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THE MAMMAL AND BIRD BONE FROM THE 1986 EXCAVATIONS AT CROWN COURT, NEWCASTLE ON TYNE, TYNE & WEAR. PARTS 1 & 2.

Louisa J Gidney

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Summary

Animal bone was recovered from two areas, F and H, excavated to examine the development of the quayside area. Human activity begins in the 13th century on both sites and continues until the 20th century in Area H and post-15th century in Area F.

Over 8,000 fragments of bone were recovered by hand during excavation, with further fragments from the sieved samples. The larger groups of bone are from the 14th to 16th century phases. Preservation is good in the earliest, waterlogged deposits but generally poor in the later phases.

The collection from both areas largely consists of cattle and sheep/goat bones with some pig. Other species are present but their remains are scarce. There are some slight differences chronologically and spatially between the two areas: for example the relative proportion of sheep/goat bones increases in the later phases. There are no clear patterns of skeletal selectivity to suggest any specific sources for any of this material. Rather it all appears to derive from general mixed urban household refuse.

While juvenile bone may well be under-represented the majority of the surviving bones are from animals that had reached reproductive age and thus may only have been consumed as food at the end ot their useful working lives.

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The Mammal and Bird Bone from the 1986 excavations at Crown Court, Newcastle upon Tyne. Part 1.

By L. J. Gidney.

Introduction

The animal bones in this report were recovered both by hand picking on site and from sieving of samples of Phases 1-3 in Area H and Phases 1-2 in Area F. Part 2 of this report also contains information on the animal bone from Area H Phases 4-6 and Area F Phase 3. This approach is regretted but had to be adopted to meet the excavator's deadline for the report. Part 1 of this report was prepared first and forms the basis of the published bone report for this site. Part 2 was prepared later and this information is not included in the published site report.

The animal bones are stored with the Archaeological Unit for North East England, The University, Newcastle upon Tyne.

The smallest collection, as can be seen from Table 1, was recovered from Area H Phase 1 - the earliest quay wall and associated deposits. Less than half the deposits assigned to this phase produced animal bone. Area H Phase 2 consists of dumping in front of the quay wall, roughly half the contexts in this phase contained bone though the overall quantity is still quite small. Phases 1 and 2 are thought to span the mid/late thirteenth century.

Area H Phase 3 consists of build up above the quay wall and is thought to be fourteenth century activity. There is a greater variety in the nature of the contexts encountered and over half the contexts contained animal bone.

Both phases under consideration in Area F produced structural remains. Phase 1 covers the late thirteenth to mid fourteenth century while Phase 2 spans the mid fourteenth to fifteenth centuries.The features assigned to Phase 1 were uncovered in a smaller trench within the main area of excavation hence the smaller collection of bones.

The material from each phase has been considered together irrespective of the individual nature of the contexts whence it derived. Some loss of information may occur with this approach.

Identification

Where possible bone fragments were identified to species using the reference collection of the Biological Laboratory, Department of Archaeology, University of Durham. Fragments not readily identifiable to species, such as ribs and vertebrae, were ascribed to the size categories of large ungulate and small ungulate.

Large ungulate corresponds to cattle, horse and red deer. However given the total absence of identified red deer remains and the paucity of horse remains large ungulate is here taken to generally represent fragments of cattle. The term large mammal is used for long bone fragments and some amorphous pieces from cattle sized bones.

Small ungulate corresponds to sheep/goat, pig, fallow and roe deer, but as neither deer is present and pig bones are more readily identified small ungulate may be taken to generally indicate sheep/goat.

The alternatives of sheep or goat are given in this report due to the difficulty of distinguishing the two species from most bone fragments. A fragment of goat horn core was recovered from Area F Phase 2 while fragments of sheep skull were found in Area F Phase 2 and Area H Phase 3. None of the metapodials or other fragments obviously exhibited the characteristics of goat. Since only one fragment was identified as goat it is presumed that the majority of sheep/goat fragments are derived from sheep.

No bones were measured as a rapid scan of the material suggested that there would be insufficient intact specimens of like elements to allow meaningful analysis of metrical data. The taking of measurements would also have increased the time needed to produce this report. In view of the limited time allowed it was not felt that the information gained from measurements would be cost effective for this site.

Details of the sampling procedures used on this site may be found in the main site report. The sampling programme produced bone fragments from Phases 1 and 2 in Area F and Phases 2 and 3 in Area H. The most significant contribution of the samples occurs in Area F Phase 1 where there is a noticeable increase in the number of sheep/goat and pig fragments compared to the hand picked fragments. In all the samples vast numbers of minute bone fragments were recovered - the figures given in the unidentified column in Table 1 are the number of fragments that could be picked up by hand in the laboratory and does not include 'dust'. This gives some indication of the total quantity of bone fragments recovered from the samples and the proportion of

identifiable fragments. Only the fragments identifiable to species from the samples have been used in the further analyses.

Preservation and Fragmentation

This collection comprises 3593 hand picked fragments of mammal and 91 fragments of bird bone and approximately 1450 fragments of mammal and 29 fragments of bird bone from the samples.

The state of preservation varied between the phases. The bone from the earlier phases was generally in good condition. The fairly high proportion of bones from Area H Phase 1 recorded as decayed in Table 2 appears to have weathered prior to burial in these deposits and stabilised thereafter. The bones in Area F Phase 2 and Area H Phase 3 were generally in poor condition with the surfaces flaking and the bone becoming soft and crumbly. Some contexts produced bones that were in noticeably poorer condition and this is probably related to the nature of the deposit from which they were recovered.

The poor level of preservation may account for the absence of identified red or fallow deer bones. A few exceptionally gracile but very decayed fragments were at first thought to be deer but were catalogued as cattle after a very gracile femur in better condition was seen from Area H Phase 4..

