over C22. Domestic waste / feasting |
| 2022E509:2 | 24 | Iron knife blade fragment | Iron | Fragment of small iron knife, triangular sectioned blade. Rounded back, middle section only. Goodall's Type E / Laing's Type 1. Possibly early medieval or medieval. Conserved. | Type E | L 2.87, W 1.42, T 0.34 | Fill of pit C9, under C23, over C25. Contains disarticulated human bones |

*Plate 1: Iron ring 22E0509:1*

*Plate 2: Possible knife blade 22E0509:2*

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# Final report on the metalworking remains at Maynetown, Co. Dublin (22E0509)

Paul Rondelez

Macroom, Co. Cork

1 March 2023

**Introduction**

During archaeological testing ahead of construction work at Maynetown, Co. Dublin a small assemblage of metalworking waste (1436g) was found associated with an early medieval enclosure. The material consisted of blacksmithing debris and most of it was recovered from a large waste pit.

**Description of the material**

Trench 1, was placed over a the ditch of a circular enclosure and part of its interior. Upper fill C6 of enclosure ditch C7 contained a likely smithing hearth cake fragment (68g). Radiocarbon analyses of a cow bone from lower fill C29 in that same enclosure ditch returned a date between the late 8$^{th}$ to mid 10$^{th}$ centuries AD (2 sigma).

About 7m south of the enclosing ditch, and in its interior, a large pit C9 was uncovered. Lower fill C24 of that pit contained three smithing hearth cakes (278g, 501g and 508g) (Pl. 1), a likely smithing hearth cake fragment (47g) and a small piece of slag (1g) recovered from the inside of a skull. Upper fill C8 yielded a piece of heavily weathered slag (33g).

**Interpretation and conclusions**

The metalworking waste is consistent with that from early blacksmithing. The material was mainly found in a large waste pit in the interior of the early medieval enclosure, it is very likely that forging activities took place inside and contemporary with that enclosure.

Small amounts of blacksmithing waste were recovered from several nearly excavated sites of broadly contemporary date: a double-ditched enclosure about 500m to the west in the townland of Portmarnock (Rondelez 2020), an enclosure about 600 northwest at Portmarnock, Station Road (Rondelez 2019) and an enclosure in the townland of Drumnigh about 750m to the west (Rondelez 2023).

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## Catalogue



| Cut | Fill | Sample | Feature | Description | Weight (g) |
|---|---|---|---|---|---|
| 7 | 6 | 16 | Enclosing ditch | Piece of rather dense slag, likely SHC fragment | 68 |
| 9 | 8 | 18 | Pit | Heavily weathered rather dense slag with some flow structure | 33 |
| 9 | 24 | 11 | Pit | Rather dense irregular bun-shaped SHC. Rusty upper surface and imprints after charcoal on both surfaces | 278 |
| 9 | 24 | 14 | Pit | Fractured, heavily weathered smithing hearth cake covered in concretion | 508 |
| 9 | 24 | 14 | Pit | Fractured, rather dense irregular bun-shaped SHC. Weathered protrusion on upper surface, rather smooth lower surface | 501 |
| 9 | 24 | 19 | Pit | [In skull] Piece of rather dense slag | 1 |
| 9 | 24 | 17 | Pit | Piece of rather dense slag, likely SHC fragment | 47 |

## Plates

*Pl. 1. Smithing hearth cake from fill C24 in pit C9*

**Appendix 5.5** **Radiocarbon dating – Chrono Lab, Queen's University Belfast**



CHRONO Radiocarbon Database


$^{14}$CHRONO Centre
Queens University
Belfast
42 Fitzwilliam Street
Belfast BT9 6AX
Northern Ireland

| UBANo | Sample ID | Material Type | $^{14}$C Age | ± | F14C | ± | mg Graphite |
|---|---|---|---|---|---|---|---|
| UBA-49764 | Sample 13, C25 | Failed | Failed | Failed | Failed | Failed | Failed |
| UBA-49765 | Sample 15, C29 | Bone, cattle mandible | 1176 | 24 | 0.8638 | 0.0025 | 0.992 |

| UBANo | Sample ID | Material Type | $^{14}$C Age | ± | F14C | ± | mg Graphite |
|---|---|---|---|---|---|---|---|
| UBA-50542 | C24, 22E0509:3 | human, femoral shaft fragment | 1251 | 26 | 0.8558 | 0.0028 | 0.985 |

