

**Archaeological Excavation of
Pit Features at
Site 134, Faughart Lower 6,
Dundalk, Co. Louth
M1 – Dundalk Western Bypass**

Licence Holder: Avril Hayes MA MIAI

Final Report

NGR: 306206/311037

Chainage: 26400

Excavation Licence Number: 04E0811

ÆGIS Ref: 255-1.20



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PROJECT ARCHAEOLOGIST:	Niall Roycroft

PLEASE NOTE...

That the archaeological recommendations, mitigation proposals and suggested methodology followed in this report were first formulated and approved by the National Roads Authority Project Archaeologist Niall Roycroft, prior to the commencement of the archaeological dimension of the project. The National Monuments Acts 1930-2004 is the current legislation in relation to archaeological projects.

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Contents

	page
I. Abstract	4
II. List of figures, plates and tables.....	5
III. Abbreviations and terms used in the text	6
1. Introduction	7
1.1 Background to Excavation	
1.2 Project Personnel	
1.3 Location & Existing Environment	
1.4 Historical Background	
1.5 Excavation Methodology	
2.Context List	15
3. Stratigraphic Sequence	16
3.1 Matrix	
3.2 Context Descriptions	
4. Interpretation of Stratigraphy	26
5. The Artefacts	28
5.1 Pottery (Helen Roche & Dr Eoin Grogan)	
5.2 Wood Identification (Stjuits 2006 and Beta Analytic 2006)	
5.3 Cremations (Margaret McCarthy MA MIAI)	
5.4 Flint Flake (Woodman 2005)	
6. Discussion	31
7. Sample and Find List	33
7.1 Samples	
7.2 Finds	
8. Conclusions	35
9. Non-Technical Summary	36
10.Project References	38
11.Signing-Off Statement	40
12.Archive Index Sheet	41
13.Appendices	43
13.1 Pottery Report	Helen Roche & Eoin Grogan
13.2 Charcoal Identification Report	Dr Ingelise Stjuits
13.3 Flint Report	Professor Peter Woodman
13.4 Radio-Carbon Dating Report	Beta Analytic

I. Abstract

This final excavation report details the licenced archaeological excavation of pit features discovered during the monitoring of topsoil stripping associated with the construction of the M1, Dundalk Western Bypass Dundalk, Co. Louth. (licence holder: Avril Hayes; licence no: 04E0335). The features were uncovered at Faughart Lower, a townland located at the northern end of the Bypass. Full site details include:

- Project Site No: Site 134, Faughart Lower 6
- Licence No: 04E0811
- NGR: 306206/311037
- Chainage: 26400
- OD: c.6m

A number of circular and oval features were uncovered during the course of the topsoil stripping at Faughart Lower; eight pit features were identified, all of which were excavated by hand. The site was located in an undulating landscape, immediately north of the main Dundalk to Newry road. Excavation took place in May 2004. A preliminary (stratigraphic) report was submitted to the Department of the Environment Heritage and Local Government (DoEHLG) in August 2005, subsequent to its approval by the NRA Project Archaeologist (Hayes 2005; Report Reference 355-1.9).

This site was a late Neolithic/early Bronze Age site possibly associated with domestic activity. The pottery fragments recovered from the excavation are fine and domestic beaker ware. A fairly uniform date range was returned from the C14 analysis (2880 cal BC – 2460 cal BC).

The excavation was funded in full by Celtic Roads Design Group.

II. List of Figures, Plates and Tables

FIGURES:

	<i>page</i>
1. General location map of site, north to top (after Discovery Series 36, 1box = 1km ²)	8
2. Location of site in relation to Dundalk Western Bypass	9
3. Detail of RMP sheets 4 and 7, for Louth showing site location	9
4. 1 st edition 6 inch map showing site location, proposed road in blue (OS 1835)	10
5. Post excavation plan of site	18
6. Southeast-northwest profile of [c3] and [c5]	19
7. Northeast-southwest profiles of [c9] and [c11]	20
8. Northeast-southwest profile [c13]	20
9. Northeast to southwest profiles of [c7], [c15] and [c17]	21

PLATES

(Note- scale in photos 1m)

1. [c2] and [c4] from southwest	23
2. [c3] and [c5] post excavation from southwest	23
3. [c6] pre excavation from south	23
4. [c8] pre excavation from north	23
5. [c10] pre excavation from south	23
6. [c11] post excavation from south	23
7. [c12] pre excavation from south	24
8. [c13] post excavation from south	24
9. [c14] pre excavation from north	24
10. [c15] post excavation from east	24
11. [c16] pre excavation from south	24
12. [c17] post excavation from east	24
13. Site at Faughart Lower from east	25
14. Vessel 1, fine Beaker ware with all-over-cord decoration	29
15. Vessel 7 domestic beaker, rim sherds (find nos shown)	29

TABLES:

	<i>page</i>
1. List of finds from Faughart Area (NMI Topographical Files)	11

III. Abbreviations & Terms Used in Text

Bank Right bank and left bank of a river or stream may be determined when one looks downstream, i.e. in the direction that the river is flowing. It may also be an earthen “wall” around an enclosure, often associated with a ditch.

Barony, Parish, Townland These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the country. The origins of these divisions are believed to be in the Early Medieval/Christian period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500).

Bronze Age C. 2,500 – 500BC (2500-2000BC sometimes referred to as “Beaker Period”)

Context Each feature found during the excavations is allocated a number, commonly termed a “Context Number” in order to record the archaeology.

Ditch A cut feature forming an enclosure and associated with a bank in some cases.

Diaphyses Shaft area of a long bone

First Edition This relates to editions of the OS 6 inch maps for each county. The first edition map completed for the area dates to the early 1840s and this is referred to in the text as the “first edition”.

G.S. Grid square

LH - This number is the number of the site on the RMP map (see below). It begins with the county code, here LH for Louth, the 6-inch sheet number, followed by the number of the archaeological site.

M Metres, all dimensions are given in metres or part of a metre, unless otherwise stated

OS Ordnance Survey

Ph Parish

RMP Record of Monuments and Places. An update of the older SMR, (sites and monuments record), on which all known archaeological sites are marked and listed in an accompanying inventory. The sites marked afford legal protection under the National Monuments Acts 1930-1994. The record is based on the 6 inch map series for the country and is recorded on a county basis.

Sheet This relates to the six inch map for each county which is divided into sheets.

Td Townland

1. Introduction

1.1 Background to Excavation

The site at Faughart Lower was noted during monitoring of the topsoil stripping phase of the project in advance of the Dundalk Western Bypass, under licence: 04E0335. There was no trace of these features above ground. The site was excavated over a period of one week in May 2004.

The entire length of the route was subject to an Archaeological Impact Assessment in 1993 and 2000. A programme of centre-line testing was subsequently undertaken in 2002 by Irish Archaeological Consultancy Ltd (licence Nos. 02E0373 & 02E0658) and archaeological sites encountered during the testing were excavated prior to the topsoil stripping phase of the project.

1.2 Project Personnel

The site at Faughart Lower was excavated by three staff of Aegis Archaeology Ltd. The licence holder for the project was Avril Hayes. Jack Curley was the site agent for the client. Niall Roycroft is the NRA Project Archaeologist. Margaret Mc Carthy was the animal bone specialist. Helen Roche and Eoin Grogan were the pottery specialists. Dr Ingelise Stjuts identified the wood. Radio-Carbon dates were returned by Beta Analytic.

1.3 Location and Existing Environment (figures 1 & 2)

The site is located to the north of Dundalk town in the townland of Faughart Lower (NGR 306206/311037), the parish of Ballymascanlon and Barony of Lower Dundalk (*Townland Index* 1982). The Dundalk Western Bypass joins the existing N1 roadway from Dundalk to Newry in this vicinity.

The site sits at the base of a low hill (AOD 6.75m), which slopes gradually upwards to the west. The land here appears to have been part of the estate attached to Faughart House, which lies to the northwest of the site. Undulating fields in pasture dominate the landscape around the site. The field in which the site is located had been planted in the past.

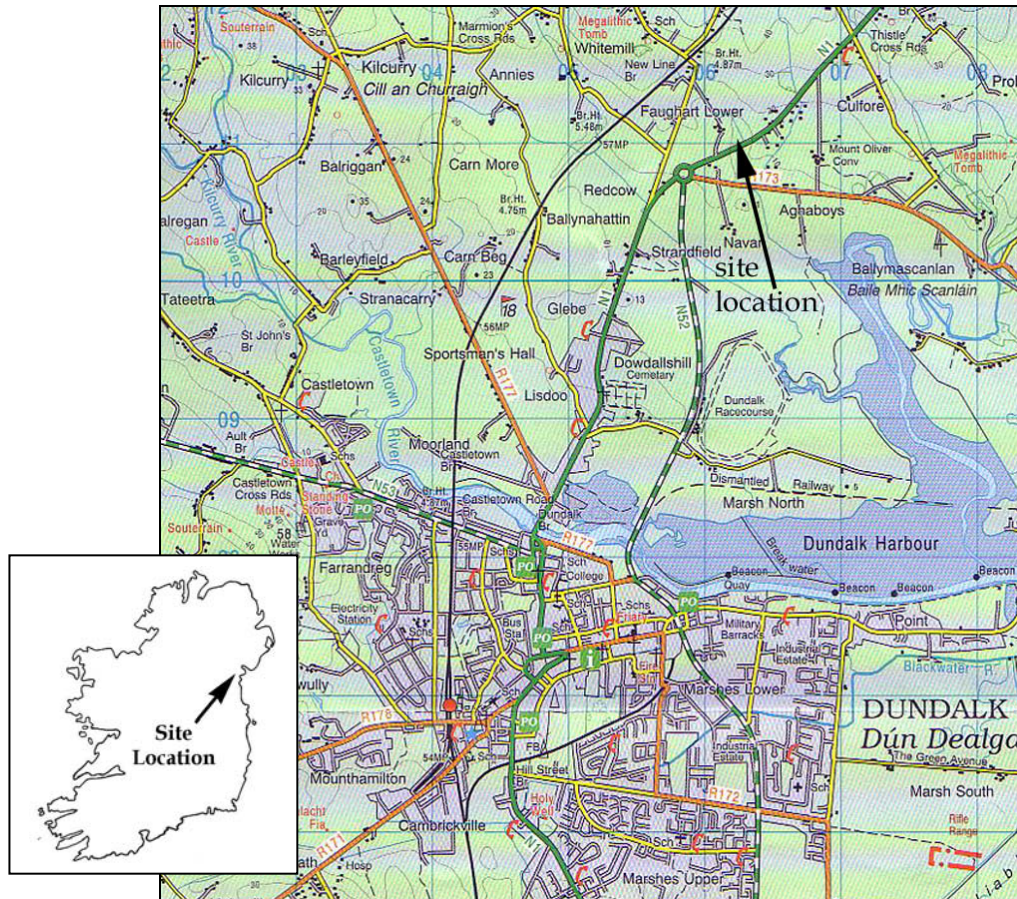


Figure 1. General location map of site, north to top (after Discovery Series 36, 1box = 1km²)

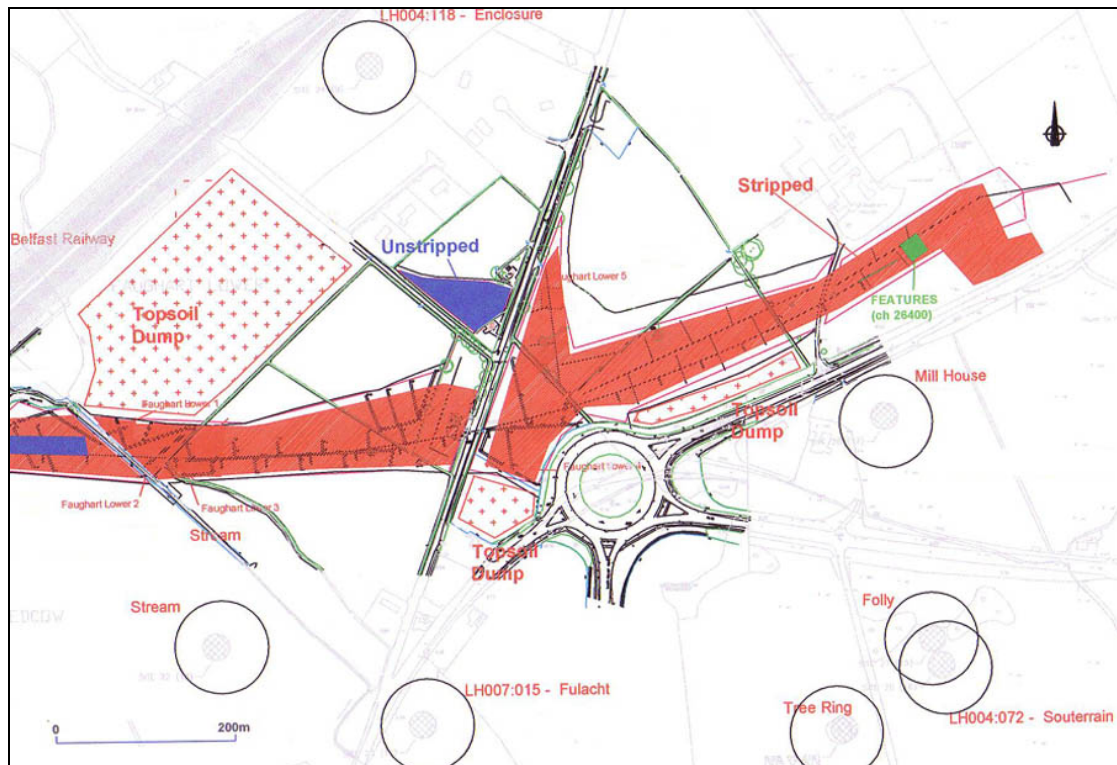


Figure 2. Location of site (in green) in relation to Dundalk Western Bypass (supplied by NRA Project Archaeologist with additions)

1.4 Background (figs 3 & 4)

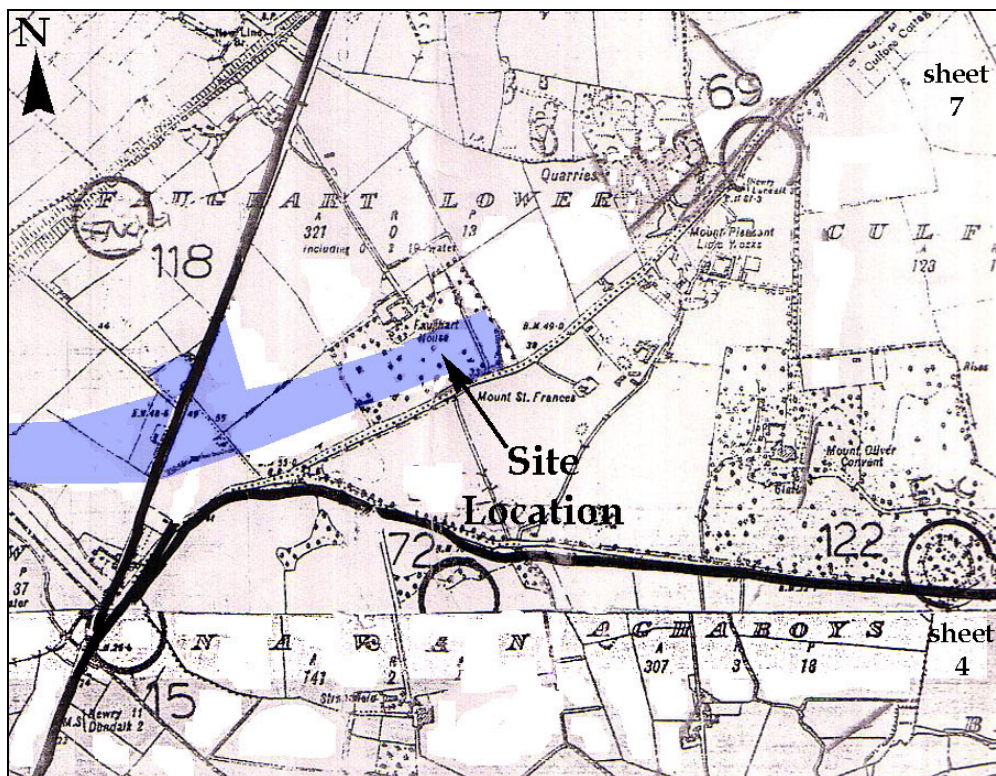


Figure 3. Detail of RMP sheets 4 and 7, for Louth showing site location (Archaeological Survey of Ireland 1994)

The *Archaeological Inventory of County Louth* (Buckley 1986) notes several archaeological sites in the townland of Faughart Lower (fig 3). A possible *fulacht fiadh* (LH007-015---) survives as a low mound beside a stream. In the neighbouring townland of Navan, also in the parish of Ballymacscanlan, are the remains of a souterrain (LH004-072---) disturbed by ploughing activity. LH004-118--- is described as a partially extant enclosure first identified in 1835. The site was subsequently largely demolished during railway embankment construction. The only extant portion is the curving line of a field fence, which marks the northern and eastern perimeter of the enclosure.