A generally poorer state of preservation in the later phases can also be seen in Table 3 with the

increase in totally unidentifiable fragments. A high proportion of loose teeth generally indicates poor preservation as teeth are very robust and survive after the jaw has decayed. It can be seen from Table 4 that Area F Phase 2 has a high proportion of teeth amongst the identified fragments.This does not include loose teeth which obviously formed part of the same tooth row and so were catalogued as a mandible or maxilla fragment.

The degree of fragmentation is further illustrated in Table 5 showing the number of zones represented. This is a method developed by Rackham (1987) whereby each major bone is allocated up to ten diagnostic zones, each zone being recognisable on a bone fragment though not every identifiable fragment encompasses a zone. A zone is only counted if at least half the appropriate feature is present. A higher number of zones to identified bones gives a higher fragmentation index which indicates a lesser degree of fragmentation. It can be seen that although Area F Phase 2 has the greatest number of identified cattle remains the fragmentation index is the lowest. The fragmentation indices for sheep/goat are overall higher than those for cattle showing that they are not as comminuted as the cattle bones though Area F Phase 2 again has the lowest index. There are far fewer bones of pig but again Area F has lower indices than Area H.

Surprisingly few identifiable sheep/goat fragments were recovered from the samples. Irrespective of the degree of fragmentation the smaller elements of sheep/goat are often missed by hand excavation (Payne, 1972).

Table 6 indicates some of the factors affecting the collection prior to deposition though it should be noted that post depositional decay will have obscured many butchery and gnawing marks. Occasional bones of dog were recovered from each phase and bones with canid gnaw marks were only absent from the small group from Area H Phase 1. The effect of canid scavenging on this assemblage is probably greatly underestimated by a simple count of bones with clearly visible gnaw marks. In comparison bones with rodent gnaw marks were extemely scarce. Actual rodent bones were also scarce only being noted in samples from three contexts and not identified to species as the only jaw lacked teeth.

Butchery marks were noted in all phases though the low proportion of bones exhibiting such marks does not imply that the majority of this collection was not domestic food refuse, many bones shatter without having clearly noticeable chop marks. Knife marks were only noted on the well preserved fragments from Area H Phase 1 suggesting that the poor state of preservation has obscured such traces.

A few small fragments of burnt bone were recovered from the hand picked collections in each phase but the samples from Area F Phase 2 and Area H Phase 3 provided a dramatic increase in small burnt fragments suggesting much bone in these phases had been destroyed by fire. One identifiable fragment was a sheep/goat first phalanx which may provide one explanation, apart from recovery bias, for the low numbers of phalanges to metapodials encountered. One fragment probably of grouse ulna suggests that much small bird bone has been lost too,

however most burnt fragments were too distorted or too comminuted to identify.

It can be seen from Table 1 that eight species of mammal were identified though the bulk of the fragments were from the three domestic food animals: cattle, sheep and pig. The remains of the other domestic animals: horse, goat, dog and cat are sparse. While goat and horse are perfectly edible there is insufficient evidence from this site to indicate the consumption of either species.

A dog burial would appear to have been disturbed in Area F Phase 2 otherwise the cat and dog remains were stray fragments.

A single rabbit bone was found in Area H Phase 3. There would appear to be a general paucity of cat and rabbit remains on this site as only one further cat bone was recovered from the samples.

Goose and domestic fowl are present in all but the small collection from Area H Phase 1. Amongst the unidentified bird fragments are several which are probably juvenile fowl and long bone fragments of goose. Otherwise the majority of the bird bone and the greatest range of species were recovered from Area H Phase 3. The pigeon, grouse and guillemot bones from Area H Phase 3 are probably food waste while the crow/rook and gull could equally be natural mortalities or killed as pests. Poultry and game must have added very infrequent variety to the diet. Nontheless their contribution to the diet is probably greatly underestimated by these few fragments.

Quantification of the major domestic species

To enable some degree of comparison with the associated Queen Street site three of the methods of quantification used by Rackham (1988) are presented here in Table 7. These are the relative percentage of identified fragments for each species, the relative percentage of the total number of zones of each species and the ratio of the most frequent zones in each species. The inherent biases of these methods have previously been discussed by Rackham (op. cit.).

The general trend apparent in all phases is for cattle fragments to be most numerous followed by sheep/goat then pig though there would appear to be less difference between the proportions of cattle and sheep/goat present in Area H Phases 2 and 3.

Relative Frequency of Skeletal Elements

It has been previously noted that this collection has suffered considerable decay and may no longer be representative of the original consumption patterns. It can be seen from Table 8 that all parts of the carcase of cattle and sheep/goat are represented in the larger groups. There are some variations between Area F Phase 2 and Area H Phase 3 which may be indicative of the preferred carcase portions consumed in these phases. In Area F Phase 2 both cattle and sheep/goat have high proportions of skull and jaw fragments whereas in Area H Phase 3 there are high proportions of ribs and vertebrae for both species. However the number of ribs present is exaggerated by the fact that even tiny fragments can be recognised and counted. This is also true of vertebrae. There are slightly more fragments from the forelimb than

the hindlimb of cattle whereas fragments of both limbs of sheep/goat occur in approximately equal numbers in both phases. Feet are well represented for both cattle and sheep/goat in both phases.

While skull and jaw fragments are common in Area F Phase 2 only two small fragments of cattle horncore and one of goat horncore were identified suggesting that heads with the horns removed were bought for food. The sheep do not appear to have been polled as the scar of a horn core was noted on one skull fragment.
The few pig bones show a slight preponderance of head fragments too in the later phases.

In general it would seem that poorer quality/cheaper cuts of beef were commoner in Area F Phase 2. The lack of skeletal selectivity suggests that these bones derive from domestic food waste and are not the byproducts of commercial processing.

