ANIMAL BONE REPORT, WATERMEAD COUNTRY PARK (ACCESSION NO. A57.1996)

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Introduction

The bones excavated by University of Leicester Archaeological Services from Watermead Park, Birstall, Leicestershire (site code: A57.1996) were recorded as to site context, anatomical and taxonomic identity, age-indicators, measurements, and post-mortem change. The original records are kept at the University of Leicester School of Archaeology and Ancient History. Much of the bone was unstratified, and contextual interpretation depends on radiocarbon dates of a few specimens. The most conspicuous taxon present is the aurochs which is nowadays extinct. Context 129, a peat layer, has been dated to the Iron Age.

Materials and Methods

Information was recorded electronically into a spreadsheet (Microsoft Excel) using separate worksheets for different classes of information, then sorted using a relational database (Microsoft Access). Categories of information which were recorded included: Context; Identification; Breakage; Burning; Butchery; Fusion (epiphyses, sutures); Gnawing; Horns; Measurements. A category for abnormalities was not used.

The bone assemblage was identified morphologically, with reference to comparative specimens housed in the collection of the School of Archaeology and Ancient History, University of Leicester.

Observations were made on age-diagnostic criteria such as epiphyseal fusion and dental eruption (Silver, 1969). Dental wear stages (Grant, 1975) were also recorded.

Measurements were made of adult bone following mostly the recording conventions of von den Driesch (1976). Withers heights were calculated using published scaling factors (von den Driesch and Boessneck, 1974). Factors where used for aurochsen have been derived for domestic cattle. Variation in size among aurochsen seems not to result from uniform scaling of the complete skeleton but incorporates proportional changes; the metapodia are particularly variable (Chaix and Arbogast, 1999). Hence withers height has been estimated not by applying uncritically scaling factors to individual bones, but by comparing excavated bones

with corresponding elements of complete skeletons from Denmark (Degerbøl and Fredskild, 1970). For the Danish aurochsen estimates of height may be derived simultaneously from a number of skeletal elements, which may then be pooled for each individual, resulting in a cluster of estimates for the specimen. A second source of variability lies in the choice of scaling factors derived by independent researchers, particularly when studying metapodia. The notes below use furthermore separate metapodial scaling factors for males and females. In all cases the estimated height ranges are empirical, not probabilistic.
Inspection for signs of butchery was initially carried out assisted by a low power magnifying lens with illuminator. Specific marks were examined optically using a stereomicroscope at magnifications of 12.5x up to 80x with twin fibre-optic illumination and the observations compared with published illustrations and descriptions.

Results and Discussion

Dating

Table 1 gives the radiocarbon dates obtained from the bone. The range of dates spans from the first century to the end of the fourth millennium BC, with the means ranging from 195 BC to 2870 BC. The bones clearly do not form a single assemblage. The aurochs bones are dated to a period which Darvill (2002: 494) fits within the earliest British Bronze Age, though Barber (2003: 42) defines the British Early Bronze Age as beginning at about 2,300 BC. The earliest copper and gold found in Britain dates to perhaps as early as 2,700 BC and metal blades were copied in flint in Britain around the period 2,600 - 1900 BC, with an actual bronze axe dated to about 2,300 BC (Parker-Pearson, 1993: 78-82). The aurochs bones have mean ages of 2,435 and 2,305 BC. Evidence for metal versus stone cuts, such as butchery marks, around the age of the aurochs bones might therefore throw light on the spread and application of metal technology.

Table 1: Radiocarbon dates for bones found at the site of the burnt mound.