## Radiocarbon Date Certificate



| | |
|---|---|
| Laboratory Identification: | UBA-49765 |
| Date of Measurement: | 2023-02-17 |
| Site: | 22E0509 Maynetown |
| Sample ID: | Sample 15, C29 |
| Material Dated: | bone, antler or tooth root |
| Pretreatment: | Collagen |
| mg Graphite: | 0.992 |
| Submitted by: | Gill McLoughlin |

| | |
|---|---|
| Conventional $^{14}C$ Age: | 1176±24 BP |
| Fraction corrected | using AMS $\delta^{13}C$ |

## Radiocarbon Date Certificate

| | |
|---|---|
| Laboratory Identification: | UBA-50542 |
| Date of Measurement: | 2023-06-01 |
| Site: | Maynetown 22E0509 |
| Sample ID: | C24, 22E0509:3 |
| Material Dated: | bone, antler or tooth root |
| Pretreatment: | Collagen |
| mg Graphite: | 0.985 |
| Submitted by: | Gill McLoughlin |

| | |
|---|---|
| Conventional $^{14}C$ Age: | 1251±26 BP |
| Fraction corrected | using AMS $\delta^{13}C$ |

RADIOCARBON CALIBRATION PROGRAM*
CALIB REV8.2

*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230.

UBA-49765
49765
Radiocarbon Age BP 1176 +/- 24
Calibration data set: intcal20.14c # Reimer et al. 2020

| % area enclosed | cal AD age ranges | relative area under probability distribution |
|---|---|---|
| 68.3 (1 sigma) | cal AD 775- 788 | 0.195 |
| | 827- 889 | 0.805 |
| 95.4 (2 sigma) | cal AD 774- 793 | 0.164 |
| | 795- 896 | 0.728 |
| | 922- 952 | 0.108 |

Median Probability: 850

References for calibration datasets:
Reimer P, Austin WEN, Bard E, Bayliss A, Blackwell PG, Bronk Ramsey C, Butzin M
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Fahrni S, Fogtmann-Schulz A, Friedrich R, KÃ¶hler P, Kudsk S, Miyake F, Olsen J
Sakamoto M, Sookdeo A, Talamo S. 2020.
The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0-55 cal kB
Radiocarbon 62. doi: 10.1017/RDC.2020.41.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.

RADIOCARBON CALIBRATION PROGRAM*
CALIB REV8.2
Copyright 1986-2020 M Stuiver and PJ Reimer
*To be used in conjunction with:
Stuiver, M., and Reimer, P.J., 1993, Radiocarbon, 35, 215-230

UBA-50542
50542
Radiocarbon Age BP 1251 +/- 26
Calibration data set: intcal20.14c # Reimer et al. 2020

| % area enclosed | cal AD age ranges | relative area under probability distribution |
|---|---|---|
| 68.3 (1 sigma) | cal AD 686- 742 | 0.720 |
| | 762- 764 | 0.008 |
| | 772- 775 | 0.020 |
| | 790- 805 | 0.148 |
| | 810- 821 | 0.104 |
| 95.4 (2 sigma) | cal AD 674- 753 | 0.601 |
| | 757- 775 | 0.083 |
| | 786- 833 | 0.257 |
| | 850- 876 | 0.059 |

Median Probability: 735

References for calibration datasets:
Reimer P, Austin WEN, Bard E, Bayliss A, Blackwell PG, Bronk Ramsey C, Butzin M
Edwards RL, Friedrich M, Grootes PM, Guilderson TP, Hajdas I, Heaton TJ, Hogg A
Kromer B, Manning SW, Muscheler R, Palmer JG, Pearson C, van der Plicht J, Reim
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Fahrni S, Fogtmann-Schulz A, Friedrich R, KÃ¶hler P, Kudsk S, Miyake F, Olsen J
Sakamoto M, Sookdeo A, Talamo S. 2020.
The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0-55 cal kB
Radiocarbon 62. doi: 10.1017/RDC.2020.41.

Comments:
* This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.^2 + curve std. dev.^2)
** 2 sigma = 2 x square root of (sample std. dev.^2 + curve std. dev.^2)
where ^2 = quantity squared.
[ ] = calibrated range impinges on end of calibration data set
0* represents a "negative" age BP
1955* or 1960* denote influence of nuclear testing C-14

NOTE: Cal ages and ranges are rounded to the nearest year which may be too precise in many instances. Users are advised to round results to the nearest 10 yr for samples with standard deviation in the radiocarbon age greater than 50 yr.