ELMS FARM PROJECT (HYEF 93/94)

HISTORIC-PERIOD CREMATIONS AND OTHER BONE SAMPLES

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Forty-two samples were examined, having been identified at assessment stage as requiring further examination, being additional parts of these or having missed assessment, for example by having been found with animal bones. Methods used are those of Cho *et al*. (1996) and Ubelaker (1989) for general bone analysis and of McKinley (1989) and Mays (1998: Chapter 11) for cremations. The table below (Fig. 1) summarises the findings for all the material examined of the historic period, arranged according to the Group Sheets; McKinley's 'ideal' cremation percentages are added below the cremation section for easy comparison.

Cremations

A cremation recording form is attached as Figure 2.

All contexts except the smallest six (which were examined because of their potential association with larger samples) were sieved through 4 mm and 2 mm sieves. The larger fraction, retained in the 4 mm sieve, was fully sorted into bone elements for the different areas of the body — skull, axial skeleton, limbs/extremities — and each area weighed, as well as the unidentifiable fragments. Identifiable fragments were sorted further, for example into skull areas or particular long bones, and recorded, although the identification of long-bone shaft fragments and lumps of cancellous bone was problematical in most cases, as has been noted by other authors. The smaller fraction retained in the 2 mm sieve was weighed and scanned for any diagnostic fragments. Representation of body areas was calculated both as percentages of the total weight of bone and of weight of identifiable bone, as shown on the recording form. It is the latter which is presented as percentages in the table, because in most cases the unidentifiable bone did not represent a large proportion of the sample and because, given an equal amount of damage to all parts of the sample, all skeletal areas are equally likely to be identified rather than being lost in 'unidentifiable' (the exceptions are discussed in detail below).

Total weights are lower than given in any ECCFAU documentation because each sample has had loosely-adherent soil and pea grit removed and the smallest fraction, of mixed bone dust and fine soil particles, sieved out.

The largest fragments were measured, to contribute, with the proportions of larger to smaller fractions, to an estimate of fragment size. The note 'very large fragments' indicates a sample containing at least three fragments of maximum dimension of 8 cm or greater; the note 'large fragments' is only used in the D14 group to distinguish these two samples, which were also unusually concreted, from the remaining sample of contrasting character.

Note was made of the colour of the fragments and whether differences in colour were concentrated on particular bones or skeletal areas, as this is informative as to pyre technology: temperature attained and/or duration of burning and differential burning of body areas. Following Mays (1998: 216–20; Table 11.1 and references), a range of colours is taken as indicative of degree of removal of organic matter, and hence efficiency of burning: red/orange, brown, black, grey (in my experience,

this is usually blue-grey, as observed, for example, by Shipman *et al*. {1984}) and white. No Elms Farm cremated material was red/orange, which would be categorised as 'very poor' burning; 'poor' indicates brown fragments present, 'fair' indicates black, 'good' indicates blue-grey present and 'excellent' indicates only white fragments, although sometimes a brownish colour has been produced on white fragments by soil staining. Both Mays and Shipman *et al*. (in Mays 1998: Table 11.1) have found that the minimum temperature required to produce white colouration is 645°C, although higher temperatures can be obtained easily in experimental wood fires. It is essential, however, that the pyre be maintained for long enough to achieve complete combustion, and/or a pyre temperature of over 900°C is reached to start the body fats burning. In Elms Farm samples where there were two or more colours on bones, the colour indicating poorer burning was within the shafts of the more substantial long bones, around the pelvis (where thick muscle tissue would have protected the bone) and on parts of the skull vault and some of the bones of the extremities (which, being areas of little fat, would have not participated in the fierce burning that body fat produces when ignited).

Sexing and ageing was attempted, but it will be seen below that few individuals could be sexed with confidence, no adults aged more precisely than 'younger' or 'older' adult and even the estimates of the ages of immatures are very tentative. There were no unequivocal pathological changes except osteophytic lipping of vertebrae, and those specimens with such lipping are suggested as being over 35 years of age, that is 'older' adult in this report.

All samples which the archaeological context suggests are potentially related, that is, they might contain fragments from the same individual, have been examined for bone refits. Even where refits could be made within samples, none could be made between samples. This does not mean that these samples are unrelated, of course, as small sample size, natural fragmentation, disturbance/truncation and erosion all detract from the potential for refitting.