Lab. no.	Ref. no. returned with specimen	Sample	Radiocarbon years bp	δ13 (‰)	Calibrated date range (95% probability)
GrA-23584		Cattle skull id. 111	2105 ± 45	-22.25	360 - 30 BC
GrA-23572		Horse skull, id. 114	2165 ± 45	-22.6	380 - 100 BC
GrA-23589	32921	**Aurochs humerus**, id. 190	3840 ± 50	-23.36	**2470 - 2140 BC**
GrA-23585	32924	**Aurochs** femur, id. 03	3925 ± 45	-23.13	**2580 - 2290 BC**

The dates are spread through the Neolithic to the Iron Age indicating a series of deposits of bone at the site. $\delta^{13}C$ values show a clustered group appropriate for a terrestrial habitat before the introduction to Europe of plants such as maize with a C_4 photosynthetic metabolism.

The range of taxa represented by the bones

In the discussions of each taxon, scientific names are given following common convention (Clutton-Brock, 1987: 196-197) accompanied by the more pedantic name where relevant. “L.” in the context of scientific names signifies the authority, “Linnaeus, 1758”. Table 2 lists the taxa and the number of bones according to context. 275 bone specimens were recorded. Further data on individual taxa follows. Where measurements are discussed, the abbreviations denoting the measurements follow von den Driesch (1976). A list of identified taxa is given in Table 2.

Table 2: All bone by taxon and context: NISP.

Taxon ↓ \ Context →	0	100	101	127	129	345	373	Total
Homo	4							4
Equus	21				12	1		34
B. primigenius* & cf. *primigenius	27			1	1			29
B. taurus* & cf. B. *taurus	73	6	2	1	16		1	99
***Bos/Cervus* indet.**	1			1	1			3
Cervus* and cf. *Cervus	23			1	6			30
Sus	6							6
Capra/Ovis*, *Ovis*, and cf. *Capra/Ovis	24			1				25
Canis	2							2
Felis	1							1
combined unidentified	33	1		2	4			40
Overall total	215	7	2	7	40	1	1	273

The taxa are discussed below with an emphasis on the aurochs. In general there seems to be little pattern to anatomical representation and this is attributed to the vagaries of commercial excavation. Anatomical representation and its taphonomic implications are therefore not discussed for individual taxa except to make specific points.

Human, Homo sapiens L.

Four unstratified human bones were recovered as incidental finds among the animal bone. Other human remains were recovered and they are dealt with more completely elsewhere.

Horse, Equus caballus L.

Table 3: Horse bone by anatomy and context: NISP.

Anatomy ↓ \ Context →	0	100	101	127	129	345	373	Total
skull	2				6			8
dentary	6				2			8
vertebra: cervical 1 (atlas)	2				1			3
rib	1							1
scapula					1			1
radio-ulna	2							2
pelvis	2				1	1		4
tibia	6				1			7
***Equus* total**	21				12	1		34

Anatomical parts are listed in Table 3. At least four individuals are represented. Estimates of stature for three unstratified left tibiae follow, with estimation of withers height following Vitt (*cit. in* von den Driesch and Boessneck, 1974). The smallest tibia fits Vitt's below average size class, with a withers height of about 13 hands, the other two lie in his middle size range at about 14 hands.

greatest length	*size class*	*height: metres;*	*inches;*	*hands*
330 mm.	325-345 mm.	1.28-1.36 m.	50½ - 53½"	12.5 - 13.3 hh
358 mm.	345-365 mm.	1.36-1.44 m.	53½ - 56¾"	13.3 - 14.2 hh
359 mm.	345-365 mm.	1.36-1.44 m.	53½ - 56¾"	13.3 - 14.2 hh

Aurochs or Urus, *Bos taurus* Linnaeus, 1758 in part (*B. primigenius* Bojanus, 1827)

Introduction

The aurochs is the wild ancestor of domestic cattle. The domesticated forms seem to have arisen in the Middle East, and in Britain at least, the wild and domestic forms remained genetically separate (Troy *et al.*, 2001). The time range for the presence of aurochs in Britain ranges from late Devensian to Bronze Age with an earlier occurrence in the Ipswichian interglacial, and a latest find from 4th century AD Roman Segontium at Caernarfon (Yalden, 1999: 106-111). This last is an isolated record and begs the question of whether it might be an import, a redeposition, or a contemporary animal. There are local finds from a peaty deposit at Cossington, Leicestershire, which include a distal fragment of humerus, a lower jaw and ribs (Browning, unpub.). Those finds were not all recovered by organised archaeological excavation and associated material (ox, pig and red deer; horse teeth from a Bronze Age burial mound; mammoth tusk) was highly likely from more than a single context.