Analysis of Age Structure

The age at which animals were slaughtered is estimated from the stages of epiphysial fusion and tooth eruption and wear. The poor state of preservation of much

bone from this site has had a serious effect on the original pattern of slaughter and consumption as much juvenile bone will have decayed beyond recognition. It can be seen from Table 9 that the number of surviving epiphysial ends is small in comparison with the number of identified fragments seen in Table 1. Furthermore few of the epiphyses are unfused ends from juvenile animals. Since the preservational bias is against juvenile bone unfused epiphyses and unfused diaphysial ends have both been counted unless they were matching ends of one bone. The ages of fusion and eruption in Tables 9 and 10 are taken from Silver (1969, 285-6, 296-8). The modern figures have been used which may underestimate the age at which these events occured in the archaeological stock, so these ages should only be used as a general guide.. For Table 10 deciduous teeth are counted as unerupted permanent teeth, slight wear corresponds to Grant Stages a-e and heavy wear to stage f onwards (Grant 1982, 92-3).

The epiphyses indicate a similar pattern of survival for cattle in Area F and Area H. All the epiphyses for each area are presented in Table 9, the subtraction of the few epiphysial ends from the earlier phases in each area does not alter the overall pattern. This may merely be an artifact of preservation as the teeth, Table 10, suggest for Area F a higher cull of animals less than 3 years old than the epiphyses do.

While the number of fragments is small and preservation is not good it may perhaps be suggested that a higher proportion of the beef consumed in Area F was provided by animals less than 5 years old with a slightly

higher proportion of more elderly beasts consumed in Area H.

The sheep/goat epiphyses show slightly more contrast between the two areas. Despite the poor preservation and low numbers of fragments it may be suggested that in Area F the majority of the mutton was provided by animals less than 5 years old and probably 2 or 3 'shear'. Rather more of the animals from Area H would appear to have survived beyond 5 years. The teeth show a similar pattern with a high proportion of deciduous teeth and adult teeth with little wear in Area F but very few in Area H. The consumption of lamb could be greatly under-represented in both areas.

Due to the overall paucity of pig bones all the epiphysial ends from both areas are presented in Table 9. The absence of any unfused bones from animals less than a year old is probably only a factor of survival as it can be seen from Table 10 that the overwhelming majority of the teeth are either deciduous or adult teeth with little wear. The absence of any third molar exhibiting reasonable wear is particularly striking. The pigs consumed in both areas would rarely seem to have attained ages in excess of 2 years

Pathology.

Several bones from Area F showed pathological conditions. A sheep/goat tibia from Phase 1 had broken and healed with massive bone growth. The leg may not have been splinted as the broken ends of the bone had healed well out of alignment.

In Phase 2 a fowl ulna had been broken and healed with the broken ends out of alignment. A pig mandible showed abnormal growth below the condyle and a pig maxilla had a most unusual enamel formation, possibly hypoplasia, on the erupting third molar. There were two examples of first phalanges of cattle showing broadening of the proximal condyle, one of which had slight lipping. A metatarsal had slight lipping on the distal condyle. Such conditions of the foot are often interpreted as indicating working oxen but may simply reflect old age.

In contrast Area H only produced a sheep/goat axis vertebra with slight lipping on the centrum.

Summary

This collection is largely composed of the remains of cattle and sheep/goat with some pig. Other species are present but their remains are very scarce.

A fairly high proportion of the cattle and sheep/goat appear to have reached productive/reproductive age and thus may only have been consumed as food after they ceased to be productive (see O'Connor 1989, 15). In contrast the pigs appear to have been killed before two years of age which may suggest that young pigs were bred for urban consumption. Though the number of fragments is small there is a suggestion that the cattle and sheep/goat consumed in Area F were younger animals than those found in Area H.

There are no clear patterns in skeletal representation for any of the three species to suggest any particular sources for this material. The bones appear to have been part of the disposal of general mixed refuse.

Some small differences are apparent between the two areas of excavation. While cattle bones are the most abundant in all phases Area H Phases 2 and 3 have the highest proportions of sheep/goat bones. In Area F Phase 2 there are higher proportions of skull fragments for cattle and sheep/goat whereas in Area H Phase 3 rib and vertebrae fragments are more numerous.

Conclusion

This collection shows many similarities to that recovered from the related Queen Street site (Rackham,

op. cit.). The debris appears to be derived from a domestic source and the relatively low proportion of contexts in Area H which produced bones suggests casual accumulation rather than communal waste disposal or exploitation of midden material for make-up deposits.

There are slight differences in the composition of the bone assemblages from Area F and Area H which may imply that the occupants of the structures located in Area F did not generate the rubbish recovered from Area H.

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Table 1. Fragment counts for the species present
H = Handpicked S = Samples

	Area F Phase 1		Area F Phase 2		Area H Phase 1		Area H Phase 2		Area H Phase 3	
	H	S	H	S	H	S	H	S	H	S
Cattle	60	7	503	7	13		44	3	235	7
Sheep/Goat	18	14	179	6	4		23	3	199	10
Sheep			2						1	
Goat			1							
Pig	7	6	51	9	3		10		62	7
Horse			6				1		2	
Dog	2	1	17	9	1		1	2	7	
Cat			1		1		1		2	1
Rabbit									1	
S. Ungulate	11	8	54	2	9		37	1	163	3
L. Ungulate	54	8	153	11	12		80	2	282	10
L. Mammal	18	2	213	16	7		30	1	203	2
Indet. Mam.	27	339	291	553	5		7	49	479	351
	197	385	1471	613	55		234	61	1636	391
Goose	2		4				4		16	1
Fowl	2	3	7	2			2	1	14	3
Crow/Rook			1						1	
Gull									1	
Pigeon									2	
Grouse									1	
Guillemot									1	
Indet Bird	1	2	7	1	2			9	23	7
	5	5	19	3	2		6	10	59	11

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Table 2. The percentage of bones recorded as decayed.

Area F Phase 1	Area F Phase 2	Area H Phase 1	Area H Phase 2	Area H Phase 3
4.5%	34.2%	16.3%	2.1%	29.5%

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Table 3. Hand picked mammal only.