Group D14 – ER cremations
Two of the cremations, (9229) and (9669), resemble each other in condition, having large fragments and being concreted together with soil, small stones and, apparently, some flecks of charcoal. The fragments are commingled from all areas of the skeleton, showing that the contents of these urns were not arranged by body part (as is sometimes found). The remaining one, (9216), consists of medium-sized fragments and is not concreted. As all three were urned and (9229) and (9216) were from cuts in the top of the same pit [9391], their contrasting condition is surprising and perhaps needs considering more closely.

Group E5 – LIA cremation
The single context in this group is exceptional for Elms Farm in being both excellently burnt (completely white, even within the long bones) and having very large fragments. Fragmentation of bone can be produced: during burning if the pyre is well tended, as periodic turning over and stirring of the pyre and its contents helps to expose all areas of the body to fire and oxygen, promoting complete combustion; at the collection stage if the bone is collected before it is cool, because hot bone is dry and brittle; at deposition stage if deliberate breakage is practiced; at any stage after deposition due to taphonomic factors, although these would need to be severe as cremated bone tends to be robust. In this case, the degree of burning suggests very good pyre technology but possibly without 'stirring', which would have increased breakage.

Group M40 – ER crems

These two cremations are of interest because of the inadequacy of their burning, one (15014) including dark grey areas and the other (15015) including black and brown areas and therefore being the only reasonably-sized sample from Elms Farm to be 'poor' in terms of burning. Cremation (15014) has an MNI of two individuals, based on the presence of three petrous bones, although there are no other duplications and the remains of the additional individual might have been picked up from a re-used pyre site; that being said, petrous bones are highly distinctive and are less likely to have been left behind on the pyre site than other fragments.

Group R5 – ER/MR cremations

This group contains four cremations of inconsistent degree of burning and fragment size. Each has good quantities of bone, (12197) being a child and therefore to be expected to be of proportionately lighter weight than the adults. Cremation (12002) has the highest weight of an Elms Farm cremation, equivalent to a complete female using Trotter and Hixon's calculation (Mays 1998: Table 11.2), but has an MNI of two, as indicated by the duplication of two bones, the presence of thick and thin vault fragments and of larger- and smaller-sized bones. The largest fragments at the site are also in cremation (12002).

Group W14 (LIA pyre-related features + 1 ER crem)

The group consists of two 'real' cremations, (502) and (528) and two other samples apparently associated with (502). As stated above, no refits could be made between any Elms Farm samples, and this is hardly surprising in this group, as the two small samples are only a gram or two in weight.

Of interest in the two larger samples is the disproportion of fragment weights from the different areas of the skeleton: the skull and axial skeleton form much lower percentages of the total than in an 'ideal' cremation. Several explanations can be offered: that the skull and axial skeleton have been differentially removed by selection at the deposition stage (including the possibility that it has been 'over-collection' of the fragments from the limbs that has pushed down the percentages of the other areas); that a deposit which had been layered with skull and axial bones at the top has been truncated; that the sample has been so damaged that certain areas appear in the 'unidentifiable' or 'small fraction' categories. The latter can, to some extent, be quantified by considering the percentages of these two categories, and in these two samples neither make up a large proportion of the whole, suggesting that little has been lost through damage. Further, although much of the axial skeleton is fragile (e.g. sternum, ribs, parts of sacrum) or hard to identify (e.g. cancellous bone in innominates and vertebrae), the skull vault preserves well and is identifiable even when minutely fragmented. The question of selection at the deposition stage can not be approached through the material, but truncation has been noted for (502) and (528) and does not seem an unreasonable explanation for the disproportions.

Group W20 – Early Roman cremations

The group contains three samples of reasonable size, (41), (565) and (556), and two very small, (555) and (580). All show good pyre technology in their white colour, but they are not consistent in their proportions, (565) and (556) being low on material from the axial skeleton. The former was plough damaged and the loss of the more-fragile axial skeleton could be accounted for in this way. The very high percentage of unidentified and small-fraction bone (over 60%) in the latter shows that

severe crushing has taken place at some time, and as it is not thought to have been plough damaged we can suggest that the crushing took place during pyre tending or at deposition.