The entire route of the Dundalk Western Bypass was subject to a phase of centre line test trenching. Numerous archaeological sites were identified and excavated as a result of this. None was discovered in the townland of Faughart Lower during that phase of the project.

The site was located in the demesne of Faughart House, and a number of estate trees were noted in the immediate area around the site as is noted in fig. 4. The townland of Faughart Lower is located in the parish of Ballymascanlon and the Barony of Lower Dundalk. Faughart Lower or *Fochaird Uacharach* means lower grassy hill (O'Donovan 1840). Lewis refers to Faughart House as having been the residence of Neale McNeale Esq. The house was 'pleasantly situated in a well-planted demesne' (Lewis 1837, 614).

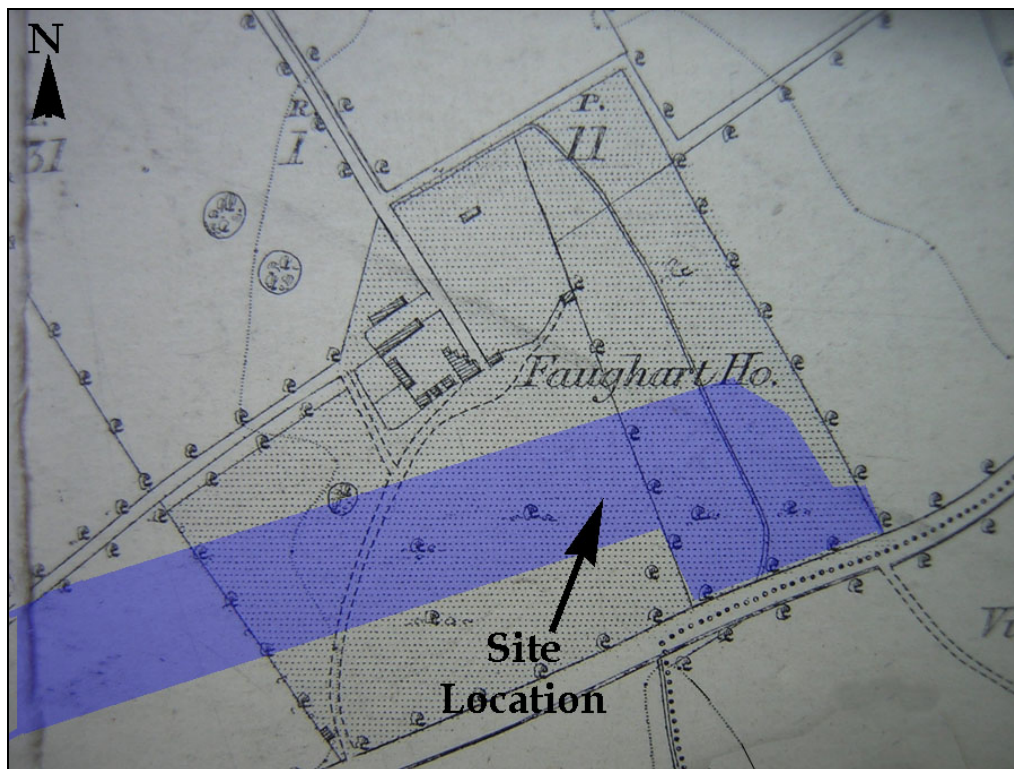


Figure 4. 1st edition 6-inch map showing site location, proposed road in blue (OS 1835)

The National Museum Topographical files note a number of finds from the townland of Faughart (lower & upper), Co. Louth. They are:

Townland	Monument	Find description	Reg. No.
Faughart	Church Site	Pot sherds (medieval Tile fragment Iron nails and slag	E77:1-30
Faughart	n/a	Winged Celt (axe)	26:2:32
Faughart Lower	Church	Rectangular monumental slab	1935:167
Faughart/Ravensdale	n/a	Bracelet twisted, 2 pieces copper alloy	1883:348

Table 1. List of finds from Faughart Area (NMI Topographical Files)

The prehistoric archaeological record of this area of Louth has been significantly added to with the construction of the Dundalk Western Bypass. As noted by Roycroft (2005, 66), 53% of sites excavated along the route were prehistoric in date. Prior to the roadworks, just 22.5% of known archaeological sites in the vicinity of the route were prehistoric in origin (*ibid.*). This indicates that the current known prehistory of the Dundalk area may be somewhat misleading and not representative of the actual reality. It is likely that this region is rich in prehistoric remains, albeit yet to be uncovered.

The earliest evidence of human activity in the Dundalk area, or indeed the county of Louth, is a waste flint flake was recovered from glacial gravel, which was deposited as early as 200,000BC near Drogheda, Co. Louth (Mitchell and Sieveking 1972, after Herity and Eogan 1989, 16). However, the flake appears to have been transported along with the gravel from an area close to the basin of the Irish Sea and instead is indicative of human activity in that area in the Middle Palaeolithic period (*ibid.*). The Mesolithic period ('Middle Stone Age') dates from 8000-4000BC and is the earliest period in Ireland with secure evidence of human habitation. People living in the Mesolithic period were gatherers, hunters, and fishers. It is thought they lived near the coastlines and along rivers, using flint and other suitable stones to make sharp tools (Anderson 1993, 16). These people are found in the archaeological record by the material they left behind, usually in the form of stone tool-making waste ('debitage'), and the tools themselves, and more rarely by habitation evidence such as house structures, pits, and hearths. One of the most well-known sites of the Early Mesolithic is Mount Sandel in Co. Derry (Woodman 1985). There is a noticeable lack of Mesolithic sites in the county of Louth in general. A perusal of the *Archaeological Inventory of County Louth* (Buckley 1986) reveals a distinct shortage of sites dating to this period. Indeed the Mesolithic appears to be primarily represented in Louth by surface scatters of diagnostic flints, such as at Richardstown (LH017-0216--). No new Mesolithic sites were recorded during the archaeological phase of the construction of the M1 Dundalk Western Bypass.

The Neolithic ('New Stone Age') saw the introduction of farming into Ireland, and the period spans from 4000 to 2500BC. The change is seen in the archaeological evidence through domesticated plant and animal remains and a more sedentary lifestyle, although it is now thought that a certain amount of hunting and gathering would have continued (Waddell 1998). An important development in the Neolithic is the appearance of community burial places, megalithic tombs (of which there are 4 types), which took much time, effort, and planning to construct (Twohig 1990). Evidence of land-clearance, possibly associated with the beginnings of cereal growing have been recorded at Ravensdale Park (Mitchell 1951, in Herity and Eogan 1989, 25) and at Redbog (McAulay and Watts 1961, in Herity and Eogan 1989, 25), with the latter manifesting as elm clearance dating to 3210BC (*ibid.*). A number of megalithic monuments are known from the area. Indeed, Dundalk appears to be the eastern end of a line of delineation stretching eastwards from Westport in Co. Mayo, north of which are virtually all of one of the earliest megalithic tombs – court cairns (Herity and Eogan 1989, 27). One of the most visually impressive tombs in the region is Proleek portal tomb (LH004-074---), located approximately 2km to the east of Faughart Lower. A ceremonial enclosure or henge monument, dating to the Neolithic Period (3400-2900BC) was excavated at Balregan (excavated by Irish Archaeological Consultancy under licence no. 03E015; Roycroft 2006, 9). Later Neolithic and Iron Age dates were also recovered from the site (*ibid.*). Early Neolithic dates were recovered from a settlement site at Donaghmore (*ibid.*), also along the route of the M1 DWB. The site at Faughart Lower 6 was dated to the Late Neolithic/Early Bronze Age and was similar in composition to material found at the nearby site of Faughart Lower 5, in that pits pottery and cremated bone was found but there was an absence of building evidence (Delaney 2006a; Roycroft 2006).

The Bronze Age (2500-500BC) marks the first introduction of widespread metal-use into Ireland, firstly copper and then bronze. It is thought that society in this period became more hierarchical, with stress in the community evidenced in the archaeological record by the disproportionate amount of weapons, particularly those which appear to be ritually deposited in watery places. A number of bronze swords are recorded in this region. These include the butt and a portion of the blade of a sword from Drogheda now housed in the British Museum in London (Eogan 1965, 73), and another sword found under 'three feet of gravel' at Derrycammagh Ford at the River Glyde and now in the National Museum of Ireland (*ibid.*, 138). Another bronze sword was recovered in 1862 in a bog between Faughart and Ravensdale, along with a twisted bronze annular ring (Eogan 1983, 106-7). The whereabouts of the sword, along with '17 pieces of Bronze Money' (probably bronze rings) is unknown (*ibid.*). Three golden dress-fasteners were also recorded as being recovered from a

bog in Cos Louth/Meath pre-1773. The Lord Chancellor acquired one of the fasteners at that time, while the other two were melted down (*ibid.*).

A variety of prehistoric sites were uncovered along the 9.5km long bypass. The artefact assemblage includes two polished stone axes; 2000 sherds of Neolithic to Early Bronze Age pottery, at least 13 Bronze Age pots; c.450 struck flints, nine metal finds and seven worked or decorated stone objects (Roycroft 2005, 72-74). The sites from which the material was uncovered consisted of domestic sites, *fulachta fiadh* and cemetery sites.

1.5 Excavation Methodology

The excavation of the site at Faughart Lower was run in compliance with the agreed method statement submitted with the excavation licence for this project. The topsoil covering the site was stripped by a mechanical excavator working under archaeological supervision. The site at Faughart Lower was completely excavated by hand in May 2004. The team consisted of one director, one supervisor and one assistant.

The resolution of the project is being undertaken in accordance with guidelines as set out by the heritage policy paper *Policy & Guidelines for Archaeological Excavation* (DAHGI 1999). The project also draws on English Heritage's policy document *Management of Archaeological Projects* (1991), which includes the following project pathway:

- Phase 1 Project Plan
- Phase 2 Fieldwork (on-site resolution)
- Phase 3 Assessment of Potential for Analysis
- Phase 4 Analysis and Report Production
- Phase 5 Dissemination

Phase Two- the site excavation, by hand, of the site, used an amended version of the MoLAS (Museum of London Archaeological Service 1994) system of context recording. This is a method of excavation that has been used in Britain since the 1970s and has proved to be very successful, in both the efficiency of on-site recording/excavating and in the formation of the report in post-excavation.

Aegis has its own Quality Manual (2001 and revisions) which sets out all its Standard Operating Procedures (SOPS) for work of this type. These are followed as part of the

company's wider Quality Management System. The Assessment of Potential for Analysis was undertaken during the post-excavation stage of the project. The main areas for analysis consisted of material sampled for identification and dating especially pottery, details of which can be found in the Appendices of this report (section 13).

A preliminary archaeological report detailing the initial findings was submitted to the Department of the Environment Heritage and Local Government in August 2005 (Aegis Ref. 255-1.9). This report represents phase 4 of the project pathway. Specialist analysis has been undertaken and a discussion based on these findings is included in this report (sections 5 & 6). Subsequent to specialist analysis licences to alter and export material for dating were sought and received from the National Museum of Ireland in 2006.

2. Context List

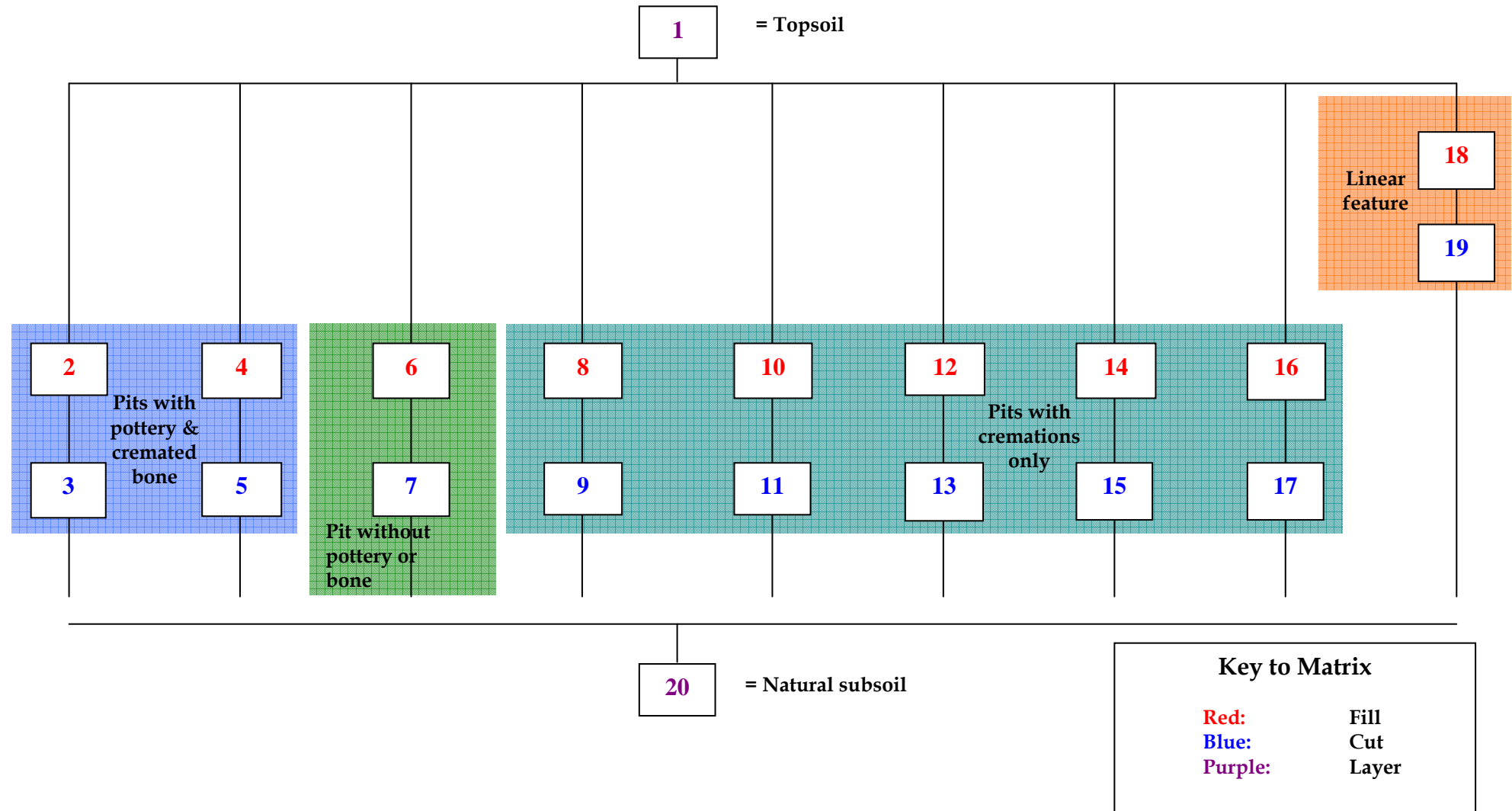
Context Number	Grid Square	Description
1	All	Topsoil
2	110/105	Burnt fill of pit [c3]
3	110/105	Circular pit containing [c2]
4	110/105	Burnt fill of pit [c5]
5	110/105	Circular pit containing [c4]
6	105/100	Burnt fill of [c7]
7	105/100	Irregularly shaped shallow feature containing [c6]
8	105/105	Fill of pit [c9]
9	105/105	Sub-oval shaped pit containing [c8]
10	100/105	Burnt fill of pit [c11]
11	100/105	Sub-circular pit containing [c10]
12	100/105	Burnt fill of pit [c13]
13	100/105	Keyhole shaped pit containing [c12]
14	100/100	Burnt fill of pit [c15]
15	100/100	Sub-circular pit containing [c14]
16	100/100	Burnt fill of pit [c17]
17	100/100	Pit containing [c16]
18	110/100	Fill of linear feature
19	100/100 to 110/100	Cut of linear drain/field boundary
20	All	Natural parent material

3. Stratigraphic Sequence

3.1 Matrix

The first stage of report compilation is the formation of the site matrix. This structure collates all the contexts excavated and recorded, and preserves their stratigraphic relationships in flow chart fashion. The entire interpretation of the site rests on this visual manifestation of the archaeology as excavated. The contexts of the matrix are then grouped and segmented to create features and phases, all of which are described in detail below (section 3.2 Context Descriptions and section 4 Interpretation of Stratigraphy).