The bones are conspicuous by virtue of their size, those of the domestic cattle being noticeably smaller. A further distinction from the bones of domestic cattle is the rugosity of the surfaces, particularly on the thoracic vertebrae, which developed in response to the much greater degree of exercise of the muscles and ligaments of animals in the wild than in confined, domesticated situations.
Most of the aurochs bone is unstratified, but contexts 127 and 129 have one bone attributed to each. They are both palaeochannel peats so the distinction between them may well be trivial. The dating of the unstratified aurochs humerus and femur to somewhere near the Neolithic/Bronze Age transition has implications for the dating of the palaeochannel infill.
Numbers of anatomical elements (Table 4) do not seem to fit a pattern. The ribs may be explained as being most abundant because they are so in the body. They are not greatly fragmented. Potentially the bones could be accounted for by a single specimen, but metrical considerations (see below) indicate at least, possibly only, two individuals. The body parts recovered are probably accounted for by the vagaries of commercial earth-moving.

Table 4: Wild cattle (Bos primigenius) bone by anatomy and context: NISP.

Taxon, anatomy ↓ \ Context →	**0**	**100**	**101**	**127**	**129**	**345**	**373**	**Total**
Bos primigenius								
skull	1							1
„ **(cf. *B. primigenius*)**	1				1			2
dentary	2							2
vertebra: cervical	1							1
vertebra: thoracic	2			1				3
rib	12							12
scapula	1							1
humerus	1							1
metacarpal	1							1
pelvis	2							2
femur	2							2
tibia	1							1
***B. primigenius* & cf. *primigenius* total**	27			1	1			29

Measurements: size and sex

Measurements (Table 5) are compared with those of Danish aurochsen (Degerbøl and Fredskild, 1970). Relevant measurements for British aurochsen do not seem to be readily available (ABMAP, 2003 website). Estimates of withers height are derived from conversion factors applied to bone lengths as published by von den Driesch and Boessneck (1974).

An intercornual fragment of the frontal bones of the cranium, thoracic vertebrae, are very large, indicating masculinity, as are most but not all the ribs. The ten largest ribs were in fairly large pieces of which seven rib fragments on the left side, represented a minimal number of six elements. Two rib specimens were noticeably smaller than the rest and if the largest ten ribs be from a bull aurochs, then these latter two may be explained as deriving from a female. Other evidence (see below) indicates that domestic cattle from the site were small, and easily distinguishable from aurochs, though of course given the unstratified nature of most of the collection there is no way of being totally sure that no bones of recent breeds have found their way into the collection.

Table 5: Measurements of aurochs bones. Abbreviations are those of A. von den Driesch (1976).

Anatomy	Measurements in millimetres:													
	LA	SH	HS	SLC	GLP	LG	BG	GL	SD	Bp	SD	DD	Bd (suture)	Bd (epiphysis)
right scapula			498	87.5	106	85.1	76.3							
right distal femur														137.5
left humerus								≥370	51.5					
left metacarpus								249		70.9	43.6	28.4	70.1	72.3
right pelvis	80.3	54.8												
left pelvis	>80	54.7												

The **scapula** most closely approaches among the Danish finds the Vig bull whose estimated withers height is 1.66 ± 0.07 metres. Values for scapular glenoid measurements, GLP and BF, lie clearly within the cluster for males in Rowley-Conwy's (1998: fig. 8.1) Star Carr data.