Group W67 (pyre sites, 1 pyre-related feature + 1 LIA crem)
These nine samples come from five features aligned along the ditch W59, and six more features aligned along the ditch contained cremated bone samples of very low weight which were examined at assessment stage. The question arises as to whether these are all independent cremations or represent a small number of individuals whose cremated remains were divided up over several small deposits — perhaps just one individual distributed in handfuls and pinches along the boundary. As stated above, no between-sample refits have been identified in the Elms Farm assemblage, so no connections can be made between even the W67 cremations which come from the same features. However, the nine samples can be shown to represent at least three individuals, two adult (two matched mandibular condyles and one additional) and one adolescent.

The material of (2417) is abraded, unlike that of (2483) from the same feature. The latter was urned while the former was recovered from outside the vessels and has presumably suffered from its exposure to the soil. Despite there being no refits, there are no duplications between these two samples and it is not impossible that they represent the same individual, an adult male. On the other hand, the abrasion might indicate that (2417) had been deposited elsewhere before it was added to the pit belonging to (2483) — perhaps a portion of an ancestor or family member?

There are some, largely inexplicable, disproportions of body parts in this group, for which no cause in plough-damage or truncation can be identified. The low percentage of skull in (2483), which, as has been discussed above for Group W14, is unlikely to be due to damage or deliberate selection, might be compensated for by the skull fragments which largely compose (2417), if these two samples indeed represent one individual.

The axial skeleton is absent or at a particularly low percentage in six samples, two of which also have low percentage of skull bone. From feature [2195], cremation (2193) has no axial fragments, but as the unidentified and small fractions total 59% of the whole, perhaps the axial material is mainly here; the same suggestion applies to its associated sample (2229) which has 58% unidentified/small fraction. Cremations (2199), (2454), (2488) and (2487), all with low axial skeleton, have 70%, 56%, 53% and 39% unidentified/small fraction respectively; the last is, however, an unconvincing figure to explain the sample's disproportion because it approaches that of 'normal' cremations from this and other sites. In all these cases, damage is only one possible suggestion, and deliberate selection of certain bones at the deposition stage is equally likely, with the 'skull and crossbones' being favoured to stand for the whole skeleton.

Unburnt bone/animal bone
Two samples from group W5 are entirely animal bone.

Of the unburnt human-bone samples, four are collections of adult bones and come from Group E11, and one is the relatively-complete female skeleton of E24; all have been reported at assessment stage, but the additional bones of (8141) confirm the first findings that this is a mature or older adult male. The remaining seven samples contain one or more bones of foetuses/neonates, aged by the methods of Stewart (1979) and Ubelaker (1989: Table 14). They are all close in age, one late foetal to neonate, three clearly neonate, two in the range from neonate to 6 months of age, and one unmeasurable but probably of similar age range to the previous two. Following Mays, we can suggest that these deaths might be due to stillbirth, live births dying around the first week post-

partum or victims of infanticide, as is found not uncommonly in Romano-British contexts (Mays 1993). We do not have sufficient numbers to plot the pattern of these burials — if individual burials they be — to distinguish between the potential causes, but while stillbirth predilects earlier gestational ages, either of the other explanations would explain the presence of babies of this age range.

References

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Figure 1: cremations and other bone samples

