BLACKFRIARS, CARLISLE

A report on the vertebrate remains and mollusc shells.

Introduction

The animal bone and shells discussed in this report have been recovered from deposits that span the period from the 1st century AD up to modern times, and have been collected exclusively by hand excavation from all features encountered. A short note on the finds recovered from soil samples is included at the end.

Methods

All the bones recovered have been identified where possible to species using a modern comparative collection and where not possible to an animal size category. They have been catalogued in phase and context sequence within each spatial unit but owing to the large number of phases have subsequently been analysed within broader archaeological date categories. The cataloguing and analysis has been carried out using a semi-automated recording system and a microprocessor. The analytical programmes were developed at the Ancient Monuments Laboratory, Department of the Environemnt. Measurements were taken whenever possible, and not restricted to whole bones, and follow those of Von den Driesch (1976) and Jones et al (n.d).

Material

The material is broadly considered within the Roman period and post-Roman periods. The site during Roman times consisted of three separate buildings and the collections from this period are considered within these spatial units.

Roman Building 1. This area of the site contains deposits that range in date from the 1st century AD up to the late 4th and early 5th century. The

collection comprises 1048 bones and bone fragments unevenly distributed through nine archaeological periods and a number of sub-periods recorded for the building plot. Approximately 47.3% of the remains were identified to species.

Building 2. contains deposits from the 1st century to the early 5th century in date. The sample of animal bones consisted of 1476 bones and fragments from a variety of features. The majority of the material is 2nd century and 46.3% of the remains have been identified to species.

Building 3. Little material was recovered from this area of the site (272 bones) and all of it falls into Periods 4, 5 and 6 of Building 3, an archaeological date of 2nd-4th century AD. 50% of the collection was identified to species.

Post-Roman. The spatial units recognised in the Roman period ceased to apply after the 5th century and the Anglo-Saxon and later material is dealt with purely on a chronological basis. The sample from these deposits consists of 1800 bones and fragments of which 41.4% were identified to species.

Contamination and Residual material

It is inevitable in a multi-period urban site that items in many layers may be derived from a period earlier than that in which the layer formed. It is therefore a pre-requisite of any study to consider the potential level of contamination and select layers and deposits for analysis in order to reduce the possibility of residual material being included. This is most readily done by a consideration of the pottery and other dateable archaeological finds. On the Blackfriars site for the Roman period the nature of the archaeological layers and the dating evidence is such that residual material is likely to be minimal although some 1st century pottery is found in 2nd century levels, and 2nd century in 3rd century and so on. The sample sizes for each period are so small that only generalised comments are made and in establishing the slaughter pattern all the Roman material is used and therefore the residual nature of some is unimportant.

In the post-Roman period the situation is more complicated. Roman pottery is a common contaminant and in the 13th-16th centuries AD the site was a Friary and many graves were dug disturbing earlier levels. For this reason a number of layers whose bone samples were catalogued have not been included in this analysis. Periods 13-14 contain mainly Roman pottery despite their post-Roman date and Period 15 is mainly pit features and has a high level of residual and intrusive material. Periods 16-18 all contain Roman pottery and there is evidence for intrusive material also and Periods 19-21 contain archaeological material from all periods although the deposits formed after the 16th century.

The post-Roman group is therefore considerably more doubtful than that from the Roman periods and although the finds have been catalogued and noted below in the tables the finds are not discussed in detail.

Species

The number of fragments of each species that have been identified in the sample are listed in Tables 1, 2, 3 and 4. The only wild mammals represented in the collection are red and roe deer which occur infrequently in most of the periods. The middle Saxon deposits (Period 14) produced one layer (A 147) with 22 fragments of antler - probably of red deer, but none showed evidence of having been worked.

The bird remains from the site were few (Table 4) and consisted mainly of the bones of domestic fowl and those comparable with domestic goose. In addition to these, two bones of wild goose were identified from Roman levels and a single bone of the whooper swan. A raven bone was recovered from unstratified levels.

Fish remains were practically non-existent in the collection and the only fish bone found was unidentifiable.

Domestic species ratio

The domestic animals include, horse, cattle, pig, sheep, goat and dog remains. In the following analysis horse, cattle, pig and sheep and goat are considered.

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Table 1

Species list and fragment counts for the bone sample from Roman deposits in Building 1.