The **humerus** is damaged at each end, so the total length (GLl) is an estimate. This was multiplied by a factor of 4.77 to give a withers height of ≥ 1.532 metres. This measurement lies below the range for Danish aurochs bulls by 27 mm. but just above that for females by only 3 mm. (The range for domestic cattle quoted by Degerbøl and Fredskild (1970) has a maximum at 28 mm, below our specimen's size.)

The **metacarpus** is a variable bone and may account for size differences between individuals to a greater proportion than do other limb bones (Chaix and Arbogast, 1999). A range of scaling factors for determination of height is offered by different authors (*cit. in* von den Driesch and Boessneck, 1974) and differ for males and females. The length, which is close to that of the St Taastrup specimen at the top end of the females' range, is near the middle of the (244-253 m.) overlap between Danish male and female aurochsen, and below that for quoted domestic cattle, so length alone is insufficient for sexual determination, though comparison with the larger bones suggests a female. The breadth measurements (proximal, midshaft and distal) and the midshaft anteroposterior depth fit the female aurochs better than any other group in the Danish study.

Proportions of breadth against length expressed as percentages for comparison with Degerbøl's and Fredskild's (1974) data are as follows: Bp/GL = 28.47; SD/GL = 17.51; Bd/GL = 29.04. All these ratios are lower than the corresponding ones for Danish aurochs

bulls, and lie within the range for cows. They are incidentally within the ranges quoted for domestic material whose respective ranges for males and females offer less discrimination, possibly obscured by the practice of castration as well as by intentional breeding. The Danish specimens with the most similar metacarpi were three females, with the Vittrup cow being closest in terms of proportions. In conclusion the sex of the animal which was the source of the metacarpus is most likely female.
On this basis, stature estimation using scaling factors ranging from 6 to 6.31 works out at 1.53 ± 0.06 m. (1.47 - 1.59 m.) depending on the scaling factors used. This admits the possibility of a common origin for the metacarpus and humerus. (Corresponding estimates for a bull would come to a 1.59 ± 0.08 m. (1.51 - 1.67 m.) using factors ranging from 6.24 to 6.71).

The **pelves** are not complete. They are large, but the acetabular lengths are not hugely so in comparison with modern reference specimen of a domestic animal.

The stature based on the distal **femoral** end can be calculated by predicting femoral length from the distal breadth if a close relationship between breadth and length among individuals be assumed. The distal breadth compares with the males rather than the smaller females, and by comparison with the proportions of the bull aurochs from Grejs Mølle, the length is probably of the order of 0.508 metres laterally, 0.473 medially. Multiplying the lateral length by 3.23, and the medial by 3.47 both give 1.641 metres. This is close to the estimate derived from the scapula. A greater trochanter from the proximal end may also be from a male, but the confidence is a little less.

To summarise, there seem to be at least two individuals present, quite possibly just one of each sex. The male is represented by the scapula and femur and probably also by the intercornual cranial fragment, at least two of the vertebrae, and most of the ribs. The female contributed the humerus, metacarpus, and possibly a vertebra and two ribs.

Age

All epiphyseal sutures were observed to be fused. Thus for the male, the coracoid process was fused to the scapula indicating an age above seven months, and the distal femoral fusion indicated an age of over three-and-a-half years. The major trochanter of the proximal femur (sex undetermined, but plausibly male on account of size) was also fused, giving a lower age limit the same as for the distal fragment. The female metacarpus is fused distally denoting an age of over two years, and fusion of the proximal humerus indicates an age of at least three-and-a-half years. Thus both the bull and the cow were adults at over three-and-a-half years. The proximal ends of the ribs were all fused, as were the anterior and posterior facets of the thoracic centra.

Butchery

Gnawing was minimal and superficial, but the cow humeral shaft bore many fine scratches very likely inflicted by incisors of carnivores such as foxes. Thus human activity remains an important suspect for observed breakage where the bones are in good condition.