Faughart Lower Matrix: 04E0811



3.2 Context Descriptions (figure 5)

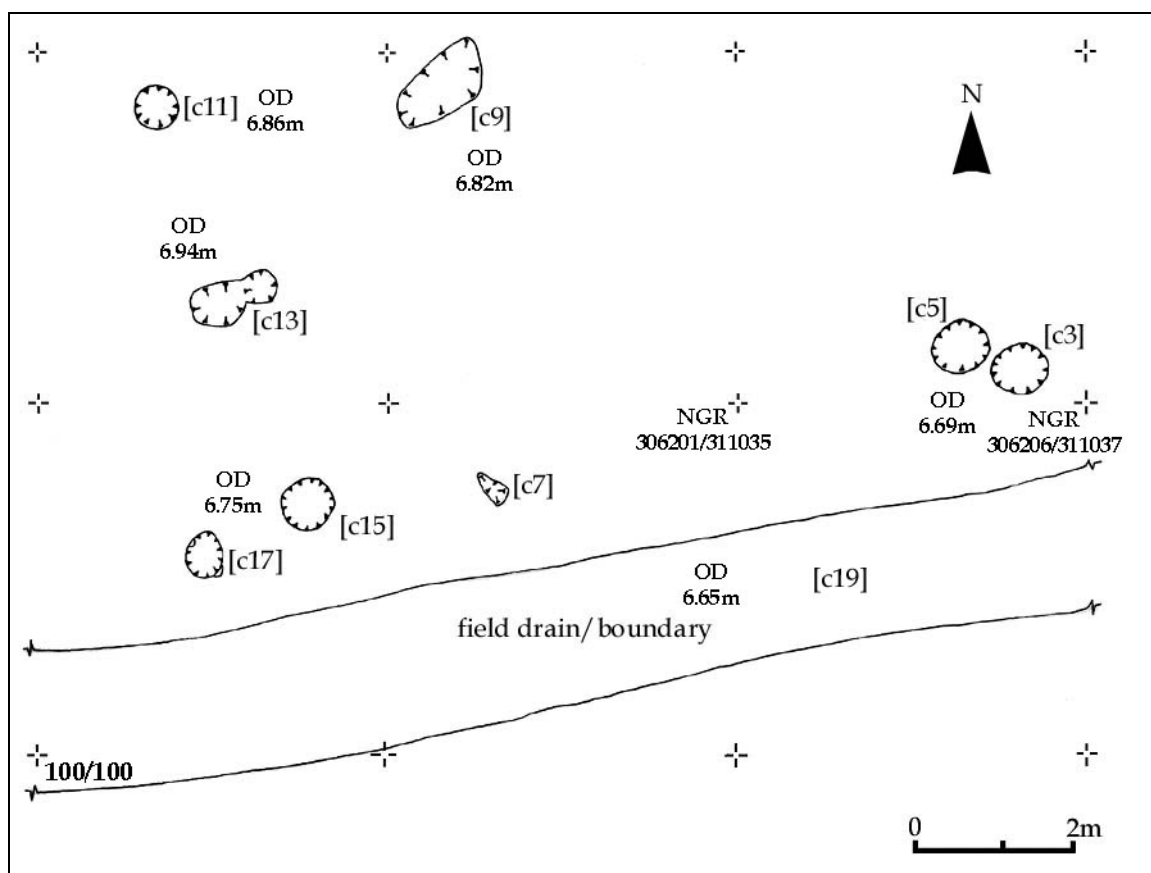


Figure 5. Post excavation plan of site

Note: Features below referred to by their cut numbers

Context 3

Context type: Cremation pit (plates 1 & 2; figure 5 & 6)

This circular cremation pit was 0.70m in diameter and approximately 0.30m deep. The break of slope was sharp at the top and indiscernible at the base. The sides were concave and the base was rounded. It contained [c2], a moderately firm dark blackish brown sandy silt. This contained occasional flecks of cremated animal bone (sample no. 1), a moderate amount of charcoal (sample no. 2) and a moderate amount of small angular stones. Traces of nut shells were also recovered (sample no. 14). Fragments of prehistoric pottery (finds 2:1 to 2:27) were also found including rim sherds and basal sherds. These came from several different vessels, some of which were decorated. A soil sample was retained from the fill (sample no.15).

Context 5

Context type: Cremation pit (plates 1 & 2; figure 5 & 6)

This circular cremation pit lay 0.10m to the west of [c3]. It was 0.75m in diameter and approximately 0.20m deep. The break of slope was sharp at the top and gradual at the base, with

concave sides and a rounded base. It contained [c4], a friable dark blackish brown sandy silt. This contained frequent pieces of charcoal (sample no. 4), occasional flecks of cremated animal bone (sample no. 3) and a moderate amount of small angular stones. A soil sample was also retained from the fill (sample no. 16). Some fragments of prehistoric pottery were also recovered from this pit (find nos. 4:1 to 4:9).

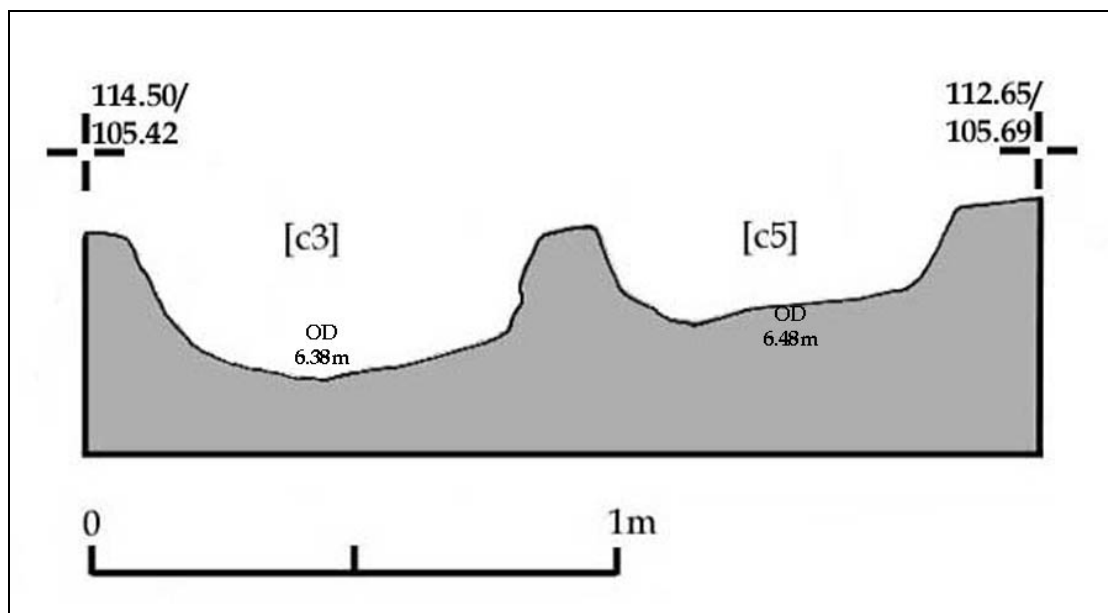


Figure 6. Southeast-northwest profile of [c3] and [c5]

Context 7

Context type: Possible pit (plate 3; figure 5 & figure 9)

This shallow, irregularly-shaped feature was approximately 0.50m in length from east to west and had a maximum width of 0.40m. The break of slope was sharp to the north and east and almost indiscernible to the south and west. It had a maximum depth of 0.15m with an irregular, stony base. It was filled by [c6], a loose dark brownish grey silty clay, which contained occasional flecks of charcoal and occasional fragments of burnt stone. It is possible that this was a non-archaeological feature.

Context 9

Context type: Pit (plate 4; figure 5 & figure 7)

This sub oval shaped pit was aligned approximately from northeast to southwest. It was 1.60m in length, 0.90m wide and 0.15m deep. The break of slope was gradual at the top and at the base. It had concave sides and a reasonably flat base. It contained [c8], a loose mid greyish brown gravelly sand. There were inclusions of occasional flecks of charcoal (sample no. 6) and cremated animal bone (sample no. 5) in this. This pit lay approximately 5m to the north of [c7].

Context 11

Context type: Cremation pit (plates 5 & 6; figure 5 & figure 7)

This circular pit was approximately 0.60m in diameter and 0.24m deep. It had a sharp break of slope at the top and at the base. The sides were vertical and the base was quite flat. It was filled by [c10], a loose mid greyish brown silty sand containing a frequent amount of charcoal (sample no. 8), occasional fragments of burnt stone and occasional flecks of cremated animal bone (sample no. 7). A fragment of flint was recovered from this pit (find 10:1). The cut of the pit was reddened, probably due to presence of burning *in situ*.

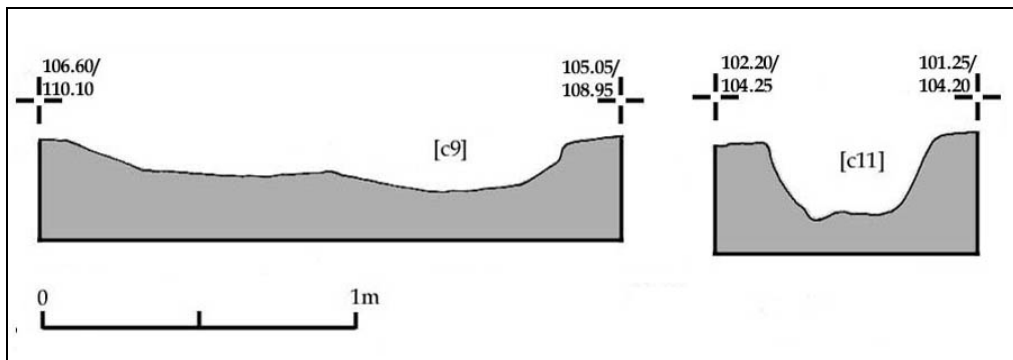


Figure 7. Northeast-southwest profiles of [c9] and [c11]

Context 13

Context type: Pit (plates 7 & 8; figure 5 & figure 8)

This keyhole shaped pit was 1.35m in length from east to west and was approximately 0.55m wide. The eastern end of the pit consisted of a deeper, circular pit 0.50m in diameter and 0.20m deep. The eastern part was sub oval shaped and was 0.15m deep. The pit contained a uniform fill, [c12], which was a loose dark brownish black gravelly silt. This contained frequent small stones along with occasional burnt stone fragments. There were also occasional flecks of charcoal (sample no. 10) and cremated animal bone (sample no.9).

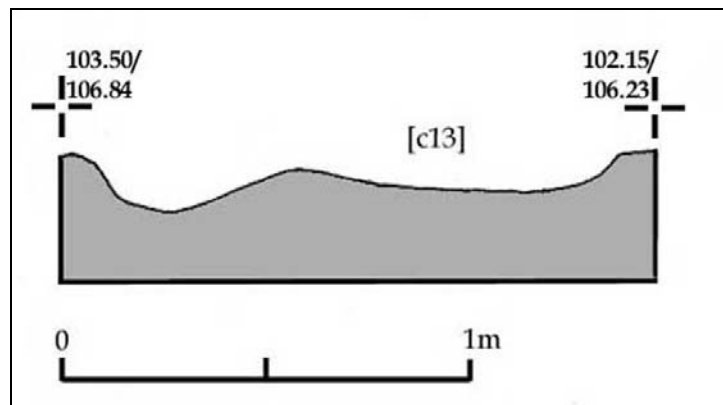


Figure 8. Northeast-southwest profile [c13]

Context 15

Context type: Pit (plates 9 & 10; figure 5 & figure 9)

This sub circular pit lay approximately 3m to the south of [c13]. It had a maximum diameter of 0.74m from north to south and was 0.30m deep. The break of slope was sharp at the top and at the base. The side was vertical to the southwest and convex elsewhere. The base was flat. It was filled by [c14], a loose mid greyish brown sandy gravel containing occasional flecks of charcoal (sample no.12) and burnt animal bone (sample no.11).

Context 17

Context type: Cremation pit (plates 11 & 12; figure 5 & figure 9)

This sub oval shaped pit had a maximum length of 0.65m from east to west and an approximate width of 0.55m from north to south. It was 0.35m deep. The break of slope was sharp at the top and at the base. It had vertical sides and the base sloped downwards slightly to the west. It was filled by [c16], a firm dark brownish grey sandy silt containing frequent small stones and occasional flecks of cremated animal bone (sample no.13).

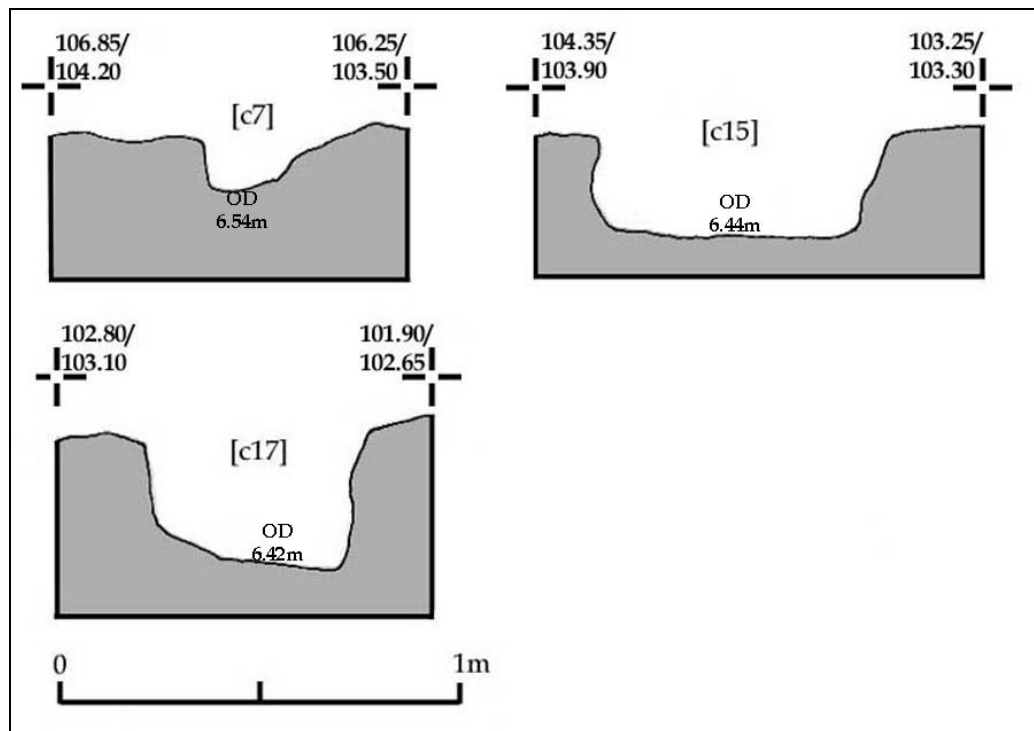


Figure 9. Northeast to southwest profiles of [c7], [c15] and [c17]

Context 19

Context type: Linear feature (plate 13; figure 5)

This linear feature ran approximately from east to west across the southern part of the site. It was 2m wide and 0.40m deep. The break of slope was sharp at the top and at the base. It had concave sides and a flat base. It was filled by [c18], a dark brownish grey gravelly silt. This contained occasional fragments of red brick or tile and plastic. It was clear that this was quite a modern field drain or boundary and therefore was not of archaeological in nature. No further archaeological features were detected to the south of this feature.



