DEPARTMENT OF THE ENVIRONMENT
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THE ANIMAL BONES FROM COWDERY'S DOWN, BASINGSTOKE, HAMPSHIRE

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The Animal Bones form the Excavations at Cowdery's Down, Basingstoke

The animal bones from all seasons of excavation were examined using the modern comparative collection at the D.o.E. Faunal Remains Project at the University of Southampton. They were computer-recorded using the Ancient Monuments Laboratory system (Jones et al. 1981) and an archive created upon which this report is based.

Period 1 - Early-Middle Bronze Age

Animal bones were found in Ring Ditches 3-5 (Table 1). The majority were recovered from Ring Ditch 3 (228 fragments). This total excludes hundreds of amphibian bones (of both frog and toad) recovered from 210. This death assemblage was probably formed subsequently. Such assemblages occur quite commonly in prehistoric earthern mounds or cairns. The rest of the sample was quite severely eroded due to the relatively shallow burial of the bones. 76% of the fragments were eroded and certain parts of the skeleton are unlikely to survive in such circumstances. This is reflected particularly in the sheep/goat assemblage, which was dominated by loose teeth and the densest parts of the mandible and tibia. Less dense elements were underrepresented. The poor survival of the bones is also reflected by the paucity of articulations of the longbones of all species. In most cases only the densest parts of the shafts survived (Table 2). Nevertheless, despite the problems of differential preservation, cattle mandible fragments were unusually abundant, forming 30% of the cattle assemblage. Admittedly most of these fragments were small and could have belonged to different parts of the same bones. At least four animals were represented by these fragments whereas three were represented by humeri fragments and two each by fragments of femora and tibiae. Despite this, it is possible that there was a preferential disposal of cattle mandibles in this ditch. Another unusual feature of the assemblage was the occurrence of two otter (Lutra lutra) teeth, probably from the same maxilla. To my knowledge this species has not been found on any Bronze or Iron Age settlement in Wessex. Otters could have been breeding nearby on the river Lodden, although, of course, the teeth represented here need not have belonged to a local animal.

The other two ring ditches produced much fewer bones. Only five very eroded fragments were recovered from Ring Ditch 5, none of which were identifiable to species. Of the 37 fragments in Ring Ditch 4, 12 consisted of small eroded fragments possibly of the same red deer (Cervus elaphus) antler.

Period 2 - Late Bronze-Early Iron Age

9 fragments only were recovered from Ring Ditches 1-2 (Period 2A, Table 3). Most of the small sample obtained from Period 2B contexts came from Pit Group 1 (178 fragments). In general the preservation of the bones was somewhat better than those in the earlier ring ditches and only 31.5% of the fragments were eroded, although there was still a significant bias towards the survival of the densest parts of the skeleton, particularly loose teeth (Table 4). Very few articulations of longbones survived. Nevertheless sheep/goat and pig fragments were better represented in this pit group. Horse bones, which were absent from the Bronze Age deposits, now occurred in small numbers. Pit Groups 3-4 produced only five and 26 fragments respectively (Table 3).

Period 3A - Late Iron Age (c.50 B.C.-50 A.D.)

291 fragments were examined from three features.(Table 5). 187 of these were taken from Pit 1. This assemblage was remarkable for the high percentage of burnt bone fragments it produced (56.1%), particularly from 22 (66%). Sheep/goat and sheep-sized fragments dominated . A pair of first phalanges and a metatarsus certainly belonged to the same sheep and many of the other fragments could have derived from the same animal, although at least two sheep were represented. No goat bones were identified, whereas 14 of the 56 sheep/goat bones certainly belonged to sheep. Table 6 shows that the sheep/goat skeleton was quite evenly represented apart from the low number of vertebrae. Apart from the charring and burning the sample from this pit was well preserved. Only 9.6% of the fragments were eroded and the dominance of loose teeth and other dense bone elements was not as marked as in the earlier deposits. The greater number of longbone articulations present (Table 6) also indicates that the assemblage was not as severely modified by dog gnawing or other destructive processes. The bones appear to have been burnt prior to dumping in the pit. No evidence of butchery was found on any of the burnt fragments.

A cattle scapula from 22, however, displayed several significant butchery marks. Its spine had been chopped off axially along most of its length. Scapulae butchered in this way have been found recently at Winchester in deposits of early Roman date (J.P. Coy pers. comm.) and in Pre-Flavian levels at Silchester (Maltby n.d.1). The process is not uncommon in Romano-British samples, although its function is of some debate. The most likely explanation is that the bones were cleaved axially whilst filleting the scapula from the shoulder meat. Certainly the method was different from that commonly practised at Middle Iron Age settlements in Hampshire. On those a much finer cutting implement was employed producing fine "knife-cuts" on some specimens made during the disarticulation of the scapula from the humerus and others running axially along both aspects of the flat part of the bone made during filleting, as at Old Down Farm (Maltby 1981b: 150). Generally, the weight of evidence has suggested that the cleaving method was a Romano-British introduction, although the paucity of late Iron Age assemblages has left the question open. This specimen therfore is an important early example of this practice.

23 fragments were found in Pit Group 7 including one of a hare (Lepus sp.). 81 fragments were found in Enclosure Ditch 1, belonging predominantly to unidentified large mammal or cattle. 66.7% of these bones were eroded.

A complete sheep metacarpus from Pit 1 measured 122 mm. in length giving a withers height of 59.1 cm. using the conversion estimates of Teichert (von den Driesch & Boessneck 1974: 339). This and the few other measurable bones fell within the ranges of both Iron Age and Romano-British measurements from other sites in Hampshire.