group	*feature*	*context*	*sample*	*period*	*weight*	*burning*	*% sk*	*% ax*	*% li*	*condition*	*sex/age*
D14	9927	9229	362	IIIC	1057	good	15.8	15.4	68.8	lge frags, concreted lumps	adult ?older
	9928	9216	360	IIIC	614	good	21.3	18.2	60.5	med frags, no lumps	adult
	9665	9669	362	IIIC	810	good	21.7	24.7	53.6	lge frags, concreted lumps	?imm
E5	8177	8169	1825	II	1117	excellent	17.7	19.5	62.8	very large frags	adult ?M
M40	15017	15015	439	III	713	poor	11.7	11.3	77.0		adult
	15040	15014	440	III	572	fair	25.5	12.9	61.6		MNI 2: A) <16 y; B) ?adult
R5	12003	12002	2400	IIIC	*1600	fair	17.3	24.4	58.3	very large frags	MNI 2: A) imm; B) adult
	12006	12005	2402	IIIC	*1107	excellent	13.8	35.7	50.7		adult ?younger
	12203	12197	2418	IIIC	239	good	28.6	15.4	56.0		imm >6y
	12219	12214	2424	IIIC	868	good	29.4	15.6	55.0	very large frags	adult ?F
W14	510	502	38	II-III	158	excellent	9.9	2.2	87.9	sk and ax low	adult ?F
	"	501		"	1	good	N/A	N/A	N/A		N/D
	"	509		"	1	good	N/A	N/A	N/A		N/D
	559	528	54	II-III	125	good	7.7	6.2	86.1	sk and ax low	?adult
W20	43	41	278	III	330	excellent	18.0	19.1	62.9		adult ??F
	554	565	73	III	473	excellent	27.7	4.6	67.7	ax low	adult M
	"	555		"	18	excellent	N/A	N/A	N/A		N/D
	557	556	72	III	141	excellent	14.3	1.8	83.9	ax low	adolescent/adult
	"	580		"	4	excellent	N/A	N/A	N/A		N/D
W67	2195	2193		"	68	good	10.7	0.0	89.3	ax absent	?adult
	"	2229	106	II	239	excellent	57.4	7.9	34.7	ax low, sk high	N/D
	2201	2199	123	II	583	good	14.3	10.9	74.8	ax low, sk high	?adult
	"	2200		"	10	good	N/A	N/A	N/A		N/D
	2379	2483	287	II	386	excellent	4.0	25.0	71.0	sk low	adult ?M ?older
	"	2417		"	44	good	N/A	N/A	N/A	abraded, contra. 2483	adult ??M
	2455	2454	153	II	421	good	6.5	1.6	91.9	abraded; sk and ax low	adolescent/ adult F
	2490	2487	155	II	181	excellent	11.7	3.6	84.7	ax low	adolescent/adult
	"	2488	156	II	264	excellent	7.1	4.8	88.1	sk and ax low	adolescent

18.2	23.1	58.7	McKinley's 'normal' cremation proportions

* = small fraction removed by ECCFAU

group	*feature*	*context*	*sample*	*period*	*weight*	*burning*	*% sk*	*% ax*	*% li*	*condition*	*sex/age*
N/K	N/K	4925				unburnt				one bone	neonate–6 m
N/K	N/K	4993				unburnt				several bones	if one indiv., late foetal–neonate
E11	8142	8141	1818	V		unburnt				skull, thorax and arm bones	M 31–71 y
	8155	8153	76	V		unburnt				several bones, mixed with animal	adult
	"	8162		V		unburnt				arm, pelvis and leg bones	?M ?>35 y
E24	10776	10683 10758	1549 1550 1551	IV		unburnt				skeleton; no evidence of peri/m trauma	F 17–25
I31	13167	13171		IIC		unburnt				skull, upper limb, pelvis and femur	neonate
N/K	N/K	13568				unburnt				one bone	neonate
N/K	N/K	15272				unburnt				one bone	neonate
N/K	N/K	15280				unburnt				one bone	>neonate
N/K	N/K	17037				unburnt				two bones	infant

W5	84	?	292	Saxon		unburnt				animal	
	9750	9749	427			unburnt				animal	

Figure 2: Cremation record form

CREMATION RECORD FORM

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Skeleton	( ) [ ]

Context

Laboratory excavation	
Photographs	

Bone condition

Colour	
Largest fragment(s)	

Fragmentation	weight of LF	total weight	% of LF

Weights of fractions:

	weight	*% of whole*	*% of identified bone*
skull			
axial skeleton			
limbs			
all identified bone			100.0
unidentified	SF + =		
TOTAL		100.0	

Identifiable fragments:

skull	vault ☐ face ☐ base ☐ mandible ☐
teeth	
axial skeleton/ shoulder girdle/ pelvic girdle	C ☐ T ☐ L ☐ S ☐ scapula ☐ clavicle ☐ rib ☐ innominates ☐
limbs	humerus ☐ ulna ☐ radius ☐ femur ☐ tibia ☐ fibula ☐
extremities	hand ☐☐☐☐ foot ☐

MNI

Number:	*from which bones?*

Ageing and sexing

Sex estimate:	*skull*	*pelvis*	*other*

Age estimate:	*dentition*	*epiphyses*	*symphysis*
	attrition	*sutures*	*other*

Pathological conditions:

bone	*location*	*form of lesion*

Artefacts/associated remains and other comments

thought to be associated with context:

animal bones:

pyre/grave goods:

other: