CARTERTON, OXFORDSHIRE (CACE18): REPORT ON THE HUMAN REMAINS

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INTRODUCTION

This report details the results of a specialist analysis of one discrete cremation deposit (20002), found during archaeological investigations at Carterton, Oxfordshire.

Deposit 20002 was found in shallow sub-circular earth cut pit (20001: up to 0.05m deep). The shallow depth of the feature may be indicative of horizontal truncation by ploughing. The pit was located within the centre of a ring ditch (Group 20000). The pit was cut into natural 20011. The cremation burial was dated to the middle Bronze Age, 1427-1288 cal BC (95% probability)

METHODOLOGY

The context containing cremated bone was subject to whole earth recovery, then processed by flotation and wet sieving which sorted the material into >10mm, 10-4mm, 4-2mm and 2-0.5mm fractions. Floated residues were retained in a 250µ mesh. Once dried, the extraneous material (e.g. stones) from the >10mm and 10-4mm fractions was separated from the cremated bone and discarded. All cremated bone was examined in accordance with national guidelines (Brickley and McKinley, 2004; McKinley, 2004; McKinley, 2017).

A 20g sample of the 4-2mm sieve fraction was sorted. An estimation of the total bone weight was calculated for the entire fraction, based on the proportion of cremated bone present in the 20g sample. The estimated weights are included in the total weights presented below.

The smallest fraction sizes (2-0.5mm) were not sorted but were rapidly scanned for identifiable skeletal remains and artefacts. Estimations of the proportions of bone present within the 2-0.5mm fractions were made and recorded in the archive. These are presented below, but were not included in the total bone weights.

Analysis of the cremated bone deposit involved recording its colour, weight and maximum fragment size. These observations can provide information on factors such as the efficacy of cremation (effectiveness of cremation, i.e. how well burnt the body was), relative quantity of fuel used, attained temperature within the pyre, length of time over which the cremation took place, degree of bone oxidation, and how well collected the burnt remains were from the pyre site (McKinley, 2004: 10-11). The deposit was examined for the presence of pyre goods, but these were absent. The weight, and presence or absence of charcoal fuel waste was also considered in order to explore deposit type, i.e. whether the deposit represented a formal burial or pyre debris.

The cremated bone was examined for identifiable bone elements and the minimum number of individuals (MNI) was estimated. The MNI was determined based on the presence/absence of repeated skeletal elements and on the comparative size of bones (e.g. adult versus juvenile size: Buikstra and Ubelaker, 1994). Where possible, estimation of age and sex was attempted following published methods (Phenice, 1969; Buikstra and Ubelaker 1994; Scheuer and

Black 2000), although it was not possible to assign an age at death beyond adult (>18 years) for any of the remains. Fragments were examined for evidence of normal morphological variation (non-metric traits, after Berry and Berry, 1967; Finnegan, 1978) and pathological lesions (after Aufderheide and Rodríguez-Martín 1998; Ortner 2003).

RESULTS

A summary of the osteological findings is presented in Table 1.

Bone Weights

A summary of bone weights is presented in Table 2. The deposit weighed a total of 574.09g, which falls just below the weight range cited by McKinley (2013: 154) for archaeologically recovered cremations (600-900g). Furthermore, it has been demonstrated that some types of Bronze Age cremation deposits frequently include bone weights in excess of 900g (McKinley, 2013: 163). The extent to which deposit 20002 is truncated is unclear, so the quantity of bone that has been lost is unknown.

Fragmentation

A summary of fragmentation per deposit is presented in Table 3. The largest bone fragment measured 63.8mm (a fragment of radius shaft from sample 20001). The largest proportion of bone fragments came from the 10-4mm sieve fraction (42.5%), although a large proportion of bone also came from the >10mm fraction (37.0%). Moderate proportions of cremated bone were also present in the 2-0.5mm residue (Table 4), although the total bone weights could not be estimated.

Skeletal Representation

A summary of skeletal representation is presented in Table 2. Of the identified fragments, bone from the skull was the most frequently observed (141.2g; 24.60% of the total bone weight). A high proportion of skull fragments is a pattern often noted during cremation analysis, as the skull vault is more easily identified than other bones, even within the smaller fractions. Bone fragments from the axial skeleton and upper and lower limbs were also identified in smaller proportions.