	Area F Phase 1	Area F Phase 2	Area H Phase 1	Area H Phase 2	Area H Phase 3
% id. to species	44%	51.3%	25.9%	34%	30.8%
% id. to size	42%	28.4%	58%	62.7%	39.1%
% not id	13.7%	19.7%	9%	2.9%	29.2%

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Table 4

	Area F Phase 1	Area F Phase 2	Area H Phase 1	Area H Phase 2	Area H Phase 3
Cattle					
No. of id. frags without teeth	60	382	13	44	223
No. of loose teeth	0	121	0	0	12
Loose teeth as % of total no. of id. frags	0	24.0%	0	0	5.1%
Sheep/Goat					
No. of id. frags without teeth	17	139	4	23	187
No. of loose teeth	1	43	0	0	13
Loose teeth as % of total no. of id. frags	5.5%	23.6%	0	0	6.5%
Pig					
No. of id. frags without teeth	7	39	3	9	53
No. of loose teeth	0	12	0	1	9
Loose teeth as % of total no. of id. frags	0	22.2%	0	10.0%	14.5%

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Table 5

	Area F Phase 1		Area F Phase 2	Area H Phase 1	Area H Phase 2	Area H Phase 3
Cattle	H	H+S				
No. of zones	75	82	347	21	51	299
No. of bones with zones	40	44	222	12	29	208
No. of bones id.	60	67	503	13	44	235
Frag. Index	1.25	1.22	0.68	1.61	1.15	1.27
Sheep/Goat						
No. of zones	32	49	208	9	50	323
No. of bones with zones	27	15	100	2	16	136
No. of bones id.	18	32	182	4	23	200
Frag. Index	1.77	1.53	1.14	2.25	2.17	1.61
Pig						
No. of zones	2	4	35	4	8	56
No. of bones with zones	2	4	25	2	6	30
No. of bones id.	7	13	51	3	10	62
Frag. Index	0.28	0.30	0.68	1.33	0.80	0.90

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Table 6. Nos. of fragments with gnawing, butchery or burnt
+ = + samples

	Area F Phase 1	Area F Phase 2	Area H Phase 1	Area H Phase 2	Area H Phase 3
Gnawed by dog	14	18		7	26+1
Gnawed by rodent		2		1	1
Chop marks	20	61	3	18+1	42+2
Knife marks			3		
Burnt	2+17	2+155	1	1+7	31+89

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Table 7. Figures obtained using three quantification methods

	Cattle		Sheep/Goat		Pig	
Area F Phase 1						
No. of frags	60	70.5%	18	21.1%	7	8.2%
Total no. of zones	75	68.8%	32	29.3%	2	1.8%
Most frequent zone	6	66.6%	2	22.2%	1	11.1%
Area F Phase 2						
No. of frags	503	68.3%	182	24.7%	51	6.9%
Total no. of zones	347	58.8%	208	35.2%	35	5.9%
Most frequent zone	18	56.2%	10	31.2%	4	12.5%
Area H Phase 1						
No. of frags	13	65%	4	20%	3	15%
Total no. of zones	21	61.7%	9	26.4%	4	11.7%
Most frequent zone	3	60%	1	20%	1	20%
Area H Phase 2						
No. of frags	44	57.1%	23	29.8%	10	12.9%
Total no. of zones	51	46.7%	50	45.8%	8	7.3%
Most frequent zone	3	33.3%	5	55.5%	1	11.1%
Area H Phase 3						
No. of frags	235	47.2%	200	40.2%	62	12.4%
Total no. of zones	299	44.1%	323	47.6%	56	8.2%
Most frequent zone	22	52.3%	16	38.0%	4	9.5%

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Table 8. Nos of skeletal elements. + = + samples

Cattle & L.Ung.	Area F Phase 1	Area F Phase 2	Area H Phase 1	Area H Phase 2	Area H Phase 3
Skull	7	110+1		4	23
Jaw	4+3	126+3		3	18+1
Scapula	9+2	27	3	2	29+1
Humerus	1	29		5	17
Rad. & Uln.	7	39	1	7	38+1
Cervical Vt.	1	20		2	13+1
Thoracic Vt.	4+1	13	1	3	19+1
Lumbar Vt.	3	14	8	4	13+1
Rib	42+5	85+6		64+1	238+7
Pelvis	6	17	3	3+1	31
Femur	+1	15		+1	12+1
Tibia	2	15	1	2	24
Carpals		3			2+1
Tarsals	5	15	2	4	18
Metacarpal	4+1	28+1		4	24
Metatarsal	8	34	3	6	24+1
Phalanges	7	38+2		4+1	41+1
Sheep/Goat & Small Ungulate					
Skull	1+2	21+2		+1	14+1
Jaw	2+2	41+1	1	2	29+5
Scapula	1	14+1	2	2+1	17
Humerus	2	12	1		10+1
Rad. & Uln.	2+1	14		7	19+1
Cervical Vt.	1	3		+1	10
Thoracic Vt.	+1	1	1	1	9+1
Lumbar Vt.	+1	1+1			13+2
Rib	6+4	34	8	32	88
Pelvis	2	14		6	16
Femur	2	10		+1	7
Tibia	2	21+1		3	26+1
Carpals					
Tarsals					5
Metacarpal	1+1	17		1	19
Metatarsal	3+2	9+1		2	20+1
Phalanges	+7	7			10
Pig					
Skull	2+3	9+3		2	16+3
Jaw	1+2	18+4	1	3	12+3
Scapula	1	2		1	3
Humerus		4			5
Rad. & Uln.	1	3+2		1	5
Cervical Vt.		1			
Thoracic Vt.				1	2
Lumbar Vt.					
Rib					
Pelvis		3			4
Femur	1	2	1		3
Tib. & Fib.	+1	6	1	1	3
Carpals					
Tarsals		1			2
Metacarpals					2
Metarsals	1	2		1	4
Phalanges					+1

