

Ancient Monuments Laboratory
Report 31/90

ANIMAL BONES FROM CATTERICK BRIDGE
(CEU 240), A ROMAN TOWN (NORTH
YORKSHIRE) EXCAVATED IN 1983.

Beverley Meddens

AML reports are interim reports which make available the results of specialist investigations in advance of full publication. They are not subject to external refereeing and their conclusions may sometimes have to be modified in the light of archaeological information that was not available at the time of the investigation. Readers are therefore asked to consult the author before citing the report in any publication and to consult the final excavation report when available.

Opinions expressed in AML reports are those of the author and are not necessarily those of the Historic Buildings and Monuments Commission for England.

Ancient Monuments Laboratory Report 31/90

ANIMAL BONES FROM CATTERICK BRIDGE
(CEU 240), A ROMAN TOWN (NORTH
YORKSHIRE) EXCAVATED IN 1983.

Beverley Meddens

Summary

This small collection of Roman animal bones from Catterick comes from two phases dating late 2nd-3rd centuries A.D. and late 3rd-4th centuries A.D.. The nature of the animal bone in these phases does not appear to differ greatly, indicating that there were no important changes in the exploitation of animals through the time period represented by this collection.

The majority of bones come from cattle, sheep/goat, and pig and probably derive from domestic waste. Horse bones also occur in significant numbers, but whether they were eaten or not is not clear. Most of the cattle were adult, but no very old cattle were found. The sheep were mainly adult when slaughtered, but a fairly wide range of ages were represented. The pigs were slaughtered at under 2 years. All parts of the body were found indicating that the animals were probably butchered on site, although there is some little evidence of bias towards primary butchery waste in the cattle bones.

The main benefit of a collection of this type is its addition to the corpus of animal bone data from Roman Britain and particularly Roman Yorkshire.

Author's address :-

Beverley Meddens

Ancient Monuments Laboratory
English Heritage
23 Savile Row
London
W1X 2HE

ANIMAL BONES FROM CATTERICK BRIDGE (CEU 240),
A ROMAN TOWN (NORTH YORKSHIRE), EXCAVATED IN 1983.

INTRODUCTION

The Roman town of Cataractonium has been known since 1625 from both archaeological finds and classical sources. The history of previous work at the site in this and the last century has been fully documented (Wacher 1960 and 1971; Wilson 1984). Since 1981 the town and its environs have been the site of rescue excavations by the Central Excavation Unit. The animal bones that form the subject of this report came from the excavations at Catterick Bridge CEU 240 (Wilson 1984).

There are no other published animal bone reports from Catterick known to the author, although fairly extensive excavations have been carried out over the years. Hildyard states: "... later the hypocaust was filled up with rubbish, which, besides pottery included a large number of chicken bones." (Hildyard, 1958). He also describes some bone artifacts including a bone pin, a bone bracelet fragment, and a knife handle made from a sheep metatarsal (Hildyard, 1958). Wacher mentions a large midden possibly associated with a tannery (Wacher, 1971), (the deposit is contemporary with the military occupation of the site but from excavations just outside the fort), a reference that was taken up by Frere who suggests that the army had the leather delivered on the hoof because of "... the great quantities of bones which accompanied the debris of manufacture." (Frere 1967). Tantalising though this all is, the only animal bone data available for comparison with the collection from CEU 240 was provided by Hodgson, on the animal bones from Wacher's excavations in 1959 (Hodgson, 1977).

The Central Excavation Unit site of Catterick Bridge is situated to the east of the main concentration of civilian occupation in the suburb north of the river Swale (Wilson 1984, figure 9.2). The excavations had six separate units, three of which produced bone: SSD4, SSD5, and SSD6. The occupation and use of the site fell into two phases, with seven contexts forming a stratigraphic division between them (Appendix 1). Phase I dates from late 2nd century to the third century A.D.. The area excavated was judged to be a peripheral area of activity outside the main town. There was no occupation. The bone material is probably an assortment of material dumped outside the town defences. The deposits from phase I came from a late Flavian/Antonine revetment and ditch (SSD4), a gully (SSD5), and a ditch (SSD6). Phase II dates from the late 3rd century to the 4th century A.D.. The area had now become the site of major activity and the bone material is more likely to be primary deposits of occupation debris, especially from SSD4. The deposits from phase II came from timber buildings and stone floored buildings, ditches and gullies (SSD4), an extension to the revetment (SSD5), and a road (SSD6). The deposits which make up the stratigraphic division between phases I and II are late 3rd century A.D. occupation deposits: layers, pits and a gully (SSD4).

METHODS

The bones were recorded in 1984 using the system employed at the Ancient Monuments Laboratory (Jones, R.T. 1978), and identified with aid of the skeletal reference collection housed there.

In general no attempt was made to distinguish sheep and goat and all bones of these species were recorded as sheep/goat, except one skeleton which was positively identified as sheep following the criteria described by Boessneck (1969). All other bones except ribs and vertebrae were identified to species wherever possible. Ribs and vertebrae were assigned to size categories: 'LAR' or 'cattle-sized' intended to incorporate cattle, horse, and red deer; 'SAR' or 'sheep-sized' intended to incorporate sheep, goat, roe deer, and pig. Tooth wear stages were recorded using the system devised by Grant (Grant, 1975).

A copy of the archive is lodged with the Ancient Monuments Laboratory, the Central Excavation Unit, and the NMR. The bones themselves are stored at Yorkshire Museum, York, Yorkshire.

RESULTS

The Material

The method of recovery was by hand and no sieving was done. This may explain the paucity of small mammals and birds, and may bias the collection in favour of the larger species and larger bone fragments. In general the preservation of the bone was good. Table ii, Appendix 1 lists the different recorded conditions of the bones.

The bones were divided into two main phases, with seven contexts forming a stratigraphic division between them, discussed above (table 1). Omission of the bones from contexts which could be identified as containing a high proportion of residual pottery does not seem to alter the basic proportions of the collection (table 2). The quantity of eroded bones present could be another guide to the proportion of residual bone in the collection and seems to be quite low at 3%, and so bones from all the phased contexts have been considered.

Species present and their frequencies. (tables 1-3)

Of the 4157 bones recorded only 33% were identified to species, (counting sheep/goat). This is because the recording method used assigns a great many fragments to size categories only. It is probable that the majority of the 'LAR' fragments belong to cattle, and that the majority of the 'SAR' fragments belong to sheep. Fragments can often be identified as pig, but distinguishing sheep from roe deer presents a greater problem, thus many sheep-sized fragments are recorded as 'SAR' when they are probably sheep or goat. Inclusion of these fragments does not greatly alter the relative proportions of the different animals within the collection (table 3). However it is important to include them in the analyses of anatomical parts.

The majority of the identified bones came from domestic animals: cattle 64%, sheep/goat 17%, pig 8%, and horse 9%. No bones

were specifically identified to goat and all the bones specifically identified to sheep came from the skeleton in Area 6 layer 595 (see below). Of the five deer bones recovered 3 were positively identified as red deer, 2 antler fragments and a metacarpal. The remaining two were fragments of antler and probably belong to red deer though the possibility of them being fallow deer cannot be ruled out. Dogs were also present and comparison of the lengths of the first molars from two mandibles from phase II (probably representing one individual), shows that at least one Catterick dog was at the smaller end of the range recorded for Roman dogs (table 4). The bone fragments recorded as dog/fox are probably also small domestic dogs. Hare, brown bear and domestic fowl were also represented. Three bones from a small duck, possibly garganey, all came from the same context and probably the same individual.

Distribution. (tables 5 & 6.)

Details of the numbers of bones from the different phases and areas are given in table 5. There is no indication of any major change or difference between the different phases and areas. In general cattle make up 60%-70% of the collection, sheep/goat 15-20%, and both pig and horse less than 10%.

Table 6 details the fragment numbers from different types of feature/context. Most of the bones were recovered from ditches/gullies, layers (general spreads and occupation deposits), and pits. All the bones from the pits in phase I, except one longbone fragment, came from one pit. The bones from phase II come from a wider variety of contexts including hearths, flood defenses, revetment and revetment tumble, a road, beam slots, post and stake pits, foundation trenches, and grave fills. The majority of bone comes from layers, but there are minor fluctuations in the relative percentages of cow, sheep/goat, pig, and horse within the different feature types. Sheep/goat appear to be more abundant in ditches than in pits and layers, but the numbers are very small.