Ribs appear to have been broken free from the vertebral column as would be expected in ancient butchery, rather than splitting the carcase down the midline so that the rib comes away with half a vertebra attached. The more modern technique in use from the mediaeval period necessitates suspending the carcase by the hocks before splitting (Armitage, 1982). Thus the vertebrae are all intact to the extent of left and right halves being united. One thoracic vertebra (small find no. 44), smaller, presumably from the female, has been trimmed

on the right side and the neural spine broken off. Sectioning of the vertebral column into shorter lengths was illustrated by a grazing chop or deep cut posteriorly and rather ventrally on the lower right margin of the centrum of a large thoracic vertebra. Underlying spongy tissue has been exposed and this is much more porous towards the rim where a greater thickness of tissue had been removed. The blade used seems to have left no recognisable grooves. This would need to have been done with either a metal edge, or a polished rather than chipped stone blade. The nature of the operation was to separate adjacent vertebrae rather than hack through them and is appropriate to using a knife rather than a cleaver.
Butchery could have effected detachment of a complete rib from the left side and breakage through the neck of the rib itself on the right. Without a more complete set of ribs it is not obvious whether they were removed singly or as slabs of brisket. Of the largest ribs, there is an imbalance between left and right sides. Of the four right ribs, three have intact proximal ends (the fourth seems to have been broken recently), whereas the left ribs include four broken proximally and one not. It is as though the carcase was lying on one side when butchered and then either partly used or dismembered with a different degree of expertise when turned over. This is no more than speculation. Of the two smaller ribs the right was intact proximally, the left broken.

A smaller left rib which has been broken or chopped through the proximal end, bears on the medial face of the blade a series of scratches running roughly perpendicularly to the main axis of the blade. They appear to be dental scratches, caused by a small animal. Although the scratches are narrow, they do not seem to be grouped in pairs so are unlikely to be caused by a rodent. They may have been caused by a superficial scraping by fox teeth. Such features occurred on a number of bones and were examined closely in the expectation of deciphering butchery.

The **humerus** has two fairly flat, broken surfaces indicating chopping planes: once obliquely through the shoulder to separate the upper arm from the shoulder by a stroke running from proximolaterally of the joint towards the armpit distomedially. Logically, the chop could have been applied after removal of the whole leg from scapula to hooves. The second chopping plane was applied to dismember the elbow joint following a plane starting anteriorly and proximally of the joint, then directed obliquely posterodistally through the angle of the elbow. In both cases the chopped surfaces were too degraded to permit determination of the direction of chopping, or to recognise striations running vertically from the surface of entry to the nadir (cf. Olsen, 1998). This condition also applies in the femur below.

A major trochanter with a small tapering part of the shaft, from the proximal end of a right **femur**, has been broken free from the rest of the bone. It appears that the shaft has been deliberately split open for access to marrow or perhaps for utilisation of the bone tissue itself.

In the distal end fragment of a right **femur** the major feature of butchery is provided by a break just above the knee, leaving a fragment of shaft posteriorly. A roughly transverse break indicates a chop applied across the front of the knee and just proximally of the joint. Infolding of the edge of the break show the impact to have come from an anteromedial direction. Additionally there are two parallel chopmarks, wedge-shaped in cross-section on the posterolateral condyle, running not quite perpendicular to the shaft, but somewhat diagonally. The marks are V-shaped in section, 23 mm. (upper, i.e. proximal mark) and 16 m. (lower, i.e. distal mark) long, about 2 mm. wide at most, and with impression of the surface of the bone into the grooves. This looks like further disarticulation of the knee joint and might have been applied as part of breaking through tendons to remove meat from the back of the thigh.

Domestic cattle *Bos taurus* L. (excluding aurochs)

Recovered anatomical parts are listed in Table 6. Head parts appear in greatest number, in part because of the fragmentation of skulls and durability of teeth. Ribs are in significant abundance because of there are so many in the body; scapulae are conspicuous and easily recovered during excavation; and the distal humerus is an exceptionally durable unit.

Table 6: Domestic cattle bone by anatomy and context: NISP.