Period 3B - Early Romano-British Period (c.50-150 A.D.)

Four features produced 937 fragments. 831 of these came from various layers of Enclosure Ditch 2 (Table 7). In general, the preservation of bones in this feature was quite good, only 14.4% of the bones being eroded, although this figure varied significantly in different layers. In addition, 7.1% of the fragments showed various degrees of cracking, mostly of a superficial nature, probably caused by weathering due to exposure before burial (cf Behrensmeyer 1978). Several layers, particularly 14, 16 and 110, contained a high percentage of bones that were stained dark brown. Because of the relatively good surface preservation of the bones, it was easier to distinguish evidence of canid gnawing and 8.9% of the fragments showed

evidence of such activity.

Throughout most of the excavated sections of the ditch cattle and unidentified large mammal fragments were the most common elements recovered. Mandible, skull fragments, scapula and loose teeth were the most abundant bones in the cattle sample. This may reflect a trend to deposit the bones discarded after primary butchery into the ditch, although factors of differential preservation and recovery complicate the issue. Although the state of preservation was quite good, there is no doubt that the combined effects of erosion, weathering and scavenging modified this assemblage. The relatively high numbers of small unidentifiable large mammal fragments support this conclusion. In addition, although the articulations of cattle longbones were relatively well represented, there was still a bias towards the denser elements of the skeleton. Consequently the low representation of phalanges and the more vulnerable longbone articulations (e.g. the proximal articulations of the humerus and tibia) is more likely to be the consequence of differential preservation than of carcass disposal factors.

19 cattle bones bore butchery marks. Three mandibles had chop marks on or close to the mandibular condyle made during their detachment from the skull. A fourth specimen had a similar disjointing cut made with a finer cutting edge. Two other mandible fragments had chop marks; one had been chopped superficially beneath the cheek teeth and the other had marks on the medial aspect of the diastema, possibly made during the separation of the two mandibles. Knife cuts were found on two other mandibles; one specimen had several cuts on both medial and lateral aspects of the diastema and the other had a small cut made on the lateral surface beneath the cheek teeth. Two scapulae bore chopmarks similar to the specimen from 22 described above. Another had had its glenoid tuberosity chopped off during disjointing from the humerus. A small knife cut was found on the medial aspect of the blade of another scapula. A humerus bore knife cuts on the medial aspect near the distal articulation made during the disjointing of the cubital joint. Five other bones bore chopmarks; the proximal articulation of a femur had been chopped off during disarticulation from the pelvis; a calcaneus bore a superficial chop mark; a fragment of a frontal bone attached to the base of its horn core had been chopped superficially probably during the removal of the horn; a zygomatic fragment had a superficial chopmark and a cervical vertebra had been chopped axially from the ventral aspect. The same fragment bore a small knife cut made subsequently. A pair of first phalanges

each bore knife cuts probably made during skinning. Most of these butchery marks have parallels in contemporary assemblages from Silchester and Winnall Down, near Winchester (Maltby n.d.1; n.d.2). The presence of chopmarks and knife cuts on different specimens is interesting. Generally the latter type are predominant in Iron Age assemblages in Hampshire, whereas Romano-British cattle samples produce a much greater number of chopmarks. The history of this development in butchery practices is unclear and would repay further study. Certainly at Cowdery's Down both methods appear to have been in operation at the same time.

Most of the cattle represented in Enclosure Ditch 2 were mature animals. Of the 13 ageable mandibles, 9 had reached full dentition (P4 in wear) and belonged to animals over four years old at least. Several were substantially older judging by the heavy wear on the molars (Table 9). Metrical analysis revealed the presence of some large cattle. An astragalus from 174 had a greatest lateral length of 68.4 mm. and was similar in size to the largest specimens of early Romano-British date found at Winnall Down (Maltby 1981a: 186). Cattle of this size have rarely been found in Iron Age contexts in Hampshire and the appearance of some larger animals in the early Romano-British period may indicate the introduction of new stock, or at least the improvement of some of the existing stock. Several other bones of large cattle were found in 174 - a scapula, tibia, calcaneus and four articulated cervical vertebrae. It is possible that these all belonged to the same animal. However, other large specimens were also found elsewhere in the ditch. On the other hand, the metrical analyses of other bones showed that some of the cattle, perhaps the majority, were no larger than those found in the Iron Age.

133 fragments of sheep/goat were found in Enclosure Ditch 2. Goat was not identified positively but 17 bones definitely belong to sheep. The assemblage was dominated by mandible, loose teeth, tibia and metatarsus fragments (Table 8). This reflects the relatively good preservation of these dense elements and it appears that the sheep/goat assemblage has been subjected to a greater degree of destruction than the cattle sample. 14 mandibles bore evidence of tooth eruption; half of these belonged to mature animals with heavy wear on their first and sometimes their second molars as well (Table 9). Toothwear is very variable in older sheep but most, if not all, of these animals were probably well over four years of age at death. Four mandibles had the

first two molars but not the permanent premolars nor third molar in wear. These belonged to animals culled for meat probably in their second or third years. Two other mandibles belonged to slightly older animals, having the third molar in an early stage of wear. Only one mandible of a young lamb of under three months of age was represented. The virtual absence of young mandibles may be a factor of poor preservation, as these survive less well than the more sturdy older mandibles (Maltby n.d.3). However, the greater proportion of animals killed in their second and third years, rather than in their first year, is a phenomenon that appears to coincide with the Romano-British period (although local late Iron Age assemblages are in short supply) (Maltby 1981a: 172-176). The proportion of old sheep represented at Cowdery's Down is higher than in the contemporary deposits at Silchester (Maltby n.d.1), although both samples are very small. It should be emphasised that the ages of animals consumed at a particular settlement need not represent a cross-section of the regional mortality pattern, since it is likely that trade and redistribution would have resulted in a lot of movement of stock. An urban centre such as Silchester may have attracted the slaughter of a larger proportion of sheep reared specifically for meat and this in turn may be reflected in the mortality profiles.

