

Palaeoecology Research Services

**Technical report: biological remains from excavations  
at Curraheen 1, N22 Ballincollig bypass scheme, County  
Cork, Republic of Ireland (site code: 01E1209)**

by

Malin Holst, Allan Hall, Deborah Jaques and John  
Carrott

*Palaeoecology Research Services  
Unit 8, Dabble Duck Industrial Estate  
Shildon, County Durham DL4 2RA*

**Technical report: biological remains from excavations at Curraheen 1,  
N22 Ballincollig bypass scheme, County Cork, Republic of Ireland  
(site code: 01E1209)**

by

Malin Holst, Allan Hall, Deborah Jaques and John Carrott

**Summary**

*Small quantities of biological remains recovered from deposits encountered during monitoring works for the N22 Ballincollig bypass scheme at Curraheen 1, Ballincollig, County Cork, were submitted for analysis. A large number of archaeological features were located relating to activity from the late Neolithic to the medieval period.*

*Several of the samples were rich in the remains of oats which had been preserved by charring. In the absence of dating information, little can be said about these oat-rich samples. They seem likely to be medieval, given the prominence of oats (which appears to be rare or absent in the prehistoric period in Ireland, though the tally of records for the island is still quite small) and the presence of 'bread/club' wheat. The crops represented in Features 99, 101 and 109 were remarkably free of weeds, but all showed some signs of the oats, at least, having started to germinate. The remaining plant material was typical of many occupation deposits: very low levels of charred cereals, perhaps mostly reworked, and of little interpretative value.*

*Osteological assessment of the five cremated bone assemblages found that the bone was well-calcined and exhibited little cracking or warping. One of the cremated bone assemblages consisted entirely of animal bone, while the remaining four assemblages included both human and non-human remains. The majority of the identifiable human skeletal elements were long bones. It was only possible to determine age for one individual, who was an adult.*

*The small assemblages of burnt animal bone were of little interpretative value. The fragments may represent sacrificial or food offerings, but the absence of dating evidence and the paucity of identifiable remains limits further interpretation.*

**KEYWORDS:** CURRAHEEN 1; N22 BALLINCOLLIG BYPASS SCHEME; COUNTY CORK; REPUBLIC OF IRELAND; TECHNICAL REPORT; LATE NEOLITHIC; IRON AGE; EARLY MEDIEVAL; MEDIEVAL; CHARRED PLANT REMAINS; CHARRED GRAIN; VERTEBRATE REMAINS; HUMAN REMAINS; CREMATED BONE

Contact address for authors:

Prepared for:

Palaeoecology Research Services  
Unit 8  
Dabble Duck Industrial Estate  
Shildon  
County Durham DL4 2RA  
United Kingdom

Archaeological Consultancy Services Ltd  
21 Boyne Business Park  
Greenhills  
Drogheda  
County Louth  
Republic of Ireland

15 May 2003

## Technical report: biological remains from excavations at Curraheen 1, N22 Ballincollig bypass scheme, County Cork, Republic of Ireland (site code: 01E1209)

### Introduction

An archaeological excavation of deposits encountered during the initial stages of the monitoring programme for the N22 Ballincollig bypass scheme, County Cork, Republic of Ireland, was undertaken by Archaeological Consultancy Services Ltd (ACS).

A large number of archaeological features (including two enclosing ditches, a large number of postholes and stakeholes, and at least one hearth) were located relating to activity from the late Neolithic to the medieval period (mainly late Neolithic and early medieval). The site had suffered substantial damage from both quarrying and the construction of a railway line.

Small quantities of biological remains recovered from the processing of bulk sediment samples were submitted to PRS for analysis.

### Methods

The soil samples were placed onto 1 mm nylon mesh in a sieving tank. The light organic fraction was washed over through a 2 mm sieve into a 500 micron sieve to collect the flots. Each of the soil samples was put through this system twice to ensure that as much material as possible was recovered.

The sediment samples were processed by ACS prior to delivery to PRS and only the small quantities of recovered plant remains and the bone were submitted for analysis.