Date	Period 2 70-80 AD	Period 3a-g L.1st/E 2nd	Periods 4-8 1st half 2nd	Period 9a-p L2nd/E.3rd	Period 9q-w L.3rd/E.4th	Period 9x-y L.4th/E.5th	Total
Cattle	8	65	72	74	21	12	252
Sheep	1	6					7
Goat		1					1
Sheep/goat	19	41	20	10	1	1	92
Pig	1	43	11	27	4	1	87
Horse		1	2				3
Dog			1	1			2
Red deer, Cervus elaphus		6	1	1			8
Roe deer, Capreolus capreolus				2			2
Large mammal, indet.	4	43	47	61	26	16	197
Large ungulate	4	72	35	49	19	17	196
Small ungulate	4	27	3	16		1	51
Indet. mammal	1	30	16	43	8	5	103
Totals	42	337	210	289	79	54	1011

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Table 2

Species list and fragment counts for the mammal bone samples from Roman deposits in Building 2 and 3.

Building 2	Period 2	Period 3	Periods 4–8	Period 9	Period 9s-y &10	Periods 11 & 12	Totals	Building 3 Periods 4–6
Date	70–80 AD	L.1st/E.2nd	E.2nd	L.2nd/E.3rd	L.3rd/E-mid 4th	L.4th/E.5th		L2nd/E.3rd
Cattle	41	69	121	68	40	12	351	81
Sheep	3	1	1	1			6	
Sheep/goat	40	78	64	10	1	10	203	21
Pig	8	40	37	19	12	2	118	32
Horse		11	2	2	1	1	17	
Dog	1			1			2	
Red deer, Cervus elaphus			3				3	1
Large mammal, indet.	21	74	112	66	22	20	315	47
Large ungulate	30	69	121	43	16	6	285	55
Small ungulate	11	31	11	5	1		59	8
Indet. mammal	15	52	58	16	2	5	148	26
Totals	170	425	530	231	95	56	1507	272

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Table 3

Species list and fragment counts for the mammal and fish bone samples from the post-Roman deposits on the whole site.

Period	13	13/14	14	15	16/17	18	19-21	Mixed Later periods
Date	5th-9th	5th-12th	Mid.Saxon	12th-13th	13th?	13th-16th	Tudor-Modern	Roman-Modern
Cattle	18	11	57	105	19	55	142	48
Sheep						1	1	
Sheep/goat	1		8	13	6	20	85	3
Pig	3		9	12	2	13	45	1
Horse	2			3	2	2	4	
Dog				2	4	2	20	
Red deer, Cervus elaphus		1	5	4			2	
Red or Fallow deer antler			22					
Roe deer, Capreolus capreolus				1				
Large mammal, indet.	7	2	88	54	24	64	165	20
Large ungulate	4		65	34	9	17	55	5
Small ungulate	1		25	8	5	3	27	
Indet. mammal	5		84	42	32	34	147	3
Indet. Fish							1	
Totals	41	14	363	278	103	211	694	80

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Table 4

Species list and fragment counts for the bird bones from the whole site

Period	2-3	4-9a-p	9q-12	13-15	16-18	19-21	Mixed	Total
Whooper Swan, *Cygnus cygnus*		1						1
Goose, cf.domestic/ Greylag, *Anser anser*	1	3	1	3	2	2		12
Wild goose, size of Whitefront, *A.albifrons*, or Barnacle, *Brantus leucopsis*	1	1						2
Indet. Goose sp.		1	2			1		4
Domestic fowl, *Gallus gallus*	7	5	4	5	21	12	3	57
Raven, *Corvus corax*							1	1
Indet. bird		2				3		5
								82

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Table 5

Counts and percentages of the major domestic food animals from the Roman periods, by date.

