

Animal bones and funerary rites

1. Introduction

The animal bones from the following eleven cemetery sites are included in this report (ordered by plot number):-

9 St Clare Street, EC3 (SCS83)
49-59 Mansell Street, E1 (MSL87)
28-29 West Tenter Street, E1 (WTE90)
31-43 Mansell Street, E1 (MST87)
The Three Lords, 27 Minories, EC3 (TTL85)
Hooper Street, E1 (HOO88)
13 Haydon Street, EC3 (HAY86)
65-73 Mansell Street, E1 (MNL87 and 88)
East Tenter Street, E1 (ETN88)
West Tenter Street, E1 (WTN84)
63-66 Prescott Street, E1 (PRE89)

All the bones from these sites, with one exception, was recorded on ORACLE using a database designed by and for the Environmental Section of the Museum of London Archaeology Services. The exception is the assemblage from WTN84, the information for which was taken from Waldron (1986). The identification of the majority of the Hooper Street bones was achieved by Alan Pipe, who also produced an archive report (Pipe. 1992). The fish bones were identified by Alison Lockyer. In addition the contents of a pit from SCS83, which proved to be extremely rich in small mammal, bird and amphibian remains, was recorded by Hibberd (1991). All this data has been amalgamated into the present report.

Recovery of the bones was essentially by hand. However this method was augmented by a bulk sampling procedure, concentrating on the cremation deposits. All deposits with a concentration of burnt bones were sampled.

The description of the animal bones is divided into two main sections, essentially dealing with those bones found in direct association with human remains (graves and cremations), and those found within the various secondary or peripheral cemetery deposits.

2. Animal bones with burials

2.1. Inhumations

2.1.1. Interpretation

The interpretation of a group of animal bones or indeed a single bone as gravegoods depends on the proximity of these bones or bone to the human remains and/or, if more than one bone, the likelihood that they represent the remains of one individual. Another criterion used here is based on the assumption that single bones from species occurring as articulations may also represent gravegoods if found in close proximity to human remains. Obviously either the second criterion or a combination of the first and second will allow for a safer interpretation compared to either the first or third criterion.

The true or possible gravegoods are taken from three sources, as follows:- 1) those found in situ (all in close proximity to the human skeleton), 2) animal bones lifted erroneously as human remains ('sk') and 3) the gravefills. Those included in type 1) are listed in table 1a. Now it can be seen that a proportion of these comprise semi or full articulations. Each of these can be safely interpreted as gravegoods, as can three other articulations, one initially interpreted as 'sk' from B447, and two recovered from gravefills (B709 and B479). Additional gravegoods are listed in table 1b. At this point it should be noted that the

actual location of the later two articulations is unknown, and they could conceivably represent offerings made during rather than prior to the filling of these graves.

Using the first and third interpretive criteria i.e. proximity and similar species, the 'sk' bones from B383, B350, B589 and B456 were added to the 'possible' gravegood list (table 1b). With respect to the other pig bones designated as 'sk' (see table 2b) all were found to be dog chewed. Allowing dogs to chew a potential offering is perhaps unlikely and so these bones were not included on this list.

All the remaining 'close proximity' bones are excluded as true or possible gravegoods on the grounds that they are more likely to represent redeposited than in situ material. Comparisons were made between the species representation of the 'gravegood' collection (as defined above and see table 1), those bones designated as 'sk' and those found in the gravefills (see tables 2b and 2a respectively). The 'sk' assemblage, following the removal of the possible gravegood bones, is clearly very similar to the general gravefill assemblage, and both show little to no similarities with the gravegood assemblage. Redeposition and the possible source/sources of the gravefill animal bones are described and discussed in the section (3.1) on secondary deposits.

The in situ bones which should be removed from the gravegood list (table 1a) are those found in graves B300, B383, B400 and B478. A tentative inclusion is the pig represented by a single tooth in B283. Obviously single bones can be more easily interpreted as redeposited, however, this bone may represent the only part remaining from a larger offering. The same argument could be used to explain the other single bone gravegoods included (see table 1b). This brings the total number of true and possible gravegoods to 19. Out of this total, graves with single species include 14 with chicken and two each with pig and goose, while a single grave produced multiple species, comprising chicken, goose and pig. The former total includes one possible (B819 in table 1a) where the bones have been lost and identification must rely on the excavators notes. These refer to an 'articulated bird', which is assumed here, on the basis of overriding evidence, to be chicken rather than any other bird species.

2.1.2. Distribution

The 19 graves with gravegoods were located in plots 2 (9 graves), 17 (2 graves), 22 (4 graves) and 12, 15, 18 and 28 (with 1 grave each). These correspond to less than 4% of the graves in plots 2, 17 and 28 and 20-25% of the graves in the remaining plots. The larger percentages are from plots with relatively few graves. Overall just 3% of the graves produced animal gravegoods.

The condition of the human remains (see human bone section) are, in general, moderate to poor (149 in good condition out of 551) and that a large proportion have suffered either gross fragmentation or truncation (126 skeletons are >80% complete, and 66 of these are in good condition). These factors will undoubtedly have affected the representation of animal gravegoods. However it should be noted that just 5 out of the 19 human bodies with gravegoods were >80% complete and that one grave (B696) produced no human remains at all, presumably deteriorating in situ while the remains of the coffin and the chicken gravegood survived.

Table 1. Animal gravegoods in inhumation deposits

a) separated in situ

Plot/Burial	Sex	Age	Species	Num	Description	Int.
2/B300	F	5	Horse	1	Tooth	?N
/B346	?M	5	Chicken	2	L/R tibia	?Y
/B383	?	7	Horse	1	Tooth	?N
/B400	?F	5	Horse	1	Femur	?N
/B504	?	1	Chicken	44	Skeleton	Y
/B478	?M	5	Cattle	1	Tooth	?N
/B283	M	4	Pig	1	Tooth	?Y
			Cattle	1	Tooth	
12/B171	?	1	Chicken	13	Skeleton	Y
15/B605	?	8	Pig	18	Skeleton	Y
			Chicken	3	R leg	
			Goose	42	Skeleton	
17/B106			Chicken	?	Skeleton	Y
/B118			Chicken	?	Skeleton	Y
18/B819	?F	5	?Chicken	?	?Skeleton	Y
22/B677	?	8	Chicken	31	Skeleton	Y
/B686	M	5	Chicken	34	Skeleton	Y
/B696*			Chicken	16	Skeleton	Y
/B704	?M	4	Chicken	2	bones in a pot	Y

b) possible gravegoods

Plot/Burial	Sex	Age	Species	Num	Description	Int.
2/B383	?	7	Chicken	1	Tibia	?Y
/B447*			Pig	3	L foreleg	Y
/B479	F	4	Chicken	3	2 indiv.	?Y
/B350	?	7	Goose size	1	Longbone	?Y
/B589	?F	4	Chicken	1	Tmetatarsus	?Y
/B456	M	5	Goose	1	mandible	?Y
28/B709	?M	4	Chicken		Part skeleton	Y

Information on human remains:- Sex - F female, M male; Age - for codes used see section...

The gravegoods:- Num number of bones comprising the gravegood

The animal/bird bones:- Indiv. individual, L left and R right.

Int. Interpretation, where Y and ?Y equal definite and possible gravegoods respectively, and ?N are unlikely to represent gravegoods.