Body-part Frequency (tables 7-9)

a) Cattle. Figure 1 illustrates a method of showing biases in the frequency of different parts of the body. The numbers of bones present are adjusted to reflect the expected frequency of bones in the complete skeleton (O'Connor 1982). Any selection for particular bones should be highlighted. It is assumed that each fragment represents a whole bone. Allowing for the fact that skulls notoriously breakup into many fragments and that long bones can be butchered into numerous fragments, this method shows vertebrae, phalanges, and other small bones to be under-represented, and mandible, forelimb (particularly scapula), and hindlimb (particularly pelvis) to be over represented relative to a complete skeleton. There is no great difference between the phases, and the low numbers of small bones can probably be explained by recovery bias. The high frequency of mandibles, scapulae, and pelvises may also have been produced by recovery bias, but an alternative explanation is that the collection contains a component of primary butchery waste. Figure 3

illustrates, for phase II only, a method of showing body-part frequency by only counting fragments of 25% or greater (Bruce Levitan pers. comm.). Using this method metapodials, and particularly astragalus and calcaneum are more frequently represented than in figure 1, but the differences are less pronounced. Evidence for this collection being biased towards primary butchery waste is inconclusive.

b) Sheep/Goat. All body-parts were represented but as with the cattle some categories were under-represented (figure 2), in particular vertebrae and phalanges. This is a fairly common occurrence from many sites where hand picking was the main method of recovery. In both phases the main body parts represented were, mandibles, forelimb (particularly radius and ulna), and hindlimb (particularly tibia).

c) Pig. The body-parts represented were similar to that of sheep/goat, mostly skull, forelimb, and hindlimb.

The bone collection from Catterick Bridge is typical of collections normally interpreted as domestic rubbish which tend to be biased towards meat bearing bones.

Butchery

The majority of the butchery marks recorded were chop marks (table 10). Most of these were on the cattle bones of which 20% were butchered (described below). Very few knife cuts (12) were recorded. One deer antler was both sawn and chopped. Three cases of butchery were recorded on the horse bones. One horse skull had been repeatedly chopped above the occipital condyles, and a tibia had been chopped through the shaft. One radius had been repeatedly cut around the anterior part of the shaft.

Butchery to the cattle bones was most commonly in the form of chops to dismember the carcass. All chops to the mandible were through the condylar process and through the lateral side of the ascending ramus. One mandible was chopped through the ascending ramus, (from the anterior to the posterior as though the jaws had been opened before being chopped), to remove the mandibles from the head. Only two chops were recorded from the skull, one removing the horncore and the other a chop to the petrous, a chop that would correspond to the removal of the mandibles.

Nearly all the cattle scapulae were chopped along the spine. Other forms of butchery to the scapula were chops to the articular surface and superficial chops to the caudal edge of the blade. Most cattle humerus fragments were chopped through the distal articulation or shaft. The back of the ulna was chopped through ventro/dorsally corresponding with the chops to the distal joint surface of the humerus, and chops to the lateral part of the proximal radius also correspond to chops to the distal humerus. The rest of the radius was more irregularly chopped - possibly depending on requirements.

Butchery to the pelvis was focussed around the ilium shaft and

the acetabulum, probably to remove the hind limb. The femur is poorly represented on the whole by shaft fragments and femur head fragments, corresponding to the butchery of the pelvis.

Ageing (tables 11-14)

a) Cattle. Most cattle were older than 3 years at death. One loose dpm4 was only slightly worn and represents the youngest animal in the collection. All the other cattle were probably older than 18 months, but over 80% of the cattle represented were over 3 years of age at slaughter.

The epiphysial fusion data complements the mandible ageing, in that the general trend is towards animals being over 2-3 years at death. The epiphysial fusion data extends the range of the ageing, although it is generally assumed to be poor quality data. Silver (1969) says the vertebral epiphyses fuse at about 60 months. If this is the case, then a substantial proportion of the cattle represented by these late fusing epiphyses were killed beyond 5 years of age.

b) Sheep/Goat. Relatively little ageing data are available for sheep/goat. Sheep of all age groups are represented and this corresponds with other Roman assemblages (Maltby, 1981). About half the sheep represented by mandibles were not adult (ie less than 3 years), but there are few very old sheep.

c) Pigs. The epiphysial fusion and tooth eruption data suggest that nearly all the specimens represented were less than 2 years of age, and it is likely that none of the pigs were over than 3 years of age.

Pathology and traits

In general very little pathology was observed. The pubic part of one acetabulum had an area of abraded and polished articular surface, this could have been the start of a condition that could have led to arthritis, brought on by old age or working conditions. One metatarsal had extra bony growth around the proximal articulation, and a second had extra bony growth on the lateral side of the proximal part of the shaft. One mandible exhibited malocclusion causing uneven wear on the teeth, which included the PM4 wearing a notch into the side of the adjacent M1. There were two cases of distorted "cattle-sized" ribs fragments (probably cattle), they both appear to be consistent with healed fractures. No pathological sheep/goat bones were found other than those of the skeleton, described below. One pig calcaneum was massively distorted and extra bony growth was present, and one dog ulna had extra bony growth around the proximal joint surface.

Two cattle mandibles without PM2 (shown with a * table 11) and two mandibles where the 3rd cusp on M3 is missing (shown with a ^ in table 11) are probably non-pathological but genetically influenced conditions (Andrews and Noddle 1975; Baker and Brothwell 1980, 137). One sheep/goat mandible with pitting in the articular condyle was recorded. This seems to be quite

common and may also be a non-pathological condition, such as the depressions occurring on the surfaces of articular condyles described by Baker and Brothwell (1980, 112).

Articulated Bones

a) Sheep. The only recorded articulated bones recovered from the site were those of a sheep skeleton CEU no. 9310212. This skeleton came from layer 595, a layer in area 6, Phase II, dated to possibly fourth century. Layer 540 and 539 are both part of 595, although only layer 540 had any animal bone in it. Although only the bones in layer 595 were identified as a skeleton it is possible that the six bones in layer 540 belong to it as well (table 15). Most of the vertebral column was recovered but the 6th lumbar vertebra was not the final lumbar vertebra, so this sheep had at least 7 lumbar vertebrae. Although this is not improbable it is unusual. No hindlimbs were recovered.

The mandibles and maxilla have complete permanent dentition and the mandibles were complete enough to give a wear stage, numerical value 38 and 40. This individual is the oldest sheep on the site, (aged by tooth wear, the mandibles are marked with a # in table 12). The epiphyseal fusion data correspond with the dental ageing, distal scapula, proximal and distal humerus, proximal and distal radius+ulna, and proximal ribs are all fused. Of the vertebrae, cranial and caudal epiphyses of the cervical and lumbar vertebrae are fused, the cranial and caudal epiphyses of the 9th-13th thoracic vertebrae are fused, but both cranial and caudal epiphyses of the 1st-8th thoracic vertebrae are only just fusing. According to Silver (1969), this would put our sheep at about 5 years of age. Of the sternbrae the 4th and 5th were fused; all the rest were not.

The right maxilla had a possible abscess in the region of the 3rd permanent molar. In context 540 the group of phalanges and sesamoid all articulate and as already mentioned above could belong to the skeleton. All the bones have bony growth around the shaft, and in the case of the 1st phalanges around the distal articulation also.

All the measurements are listed (appendix 2). The humerus and radius were complete enough to take total lengths and therefore estimate withers heights of 666mm-679mm (Leichert 1975).

b) Horse. There was one small group of bones from a revetment (context 380, phase II), which consists of left and right proximal and distal femur, left and right proximal tibia and right distal tibia, and a left astragalus. It is possible that these represent part of an unrecorded/unnoticed partial skeleton.

Measurements

The measurements are all listed in Appendix 2. The animals present at Catterick do not differ greatly from other Roman bones found in Britain. The numbers present do not warrant detailed analysis but may serve to add to the growing corpus of data for the north of England.

DISCUSSION

The sample of animal bones recovered from the excavations at Catterick Bridge is fairly small. Although the collection could be divided into two phases the resultant phase groups are even smaller. The nature of the animal bone in these phases does not appear to differ greatly, and this would suggest that there was no important change in the exploitation of animals through the time period represented by this collection. There is no indication of any specialised activity in any particular area, and the collection seems to bear all the hallmarks of typical Roman domestic debris, and conforms to the pattern of a great many other Roman sites (King 1984).

Beef was the most commonly consumed meat on the site and the ageing data suggests that most of the animals were adult. Only a few minor pathological conditions were noted. Analysis of the different parts of the body represented indicates that there may be a primary butchery component in this collection (mandibles, scapulae, pelvis, and metapodials) but there is some indication the the collection is biased by low recovery of small bones and fragments, and possibly by differential preservation as indicated by the low frequency of ribs and vertebrae. Butchery of the animals seems to be quite normal for the period, and concentrates on dismembering the animal.

The majority of sheep/goat bones probably belong to sheep, as no goat bones were found, and sheep were the second most commonly exploited animal on the site. Preservation and recovery biases have probably affected the sheep sample more than the cattle sample, and this may explain very low numbers of small bones and vertebrae. The sheep were mainly adult when slaughtered, but a fairly wide range of ages were represented. The pigs were slaughtered at under 2 years.

Horses were quite common and, in terms of fragment numbers, at least as common as pig. Some horse bones were butchered so it is possible that horse meat was eaten.

The animal bones from Catterick have offered a hint at other aspects of the life in this town. Other animal bones have been reported on from Catterick, by G. Hodgson (Hodgson 1977), in which he describes a skull of a Barbary Ape. This and the bear tibia in this collection both tantalise without really providing enough data to offer interpretations for their presence. The main benefit of a collection of this type is its addition to the overall picture, within the context of Roman Britain and particularly Roman Yorkshire.

REFERENCES

- Andrews, A.H. and Noddle, E. 1975 Absence of premolar teeth from ruminant mandibles found at archaeological sites, *J.A.S.*, 2, 137-144.
- Baker, J. and Brothwell, D. 1980 Animal Diseases in Archaeology London: Academic Press.
- Boessneck, J. 1969 Osteological Differences between Sheep (*Ovis aries* Linne) and Goat (*Capra hircus* Linne), in D. Brothwell and E. Higgs, (eds.) Science and Archaeology 2nd edition, London, 331-358.
- Frere, S. 1967 Britannia, a history of Roman Britain, London.
- Grant, A. 1975 The animal bones, in B.W. Cunliffe, Excavations at Portchester Castle Vol. 1: Roman, 378-408.
- Grant, A. 1982 The use of tooth wear as a guide to the age of domestic ungulates, in B. Wilson, C. Grigson, and S. Payne (eds.) Ageing and Sexing Animal Bones from Archaeological Sites, Oxford: British Archaeological Reports (British Series 109).
- Harcourt, R.A. 1974 The dog in prehistoric and early historic Britain, *J.A.S.* 1, number 2, 151-175.
- Hildyard, E.J.W. 1958 Cataractonium, Fort and Town, Yorkshire Archaeological Journal, 39, 224-265.
- Hodgson, G.W.I. 1977 Report on the Animal remains from the Roman Levels excavated at CATTERICK 1959: Ancient Monuments Laboratory Report no. 2404.
- Jones, R.T. et al Computer Based Osteometry Data Capture User Manual (1), compiled by R.T. Jones, S.M. Wall, A.M. Locker, J. Coy, and H. Maltby: Ancient Monuments Laboratory Report No. 3342, and 1st supplement to A.M.L. Report No. 2333.
- King, A.C. 1984 Animal bones and the dietary identity of military and civilian groups in Roman Britain, Germany and Gaul in F.F.C. Diaz and A.C. King (eds) Military and Civilian in Roman Britain: Cultural Relationships in a Frontier Province, Oxford: British Archaeological Reports (British Series 136), 187-217.
- Maltby, M. 1982 Iron Age, Romano-British and Anglo-Saxon Animal Husbandry: A Review of the Faunal Evidence, in M. Jones and G. Dimbleby (eds.) The Environment of Man: the Iron Age to the Anglo-Saxon Period, Oxford: British Archaeological Reports (British Series 87), 155-203.
- O'Connor, T.P. 1982 Animal Bones from Flaxengate, Lincoln c870-1000. The Archaeology of Lincoln, Volume XVIII:1, the Council for British Archaeology.
- Silver, I.A. 1969 The ageing of domestic animals, in D. Brothwell and E. Higgs (eds.) Science in Archaeology, Thames and Hudson.
- Sisson, S. and Grossman J.D. 1975 Sisson and Grossman's The anatomy of the domestic animals, W.B. Saunders Company 5th Edition.
- Leichert, H. 1975 Osteometrische Untersuchungen zur Berechnung der Widerristhöhe bei Schafen, in A.T. Clason (ed.) Archaeozoological studies, 51-69, North-Holland.
- Wacher, J.S. 1960 Excavations at Catterick 1959, Journal of Roman Studies, Vol 50, 217-8.
- Wacher, J.S. 1971 Yorkshire Towns in the Fourth Century, in R.M. Butler (ed.) Soldier and Civilian in Roman Yorkshire, 165-177.
- Wilson, P. 1984 Recent Work at Catterick in P.R. Wilson, R.F.J. Jones, and D.M. Evans (eds.) Settlement and Society in the Roman North.

Table 1. Numbers of bone fragments of each species and category from each phase from Catterick Bridge CEU 240.

	Phase I		Phase I/II		Phase II		Total	
	n	%	n	%	n	%	n	%
Cattle	194	23	20	17	619	19	833	20
Horse	17	2	2	2	93	3	112	3
Red deer	-	-	-	-	3	<1	3	<1
Red/fallow deer	-	-	-	-	2	<1	2	<1
Large mammal	413	49	37	32	1452	45	1902	46
Sheep†					72*	2	72*	2
Sheep/goat	38	5	20	17	165	5	223	5
Pig	16	2	3	3	80	3	99	2
Small ungulate	78	9	29	25	265	8	372	9
Dog	2	<1	-	-	12	<1	14	<1
Dog/fox	2	<1	-	-	3	<1	5	<1
Hare	1	<1	-	-	-	-	1	<1
Brown bear	-	-	-	-	1	<1	1	<1
Unident. mammal	80	10	5	4	424	13	509	12
Domestic fowl	-	-	-	-	1	<1	1	<1
Duck	-	-	-	-	3	<1	3	<1
Unidentified bird	1	<1	-	-	4	<1	5	<1
Total	842	100	116	100	3199	100	4157	100

Large mammal includes cattle, horse, and red or fallow deer.

Small ungulate includes sheep, goat, pig and roe deer.

† single skeleton. Duck = Garganey cf.

Table 1a. Numbers of bone fragments from Catterick Bridge CEU 240, excluding unidentified bones and the sheep skeleton.

	Phase I		Phase I/II		Phase II		Total	
	n	%	n	%	n	%	n	%
Cattle	194	73	20	44	619	64	833	64
Horse	17	6	2	4	93	9	112	9
Deer	-	-	-	-	5	<1	5	<1
Sheep/goat	38	14	20	44	165	17	223	17
Pig	16	6	3	7	80	8	99	8
Dog/fox	4	1	-	-	15	2	19	2
Hare	1	<1	-	-	-	-	1	<1
Brown Bear	-	-	-	-	1	<1	1	<1
Fowl	-	-	-	-	1	<1	1	<1
Duck	-	-	-	-	3	<1	3	<1
Total	270	100	45	99	982	100	1297	100

Table 2. Numbers of bone fragments from Catterick Bridge-CEU 240, excluding bones from contexts with residuality as a feature.

```
*****
```

	Phase I		Phase I/II		Phase II		Total	
	n	%	n	%	n	%	n	%
Cattle	194	23	19	17	454	18	667	19
Horse	17	2	2	2	80	3	99	3
Deer	-	-	-	-	2	<1	2	<1
Large mammal	411	49	37	33	1170	46	1618	46
Sheep/goat	38	5	20	18	197*	7	248*	7
Pig	16	2	3	3	59	2	78	2
Small ungulate	78	9	27	24	219	9	324	9
Dog/fox	4	<1	-	-	8	<1	12	<1
Hare	1	<1	-	-	-	-	1	<1
Brown Bear	-	-	-	-	1	<1	1	<1
All bird	1	<1	-	-	8	<1	9	<1
Unident. mammal	80	10	5	4	346	14	431	12
Total	840	100	113	100	2537*	100	3490*	100

```
*****
```

Large mammal includes cattle, horse, and red or fallow deer.

Small ungulate includes sheep, goat, pig and roe deer.

* includes single skeleton

Table 3. Numbers of bone fragments from Catterick Bridge CEU 240, (excluding the sheep skeleton and unidentified mammal but incorporating the large mammal and small ungulate bone apportioned to cattle, horse, and deer, and sheep/goat and pig).

```
*****
```

	Phase I		Phase I/II		Phase II		Total	
	n	%	n	%	n	%	n	%
Cattle	574	75	54	49	1868	69	2496	70
Horse	50	7	5	4	262	10	337	9
Deer	-	-	-	-	19	1	19	1
Sheep/goat	93	12	45	41	343	13	480	13
Pig	39	5	7	6	167	6	214	6
Dog/fox	4	1	-	-	15	1	19	1
Hare	1	<1	-	-	-	-	1	<1
Brown Bear	-	-	-	-	1	<1	1	<1
All bird	1	<1	-	-	8	<1	9	<1
Total	762	100	111	100	2703	100	3576	100

```
*****
```

Table 4. Comparison of the Length of the First Lower Molar in Dogs from Catterick Bridge CEU 240 and those from sites quoted in Harcourt (1974).

```
*****
```

Sources	Number	Range	Sources	Number	Range
Harcourt neolithic	4	19.7-21.6mm	Harcourt roman	132	15.0-25.5mm
Harcourt bronze age	14	20.0-25.0mm	Catterick Bridge roman	2	15.9-16.1mm
Harcourt iron age	65	18.0-25.6mm	Harcourt anglo-saxon	19	19.0-25.0mm

```
*****
```

Table 5. Numbers of bone fragments from the different Areas and Phases from Catterick Bridge CEU 240.

Area Phase	Area 4				Area 5			Area 6		
	I	I/II	II	Total	I	II	Total	I	II	Total
Cattle	143	20	269	432	3	79	82	48	271	319
Horse	13	2	27	42	-	12	12	4	54	58
Deer	-	-	3	3	-	-	-	-	2	2
Sheep/goat	27	20	61	108	1	18	19	10	158‡	168‡
Pig	4	3	55	62	-	9	9	12	16	28
Dog (dog/fox)	1	-	7(1)	8(1)	-	(1)	1	1(2)	5(1)	6(3)
Hare	1	-	-	1	-	-	-	-	-	-
Brown Bear	-	-	-	-	-	-	-	-	1	1
All Bird	-	-	1	1	-	1	1	1	6	7
Sub-total	189	45	424	658	4	120	124	78	514‡	592‡
Large mammal	211	37	557	805	7	145	152	195	750	945
Small ungulate	41	29	105	175	3	20	23	34	140	174
Unident. mammal	46	5	177	228	-	32	32	34	215	249
TOTAL	487	116	1263	866	14	317	331	341	1619‡	1960‡

‡ = 72 bones from the sheep skeleton are included.

Identified Birds:- 1 Fowl Area 6 Phase II, 3 Duck (Garganey cf.) Area 6 Phase II.

Table 6. Numbers of bone fragments from the different context types within each phase from Catterick Bridge CEU 240.

Phase Context type	Phase I				Phase I/II				Phase II				
	Pit	Ditch	Layer	Total	Pit	Ditch	Layer	Total	Pit	Ditch	Layer	Other	Total
Cattle	88	35	71	194	4	-	16	20	33	52	507	27	619
Horse	2	4	11	17	1	-	1	2	4	4	57	28	93
Deer	-	-	-	-	-	-	-	-	-	1	4	-	5
Sheep/goat	12	12	14	38	2	-	18	20	6	27	196‡	8	237‡
Pig	-	3	13	16	-	-	3	3	2	6	63	9	80
Dog/fox	-	1	3	4	-	-	-	-	1	3	10	1	15
Hare	1	-	-	1	-	-	-	-	-	-	-	-	-
Brown Bear	-	-	-	-	-	-	-	-	-	-	1	-	1
All Bird	-	-	1	1	-	-	-	-	1	4	2	1	8
Sub-total	103	55	113	271	7	-	38	45	47	97	840‡	74	1058‡
Large mammal	74	85	254	413	1	1	35	37	94	176	1129	53	1452
Small ungulate	16	18	44	78	4	-	25	29	14	47	188	16	265
Unident. mammal	12	26	42	80	-	-	5	5	18	45	269	72	424
TOTAL	205	184	453	842	12	1	103	116	173	365	2446‡	215	3199‡

Other contexts include hearths, flood defenses, revetment, revetment tumble, feature, road, beamslots, post pits, stake-holes, foundation trenches, and grave fills.

Figure 1. Relative proportions of different parts of the skeleton for Cattle and Large Mammal at Catterick Bridge site 240.

	n	EF Phase I	n	EF Phase II
Skull	159	38 *****	106	38 *
Horncore	4	2 **	9	2 *
Mandible	22	2 *****	157	2 *****
Loose teeth	16	40 .	143	40 **
Vertebrae	51	51 *	126	51 *
Ribs	73	26 ***	234	26 ***
Scapula	36	2 *****	118	2 *****
Humerus	12	2 *****	51	2 *****
Radius+Ulna	10	4 ***	64	4 *****
Carpals	1	12 .	5	12 .
Metacarpal	9	2 *****	43	2 *****
Pelvis	20	2 *****	80	2 *****
Femur	11	2 *****	13	2 **
Tibia	7	2 ****	29	2 ****
Astragalus	5	2 ***	12	2 **
Calcaneum	5	2 ***	19	2 ***
Tarsal		6 .	3	6 .
Metatarsal	9	2 *****	47	2 *****
Metapodial	2	4 *		4
Phalanges	14	24 *	52	24 *
TOTAL	450	227	1911	227

Figure 2. Relative proportions of different parts of the skeleton for Sheep/Goat and Small ungulate at Catterick Bridge site 240.

	n	EF Phase I	n	EF Phase II
Skull	1	38 .	11	38 .
Horncore		2		2
Mandible	10	2 *****	25	2 *****
Loose teeth	6	40 *	47	40 *
Vertebrae	2	51 .	37	51 *
Ribs	11	26 **	64	26 ***
Scapula	3	2 *****	10	2 *****
Humerus	2	2 ****	19	2 *****
Radius+Ulna	13	4 *****	29	4 *****
Carpals		12	1	12 .
Metacarpal	11	2 *****	19	2 *****
Pelvis		2	10	2 *****
Femur	1	2 **	15	2 *****
Tibia	5	2 *****	41	2 *****
Astragalus		2	2	2 *
Calcaneum		2		2
Tarsal		6		6
Metatarsal	8	2 *****	18	2 *****
Metapodial	1	4 *	1	4 .
Phalanges		24	7	24 .
TOTAL	74	227	356	227

n = number of fragments, EF = expected frequency, n/EF expressed as * a relative percentage. Were all parts of the skeleton present in appropriate numbers to reflect whole animals all the columns would be the same length.

Figure 3. Catterick Bridge Cattle+LAR Phase II

(fragments 25% and greater counted)

	EF	n1	n2	n3	Index	
Skull	2	0	0	0	.0	
Horncore	2	0	3	0	.7	**
Mandible	2	1	12	11	4.8	*****
Cervical	7	4	3	8	1.0	**
Thoracic	13	0	9	11	.5	**
Lumbar	6	0	2	6	.4	.
Caudal	20	0	1	0	.0	
Rib	26	1	10	33	.5	**
Scapula	2	0	8	16	4.0	*****
Humerus	2	0	4	7	1.8	***
Radius	2	0	4	11	2.3	***
Ulna	2	1	2	11	2.3	***
Carpal	12	4	1	0	.3	.
Metacarpal	2	2	6	16	4.5	*****
Pelvis	2	0	11	12	4.2	*****
Femur	2	0	0	5	.6	**
Tibia	2	0	11	5	3.3	*****
Astragalus	2	9	3	0	5.2	*****
Calcaneum	2	0	10	7	3.3	*****
Tarsal	6	1	1	1	.2	.
Metatarsal	2	1	15	9	5.3	*****
1st phalanx	8	16	8	5	2.6	*****
2nd phalanx	8	13	1	0	1.6	***
3rd phalanx	8	8	1	0	1.0	**

EF = expected frequency (bones), n1 = number of fragments >75%
n2 = number of fragments 50-75%, n3 = number of fragments 25-50%
Index=(n1/EF)+(n2/2*EF)+(n3/4*EF) expressed as % a relative percentage.

Table 7. Numbers of Fragments from different Anatomical Elements from Phase I at Catterick Bridge CEU 240.

Species	Cow	Horse	LAR	Sh/G	Pig	SAR	Dog	Hare	Bird	Unid
Skull	74	1	85	-	1	1	-	-	-	-
Horncores	4	-	-	-	-	-	-	-	-	-
Antler	-	-	-	-	-	-	-	-	-	-
Mandible	7	1	15	7	1	3	-	-	-	-
Loose Teeth	16	2	-	6	5	-	1	-	-	-
Scapula	18	1	18	-	1	3	-	-	-	-
Humerus	4	1	8	-	2	2	-	-	-	-
Radius+Ulna	8	3	2	5	-	8	2	1	-	-
Pelvis	8	1	12	-	-	-	-	-	-	-
Femur	5	1	6	1	1	-	-	-	-	-
Tibia	3	1	4	-	2	5	1	-	-	-
Fibula	-	-	-	-	1	-	-	-	-	-
Metacarpal	9	-	-	11	1	-	-	-	-	-
Carpals+Ses.	1	-	-	-	-	-	-	-	-	-
Metatarsal	9	2	-	7	1	1	-	-	-	-
Tarsals	-	-	-	-	-	-	-	-	-	-
Calcaneum	5	1	-	-	-	-	-	-	-	-
Astragalus	5	1	-	-	-	-	-	-	-	-
Phalanges	14	1	-	-	-	-	-	-	-	-
Metapodials	2	-	-	1	-	-	-	-	-	-
Atlas	1	-	1	-	-	-	-	-	-	-
Axis	1	-	-	-	-	-	-	-	-	-
Cervical	-	-	11	-	-	2	-	-	-	-
Thoracic	-	-	15	-	-	-	-	-	-	-
Lumbar	-	-	19	-	-	-	-	-	-	-
Sacrum	-	-	3	-	-	-	-	-	-	-
Caudal	-	-	-	-	-	-	-	-	-	-
Unid. Vertebra	-	-	-	-	-	-	-	-	-	-
Ribs	-	-	73	-	-	11	-	-	-	3
LB fragments	-	-	116	-	-	42	-	-	1	-
Unid. fragments	-	-	25	-	-	-	-	-	-	77
TOTAL	194	17	413	38	16	78	4	1	1	80

 LAR = cattle-sized large mammal, Sh/G = sheep/goat, SAR = sheep-sized small ungulate.
 Ses.= Sesamoids, LB = Long bone, Unid.= Unidentified.

Table 8. Numbers of Fragments from different Anatomical Elements from Phase I/II at Catterick Bridge CEU 240.

```

*****
Species      Cow   Horse  LAR   Sh/G  Pig   SAR   Bird
-----
Skull        1    -     3     4    -    16    -
Horncore     1    -     -     -    -     -     -
Antler       -    -     -     -    -     -     -
Mandible     5    -     1     -    1     -     -
Loose Teeth  4    -     -     3    1     -     -
-----
Scapula      -    -     -     -    -     -     -
Humerus     1    -     1     -    -     -     -
Radius+Ulna -    -     -     -    -     -     -
-----
Pelvis       2    -     -     -    -     -     -
Femur       -    -     -     -    -     -     -
Tibia       -    -     -     1    1     1     -
Fibula      -    -     -     -    -     -     -
-----
Metacarpal  1    1     -     5    -     -     -
Carpals+Ses. -    1     1     -    -     -     -
Metatarsals -    -     -     7    -     -     -
Tarsals     1    -     -     -    -     -     -
Calcaneum   -    -     -     -    -     -     -
Astragalus  -    -     -     -    -     -     -
Phalanges   3    -     -     -    -     -     -
Metapodials -    -     -     -    -     -     -
-----
Atlas        1    -     -     -    -     -     -
Axis         -    -     -     -    -     -     -
Cervical     -    -     1     -    -     -     -
Thoracic     -    -     4     -    -     -     -
Lumbar       -    -     -     -    -     -     -
Sacrum       -    -     -     -    -     -     -
Caudal       -    -     -     -    -     -     -
Unid. Vertebra -    -     -     -    -     -     -
-----
Ribs         -    -     4     -    -     1     -
LB fragments -    -    20     -    -    11     -
Unid. fragments -    -     2     -    -     -     5
-----
TOTAL        20    2    37    20    3    29    5

```

 LAR = cattle-sized large mammal, Sh/G = sheep/goat, SAR = sheep-sized small ungulate.
 Ses.= Sesamoids, LB = Long bone, Unid.= Unidentified.

Table 9. Numbers of Fragments from different Anatomical Elements from Phase II at Catterick Bridge CEU 240.

Species	Cow	Horse	Deer	LAR	Sh/G	Pig	SAR	Dog	Bear	Bird	UNK
Skull	76	2	-	39	4	10	7	-	-	-	-
Horncore	(9)	-	-	-	-	-	-	-	-	-	-
Antler	-	-	4	-	-	-	-	-	-	-	-
Mandible	63	17	-	94	18	16	7	3	-	-	-
Loose Teeth	139	26	-	4	47	20	-	1	-	-	-
Scapula	30	2	-	88	3	5	7	1	-	-	-
Humerus	25	3	-	26	11	10	8	2	-	1	-
Radius+Ulna	44	4	-	20	16	5	13	3	-	1	-
Pelvis	38	4	-	42	4	2	6	1	-	-	-
Femur	5	4	-	8	5	2	10	-	-	-	-
Tibia	12	6	-	17	14	6	27	4	1	2	-
Fibula	-	-	-	-	-	-	-	-	-	-	-
Metacarpal	43	-	1	-	19	1	-	-	-	-	-
Carpals+Ses.	4	1	-	1	1	-	-	-	-	-	-
Metatarsal	46	2	-	1	18	-	-	-	-	-	-
Tarsals	3	-	-	-	-	-	-	-	-	-	-
Calcaneum	15	1	-	4	-	1	-	-	-	-	-
Astragalus	12	5	-	-	2	-	-	-	-	-	-
Phalanges	52	8	-	-	7	1	-	-	-	-	-
Metapodials	-	5	-	-	1	1	-	-	-	-	-
Atlas	1	-	-	-	1	-	-	-	-	-	-
Axis	3	1	-	-	4	-	-	-	-	-	-
Cervical	-	-	-	35	5	-	-	-	-	-	-
Thoracic	-	-	-	52	12	-	2	-	-	-	1
Lumbar	-	-	-	16	8	-	-	-	-	-	-
Sacrum	-	-	-	1	-	-	-	-	-	-	-
Caudal	-	-	-	18	-	-	-	-	-	-	-
Unid. Vertebra	-	-	-	-	5	-	-	-	-	-	-
Ribs	-	2	-	234	32	-	32	-	-	1	11
LB fragments	8	-	-	592	-	-	144	-	-	3	8
Unid. fragments	-	-	-	160	-	-	2	-	-	-	404
TOTAL	619	93	5	1452	237	80	265	15	1	8	424

 LAR = cattle-sized large mammal, Sh/G = sheep/goat, SAR = sheep-sized small ungulate.
 Ses. = Sesamoids, LB = Long bone, Unid. = Unidentified.

Table 10. Frequency of Chops on Cattle, Sheep/goat, and Pig bones from Catterick Bridge.

	Cattle	LAP	Sheep/Goat	SAR	Pig
Skull	2	1	-	-	-
Atlas	2	-	-	-	-
Axis	3	-	1	-	-
Mandible	10	8	-	-	-
Scapula	42	4	1	-	4
Humerus	18	10	-	1	1
Radius&Ulna	26	4	2	3	1
Metacarpal	7	-	2	-	-
Pelvis	24	7	3	3	1
Femur	4	3	-	-	1
Tibia	5	2	2	3	5
Calcaneum	7	-	-	-	-
Astragalus	3	-	-	-	-
Metatarsal	8	-	2	5	-
Phalanges	3	-	-	-	-
Ribs	-	51	-	9	-
Cervical vert.	-	8	-	-	-
Thoracic vert.	-	5	-	-	-
Lumbar vert.	-	3	-	-	-
Longbone frag.	-	21	-	1	-
Unident. frag.	-	4	-	-	-
Total	164	105	13	25	13

LAP = cattle-sized mammal SAR = sheep-sized mammal

Vert. = vertebrae Frag. = fragment Unident. = unidentified

Table 11. Tooth Wear Patterns on the Cattle Mandibles.

wear patterns recorded by letter after Grant (1975,1982)

MWS = mandible wear stage after Grant (1975,1982)

(e) = estimated value, by comparison with the collection at Bainesse Farm CEU 46.

wear = tooth in wear but pattern not recorded

* = PM2 absent, ^ = third cusp of M3 absent, - = alveolus only

Context	PM2 (dpm2)	PM3 (dpm3)	PM4 (dpm4)	M1	M2	M3	Value MWS
---------	---------------	---------------	---------------	----	----	----	--------------

Phase I

362				k	j	j	43
644			wear				
1031		wear	wear	wear			
1200		-			wear		

Phase I/II

4111			e	k	j		40(e)
------	--	--	---	---	---	--	-------

Phase II

598					f	4	28(e)
174		wear	4	-	f	c	34(e)
374		c	5	-	f	c^	34(e)
204	wear	e	c				
694	5	f	c	k	g	f^	38
300					g	f	38(e)
251			c	k	j	f	40
680				k	j	f	40
260					j	f	41(e)
273		e	f	k	k	g	42
308				l	k	g	43
208					k	g	43(e)
632						g	43(e)
374		e	f	k	k	j	44
305	*	f	f	k	k	j	44
374	*	-	-	-	k	j	45(e)
374	wear	f	g	k	k	k	45
1306					k	k	46(e)
683				m	l	k	48
949					l	k	48(e)
683	-	-	-	n	l	k	49
736			g	o			50(e)
1040				wear			
133						wear	
556						wear	
597						wear	
687						wear	
688						wear	
556		wear	wear				
374		wear					

Table 11a. Cattle Mandibular teeth. (no teeth recorded for stages 0-3)

UW=unworn, UA=unassigned, W=worn

Phase I																					
	4	5	a	b	c	d	e	f	g	h	j	k	l	m	n	o	UW	UA	W	Total	
dp4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Premolar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1
P2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
P4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Molar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1
M2	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1
M3	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	1

Phase I/II																					
	4	5	a	b	c	d	e	f	g	h	j	k	l	m	n	o	UW	UA	W	Total	
dp4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Premolar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P4	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Molar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
M2	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Phase II																					
	4	5	a	b	c	d	e	f	g	h	j	k	l	m	n	o	UW	UA	W	Total	
dp4	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Premolar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	5
P2 (#2)	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	3(2)
P3	-	-	-	1	-	3	3	-	-	-	-	-	-	-	-	-	-	-	3	-	10
P4	1	1	-	3	-	3	3	-	-	-	-	-	-	-	-	-	1	-	1	-	13
M1/M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	17	-	-	19
M1	-	-	-	-	-	-	-	-	-	-	7	1	1	1	1	-	-	-	1	-	12
M2	-	-	-	-	-	-	3	2	-	3	8	3	-	-	-	-	-	-	-	-	19
M3	1	1	-	2	-	5	4	1	3	6	-	-	-	-	-	-	-	1	6	-	30

Table 12. Tooth Wear Patterns on the Sheep/Goat Mandibles

wear patterns recorded by letter after Grant (1975,1982)

MWS = mandible wear stage after Grant (1975,1982)

(e) estimated value, by comparison with the collection at Baines Farm CEU 46.

wear = tooth in wear but pattern not recorded

- = alveolus only

#####

Context	PM2 (dpm2)	PM3 (dpm3)	PM4 (dpm4)	M1	M2	M3	Value MWS
---------	---------------	---------------	---------------	----	----	----	--------------

Phase I

570		(wear)	(wear)				
97			(f)	g	c		22(e)
1286	a	wear	f	g			32(e)
104			g	-	f	c	32(e)
1035				g	f		
1294		a	wear	g	g	c	32

Phase II

308	(wear)	(wear)	(f)	3	0		3
1217	(a)	(wear)	(g)	b	3		10
509	(wear)	(wear)	(h)				
556	(wear)	(wear)	(wear)				
246					wear	wear	
632						wear	
372				g	d		24(e)
373			3	g	e		25(e)
308	a	wear	f	g	g	c	32
684						e	35(e)
598				j	g	e	36
684				j	g		36(e)

595	wear	wear	h	j	g	g	38#
595	wear	wear	h	l	g	g	40#

#####

#left and right jaws of the sheep skeleton

Table 12a. Sheep/Goat Mandibular teeth.

UW=unworn, UA=unassigned, W=worn

Phase I																					
	0	1	2	3	4	5	a	b	c	d	e	f	g	h	j	k	l	UW	UA	W	Total
dp2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
dp3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
dp4	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Preolar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
P3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
P4	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	3
Molar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
M1	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	4
M2	-	-	-	-	-	-	-	-	1	-	-	2	1	-	-	-	-	-	-	-	4
M3	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2

Phase I/II 1 molar 1 unassigned

Phase II																					
	0	1	2	3	4	5	a	b	c	d	e	f	g	h	j	k	l	UW	UA	W	Total
dp2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	4
dp3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4
dp4	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	1	4
Preolar	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	3
P2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	2
P3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
P4	-	-	-	1	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	4
M1/M2	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	12	2	16
M1	-	-	-	1	-	-	1	-	-	-	-	3	-	3	-	1	-	-	-	-	9
M2	1	-	-	1	-	-	-	1	1	1	-	5	-	-	-	-	-	-	-	1	10
M3	2	-	-	-	-	-	2	1	-	2	-	2	-	-	-	-	-	-	4	-	11

Table 13. Tooth Wear Patterns on the Pig Mandibles.

wear patterns recorded by letter after Grant (1975,1982)

MWS = mandible wear stage after Grant (1975,1982)

(e) estimated value, by comparison with the collection at Bainesse Farm CEU 46.

wear = tooth in wear but pattern not recorded

```

*****
Context  PM2    PM3    PM4    M1    M2    M3    Value
          (dpm2) (dpm3) (dpm4)
-----
Phase I/II
267                d    g    c                25(e)
-----
Phase II
209                wear  wear
361                2    a
361                f    a                20(e)
694                a                2    20(e)
361                a                2    20(e)
555                a                2    20(e)
283                a                2    loose tooth
374                g    b                24(e)
208                c                4    25(e)
370                c                36(e)
370                c    a    k
282                wear    loose tooth
*****

```


Table 14. Epiphysial Fusion Data for Cattle, Sheep, and Pig.
(not including the sheep skeleton)

Species Phase Fusion State	Cattle					Sheep				Pig			
	I		II			I		II		I		II	
	AG	NF	F	NF	F	NF	F	NF	F	NF	F	NF	F
Metacarpal proximal	0	-	4	-	25	-	4(1)	-	11	-	1	-	1
Metatarsal proximal	0	-	2	-	21	-	3(1)	-	7	-	1	-	-
1st Phalanx distal	0	-	5	-	28	-	1	-	2	-	-	-	-
2nd Phalanx distal	0	-	7	-	13	-	-	-	-	-	-	-	1
Scapula	1	-	9	-	19(6)	-	-	-	1(1)	-	-	-	-
Acetabulum	1	-	3	-	26(1)	-	-	(1)	2(1)	-	-	-	1
2nd Phalanx proximal	2	-	6	-	14	-	-	-	-	-	-	-	1
Humerus distal	2	-	3	-	12(4)	-	-	-	3	-	-	-	1
Radius proximal	2	-	4	-	14(1)	-	2	-	8	-	-	-	1
1st Phalanx proximal	2	-	3	-	24	-	1	-	1	-	-	-	-
Metacarpal distal	3	-	4	2	9	-	1	-	2	1	-	-	1
Tibia distal	3	-	2	1(2)	10(1)	-	(1)	-	8	1	-	2	-
Metatarsal distal	3	1	4	3	5	-	-	-	1	1	-	-	-
Metapodial distal	3	-	1	1(1)	6(1)	-	-	-	1	-	-	-	-
Calcaneum proximal	4	-	2	-	1	-	-	-	-	-	-	1	-
Femur proximal	4	-	-	x1	1(2)	-	-	1	1	-	-	-	-
Ulna distal	4	-	-	-	1	-	-	-	-	-	-	-	-
Ulna proximal	5	-	-	1	1	-	-	-	-	-	-	-	-
Radius distal	5	-	2	x2(5)	8	-	-	-	1	-	-	-	-
Femur distal	5	-	-	-	-	-	-	1	2	-	-	-	-
Tibia proximal	5	-	-	-	(2)	-	-	-	-	-	-	-	-
Humerus proximal	5	-	1	(x2)	(1)	-	-	-	-	-	-	-	-
Vertebra	6	(9)	(2)	(14)	(35)	(2)	-	-	(2)	-	-	-	-

F = fused, NF = not fused, x = epiphysis, figures in brackets are large mammal and small ungulate.
n = number of specimens, AG = age group, cattle only.

In most cases NF = unfused metaphyses, but in some cases there were only unfused epiphyses present and these are marked with an x. In one case only, large mammal distal tibia, were there both unfused metaphyses and unfused epiphyses present, (two metaphyses and one epiphysis), only the metaphyses are listed in the table. Fusion ageing data from Sisson and Grossman 1975.

Summary of Epiphysial Fusion Data for Cattle+Large Mammal

Phase Fusion State	I				II			
	Not Fused		Fused		Not Fused		Fused	
	n	%	n	%	n	%	n	%
Age Group								
0 birth	-		18		-		87	100
1 7-10 months	-		12		-		52	100
2 10-24 months	-		16		-		69	100
3 24-36 months	1	(8)	11	(92)	10	19	42	81
4 36-42 months	-		2		1		5	
5 42-48 months	-		3		8	(40)	12	(60)
6 very late	9		2		14	29	35	71

Table 15. Sheep Skeleton CEU no.8310212

```

*****
Layer          540      595
-----
Hyoid          -        2
Skull          -        1
Mandible       -        2
Scapula        -        2
Humerus        -        2
Radius+Ulna    -        1
1st Phalanx    3         -
2nd Phalanx    2         -
Sesamoid       1         -
Rib            -       26
Cervical       -        7
Thoracic       -       12
Lumbar         -        6
Sternum        -        5
Costal cartilage -        6
-----
TOTAL          6        72
*****

```

Appendix 1.

Table i. Contexts Containing Animal Bones for each Phases for Catterick Bridge CEU 240. (based on information available in October 1986)

Unstratified Contexts (data recorded but not reported on)

66, 67, 79, 85, 93, 94, 98, 216, 236, 239, 276, 284, 290, 369, 516, 517, 525, 526, 739, 913, 918, 1120, 1122.

Unphased Contexts (data recorded but not reported on)

177, 232, 327, 432, 436, 481, 543, 585, 599, 604, 648, 714, 726, 906, 927, 952, 998, 1037, 1046, 1067, 1079, 1101, 1202, 1205, 1271, 1275, 1279, 1300, 1328, 1350, 1429, 1438.

Phase I (2nd century - late 3rd century)

Area 4

97, 310, 355*, 362, 378, 382, 383, 384, 801, 805, 814, 882, 914, 920, 939, 994, 996, 1031, 1035, 1054, 1056, 1061, 1111, 1115, 1124, 1127, 1136, 1200, 1245, 1277, 1284, 1286, 1290, 1291, 1294, 1461, 1463, 1465, 1466, 1468, 1469, 1470.

Area 5

104, 144.

Area 6

524, 570, 571, 572, 576, 580, 589, 593, 640, 644, 657, 658, 675, 708, 710, 712, 733, 746.

Phase I/II (Interface 267 late 3rd century)

Area 4

243*, 267, 307, 411, 1033, 1295, 1296.

Phase II (late 3rd century - 4th century)

Area 4

72, 204, 206, 208, 209, 213, 214, 218, 227, 233, 235, 246, 259, 260, 262, 264, 266, 273*, 278, 282, 283, 292, 300, 301*, 303*, 304*, 305*, 306*, 308*, 319*, 321*, 326, 341*, 344*, 358*, 361*, 363, 370*, 372, 373, 374, 379, 380, 409*, 413, 705*, 707*, 901*, 903*, 949, 1002*, 1004*, 1010*, 1017*, 1040, 1073*, 1089, 1093, 1096, 1216*, 1217*, 1232, 1241*, 1244*, 1247*, 1263*, 1280*, 1306, 1458*, 1521*.

Area 5

102, 103, 106, 114*, 124, 126, 133, 134, 145, 161, 164*, 168*, 173*, 174*, 180*, 189*, 193*, 251, 261, 263.

Area 6

509*, 513*, 527, 533, 540, 542, 553, 555, 556, 557, 562, 595, 597, 598, 601, 607, 610, 613, 614, 616, 617, 618, 619, 621, 622, 626, 629, 631, 632, 633, 635, 637, 650*, 661, 665, 667, 678*, 680, 683, 684, 685, 687, 688, 689, 690, 694, 698, 701, 711*, 720, 724, 729, 734, 736, 737, 738*, 750, 753*.

Contexts With High Residuality - marked with an *

Table ii. Condition of the Animal Bones.

```

*****
Phase          Phase I  Phase I/II  Phase II  Total
-----
Burnt
  Black/brown   11        1         54       66
  White         -         -          1         1
% of total     1         1          2         2
-----
Stained         -         -          1         1
-----
Weathered       2         -          4         6
-----
Freshly Broken 338        52       1149     1539
% of total     40        45         36         37
-----
Erosion
  Slightly      -         -          1         1
  Moderately    7         -         40        47
  Extremely     21        3         67        81
% of total     3         3          3         3
-----
Rodent Gnawing -         -          2         2
-----
Canid Gnawing on:-
  Cattle        6         -         13        19
  Sheep/Goat    2         1         16        19
  Pig           2         -          4         6
  SAR           2         1          7         10
% of total     2         2          1         1
-----
Number Frags   842       116       3199     4157
*****

```

Appendix 2

Selected Measurements from Catterick Bridge

Measurements with numbers ie m7 are those as defined in the recording system used in the Ancient Monuments Laboratory (Jones et al). Where these correspond with measurements defined by von den Driesch (1976) her codes are inserted below. Other measurements can be obtained from the archive. All measurements are in millimetres.

CATTLE

Cattle Horncore

Phase	Measurement	
	m1	m2
I	34.3	27.0
	35.0	25.4
	65.5	43.5
II	61.7	47.6
	43.1	33.4
	42.9	34.5

Cattle Radius

Phase	Measurement						
	m4	m5	m6	m8	m9	m11	
II			Bd	BFp	BFd	SD	
	32.4	18.7	-	-	-	-	
	34.7	-	-	63.1	-	-	
	44.1	22.7	-	77.0	-	41.7	
	38.8	21.2	-	73.8	-	38.2	
	40.5	-	-	69.6	-	-	
	-	23.8	-	79.8	-	-	
	-	-	-	-	53.2	-	
	-	-	66.5	-	62.3	-	

Cattle Humerus

Phase	Measurement				
	m5	m6	m7	m8	m10
I	BT		Bd	SD	LT
	-	-	-	-	45.7
	66.7	-	-	-	39.8
	-	-	-	33.3	41.2
	-	-	-	-	42.6
	75.8	-	-	-	44.8
	68.5	52.4	76.0	-	40.3
	-	-	-	35.7	-
	-	-	-	31.3	-

Cattle Scapula

Phase	Measurement					
	m2	m3	m4	m5	m6	
I	SLC		GLP	BG	LG	
	46.3	19.9	-	-	53.3	
	-	-	-	-	50.4	
	46.6	-	-	-	54.5	
	46.6	19.3	62.5	-	-	
	55.6	-	80.1	-	65.5	
	58.1	-	-	-	-	
	II	54.2	24.3	-	-	-
		54.2	22.1	68.8	-	56.8
		-	-	59.5	41.1	49.4
-		-	63.0	41.5	49.5	
46.8		-	60.9	-	-	
45.9		19.7	68.0	45.0	55.8	
46.4		20.2	-	-	-	
47.7		-	-	-	-	
-		-	58.1	-	-	
-		-	70.7	-	57.4	

Cattle Metacarpal

Phase	Measurement														
	m2	m3	m4	m5	m6	m7	m8	m9	m10	m11	m12	m13	m14	m15	
I	Bp	Dp	SD		Bd							DD	DFB	DFD	
	47.9	32.3	-	-	-	-	-	-	-	-	-	-	-	-	
	62.1	38.8	-	-	-	-	-	-	-	-	-	-	-	-	
	-	-	31.1	21.9	-	-	-	-	-	-	-	-	-	-	
	-	-	-	-	49.0	23.3	-	20.5	-	23.4	22.8	-	45.5	-	
	-	-	-	-	53.0	24.8	29.8	21.4	29.0	25.7	25.6	19.6	48.0	26.1	
	I/II	-	-	-	-	-	-	-	-	-	-	-	19.0	48.6	25.3