Only four sheep/goat bones bore cutmarks. A sheep's skull fragment bore a knife cut on the frontal bone near the horn core. Two mandibles had been cut near the mandibular condyle during their detachment from the skull and a humerus bore several knife cuts on and near the distal articulation made during its disarticulation from the radius and ulna. No chopmarks were found on any sheep/goat bones. The few measurements it was possible to take included one of a large sheep radius that had a maximum proximal width of 30.2 mm., substantially larger than most Iron Age specimens from Hampshire. One skull of a naturally polled animal was found.

Pig was poorly represented (30 fragments). Indeed, horse (52 fragments) was better represented, although this total included two groups of articulated bones in 110. In that layer the 13 horse bones included a left radius and ulna of the same animal and the three phalanges and complete third and fourth metacarpals also of one animal, possibly the same one. In the same layer a second and third metacarpal of a smaller animal were also found. No evidence of butchery was found

on any of these bones. Using Kiesewalter's conversion estimates for the shoulder height of horses from the lateral lengths of the third metacarpals (von den Driesch & Boessneck 1974:333), these horse stood at 135.7 and 122.2 cm. respectively. These therefore were small ponies standing just under 12 and 11 hands, if the conversion estimates are accurate. Horses of this diminutive size have been found commonly in Iron Age contexts in Hampshire (Coy 1981: 97; Maltby 1981a: 192). Another complete third metacarpal from this ditch gave an estimated shoulder height of 132.4 cm. Only one cutmark was found on any of the horse bones, a first phalanx which had a knife cut near the proximal articulation on the anterior aspect, possibly made during skinning. The relatively large number of horse bones found in this period contrasts sharply with the assemblages recently analysed from Silchester, where, from admittedly a limited set of deposits, horse bones were found only rarely (Maltby n.d.1). On the other hand, have been found more commonly at early Romano-British rural settlements in Hampshire, for example at Winnall Down (Maltby n.d.2) and Little Somborne (Maltby n.d.4).

Of the remaining species in Enclosure Ditch 2, dog was represented by 15 bones, 11 in 174, several of which probably belonged to the same animal. A pair of mandibles in that layer had a striking number of butchery marks. Both had been chopped superficially but repeatedly beneath the cheek teeth; on one mandible these blows were found on the laberal aspect and on the other on the medial aspect. Butchery of dogs in Iron Age contexts is not unusual; however these usually consist of knife cuts. The excessive butchery on these mandibles is not easy to explain. A dog humerus in 14 belonged to a very small animal, having a maximum distal width of only 17.1 mm. Small breeds of dog appear in the Romano-British period (Harcourt 1974) and this is one of the smallest examples as yet discovered. A domestic fowl radius was found in 11, the earliest occurrence of this species on the site. It is absent or rare on Iron Age sites in Hampshire (Maltby 1981a: 161-162).

Pit 2 produced 68 fragments (Table 7). These included a radius of a fallow deer (Dama dama) in 12. Fallow deer has been claimed to have been found on several Romano-British sites, although often doubts have arisen about the date and accuracy of these identifications. The weight of recent evidence suggests that fallow deer were not

reintroduced until the Norman period (Coy 1981: 99). The bone in this pit was associated with Roman pottery, although its state of preservation was markedly superior to most of the other bones in this layer. It is possible that it could have belonged to an imported animal or carcass, although it cannot be entirely ruled out that the bone was intrusive, especially as fallow deer bones were also found in the postmedieval layers on the site. In 2 of the same pit a large bird tarsometatarsus was discovered. In size it was very similar to peafowl (Pavo cristatus), although there were some anomalies in its morphology when compared to modern specimens. Alternatively it could have belonged to a very large domestic fowl. If so, it is very large for a Roman specimen and could be intrusive.

Pit Groups 5 and 6 produced only 21 and 17 fragments respectively.

The animal bones from this period combine a number of traits asociated with Iron Age or Romano-British assemblages. Typical Iron Age features include:

1) The relative abundance of horse bones.
2) Butchery using a knife or similar sharp cutting edge.
3) The small size of much of the domestic stock.
4) Butchery of dogs.

Romano-British feature include:

1) The large size of some cattle bones.
2) Presence of domestic fowl.
3) Presence of a small breed of dog.
4) Chopmarks on some cattle bones.
5) The slaughter of some sheep between 2-3 years of age.

The mixture of such traits on early Romano-British rural settlements is perhaps to be expected. Further investigation of these features on other settlements should produce a greater understanding of the integration of native and Roman animal husbandry practices.

Period 3C - Later Romano-British Period (c. 150-400 A.D.)

Only 81 fragments were recovered, mainly from Field Boundary D (Table 10).

Period 3 (A-C) Undefined Late Iron Age- Romano-British Period

12 fragments from a posthole were recovered.

Period 4A - Anglo-Saxon Period A (5th-7th Centuries A.D.)

Few bones were found in any of the Anglo-Saxon phases. From this period only 17 fragments were recovered, 14 from Structure A1 (Table 11).

Period 4B - Anglo Saxon Period B (5th-7th Centuries A.D.)