* burial with few or no human remains

Table 2. Species frequency and representation in gravefills.
Excluding gravegoods.

a) All animal bones

Species	Frequency	Number of fragments
Cattle	76	140
Cattle size	98	251
Sheep/Goat	31	44
Pig	35	43
Sheep size	54	202
Horse	35	75
Red deer	1	1
Dog	8	9
Small mammal	3	3
Chicken	15	18
Goose	4	4
Mallard	2	2
Chicken size	4	6
Goose size	1	1
Eel	2	2
Ind. fish	3	3

Total number of graves with animal bones (not counting those with gravegoods only) = 188.

b) Animal bones found adjacent to human remains (type='sk')

	Frequency	Number of fragments
Cattle	4	4
Cattle size	13	37
Sheep/Goat	2	2
Pig	4	7
Sheep size	3	3
Horse	2	4
Dog	1	1
Small mammal	1	1
Chicken	2	2
Goose	1	1
Goose size	1	1

Graves where animal bones separated with human bones i.e. type 'sk' = 25

Frequency - number of graves with this species
Number of fragments - total number of fragments
Gravegoods - bones listed in table 1

2.1.3. General description

The species represented as gravegoods, as mentioned above, were pig, chicken and goose. Partial and/or complete skeletons are represented by all three species (see table 1). The state of articulation of the in situ skeletons (i.e. those described in table 1a) is recorded for all but two of the gravegoods (B686 and B696). Those articulated when found include the chicken remains from B504, B171, B106 and B118. All the remaining skeletons and partial skeletons were clearly disarticulated. In two graves the disarticulated remains had been arranged into multiple groups, these being B605 and B667. In the former grave the various skeletal parts of a foetal/neonatal pig had been arranged into two groups, one containing the anterior half of the skeleton and the other the posterior half. A relatively complete gosse carcass had been placed with the former group and the right leg of a chicken with the latter group. B667 contained the skeletal parts of a single chicken divided into three small groups. No field notes were retained regarding the skeletal representation in each group, and they were not retained separately when lifted.

One problem which should be discussed is whether those gravegoods which are less than complete represent the entirety or the remains of that gravegood. It is noticeable in the relatively complete bird skeletons that head parts and phalanges are poorly represented. Conceivably, both parts may be absent if these skeletons represent the remains of dressed birds. However as a number of these birds do have phalanges (4 cases) or, at the least, lower limb parts (5 cases), this would seem to be unlikely. A more appropriate explanation for the absence of these parts is a combination of selective fragmentation and recovery i.e. in the absence of sieving. This explanation can also account for the lack of parts in the B709 skeleton, these having been separated from the bones removed from a hand recovered gravefill.

Alternatively it would appear that deliberate partial remains are represented. Certainly the above explanation cannot be used to explain the absences from the chicken right leg found in B605, the two bones (an ulna and a femur, probably from the same skeleton) found inside a pot in B704 and the tibiotarsus pair from B346. Two other partial skeletons should be considered i.e. the goose remains from B605 (dressed carcass remains only) and the pig left foreleg bones (humerus, radius and ulna) from B447 (separated from a gravefill). It is assumed that goose bones would be more likely to survive (greater robustness) and be recovered (greater size) relative to chicken, while the separation of three pig bones, all from the same limb, would seem to represent something more than just fortuitous recovery.

The obvious interpretation of the complete or partial articulated animal/bird remains is that they represent a meat offering (on the bone), while the disarticulated remains may represent the remains of a meal/feast, possibly taking place at the graveside.

Regarding the age and sex of the gravegood species, it was found that pig is represented by one foetal/neonate individual (as described above) and one which is immature (a fused distal humerus with an unfused distal radius); the goosebones are from a mature bird (this interpretation based on the presence of fused longbones); and the majority of the chickens (with the exception of those in B106, B118, B346 and B686) were mature. None of the pigs could be sexed and unfortunately three out of the five chicken skeletons with tarsometatarsii were juvenile i.e. representing birds which are too young to have produced a spur. The remaining two were spurless and were therefore probably female. In addition an unspurred tarsometatarsus is one of the three bones in the possible gravegood from B479.

2.1.4. Associations

Two main sets of data are looked at i.e. position of gravegoods relative to the human remains and the sex/age of the gravegoods in relation to the sex/age of the associated humans. The quantity of graves with gravegoods is not sufficient to allow a spatial element to this analysis. Regarding the first topic and referring to the 12 in situ gravegoods, animal bones were placed near the head/shoulder (3, all chicken), adjacent to the left humerus (chicken), adjacent to the left femur (chicken) and to one side or between the feet (5 and 1 respectively, including the remaining chicken and the goose and pig). No record was kept concerning the location of the pig tooth from B283. A case could be made for the preferential use of the feet area (6 out of 11) and the left side of the body i.e. 1 at the shoulder, one each at the arm and upper leg and two at the feet (5 out of 11). The possible gravegoods found in B383, B447 and B350 were associated with human skeletons represented by feet only which must describe the

general position of the chicken, pig and goose remains respectively. Two of the in situ gravegoods were found below the body (left shoulder - B819 and left femur - B346) which suggests either the movement of the human bones as the body settled or the deliberate placing of gravegoods under the corpse and/or the coffin. The remains of coffins were found in 7 of the gravegood graves (chickens plus the chicken, goose and pig in B605). In 6 cases (including B605) the bones were placed outside the coffin, in one case inside a pottery vessel (B704). Two graves produced gravegoods which were clearly divided into two or more groups. The fore and hind portions of the pig found in B606 (as described in the last section) had been separated, the former bone group including the complete goose skeleton while the latter group had the chicken leg. Both groups were placed outside the coffin on the left side of the lower left leg (the chicken group being closer to the left foot). The other multi group example is B677, where three concentrations of chicken bones were found below the left foot (and see last section).

No obvious links regarding sex or age or a combination of the two could be seen between the gravegoods and the human remains. However, relatively more gravegoods were found in male or possibly male graves and those graves representing individuals of at least young adult in age (codes 4 to 7) dominate the animal gravegood assemblage (see tables 1a and 1b). These results follow the general trends for the human assemblage as a whole.

Another example of the gravegoods following a general trend is the ratio of gravegoods found in 'chalk' and other burials i.e. 2 and 17 respectively. The former graves include B605 and B819.

2.2. Cremations

2.2.1. Interpretation

As mentioned in the introduction, all the bones from the cremation deposits were recovered by sieving. The samples taken would, in general, be limited either by the pot, if urned, or the spread of the burnt bones, if unurned. Clearly there is some possibility, especially in the latter deposits, of the inclusion of bones in these samples which had not been deliberately buried with the human remains. Both burnt and unburnt bones were found in each cremation type i.e. urned and unurned (see table 3). It can perhaps be safely assumed that most of the burnt animal bones found in either type of cremation were directly associated with the human remains. The interpretation of the source of the unburnt bones is a little more problematic. However, a large proportion of these bones were recovered from urned cremations. In addition, following the argument propounded for the interpretation of the inhumation gravegoods, many of the unburnt species are represented amongst the burnt assemblage (table 4). Interpretation can rely, to a limited extent, on a comparison with the assemblages from associated or adjacent features, in an attempt to determine the likelihood of redeposition based on a comparison of the cremation and background bone assemblages. Unfortunately this method cannot be accurately applied due to the smaller proportion of samples taken amongst the latter features compared to the cremations (see Section 3.2 Other deposits).

Table 3. Number of cremations with burnt and unburnt animal bones

	Urned	Unurned
Burnt only	28	7
Burnt and unburnt	13	13
Unburnt	8	8
Total	49	28

A few possible exclusions can be made concerning species but not concerning cremations, all of which will be included in the following sections of this report. Species have been excluded on the following grounds:-

a) redeposition from later deposits - this includes the unburnt rabbit bones from an urned cremation (table 4). Due to the possibility of a sealed context (1137 in B762, plot 28) it may represent one of the earliest rabbits in the country. However the accepted Norman introduction of this species (e.g. see Grant 1988. 164) and its burrowing habits suggest a more mundane interpretation of its presence i.e. redeposition.

b) redeposition from surrounding features - this possibly includes the single horse bone represented. As this species is prevalent amongst the gravefills and secondary features at this site, and as this bone is unburnt, it is more likely to be redeposited than associated. Cattle and cattle-sized fragments are also far more prevalent in such features relative to the cremation deposits, therefore it could be supposed that a proportion of these may also be redeposited. The presence of burnt cattle and cattle-sized bones (table 4) clearly suggest that some at least are associated. As more cattle bones were identified relative to horse it can be assumed that the cattle sized bones belong to cattle rather than horse.

c) accidental inclusion of wild fauna - namely the rodents, other than rabbit, the frog/toad and possibly those in the small mammal category. These include animals whose presence can be explained by the fact that they lived in the vicinity of the cemeteries and whose bones were incorporated purely by chance. Some of these are burnt, which may argue for an alternative explanation.