SHEEP/GOAT

Sheep/Goat Scapula

Phase	Measurement				
	m2	m3	m4	m5	m6
	SLC		GLP	BB	LG
II	19.0	9.8	31.6	-	25.2

Sheep/Goat Radius

Phase	Measurement					
	m2	m3	m4	m5	m8	m11
	Bp				BFp	BFd
I	31.9	15.9	17.3	9.2	-	-
	-	-	-	-	-	14.8
	-	-	15.2	7.0	-	-
	-	-	15.6	7.2	-	-
II	27.1	14.3	15.7	7.9	-	14.6
	25.7	12.8	14.8	6.9	-	-
	28.5	-	-	-	25.8	-
	-	-	15.6	7.7	-	-
	-	-	16.2	8.1	-	14.8
	-	-	14.7	7.1	-	13.9
	-	-	18.1	8.6	-	-
	-	-	14.3	7.4	-	-
	-	-	15.1	7.9	-	-

Sheep/Goat Humerus

Phase	Measurement	
	m8	m10
	SD	LT
II	13.3	-
	14.2	-
	13.9	17.5
	13.1	-
	12.6	-
	13.5	-
	15.5	-

Sheep/Goat Metacarpal

Phase	Measurement									
	m2	m3	m4	m5	m7	m9	m10	m13	m14	m15
	Bp	Dp	SD					DD	DFB	DFD
I/II	22.9	-	14.4	11.3	-	-	-	-	-	-
II	-	-	13.1	10.4	-	-	-	-	-	-
	18.4	-	-	-	-	-	-	-	-	-
	-	-	13.4	9.7	-	-	-	-	-	-
	-	-	12.8	-	-	-	-	-	-	-
	21.2	15.3	12.8	10.7	-	-	-	-	-	-
	21.6	16.1	13.5	11.2	-	-	-	-	-	-
	19.6	13.2	12.0	10.1	-	-	-	-	-	-
	19.6	13.3	-	-	-	-	-	-	-	-
	-	-	15.3	10.5	-	-	-	-	-	-
	19.9	14.5	13.1	9.7	-	-	-	-	-	-
	-	-	-	-	-	-	-	8.4	-	-
	-	-	11.1	9.7	9.6	9.2	13.8	7.9	21.0	11.4
	-	-	11.8	9.6	-	-	-	-	-	-

Sheep/Goat Pelvis

Phase	Measurement			
	m9	m16	m19	m20
	SB	SH	LA	LAR
II	-	-	26.3	23.5
	8.7	13.3	-	-
	8.8	14.2	-	-
	7.3	12.4	-	-

Sheep/Goat Tibia

Phase	Measurement		
	m5	m6	m7
	SD		Bd
I/II	-	-	21.8
II	-	-	24.7
	12.2	9.4	21.0
	12.5	10.4	-
	13.0	10.9	-
	12.2	9.8	-
	13.4	10.9	-
	13.8	11.0	-

Sheep/Goat Metatarsal

Phase	Measurement			
	m2	m3	m4	m5
	Bp	Dp	SD	
I	19.2	19.1	-	-
I/II	18.4	18.6	11.8	12.2
II	18.4	18.0	11.0	11.5
	19.3	19.6	12.0	12.0
	17.2	17.7	10.5	10.9
	-	-	10.3	10.9

Sheep/Goat Astragalus

Phase	Measurement			
	m1	m2	m5	m6
	GL1		Bd	D1
II	28.1	21.6	17.9	15.4
	-	-	17.5	-

SHEEP SKELETON PHASE II CONTEXT 595**Sheep Skull**

Measurement															
m3	m4	m5	m7	m8	m9	m10	m11	m12	m13	m14	m16	m17	m18	m19	m20
72.2	49.0	24.4	50.4	50.3	20.9	20.4	70.4	76.3	48.0	63.1	76.2	258.0	251.5	46.4	49.3

Sheep Mandible

Measurement																			
m1	m2	m3	m4	m5	m6	m7	m10	m11	m12	m13	m14	m15	m16	m17	m18	m19	m20		
29.2	-	-	-	-	-	-	121.5	21.5	50.9	48.7	19.4	22.0	22.4	23.4	26.7	-	23.6	72.9	
30.2	86.7	75.3	104.5	194.2	134.3	123.4	22.4	51.6	50.8	19.7	21.9	22.5	24.1	27.9	33.0	22.3	73.4		

Sheep Scapula

Measurement							
m1	m2	m3	m4	m5	m6	m7	m8
Ld	GLC		GLP	BG	LG	HS	DHA
-	24.8	11.5	39.2	24.7	30.4	163.4	175.3
110.9	24.3	11.7	38.5	24.4	30.0	164.2	176.3

Sheep Humerus

Measurement									Withers Height
m2	m3	m5	m6	m7	m8	m9	m10		
GLC	Bp	BT		Bd	SD	GL	LT		
145.9	42.3	32.6	24.0	35.4	17.4	161.0	21.4	679.4	
144.7	43.2	32.5	25.1	35.0	17.1	159.5	21.2	673.1	

Sheep Radius and Ulna

Measurement											Withers Height
m1	m2	m4	m6	m8	m9	m11	m12	m13	m14	m16	
GL	Bp		Bd	BFp	BFd	SD	GL1	LD	BFC	SDD	
166.6	36.3	20.7	34.8	32.4	27.6	20.1	212.5	45.3	20.8	25.9	666.4

PIG**Pig Maxilla**

Phase	Measurement	
	m1	m2
II	29.6	18.6
	29.4	17.1

Pig Humerus

Phase	Measurement			
	m5	m7	m8	m10
	BT	Bd	SD	LT
I	-	-	10.1	-
II	-	-	14.2	-
	-	-	13.9	-
	-	-	12.8	-
	26.8	34.8	-	25.1

Pig Third Metacarpal

Phase	Measurement
	m2
	Bp
I	18.4

Pig Fourth Metacarpal

Phase	Measurement
	m1 m2 m3
	GL Bp Bd
II	64.5 13.4 14.9

Pig Third Metatarsal

Phase	Measurement
	m2
	Bp
I	13.5

HORSE**Horse Skull**

Phase	Measurement
	m5 m6 m7
I	34.6 37.9 81.3

Horse Mandible

Phase	Measurement
	m10 m11
II	89.8 -
	83.8 78.7

Horse Scapula

Phase	Measurement
	m4 m5 m6
	GLP BG LG
II	90.5 42.3 55.5
	- - 58.0

Horse Humerus

Phase	Measurement
	m5 m6 m7 m8 m10
	BT Bd SD LT
II	69.7 50.2 77.0 28.9 47.4

Horse Pelvis

Phase	Measurement
	m12 m13 m19 m20
	LA LAR
II	- - 61.2 55.4
	60.5 56.1 - 60.5

Horse Femur

Phase	Measurement
	m3 m4 m5 m6 m7 m8 m9 m10
	Bd SD DC Bp
II	81.0 33.9 30.9 98.0 32.0 43.6 - -
	- - - - 32.0 42.2 46.6 98.2
	- - - - - - 46.7 -

Horse Tibia

Phase	Measurement
	m5 m6 m7 m8
	SD Bd Dd
II	- - 63.3 40.0
	33.8 27.1 - -

Horse Metatarsal

Phase	Measurement
	m1 m2 m4 m5 m6 m13 m14 m16
	GL Bp SD Bd DB DFB DFD
I	255.0 47.5 27.8 27.6 - - -
	255.0 46.7 - - 46.7 22.7 43.6 -
II	- - - - - 26.0 - -
	268.4 47.3 28.1 26.1 - 22.7 - 261.5

Horse Astragalus

Phase	Measurement
	m1 m2 m3 m4 m5 m6 m7 m8
	LnT GB GH BFD
I	60.4 33.4 59.5 51.6 57.3 65.5 59.5 54.7
II	52.5 31.0 - - 46.9 53.5 49.5 44.8
	56.8 37.1 55.4 - - - 57.0 -
	58.7 34.9 - - - - - 49.9
	- 43.5 61.6 - 59.0 - - 55.3

RED DEER

Red Deer Metacarpal

Phase	Measurement	
	m2	m3
	Ep	Dp
II	38.6	26.0

DOG

Dog Mandible

Phase	Measurement						
	m11	m14	m15	m16	m17	m19	m20
	10	20			19	13L	13B
II	-	-	-	-	-	16.1	6.3
	21.9	10.4	10.1	9.9	12.2	15.9	6.3

Dog Humerus

Phase	Measurement	
	m8	
	SD	
II	10.4	

Dog Ulna

Phase	Measurement	
	m2	m4
	BPC	SDO
II	19.7	22.8

HARE

Hare Ulna

Phase	Measurement	
	m2	m4
	BPC	SDO
I	8.7	11.8

BROWN BEAR

Brown Bear Tibia

Phase	Measurement	
	m7	m8
	Bd	Dd
II	64.7	35.1