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Table 9

Age Cattle	Area F Phases 1 & 2 Fused	Unfused & Just fused	% Unfused in each age category	% killed
0-2 yr	62	1	1.5%	1.5%
2-3 yr	29	8	21.6%	20.1%
3-4yr	13	9	40.9%	19.3%
5yr	7	27	79.4%	38.5%
>5 yr				20.6%
Cattle	**Area H Phases 1 - 3**			
0-2 yr	52	1	1.8%	1.8%
2-3 yr	24	6	20.0%	18.2%
3-4yr	9	9	50.0%	30.0%
5 yr	7	16	69.5%	19.5%
>5 yr				30.5%
Sheep/Goat	**Area F Phases 1 & 2**			
0-1 yr	22	1	4.3%	4.3%
1-2 yr	29	1	3.3%	0
2.5-3.5 yr	1	7	87.5%	83.2%
5 yr	2	6	85.7%	0
>5 yr				12.5%
Sheep/Goat	**Area H Phases 1 - 3**			
0-1 yr	20	1	4.7%	4.7%
1-2 yr	28	4	12.5%	6.7%
2.5-3.5 yr	11	13	54.1%	41.6%
5 yr	9	12	57.1%	3.0%
>5 yr				42.9%
Pig	**Area F and Area H**			
0-1 yr	12			0
2-3 yr	1	7	87.5%	87.5%
3-4 yr	1	8	88.8%	1.3%
5 yr		3	100%	11.2%
>5 yr				0

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Table 10
U = Unerupted S/W= Slight Wear H/W = Heavy Wear

		Area F			Area H		
Cattle		U	S/W	H/W	U	S/W	H/W
5-6m	M1			46			9
15-18m	M2	1	5	36		1	2
24-30m	P2		2	1			1
18-30m	P3	4	5	5			3
24-30m	M3	5	10	34			3
28-36m	P4	4	3	9	1	1	2
Sheep/Goat							
3-5m	M1			19			13
9-12m	M2		1	21			18
21-24m	P2		3	2		3	1
21-24m	P3		2	6	1		8
18-24m	M3	2	15	12		4	16
21-24m	P4		3	9			10
Pig							
4-6m	M1		2	6		2	4
7-13m	M2	1	4	1		2	2
12-16m	P2		2		1	1	
12-16m	P3	2	2	1	1	2	
12-16m	P4	2	2	1	2	3	1
17-22m	M3	1	2		3		

The Mammal and Bird Bone from the 1986 excavations at Crown Court, Newcastle upon Tyne. Part 2.

By L. J. Gidney.

Introduction

The animal bone from the later phases of activity could not be incorporated in the published animal bone report for this site. This report is an adjunct to Part 1 of the Mammal and Bird Bone report which should be referred to for the approach taken with this material. The published report is based on Part 1 of the archive report only.

The animal bone is stored at the Archaeological Unit for North-East England, The University, Newcastle upon Tyne.

The groups under consideration here are Phase 3 in Area F and Phases 4-6 in Area H. Area F Phase 3 appears to have been open ground used for dumping from the fifteenth century onwards. Area H Phase 4 is thought to span the fifteenth to sixteenth centuries, Phase 5 is seventeenth to eighteenth century and Phase 6 nineteenth to twentieth century. The bones from Area H Phase 4 have the greatest potential interest as they are associated with a phase of industrial activity, though it is not known what was being produced. Over half the contexts assigned to this phase produced bone and the collection from this phase is the largest encountered at Crown Court. Area H phases 5 and 6 are small groups associated with relatively modern brick constructions. The bone from these two groups has been catalogued but no further analysis has been undertaken. A small collection of

unstratified bone is also present but has not been catalogued in detail.

The bone fragments from the samples were looked at but due to a tight time scedule only those fragments identifiable to species were recorded and listed in Table 1. These fragments have not been used in the other tables.

Preservation and Fragmentation

The two large groups, Area F Phase 3 and Area H Phase 4, comprise 4453 handpicked fragments of mammal and 80 fragments of bird bone with a further 192 fragments of mammal and 9 of bird from the late phases in Area H.

The state of preservation of the bone in these later deposits is very variable. As can be seen from Table 2i Area F Phase 3 has the highest proportion of decayed bone, with surfaces flaking and the bone crumbling, of any phase. A significantly smaller proportion of bones from Area H Phase 4 were decayed in comparison with Area H Phase 3. The decayed bone from Area H Phase 4 may be largely redeposited after prolonged surface weathering since some contexts produced fragments in exceedingly poor condition together with well preserved juvenile bone. Post-depositional decay would have eliminated the porous and fragile juvenile bone first. The bone from Area F Phase 3 appears to have suffered post-depositional conditions similar to those encountered in the earlier phases with the bone becoming flaky and crumbly. Also of note are two contexts from Area H Phase 4 and one from Phase 5 which contained some bones in exceptionally good condition. These appear to have been redeposited from early waterlogged deposits. Bone that

appears to have been waterlogged is also present in the unstratified material.

Preservational differences between Areas F and H can also be seen in Table 3i. Area F Phase 3 exhibits great similarity to Area F Phase 2. Area H Phase 4 shows an increase in the proportion of fragments identifiable to species compared to the earlier phases in Area H. There is a concomitant drop in the fragments only assignable to a size category but the proportion of unidentifiable fragments remains similar. This may be related to the better condition of the bone from Area H Phase 4 with more fragments having identifiable features surviving. In contrast it may be suggested that the low proportion of unidentifiable fragments from Area F Phases 2 and 3 compared with the high proportion of decayed fragments indicates that fragments that have survived as indeterminate in Area H have completely decayed in Area F.

As can be seen from Table 4i there is a slight rise in the proportion of loose teeth in both Area F Phase 3 and Area H Phase 4. While this phenomenon is open to more than one interpretation in Area F Phase 3 this could probably be further illustration of the poor condition of the bone in general whereas in Area H Phase 4 the loose teeth may be indicative of the redeposited weathered material or of dog scavenging (Serjeantson 1989, 4).