Plate 1. [c2] and [c4] from southwest



Plate 2. [c3] and [c5] post excavation from southwest



Plate 3. [c6] pre excavation from south



Plate 4. [c8] pre excavation from north



Plate 5. [c10] pre excavation from south



Plate 6. [c11] post excavation from south



Plate 7. [c12] pre excavation from south



Plate 8. [c13] post excavation from south



Plate 9. [c14] pre excavation from north



Plate 10. [c15] post excavation from east



Plate 11. [c16] pre excavation from south



Plate 12. [c17] post excavation from east



Plate 13. Site at Faughart Lower from east

4. Interpretation of Stratigraphy

The stratigraphy of the site at Faughart Lower does not directly reveal any information as to its date. The preliminary report identified the cremated bone as human in nature but on further analysis it was identified as animal bone. An initial scan of the cremated bone indicated that four of the seven pits yielded animal bone. The bone was un-diagnostic. Sufficient quantities of charcoal were retrieved and a date range of 2880 cal BC to 2460 cal BC was recovered from pits across the site.

All of the pits were cut into the subsoil [c20] and were overlain by topsoil [c1]. The pits on this site were all of a reasonably similar form and contained quite a uniform fill. The quantities of cremated bone from the pits were quite small and the pottery was weathered suggesting they were secondary insertions and had been exposed before they were transferred into the pits.

Fragments of pottery were retrieved from [c2] and [c4], the fills of pits [c3] and [c5] respectively. These pits were only 0.10m apart and were situated at the eastern part of the site, at least 5m away from the nearest feature. It is not clear, however, if these pits were in any other way distinct or separate from the others but given the dates it may be assumed that all the pits were part of a single activity. It is likely that pits [c3] and [c5] may be contemporary and this is borne out by radio-carbon dates from both pits which returned similar dates.

The only other artefact found in these pits was an un-diagnostic burnt flint flake from [c10], the fill of pit [c11]. A large quantity of charcoal came from this pit but it was predominantly composed of oak so were not considered for dating purposes. The reddened base and sides of the pit may indicate burning *in situ*. The significance of this is not clear and only a small amount of cremated bone came from this pit.

A linear feature, [c19] lay to the south of the concentration of pits, cut into the subsoil. A section was dug through this, which revealed modern rubbish in the fill, [c18]. It is clear that this was a modern feature, probably a drain, and was not associated with the adjacent archaeological features. It was not possible to determine if there were pits located further south of the drain/boundary feature as the area was located beyond the line of the road take.

5. The Artefacts

5.1 Pottery (summarised from Roche & Grogan 2006; Appendix 13.1; plates 14 & 15)

The fragments of six fine Beaker vessels and one domestic Beaker were recovered from the excavation, with a date range of 2450-2200BC (Grogan and Roche 2005). The fine Beaker vessels are assigned to Clarke's (1970) European Bell Beaker classification. The fine beaker pottery is typical of fine Beaker pottery in Ireland especially the Boyne Valley, Co. Meath. The weathered nature of the pottery fragments indicated that the pots were exposed, either on a floor or midden, before the fragments were deposited in the pits.

The fine beaker fragments are decorated with twisted cord and comb impressions. One of the fragments was burnished (Vessel 3), which is a rare feature in Ireland and until recently was noted only on pottery from Newgrange, Co. Meath. However, sites excavated at Newtownbalregan 2 and 6, along the M1 DWB also had burnished fragments. The all-over-cord decoration identified on Vessel 1 is rare in Ireland. Evidence from Britain shows that all-over-cord decorated pots (Case's Style 1) represent the earliest Beakers. Only a few sites in Ireland have all over cord decoration and they are Newgrange, Co. Meath, Dalkey Island, Co. Dublin and the Hill of Rath, Co. Louth.

The domestic Beaker, (Vessel 7), was represented by five fragments. It is a bucket-shaped domestic Beaker with a flattened rim. It has impressed bird-bone decoration, which is unusual as the majority of other domestic vessels are decorated with finger nail impressions. Similar sites with bone impressed ware are Newgrange, Co. Meath, Lough Gur and Rockbarton, Co. Limerick. The pot had a raised corden below the rim in order to facilitate a firm grip on the vessel. There was no blackening/burning on the pot indicating it was used for storage rather than cooking.

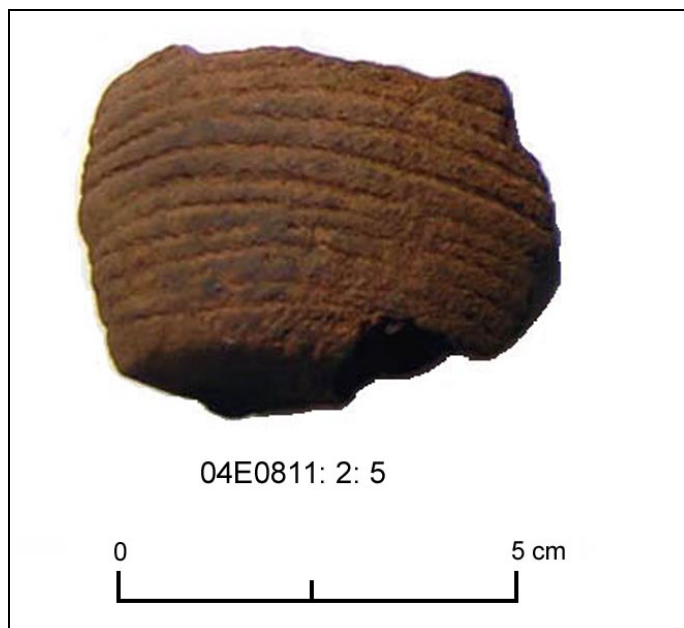


Plate 14. Vessel 1, fine Beaker ware with all-over-cord decoration



Plate 15. Vessel 7 domestic beaker, rim sherds (find nos. shown)

5.2 Wood Identification (summarised from Stjuits 2006 & Beta Analytic 2006; Appendices 13.2 & 13.4)

The charcoal composition of Faughart Lower indicates selection of wood species for the burning process. A total of three wood species was identified at Site 134, Faughart Lower namely hazel, apple-type and oak. The species can be found in dry-land situations. The wood was not of good quality and so was likely collected from dry-land sources by either the collection from forest floors of rotten branches or the burning of selected degraded wood pieces. Firewood was often

collected as close as possible to, or within a settlement and the evidence for Faughart Lower suggests this method rather than collection from managed woodland.

There were six charcoal samples recovered for dating purposes. Two samples were identified as oak and therefore not submitted for dating (sample nos 8 & 10). Four samples (three hazel and one apple) were submitted for dating. Sample no. 6 (hazel), from pit [c9] returned a date of 2600-2460 cal BC and sample no 12 (apple) from pit [c14] returned a date of 2880-2580 cal BC. The dates returned from the two pits containing pottery (sample nos 2 & 4: both hazel) returned two radio-carbon date ranges from charcoal of 2860-2800 cal BC and 2760-2460 cal BC, placing them within the late Neolithic/early Bronze Age period.

5.3 Cremations (M. McCarthy)

None of the cremated animal bone fragments were diagnostic to species (McCarthy pers. comm.). The proportion and burnt nature of the samples prohibited further detailed analysis.

5.4 Flint Flake (summarised from Woodman 2005; Appendix 13.3)

The distal portion of a primary flake struck off a water rolled flint nodule was recovered from the fill of a pit containing cremated bone (pit [c11]). The flint was poor quality and may have originated on the beaches of the Cooley Peninsula. It is un-diagnostic and cannot be assigned to any particular period.

6. Discussion

The site at Faughart Lower 6 appears to be the remains of a number of domestic pits dating to the Late Neolithic/Early Bronze Age which is known as the Beaker period. The material recovered from the pits i.e. weathered pottery and cremated bone could represent domestic waste pits and as was noted by the specialists (Roche and Grogan 2006) the pottery abrasion suggests that the material could have originated from a floor surface or midden.

Although there is evidence for settlement during this period the scarcity of structures is well-known (Waddell 1998, 117). The evidence from Faughart Lower 6 is in keeping with the archaeological record in that no clear traces of house plans were noted. In fact the features found were not believed to have been postholes. Roycroft (2006) has noted that the nearby site at Faughart Lower 5 had similar finds to Faughart Lower 6 and that evidence for buildings were absent on that site also. It has been suggested in line with the evidence from Britain that many of the huts and houses dating to this period were lightly built (Waddell 1998, 117) contributing to their low survival in the archaeological record.

The sites where habitation is found in association with Beaker pottery includes, Monknewtown, Co. Meath, where Sweetman (1976) has suggested that a series of irregular, possible postholes indicated an oval house plan. The habitation area was located inside the embanked enclosure. O'Kelly has termed these 'squatting areas', based on the un-specific house plans (O'Kelly 1989, 73; 135). A similar squatting area was noted on the periphery of the Newgrange monument after it had fallen into decay. O'Kelly noted that it was not possible to reconstruct with certainty any specific house plans and people were squatting in flimsy structures and as one house or hut became unusable, others were set up (*ibid.*, 74). He also noted that groups of pits, which were dug to the southeast of the passage grave, had been backfilled quickly with charcoal, animal bone food waste and sherds of pottery sometimes thrown in with the soil (O'Kelly 1989, 71).

The habitation site at Dalkey Island is a settlement dating from 4000BC to the early historic period (Liversage 1968). Scattered Beaker ware with no trace of houses prompted Waddell to suggest that it was a temporary or seasonal occupation site (Waddell 1998, 117). Other inconclusive evidence from Lough Gur suggested that roughly oval shaped houses were contemporary with the Beaker ware found there, but as was the case at Newgrange houses were built and rebuilt over a considerable period of time.

The pottery recovered from the pits at Faughart Lower were secondary insertions as evidenced by weathered fragments which Grogan and Roche note may have been in a context where the material was previously trampled, moved about or exposed on the surface before being inserted into the pits (Roche & Grogan 2006). The assemblage fits well with the well-known large assemblages from Knowth and Newgrange and Beaker sites at Rathmullan, Co. Meath the Hill of Rath and at Beaverstown and Lusk, Co. Dublin.

The site at Faughart Lower may be a peripheral element of a larger settlement concentration. As noted above a nearby site uncovered prehistoric pits (Delaney 2006b) and a *fulacht fiadh* was excavated at Faughart Lower (Delaney 2006a).

Dating (appendix 13.5)

The two pits containing pottery returned two radio-carbon date ranges from charcoal of 2860-2800 cal BC and 2760-2460 cal BC, placing them within the late Neolithic/early Bronze Age period. The associated pottery date range, based on Case's classification, indicated a date range of 2450-2200BC (Roche and Grogan 2006), placing them in the Early Bronze Age. Vessel 1 represents the earliest Beakers, which would date to the late Neolithic/Early Bronze Age, more in keeping with the radio-carbon dates returned.

Based on radiocarbon dates, it may be assumed that the pits at Faughart Lower formed a single, cohesive site.

Distribution

The site at Faughart Lower reinforces the predominantly north of Dublin concentration for 'Beaker' sites although beaker pottery is found in association with habitation sites in the south of Ireland (Parknabinnia Co. Clare; Ross Island, Co. Kerry and Lough Gur, Co. Limerick; Waddell 1998, 118).

7. Sample & Find List

7.1 Samples (see section 13)

Samples were only taken and numbered of those contexts that yielded sample material in the excavation. Charcoal samples were identified by Dr Ingelise Stuijts (Appendix 13.2). The animal bone was identified by Margaret McCarthy. Samples were sent to Beta Analytic after consultation with the specialist report and radio-carbon dating requirements (Appendix 13.5).

Sample number	From Context	Material	Purpose of sample	Result of analysis
1	[c2]	Cremated bone	ID	Animal bone, undiagnostic
2	[c2]	Charcoal	ID & Dating	Hazel – 2860-2800 cal BC
3	[c4]	Cremated bone	ID	Animal bone, undiagnostic
4	[c4]	Charcoal	ID & Dating	Hazel – 2860-2800 cal BC
5	[c8]	Cremated bone	ID	Animal bone, undiagnostic
6	[c8]	Charcoal	ID & Dating	Hazel – 2600-2460 cal BC
7	[c10]	Cremated bone	ID	Animal bone, undiagnostic
8	[c10]	Charcoal	ID & Dating	Predominantly Oak identified – Not dated
9	[c12]	Cremated bone	ID	Animal bone, undiagnostic
10	[c12]	Charcoal	ID & Dating	Predominantly Oak identified – Not dated
11	[c14]	Cremated bone	ID	Animal bone, undiagnostic
12	[c14]	Charcoal	ID & Dating	Apple type – 2880-2560 cal BC
13	[c16]	Cremated bone	ID	Animal bone, undiagnostic
14	[c2]	Hazelnut shells	ID & Dating	Not dated – due to suitability of charcoal already obtained for dating
15	[c2]	Soil	Archaeobotanical	No ecofacts / archaeo-botanical remains recovered during sieving
16	[c4]	Soil	Archaeobotanical	No ecofacts / archaeo-botanical remains recovered during sieving

7.2 Finds (see section 13)

The finds numbers below are prefixed by the site excavation licence number: 04E0811, followed by the context number and then by the find number of that context.

Pottery (plates 14 & 15), analysed by Helen Roche & Dr Eoin Grogan (appendix 13.1)

Find No.	Description	Analysis
2:1	Orange fabric rim sherd. Comb motif decoration. 80mm x 50mm x 9mm thick..	Vessel 2: Fine Beaker
2:2	Orange fabric rim sherd. Comb motif decoration. 58mm x 57mm x 8mm.	Vessel 2: Fine Beaker
2:3	Orange rim sherd with raised corden. Bird bone impressed decoration. 45mm x 33mm x 10mm.	Vessel 7: Domestic Beaker
2:4	Orange rim sherd with raised corden. Bird bone and nail impressed decoration. 33mm x 52mm x 9mm.	Vessel 7: Domestic Beaker
2:5	Red fabric basal sherd. Cord impressed decoration. 63mm x 34mm x 5mm. Flat bottomed.	Vessel 1: Fine Beaker
2:6	Orange brown bodysherd. Possibly burnished. Impressed decoration. 60mm x 47mm x 12mm.	Vessel 3: Fine Beaker
2:7	Orange brown neck fragment. Possibly burnished. Fine comb impressed decoration. 43mm x 25mm x 10mm.	Vessel 3: Fine Beaker
2:8	Orange exterior, grey core body sherd. Cord impressed. Worn. 31mm x 20mm x 4mm.	Vessel 1: Fine Beaker
2:9	Orange brown bodysherd. Weathered. Decoration evident. 62mm x 77mm x 10mm.	Vessel 3: Fine Beaker
2:10	Orange body sherd. Possibly burnished. Impressed decoration. 30mm x 20mm x 10mm.	Vessel 3: Fine Beaker
2:11	Orange body sherd. Impressed decoration. Possibly burnished. Worn. 20mm x 21mm x 9mm.	Vessel 3: Fine Beaker
2:12	Orange fragment. Tooth-point impressed decoration. 21mm x 18mm x 9mm.	Vessel 5: Fine Beaker
2:13	Orange fragment. Tooth-point impressed decoration. 19mm x 16mm x 8mm.	Vessel 5: Fine Beaker
2:14	Buff-orange rim sherd. Faint comb decoration evident. 14mm x 12mm x 5mm.	Vessel 4: Fine Beaker
2:15	Orange fragment. Tooth-point impressed decoration. 25mm x 20mm x 10mm.	Vessel 5: Fine Beaker
2:16	Orange fragment. Tooth-point impressed decoration. 16mm x 11mm x 6mm.	Vessel 5: Fine Beaker
2:17	Orange fragment. smooth with possible impressed decoration. 23mm x 16mm x 5mm.	Vessel 7: Domestic Beaker
2:18	Orange body sherd. Possible decoration. 35mm x 46mm x 11mm.	Vessel 7: Domestic Beaker
2:19	Orange fragment. Tooth-point impressed decoration. 18mm x 10mm x 6mm.	Vessel 5: Fine Beaker
2:20	Orange brown fragment.. Weathered 21mm x 16mm x 9mm.	Vessel 3: Fine Beaker
2:21	Orange fragment. Tooth-point impressed decoration. 25mm x 15mm x 6mm.	Vessel 5: Fine Beaker
2:22	Orange fragment. Undecorated. 23mm x 23mm x 8mm.	Vessel 7: Domestic Beaker
2:23	Orange fragment. Undecorated. 24mm x 16mm x 6mm.	Vessel 5: Fine Beaker
2:24	Orange exterior, grey core. Undecorated. 13mm x 11mm x 4mm.	Vessel 1: Fine Beaker
2:25	Orange fragment. Undecorated. 7mm thick.	Vessel 5: Fine Beaker
2:26a-c	Red fabric. Three crumbs. Undecorated. 4mm thick.	
2:27	Orange exterior, grey core body sherd. Cord impressed. 9mm x 12mm x 4mm.	Vessel 1: Fine Beaker
4:1	Orange-brown base-angle sherd with fine comb impressions. 47mm x 70mm x 10mm thick (base) 5mm thick (sides).	Vessel 6: Fine Beaker
4:2	Orange-brown base-angle sherd with fine comb impressions. 35mm x 50mm.	Vessel 6: Fine Beaker
4:3	Orange-brown base fragment. 25mm x 15mm x 4mm thick.	Vessel 6: Fine Beaker
4:4	Red fabric fragment with mica evident in section. 25mm x 15mm.	Vessel 5: Fine Beaker
4:5	Orange-brown fragment. 21mm x 20mm x 7mm.	Vessel 6: Fine Beaker
4:6	Orange-brown fragment. Decorated with three incised lines. 22mm x 10mm x 6mm.	Vessel 6: Fine Beaker
4:7	Orange-brown fragment. Decorated with four incised lines. 12mm x 12mm x 5mm.	Vessel 6: Fine Beaker
4:8a-b	2 Orange-brown crumb fragments. 13mm diameter x 2mm thick.	Vessel 6: Fine Beaker
4:9a-k	11 Orange-brown crumb fragments between 5mm and 10mm in size.	Vessel 6: Fine Beaker