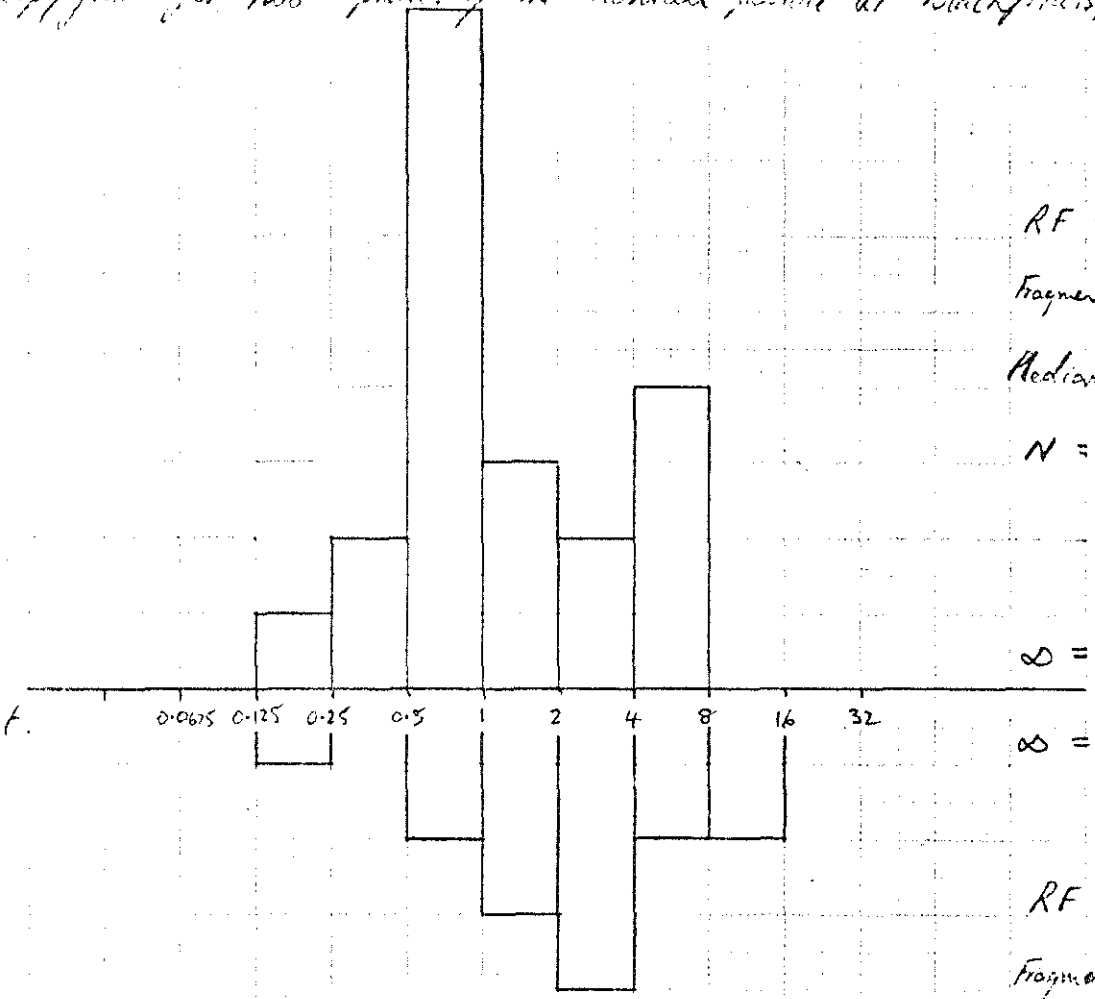
Total	Date	70-80 AD		L.1st/E.2nd		1st half 2nd		L.2nd/E.3rd		L.3rd/E.4th		L.4th/E.5th	
54.2%	Cattle	49	43.4%	134	37.6%	193	58.5%	223	64.6%	61	76.25%	24	61.5%
	Sheep	4		7		1		1					
	Goat			1									
26.1%	Sheep/goat	59	55.8%	119	35.7%	84	25.5%	41	12.2%	2	2.5%	11	28.2%
18.1%	Pig	1	0.9%	83	23.3%	48	14.5%	78	22.6%	16	20.0%	3	7.7%
1.6%	Horse			12	3.4%	4	1.2%	2	0.6%	1	1.25%	1	2.6%
	N =	113		356		330		345		80		39	

Counts and percentages of the major domestic food species from the post Roman periods, by date.

Date	5th-12thC.		12th-13th		13th-16th		Tudor-Modern	
Cattle	86	78.9%	124	76.6%	55	60.4%	142	51.3%
Sheep					1		1	
Sheep/goat	9	8.3%	19	11.7%	20	23.1%	85	31.0%
Pig	12	11.0%	14	8.6%	13	14.3%	45	16.2%
Horse	2	1.8%	5	3.1%	2	2.2%	4	1.4%
N =	109		162		91		277	

Fig. 1 A frequency plot of the ratios of the fragments of individual bones of cattle and sheep/goat for two phases of the Roman period at Blackfriars, Carlisle.

Rowlands 1 & 2
Periods 2 & 3.



Ratio of Cattle/Sheep or goat.

RF = 0·83
Fragment Ratio = 0·96
Median = 0·92
N = 439 bone fragments (excluding ribs)

∝ = 7
∝ = 14

Rowlands 1 & 2
Periods 4–8

RF = 1·35
Fragment Ratio = 2·3
Median = 2·4
N = 295 bone fragments (ex. ribs)

The pig bones fluctuate in number and it is evident from both Building 1 and 2 that during the Roman period as the sheep bones diminish in number and the cattle fragments increase the relative proportion of pig bones changes (Table 5) rising to nearly 24% of the identified fragments in one period. Only in periods 9 and 10 do the number of pig bones exceed those of sheep or goat.

