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A Cremation Burial at Pinkie Mains, Musselburgh, East Lothian

Post-excavation Archive Report

Report No. 2173

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1. INTRODUCTION

An archaeological evaluation was undertaken in March 2012 by CFA Archaeology Ltd (CFA) at Pinkie Mains, Musselburgh, East Lothian (NGR: NT 357 726, Fig. 1). The work was commissioned by Taylor Wimpey East Scotland. The results of the evaluation have been reported in full (McCaig and Suddaby 2012).

The evaluation was carried out as the site lay within the area of the Battle of Pinkie Cleugh (1547). The area was also known to have contained an 18th and early 19th-century barracks complex which is shown on John Thomson's map of 1832.

The evaluation, which involved the excavation of 72 trenches (7600m^2, 7% of the total area), revealed a single cremation burial within the northern end of Trench 17. An area measuring 10m x 10m and centred on the pit was subsequently excavated, but no further burials were identified.

This report presents the results of post-excavation analysis of the finds related to this discovery.

2. ARCHAEOLOGICAL SUMMARY

Trench 17 located a cut feature (**1701**) with a stone-lined perimeter (**1703**, Figs 2–3), cut into clean natural sand. This measured 1.4m by 1.2m in plan and its long axis was aligned close to N–S. The interior was filled with charcoal-flecked grey sand (**1702**) containing quantities of burnt bone. No finds were recovered but many of the stones were degrading and may have been heated. Feature **1701** was fully excavated and the fill was retained as a sample. A 10m by 10m trench was excavated around this feature but no further features were present.

3. FINDS ANALYSIS

3.1 Introduction

A sample <1> was recovered from the fill of feature 1701. All finds and bone were recovered during the post-excavation processing of the sample. The finds comprised six pieces of prehistoric pottery, three tiny fragments of vitrified material (probably fuel ash slag) and a tiny chip of uncoloured modern glass, presumably intrusive. A quantity of wood charcoal was also recovered. The results of the analyses of the pottery, bone and charcoal are presented below.

3.2 **Prehistoric pottery**, by Melanie Johnson

A very small quantity of pottery (2g) was recovered from the fill of the cremation pit in Trench 17 (context 1702) following wet-sieving of the soil samples. The sherds are small, abraded fragments of handmade prehistoric pottery with no diagnostic features. The larger of the fragments are in a fine fabric with few visible inclusions, and either brown or dark grey in colour with a dark core. The surfaces, where sufficient survives, are smoothed, and one sherd has a concave exterior surface suggesting it may have

been from the neck of the vessel. There is insufficient material to make any further comment on date or morphology.

3.3 **Cremated human bone**, by Sue Anderson

Introduction

This report examines the cremated bone collected from a cremation burial. The burial is dated to the Middle Iron Age. A full catalogue is appended to this report.

Methodology

Context 1702 was collected as a bulk sample and sieved, the entire residue being retained as a single group which was then sieved into four fractions (>10mm, >4mm, >2mm, <2mm) prior to sorting. All stone and other non-osseous material was removed from the three largest fractions, but the quantity of bone in the smallest fraction was estimated. The bone from each context was sorted into five categories: skull, axial, upper limb, lower limb, and unidentified. All fragments were weighed to the nearest tenth of a gram. Identified fragments were also counted to provide an average fragment weight. Measurements of maximum skull and long bone fragment sizes were also recorded. Observations were made, where possible, concerning bone colour, age, sex, dental remains and pathology. Identifiable fragments were noted. Methods used follow the Workshop of European Anthropologists (WEA 1980) and McKinley (1994 and 2004).

The cremated bone

Table 1 shows the bone weights and percentages of identified bone from the burial, and the proportions of bone identified from the four areas of the skeleton (skull, axial, upper limb, lower limb). Expected proportions are provided based on McKinley (1994, 6).

Area	>10mm	>4mm	>2mm	<2mm	Total wt/g	% identified	% expected
Skull	41.4	47.7	3.8		92.9	26.1	*18.2*
Axial	6.6	16.5	1.0		24.1	6.8	*20.6*
Upper limb	36.7	42.6	0.1		79.4	22.3	*23.1*
Lower limb	93.7	65.3	0.1		159.1	44.8	*38.1*
Unidentified	25.3	239.3	272.5	c.85	622.1	-	
Total	**203.7**	**411.4**	**277.5**	**c.85**	**977.6**		

Table 1. Percentages of identified fragments out of total identified to area of skeleton.