The majority of bone was unidentified, e.g. from unidentified long bones (54.9g; 9.56%). Very small proportions of bone were from the hands and feet (1.3g; 0.23%), or joint surfaces (0.8g; 0.14%). However, most of the unidentified bone could not be assigned to a skeletal region (262.69g; 45.76%). Most of the unidentified bone was from the 4-2mm fraction. This is unsurprising: the 4-2mm fractions were of moderate size, so only a 20g sample of each of these was sorted and an estimated bone weight calculated based upon the proportion of bone found in the 20g sample (Table 5).

Efficiency of Cremation

Approximately 80% of observed bone fragments were white in colour (Table 1). This indicates a generally efficient cremation process with the majority of bones being burnt at a temperature in excess of 600ºc, and is a common observation in archaeological cremation burials (McKinley, 2006: 84). This indicates that the greater part of the corpse was placed in a location on the pyre where maximum and consistent heat and oxygen supply were available (McKinley, 2013: 158).

The remainder of the bone was coloured grey/blue and black. Interestingly, most of the charred, black fragments were observed to be from the femoral shaft. A mixture of white, black and grey fragments also belonged to the tibial shaft. Black colouration of the bone occurs at temperatures up to 300˚C (McKinley, 2004: 11). Cremation of the bone may be inhibited where the overlaying soft tissues are thicker: until these are removed, the bone is insulated from oxygen and the heat of the fire (McKinley, 1989: 65; McKinley, 2013: 158). This can lead to variation in the degree of bone oxidation across the skeleton (Ibid.). The pattern of charring observed in deposit 20002 may indicate that the soft tissues of the thigh and leg (e.g. the gluteal muscles) were slow to be removed either because of their thickness, because they were placed in a position on the pyre where oxygen flow and heat were inconsistent or limited, or because the corpse was placed in a position on the pyre that impeded heat and oxygen to these anatomical areas.

Demography

A minimum number of one individual was present, based upon the number of discrete deposits and the non-repetition of observable, identifiable, skeletal elements in each deposit (Buikstra and Ubelaker 1994).

Osteological indicators of age were very limited. The size and morphology of the identified bone fragments were in keeping with those of adults, aged over 18 years (Scheuer and Black, 2000).

Sexing methods must be employed with caution to burnt human bone. In unburnt adult skeletons, typical accuracy for sex assessment from morphological traits is 90-95% when using the pelvis, and 80% when using the skull (Krogman and Işcan, 1986). Therefore, sexual dimorphism in the cranium is more variable than in the pelvis, and sex determination more accurate when utilising multiple traits, preferably from the pelvic bones. When applying these observations to burnt material, there is the added complication of potential for bone shrinkage and warping as a result of dehydration, which may influence the size and morphology of sexually dimorphic traits.

One cranial trait (the orbital margin) was observable. The rounded shape of the orbital margin fragment was in keeping with that of a male individual. As this was the only trait available, and considering the above points, the estimation is very tentative.

Non-metric Traits and Pathology

No evidence of non-metric traits or pathological lesions were present.

Pyre Debris

A small quantity of charcoal was present in the 4-2mm sieve fraction from sample 20001. Moderate quantities of charcoal were also present in the floated residues (see Enviro report). This suggests that some attempt was made to exclude charcoal from the buried deposit, but complete deliberate exclusion of pyre debris was perhaps not deemed necessary.

SUMMARY AND DISCUSSION

The assemblage comprises the remains of a minimum number of one cremated individual, an adult possible male aged over 18 years.

The weight of the deposit was just under the lower end of the typical weight range for archaeologically recovered cremation burials (600-900g, McKinley, 2013: 154). Substantial quantities of larger fragments from the >10mm and 10-4mm sieve fractions were present. The moderate weight suggests that this deposit once represented most of a cremated individual, but there has been some degree of bone loss due to horizontal ploughing truncation. Lesser proportions of the smaller, unidentifiable bone fragments may also have been left at the pyre site. Evidence indicates that an attempt had been made to exclude pyre debris from the material selected for burial. This and any remaining unidentifiable human bone may have been left in situ at the pyre site, or redeposited elsewhere (Ibid: 153-4).