Part of the argument for the interpretation of a species as associated rather than redeposited or accidentally incorporated concerns the possible use of this species. If the animal is not obviously edible the conclusion is likely to turn away from association. However in the case of a funerary rite it perhaps should be considered that certain species could be present for reasons other than their quality as food.

2.2.2. Species representation

A full list of the species identified is given in table 4. This list prompts the review of two main points:- a) the predominance of pig and chicken in these deposits and b) the differences in both the representation and number of species found as burnt or unburnt, within urned or unurned cremations. These two topics are discussed below.

a) Pig and chicken are well represented in both urned and unurned cremations (see tables 4 and 5a). As each species dominates those bones found in their size category it is likely that the vast majority of the sheep-size and chicken-size bones belong to pig and chicken respectively. All cremations with pig, sheep-size or both were added together and similarly cremations with chicken, chicken-size or both to give the figures in table 5b. Both sets of data i.e. in tables 5a and 5b, reveal a similarity in the frequency of burnt chicken found in each cremation type, while the burnt to unburnt pig distribution is clearly different. The results indicate that chicken is more likely to be found as burnt bones irrespective of cremation type while pig is best represented by burnt bones in urned and an approximately equal frequency of burnt and unburnt in unurned deposits. These two species were also the most commonly found combination and in all but two cases were represented by burnt bones (table 5b). Disarticulated pig and chicken skeletons or partial skeletons were identified in a number of deposits (table 6). Few of the remaining species were represented in individual cremations by more than one bone and no other cremations produced clear evidence of even partially complete skeletons.

b) The total number of burnt to unburnt species is as follows (excluding rabbit, horse, unidentifiable bird and fish, and all size categories with the exception of finch size and small mammal):- urned - 8 and 8; unurned - 5 and 18 respectively. If size categories are included in the absence of any identified species in this category the ratios become:- 8 and 9 (including cattle size), and 5 and 19 (including goose size) respectively.

It is conceivable that a greater number of unburnt species may relate either to redeposition or to fragmentation. The first explanation has been covered elsewhere (see 'Interpretation') and it is sufficient to say that certain species or size categories may indeed have become incorporated into the less well sealed deposits i.e. those with broken urns or no urns.

It was observed, regarding the second explanation, that the burnt bones were generally far more fragmented in comparison to the unburnt bones. Indeed it has long been recognised that burning tends to make bones more brittle and therefore more susceptible to fragmentation pressures (see Lyman 1994. 389). Such pressures would affect in particular the more fragile species groups, as birds and fish.

Extending this argument it could be supposed that the good representation of burnt chicken is in fact underrepresented relative to pig and, that, the unburnt chicken is possibly overrepresented.

The fragmentation argument could explain the good representation of unburnt relative to burnt fish (see table 4). Unlike chicken, fish were more commonly found unburnt. The fish bone figures are as follows (number of cremations with fish bones):- burnt only, urned - 1; burnt and unburnt, unurned - 1; unburnt only, urned - 5 and unurned - 11. Assuming similar fragmentation pressures in operation in the formation of both urned and unurned deposits, it can perhaps be suggested that the greater abundance of unburnt fish in the latter cremation type is related more to either redeposition or to differing funerary practises rather than to fragmentation (and see below).

Table 4. Species frequency in urned and unurned cremations

	Urned*		Unurned*	
	Burnt	Unburnt	Burnt	Unburnt
Cattle	4			3
Cattle size	8	8		6
Horse				1
Sheep/Goat	1	1		2
Pig	15	3	1	2
Sheep size	24	5	12	12
Mouse/Vole		1	1	3
Rat				3
Rabbit		1		
Small mammal			1	3
Chicken	14	2	4	3
Chicken size	4	1	5	
Goose	1			
Goose size	1			1
Mallard	1	1		
Finch size				1
Unid. bird	1	1	4	1
Plaice/Flounder			1	3
Whiting	1	1		1
c.f. Shad				1
?Dab				1
Sprat				1
Herring		1		6
Sprat/Herring				2
Eel		1		2
Smelt				2
Cyprinid				2
Ind. fish		2		7
Frog/Toad	1			2

* number of cremations with these species.

Table 5. Frequency of pig and chicken in cremations

a) Pig and chicken only

	Burnt		Unburnt	
	U	UN	U	UN
Pig	15	1	3	2
Chicken	14	4	2	3
Pig and Chicken	5		1	

b) Including Sheep size and chicken size

Pig	26	14	6	11
Chicken	17	8	2	3
Pig and Chicken	9	6	1	1
Total	41	20	21	21

U urned, UN unurned

Totals used (figures taken from table 3):-

Burnt - total cremations with burnt and burnt and unburnt

Unburnt - total cremations with unburnt and burnt and unburnt

Table 6. Skeletons and partial skeletons in cremation deposits.

Plot/Burial	Type	Sex	Age	Species	Bones
1/B4	U	F	4	Pig	Part skeleton
2/B581	U	?	7	Chicken	Skeleton
/B333	U	M	5	Pig	R foreleg
/B413	U	?F	11	Pig	L foreleg
/B839	U	F	5	Chicken	Skeleton
/B840	U	M	5	Chicken	Skeleton
3/B187	U	?	2	Pig	R foreleg
16/B134	U	F	5	Chicken	Skeleton
17/B138	U	?F	7	"	"
28/B752	U	?F	5	"	"
/B761	UN	?	5	"	"
/B765	U	?F	5	"	"
/B788	UN	?	7	"	"
/B765	U	?F	5	Pig	L foreleg

Type U urned, UN unurned

Sex F female, M male

Age For age codes used see section...

Bones L left, R right

The second part of this topic concerns the number of species found amongst these cremation types. Table 7 shows the distribution of burnt and unburnt species, grouped as two or more, and three or more, within the urned and unurned cremations.

Species count > or equal to		Urned		Unurned	
		N	%	N	%
2	burnt	15	40.5	7	41.1
	unburnt	7	41.1	13	65.0
3	burnt	3	8.1	1	5.8
	unburnt	2	11.8	9	45.0

N number of cremations in each category with 2 or more species

% N/ Total number of cremations in each category* x 100

* Totals:- urned - 37 burnt and 17 unburnt; unurned - 17 burnt and 20 unburnt. Most urned and unurned cremations have both burnt and unburnt animal bones

Table 7. Cremations with two or more species.

Noticeably the proportion for both the urned and unurned cremations are approximately similar regarding the burnt species, while the proportional abundance of unburnt species is greater in the unurned deposits. As with the noted greater variety of species found in the latter deposits (described above) the greater abundance of unburnt species may also relate to redeposition. However the possibility of an actual difference in the use of unburnt offerings dependant on cremation type should be entertained as an alternative explanation.

2.2.3 Skeletal parts, age and sex.

The burnt skeletal part distribution of pig and chicken throughout the cremations is similar in having a wide range of skeletal elements but dissimilar regarding concentrations of these elements. No chicken skull or phalanges were represented. While their absence may be due to fragmentation biases it is possible that only dressed carcasses were used. The majority of the bones making up such a carcass are represented in 5 skeletons (table 6). Pig is represented mainly by skull/mandible fragments and especially by forelimb bones. In 4 cremations the latter parts represented a forelimb articulation and in another case were included in a partial skeleton (see table 6). Forelimb parts were found in 8 out of the 16 cremations with burnt pig bones (see table 4), in 7 of these exclusively. In addition a forelimb part was found in one out of the five cremations with unburnt pig bones.

The pig bones generally represent animals which are at least immature, at most mature, with exceptions including 2 juveniles and one possible neonate (all in the forelimb collection). All the chicken were mature.

The remaining species were represented by a mix of skeletal parts, including primary waste bones, with the exception of the fish species which were identified mainly from vertebrae. It was not possible to age the bones belonging to these animal and fish species although no obviously very juvenile or very old individuals were represented.

Most of the bones categorized according to size were either shaft or indeterminate pieces. These were often found at a frequency of about one to ten bones per cremation. The exception to this rule were 5 deposits, 2 urned and 3 unurned in plot 2 (see table 8a) which produced above average quantities of sheep sized bones, all burnt.