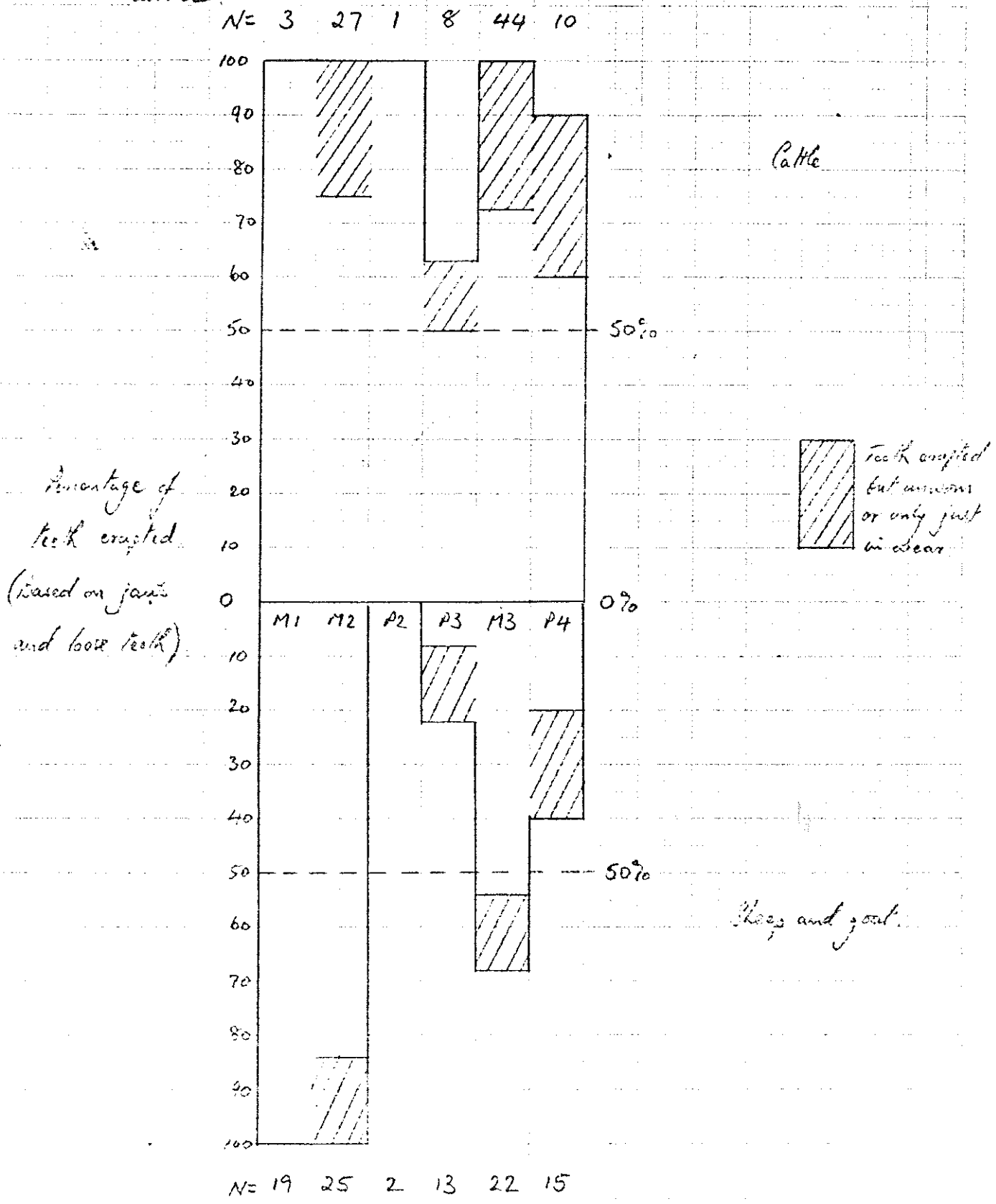
There is considerable criticism of fragment numbers as a basis for determining the relative frequency of the species and RF (op. cit.) and relative abundance (op. cit.) are considered less problematic. The larger samples are therefore considered using these two methods. The accuracy of RF and relative abundance are suspect in very small samples or very small numbers of one species relative to the others so in this consideration only sheep/goat and cattle are discussed.