The degree of fragmentation as evidenced by the fragmentation index using zones is shown in Table 5. Area H Phase 4 shows higher fragmentation indices for all 3 species than Area F Phase 3, again illustrating that the bone from Area H is generally in better condition than

that from Area F. However despite the overall increase in the number of identified fragments the fragmentation indices for cattle and sheep/goat are very similar between Area F Phases 2 and 3. In contrast Area H Phase 4 shows considerably lower fragmentation indices than Area H Phase 3 for both cattle and sheep/goat. Only for pig bones are the indices for Area H Phases 3 and 4 similar unlike Area F where the fragmentation index for pig is lower in Phase 3 than Phase 2. This may be related to Table 4i where it can be seen that there is an increase in the proportion of loose pig teeth in Area F Phase 3.

It can be seen from Table 6i that there is a considerable increase in the proportion of bone fragments with canid gnaw marks in Area H Phase 4. Since this is a structural phase unlike the open ground of Area F it seems probable that dogs were kept by the occupants of the structures and either given bones to gnaw or scavenged the waste food debris of the inhabitants. The consumption of bones by dogs in this phase has probably resulted in the low fragmentation indices for cattle and sheep/goat, seen in Table 5i, for an otherwise reasonably well preserved collection.

Only 4 dog bones were recovered from Area H Phase 4 suggesting that the inhabitants did not bury dead dogs in their back yard. However an adult cat had been interred in Context 088.

Only one fragment from Area H Phase 4 and one from Area F Phase 3 had been gnawed by rodents though rodent or small mammal bones were recovered from samples taken from 6 contexts in Area H Phase 4.

Butchery marks are present on fragments from both phases but more have probably been obscured by weathering, decay and canid gnawing. It is presumed that the majority of these groups derive from the sporadic disposal of domestic food refuse.

Very few burnt fragments were recovered by hand excavation and the samples did not provide the dramatic increase in burnt fragments seen in the earlier phases. Given the number of hearth fills and ashy deposits recorded in Area H Phase 4 it is surprising that there are fewer fragments of burnt bone than in Area H Phase 3.

Species

It can be seen from Table 1 that ten species of mammal were identified though the overwhelming majority of the fragments were of the domestic food animals: cattle, sheep/goat and pig. The option of sheep or goat is given but 24 skull fragments were positively identified as sheep. None of the remaining skull fragments or feet bones suggested the characters of goat so goat is not thought to be represented. Remains of other animals are sparse. The group of 73 cat bones from Area H Phase 4 are all from one animal. The sampling programme only produced 2 further cat bones and none of dog, rabbit or hare showing the scarcity of the remains of these species. The waste ground of Area F Phase 3 does not appear to have attracted the disposal of inedible carcases such as dog and horse.

Goose bones appear in similar numbers to those of fowl though rather more of the indeterminate fragments are likely to be long bone shaft fragments of goose. Only one

wild species, crow/rook, is represented. The absence of other wild species is unusual compared to the earlier phases since these groups are larger. This may suggest that the wild birds eaten in earlier phases were perhaps replaced by the occasional hare or rabbit in the later phases. Consumption of wild birds may have declined at the Reformation with the ending of certain dietary restrictions. In any case poultry and game must have been a very infrequent treat.

Red deer is represented in Area H Phase 4 by single fragments of antler beam and metatarsal, both decayed. Neither piece is from a meat bearing joint so there is no evidence for the consumption of venison. An exceptionally gracile femur was recovered from Area H Phase 4 but this was definitely ox and supports the identification of the gracile fragments from the earlier phases as ox rather than deer.

Roe deer is represented in the unstratified material by a complete antler which had been chopped from the skull.

The unstratified material largely comprises cattle, sheep/goat and pig with single fragments of horse and dog.

Quantification of the major domestic species

The same methods as were used in the Queen Street and Crown Court part 1 reports are presented in Table 71. Using fragment counts cattle fragments are more numerous in Area F Phase 3 but both methods using zones suggest a more even division between cattle and sheep/goat. In Area H Phase 4 fragment counts suggest little difference between the representation of cattle and sheep/goat

whereas the zone methods indicate a higher proportion of sheep/goat. This pattern is very similar to that seen in Queen Street Phase 6 (Rackham, 1989).

Relative Frequency of Skeletal Elements

It is very noticeable from Table 8i that there are very high numbers of skull and jaw fragments present for all three species in Area F Phase 3 and low numbers of vertebrae. Remains of all parts of the body are much more evenly represented in Area H Phase 4. The proportions of limb and feet bones are not dissimilar in both phases for both cattle and sheep/goat, though there are relatively more metapodials to other long bones for cattle in Area F Phase 3.

The pig bones from Area F Phase 3 show either greater selectivity or a higher level of destruction with over half the fragments being from the head, the rest being limb and feet bones. No pig vertebrae were identified in this phase. The pig bones from Area H Phase 4 show a much more even representation of all parts of the carcase.

Despite the general frequency of skull fragments horncores are scarce with only two fragments of cattle horncore recovered from Area H Phase 4 and one from Area F Phase 3. Area H Phase 4 produced some particularly well preserved sheep skull fragments, including five partial skulls of naturally polled sheep and two fragments with scars from the removal of the horncores, presumably by the butcher. Area F Phase 3 produced only one fragment of horncore probably from a ram. This could be a stray fragment of horners waste as ram horn is a versatile commodity for walking stick handles and other artifacts.

Amongst the unstratified bone is a well preserved partial skull of a horned ewe very similar to a modern Swaledale.

Analysis of Age Structure

The slaughter patterns suggested by the stages of epiphysial fusion are shown in Table 9i and teeth wear in Table 10i. The pattern of survival for cattle is very similar in both Area F Phase 3 and Area H Phase 4 though there is a slightly higher proportion of animals slaughtered up to 3-4 years in Area H Phase 4 compared to Area F Phase 3 which has slightly more killed at roughly 3-4 years. Both these later phases show a higher proportion of beasts surviving beyond five years than was seen in the earlier phases in both areas. The teeth from Area F Phase 3 indicate a very similar pattern to the epiphyses with a third of the teeth that erupt in the second and third year having slight wear (Grant stages a-e) or not erupted. The fewer teeth from Area H Phase 4 also have a quarter of the later erupting teeth unerupted or with slight wear.