This shows that skull and lower limb fragments are over-represented amongst the identifiable material, and that other areas of the skeleton are under-represented, although this applies most to the axial component. It has been suggested that 'it should be possible to recognise any bias in the collection of certain areas of the body after cremation' (McKinley 1994, 6). However, there is also some bias inherent in the identification of elements. McKinley notes the ease with which even tiny fragments of skull can be recognised, and conversely the difficulty of identifying long bone fragments. These figures can therefore provide only a rough guide to what was originally collected.

Identifiable pieces in this group included cranial vault (including occipital), left zygoma, a fragment of mandible, tooth root and crown fragments, pieces of vertebral arch and facet, ribs, humerus, ulna, radius finger phalanges, femur, tibia, fibula and metatarsals.

Mays (1998, Table 11.2) notes that the combusted weight of an adult skeleton has a mean of around 1500g for females and 2300g for males. The quantity of bone in this assemblage therefore represents less than two-thirds of the combusted weight of an average adult female skeleton.

There was no definitive evidence, in the form of duplicated elements, to suggest that more than one individual was present in this burial, although some bones were notably more abraded than others and the possibility cannot be entirely discounted. Alternatively the abraded fragments could be pieces of animal bone.

Based on the complete fusion of the finger phalanges, the complete formation of the tooth roots, and the overall size of the bones, the individual was an adult. There is some evidence of degenerative or physical stress-related changes to some of the surviving joints and muscle attachments, with osteophytes present on at least two vertebral facets/bodies and new bone growth on the linea aspera of the femur. This suggests that the individual may have been in middle or older age. However, the cranial sutures appear not to have been fused at the time of death. A fragment of molar crown may have survived through being unerupted, perhaps suggesting that the wisdom teeth had not erupted. Whilst this may indicate a young age at death, impaction or lack of complete development of these teeth is relatively common. The individual is therefore classified as 'young or middle-aged adult'. Sexing criteria were infrequent, but based on the gracile appearance of the zygoma and part of the occipital, together with the small size of the finger phalanges, it is suggested that the individual was probably female.

The degree of fragmentation was very high, as shown by the high proportion of material in the >4mm and >2mm fractions. This accounts for the relatively low identification rate of only 36.4%. The largest fragment of skull was 31mm long and the largest piece of long bone 67mm long.

The majority of bone in this group was fully oxidised white in colour. A few small pieces of rib and the left femur were brown and not fully combusted. The presence of a high proportion of white bone indicates firing temperatures in excess of c.600°C (McKinley 2004, 11). Mays (1999, 159) noted that the uniformity of colour in the surviving bone at Ardleigh in Essex may be due to poor survival of less well cremated bone.

3.4 **Charcoal**, by Michael Cressey

Introduction

Charcoal recovered from the wet-sieving of Sample 1 was examined (fill 1702). The sample was recovered from a human cremation. The sample volume was very small but sufficient material survived to establish the wood species forming part of the pyre fuel.

Results

The identification results (Table 2) confirm the presence of Birch (*Betula* sp) and Hazel (*Corylus avellana*). Both species were present in very low amounts and represent only a minute fraction of the material that would have been required in the funerary ritual. Coal and shale was also present, hinting at taphonomic re-working of this material. A single fragment of unidentifiable vitrified charcoal was present indicating pyrolosis at a very high temperature.

There is insufficient material present to establish local woodland cover. However both species formed a major part of the local woodland composition throughout prehistory.

Species	No of IDs	Wt (g)	Condition
Betula	25	3.4	amorphous
Corylus	7	0.4	amorphous
Coal	N/a	N/a	N/a
Shale	N/a	N/a	N/a
Vitrified	1	N/a	amorphous

Table 2. Contents of sample 1 (1702).

3.5 Radiocarbon date

A single sample, a fragment of femur (3.7g), was submitted for radiocarbon dating. The resulting date range, at 2σ, was 359–112 cal BC (2163±27 BP; SUERC-44524), indicating that the burial took place in the Middle Iron Age period.