In Periods 2 and 3 of Buildings 1 and 2 RF gives a value of 0.83:1 cattle/ sheep and goat and the median of the distribution of relative abundance is 0.92:1 (fig. 1). There are similar to the ratio for cattle to sheep and goat obtained from fragment numbers which is 0 96:1. In Periods 4-8 of Buildings 1 and 2 the ratios have changed markedly (Fig. 1). The RF value is 1-35 cattle : 1 sheep and goat but the median for the relative abundance distribution is 2.1:1 and this may possibly be viewed as an underestimate since 14 elements of cattle were unmatched by the same elements from either sheep or goat. The fragment ratio for this period is 2.3:1.

The sample sizes in the remaining Roman periods are too small to permit the satisfactory use of these methods, and this is also the case for all the mediaeval periods.

It might be supposed that this evidence suggests some gross changes in the availability of the different species which may reflect changes in husbandry. A number of the samples from the periods discussed are small and the percentages such as those for late Roman periods in Buildings 1 and 2 (Table 5) can hardly be used to postulate such changes.

Fig 4. Proportions of erupted and unerupted teeth of cattle and sheep/goat from Roman deposits at Blackfriars, Carlisle.



Skeletal Representation

The samples from each phase and area are too small to pick up any marked selection of bone element although some bones occur in disproportionately high numbers. Cattle and sheep metapodial fragments are characteristically high, probably due to their ease of recognition from quite small fragments. Sheep and goat carpals, tarsals and phalanges are underrepresented and this could be explained by recovery efficiency. The discrepancies can largely be explained by survival qualities and recovery efficiency. There is no evidence in any periods for trade or craft activities and the collection appears to be exclusively food debris. This accords with the tentative archaeological conclusion that the Buildings in the Roman period are of a domestic nature.

Age structure of the sample

Cattle: An analysis of the factors reflecting the age at death of the cattle whose bones are incorporated in the sample shows no discernible differences throughout the occupation of the site. The number of unfused bones fluctuates between 5.7 and 10.9% of the total number of fused and unfused epiphyses (excluding vertebrae) in each period. There is no evidence for very young cattle on the site, and there are no remains identified from cattle slaughtered before approximately 18 months (based upon Silver (1969) figures for modern cattle). By far the majority of the later fusing epiphyses also show the adult condition although 50% of the vertebral epiphyses are unfused (Fig. 2). The teeth suggest that although the majority of animals are living to skeletal and dental maturity a number are being slaughtered when the deciduous premolars 3 and 4 are still present and the molar 3 is present but either unworn or only just in wear. This would correspond in modern cattle (Silver, 1969) with an age of 2-3 years and suggests slaughter in their third season an appropriate time for animals raised for beef (Fig. 4).

Sheep and goat: Only the Roman deposits at this site have produced enough bones for any comment on the slaughter age of the animals represented. In contrast to the cattle a larger number of sheep bones have an unfused epiphysis.

30% of the epiphysis (excepting bertebrae) in the 1st and 2nd century samples are unfused (Fig. 3). The sample does not permit the determination of a pattern but individuals are being slaughtered at all ages from less than six months upwards. The teeth indicate a number of animals with deciduous premolars and 33% of the molar 3's identified from the Roman periods are unerupted. This suggests on the basis of modern stock (Silver 1969) that a large proportion of the sheep are being slaughtered before they reach 18 months but after their first year since all the molar 2's identified were erupted and in war (Fig. 4). None of the molar 3's shoed extensive wear in this period and only two of the seven vertebral epiphyses were fused.

Size and Sex

The Morphological recognition of sex was not attempted except upon the canine teeth of pig. The frequency of other bones from which the sex of the individuals might be recognised such as the innominate was low and fragmentation had generally obscured the characters.

Measurements were taken on 115 bones, but only cattle metacarpals, metatarsals and 1st phalanges occurred in sufficient abundance for these to be analysed. Scattergrams of two measures on the distal end of the cattle metopodials are given in Figures 5 and 6. The distributions in both figures are discontinuous and it is probable that they represent sexual morphs. The interpretation of these is complicated by the probable presence of three sexual types, female, male and castrate. Since in all the specimens the distal epiphysis was completely fused it is probable that all the animals are adult and the sample does not contain any of the individuals that the ageing data suggests were killed between 2 and 3 years of age. In each scattergram, three tentative groups can be recognised and it seems probable that group 1 are bulls. There are unfortunately a number of alternative interpretations for the remaining groups. Group 2 may be smaller and younger bulls or castrates and group 3 may be castrated or cows. Unfortunately insufficient length measurements could be taken which might have clarified the interpretation. The asterisked specimen on Fig. 5 had an expanded