The cattle killed before two years old include 17 fragments from Area H Phase 4 and 2 fragments from Area F Phase 3 from very young, probably neonatal, calves. These may be bobby calves bought for potted veal or natural mortalities from urban milch cows.

The sheep/goat show a peak cull at roughly 2.5-3.5 years which was also the peak cull age in the earlier phases. However the small sample from Area F Phase 3 suggests that a higher proportion may have survived beyond 5 years than in Area H Phase 4. This would be a

reversal of the trend seen in the earlier phases where Area H Phase 3 had the highest proportion surviving beyond 5 years. In both the later phases there is an increase in the proportion of lambs less than one year old despite the poor level of preservation seen in Area F Phase 3. There are no bones from infant lambs, only fat lamb. This may suggest that the occupants of the structures associated with the industrial Phase 4 in Area H could afford better quality meat than the unknown citizens who deposited rubbish on Area F in Phase 3. Since O'Connor (1989a, 15) argues that the urban consumer of meat does not influence farming strategy at this period, this pattern may also reflect changes in wool production.

The sheep/goat teeth appear to corroborate the epiphysial data as half the third molars from Area H Phase 4 show little or no wear (Grant stages a-e) which corresponds with the proposed 50% cull of animals 2.5-3.5 years old. Rather more of the third molars exhibit heavy wear in Area F Phase 3 which correlates with the animals thought to survive up to and beyond 5 years.

Nine sheep/goat mandibles with complete molar tooth rows were recovered from Area H Phase 4, of these eight had molar 3 in wear and one had molar 3 unerupted. Mandibular Wear Stages ranged from 30 to 49 with 7 jaws having M.W.S. 33-40 (Grant 1982). The jaw with M.W.S. 49 must have been a very elderly animal. Only one jaw from Area F Phase 3 had a complete molar row giving a M.W.S. of 41.

The epiphysial evidence suggests that the majority of pigs were killed as young animals, up to 2-3 years,

though there is only one bone from a very young piglet which may have been consumed as sucking pig. A small number of adult animals are also present which were not seen in the earlier phases. The teeth show that the majority of the permanent teeth have little wear and in particular no molar 3 shows any degree of wear.

Pathology

Very few bones in the later phases showed pathological conditions. A pig metatarsal from Area H Phase 4 had an abnormal depression on the shaft and distortion of the distal condyle, the cause of which is uncertain.

In Area F Phase 3 two cattle acetabula showed eburnation of the socket, these come from the same context and are probably two sides of the same pelvic girdle. This condition is associated with osteoarthritis and could have made walking very painful for the animal. It is found in draught animals and in elderly cows who adopt a different gait to accomodate a pendulous udder. A cattle metatarsal showed porosity and lipping of the proximal end, a traumatic change which may indicate a working ox. Two distal metacarpals had splayed condyles which can be associated with draught oxen though can also be found in animals not used for traction..

Discussion

The animal bones from the later phases in Area F and H continue some trends seen in the earlier phases. Sufficient differences again exist between these two groups to suggest that Area H is not generating the rubbish found in Area F. The waste ground of Area F

appears to attract casual accumulations of household waste but no commercial or knackers waste.

The refuse of Area H Phase 4 may be related to the occupants of the adjoining structures whereas Area F Phase 3 may represent more general consumption patterns within the city, classified as "background" (O'Connor 1989b, 192). The better state of preservation in Area H Phase 4 may be expected in the vicinity of structures where the garbage buried may include other organic waste which will enhance the survival of bone. The industrial processes of this phase do not seem to have involved the use of bone. Exposure on open ground will have accelerated the decay of bone in Area F Phase 3.

There seems a trend in the later phases towards increased consumption of mutton at the expense of beef. This has also been noted at Queen Street, Black Friars and Black Gate by Rackham (1988, 1987,1981) and at York and Lincoln by O'Connor (1989a, 18). O'Connor relates this to an increase in wool production and the decline of oxen as a supply of beef with the increased use of horses for haulage. The appearance of polled sheep is interesting, polled sheep were also present at Black Gate (Rackham 1981, 237). This may suggest the development or introduction of a new type or breed of sheep to enhance wool production. It is tempting to see the polled sheep as forerunners of the Blue Faced Leicester and Cheviot.

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Newcastle Crown Court
Table 1i. Fragment Counts for the Species Present.
H = Hand picked S = Samples

	Area F Phase 3		Area H Phase 4		Area H Phase 5		Area H Phase 6	
	H	S	H	S	H	S	H	S
Cattle	676	10	466	16	3		6	
Sheep/Goat	358	13	415	16	1		1	
Sheep	7		17					
Pig	76	1	101	22	1		1	
Horse	5				1			
Dog	4		4					
Cat	3		7+73	2				
Rabbit	1				1			
Hare	1		1					
S. Ungulate	63		242		8		6	
L. Ungulate	176		287		3		1	
L. Mammal	237		258		3		1	
Indet. Mam.	396		648		2			
Red Deer			2					
Rodent			1	36				
	2003		2450		24		20	
Goose	3		22	1				
Fowl	6		18	6	1		1	
Crow/Rook	1							
Indet Bird	1		29	31				
	11		69		1		1	

Newcastle Crown Court
Table 2i. The percentage of handpicked bones recorded as decayed

Area F Phase 3	Area H Phase 4	Area H Phase 5	Area H Phase 6
37.2%	14.5%	12.5%	15%

Newcastle Crown Court
Table 3i. Hand picked mammal fragments only.

	Area F Phase 3	Area H Phase 4	Area H Phase 5	Area H Phase 6
% id to species	56.6%	41.4%	36.6%	48.1%
% id to size	23.6%	32%	56.8%	40.9%
% not id	19.7%	26.4%	6.4%	10.8%

Newcastle Crown Court
Table 4i

	Area F Phase 3	Area H Phase 4
Cattle		
No. of id. frags without teeth	497	426
No. of loose teeth	179	40
Loose teeth as % of total no. of id. frags	26.4%	8.5%
Sheep/Goat		
No. of id. frags without teeth	278	388
No. of loose teeth	87	48
Loose teeth as % of total no. of id frags	23.8%	11%
Pig		
No. of id. frags without teeth	51	91
No. of loose teeth	25	10
Loose teeth as % of total no. of id. frags	32.8%	9.9%

Newcastle Crown Court
Table 5i

Cattle	Area F Phase 3	Area H Phase 4
No. of zones	471	378
No. of bones with bones	299	267
No. of bones id.	676	466
Frag. Index	0.69	0.81
Sheep/Goat		
No. of zones	457	583
No.of bones with zones	209	276
No. of bones id.	365	436
Frag. Index	1.25	1.33
Pig		
No. of zones	39	94
No. of bones with zones	23	52
No. of bones id.	76	101
Frag. Index	0.51	0.93

Newcastle Crown Court

Table 6i. Nos. of fragments with gnawing, butchery or burnt
+ = + samples

	Area F Phase 3	Area H Phase 4
Gnawed by dog	14	116
% gnawed by dog	0.7%	4.7%
Gnawed by rodent	1	1
Chop marks	78	90
Knife marks	6	1
Burnt	2+5	5+42

Newcastle Crown Court

Table 7i. Figures obtained using three quantification methods.

	Cattle		Sheep/Goat		Pig	
Area F Phase 3						
No. of frags	676	60.5%	365	32.6%	76	6.8%
Total no. of zones	471	48.7%	457	47.2%	39	4%
Most frequent zone	24	44.4%	26	48.1%	4	7.4%
Area H Phase 4						
No. of frags	466	46.4%	436	43.4%	101	10%
Total no. of zones	378	35.8%	583	55.2%	94	8.9%
Most frequent zone	20	35%	29	50.8%	8	14%

Newcastle Crown Court

Table 81. Distribution of skeletal elements.

Cattle & L. Ung.	Area F Phase 3	Area H Phase 4
Skull	132	46
Jaw	169	68
Scapula	33	27
Humerus	40	22
Rad. & Uln.	29	32
Cervical Vt.	28	23
Thoracic Vt.	13	29
Lumbar Vt.	16	29
Rib	114	161
Pelvis & Sacrum	33	46
Femur	34	32
Tibia	17	35
Carpals		9
Tarsals	26	30
Metacarpal	42	21
Metatarsal	54	31
Phalanges	52	48
Sheep/Goat & S. Ung.		
Skull	146	114
Jaw	82	45
Scapula	21	21
Humerus	32	39
Rad. & Uln.	42	54
Cervical Vt.	5	13
Thoracic Vt.	2	11
Lumbar Vt.		10
Rib	24	98
Pelvis & Sacrum	14	28
Femur	15	22
Tibia	38	42
Carpals		5
Tarsals	6	4
Metacarpal	23	27
Metatarsal	23	24
Phalanges	4	14
Pig		
Skull	15	22
Jaw	33	15
Scapula	2	9
Humerus	1	5
Rad. & Uln.	3	6
Cervical Vt.		2
Thoracic Vt.		1
Lumbar Vt.		2
Rib		
Pelvis & Sacrum	1	10
Femur	4	1
Tib. & Fib.	6	11
Carpals		
Tarsals	1	5
Metacarpals	2	6
Metatarsals	3	3
Phalanges		2

Newcastle Crown Court

Table 9i. Suggested Patterns of Slaughter. Ages after Silver 1969.

Age Cattle	Fused	Area F Phase 3 Unfused & Just fused	% Unfused in each age category	% kille
0-2 yr	82	6	6.8%	6.8%
2-3 yr	36	9	20%	13.2%
3-4 yr	22	16	42.1%	22.1%
5 yr	11	18	62%	19.9%
>5 yr				38%
Cattle		Area H Phase 4		
0-2yr	60	3	4.7%	4.7%
2-3 yr	25	13	34.2%	29.5%
3-4 yr	23	15	39.4%	5.2%
5 yr	17	27	61.3%	21.9%
>5 yr				38.7%
Sheep/Goat		Area F Phase 3		
0-1 yr	40	5	11.1%	11.1%
1-2 yr	35	9	20.4%	9.3%
2.5-3.5 yr	13	17	56.6%	36.2%
5 yr	2	2	50%	0
>5 yr				43.4%
Sheep/Goat		Area H Phase 4		
0-1 yr	57	6	9.5%	9.5%
1-2 yr	43	9	17.3%	7.8%
2.5-3.5 yr	10	21	67.7%	50.4%
5 yr	5	28	84.8%	17.1%
>5 yr				15.2%
Pig		Area F Phase 3 & Area H Phase 4		
0-1 yr	11	1	9%	9%
2-3 yr	6	11	64.7%	55.7%
3-4 yr	1	7	87.5%	22.8%
5 yr	1	4	80%	0
>5 yr				12.5%

Newcastle Crown Court

Table 10i. Tooth eruption and wear. Ages after Silver 1969.

U = Unerupted S/W = Slight Wear H/W = Heavy Wear

		Area F Phase 3			Area H Phase 4		
Cattle		U	S/W	H/W	U	S/W	H/W
5-6m	M1		1	57			15
15-18m	M2	2	7	38	1	1	8
24-30m	P2		1	6			2
18-30m	P3	1	6	14	1	1	6
24-30m	M3	3	13	31		3	9
28-36m	P4	10	6	21	3		7
Sheep/Goat							
3-5m	M1			38			35
9-12m	M2	1	9	32		4	24
21-24m	P2			1	1	2	4
21-24m	P3	1	1	4	2	2	17
18-24m	M3	1	17	30	2	18	19
21-24m	P4	5	1	15	3	3	20
Pig							
4-6m	M1			6			6
7-13m	M2		5	2		4	
12-16m	P2		4			1	
12-16m	P3		10			3	1
12-16m	P4		7		1	4	1
17-22m	M3	2	3		2	2	