### *Plant remains*

The plant remains recovered from the samples were examined and identified as closely as possible.

### *Human bone*

The cremated human bone was sieved through a stack of sieves of 10 mm, 5 mm and 2 mm mesh sizes. The bone recovered from each sieve was weighed and sorted into identifiable and non-identifiable bone (any non-human remains were bagged separately). The identifiable bone was divided into five categories: skull, axial (excluding the skull), upper limb, lower limb and long bone (unidentifiable as to the limb).

All identifiable groups of bone were weighed and bagged separately. Bone colour, fragmentation, preservation and the rate of cracking and warping resulting from burning were recorded with the aim of obtaining information on cremation processes and subsequent funerary rituals.

The preservation of the skeletal remains was assessed subjectively, depending on bone surface erosion and fragmentation, using a grading system divided into five categories: very poor, poor, moderate, good and excellent.

Age was determined using standard ageing techniques as specified by Buikstra and Ubelaker (1994) and Scheuer and Black (2000). Determination of sex, which is dependant on the presence of skulls and pelvis, followed morphological characteristics described by Mays and Cox 2000.

Each cremated bone assemblage was examined for thirty cranial and thirty post-

cranial non-metric traits selected from the osteological literature (Buikstra and Ubelaker 1994, Finnegan 1978, Berry and Berry 1967).

### *Animal bone*

For the animal remains records were made concerning the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Other information, such as fragment size and fresh breakage, was noted, where applicable.

Where possible, fragments were identified to species or species group. The bones, which could not be identified to species, were described as the 'unidentified' fraction. Within this fraction fragments were grouped into the following categories: medium-sized mammal (assumed to be caprovid, pig or small cervid) and totally unidentifiable.

## Results

### *Plant remains*

The results are presented in feature number order. Archaeological information, provided by the excavator, is given in square brackets. Sediment descriptions were also supplied by the excavator.

#### **Feature 99** [charcoal-rich hearth deposit] Sample 29

Loose, dark brown-black, silty clay, with frequent charcoal and occasional oxidised clay and moderate pebble inclusions.

The washover consisted of 39 g of charred cereals with some modern rootlets (total volume about 130 cm<sup>3</sup>). The cereal grains were mainly rather well preserved oats, *Avena* (including some cultivated oat, *A. sativa* L., identified on the basis of spikelet bases present on a small number of specimens), with a little barley (*Hordeum*), and a few 'bread/club' wheat (*Triticum 'aestivo-compactum'*). It was estimated that the grains were present in the proportions 5 oats to 1 barley, with wheat merely present as a 'trace'. Some of the oat grains were somewhat shrivelled/grooved, especially at the embryo end, and some bore an emerging coleoptile

to about half the grain length, indicating that they had begun to germinate (and perhaps the reason for charring, via an attempt to dry or to dispose of them in a fire).

There was a further sample with the same feature and sample numbering, containing a further 6 g of barley and oats (this time roughly in approximately equal proportion) with the oats again showing some signs of germination. The sample also contained a very little charcoal (including oak, *Quercus*) to 10 mm in maximum dimension.

#### **Feature 101** [charcoal rich hearth] Sample 22

Loose, dark brown-black, silty clay, with frequent charcoal and occasional oxidised clay and moderate pebble inclusions.

The sample consisted of 9 g of charred cereals, about 30 cm<sup>3</sup> in volume (including some modern rootlets), mainly oats but with some barley (estimated to be in a proportion of about 3 to 1), with a little charcoal (including oak) to 10 mm. There were no weeds, and the oat material lacked diagnostic spikelet bases (though again it was probably mostly cultivated oats); however, the oat grains were very variable in size. Again there was some shrivelling visible at the embryo end and some grains had begun to sprout.

#### **Feature 109** [posthole fill] Sample 40

Loose, light brown, silty sand, with frequent charcoal (at surface) and moderate angular stone inclusions.