This type of interpretation is further confirmed by the results of the analysis at Fisher Street, Carlisle (Rackham n.d.). At this latter site the species ratio acted in a contradictory manner to that exhibited by the sample from Blackfriars; the cattle/sheep and goat ratio being 81%:8% of the identified fragments in the Roman layers and 51%:29.4% in the mediaeval layers (Table 6). This reversal of the pattern between two sites in the same town suggests that samples of this size from urban sites cannot be extrapolated to 'agricultural economies' but are likely to relate more to intra-site factors, and small sample bias. The possibility of contamination from earlier periods may also be important and it

Table 6

	Blackfriars Roman	Fisher Street Roman	Blackfriars Mediaeval	Fisher Street Mediaeval
Cattle	54.2%	81.3%	73.2%	51.0%
Sheep + goat	21.1	8.2	13.4	29.5
Pig	18.1	8.2	13.4	17.7
Horse	1.6	2.2	2.5	1.7
n =	1263	182	362	1377

has been suggested by Cooper (1983 unpubl.) that as much as 70% of deposits in urban sites will contain residual material. The larger samples from Roman Blackfriars and Mediaeval Fisher Street are very similar in terms of the proportions of species fragments; although the summation of the samples from all Roman periods at Blackfriars can be seen to misrepresent the actual picture (see Table 5). Furthermore, the Fisher Street sample may contain little or no material contemporary with the 1st and 2nd century - if so the apparent discrepancy is to some extent lost (i.e. 66.4% cattle : 11% sheep at Blackfriars (Periods 4-12) compared with 81.3%:8.22% at Fisher Street). This exercise illustrates how important it is in these studies to use closely dated and secure samples when comparing sites.

lateral condyle often associated with use of an animal for draught during life. This condition has lifted the specimen to the top of group 3 and although oxen are traditionally used for draught, which would lead to the interpretation of this group as castrates, it is not uncommon for cows to be used and the dilemma is therefore unsolved. The possibility that different cattle types may be responsible for the groups cannot be excluded and although the sample is small there is some evidence in Fig. 5 that the metacarpals from post-Roman deposits may have a different size distribution to the Roman specimens.

It is not possible from the sample to gain any conclusive evidence on the proportions of the sexes in the sampe - even for the measured specimens. There is little information on the size of the animals but length measurements of a few cattle , sheep and goat metapodials were recorded (Table 7).

Table 7

Cattle	metacarpus length	metatarsus length	Sheep and goat	metarcarpus length	metatarsus length
Roman - Period 2	186 mm	Period 4 209 mm	Sheep Period 3	115 mm	Goat Period3 104 mm
Period 9	184 mm	203 mm		127 mm	Sheep Period2 140 m
no information	187 mm			125 mm	
no information	162 mm		Period 4	112 mm	
			Period 8	115 mm	
				122 mm	

No detailed study has been made of the material from post-Roman layers because in any one period the sample is small, subject to contamination and an analysis of skeletal parts and other data would be of little value even for cattle. The data on epiphyseal fusion of cattle bones from the mediaeval layers is however plotted in Figure 2.