4. DISCUSSION

Prior to the discovery of this burial, the only known prehistoric cremated bone deposits in the vicinity were from Pinkie Mains West (Stevenson 1949). These were urned burials of Late Bronze Age date and are therefore unrelated to the present find.

The find appears to have been an isolated burial, with no others close by, nor any evidence of other types of activity of this date in the vicinity.

The burial contained the fragmented remains of a young or middle-aged woman. The total weight of bone indicates that the skeleton was not complete. This may be due to poor collection following the cremation ritual, poor preservation of incompletely cremated material following burial, or truncation. The shallow depth of the feature suggests that the latter is very likely. Iron Age cremation burials generally tend to be less well preserved than earlier Bronze Age examples, partly due to the inclusion of the latter in large urns which protected the contents, but perhaps also due to a change in ritual with deliberate crushing of the bone taking place following collection.

In Eastern Scotland as a whole, this period is under-represented in terms of cremation burials (Wallace 2011). Wallace has listed only nine sites in an area stretching from Fife to Northumberland. Geographically, the closest were found along the route of the A1 at Pencraig Hill and Eweford West, but neither of these fell within the date range of the Pinkie burial (Lelong and MacGregor 2007, 122). However, both were deposits in cists and the example at Pencraig Hill was similar in appearance to the Pinkie stone

setting, particularly if it is assumed that the latter was heavily truncated. A cist burial at Whitekirk contained remains of both earlier and similar date to the Pinkie burial, suggesting re-use of the feature or re-deposition of earlier material (Haselgrove et al 2009, 90–95). Evidence from Phantassie (Lelong and MacGregor 2007, 195) suggests that treatment of the cremated dead in the Middle Iron Age was sometimes more complex than simple interment, with burnt human bone occurring in midden deposits and occupation layers at the farmstead excavated there.

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APPENDIX 1: CREMATION CATALOGUE

Quantification and measurements

Mesh	Skull			Axial			Upper limb			Lower limb			Unident	Totals	max skull (mm)	max l.b. (mm)	Colour
	No.	Wt/g	Ave. wt	No.	Wt/g	Ave. wt	No.	Wt/g	Ave. wt	No.	Wt/g	Ave. wt	Wt/g	Wt/g			
>10mm	41	41.4	1.0	8	6.6	0.8	26	36.7	1.4	44	93.7	2.1	25.3	203.7	31	67	white
>4mm	205	47.7	0.2	96	16.5	0.2	86	42.6	0.5	112	65.3	0.6	239.3	411.4	20	41	white
>2mm	83	3.8	0.05	19	1.0	0.05	2	0.1		1	0.1	0.1	272.5	277.5			
<2mm													c.85.0	85.0			
Totals	**329**	**92.9**	**0.3**	**123**	**24.1**	**0.2**	**114**	**79.4**	**0.7**	**157**	**159.1**	**1.0**	**622.1**	**977.6**			

Catalogue

Cremation burial 1702: young or middle-aged female?

Quantification: Total weight 977.6g: Skull 329 (92.9g), axial 123 (24.1g), upper limb 117 (79.4g), lower limb 157 (159.1g), unidentified (622.1g). Sample 3.7g femur selected for radiocarbon dating.

Description: Isolated cremation burial with stone-lined perimeter.

Condition: Good, but mostly heavily fragmented, some abrasion.

Determination of age: Size of bones, degenerative changes, cranial sutures unfused.

Determination of sex: Occipital and zygoma gracile, finger phalanges small, fragment of sciatic notch appears wide.

Identified elements: Cranial vault (occipital, 1 poss wormian), L zygoma, mandible frag, ribs, illium, acetabulum inferior frag, vert facets & ?body, hum, rad, ulna, 8 finger phals, hamate frag, R & L fem, tib, fib, MTs, toe phal frag.

Measurements: Max skull frag size 31mm.

Colours: White (a few incompletely calcined pieces of rib and proximal left femur).

Teeth: 49 tooth roots and frags (includes 5 molar, 3 lower incisor, 4 single-root), 3 crown frags.

Pathology: Osteophytes on one facet and one ?body of vertebrae, slight lipping linea aspera.