17 fragments were recovered, 16 from Structure B4 and a burnt fragment from Structure B5 (Table 11).

Period 4C - Anglo Saxon Period C (5th-7th Centuries A.D.)

The only large quantity of bones found in these deposits all belonged to the skeleton of an adult cow in Pit 6. A lot of the bones had been broken during and after excavation but 99 were represented. The majority of the bones of the skull, vertebrae, ribs and front legs were found. The pelvis was represented only by a fragment of pubis but the majority of the bones of the right hind limb were recovered. The femur and the tibia of the left leg were found but the bones of the lower leg were not present. Despite the missing bones it is likely that the whole carcass was dumped in the pit and the absent bones were either missed during excavation or destroyed prior to it. The animal lay on its right side and the missing bones of the left hind leg would appear to have lain near the top of the pit, judging from the in situ distribution of the surviving bones, and they could have thus been disturbed or removed prior to excavation. On the other hand, there is evidence that butchery or skinning had at least begun on the carcass before dumping. The left mandible had a knife cut on the lateral aspect of the diastema running in a dorso-ventral direction, a mark possibly associated with skinning. The left humerus had several knife cuts near the distal articulation on the lateral and posterior aspects. Another knife cut was found on the posterior aspect of the olecranon of the left ulna. Marks such as these are often considered to have been made during the dismemberment of the cubital joint. If so, in this instance the process was abandonned since the joint was found in articulation. For some reason it seems that the butchery process was abandonned at an early stage and the carcass buried.

No evidence for any disease was found on any of the bones, although the mandibles did not possess the posterior cusp on their third molars. This absence is assumed to be a genetic condition and specimens have been found on several British sites. The absence of this cusp resulted in uneven wear in the corresponding upper third molars. This confirms the postulation that similar uneven wear noted

in Saxon deposits at Southampton was caused by the lack of a fully developed posterior cusp on the lower third molars (Bourdillon & Coy 1980: 91).

The cheek teeth rows had fully erupted, although the permanent fourth premolars were in a relatively early stage of wear. All the epiphyses of the longbones had fused, although the sternebrae had not fully fused. The ageing evidence therfore suggests that the animal was probably over five years of age but had not reached old age.

It was possible to measure several bones of the skeleton, including the lengths of several limb bones enabling estimates of withers height to be made. Using the conversion estimated of Matolsci (von den Driesch & Boessneck 1974: 336) the following estimates were made: humerus 107.6 cm; radius 104.5 cm; metacarpus 106.5 cm; tibia 101.4 cm; metatarsus 106.0 cm. Apart from the estimate from the tibia therefore, the estimated withers heights fell into the range of 105-108 cm. The estimates for the metapodia used Matolsci's conversion factors for females, since the overall dimensions of these bones suggested that they probably belonged to a cow. The size of the animal was similar to the smallest beasts represented in Southampton (Bourdillon & Coy 1980: 105-106).

Apart from this skeleton only 30 fragments were recovered from other features in this period. Disposal of animal bones in the Saxon period at this settlement would appear to have been in contexts that did not permit their survival into the archaeological record.

Period 5 - Postmedieval (16-17th Centuries A.D.(+ some possible later contamination)

261 bones came from these layers. These consisted of 56 cattle fragments, 76 sheep/goat bones (19 definitely sheep), 30 pig, 4 horse, 1 fallow deer, 1 cat, 50 unidentified large mammal, 35 unidentified sheep-sized mammal, 6 unidentified mammal and 2 unidentified bird bone fragments.

The Marine Molluscs

The following identifications of oyster (Ostrea edulis) were made:
Period 2B - 8 fragments in 155 (Pit Group 4).
Period 3B - 10 fragments from Enclosure Ditch 2, 1 from Pit Group 6.

Period 4B - 1 fragment from Structure B4, 1 from Structure B6.
Period 4C - 10 fragments from Structure C8, 4 from Structure C13, 1 from the fence, 6 from Structure C12, 12 from Boundary Ditch D (1000). In addition a fragment of mussel (Mytilus edulis) was found in Enclosure Ditch 2 and a cockle fragment(Cardium edule) in Structure C13.

As expected, therefore, most occurrences of oyster were of Romano-British date or later. Considering the sparse number of bone fragments in the Saxon features, the discovery of several oysters in the footings of the structures is interesting.

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Table 1 - Number of Fragments Recovered from Period 1 Deposits

Feature	Total	Cow	LM	S/G	Pig	SM	Dog	UM	Red	UR	Amph	Otter	Gn	E	C	I	B
Ring Ditch 3																	
27	41	7	10	4	1	15	-	3	-	1	-	-	1	36	2	-	-
191	158	57	48	23	8	13	2	4	1	-	-	2	1	118	17	2	-
192	20	5	4	7	1	3	-	-	-	-	-	-	1	15	5	-	-
193	5	1	-	-	-	3	-	-	-	-	1	-	1	2	-	-	-
210	4*	-	1	2	-	1	-	-	-	-	100s	-	-	2	-	-	-
Total	228*	70	63	36	10	35	2	7	1	1	1*	2	4	173	24	2	-
Ring Ditch 4																	
211	1	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
212	15	1	-	2	-	-	-	-	12	-	-	-	-	14	-	-	-
306	21	3	11	1	4	1	-	1	-	-	-	-	1	16	-	-	3
Total	37	5	11	3	4	1	-	1	12	-	-	-	1	31	-	-	3
Ring Ditch 5																	
308	5	-	4	-	-	1	-	-	-	-	-	-	-	5	-	-	-

Cow = cattle; LM = unidentified large mammal; S/G = sheep/goat; SM = unidentified sheep-sized mammal; UM = unidentified mammal; Red = red deer; UR = unidentified rodent; Amph = amphibian; Gn = gnawed by canid; E = eroded; C = cracked; I = ivoried; B = burnt. * = excluding amphibian death assemblage in 210.