A number of the bones were cut or chopped, and although analysis of the

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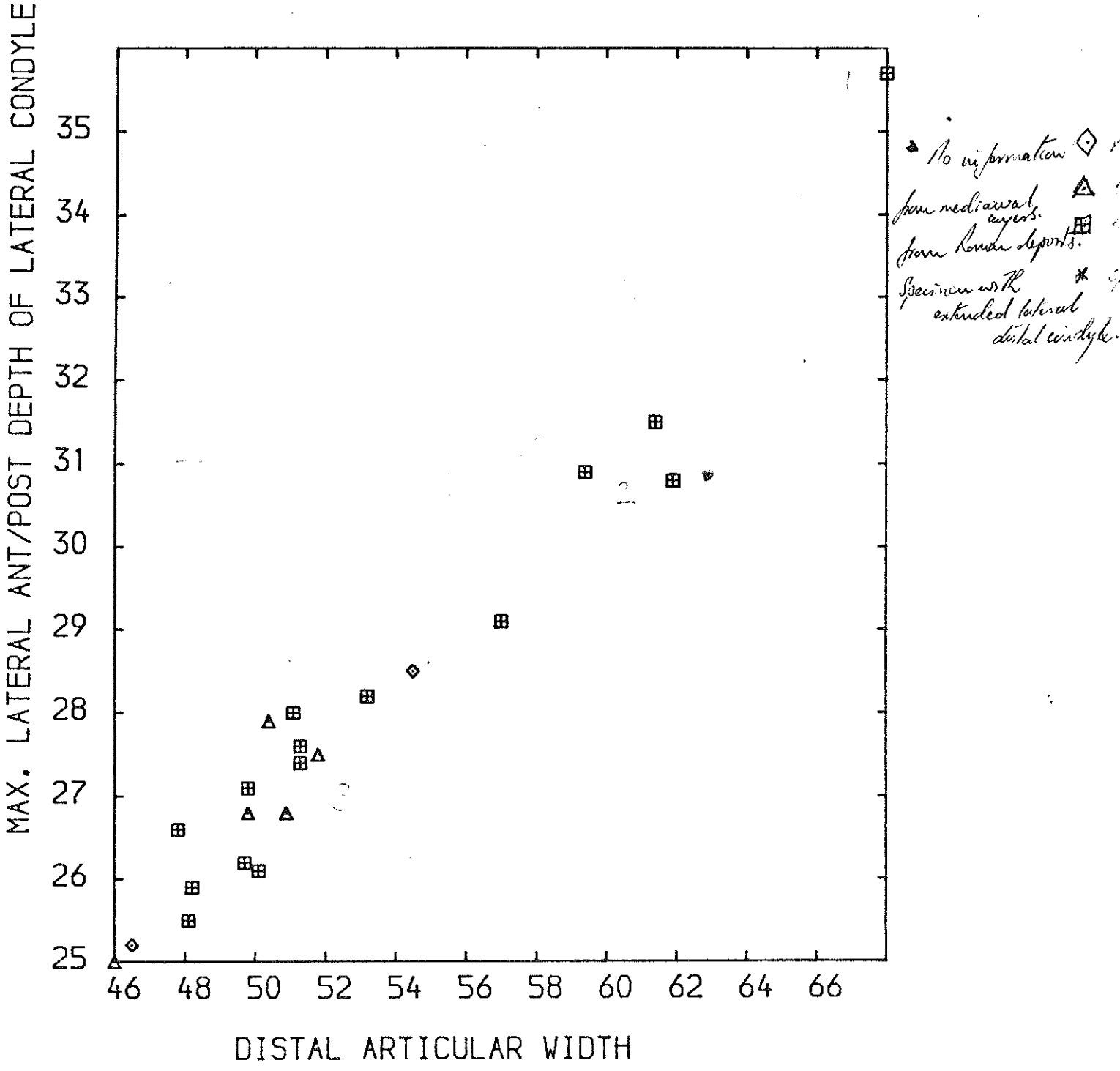
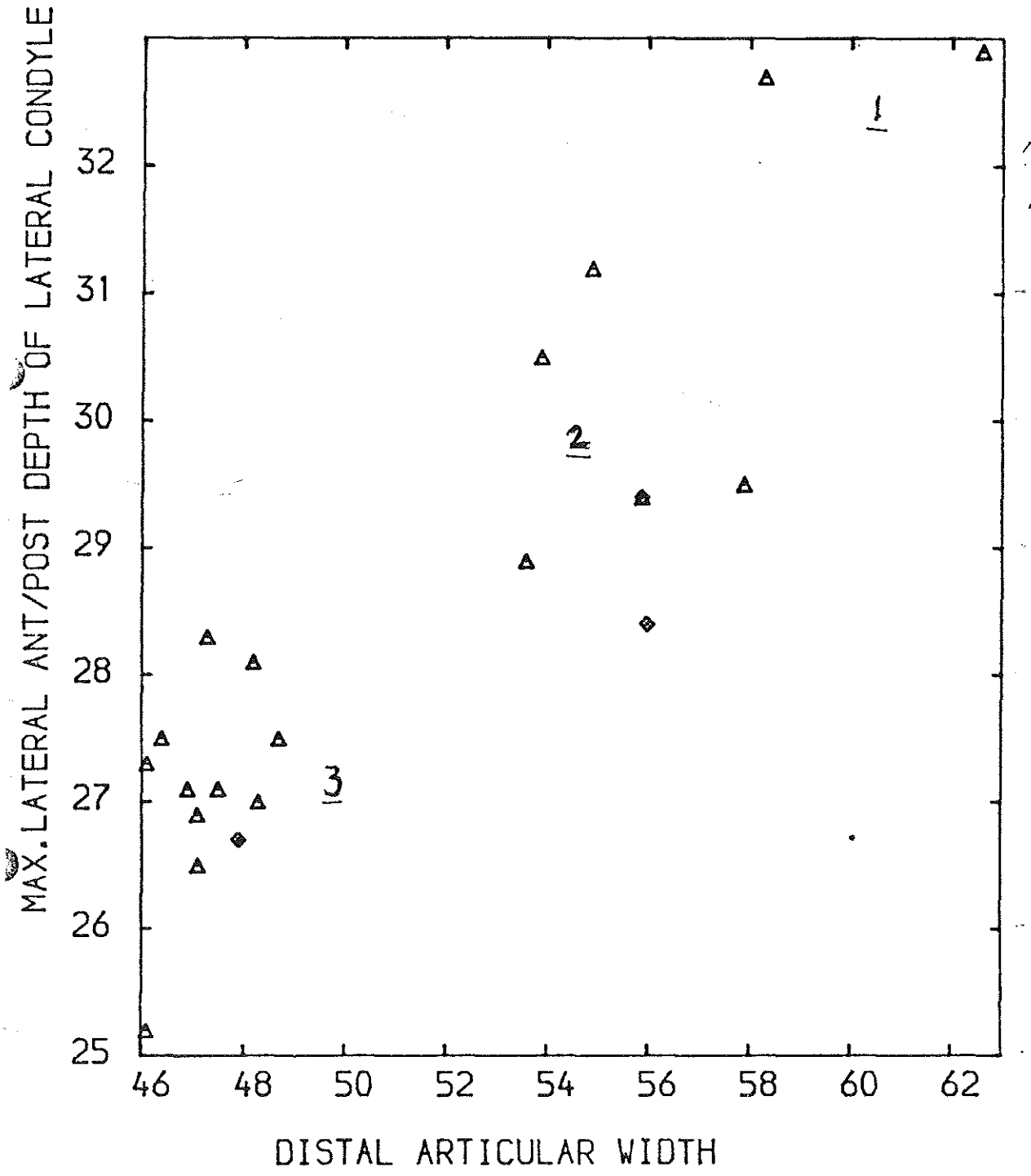