Taxon, anatomy ↓ \ Context →	**0**	**100**	**101**	**127**	**129**	**345**	**373**	**Total**
Bos taurus								
skull	6	4			2			12
„ **(cf. *B. taurus*)**	1				3			4
dentary	12				4			16
„ **(cf. *B. taurus*)**	2		1		3			6
vertebra: cervical	2							2
„ **(cf. *B. taurus*)**	1							1
vertebra: thoracic	2							2
„ **(cf. *B. taurus*)**							1	1
rib	7							7
„ **(cf. *B. taurus*)**	7							7
cf. rib **(cf. *B. taurus*)**				1				1
vertebra: lumbar	1							1
vertebra: cf. lumbar					1			1
vertebra: sacral 1	1							1
scapula	7							7
„ **(cf. *B. taurus*)**	2							2
humerus	9							9
radio-ulna	3	1			1			5
cf. radio-ulna **(cf. *B. taurus*)**		1						1
metacarpus	2							2
pelvis			1					1
„ **(cf. *B. taurus*)**					1			1
femur	2							2
„ **(cf. *B. taurus*)**	1							1
tibia	2							2
metatarsus	1				1			2
metapodial	1							1
cf. phalanx proximalis **(cf. *B. taurus*)**	1							1
***B. taurus* total**	57	5	1		8			71
cf. *Bos taurus* total	16	1	1	1	8		1	28
***B. taurus* & cf. B. *taurus* total**	73	6	2	1	16		1	99

There were no complete long bones for estimation of stature except for an unstratified metacarpus of length 189 mm. (Bp =50.4; SD = 26.5; Bd = 52.1). The horns were in Armitage and Clutton-Brock's (1976) terminology, adult or subadult, small-horned (length of curvature of damaged horn c. 55 m.), curved, probably round-ended.

Butchery

The horned cranium from context 100 (top of peat) bears apparently numerous cuts and scrapes initially attributed to skinning. Careful examination and reflection invites the conclusion that these features are all dental marks from scavenging animals such as foxes. The grooves are grouped like teeth; the contours are u-shaped in section, they are shallow without sharp angles; and some of them contain multiple longitudinal nadirs.

Two unstratified dentaries show occasional signs of filleting on the lateral (buccal) side a short way below the point of articulation with the skull.

Condyle and coronion may remain attached to the ascending ramus, but the coronion (the extension of the lower jaw which slots and slides behind the rear of the zygomatic arch (cheekbone) is broken off in examples from contexts 101, 129 and unstratified. This breakage is probably consequent upon disassembly of the lower jaw from the skull, thus facilitating removal of the tongue. Breakage across the jaw separating horizontal and ascending sections may achieve much the same end. Few jaws are found complete.

A right lateral process is broken off a thoracic vertebra (context 373, peat base) and may reflect removal of the right rib. The left counterpart is undamaged and may indicate detachment of the corresponding rib without damage to the vertebra. This is the same type of dismemberment noted for the aurochs above.

Unstratified ribs (large mammal/cf *Bos*) exhibit two types of mark, which probably reflect the stratigraphically mixed nature of the sample. Lateral, transverse cuts are in one right rib definable as a closely spaced pair of stone-cut slices by their asymmetric, v-shaped section and chattermarks (visible at 80x magnification). A left rib shows quite a different feature medially. Very clear grooves are scored in irregular directions but are generally aligned proximodistally . They are flat-bottomed and smooth with suggestions of chattermarks. A metal blade point seems to be the cause, and there seems to be no logical imperative other than unskilled defleshing or idle “doodling” to account for this.

Butchery marks were also noted on an unstratified scapula, humerus and radius as well as a fragment of limb bone possibly radius, from context 100.

Red deer, *Cervus elaphus* L.

Table 7: Red deer bone by anatomy and context: NISP.