Flint: analysed by Professor Peter Woodman (appendix 13.4)

Find No.	Description	Analysis
10:1	Burnt flint flake. 29mm x 23mm.	Waste flake, undiagnostic

8. Conclusions

The excavation of features discovered during the archaeological monitoring of topsoil stripping associated with the construction of the Dundalk Western Bypass at Faughart Lower, Dundalk, Co. Louth was undertaken in May 2004. There were no above ground indications prior to topsoil stripping.

Several pits were excavated, revealing small quantities of cremated animal bone and charcoal. Fragments of fine and domestic Beaker pottery were found deposited in two of the pits. This site appears to have been a scatter of pits possibly reflecting domestic activity associated with a nearby settlement. A date range of 2880-2460 cal. BC was returned from charcoal in the pits.

The entire archaeological dimension of this project was funded by the client.

9. Non-Technical Summary

9.1 Introduction

This report details the archaeological excavation of a concentration of eight pits at Faughart Lower, Dundalk, Co. Louth. This excavation was necessitated due to the proposed Dundalk Western Bypass, the construction of which would destroy the site.

9.2 Context list

A context method of recording the archaeology was used at Faughart Lower. This method uses a numbering sequence for the archaeological features found. Each feature or each element in a feature is numbered one to infinity. The context list then is a full list of all the numbers allocated during the excavation (section 2 of the report).

9.3 Stratigraphic Sequence

Section 3 of the report visually shows the numbers allocated during the excavation and the relationships between them in the form of the “matrix”. These relationships are also described in words.

9.4 Interpretation of Stratigraphy

Section 4 attempts to explain what the site at Faughart Lower was and what it was used for. This is not always possible and sometimes functions of some features remain conjecture. A dating sequence for the site is an important consideration at this point and it is attempted to show the use of the site over time.

9.5 Artefacts

This section presents a general summary of the artefacts found during the excavation. This information is taken from the specialist reports in section 13: appendices.

9.6 Discussion

A wider perspective of the sites is taken in section 5 of this report. The importance of the excavation is also discussed.

9.7 Sample and Find List

This is a numbered list of the samples taken during the excavation for the purposes of analysis and the results of that analysis. Samples of charcoal, cremated animal bone and bulk soil were taken from the site. Fragments of pottery were recovered from two pits, as well as one flint flake.

9.8 Conclusions

The report concludes with a brief summation on the purpose of the excavation, its findings and the results of the specialist analysis.

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11. Signing-Off Statement

Archaeological Firm: ÆGIS ARCHAEOLOGY LIMITED

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Aegis Archaeology Ltd
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Client: Celtic Roads Design Group
C/o Ascon Ltd,
Kill,
Co. Kildare

Signed: _____
For AEGIS ARCHAEOLOGY LTD

Dated: August 2007

12. Archive Index Sheet

Project	M1 DWB - Faughart Lower Excavation			
Site Names/Reference/	Site No: 134; Faughart Lower 6			
Licence numbers	04E0811			
Contractor	AEGIS ARCHAEOLOGY LTD			
Field director	Avril Hayes			
	Items (quantity)	Boxes/file s (quantity)	Checked/indexed/ cross-referenced/filed etc	Further work to do
Field Records				
Site plan & sections	2	1 roll	Yes	
Site registers/indexes	8	1 file	Yes	
Site diary/ notes	1 page	1 file	Yes	
Context matrix	1	1 file	Yes	
Report	1 (preliminary report)	1 file	Yes	
Summary	1		Yes	
Survey/levels data (origin information)	levels taken on site marked on plans		GPS coordinates and site grid	
Borehole logs etc	n/a			
Context sheets	17	1 file	Yes	
Trench record sheets	n/a			
Wood Sheets	n/a			
Skeleton Sheets	n/a			
Worked stone sheets	n/a			
Sample sheets used yes/no	Yes 1 register	1 file	Yes	
Other sheets (Specify)				
Single context & Multi context plans (totals rather than sheets)	1	1 roll	Yes	
Other plans (sketches, non- context plans etc)	n/a			
Sections/elevations	1	1 roll	Yes	
Timber drawings	n/a			
Stone drawings	N/a			
Images monochrome	n/a			
Images colour (SLR)	24	1 CD	Yes	
Images digital	13	1 CD	Yes	

Image/photo index	2	1 file	Yes	
Methodology	1	1 file	Yes	
SECURITY COPY (whole or part) If so what type?	1CD (drawings; scanned incl. photos) Site archive: 1 1 scanned copy	1 box	Yes	

	Items/ Fragments (quantity)	Boxes/files (quantity)	Processed/cleaned /sorted/checked/ indexed/x-ray/stored appropriately etc	Further work
Finds and Enviro. Archive				
Accessioned/special finds (specify types, especially wet finds or dry finds)	N/a			
Chert/flint	1	1 bag	Yes	For curation
Pottery (specify periods)	7 Vessels: Beaker Period	1 box	With specialist	For curation
Ceramic Building Material (specify types eg daub, tile)	n/a			
Inscribed stones	N/a			
Metalwork (specify types eg bronze, iron)	N/a			
Glass	n/a			
Slag	n/a			
Human bone (specify type eg cremated, skeleton, disarticulated)	N/a			
Animal bone	Cremated fragments	1 small box	Yes	For curation
Enviro bulk (specify number of samples and total number of litres sampled)	N/a			
Enviro monolith (specify number of samples and number of tins per sample)	n/a			
Name	Avril Hayes			
Title	Licence Holder			
Date	16/7/07			

Template supplied by NRA Project Archaeologist

13. Appendices

The bone was analysed by Aegis zoo-archaeologist Ms Margaret McCarthy MA MIAI. The pottery was analysed by Helen Roche and Dr Eoin Grogan. Dates were supplied by BETA Analytic.

A table showing material for further analysis was submitted as an appendix to the preliminary stratigraphic report (Ref: 255-1.19). The table below is a summary of the results of that further analysis:

Material	From Context	Specialists	Summary of Analysis
Pottery Find Nos. 2:1 – 2:27 4:1 – 4:9	[c2] and [c4]	Helen Roche & Eoin Grogan	6 fine beaker vessels & 1 domestic beaker vessel represented. Dated to c. 2450-2200 BC (Roche & Grogan 2006)
Charcoal Sample Nos. 2, 4, 6, 8, 10, 12	[c2], [c4], [c8], [c10], [c12], [c14]	Dr Ingelise Stuijts	Charcoal identified was a mixture of Hazel & Oak (Stuijts 2005)
Charcoal Sample Nos: 2, 4, 6, 12	[c2], [c4], [c8], [c14]	BETA Analytic Ltd	Treatment: AMS standard delivery Date range: 2850-2460 cal. BC
Cremated Bone Sample Nos.1, 3, 5, 7, 9, 11, 13	[c2], [c4], [c8], [c10], [c12], [c14] & [c16]	Margaret McCarthy	The cremated animal bones were too small and burnt to be diagnostic to species.
Bulk Soil Sample Nos. 15, 16	[c2], [c4]	Sieving by Aegis Archaeology Ltd.	No ecofacts / archaeo-botanical remains recovered
Flint Find No: 10:1	[c10]	Professor Peter Woodman	Undiagnostic distal portion of a primary flake struck off a pebble which may have originated on the beaches of the Cooley Peninsula (Woodman 2005)

Each of the specialists reports are located in this section

- (13.1) Pottery Report
- (13.2) Charcoal Identifications Report
- (13.3) Flint Report
- (13.4) Radio-Carbon Dating Report

13.1 Pottery Report

(Helen Roche & Eoin Grogan)

In consultation with the specialists the pottery was considered stable. It was noted that any conservation work would seriously impair any future assessment or analysis of the pottery.

The prehistoric pottery from Faughart Lower, Dundalk, Co. Louth (04E0811)

Summary

The assemblage consists of 23 sherds representing seven fine and domestic Beaker vessels dating to the Final Neolithic/Early Bronze Age period.

The Assemblage

This small but important assemblage was found in the fill (C. 2 and 4) of two pits (C. 3 and 5). Although the sherds are fragmented six vessels of fine Beaker and a single domestic Beaker were identified. The fine Beakers, with their overall decoration and soft S-shaped profiles, are a type generally assigned to Clarke's (1970) European Bell Beaker. More recently following reviews by, for example, Lanting and van der Waals (1972), there has been a greater recognition of the regional development of Beaker. Case's (1993) simpler threefold scheme, and its specific application to the Irish material, provides a straightforward medium for insular comparison (Case 1995). The Faughart material, with its classic Bell Beaker profile and simple horizontally arranged ornament, conforms to his style 2 and is dated to c. 2450-2200 BC. Domestic Beakers are identified as larger heavier vessels often with less formal decoration and have been found associated with fine Beaker ware throughout the country.

Fine Beaker vessels

The Faughart pottery is generally fine and not withstanding weathering, firing is generally good and very even resulting in reasonably consistent colouring and the 'sandwich' profile typical of much Beaker pottery. The colour, buff to orange-brown, orange-grey is typical of the finer Beaker pottery in Ireland and especially in the Boyne Valley, Co. Meath. The vessels are thin-walled, ranging between 4.1mm and 10.9mm in thickness, with smoothed surfaces and with inclusions rarely appearing on, or protruding through. The vessels all contain small to medium quantities of finely crushed quartzite inclusions, typical of most Beaker pottery in Leinster, but some sherds also contain smaller amounts of shale or sandstone. The sherds representing vessel 3 may have been burnished, a feature noted at Newgrange, Co. Meath (Cleary 1983), but rarely identified elsewhere¹.

All vessel show evidence for decoration with twisted cord impressions on vessel 1 and comb impressions used on vessels 2-6. From the surviving sherds of vessel 1 it appears that this small pot was decorated from rim to base with closely spaced horizontal rows of twisted cord impressions. Evidence from Britain shows that all-over-cord decorated pots (Case's Style 1) represent the earliest Beakers and are a rare find in Ireland. Fragments of similarly decorated

¹ Rare exceptions occur on the nearby sites of Newtownbalregan 2 and 6, Co. Louth (Grogan and Roche 2005b; 2005a).

vessels were found at Newgrange, Co. Meath, Dalkey Island, Co. Dublin, and the Hill of Rath, Co. Louth (Cleary 1983, fig. 23: E56:197; Liversage 1968, fig. 11: p187; Duffy 2002, 231-3).

The comb ornamented vessels vary only slightly in fabric quality but sherds from vessels 3, 5 and 6 are heavily weathered. Different toothed implements have also been used to fashion the decoration. An implement with elongated teeth (up to 3.0mm in length) had been used to create sharp rectangular impressions on vessel 2, a shorter rounded toothed implement was used on vessels 3, 4 and 6 while short, more pointed teeth occur on vessel 5. Due to the fragmented nature of the sherds it is not possible to identify the overall decorative arrangement on each of the vessels. Only the rim/neck area of vessel 2 survives but similarly decorated vessels with horizontal and oblique bands of decoration have been found at Knowth, Dalkey Island and Lough Gur, Circle L (Eogan 1984, fig. 116: 3748a; Liversage 1968, fig. 9:p61; Grogan and Eogan 1987, fig. 46:1420). The slightly haphazard arrangement of oblique rows of comb impressions on vessel 3 has comparisons at Knowth and Lough Gur, Circle L, Co. Limerick (Eogan 1984, fig. 94: 1558; Grogan and Eogan 1987, fig. 48:1435). Sherds decorated with horizontal rows of comb impressions similar to vessels 4, 5 and 6 have been found at Knowth, Newgrange, and Lough Gur, Circle K (Eogan 1984, fig. 109: 3119; Cleary 1983, fig. 23; Grogan and Eogan 1987, fig. 28). The shorter more pointed type of implement used to decorate vessel 5 can also be seen on sherds from Knowth and Lough Gur, Circle K (Eogan 1984, fig. 109: 3108; Grogan and Eogan 1987, fig. 28:1247). The basesherds representing vessel 6 show that the vessel had all-over-ornament of closely spaced horizontal rows of comb impressions. There are a limited number of Irish Beakers with all-over-ornament, most surviving evidence suggest that decoration does not always extend as far as the base; other examples were found at Newgrange, and Dalkey Island, Co. Dublin and Mell, Co. Louth (Cleary 1983, 66-7; Liversage 1968, fig. 9, p61; Roche and Grogan 2005).

Domestic Beaker

Five sherds consisting of two rimsherds, a bodysherd and two fragments represent a single domestic Beaker (vessel 7). Similar to other bucket-shaped domestic Beakers found throughout the country this vessel has thicker walls than the fine Beakers and has a flattened rim. The impressed bird-bone decoration is unusual, in that the majority of other domestic vessels are decorated with fingernail impressions. However, bone impressed vessels have been found at Newgrange, Lough Gur, Circle K and Rockbarton, Co. Limerick (Cleary 1983, fig. 46; Grogan and Eogan 1987, fig. 30:V.25; Mitchell and Ó Ríordáin 1942, fig.6). The Faughart vessel also has a raised cordon just below the rim which is paralleled on domestic vessels at Kilgobbin, Beaverstown and Dalkey Island, Co. Dublin, Knowth, Co. Meath, Lough Gur Site D and Rockbarton, Co. Limerick (Grogan 2004a and b; Liversage 1968, 72, pl. 7.p54; Eogan 1984, 305,

fig. 116.3728; Ó Ríordáin 1954, 379, fig. 38.1; Mitchell and Ó Ríordáin 1942, 264, fig. 6. II.I). It is probable that the application of cordons to the upper portion of vessels was functional as well as decorative and was executed to facilitate a firm purchase on large domestic vessels (Gibson 2002, 53). Cordons also suggest the use of covers, probably of leather or cloth, which were tied in place over the mouth of the vessel. The Faughart vessel does not show evidence, in the form of sooting or blackened accretions, which would indicate its use in cooking so it was probably used for storage. The presence of a domestic Beaker in association with fine Beakers at Faughart and at sites such as Knowth, Newgrange and Monknewtown, Co. Meath, Dalkey Island and Kilgobbin, Co. Dublin, Doonmoon, Co. Limerick, and several excavations at Lough Gur, including Sites C, D and K (Eogan 1984; Cleary 1983; Sweetman 1976; Liversage 1968; Grogan 2004a; Gowen 1988, 52-61; Ó Ríordáin 1954; Grogan and Eogan 1987), shows that domestic Beakers were an integral component of the overall Beaker assemblage.