The majority of bone fragments were white, indicating a generally efficient cremation process (McKinley, 2004: 11). The small proportion of grey/blue and black fragments may pertain to anatomical regions of the body that were placed more peripherally on the cremation pyre, where temperature fluctuation is greatest and full oxidation of the bone not always possible (McKinley, 2013: 158). It was noted that many of the black and grey bone fragments derived from the femoral or tibial shaft. This may occur where anatomical regions have thicker layers of muscle and fat, where the cremation process was slow to burn away the soft tissues and it was not possible to fully oxidise the bone (McKinley, 1989: 65). Additionally, oxidation of the bones of the thigh and leg may have been hindered by the position of the corpse on the pyre.

Evidence from cremated bone deposit 20002 suggests this is a primary cremation burial rather than other types of deposit, such as pyre debris or cenotaph burial.

Cremation rather than inhumation appears to have been the dominant funerary practice in Britain from the beginning of the second millennium B. C (Roberts, 2013: 535). A recent study collating comprehensive osteological and funerary data from 3133 Middle Bronze Age cremation burials from the British Isles found that cremation practice during this period most commonly involved burial of the remains of a single individual, as observed as Carterton (Caswell and Roberts, 2018: 333). Cremation burials were most frequently found in the south of England (compared to the north of England, Scotland and Wales: Ibid.: 334). The majority (52%) of observed burials were interred in barrows (Ibid.: 334). Additionally, just under a third (27%) of burials were unurned (Ibid.: 337). Based upon this data, the Carterton burial may be viewed as broadly typical for the Middle Bronze Age in southern Britain.

Sufficient data has been obtained from the cremated bone deposit from Carterton, allowing where possible observations to be made regarding pyre technology, funerary rite, demography, non-metrics and palaeopathology. No further osteological analysis of these fragments is recommended. If further burials are recovered from this site in the future, the cremation deposits described here should be considered as part of the wider burial landscape, with a review of similar burials in type and date within the region.

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Carterton East (CACE18) Tables

Table 1: Osteological summary

Cut	*Deposit*	*Total weight*	*Colour*	*MNI*	*Age*	*Sex*	*Non-metrics/ pathology/ other comments*
20001	**20002**	574.09g*	White 80%, grey 5%, blue 5%, black 10%	1	Adult >18 years	M??	-

Key: M?? = possible male. * denotes inclusion of estimated bone weights

Table 2: Cremation burial 20002 - summary of bone weights

	Skeletal Element (g)								
Sample	***Skull***	***Axial***	***Upper Limb***	***Lower Limb***	***Unid. Long Bone***	***Unid. Hand/ Foot***	***Unid. Joint Surface***	***Unid. Other***	***TOTAL***
20000	38.7	12.1	2.7	41.0	33.7	0.7	0.1	91.3*	**220.3g* (38.37%)**
20001	102.5	10.6	13.4	33.4	21.2	0.6	0.7	171.39*	**353.79g* (61.63%)**
TOTAL	141.2g **(24.60%)**	22.7g **(3.95%)**	16.1g **(2.80%)**	74.4g **(12.96%)**	54.9g **(9.56%)**	1.3g **(0.23%)**	0.8g **(0.14%)**	262.69g* **(45.76%)**	**574.09g* (100%)**

Note: Where indicated with *, weights include estimated weights from the 4-2mm fractions.

Table 3: Summary of fragmentation

Cremation	*Total weight*	*>10mm*	*10-4mm*	*4-2mm*	*Max. frag. size*
20002	574.09g*	212.4g	244.0g	117.69g*	63.8mm, radius shaft

Note: Where indicated with *, includes estimated weights from the 4-2mm fractions

Table 4: 2-0.5mm fraction proportional bone content

Sample	*Total 2-0.5mm fraction weight*	*% cremated bone (based on visual assessment)*
20000	111.9g	75%
20001	273.9g	40%

Table 5: 4-2mm fraction summary

Cremation	***Sample***	***Material***	***Total 4-2mm fraction weight***	***Weight from Sorted 20g Sample***	***Proportional Bone Content of 20g Sample***	***Estimated Bone Weight for Total 4-2mm Fraction***
20002	20000	Cremated bone	94.0g	10.0g	50.0%	47.0g
	20001	Cremated bone	207.9g	6.8g	34.0%	70.69g
		Charcoal		0.1g	0.5%	1.04g