Table 2 - Elements of Major Species Identified from Ring Ditch 3

Element	Cattle		LM	S/G		Pig		SM
Mandible	2T	21	-	1T	8	1T	2	-
Skull fragment		1	1		-		-	-
Loose teeth		9	-		15		2	-
Scapula	1D	2	-		-		2	-
Humerus		6	-		-		1	-
Radius	1P	1	-	1P	2	1C	1	-
Ulna		2	-		-		-	-
Metacarpal	1P	3	-		1		-	-
Os Coxae	1J	2	-		-		-	-
Femur	1P	6	-		2		-	-
Tibia	3D	9	-	1D	6		2	-
Calcaneus		1	-		-		-	-
Metatarsal		2	-		2		-	-
Phalanx 1	1C	1	-		-		-	-
Atlas		1	-		-		-	-
Axis		2	-		-		-	-
Cervical vert.		1	-		-		-	-
Thoracic vert.		-	1		-		-	-
Vertebra frag.		-	1		-		-	1
Longbone frag.		-	18		-		-	22
Fragment		-	42		-		-	12
Total		70	63		36		10	35

LM = unidentified large mammal; S/G = sheep/goat;
SM = unidentified sheep-sized mammal; T = with teeth;
C = complete bone; P = proximal articulation present;
D = distal articulation present; J = acetabulum present.

Table 3 - Number of Fragments Recovered from Period 2 Deposits

Feature	Total	Cow	Hor	LM	S/G	Pig	SM	Dog	UM	UD	Gn	E	C	I	B	S
Ring Ditch 1																
149	2	-	-	2	-	-	-	-	-	-	-	2	-	-	-	-
145	5	3	-	1	1	-	-	-	-	-	-	3	1	-	-	-
Total	7	3	-	3	1	-	-	-	-	-	-	5	1	-	-	-
Ring Ditch 2																
178	2	-	-	2	-	-	-	-	-	-	-	2	-	-	-	-
Pit Group 1																
34	28	2	-	5	4	4	12	-	-	1	-	6	2	1	-	8
115	82	13	2	26	27	4	8	1	1	-	4	30	2	2	-	7
120	19	1	-	2	4	1	9	-	2	-	-	3	1	-	-	-
121	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
157	33	3	1	6	6	5	11	-	1	-	1	17	-	-	2	1
396	9	2	-	-	2	2	3	-	-	-	-	1	-	1	-	1
397	6	-	-	2	2	1	1	-	-	-	-	1	-	-	-	1
Total	178	21	3	41	45	17	44	1	5	1	5	58	5	3	2	18
Pit Group 3																
311	3	2	-	-	-	-	-	-	1	-	-	2	-	-	-	-
312	1	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-
356	1	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-
Total	5	2	-	1	1	-	-	-	1	-	-	4	-	-	-	-
Pit Group 4																
153	4	-	-	1	1	-	-	2	-	-	-	2	1	1	-	-
154	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
155	21	4	-	2	1	3	7	-	4	-	1	10	-	-	-	2
Total	26	4	-	3	2	3	7	2	5	-	1	12	1	1	-	2

UD = unidentified deer; S = stained dark brown; see Table 1 for other abbreviations.

Table 4 - Elements of Major Species Identified from Pit Group 1

Element	Cattle		Horse		LM	S/G		Pig		SM
Mandible		2		-	-	4T	6	2T	4	1
Maxilla	1T	1		-	-		1		-	-
Skull fragment		3		-	2		-		1	1
Loose teeth		5		1	-		16		4	-
Scapula	1D	2		-	-		-		2	-
Humerus		1		-	-		-		1	-
Radius	1P	1		-	-		6		-	-
Metacarpal		-		-	-	1D	4		-	-
Os Coxae	1J	1		-	-		-	1J	1	-
Femur		1		-	-		3		-	-
Tibia		1		-	-		5		1	-
Fibula		-		-	-		-		1	-
Astragalus		-		-	-		-		1	-
Metatarsal		1		-	-		3		-	-
Phalanx 1		-	1P	1	-		-	1C	1	-
Phalanx 2		-	1P	1	-		-		-	-
Atlas		2		-	-		1		-	-
Thoracic vert.		-		-	-		-		-	1
Lumbar vert.		-		-	-		-		-	1
Vertebra frag.		-		-	2		-		-	3
Rib		-		-	7		-		-	5
Longbone frag.		-		-	8		-		-	25
Fragment		-		-	22		-		-	7
Total		21		3	41		45		17	44

See Table 2 for abbreviations.

Table 5 - Number of Fragments Recovered from Period 3A Deposits

Feature	Total	Cow	Hor	LM	S/G	Pig	SM	Dog	UM	Red	Har	Gn	E	C	I	B	S
Enclosure Ditch 1																	
3	60	12	-	38	1	3	6	-	-	-	-	-	40	3	-	-	1
4	21	5	-	5	3	2	3	1	1	1	-	-	14	2	-	1	-
Total	81	17	-	43	4	5	9	1	1	1	-	-	54	5	-	1	1
Pit 1																	
13	30	8	1	5	6	2	4	-	3	1	-	3	9	2	2	2	2
22	156	9	3	12	56	3	65	5	3	-	-	4	9	-	6	103	-
23	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	187	17	5	17	62	5	69	5	6	1	-	7	18	2	8	105	2
Pit Group 7																	
122	21	8	2	6	2	-	2	-	-	-	1	2	9	-	-	-	7
375	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
400	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	23	8	3	6	2	1	2	-	-	-	1	2	9	-	-	-	8

Har = hare; see Tables 1 and 3 for other abbreviations.