Overall Discussion

The Faughart assemblage is a small but important addition to the study of Late Neolithic/Early Bronze Age Beaker ceramics in Ireland. The occurrence of a rare all-over-cord vessel in this context is a further significant contribution to this research. While in generally reasonable condition, the sherds representing the assemblage are weathered and would appear to have been subjected to abrasion and disturbance before deposition within the pits. This may have been in a context where the material was previously trampled, moved about or exposed on the surface, such as on a floor or in a midden, the fact that so few sherds represents each vessel also supports this suggestion.

In terms of form, decoration, fabric and firing, this probable domestic assemblage fits in very comfortably with the well-known large assemblages from Knowth and Newgrange and shares a number of similarities with the ceramics from two sites at Newtownbalregan, Co. Louth (Grogan and Roche 2005a and b). The recent discovery of other important Beaker sites in the region, such as Rathmullan, Co. Meath (Bolger 2002), the Hill of Rath and at Beaverstown and Lusk, Co. Dublin (Grogan 2004b; Roche 2004), reinforces the importance of this landscape in early prehistory.

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Catalogue and Description:

The excavation number 04E0811 is omitted throughout, only the feature number, in bold, followed by the find number is included. Numbers in square brackets indicate joining sherds.

Fine Beakers:

Vessel 1. Portion of a base-angle 2:5 and three fragments 2:8, 24, 27.

Gentle angle from base to body. The angle of the fragment shows that it is from the area of the neck. Small thin-walled vessel, with hard slightly brittle fabric with a low content of inclusions ($\leq 2.6\text{mm}$). The exterior surface is smooth and well prepared, the interior surface is uneven and cavities are present. The break on the body area shows a coil break. Decoration consists of closely spaced horizontal finely twisted cord impressions that become more irregularly arranged towards the base. Just above the junction of base and body is a horizontal band of oblique dot impressions. Small areas of the exterior surface are missing which probably occurred during firing as there is no change in fabric colour and the shadow of the surface decoration is visible. Colour: orange exterior and interior surface with a grey core. Thickness: 4.1-6.9mm.

Vessel 2. Two rimsherds 2:1,2.

Out-turned rounded rim. Thin-walled good quality compact fabric with a low to moderate content of inclusions ($\leq 3.1\text{mm}$). Although originally smoothed, the exterior surface now shows evidence for weathering. The exterior surface is decorated with six horizontal rows of sharp, deeply impressed comb motifs, below which is a band of oblique comb impressions. The decoration is somewhat carelessly fashioned with the first row on sherd no. 1 sloping upwards and on the fifth row the decoration is smudged where sharp toothed implement overlaps on itself. Colour: orange exterior and interior surface with a grey core. Thickness: 7.5-7.9mm.

Vessel 3. Three bodysherd 2:6, 7, 9 and three fragments 2:10, 11, 20.

Hard good quality compact fabric with a moderate content of inclusions ($\leq 3.2\text{mm}$). The surfaces had been smoothed and the exterior may have been burnished. Sherds nos 9 and 20 are extremely weathered and the exterior surfaces are missing. Because of the fragmented nature of the sherds it is difficult to establish the exact decorative arrangement. Sherd no. 7 is from the area of the neck and is decorated with horizontal rows of fine comb impressions. A large sherd from the body no. is decorated with irregularly spaced oblique fine comb impressions. Colour: orange-brown throughout. Thickness: 8.8-10.9mm.

Vessel 4. Rim fragment 2:14.

Gently out-turned rounded rim. Thin-walled hard, slightly gritty textured fabric with a moderate content of inclusions ($\leq 1.9\text{mm}$). The surviving surfaces are smooth and tiny mica flecks are visible on the exterior surface. Two faint horizontal rows of comb impressions are visible on the exterior surface. Colour: buff-orange throughout. Thickness: 6.9mm.

Vessel 5. Nine fragments 2:12, 13, 15, 16, 19, 21, 23, 25, 4:4 and three crumbs 2:26a-c.

Hard friable fabric with a moderate to high content of inclusions ($\leq 1.9\text{mm}$). The surfaces are smooth. Decoration is present in the form of horizontal rows of tooth-point impressions. Colour: orange throughout. Thickness: 7.2-9.9mm.

Vessel 6. Two base-angle sherds 4:1,2, a base fragment 4:3, three fragments 4:5, 6, 7 and thirteen crumbs 4:8a,b, 9a-k.

Thin-walled friable fabric with a moderate to high content of inclusions ($\leq 2.3\text{mm}$). The sherds are weathered and much of the exterior surface is missing. Decoration consists of horizontal rows of fine comb impressions, executed more irregularly towards the base of the vessel. Colour: orange-brown throughout. Thickness: 6.8-7.3mm.

Domestic Beaker:

Vessel 7. Two rimsherds 2:3,4, a bodysherd 2:18 and two fragments 2:17, 22.

Gently out-turned flattened rim with a raised cordon 21.1mm on the exterior surface below the rim. Hard compact good quality fabric with a moderate content of inclusions ($\leq 3.2\text{mm}$). The exterior surface had been carefully smoothed. Decoration consists of rows of bird bone impressions above the cordon. A horizontal line is present immediately below the cordon on sherd no. 3 and appears to have been fashioned by pressing the fingernails into the wet clay. Colour: orange throughout. Thickness: 7.9-10.4mm.

13.2 Charcoal Identification Report

(Dr Ingelise Stuijts)

Charcoal Identifications

Dundalk
M1 Dundalk Western Bypass, Co. Louth
License No. 04E0811

By
Dr Ingelise Stuijts
Woodarch Archeological Research
Banse, Kilmanagh, Co. Kilkenny

For
Aegis Archaeology Ltd.
16, Avondale Court
Corbally, Limerick

January, 2006

Content

1	Introduction
2	Methods
3	Species Identification
4	Origin of the Wood Species
5	Interpretation of the Charcoal Results Site 134, Faughart Lower 6
6	Advice for Radiocarbon Dating
7	Conclusions
	References

List of Illustrations

Figure 1	Site 134, Faughart Lower 6, Frequency and Weight of Wood Species
Table 1	Faughart Lower 6, Site 134, Charcoal Identifications Results

1 Introduction

Eighteen charcoal samples from three excavation sites in Co. Louth were submitted for charcoal investigation and advice for radiocarbon dating. The sites were excavated by Avril Hayes for Aegis Archaeology Limited, Limerick. The description of the sites follows the preliminary (stratigraphic) reports written by Avril Hayes in 2005.

Site 134, Faughart Lower 6 (license 04E0811) is described as a pit cemetery with some Bronze Age pottery.

Faughart Lower 6, site 134, is located to the north of Dundalk town. The site sits at the base of a low hill that slopes gradually upwards to the west. Undulating fields dominate the landscape around the site. The land appears to have been part of the estate attached to Faughart House (Hayes 2005a). Fragments of pottery were retrieved from fills c2 and c4, and according to Hayes (2005a) these pits might have been contemporaneous. The only other artifact was a burnt flint flake from c10. This fill from pit c11 included much charcoal. Furthermore, its reddened base and sides may indicate burning in situ. Only a small amount of cremated bone came from this pit (Hayes 2005a).

Firewood was often collected as close as possible to, or within a settlement. In most cases firewood was gathered at random, but also waste material (chips from local felling of trees) was used. It is for this reason, that the wood species found within charcoal hearths provides information on the local vegetation directly surrounding settlements or activity areas. Larger pieces of wood for fuel were obtained by felling trees, but sometimes also discarded building material was used.

2 Methods

A microscope (Olympus) with incident light optics (40-400x) was used to identify charcoal, after initial selection under a low-powered binocular microscope. To analyze charcoal it was necessary to break the individual lumps to expose a fresh cross-section.

The identifications and handling of the charcoal samples followed the keys provided by F.H. Schweingruber (1978). Generally, there were no particular difficulties with the identifications, since these were made mainly to genus level, such as *Alnus* (alder) or *Fraxinus* (ash). This means that in some cases the species was also identified, e.g. *Corylus avellana* L. (hazel), or that one species was most likely represented, such as *Fraxinus excelsior* L. and *Alnus glutinosa* Gärt. The difficult subfamily of the Maloideae (Pomoideae) includes members of the apple family such as crab apple, wild pear, hawthorn and whitebeam; these are mentioned in the text and figures as apple-type and Pomoideae respectively. The various genera from this group cannot be distinguished from each other on the basis of wood anatomy characteristics.

3 Species Identification

The wood analysis from Dundalk [Site 134] yielded a total of three wood species (Figure 1, Table 1). The wood species included *Quercus* (oak), *Corylus* (hazel) and *Pomoideae* (apple-type).

The most frequent wood species is y oak, followed by hazel, then apple.

In some cases it was possible to establish the felling season. Most of those fragments derived from wood that was felled after the growth season, that means between mid summer and spring of the following year.

4 Origin of the Wood Species

The dominant wood species in the Dundalk area excavations is hazel. The dominant position of hazel is consistent with its occurrence in other archaeological sites. During all archaeological periods hazel was an important source of wood. Hazel does not grow in wet

conditions, but in other localities it thrives in Ireland. At present, hazel occurs as an undershrub, but it cannot be excluded that in prehistoric times it attained greater heights and occurred as trees rather than as shrub.

The qualities of oak are well known. Trees can produce large timbers, but oak can also be managed to produce coppice-wood for a variety of purposes. It is very likely that especially oak, and also ash and hazel, were managed in Medieval times. Both hazel and oak must have been common in the Dundalk area. That means that most fuel was derived from dry-land rather than wet situations.

Alder and willow usually grow in wetland conditions such as marginal areas of bogs and lakes, or along water-streams. These two wood species were of minor importance and were absent from site 134 (Faughart Lower). This indicates that, although some form of water or wet situations most likely was found in the area, it was not a source for the fuel.

The apple-type can derive from a number of trees, of which the most likely ones are hawthorn (*Crataegus*), mountain ash (*Sorbus*) and the wild apple (*Malus sylvestris*). In later prehistoric periods this wood type tends to be more important, maybe as a consequence of the opening of the landscape or fencing off – or in - of certain areas. Hawthorn, as a member of the apple-type group, has thorns, and is often found in hedges or at forest margins.

5 Interpretation of the Charcoal Results

Site 134, Faughart Lower 6

Oak, hazel and apple-type are the three components of the charcoal assemblage of Faughart Lower. The charcoal pieces tended to derived from larger brushwood fragments, 3 to 5 cm in diameter (category III-IV). The wood was not of good quality (gnarl wood in sample 12) and often was eaten by insects (samples 8 and 2).

Interestingly sample 8 deviates from the other sample. Only oak was present in this sample and the charcoal was of very slow growth and rotten. The wood was at least 50 years old and

more than 10 cm in diameter. It cannot be established whether this represented burning of a local rotten tree or a rotten piece of worked wood.

Sample 2 included also some fragments that must derive from larger wood pieces, from 3 cm in diameter (category III) to more than 10 cm in diameter (category VI). The hazel from this sample was badly eaten by insects and similar to sample 8 there are two possible explanations for this material: either collecting of fuel on forest floors of rotten branches or the burning of selected degraded wood pieces.

Sample 4 is different in that in this sample oak is absent: hazel is the only wood species.

The charcoal composition of Faughart Lower indicates selection of wood species for the burning process. The material was likely collected from dry-land sources. The quality of the charcoal does not indicate an origin in managed woodland.

6 Advice for Radiocarbon Dating

Most material from the Dundalk excavations are well suited for radiocarbon dating, based on their quality. Preferred pieces are roundwoods of young age. Unfortunately, the quantity of the charcoal is only in a few cases large enough to allow for conventional radiocarbon dating. However, the more expensive AMS-dating method is a possible alternative for all other samples. Where possible, hazel should be chosen as the dating material.

In Faughart Lower oak is the dominant wood species. It will be possible to date sample 8 using conventional radiocarbon dating. Sample 2 can be sent in totally for conventional dating. The other samples have to rely on AMS dating.

7 Conclusions

Six charcoal samples were investigated and analyzed. Most fragments are suitable for radiocarbon dating, but for some samples the AMS-method will have to be followed. Preferably hazel of rather young age should be selected as a dating means.

A total of three wood species was identified at Site 134, Faughart Lower namely hazel, apple-type and oak. The species can be found in dry-land situations.

Dr. Ingelise Stuijts

January, 2006

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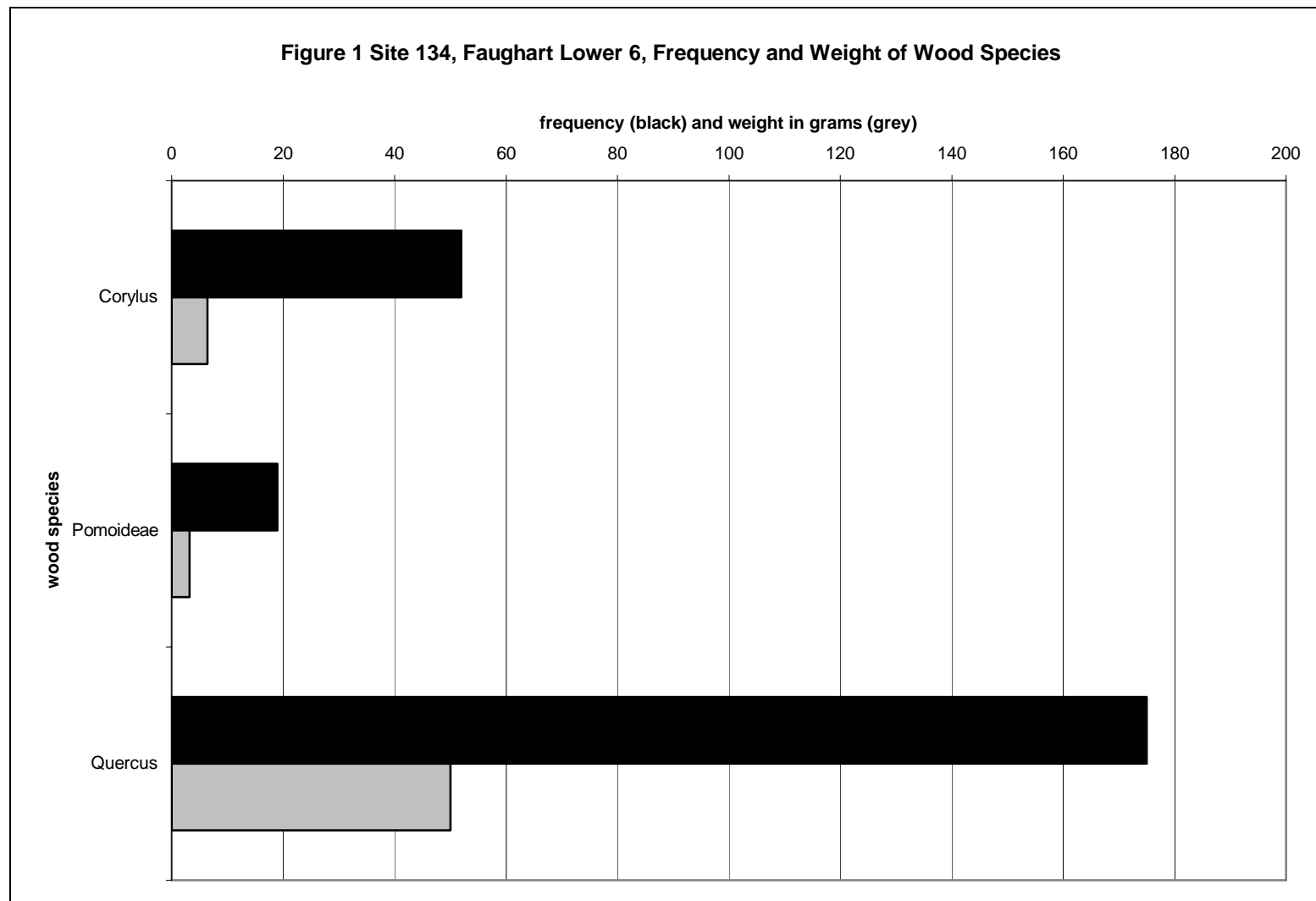
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species	frequency	weight	type	age	growth	eaten	category	remarks
<i>Faughart Lwr</i>		context 8	sample 6					
Corylus	1	0.4	split lump	30	slow		IV	age approximately
Corylus	3	1	rw	3	very fast		IV	felling end
Quercus	3	0.12	lump		fast			small fragments
not identified		0.18						
<i>Faughart Lwr</i>		context 12	sample 10					
Quercus	25	2.52	radial slivers		medium		IV or more	25 rings on 1.7 cm
Pomoideae	1	0.08	radial slivers					
<i>Faughart Lwr</i>		context 4	sample 4					
Corylus	10	0.66	rw	8	medium		III	last years slow
Corylus	2	0.38	rw	17	slow		III	
not identified		0.01						
<i>Faughart Lwr</i>		context 10	sample 8					
Quercus	110	44.15	lumps		very slow	**	VI	from large piece, big holes and frass. Biggest lump appr. 50 rings
not identified		3.13						
<i>Faughart Lwr</i>		context 14	sample 12					
Quercus	20	0.6	radial slivers		very fast		III or more	
Pomoideae	1	0.19	twig	20	slow		I	gnarl
Corylus	2	0.08	lump		fast			
<i>Faughart Lwr</i>		context 2	sample 2					
Quercus	17	2.68	lumps		medium		IV/V	23 rings on 1.6 cm
Corylus	20	0.85	rw	13	medium	***	III	insect channels with frass
Corylus	6	1.94	rw	5	fast	***	IV	big channels with frass
Corylus	8	1.11	rw		fast	*	V/VI	few rings, approximately 10
Pomoideae	17	2.9	radial slivers	15	fast		IV	11 rings on 1.7 cm
not identified		0.35						