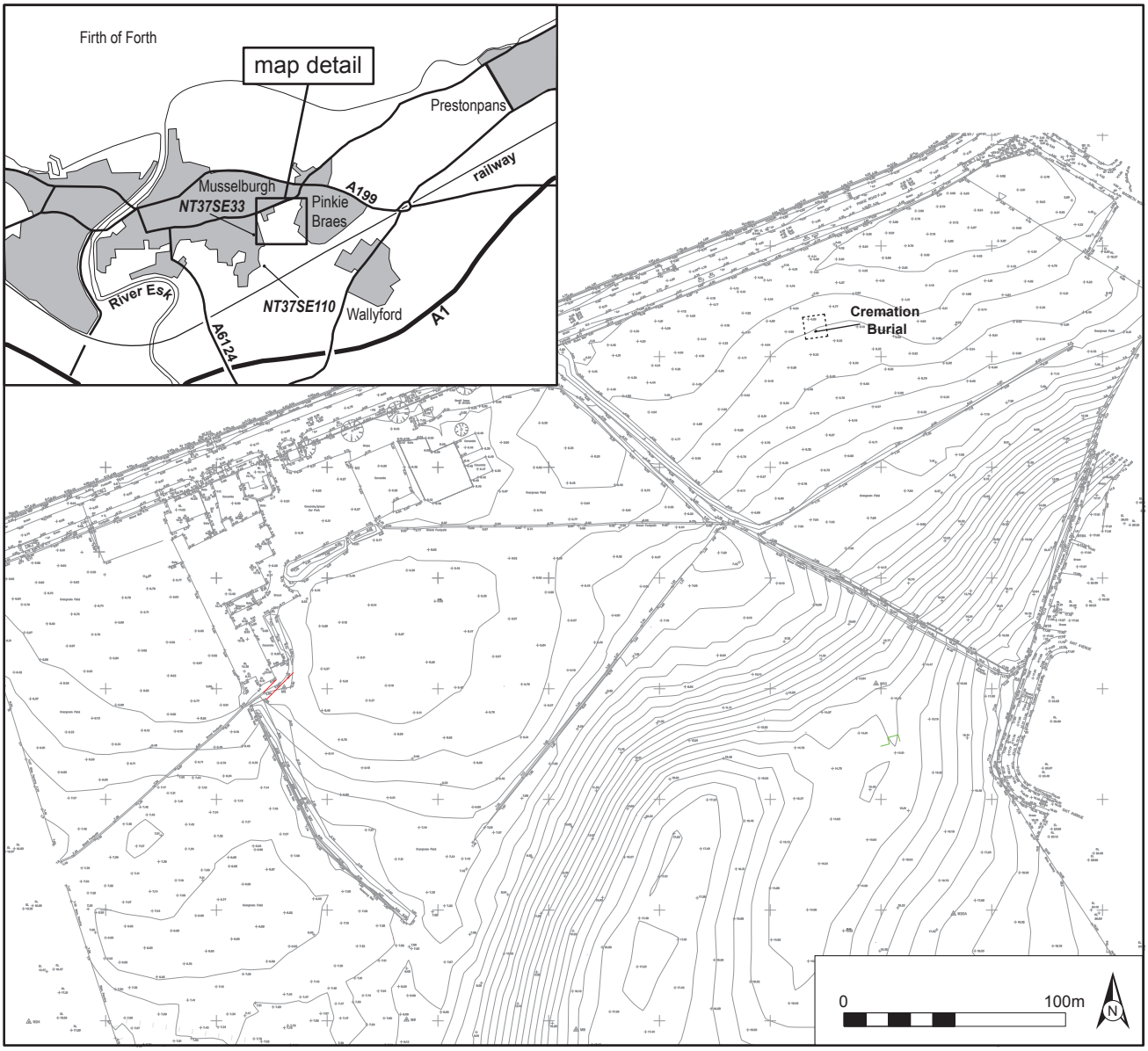

Fig. 1. Site location map

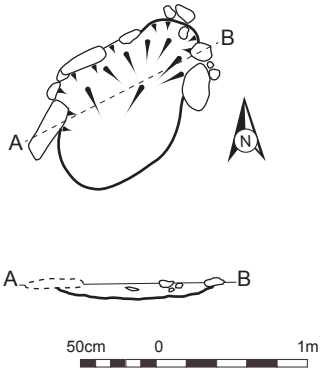

Fig. 2. Plan and section of feature 1701

Fig. 3. A view of the half-sectioned feature