Table 6 - Elements of Major Species Identified from Pit 1

Element	Cattle		Horse	LM	S/G		Pig	SM
Mandible	4T	5	-	-	2T	2	1	-
Maxilla	1T	3	-	-	2T	2	-	-
Skull fragment		2	2	-		11	-	6
Loose teeth		2	-	-		2	1	-
Scapula	1D	1	-	-	1D	2	1	-
Humerus		-	-	-	1P 1D	2	-	-
Radius	1D	1	-	-	1P 1D	6	-	-
Ulna		-	-	-		2	1	-
Metacarpal		-	-	-	1C	4	-	-
Os coxae		-	-	-	1J	5	-	-
Femur	1D	1	-	-	2P 1D	3	-	-
Patella		1	-	-		-	-	-
Tibia	1P	1	-	-		1	1	-
Calcaneus		-	-	-	2P	2	-	-
Astragalus		-	1	-		1	-	-
Metatarsal		-	-	-	1P 1D	3	-	-
Phalanx 1		-	-	-	9C	9	-	-
Phalanx 3		-	-	-		1	-	-
Atlas		-	-	-		1	-	-
Cervical vert.		-	1	-		-	-	-
Thoracic vert.		-	-	-		3	-	2
Lumbar vert.		-	-	-		-	-	2
Vertebra frag.		-	-	-		-	-	1
Rib		-	-	5		-	-	14
Longbone frag.		-	-	6		-	-	21
Fragment		-	-	6		-	-	23
Total		17	4	17		62	5	69

See Table 2 for abbreviations.

Table 7 - Number of Fragments Recovered from Period 3B Deposits (i)

Feature	Total	Cow	Hor	LM	S/G	Pig	SM	Dog	UM	Red Fowl	Sta	UR	Gn	E	C	I	B	S
Enclosure Ditch 2																		
1	41	11	3	9	7	5	6	-	-	-	-	-	5	20	1	2	1	5
6	77	17	1	19	16	5	14	-	2	1	-	1	1	-	13	4	8	5	23
7	36	4	-	15	4	-	12	1	-	-	-	-	-	1	19	1	1	2	5
11	49	9	-	13	5	-	19	1	1	-	1	-	-	2	19	3	1	3	2
14	36	15	4	12	2	2	-	1	-	-	-	-	-	6	2	1	-	-	29
16	29	2	3	9	7	2	5	-	1	-	-	-	-	4	1	1	-	-	26
17	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
80	19	6	-	3	8	1	-	-	1	-	-	-	-	2	5	3	-	1	3
81	22	3	1	14	1	1	2	-	-	-	-	-	-	1	1	1	1	-	6
82	40	16	1	13	3	1	6	-	-	-	-	-	-	2	1	1	-	1	6
83	35	13	4	4	8	3	3	-	-	-	-	-	-	5	-	-	-	-	13
110	28	5	13	8	1	1	-	-	-	-	-	-	-	5	1	1	-	-	17
111	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
112	1	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-
148	119	34	12	47	16	4	5	-	1	-	-	-	-	15	13	11	-	-	3
159	24	8	-	2	11	1	2	-	-	-	-	-	-	4	4	1	1	-	-
162	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
173	30	6	1	11	6	-	4	1	1	-	-	-	-	-	7	2	2	-	-
174	229	75	7	78	36	4	16	11	2	-	-	-	-	22	10	26	-	1	4
179	9	4	1	2	1	-	1	-	-	-	-	-	-	-	1	1	-	-	-
181	1	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
797	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Total	831	231	52	260	133	30	97	15	9	1	1	1	1	74	120	59	17	14	142

Fowl = donestic fowl; Sta = starling. See Tables 1 and 3 for other abbreviations.

Table 7 - Number of Fragments Recovered from Period 3B Deposits (ii)

Feature	Total	Cow	Hor	LM	S/G	Pig	SM	UM	Fal	F/P	Gn	E	C	I	S
Pit 2															
2	12	-	-	1	2	1	5	2	-	1	-	7	1	1	1
12	56	5	2	7	17	1	22	1	1	-	1	39	2	1	1
Total	68	5	2	8	19	2	27	3	1	1	1	46	3	2	2
Pit Group 5															
156	15	4	-	4	4	1	2	-	-	-	1	5	-	-	1
176	6	-	-	2	-	-	4	-	-	-	-	1	-	-	-
Total	21	4	-	6	4	1	6	-	-	-	1	6	-	-	1
Pit Group 6															
177	13	6	-	-	3	1	3	-	-	-	1	6	2	-	-
188	4	-	1	1	-	1	1	-	-	-	-	1	1	1	-
Total	17	6	1	1	3	2	4	-	-	-	1	7	3	1	-

Fal = fallow deer; F/P = (?) domestic fowl or peafowl. See Tables 1 and 3 for other abbreviations.