Table 1: Faughart Lower 6: Site 134: charcoal identification results

13.3 Flint Report

(Professor Peter Woodman)

Aegis Report: lithic assemblages: Faughart Co Louth.

On close examination this would appear to be the distal portion of a primary flake that has been struck off water rolled flint nodule. It is probable that this is part of a beach rolled nodule of not very high quality flint. The pebble may have originated on the beaches of the Cooley Peninsula.

It consists almost entirely of cortex. A small step flake has been removed from the ventral surface at the distal end.

Unfortunately this is not a diagnostic artefact that is typical of a particular period.

13.4 Radio-Carbon Dating Report

(Beta Analytic)

The following charcoal samples were submitted for radio-carbon dating:

Sample No	Beta No	From Context	Size/treatment/type
2	217946	[c2] - pit	1.94g - AMS standard (Hazel)
4	217947	[c4] - pit	0.66g - AMS standard (Hazel)
6	217948	[c8]- pit	1g - AMS standard (Hazel)
12	217949	[c14]- pit	0.1g - AMS standard (Apple-type)

Contents

13.5.1. Analytical Procedures

13.5.2. Pre-Treatment Glossary

13.5.3. Analysis

13.5.4. Result

13.5.1. Analytical Procedures



*Consistent Accuracy ...
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Calendar Calibration at Beta Analytic

Calibrations of radiocarbon age determinations are applied to convert BP results to calendar years. The short-term difference between the two is caused by fluctuations in the heliomagnetic modulation of the galactic cosmic radiation and, recently, large scale burning of fossil fuels and nuclear devices testing. Geomagnetic variations are the probable cause of longer-term differences.

The parameters used for the corrections have been obtained through precise analyses of hundreds of samples taken from known-age tree rings of oak, sequoia, and fir up to about 10,000 BP. Calibration using tree-rings to about 12,000 BP is still being researched and provides somewhat less precise correlation. Beyond that, up to about 20,000 BP, correlation using a modeled curve determined from U/Th measurements on corals is used. This data is still highly subjective. Calibrations are provided up to about 19,000 years BP using the most recent calibration data available.

The Pretoria Calibration Procedure (Radiocarbon, Vol 35, No.1, 1993, pg 317) program has been chosen for these calendar calibrations. It uses splines through the tree-ring data as calibration curves, which eliminates a large part of the statistical scatter of the actual data points. The spline calibration allows adjustment of the average curve by a quantified closeness-of-fit parameter to the measured data points. A single spline is used for the precise correlation data available back to 9900 BP for terrestrial samples and about 6900 BP for marine samples. Beyond that, splines are taken on the error limits of the correlation curve to account for the lack of precision in the data points.

In describing our calibration curves, the solid bars represent one sigma statistics (68% probability) and the hollow bars represent two sigma statistics (95% probability). Marine carbonate samples that have been corrected for $^{13}\text{C}/^{12}\text{C}$, have also been corrected for both global and local geographic reservoir effects (as published in Radiocarbon, Volume 35, Number 1, 1993) prior to the calibration. Marine carbonates that have not been corrected for $^{13}\text{C}/^{12}\text{C}$ are adjusted by an assumed value of 0 ‰ in addition to the reservoir corrections. Reservoir corrections for fresh water carbonates are usually unknown and are generally not accounted for in those calibrations. In the absence of measured $^{13}\text{C}/^{12}\text{C}$ ratios, a typical value of -5 ‰ is assumed for freshwater carbonates.

(Caveat: the correlation curve for organic materials assume that the material dated was living for exactly ten years (e.g. a collection of 10 individual tree rings taken from the outer portion of a tree that was cut down to produce the sample in the feature dated). For other materials, the maximum and minimum calibrated age ranges given by the computer program are uncertain. The possibility of an "old wood effect" must also be considered, as well as the potential inclusion of younger or older material in matrix samples. Since these factors are indeterminant error in most cases, these calendar calibration results should be used only for illustrative purposes. In the case of carbonates, reservoir correction is theoretical and the local variations are real, highly variable and dependent on provenience. Since imprecision in the correlation data beyond 10,000 years is high, calibrations in this range are likely to change in the future with refinement in the correlation curve. The age ranges and especially the intercept ages generated by the program must be considered as approximations.)



*Consistent Accuracy ...
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Mr. Darden Hood
Director

Mr. Ronald Hatfield
Mr. Christopher Patrick
Deputy Directors

Final Report

The final report package includes the final date report, a statement outlining our analytical procedures, a glossary of pretreatment terms, calendar calibration information, billing documents (containing balance/credit information and the number of samples submitted within the yearly discount period), and peripheral items to use with future submittals. The final report includes the individual analysis method, the delivery basis, the material type and the individual pretreatments applied. The final report has been sent by mail and e-mail (where available).

Pretreatment

Pretreatment methods are reported along with each result. All necessary chemical and mechanical pretreatments of the submitted material were applied at the laboratory to isolate the carbon which may best represent the time event of interest. When interpreting the results, it is important to consider the pretreatments. Some samples cannot be fully pretreated, making their ^{14}C ages more subjective than samples which can be fully pretreated. Some materials receive no pretreatments. Please look at the pretreatment indicated for each sample and read the pretreatment glossary to understand the implications.

Analysis

Materials measured by the radiometric technique were analyzed by synthesizing sample carbon to benzene (92% C), measuring for ^{14}C content in one of 53 scintillation spectrometers, and then calculating for radiocarbon age. If the Extended Counting Service was used, the ^{14}C content was measured for a greatly extended period of time. AMS results were derived from reduction of sample carbon to graphite (100% C), along with standards and backgrounds. The graphite was then detected for ^{14}C content in one of 9 accelerator-mass-spectrometers (AMS).

The Radiocarbon Age and Calendar Calibration

The "Conventional ^{14}C Age (*)" is the result after applying $^{13}\text{C}/^{12}\text{C}$ corrections to the measured age and is the most appropriate radiocarbon age. If an "*" is attached to this date, it means the $^{13}\text{C}/^{12}\text{C}$ was estimated rather than measured (The ratio is an option for radiometric analysis, but included on all AMS analyses.) Ages are reported with the units "BP" (Before Present). "Present" is defined as AD 1950 for the purposes of radiocarbon dating.

Results for samples containing more ^{14}C than the modern reference standard are reported as "percent modern carbon" (pMC). These results indicate the material was respiring carbon after the advent of thermo-nuclear weapons testing (and is less than ~ 50 years old).

Applicable calendar calibrations are included for materials between about 100 and 19,000 BP. If calibrations are not included with a report, those results were either too young, too old, or inappropriate for calibration. Please read the enclosed page discussing calibration.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

Variables used in the calculation of age calibration → (Variables: est. C13/C12=-25;lab. mult=1)

Laboratory number: **Beta-123456**

Conventional radiocarbon age¹: **2400±60 BP** ← The uncalibrated Conventional Radiocarbon Age (± 1 sigma)

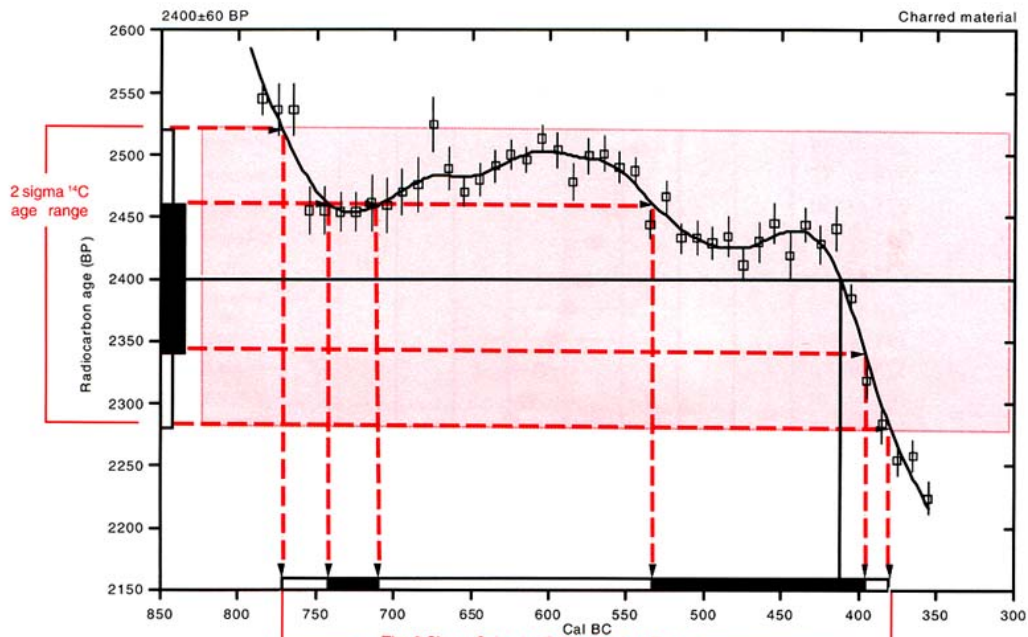
The calendar age range in both calendar years (AD or BC) and in Radiocarbon Years (BP) → **2 Sigma calibrated result: Cal BC 770 to 380 (Cal BP 2720 to 2330)** (95% probability)

¹ C13/C12 ratio estimated

Intercept data

Intercept of radiocarbon age with calibration curve: **Cal BC 410 (Cal BP 2360)** ← The intercept between the average radiocarbon age and the calibrated curve time scale. This value is illustrative and should not be used by itself.

1 Sigma calibrated result: **Cal BC 740 to 710 (Cal BP 2690 to 2660) and Cal BC 535 to 395 (Cal BP 2485 to 2345)**



References:

- Database used**
Intcal 98
Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-iii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et. al., 1998, *Radiocarbon* 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

References for the calibration data and the mathematics applied to the data. These references, as well as the Conventional Radiocarbon Age and the 13C/12C ratio used should be included in your papers.

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13.5.2. Pre-treatment Glossary

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PRETREATMENT GLOSSARY Standard Pretreatment Protocols at Beta Analytic

Unless otherwise requested by a submitter or discussed in a final date report, the following procedures apply to pretreatment of samples submitted for analysis. This glossary defines the pretreatment methods applied to each result listed on the date report form (e.g. you will see the designation "acid/alkali/acid" listed along with the result for a charcoal sample receiving such pretreatment).

Pretreatment of submitted materials is required to eliminate secondary carbon components. These components, if not eliminated, could result in a radiocarbon date, which is too young or too old. Pretreatment does not ensure that the radiocarbon date will represent the time event of interest. This is determined by the sample integrity. Effects such as the old wood effect, burned intrusive roots, bioturbation, secondary deposition, secondary biogenic activity incorporating recent carbon (bacteria) and the analysis of multiple components of differing age are just some examples of potential problems. The pretreatment philosophy is to reduce the sample to a single component, where possible, to minimize the added subjectivity associated with these types of problems. If you suspect your sample requires special pretreatment considerations be sure to tell the laboratory prior to analysis.

"acid/alkali/acid"

The sample was first gently crushed/dispersed in deionized water. It was then given hot HCl acid washes to eliminate carbonates and alkali washes (NaOH) to remove secondary organic acids. The alkali washes were followed by a final acid rinse to neutralize the solution prior to drying. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of the sample. Each chemical solution was neutralized prior to application of the next. During these serial rinses, mechanical contaminants such as associated sediments and rootlets were eliminated. This type of pretreatment is considered a "full pretreatment". On occasion the report will list the pretreatment as "acid/alkali/acid - insolubles" to specify which fraction of the sample was analyzed. This is done on occasion with sediments (See "acid/alkali/acid - solubles")

Typically applied to: charcoal, wood, some peats, some sediments, and textiles "acid/alkali/acid - solubles"

On occasion the alkali soluble fraction will be analyzed. This is a special case where soil conditions imply that the soluble fraction will provide a more accurate date. It is also used on some occasions to verify the present/absence or degree of contamination present from secondary organic acids. The sample was first pretreated with acid to remove any carbonates and to weaken organic bonds. After the alkali washes (as discussed above) are used, the solution containing the alkali soluble fraction is isolated/filtered and combined with acid. The soluble fraction, which precipitates, is rinsed and dried prior to combustion.

"acid/alkali/acid/cellulose extraction"

Following full acid/alkali/acid pretreatments, the sample is bathed in (sodium chlorite) NaClO_2 under very controlled conditions (Ph = 3, temperature = 70 degrees C). This eliminates all components except wood cellulose. It is useful for woods that are either very old or highly contaminated.

Applied to: wood

"acid washes"

Surface area was increased as much as possible. Solid chunks were crushed, fibrous materials were shredded, and sediments were dispersed. Acid (HCl) was applied repeatedly to ensure the absence of carbonates. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of each sample. The sample was not be subjected to alkali washes to ensure the absence of secondary organic acids for intentional reasons. The most common reason is that the primary carbon is soluble in the alkali. Dating results reflect the total organic content of the analyzed material. Their accuracy depends on the researcher's ability to subjectively eliminate potential contaminants based on contextual facts.

Typically applied to: organic sediments, some peats, small wood or charcoal, special cases

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PRETREATMENT GLOSSARY
Standard Pretreatment Protocols at Beta Analytic
(Continued)

"collagen extraction: with alkali or collagen extraction: without alkali"

The material was first tested for friability ("softness"). Very soft bone material is an indication of the potential absence of the collagen fraction (basal bone protein acting as a "reinforcing agent" within the crystalline apatite structure). It was then washed in de-ionized water, the surface scraped free of the outer most layers and then gently crushed. Dilute, cold HCl acid was repeatedly applied and replenished until the mineral fraction (bone apatite) was eliminated. The collagen was then dissected and inspected for rootlets. Any rootlets present were also removed when replenishing the acid solutions. "With alkali" refers to additional pretreatment with sodium hydroxide (NaOH) to ensure the absence of secondary organic acids. "Without alkali" refers to the NaOH step being skipped due to poor preservation conditions, which could result in removal of all available organics if performed.

Typically applied to: bones

"acid etch"

The calcareous material was first washed in de-ionized water, removing associated organic sediments and debris (where present). The material was then crushed/dispersed and repeatedly subjected to HCl etches to eliminate secondary carbonate components. In the case of thick shells, the surfaces were physically abraded prior to etching down to a hard, primary core remained. In the case of porous carbonate nodules and caliches, very long exposure times were applied to allow infiltration of the acid. Acid exposure times, concentrations, and number of repetitions, were applied accordingly with the uniqueness of the sample.

Typically applied to: shells, caliches, and calcareous nodules

"neutralized"

Carbonates precipitated from ground water are usually submitted in an alkaline condition (ammonium Hydroxide or sodium hydroxide solution). Typically this solution is neutralized in the original sample container, using deionized water. If larger volume dilution was required, the precipitate and solution were transferred to a sealed separatory flask and rinsed to neutrality. Exposure to atmosphere was minimal.

Typically applied to: Strontium carbonate, Barium carbonate
(i.e. precipitated ground water samples)

"carbonate precipitation"

Dissolved carbon dioxide and carbonate species are precipitated from submitted water by complexing them as ammonium carbonate. Strontium chloride is added to the ammonium carbonate solution and strontium carbonate is precipitated for the analysis. The result is representative of the dissolved inorganic carbon within the water. Results are reported as "water DIC".

Applied to: water

"solvent extraction"

The sample was subjected to a series of solvent baths typically consisting of benzene, toluene, hexane, pentane, and/or acetone. This is usually performed prior to acid/alkali/acid pretreatments.

Applied to: textiles, prevalent or suspected cases of pitch/tar contamination, conserved materials.

"none"

No laboratory pretreatments were applied. Special requests and pre-laboratory pretreatment usually accounts for this.

13.5.3. Analysis

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.2;lab. mult=1)

Laboratory number: Beta-217946

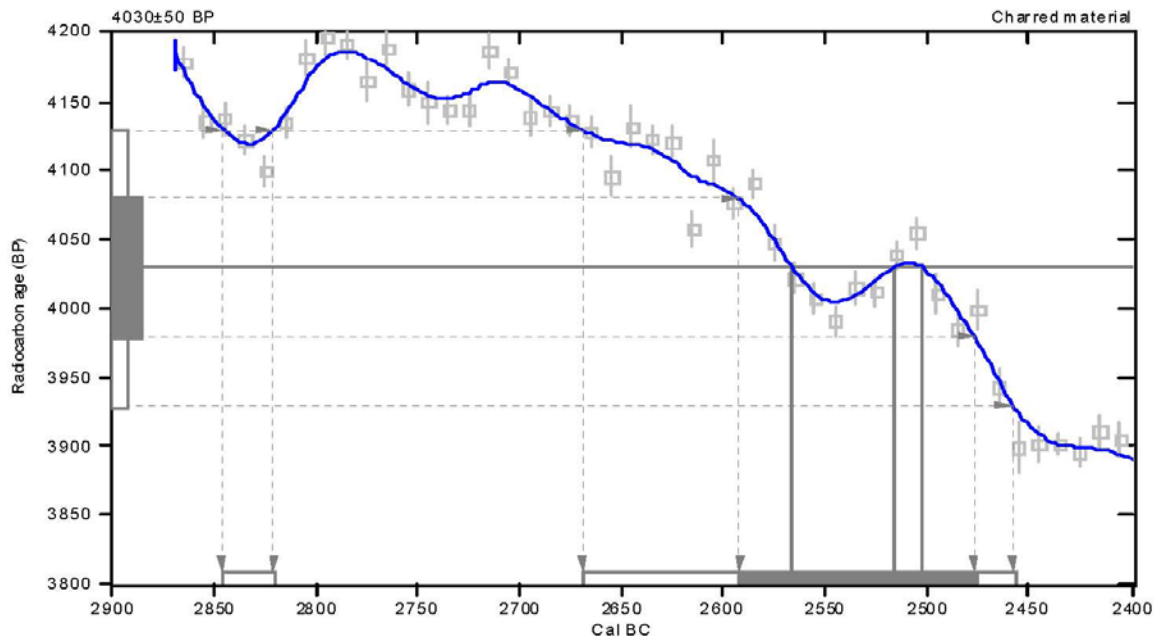
Conventional radiocarbon age: 4030±50 BP

2 Sigma calibrated results: Cal BC 2850 to 2820 (Cal BP 4800 to 4770) and
(95% probability) Cal BC 2670 to 2460 (Cal BP 4620 to 4410)

Intercept data

Intercepts of radiocarbon age
with calibration curve: Cal BC 2570 (Cal BP 4520) and
Cal BC 2520 (Cal BP 4470) and
Cal BC 2500 (Cal BP 4450)

1 Sigma calibrated result: Cal BC 2590 to 2480 (Cal BP 4540 to 4430)
(68% probability)



References:

- Database used*
INTCAL 98
- Calibration Database*
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-xiii
- INTCAL 98 Radiocarbon Age Calibration*
Stuiver, M., et al., 1998, *Radiocarbon* 40(3), p1041-1083
- Mathematics*
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.9:lab. mult=1)

Laboratory number: Beta-217947

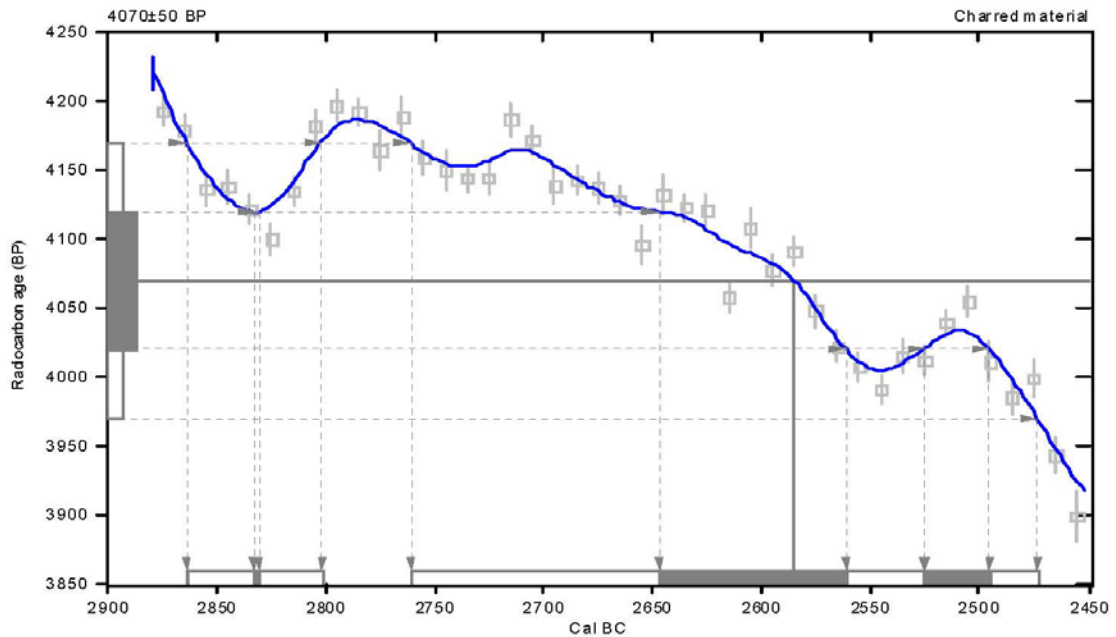
Conventional radiocarbon age: 4070±50 BP

2 Sigma calibrated results: Cal BC 2860 to 2800 (Cal BP 4810 to 4750) and
(95% probability) Cal BC 2760 to 2470 (Cal BP 4710 to 4420)

Intercept data

Intercept of radiocarbon age
with calibration curve: Cal BC 2580 (Cal BP 4540)

1 Sigma calibrated results: Cal BC 2830 to 2830 (Cal BP 4780 to 4780) and
(68% probability) Cal BC 2650 to 2560 (Cal BP 4600 to 4510) and
Cal BC 2520 to 2500 (Cal BP 4480 to 4440)



References:

Database used

INTCAL 98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-xiii

INTCAL98 Radiocarbon Age Calibration

Stuiver, M., et al., 1998, *Radiocarbon* 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.3:lab. mult=1)

Laboratory number: Beta-217948

Conventional radiocarbon age: 4010±40 BP

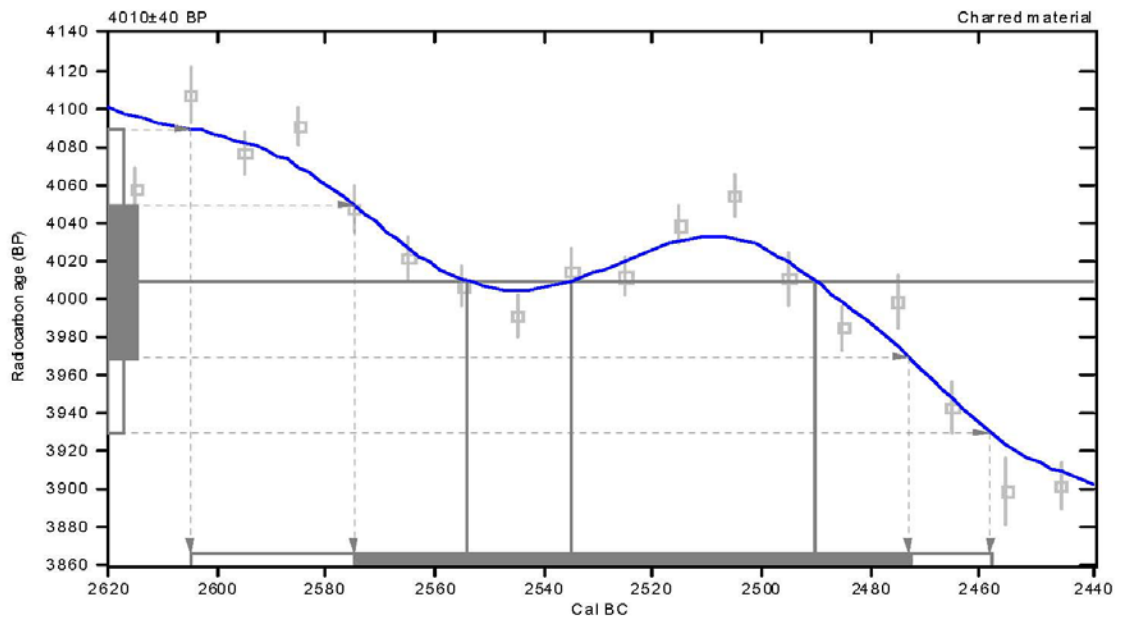
2 Sigma calibrated result: Cal BC 2600 to 2460 (Cal BP 4560 to 4410)
(95% probability)

Intercept data

Intercepts of radiocarbon age
with calibration curve:

Cal BC 2550 (Cal BP 4500) and
Cal BC 2540 (Cal BP 4480) and
Cal BC 2490 (Cal BP 4440)

1 Sigma calibrated result: Cal BC 2580 to 2470 (Cal BP 4520 to 4420)
(68% probability)



References:

Database used

INTCAL 98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxii-xiii

INTCAL 98 Radiocarbon Age Calibration

Stuiver, M., et al., 1998, *Radiocarbon* 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.7;lab. mult=1)

Laboratory number: Beta-217949

Conventional radiocarbon age: 4140±40 BP

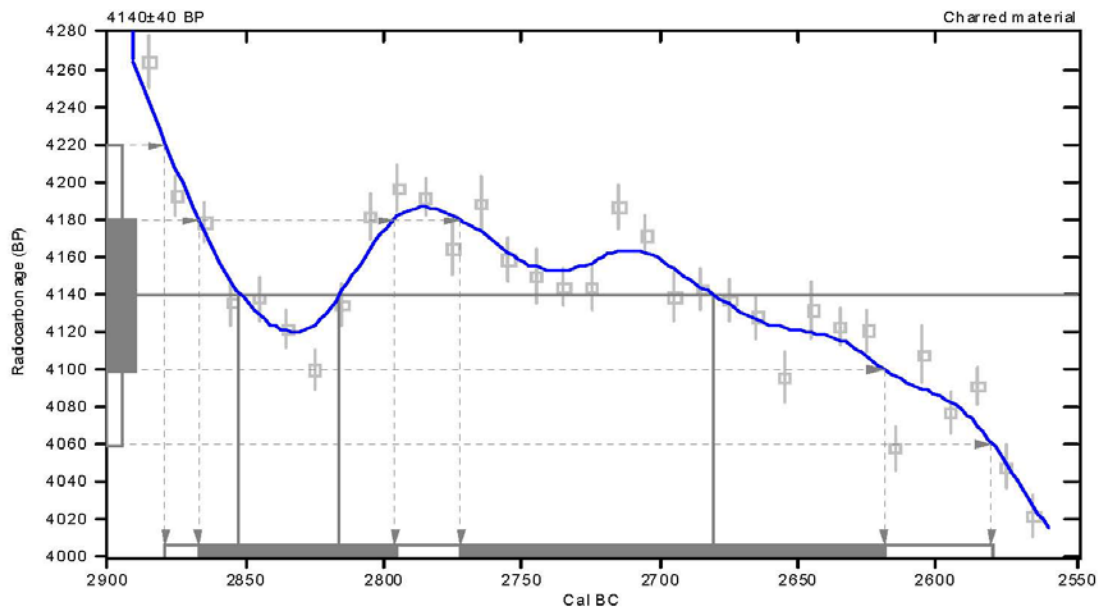
2 Sigma calibrated result: Cal BC 2880 to 2580 (Cal BP 4830 to 4530)
(95% probability)

Intercept data

Intercepts of radiocarbon age
with calibration curve:

Cal BC 2850 (Cal BP 4800) and
Cal BC 2820 (Cal BP 4770) and
Cal BC 2680 (Cal BP 4630)

1 Sigma calibrated results: Cal BC 2870 to 2800 (Cal BP 4820 to 4750) and
(68% probability) Cal BC 2770 to 2620 (Cal BP 4720 to 4570)



References:

Database used

INTCAL 98

Calibration Database

Editorial Comment

Stuiver, M., van der Plicht, H., 1998, *Radiocarbon* 40(3), pxi-xiii

INTCAL 98 Radiocarbon Age Calibration

Stuiver, M., et al., 1998, *Radiocarbon* 40(3), p1041-1083

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, *Radiocarbon* 35(2), p317-322

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13.5.4. Result

	BETA ANALYTIC INC. DR. M.A. TAMERS and MR. D.G. HOOD	UNIVERSITY BRANCH 4985 S.W. 74 COURT MIAMI, FLORIDA, USA 33155 PH: 305/667-5167 FAX: 305/663-0964 E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Avril Hayes

Report Date: 7/17/2006

Aegis Archaeology Ltd

Material Received: 6/19/2006

Sample Data	Measured Radiocarbon Age	¹³ C/ ¹² C Ratio	Conventional Radiocarbon Age(*)
Beta - 217946 SAMPLE : 04E0811:2 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2850 to 2820 (Cal BP 4800 to 4770) AND Cal BC 2670 to 2460 (Cal BP 4620 to 4410)	4030 +/- 50 BP	-25.2 o/oo	4030 +/- 50 BP
Beta - 217947 SAMPLE : 04E0811:4 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2860 to 2800 (Cal BP 4810 to 4750) AND Cal BC 2760 to 2470 (Cal BP 4710 to 4420)	4070 +/- 50 BP	-24.9 o/oo	4070 +/- 50 BP
Beta - 217948 SAMPLE : 04E0811:6 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2600 to 2460 (Cal BP 4560 to 4410)	4030 +/- 40 BP	-26.3 o/oo	4010 +/- 40 BP
Beta - 217949 SAMPLE : 04E0811:12 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal BC 2880 to 2580 (Cal BP 4830 to 4530)	4140 +/- 40 BP	-24.7 o/oo	4140 +/- 40 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.