Anatomy ↓ \ Context →	**0**	**100**	**101**	**127**	**129**	**345**	**373**	**Total**
skull (incl. antlers!)	15			1	6			22
„ ***(cf. Cervus)***	1							1
scapula	1							1
humerus	2							2
metacarpal	1							1
femur	2							2
metatarsal	1							1
***Cervus elaphus* total**	22			1	6			29
cf. *Cervus elaphus* total	1							1
***Cervus* and cf. *Cervus* total**	23			1	6			30

Antlers dominate, indicating deliberate collection (Table 7). They consist of broken beams and tines and do not show signs of having been worked. Other bones are too few for interpretation. The femur is only slightly larger than that of a reference specimen of a hind. The presence of antlers has no bearing on the likelihood of the sex of animals killed as the antlers can be collected after shedding, though a cranial fragment with a burr was found from layer 127 (palaeochannel peat). A collection of antlers with no signs of working cannot be interpreted as the outcome of successful planning. Some disruption in performance or intent is implied.

Pig, cf. domestic pig, *Sus scrofa* L. in part (*Sus* cf. *domesticus* Erxleben, 1777)

Table 8: Pig (Sus) bone by anatomy and context.

Anatomy ↓ \ Context →	0	100	101	127	129	345	373	Total
skull	2							2
dentary	1							1
scapula	1							1
femur	1							1
phalanx proximalis: 3/4	1							1
***Sus* total**	6							6

Wild boar is ancestral to domesticated pigs. The remains are assumed to be of domestic pig; no evidence of wild boar was recognised. Anatomical parts are listed in Table 8.

Caprines: sheep (*Ovis aries* L.), and indeterminate sheep or goat (*Capra hircus* L.)

Table 9: Caprine bone by anatomy and context: NISP.

Taxon, anatomy ↓ \ Context →	0	100	101	127	129	345	373	Total
skull	1							1
„ (***Ovis***)	1							1
„ (**cf. *Capra/Ovis***)	1							1
dentary (***Ovis***)	1							1
vertebra: thoracic (**cf. *Capra/Ovis***)	1							1
rib	1							1
rib (**cf. *Capra/Ovis***)	4							4
humerus	2							2
radio-ulna	1							1
metacarpus	1			1				2
pelvis	1							1
femur	5							5
tibia	3							3
metatarsus	1							1
***Capra/Ovis* total**	16			1				17
***Ovis* total**	2							2
***cf. Capra/Ovis* total**	6							6
***Capra/Ovis*, *Ovis*, and cf. *Capra/Ovis* total**	24			1				25

Femora make the most abundant anatomical category (Table 9) which may indicate consumption in the near vicinity of the site. The one complete (unstratified) femur indicates a fairly slender animal. The definite sheep skull is rather larger than a Soay, but with similar though longer horns.

Dog *Canis familiaris* L. (i.e. domesticated forms of *Canis lupus* L.)

Two unstratified bones of dog included a pelvis with cut-marks. There are four parallel cuts laterally on the ischium: three near the posterior border and ischiadic tuberosity; one nearer the foramen obturator. The cuts are best explained by filleting, and the meat cut off may have been used not necessarily for human consumption, but perhaps for other dogs.

Cat, Felis catus L.

A single humerus was unstratified.

Summary and Conclusion

Much of the bone was unstratified and not collected scientifically, and much information was inevitably lost in the course of commercial operations. Apart from the usual suite of domestic animals, there were finds of red deer and aurochs. Deer were particularly well represented by antlers, but little can be said of them except that they must represent an intentional collection, because no evidence was found of using them for industrial purposes. The aurochs is represented by at least two individuals, one male and one female. There is evidence for dismembering butchery but not for skinning or filleting. A cut surface on a thoracic vertebra remains enigmatic as to whether it was caused by metal or stone. The cut surface lacks surface irregularities one might expect from chipped stone, but the use of metal for butchery at the date considered seems unlikely in Britain.

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Jill Cook for advice on butchery marks. (I could have done with a tutorial!)

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