Table 8. Notable cremations

a) High counts of sheep sized fragments (burnt) and associations

All in Plot 2.

BN	Type	Age	Sex	N	Other
B833	UN	7	?	1000	see below in b)
B838	U	5	?M	500	see below in b)
B834	UN	11	?	50	unburnt: SSZ
B841	UN	7	?F	50	unburnt: ?rat
B842	U	5,1	?F,?	2000	unburnt: SSZ, CCZ and indeterminate fish

b) Multiple species list and associations

BN/Plot	Type	Age	Sex	Species
B399/2	U	2	?	burnt: Pig,CSZ,SSZ,CHSZ unburnt: CSZ,Eel
B567/2	UN	4	?	unburnt: M/V,F/T,Eel,SMA,SSZ
B835/2	UN	5	?	burnt: CHSZ unburnt: Whiting,Herring,P/F,GOSZ,SSZ
B846/2	UN	7	?	burnt: SSZ unburnt: Flatfish,Cattle,S/G,Chicken,SSZ
B581/2	U	7,10	?	burnt:Chicken,Goose,Duck,Pig,Whiting
B268/3	U	10	?	unburnt: Chicken,S/G,Pig,Herring,CSZ
B779/28	UN	11	?	burnt: Pig,CSZ,CHSZ unburnt: S/G,Herring
B761/28	UN	5,7	?	burnt: Chicken,P/F unburnt: Cyprinid,Smelt,Herring,SSZ
B833/2	UN	7	?	burnt: SMA,SSZ unburnt: Smelt,Herring,H/S,?Rat,Ind.fish
B837/2	UN	2	?M	burnt: SSZ unburnt: CSZ,SSZ,P/F,Herring,Ind.fish
B838/2	U	5	?M	burnt: SSZ unburnt: Herring,Ind.fish,M/V

BN Burial number
 Type U urned, UN unurned
 Age See section... for age codes used
 Sex F female, M male
 N number of sheep-sized (SSZ) fragments
 Other species/size groups present, including cattle size (CSZ)
 Species S/G sheep/goat, CSZ cattle-size, SSZ sheep-size, SMA small mammal, M/V mouse/vole, CHSZ chicken-size, GOSZ goose-size, H/S herring/sprat, P/F plaice/flounder, F/T frog/toad

Table 9. Distribution of cremations with animal bones

a) urned deposits

Plot	N	TN	%N/TN
1	1	2	50.0
2	16	30	53.3
3	4	13	30.7
16	3	6	50.0
17	2	14	14.3
21	9	11	81.8
28	13	16	81.2
29	1	3	33.3
Total	49	97	50.5

b) unurned deposits

2	12	25	48.0
11	1	2	50.0
21	2	3	66.6
28	13	21	61.9
Total	28	60	46.7

c) all cremation deposits

1	1	2	50.0
2	28	55	50.9
3	4	19	21.0
11	1	2	50.0
16	3	7	42.8
17	2	14	14.3
21	11	14	78.5
28	26	37	70.2
29	1	4	25.0
Total	77	157	49.0

N number of cremations with animal bone

TN total number of cremations

Total all cremations with animal bones (N), and all cremations, including those from plots where no animal gravegoods were found (TN)

2.2.4 Distribution

The distribution of the urned and unurned cremations with animal bones are shown in table 9. Approximately 50% of the cremations in each type produced animal remains. In general these deposits follow the overall distribution pattern of both the urned and unurned cremations i.e. where there are more cremations there are also more cremations with animal bones. However there are notable exceptions, in particular the small number of urned cremations in plots 3 and 17 with animal bones. A few plots are represented by urned and unurned cremations with no animal bone content. This is often where the total number of that type of cremation is one. Yet in plot 3 there were 6 urned cremations, none of which contained bones. Note that lesser totals in plots 11, 21 and 29 did produce such bones.

Concerning the distribution of individual species, only pig and chicken present a large enough sample to warrant any remarks. These two species taken singly or as a combination appear to follow the general distribution pattern described above. This pattern is also followed by the combined fish species found in unurned cremations i.e. plot 2 - 6 cases, plot 3 - 1 case and plot 28 - 5 cases. However the former plot also contains 4 out of the 5 urned cremations with fish bones (the fifth was in plot 29), indicating a possible concentration of cremations with fish bones in plot 2. The presence of such bones was often coincidental with the presence of a relatively large number of species (see Species representation). Out of the 11 cremations which produced 4 or more species (all shown in table 8b), 8 were in plot 2 (3 urned and 5 unurned), 1 was in plot 3 (urned) and 2 were in plot 28 (unurned) and all contained fish.

2.2.5 Associations

The associations tested for include the possible relation between the number of individuals within the one cremation, and the number of species; the frequency of cremations with individuals of a certain age or sex compared to the frequency of each species or size group represented, referring briefly to various aspects including skeletal part representation and age; and an extension of the last comparison looking at combinations of 2 or more animal species. No attempt has been made to subdivide these analyses by plot or cremation type owing to small sample sizes.

9 out of the 14 cremations with multiple burials produced animal bones. Just two of these had a greater than average species count (B581 and B761, see table 8b). The others had 3 or less species with, as usual (see Species representation), pig and/or chicken in most of them. Noticeably those cremations with the greatest number of burials i.e. B349 with 4 and B793 with 3 produced just one and two species respectively.

The age and sex of the human remains found in cremations with animal bones are shown in tables 10 and 11. In addition this information is supplied for each of the partial or complete animal skeletons recovered (table 6) and for notable cremations (table 8). Referring first to the information in tables 10 and 11, the only point of similarity is that most were found in association with adult female (or ?female) individuals. This statement loses its significance when, as with the inhumations, it is realised that this distribution merely follows the overall age and sex distribution. A similar pattern is shown by those species with reasonable samples, whether burnt or unburnt, as well as by the total numbers of each sex or age group where animal bones were present (compare the total figures given in tables 10 and 11 with the Grand totals in the latter table). There are no obvious deviations from this pattern. It is unfortunate that little could be stated about the distribution of certain species e.g. most of the fish bones were found in association with human remains of poorly definable age and unknown sex.

No associations are possible with either pig or chicken regarding their age, as both species displayed a relatively constant age distribution i.e. immature/mature and mature respectively.

The final association tested for, looking at combinations of species, revealed similar results to the single species data. Sample sizes decrease dramatically if only those cremations with 3 or more species are compared. However it is certainly clear that those deposits with at least one or two species, no matter which species are present, all follow the general age and sex pattern. The age and sex of the humans associated with the best represented cremations are shown in table 8b.

Table 10. Species frequency in cremation deposits - burnt bones.

a) Sex

	M	?M	?	?F	F
Cattle			1		
Cattle size	1	1	3	1	
Sheep/Goat				1	
Pig	1	1	6	3	2
Sheep size	3	3	13	9	2
Chicken	2		7	4	4
Chicken size			9	2	1
Goose			1		
Goose size			1		
Duck				1	
Unid. bird			3	2	
Thrush			1		
Plaice/Flounder		1			
Whiting			1		
Total(1)	6	5	31	14	6

Cremations with two individuals: Sheep size and Frog/Toad in ? or ?F.

b) Age

	1	3	5	6	7	10	11
Cattle			1				
Cattle size	1		3	1		1	
Sheep/Goat							1
Pig	1		3	1	5		4
Sheep size	1		9	1	11		7
Chicken		1	8		5		3
Chicken size	1	1	3		4		3
Goose					1		
Goose size					1		
Duck						1	
Unid. bird			1		3		1
Thrush			1				
Plaice/Flounder		1					
Whiting					1		
Total	2	1	26	4	16	6	10

Cremations with two individuals: Sheep size and Frog/Toad in 1 or 5.

Also age codes: 2 - one pig (Grand total of 2); 4 - one chicken (Grand total of 3), where Grand total = total number of cremations.