The washover of 32 g had a volume of about 115 cm<sup>3</sup>. Again, it was mainly oats (including cultivated oats—there was quite a high proportion of grains in spikelets), with a trace of barley. Some of the oat grains were sprouting and there was also a trace of charcoal.

#### **Feature 200** [primary ditch fill] Sample 47

Loosely compacted, orangish-grey, silty sand, with moderate stone and occasional charcoal inclusions.

The remains comprised a few tens of rather poorly preserved oat grains, with a trace of charred weed 'seeds' (hemp-nettle, *Galeopsis* Subgenus *Galeopsis*; nipplewort, *Lapsana communis* L.; and wild radish, *Raphanus raphanistrum* L.).

**Feature 355** [posthole fill]  
Sample 60

Moderately compacted, mid to light brown, silty clay, with occasional pebble inclusions.

There was only a single earthworm (*Oligochaeta* sp. indet.) egg capsule, apparently mineral-impregnated.

### *Human bone*

One of the cremated bone assemblages (from Feature 95) contained exclusively animal bone (see following section). The four remaining assemblages from this site contained both human and non-human cremated remains. The assemblages also included small bone fragments which were not diagnostic, and it was therefore not possible to identify whether these were human or animal. For the purpose of this report unidentified fragments have been included with the human bone.

### **Preservation**

The cremated human bone was mostly (77.4%) moderately well-preserved the remainder being well-preserved (Table 1). Few of the bones exhibited surface erosion, suggesting that they had suffered little post-depositional disturbance, although the majority of the bone was very fragmented, to a size of between 5-9 mm. Only two assemblages contained larger fragments, and most of those were not much larger than 10 mm (Table 2).

The small size of the cremated bone fragments may be attributed to post-cremation processes, as skeletal elements retrieved from modern crematoria tend to be comparatively large before being ground down for scattering or deposition in urns. However, bone is particularly prone to fragmentation if it is moved while still hot (McKinley 1994, 340) and it may be this process which contributed to the fragmentation of bone. This theory is supported by the fact that almost no heat-induced cracking or warping could be observed on the cremated bone. Cracking is a common consequence of cremation and would have made the bone more prone to fragmentation.

The cremated bone was very well burnt, causing the complete loss of the organic portion and producing a white colour throughout. According to McKinley (1989), the body needs a minimum temperature of 500 degrees Celsius over seven to eight hours to achieve such complete calcination.

The quantity of cremated human bone per burial varied from 1g to 39.8g (Table 1), with an overall mean

weight of 16.8g. The quantity of bone retrieved from the human bone assemblages weighed considerably less than that produced by modern crematoria, which tends to range from 1600g to 3600g (McKinley 1989, 66). However, Wahl (1982, 25) found that archaeologically recovered remains of cremated adults tend to weigh much less (between 250g and 2500g), as it was common to select only some of the cremated bone from the pyre for inclusion in the burial, thereby representing a symbolic, or token, interment. However, most burials at Curraheen 1 produced less than 1% of the quantity of bone expected to remain following burning. It is improbable that the small quantity of bone in these burials was the result of post-cremation selection, but is probably due to later truncation of burial features.

It was possible to identify skeletal elements in all of the cremated bone assemblages. In all cases, the majority of identifiable bones were long bone shaft fragments and in two assemblages, these were the only identifiable skeletal elements. Two burials included moderate proportions of cranial and upper limb fragments, and one of these burials also included lower limb elements (Table 3).

### **Minimum number of individuals**

It is not possible to calculate the MNI for cremation burials, as often only a token selection of bone from the pyre is buried. Double burials can be identified only if skeletal elements are duplicated, or if skeletons of different ages are represented in one burial. In this instance, double burials were identified.

### **Determination of age and sex**

None of the criteria normally used for age determination were present in the cremated remains at Curraheen 1. As a result, age determination relied on the robustness of the bones, which suggested the presence of an adult in one of the burials (Table 1). It was not possible to assess age in the other assemblages. None of the cremated assemblages contained skeletal elements which were sexually dimorphic.