Table 8 - Elements of Major Species Identified in Enclosure Ditch 2

Element	Cattle			Horse			LM	Sheep/Goat			Pig		SM
Mandible		14T	54		1T	1	1		16T	28	5T	10	1
Maxilla		4T	6			1	-		1T	1	1T	1	-
Skull fragment			29			1	26			6		4	3
Loose teeth			21			9	-			22		4	-
Scapula		8D	31		2D	3	1		1D	5	2D	4	-
Humerus	1P	4D	10	1P	1D	3	-	1C	1D	6		2	3
Radius	1C 2P	1D	6	1P	1D	4	-		3P	11		-	1
Ulna			2			1	-			1		-	-
Carpals			1			1	-			-		-	-
Metacarpal		7P	7	3C	1D 3L	7	-	2C	1P	5		-	-
Os coxae		3J	5		2J	2	-		1J	1		-	-
Femur	1P	3D	15	1P	2D	3	-			4		3	3
Tibia		3D	5		1P	1	-	1P	1D	22	1P	2	1
Calcaneus		1P	4			-	-			-		-	-
Astragalus			3			-	-			-		-	-
Metatarsal	1P	2D	6			-	-	2C	2P 1D	17		-	-
Phalanx 1		3C	3	1C	1P	2	-		1C	1		-	-
Phalanx 2		1C	1		1C	1	-			-		-	-
Phalanx 3			-			2	-			-		-	-
Metapodial			1			-	-			1		-	-
Atlas			2			1	-			-		-	-
Axis			1			-	-			-		-	-
Cervical vert.			9			5	-			1		-	-
Thoracic vert.			4			-	8			-		-	-
Lumbar vert.			4			2	-			-		-	-
Vertebra frag.			-			-	12			-		-	-
Rib			-			-	40			1		-	17
Longbone frag.			-			-	48			-		-	40
Fragment			-			-	124			-		-	28
Sacrum			1			2	-			-		-	-
Total			231			52	260			133		30	97

L = lateral metacarpals. See Table 2 for other abbreviations.

Table 9 - Tooth Eruption and Wear Stages of Cattle and Sheep/Goat Mandibles in Enclosure Ditch 2.

a) Cattle	d2	d3	d4	P2	P3	P4	M1	M2	M3	n.v.
14								k	k	43-44e
14									W	(30+e)
81					W	e	k	k	g	42
82	E	E	½							0-1e
82							n			49-51e
83			1				g	f	4	27
83						e	j	h	g	39
110							1	k		45e
148					W	g				(40+e)
148							1	k	j	45
148								1	1	48e
159								n	m	54e
173					W		j	g	e	36
174			j	E	½		g			24-28e
b) Sheep/goat										
1								1	g	45e
1							1	j		42e
6					W	W	g			30-36e
6				V	V	V	g	e		25-26e
11					U					28-30e
82						V	g	e		25-26e
83							j	g	g	38
83					W	f	g	g	e	34
83					W	h	m	j	g	43
148						1	m	k	g	44
173							g	d	C	24
174								k	g	44e
174		W	f				E			3
174							m	h	g	42

Analysis after Grant(1975); d2 etc. = deciduous premolars; P2-4 = permanent premolars 2-4; M1-3 = molars 1-3. n.v. = numerical value; W = worn; see Grant (1975) for other abbreviations.

Table 10 - Number of Fragments Recovered from Period 3C Deposits

Feature	Total	Cow	LM	S/G	Pig	SM	Dog	UM	Gn	E	C	I	B	S
Field Boundary B														
141	3	-	-	1	-	2	-	-	-	2	-	-	-	-
Field Boundary D														
9	20	7	10	-	1	-	1	1	-	1	-	-	-	5
10	43	23	11	4	1	2	1	1	1	13	2	-	1	5
Total	63	30	21	4	2	2	2	2	1	14	2	-	1	10
Pit Group 8														
798	1	-	-	-	-	1	-	-	-	1	-	-	-	-
802	2	-	2	-	-	-	-	-	-	2	1	-	-	-
804	3	-	-	-	-	-	-	3	-	2	-	-	-	-
Total	6	-	2	-	-	1	-	3	-	5	1	-	-	-
Pit Group 9														
796	8	-	1	2	-	3	-	2	-	6	-	1	1	1
801	1	-	-	1	-	-	-	-	-	1	-	-	-	-
Total	9	-	1	3	-	3	-	2	-	7	-	1	1	1

See Tables 1 and 3 for abbreviations.

Table 11 - Number of Fragments Recovered from Periods 4A-4B Deposits

Feature	Total	Cow	LM	S/G	Pig	SM	UM	E	B
(Period 4A)									
Structure A1									
315	6	-	1	2	-	3	-	3	-
266	1	-	-	-	1	-	-	1	-
290	2	-	-	1	-	1	-	1	-
425	3	1	1	-	-	-	1	3	-
427	2	1	1	-	-	-	-	1	-
Total	14	2	3	3	1	4	1	9	-
Structure A2									
817	1	-	-	1	-	-	-	1	-
Fence									
606	2	2	-	-	-	-	-	2	
(Period 4B)									
Structure B4									
428	9	-	5	1	1	2	-	8	-
457	3	-	1	-	1	-	1	2	-
525	1	-	1	-	-	-	-	1	-
532	2	1	-	1	-	-	-	1	-
711	1	-	-	-	-	-	1	1	-
Total	16	1	7	2	2	2	2	13	-
Structure B5									
724	1	-	-	-	-	1	-	-	1

See Table 1 for abbreviations.

Table 12 - Number of Fragments Recovered from Period 4C Deposits

Feature	Total	Cow	LM	S/G	Pig	SM	UM	E	B
Fence									
417	1	-	1	-	-	-	-	1	-
519	4	1	3	-	-	-	-	4	-
Total	5	1	4	-	-	-	-	5	-
Structure C8									
464	1	-	-	-	-	1	-	1	-
465	3	-	2	-	1	-	-	2	-
526	1	-	1	-	-	-	-	1	-
533	1	-	-	-	-	1	-	1	1
Total	6	-	3	-	1	2	-	5	1
Structure C9									
634	2	-	1	-	-	-	1	2	1
Structure C10									
727	1	1	-	-	-	-	-	-	-
Structure C13									
1073	3	1	2	-	-	-	-	2	-
1078	1	-	-	1	-	-	-	-	-
Total	4	1	2	1	-	-	-	2	-
Pit 4									
829	11	10	1	-	-	-	-	8	-
930	1	-	-	-	-	-	1	-	-
Total	12	10	1	-	-	-	1	8	-
Pit 6									
1244	99	99 (skeleton)						87	

See Table 1 for abbreviations.

Table X - Number of Fragments Recovered from Cowdery's Down(i)

Feature	Total	Cow	Hor	LM	S/G	Pig	SM	Dog	UM	Red	Others	Gn	E	C	I	B	S
Period 1																	
Ring Ditch 3	228*	70	-	63	36	10	35	2	7	1	1UR 1Am*20t	4	173	24	2	-	-
Ring Ditch 4	37	5	-	11	3	4	1	-	1	12		1	31	-	-	3	-
Ring Ditch 5	5	-	-	4	-	-	1	-	-	-		-	5	-	-	-	-
Period 2																	
Ring Ditch 1	7	3	-	3	1	-	-	-	-	-		-	5	1	-	-	-
Ring Ditch 2	2	-	-	2	-	-	-	-	-	-		-	2	-	-	-	-
Pit Group 1	178	21	3	41	45	17	44	1	5	-	1UD	5	58	5	3	2	18
Pit Group 3	5	2	-	1	1	-	-	-	1	-		-	4	-	-	-	-
Pit Group 4	26	4	-	3	2	3	7	2	5	-		1	12	1	1	-	2
Period 3A																	
Enclos. D.1	81	17	-	43	4	5	9	1	1	1		-	54	5	-	1	1
Pit 1	187	17	5	17	62	5	69	5	6	1		7	18	2	8	105	2
Pit Group 7	23	8	3	6	2	1	2	-	-	-	1 Hare	2	9	-	-	-	8
Period 3B																	
Enclos. D.2	831	231	52	260	133	30	97	15	9	1	1Fow 1UR 1St	74	120	59	17	14	142
Pit 2	68	5	2	8	19	2	27	-	3	-	1Fal 1F/P	1	46	3	2	-	2
Pit Group 5	21	4	-	6	4	1	6	-	-	-		1	6	-	-	-	1
Pit Group 6	17	6	1	1	3	2	4	-	-	-		1	7	3	1	-	-
Period 3C																	
Field Bdy.B	3	-	-	-	1	-	2	-	-	-		-	2	-	-	-	-
Field Bdy.D	63	30	-	21	4	2	2	2	2	-		1	14	2	-	1	10
Pit Group 8	6	-	-	2	-	-	1	-	3	-		-	5	1	-	-	-
Pit Group 9	9	-	-	1	3	-	3	-	2	-		-	7	-	1	1	1

Table X - Number of Fragments Recovered from Cowdery's Down (ii)

Feature	Total	Cow	Hor	LM	S/G	Pig	SM	Dog	UM	Red	Others	Gn	E	C	I	B	S
Period 3(A-C)																	
Posthole	12	3	2	2	2	1	2	-	-	-		2	5	-	-	-	3
Period 4A																	
Structure A1	14	2	-	3	3	1	4	-	1	-		-	9	-	-	-	-
Structure A2	1	-	-	-	1	-	-	-	-	-		-	1	-	-	-	-
Fence	2	2	-	-	-	-	-	-	-	-		-	2	-	-	-	-
Period 4B																	
Structure B4	16	1	-	7	2	2	2	-	2	-		-	13	-	-	-	-
Structure B5	1	-	-	-	-	-	-	-	1	-		-	-	-	-	1	-
Period 4C																	
Structure C8	6	-	-	3	-	1	2	-	-	-		-	5	-	-	1	-
Structure C9	2	-	-	1	-	-	-	-	1	-		-	2	-	-	-	-
Structure C10	1	1	-	-	-	-	-	-	-	-		-	-	-	-	-	-
Structure C13	4	1	-	2	1	-	-	-	-	-		-	2	-	-	-	-
Fence	5	1	-	4	-	-	-	-	-	-		-	5	-	-	-	-
Pit 4	12	10	-	1	-	-	-	-	1	-		-	8	-	-	-	-
Pit 6	99	99	(skeleton)		-	-	-	-	-	-		-	87	-	-	-	-
Period 5																	
Field Bdy.E	3	1	-	2	-	-	-	-	-	-		-	2	-	-	-	-
Complex 2	259	55	4	47	78	30	35	-	6	-	1Fal 1Cat	1UB13	59	13	4	1	9

Cow = cattle; Hor = horse; LM = unidentified large mammal; S/G = sheep/goat; SM = unidentified sheep-sized mammal; UM = unidentified mammal; Red = red deer; UR = unidentified rodent; Am = amphibian; Ot = otter; UD = unidentified deer; Fow = domestic fowl; St = starling; Fal = fallow deer; F/P = domestic fowl/peafowl; UB = unidentified bird; Gn = gnawed by dog; E = eroded; C = weathered; I = ivoried; B = burnt; S = stained dark brown; * excluding amphibian death assemblage in 210.