Total - total number of cremations with burnt animal bone

Table 11. Species frequency in cremation deposits - unburnt bones.

a) Sex

	M	?M	?	?F	F
Cattle			3		
Cattle size	1	1	8	3	
Horse			1		
Sheep/Goat			1		
Pig			3	1	1
Sheep size		1	12	1	
Mouse/Vole		2	2		
Rat				2	1
Rabbit			1		
Small mammal			2	1	
Chicken			3		1
Chicken size				1	
Goose size			1		
Finch size			1		
Unid. bird			2		
Plaice/Flounder	1	2			
Whiting			1		
c.f.Shad				1	
?Dab				1	
Sprat			1		
Herring		2	6		
Sprat/Herring			1		
Eel				2	
Smelt			2		
Cyprinid			2		
Ind. fish		2	5		
Frog/Toad				2	
Total	1	5	33	9	2
Total(2)	6	6	40	15	7
Grand Total	6	4	54	22	9

Cremations with two individuals: cattle size in ? or ?F; sheep size in ? or ?F; Ind. fish in ? or ?F.

Table 11. (cont.)

b) Age

	4	5	6	7	10	11
Cattle				1	1	1
Cattle size		2	1	3	3	2
Horse					1	
Sheep/Goat					1	
Pig				2	2	1
Sheep size	1	2	2	4	1	3
Mouse/Vole	1	2				1
Rat					3	
Rabbit						1
Small mammal	1			2		
Chicken		1		2		
Chicken size		1				
Goose size		1				
Finch size				1		
Unid. bird				1		
Plaice/Flounder	2		1			
Whiting		1				
c.f.Shad				1		
?Dab					1	
Sprat		1				
Herring		4	1	1	1	1
Sprat/Herring				1		
Eel	1					1
Smelt		1		1		
Cyprinid						1
Ind. fish	1	3		2	1	1
Frog/Toad		1			1	
Total	2	15	4	13	5	9
Total(2)						
Grand total	3	30	8	23	9	15

Also Age codes: 1 - one unidentified bird (Total = 3, Grand total = 3); 3 - one sheep size (Grand total - 3). For age codes used see section....

Cremations with 2 individuals: cattle size age 1 or 6 and age 1 or 5; sheep size age 1 or 5; herring age 1 or 6; Ind. fish age 1 or 5.

Total = total number of cremations with burnt animal bones

Total(2)= total number of cremations with burnt and/or unburnt animal bones

Grand total= total number of cremations

2.3. Pyre deposits

The animal bones were recovered from ten cremation pits or dumps, all but one from sieved samples. As with the urned and unurned cremations both burnt and unburnt bones were identified. The species frequency regarding both categories is shown in table 12. Other similarities with the cremation deposits include the relatively good representation of burnt pig/sheep-size and, especially, chicken/chicken-size and unburnt fish. At this stage it can perhaps be suggested that certain species, in particular the fish, being present in both the cremation and pyre deposits are more likely to be deliberate rather than accidental in their association with burnt human remains.

It was noticeable that the burnt bones in these deposits were more fragmented and less readily identifiable to species relative to those found in the urned and unurned cremation deposits.

Table 12. Species frequency in pyre debris deposits.

Species	Burnt	Unburnt
Cattle	2	3
Cattle-size	4	5
Horse		1
Sheep/Goat	2	
Pig	2	2
Sheep-size	8	4
Hare		1
Mouse/Vole		1
Small mammal	1	3
Chicken	4	
Chicken-size	5	1
Thrush		1
Flounder		1
Plaice/Flounder		2
Gadoid		1
Small Gadoid		1
Whiting		1
?Shad		1
Sprat		1
Herring		8
Eel		1
Smelt		2
Pike		1
Cyprinid		1
Ind. fish		4
Frog/Toad		2

Total number of deposits = 10

3. Secondary deposits

Animal bones were found within a variety of features other than inhumations, cremations or pyre debris deposits. The bone contents of these features may represent the remains of peripheral ritual activities i.e. other than those which involved the deliberate placing of food or food waste with or alongside the human remains.

Evidence is sought for any pattern, either distribution of bones or species used, to suggest some post funerary feasting/celebrations. The search for such evidence is divided between the gravefills and other deposits. Possible interpretations of this data follow a brief description of the bones found in these features. Another ritual aspect discussed here, due to the finding of either articulations or concentrations of bones belonging to a particular species, is the deliberate deposition/burial of 'offerings', extra to those found in the graves and cremations. These are described and discussed under the general heading of 'Skeletons'.

3.1 Gravefills

The distribution of gravefills with animal bones and the total number of bones found in the gravefills (excluding gravegoods) is shown in table 13. It is clear that the average number of bones found in each fill is small, ranging from 1 (plot 15) to 13.4 (Plot 10). In reality the actual range goes from 1 bone (many graves) to 40 (B164 in plot 10). The proportions of graves with bones varies a great deal. Taking those plots with a reasonable sample (20 or greater) the proportion varies between 20-40%. The exception to this rule is plot 16 where just 6.6% of its gravefills had animal bones. Most gravefill assemblages display a mix of preservation states with some bones being extremely abraded. It can be suggested that the great majority, if not all, of these bones have been redeposited.

Looking at the individual species and/or size groups, most of the bones in each plot were identified or classed as cattle, cattle-size or sheep-size. Table 2, which gives the species count for the combined gravefills, also lists horse as a major species. This species is, in fact, well represented in only a small number of plots i.e. 2, 3 and 28. In all 3 plots horse is generally represented by no more than 2 bones per grave with the exception of B516 in plot 28 which produced 24 horse bones. It should be mentioned that a large proportion of the horse bones recovered are skull fragments or teeth. Due to the greater fragmentation and recovery potential respectively of these two parts it is likely that this species is overrepresented.

The postcranial parts of the horse tend to be at least 50% complete. This evidence added to the finding of a number of horse articulations (see Skeletons) and the very small proportion of cut bones suggests that horse was infrequently used for its meat. Two butchery cases were observed i.e. a chopped femur in a gravefill from plot 1 and a knife cut humerus in one from plot 3. In contrast the cattle postcranial bones are, in general, less than 25% complete and show an extensive range of cut marks. This species exhibits a range of parts in each plot with the exception of those in Hooper St where the majority of bones represent primary waste, in particular the lower limb parts. The vast majority of the cattle-size and sheep-size bones are vertebrae, rib and longbone fragments, while the sheep and pig assemblages show a mixed distribution of skeletal parts with a small proportion of butchered bones.

Of some interest is the presence of a dog mandible from a WTN (Plot 17) gravefill with a clear knife mark on the lingual surface. A cut mark in this position could be the result of defleshing (Waldron 1986. 119).

A number of gravefills were sampled. Most of these were taken due to the finding of a concentration of burnt bones within the gravefill. It can be assumed that the majority, if not all, of these represent redeposited cremation debris. Certainly they display a similar character to the above described cremation bone assemblages - largely containing burnt chicken, pig and sheep-size fragments (as well as some probable human remains). A few of these also produced small numbers of fish bones. Herring and eel were identified amongst a majority of unidentifiable fish fragments.

Prior to a discussion of the evidence for post funerary activity, it is worthwhile considering if any of the gravefill bones represent gravegoods. To achieve this, it is necessary to compare the gravefill with the known gravegood assemblages. Obviously other gravegoods may be present which either were not preserved or that have been misidentified. Neither event can be taken into consideration here due to lack of evidence. The poor representation of chicken in the gravefills may be significant although this could also be due to preservation/recovery biases. Pig (including sheep-size) is fairly well represented. However these bones, unlike the described pig gravegoods, are neither very young or limited to particular parts of the skeleton. In addition the redeposited nature of these bones must be taken into account. The inevitable conclusion is that, if present, no extra gravegoods can be recognised amongst the gravefill assemblages.

Table 13. Frequency of animal bones in gravefills

Plots	N	N1	N2	%
1	37	4	5	80.0
2	219	87	260	33.0
3	39	19	88	21.6
8	11	4	7	57.1
10	67	5	5	
11	52	9	10	90.0
12	22	3	4	75.1
15	3	3	5	60.0
16	7	4	60	6.6
18	16	1	4	25.0
22	43	11	29	37.9
28	264	33	76	43.4
29	6	1	12	8.3

All figures exclude gravegoods, as described in section 2.1.