### **Metrical analysis**

It was not possible to metrically analyse the cremated remains, as cremated bone shrinks at an inconsistent rate (up to 15%) during the cremation process.

### **Analysis of non-metric traits**

Non-metric traits were not identified in the present cremated bone assemblages.

## Palaeopathological and dental analysis

Extensive fragmentation of the bone and the small quantity recovered from Curraheen 1 precludes any dental analysis. No pathological conditions were identified.

### *Animal bone*

Five features produced burnt bone assemblages that contained fragments possibly representing the remains of animals. No human bone fragments were identified from Feature 95, whilst the other four features (Features 98, 164, 186 and 192) contained both animal and human fragments. A list of the animal bone fragments recovered by feature can be found in the appendix.

The bone was extremely fragmented and mostly less than 50 mm in any dimension. Some fresh breakage, resulting from excavation and post-excavation processes, was observed. In most cases, it was not possible to identify fragments to species or species group, nor was it always possible to confidently determine that the unidentified fragments initially thought to be of animal bone were indeed animal, rather than human, bone.

Several fragments, however, could be identified and these included the remains of pig. A pelvis fragment was recorded from Feature 95, whilst Feature 164 produced two scapula fragments and a lateral phalanx. A small proportion of the bones could be assigned to the broad category of 'medium-sized mammal' (assumed to represent sheep or pig) and these were mainly mandible, cranium and shaft fragments. Over half of the bones remained completely unidentified.

## Discussion

### *Plant remains*

In the absence of dating information, little can be said about the oat-rich samples from Curraheen 1. They seem likely to be medieval, given the prominence of oats (which appears to be rare or absent in the prehistoric period in Ireland, though the tally of records for the island is still quite small) and the presence of 'bread/club' wheat. The crops represented in Features 99, 101 and 109 were remarkably free of weeds, but all showed some signs of the oats, at least, having started to germinate

(see comment under Sample 29 in this connection).

The remaining material was typical of many occupation deposits: very low levels of charred cereals, perhaps mostly reworked, and of little interpretative value.

### *Human bone*

The cremated bone from this multi-period site was recovered from a variety of features and included both human and animal bone; one of the assemblages included only non-human remains. The human bone was well calcined and exhibited little cracking, warping or erosion, but was very fragmented. The bone weight varied from 1g to 39.8g and suggested truncation of the burial features, which may have been due to modern quarrying or construction activity at the site. The majority of identifiable skeletal elements were long bone fragments. Based on the robustness of the bones, one individual may have been adult.

The cremation technique and selection of skeletal elements was similar to that observed at Greenfield 5 (Holst and Carrott 2003), another site associated with the Ballincollig bypass works. The presence of mixed human and animal bone at Curraheen 1 and exclusively human remains at Greenfield 5 suggests distinct funerary practices at the two sites, however. This difference in mortuary behaviour could be related to different dates for burial at the two sites.

### *Animal bone*

The small assemblages of burnt animal bone were of little interpretative value. The fragments may represent sacrificial or food offerings, but insufficient fragments were identifiable for further interpretation. Interpretation was also hampered by the limited nature of the dating evidence.

## Retention and disposal

All of the material should be retained as part of the physical archive for the site.

## Archive

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

## Acknowledgements

The authors are grateful to Rachel Sloane of ACS for providing the material and the archaeological information.

## References

- Berry, A. C. and Berry, R. J. (1967). Epigenetic variation in the human cranium. *Journal of Anatomy* **101** (2), 361-379.
- Buikstra, J. E. and Ubelaker D. H. (eds.) (1994). *Standards for Data Collection from Human Skeletal Remains*. Fayetteville.
- Finnegan, M. (1978). Non-metric variation of the infracranial skeleton. *Journal of Anatomy* **125**, 23-37.
- Holst, M. and Carrott, J. (2003). Technical report: biological remains from excavations at Greenfield 5, N22 Ballincollig bypass scheme, County Cork, Republic of Ireland (site code: 02E0946). PRS **2003/39**.
- Mays, S. and Cox, M. (2000). *Sex determination in skeletal remains*, in M. Cox and S. Mays (eds.), *Human Osteology in Archaeology and Forensic Science*, 117-130. London.
- McKinley, J. I. (1994). Bone fragment size in British cremation burials and its implications for pyre

technology and ritual. *Journal of Archaeological Science* **21**, 339-342.

McKinley, J. I. (1989). *Cremations: expectations, methodologies, and realities*, in C. A. Roberts, F. Lee and J. Bintliff (eds.), *Burial Archaeology. Current Research, Methods and Developments*, BAR British Series **211**, 65-76. Oxford.

Scheuer, L. and Black, S. (2000). *Development and ageing of the juvenile skeleton*, in M. Cox and S. Mays (eds), *Human Osteology in Archaeology and Forensic Science*, 9-22. London.

Wahl, J. (1982). Leichenbranduntersuchungen. Ein Überblick über die Bearbeitungs- und Aussagemöglichkeiten von Brandgräbern, *Prähistorische Zeitschrift* **57**, 2-125.

Table 1. Curraheen 1: Osteological summary (human remains). Key: u = undetermined.

Feature No.	Weight (g)	Feature	Animal (g)	Preservation	Colour	Age	Sex
95	-	pit	14.1	-	-	-	-
98	1	pit	0.5	moderate	white	u	u
164	39.8	linear feature	27.5	moderate	white	u	u
186	15.2	posthole	3.1	good	white	18+	u
192	11.3	linear feature	0.7	moderate	white	u	u

Table 2. Curraheen 1: Summary of cremated bone assemblages (human remains).

Feature No.	Weight (g)	Non-Human (g)	Preservation	%age	Age	10mm (g)	10mm (%)	5mm (g)	5mm (%)	2mm (g)	2mm (%)	Residue (g)
95	14.1	14.1	-	-	-	0	0	0	0	0	0	0
98	1.5	0.5	moderate	0	u	0	0	1	100	0	0	0
164	67.3	27	moderate	2	u	9.1	23	23.9	60	5.8	14	1
186	18.3	3.1	good	1	18+	5.7	38	8.4	55	1.1	7	0
192	12	0.7	moderate	0	u	0	0	4.1	36	6.2	55	1

Table 3. Curraheen 1: Summary of identifiable cremated bone fragments (human remains). Key: UL = upper limb; LL= lower limb; UI LB = unidentified limb bone; ID = identified; UID = unidentified.

Feature No.	Skull (g)	Skull (%)	Axial (g)	Axial (%)	UL (g)	UL (%)	LL (g)	LL (%)	UI LB (g)	UI LB (%)	Total ID (g)	Total ID (%)	Total UID (g)	Total UID (%)
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0.5	100	0.5	50	0.5	50
164	1.1	12	0	0	1.2	13	0	0	6.8	75	9.1	23	30.7	77
186	1.6	23	0	0	0.6	8	3.5	49	1.4	20	7.1	47	8.1	53
192	0	0	0	0	0	0	0	0	2.8	100	2.8	25	8.5	75



## **Appendix**

*Curraheen 1: Animal remains by Feature Number.*

### **Feature 95**

Burnt animal bones amounted to 15 fragments of which only one could be identified. This fragment represented a pig pelvis. Several medium-sized mammal cranium fragments were also noted.

### **Feature 98**

One medium-sized mammal shaft fragment was recovered from this feature.

### **Feature 164**

This feature produced 30 fragments, which included two pig scapula fragments and a pig lateral phalanx. Several medium-sized mammal fragments were present, mostly shaft fragments, but also two fragments which may have been part of a medium-sized mammal mandible.

### **Feature 186**

Bone from this feature included one shaft fragment and a mandible fragment, both of which were probably remains of medium-sized mammals. A third fragment could not be identified.

### **Feature 192**

Two very small fragments were recovered from this feature, neither of which could be identified.