scattergram of the maximum lateral ant/post depth of th
lateral condyle against the maximum distal ~~art~~
articular width of cattle metacarpals from blackfriars

BLACKFRIARS, CARLISLE Fig. 6



scattergram of the maximum lateral ant/post depth of the lateral condyle against the maximum distal ~~art~~ articular width of cattle metatarsals from blackfriars

butchery practice has not been undertaken for this report this evidence has been recorded and is available.

Soil Samples

In the course of the analysis of a number of soil samples for insect and botanical remains (see Kenward p.oo and Donaldson p.oo) the residues were all checked for vertebrate material. These samples therefore represent the only check on the small vertebrates such as fish and small terrestrial mammals and birds.

48 samples were processed of which a proportion produced vertebrate fragments and of these fewer still produced any identifiable remains. The samples represented approximately 57 kilogrammes of soil. Although many bone fragments we were sorted from the residues the following note considers only the identifiable material.

Only five samples from Roman levels produced identifiable vertabrate remains. These were a burnt sheep petrous from Building 1 Period 9 and a proximal fowl radius from Period 8 in Building 1. The remaining finds came from Building 2. A number of bones of house mouse, Mus musculus were found in D538 Period 2 and included a fragmented skull, mandible, radii, an ulna and a number of metapodials. It is probable that the find represents one individual. A probable field vole scapula, Microtus sp, was found in B160, an oven fill, in Period 11 and a small ungulate thoracic vertabra from D303 Period 3.

Although these finds are minimal the negative character of the soil samples is interesting. No identifiable fragments of fish bone or fragments recognisable as fish were recovered from the samples and this combined with their near absence from the hand picked collection suggests that in the Roman periods (from which the majority of the samples derive) fish probably contributed little to the diet. Only two finds of small mammal is also unusual although recent work on a considerably greater quantity of soil from the Roman levels at Castle Street,

Rackham, D.J. 1983 Faunal Sample to subsistence economy: some problems in Reconstruction in Integrating the Subsistence Economy (ed. M,K, Jones), Symposia A.E.A. No. 4, BAR Int. 181. 251-277.

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Silver, I.A. 1969 The ageing of domestic animals, in Science in Archaeology (eds. D. Brothwell and E. Higgs), 283-302.

von den Driesch, A. 1976 A guide to the measurement of animal bones from archaeological sites. Peabody Mus. Bull. 1. Harvard.