N total number of bones found in these gravefills

N1 number of gravefills with animal bones

N2 total number of graves

% $N1/N2 \times 100$

3.2. Other deposits

There follows a brief description of the bones found in each of the eleven cemetery sites. The information given is limited to certain aspects of the bone data, as quantity and site distribution, state, species and skeletal part representations. Other aspects are included where relevant. This information has been chosen in order to best illustrate the source or sources of the various bone assemblages. Clearly a ritual interpretation will necessitate a local source for some or all of these bones.

All bone data, dated to the Roman period, is included, comprising both the hand collected and sieved assemblages. Samples were taken from non-gravegood contexts from five sites. The species representation of the larger (hand collected) assemblages i.e. HOO88 and MSL87 are shown in table 14. Stratigraphic information is used in an attempt to date particular features.

In general the larger mammals follow the fragmentation and butchery patterns detailed in the last section.

9 St Clare Street, EC3(SCS83) - Plot 1.

174 bones are divided amongst four pits, a posthole, two dump levels, a ditch, a gully and a road, the latter providing the greatest proportion of the total assemblage (94 bones). The bones are, in general, relatively poorly preserved and highly fragmented, in particular those found in the road deposits. Cattle and cattle-size bones are predominant in all except three of the pits and the posthole, where horse is most abundant. Sheep/goat and pig are represented throughout in small numbers. Five samples, from the ditch and two of the pits, revealed a selection of cattle- and sheep-sized fragments.

An additional pit (1.37-9) produced a sieved assemblage of over 1,300 fragments (Hibberd 1991). This was largely composed of small mammal and amphibian bones i.e. those species which are most likely to be trapped in a high/steep sided deep feature. A small number of fragments representing each of the major domesticates was also found, plus a few bird bones including goose and, especially, heron. The latter species is represented by a relatively complete skeleton.

49-59 Mansell Street, E1 (MSL87) - Plot 2.

A total of 195 bones was recovered from eight ditches, ten pits and a few features of uncertain type. This total excludes the contents of pit 5.89 (see next section). Most of the ditchfills and a large proportion of the entire assemblage was found in fills [1158] in 7.62, [1971] in 6.44 and [1975] in 6.28, with 24, 59 and 39 bones respectively. All but two of the bones in the former fill were identified as horse (described in the next section), while the latter fills provided a mix of species, predominantly cattle and cattle-size. Of some interest in both these ditches is the presence of relatively large skull fragments; [1971] with two horse and four, possibly five, cattle skulls (three over 75% complete) and [1975] with four cattle skulls (one over 75% complete). Where the relevant parts of the skull are present, it is clear that the horncores had been removed from the cattle skulls, the method used removing the lateral edge of the orbit as well as the core. In addition one of the skulls (from [1971]) had been poleaxed. Both cattle and horse are represented within these deposits, as elsewhere in MSL, by a general mix of skeletal parts and, it would appear, solely by adults. One example of an extremely aged horse was found in an uncertain context [47] - a mandible with teeth worn down to the roots. This mandible also exhibited, on the buccal surface adjacent to the molar row, a large area of 'honeycombed' new bone. It is conceivable, considering the skeletal part affected, that this may represent the early stage of an inflammatory condition known to affect jaws called 'lumpy jaw' (see Baker and Brothwell 1980. 158). One of these two ditches i.e. 6.44, clearly dates to the period of the cemeteries use, as this ditch cuts into, and later fills within the ditch are cut by, inhumation burials. Other species found, all in relatively small numbers, include sheep/goat, pig, dog and chicken, as well as two wild species - red deer and crane. This last species has rarely been found on Roman period sites in Britain, and is represented in only one out of the 26 sites described by West (in prep), within a context dated to 120-140AD from Eastcheap (EST83). All samples taken were restricted to inhumations/cremations.

28-29 West Tenter Street, E1 (WTE90) - Plot 2.

The bones from this site, a total of 109 fragments, were very widely distributed through aseries of ditches, pits, layers, dumps and various structural fills. Most of the bones were found in layers or dumps and a large proportion are unidentifiable to species, mainly composed of cattle-size fragments. All three major domesticates are represented as are, in small numbers, horse and dog. Though the general condition of the bones is good, most contexts provided a small number of abraded/eroded bone fragments. No samples were taken from these deposits.

31-43 Mansell Street, E1 (MST87) - Plot 3.

Five contexts within two ditches, two dumps and a pit, produced just 40 bone fragments, the majority arising from ditchfill [38] in 0.97 (34 bones). A predominance of cattle-sized fragments were accompanied by a few cattle and horse bones, with a single fragment each of dog and sheep-size. The preservation of the bones is similar to that described for WTE90 and again sampling was restricted to graves/cremations.

The Three Lords, 27 Minorities, EC3 (TTL85) - Plot 8.

118 bones were recovered from seven contexts - possible make-up levels for a road or path, a surface and three uncertain deposits. A large proportion of the bones was found in one of the make-up deposits [6], described as a mortar spread, with 77 fragments (the total quantity produced by these deposits is 85 fragments). Within this context was found a relatively large number of horse and cattle-size bones (vertebrae and ribs) i.e. 31 and 19 fragments respectively. These probably represent the disarticulated remains of at least two horses. These are described in more detail in the next section. Included with the horse bones in this deposit was a number of severely eroded cattle fragments. The cattle bones, here as elsewhere in this site, show a general distribution of skeletal parts. Other parts of the site produced reasonable proportions of sheep/goat and pig bones, plus a few chicken and dog fragments. No samples were taken from this site.

Hooper Street, E1 (HOO88) - Plots 8, 22, 28 and 29.

This site produced by far the largest quantity of bones from non inhumation/cremation contexts. A total of 3,310 generally well preserved fragments were found in 155 contexts, divided between a variety of context types (see table 14). Approximately two thirds of the site assemblage was recovered from ditchfills, and the majority of these from three contexts within ditch 4.7. Another context in the same ditch produced a partial horse articulation, as did one of the pitfill contexts. These are described in the next section. Horse and cattle bones are reasonably well represented throughout, within assemblages which are clearly dominated by cattle- and sheep-size fragments. The relative proportions of sheep-sized fragments is at odds with the small numbers of sheep/goat and pig bones. Clearly the latter figures can not be seen as an accurate display of the relative worth of these species. Cattle are mainly represented by primary waste bones (skull, mandibles and phalanges), while the other mammalian domesticates display a greater mix of skeletal parts. A variety of smaller domesticates are represented, both mammalian and bird, as well as four game species. In addition there was the unusual find of a pine marten (a mandible) found in a ditch context. Samples were restricted to the 4.7 ditch contexts (see below).

The concentrated assemblage found in ditch 4.7. is worthy of further comment. On site it appeared as a dense mass of small bone fragments slumped into the ditch. It was arbitrarily divided into three contexts, all of which were extensively sampled. The major characteristic of this dump is the overriding dominance of small cattle-size fragments. Out of a total weight of 9.45kg of such pieces, the vast majority were smaller than 3cm and about 6kg were smaller than 1cm in length. The identifiable bones were composed almost entirely of cattle and horse metapodial fragments, again composed mainly of small pieces. A large proportion of these and the cattle-size fragments showed cut marks consistent with the use of the cleaver and the saw. The dating evidence suggests that this ditch remained open until the late 3rd/4th century. These fills may therefore have been deposited during the latter half of the cemetery use.

13 Haydon Street, EC3 (HAY86) - Plots 10, 11 and 12.

46 bones were found in 6 contexts, divided between two gullies. This small number of bones are generally well preserved. The cattle-size dominated assemblage also contains cattle, horse, sheep/goat, pig and chicken. Each of the mammalian species is represented by a mix of skeletal parts. Two contexts were sampled, revealing assemblages composed largely of cattle and sheep-size fragments. However both samples also produced a number of fish bones (mainly vertebrae). The majority of these were identified as eel and twaite shad, with the remainder including herring, flounder and a small salmonid, possibly a trout.

65-73 Mansell Street, E1 (MNL87 and 88) - Plot 15.

A large proportion of the total number of 50 bones found at this site (all in ditch deposits) represent the remains of one horse (23 fragments, found in ditch 6.45, see next section). The remaining bones include

a small number of cattle, cattle- and sheep-size and pig fragments. A variety of bone preservation states was noticed amongst these deposits.

East Tenter Street, E1 (ETN88) - Plot 16.

Three contexts, all dumps, produced 51 bones. Unusually for the cemetery sites, the major contributor to this total are sheep-size fragments (32 bones). The remainder comprise each of the three major domesticates, as well as horse, cattle- and chicken-size pieces. The single sample reflected the hand collected results with a predominance of sheep-sized fragments. Other bones present belonged to sheep/goat, cattle-size, small rodent (?rat), amphibian and a few fish, including eel, whiting, herring and a small number of indeterminate pieces.

West Tenter Street, E1 (WTN84) - Plot 17.

The animal bones recorded by Waldron (1986) include the complete skeleton of a horse found in pitfill [1044] (this described in the next section). Other faunal evidence is limited to gravegoods and a possible find in a gravefill. It can be assumed that no samples were taken, or that no bones were found by this method.

63-66 Prescott Street, E1 (PRE89) - Plot 18.

A small number of hand recovered and a substantial quantity of sieved bones were recovered from the fills of a timber lined well (6.1-2). One of the fills contained a relatively complete dog skeleton, approximately 75% of which was recovered by hand. This animal was clearly an adult and had at some stage of its life received a blow to the side (evidence of remodelled/healed fractures on two possibly adjacent ribs). The remainder of the assemblage can be divided into three main types i.e. a small and fragmentary collection of sheep/goat, pig, sheep-size and chicken fragments, the majority of which are burnt white; a small number of fish bones; and a very large quantity of small mammal and amphibian bones. The former bones are reminiscent of cremation animal gravegoods, and it would seem likely that they represent material from such a source. In the absence of any obvious domestic rubbish, it is conceivable that the fish bones may also represent redeposited cremation debris. These are represented by plaice, eel and herring. The wealth of bones comprising the third type are likely to represent the results of this feature acting as a pit-fall trap. Within the small mammal assemblage are several common and pygmy shrews, field and bank voles and mice. This part of the deposit would appear to be similar in character to the fill of pit 1.39 from SCS83 (see above). The dating evidence within the well (140-200/? 160 AD) suggests that the fills date to the time of the cemeteries use.

Discussion of gravefill and other deposit data

Prior to the application of a mundane or ritual interpretation to any of this data, it is necessary to establish whether any or all of these bones were deposited during the period of the cemeteries use. There is certainly evidence for extensive redeposition, particularly regarding the gravefills. In addition, redeposition could also be used to explain the varied distribution of bones found in these fills. It is noticeable that the plots with the largest gravefill assemblages are also those with the largest other deposit assemblages i.e. plots 22 and 28, both in HOO88 (compare the data given in sections 3.2 and 3.3 and table 13).

The dating evidence is rather poor (as mentioned elsewhere) and the use of stratigraphy to clarify the situation is often frustrating due to the absence of direct stratigraphic links with inhumation/cremation deposits. However there would appear to be sufficient stratigraphic data to suggest that, at the least, a proportion of these features and/or their fills were cut/deposited during the cemeteries use e.g. see the evidence from MSL87 (above) and the next section.

Evidence for the possible source or sources of this material can be found in a study of the species present and their skeletal part distributions. Essentially the large mammal domesticates, which provided the vast majority of the bones, were represented throughout these deposits either by a mix of parts or, in

just a few cases, by a concentration of lower limb bones. The former assemblages clearly represent the waste from all stages of the butchery process, from skinning (and death in one case i.e. the poleaxed beast from MSL87, see above) through to defleshing. While such activities may have precluded the on-site feasting events, it is perhaps more likely that these bones represent the mixed domestic waste from some nearby settlement i.e. the city. Certainly the various components of the assemblages found at these sites, regarding species and relative quantities (with the exception of horse, see below) are not dissimilar to those recovered from a number of similarly dated Roman sites located within the city walls (information taken from West *et al.* in prep)

Table 14. Species representation in gravefills and non gravegood deposits from HOO88 and MSL87

Hooper Street, E1 (HOO88)

	Graves	Ditch 4.7.	All	Pit	Dump	Quarry pit	Soil	Surface
Cattle	18	146	186	28	81	14	57	12
Cattle-size	98	1485	1659	126	135	109	74	61
Sheep/goat	25	2	6	4	14	2	13	1
Pig	10		4	12	10		9	1
Sheep-size	131	16	133	59	40	26	87	103
Horse	36	88	123	6	11	21	4	8
Red deer							1	
Roe deer			1					
Dog			8	1	2	8	1	
Cat				1	1			
Pine marten			1					
Hare							1	
Small rodent	1		1	1				
Chicken	6		1	13	3	1	1	
Goose	1							
Duck				1				
Crane								
Woodcock				1				
Unid bird	6	3	4				1	
Frog/toad			1					

49-59 Mansell Street, E1 (MSL87)

	Graves	Pit*	Ditch
Cattle	46	6	50
Cattle-size	56	28	67
Sheep/goat	7	7	6
Pig	13	4	3
Sheep-size	46	5	3
Horse	22	6	39
Red deer		1	
Dog	4		4
Cat	1		
Chicken	6	2	
Goose	2		
Duck	1		
Crane			1
Unid bird	1		
Fish	4		

* excluding the bone contents of pit 5.89 (see Secondary deposits - skeletons)

The primary waste deposits, and in particular the dense bone lens from HOO88 ditch 4.7., can be seen as abattoir/butchers and industrial waste respectively. This latter deposit is likely to represent waste from an oil extraction process. Such a process would have been facilitated by a programme of deliberate fragmentation. It is also significant that the same deposit contained a substantial quantity of charcoal i.e. the remains of the fuel needed during the boiling/simmering stage of this process. The pine marten fragment could be included with evidence for an industry/craft source. Though no obvious skinning marks are evident on this bone it may represent the waste from an animal captured for its pelt.

Overall the evidence points to a rather mundane source for most of the bones recovered. However there is some rather tentative evidence which may suggest the presence of peripheral on-site activities. A major feature of the gravefill assemblages relative to the majority of other deposits is the good representation of sheep-size fragments. The exceptions amongst the other deposits include the soil and surface deposits from HOO88 (see table 14). It could be supposed that with the relatively high levels of redeposition noted for the gravefill assemblages, that sheep-size are less likely to survive in comparison with cattle-size fragments. Thus the noted abundance of the former bones is unlikely to be related to a fragmentation bias. Assuming the difference to be real it can be suggested that a proportion of the bones found in the cemeteries was deposited by people visiting the graves (which may explain why the gravefills have more sheep-size fragments) and these were later mixed with substantial quantities of domestic and industrial waste arriving at these sites from the city.

The concentrated deposits found in the pit in SCS83 and the well in PRE89 deserve some comment with respect to possible ritual connotations. Both produced relatively unusual finds i.e. the skeleton of a heron from the pit and that of a dog as well as a heron bone from the well. While these occurrences cannot by themselves be construed as clear ritual activity, their significance in this respect is heightened when another aspect of these bone assemblages is considered i.e. the lack, or at least very poor representation, of ordinary domestic refuse. Dog skeletons and heron bones (though not a skeleton) have been found in city deposits dating to this period (see West in prep), in each case as part of a general dump of waste materials.

There would certainly appear to be a larger proportion of horse bones in these deposits relative to those found from sites within the city. Whether these can be interpreted as ritual or mundane or both is discussed in the next section.

A final point concerns the representation of fish bones. A relatively insubstantial number of samples cannot be used to estimate the overall distribution of fish bones in these sites. However there is sufficient evidence to suggest that a portion of the fish bones found in the cremation deposits could have been redeposited from the surrounding strata. Each of the species found in the other deposits also occurs in the cremation deposits, and none of these bones is burnt.

3.3. Skeletons

The majority of skeletons recovered were horses, with the exception of two dogs and a red deer, and most were disarticulated. None of the bones comprising these skeletons showed cut marks and it would seem likely that all were originally deposited as whole carcasses. A descriptive list of these skeletons is followed by a brief discussion.

49-59 Mansell Street, E1 (MSL87) - Plot 2

1. A pit (5.89) contained the articulated skeletons of an adult horse and dog, and a juvenile red deer. These lay at the bottom of a large subrectangular pit in a nose to tail arrangement facing anti-clockwise, with the horse on the east, the deer on the south and the dog on the west side. The pit is truncated on the north side and so it is possible that a fourth animal may have been present in order to complete the apparently ordered arrangement. Alternatively as the cut also removed the anterior half of the horse skeleton (approximately half way through the ribcage) it is conceivable that the rest of this animal filled the gap. The posterior half of the horse skeleton is complete. Most of the dog and red deer skeletons were recovered. Absences can be related to either fragmentation or recovery biases. While the horse and

dog bones were in good condition the red deer was poorly preserved, undoubtedly due to its age. Unfortunately the dating evidence for this deposit is poor. The stratigraphic evidence suggests it is either earlier or contemporary with the cemetery in this area.

2. A fill (1158) within a ditch (7.62) produced the remains of at least two disarticulated horses. One is in terrible condition and is composed of most of the forelegs, both tibias, the right astragalus and a single first phalanx. The second, which is better preserved consists of both maxillary toothrows and three mandibular teeth. Possibly associated with the latter skeleton are a right metacarpus and a left metatarsus. Both animals are small, the first being the size of a medium pony while the second is donkey-size. It can be assumed that the first skeleton may have joined the second after some period on the surface. The date of this deposit would appear to be between 50 and 120AD, and was possibly formed at a time when the cemetery was in use, due to the incidence of redeposited cremated bone in the fill.

Hooper Street, E1 (HOO88) - Plots 8, 22, 28 and 29

1. An articulated partial horse skeleton was found in the fill (1583) of a shallow irregular pit (10.34). It consisted of 33 ribs, 7 lumbar and one thoracic vertebrae. A few cattle-size vertebrae (7) and one pelvis fragment may also belong to this skeleton. The size of the pit i.e. too small to contain a horse, its articulated state, and the near absence of the thoracic vertebrae, suggest that this partial skeleton represents one of the immediate secondary deposits of a well rotted carcass. The pit has a stratigraphic date no earlier than 300AD and the fill which also contained possible pyre debris suggests a deposition date within the use of the cemetery.

2. A partial horse articulation was recovered from a fill (471) within ditch (4.7). This consisted of a scapula, 21 ribs and one vertebra. An adjacent fill (513) produced 4 ribs which are likely to be from the same skeleton. The formation process of this deposit was probably not dissimilar to that described for the partial skeleton in HOO (1583). The ditch was infilled some time in the late 3rd/early 4th century AD.

The Three Lords, 27 Minories, EC3 (TTL85) - Plot 8

A number of horse bones representing at least two adult individuals were recovered from a mortar spread (6) which possibly represents part of the make-up of a pathway or hard standing. This layer is cut on all sides by a number of features including an inhumation burial. It was formed between 240-400AD. No evidence of articulation was noticed prior to removal. The parts belonging to each skeleton, are as follows:- both included an atlas, axis and five other cervical vertebrae; the larger (medium pony size) included a fragmented skull and both maxilla, both pelvis, the left femur, both metacarpals and a first phalanx; the smaller (small pony size) included a scapula and tibia fragment, and a left femur. While the horse bones are in good condition they were associated with several severely abraded cattle bones. It is possible that these horse bones were disturbed *in situ*.

65-73 Mansell Street, E1 (MNL87 and 88) - Plot 15

The disarticulated remains, in very good condition, of an adult horse were found in a possible roadside ditch fill (237). The bones comprised the humerus, radius, metacarpus and splint bone, and the first, second and third phalanges, all probably from the same leg. Possibly associated were a sesamoid and 15 cattle-size rib fragments. The articulation state of these bones is unknown. However, it can be assumed that a similar history to that described for the horse articulation from HOO (1583), can also be suggested for these bones. The ditch was not backfilled until the 3rd/4th century AD.

West Tenter Street, E1 (WTN84) - Plot 17.

A pit fill (1044) produced an almost complete and well preserved articulated adult horse skeleton. Part of the pit was removed by the cut of a grave which also removed the head and cervical vertebrae of the skeleton. The pit is cut into a partially backfilled gravel pit, the filling of which was probably complete by 130AD, when the area started to be used for human burials. This information and the later cut by a grave shows that the horse was likely deposited within the time the cemetery was in use.

Finally the complete skeleton of a dog was found in a well deposit in PRE89. This is described with the other bones from this feature in the last section.

Amongst these skeletons the only contender for a ritual interpretation must be the three species deposit from MSL87. The association of the pitfill with the cemetery is unclear. However the arrangement of the skeletons clearly suggests an interpretation other than mundane.

Of the remaining skeletons just four i.e. the horses from WTN84, HOO88 (4.7) and MNL87, and the dog from PRE89, are from deposits which can be realistically dated within the time period of the cemeteries use. The articulated state of the PRE89 and WTN84 skeletons clearly suggest that they represent primary deposits. All the remaining horses are obviously redeposited and any date given to the deposit in which they reside merely indicates when the bones were redeposited rather than when they were originally deposited. In three cases i.e. the partial articulations found in MNL and HOO, it is possible to suggest that the remains represent immediate secondary deposits (see explanation in HOO [10.34] description). This argument therefore allows the MNL and HOO [4.7] horses to have been deposited within the time period when the cemetery was in use. The demise of the animals represented by the remaining skeletons could date to the same period but redeposition and dating evidence may suggest a later date for the HOO [10.34] horse and an earlier date for the TTL and MSL [1158] animals.

The in situ skeletons suggest that some, if not all, of these animals were intentionally buried. It has been established that such deposits date to the period of the cemeteries use. Therefore it can be inferred that they were either buried in deliberate association with inhumation/cremations, or that, as argued with other deposits, the cemeteries were used both to dispose of the dead and as a general dump. An alternative explanation is that the horse/dog burials (and other potentially mundane deposits) date to a time when the cemetery was in a period of disuse - a hiatus. This could explain the partial articulation found in HOO [4.7] and MNL [4.7], and possibly the less well dated articulations found in HOO [10.34]. All of these, as possible immediate secondary deposits, represent animals which had been disturbed within a short space of time following deposition. This is more likely to have occurred if the carcasses had either been poorly buried (a shallow cover) or been left on the surface. Either way, it is inconceivable that a funerary event would have occurred in the vicinity of a putrefying horse carcass.

The evidence from these bones, as well as from the various horse assemblages scattered around the site, perhaps point to this area acting as a Roman equivalent of a knackers yard. From the skeletal representation and the lack of any obvious skinning marks, it would appear that these carcasses had been deposited intact. All the horses are at least adult, and so it is possible that they may have reached the end of their useful lives. In one case age as well as disease may have contributed to the deliberate demise of an animal i.e. as represented by the mandible from MSL87 [47]. It is noticeable in this case, as the infection was clearly ongoing, that the animal died while diseased. The disturbance and spread of horse skeletal parts probably took place through the activities of dogs and mans reuse of these areas i.e. essentially the digging of graves. A small proportion of the horse bones found in each site do display dog gnawing marks.

In conclusion the MSL deposit, and possibly the horse from WTN, can be viewed as ritual deposits. It is unfortunate that the former deposit has no clear date association with the cemetery. The other horse (and possibly the dog) skeletal remains, some clearly dating to the use of the cemetery, are more likely to represent the results of casual dumping.

References

Baker, J. and Brothwell, D. 1980. *Animal Diseases in Archaeology*. Academic Press:London.

Hibberd, H. 1991. Masters thesis at the Institute of Archaeology, London.

Pipe, A. 1992. The animal bones from Hooper Street. Unpublished MoLAS archive report.

Waldron, T. 1986. The animal bone. In R. Whytehead. The excavation of an area within a Roman cemetery at West Tenter Street, London E1. *Transactions of the London and Middlesex Archaeological Society*. Vol. 37. 118-120

West, B. in prep. The Roman London Project. (MoLAS).