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FAUNAL REMAINS PROJECT
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UNIVERSITY OF SOUTHAMPTON

ANIMAL BONES AND MARINE MOLLUSCS FROM THE 1979 EXCAVATIONS AT ROPE LAKE HOLE, KIMMERIDGE, DORSET

Jennie Coy

A total of 5,333 bones and 3,685 shells from the 1979 excavations were examined. The 1976 material was scanned and appeared to be of a similar nature but, as detailed stratigraphic information was not available, were not included in this account.

Recording was by the Ancient Monuments Laboratory's system (Jones et al n.d.). The O.P. numbers contributing to this sample, and their phasing within the different Periods recognized by the excavator, P.J.Woodward, are given in Table 1. Table 2 lists the bones of domestic mammals which form the bulk of the finds. Tables 3-14 inclusive give the distribution of anatomical elements for the major ones in the different phases. These have not been added into Periods as the material from the different divisions does not provide additional information when lumped. Each division (Phase) represents an assemblage of bone fragments found in a very different type of context and likely to have accumulated as a result of different activities.

SPECIES REPRESENTED

The major part of the material consists of the bones of domestic cattle, sheep (there is no evidence for goat), and pig (Table 2). The first would have provided the major meat source although the second provides most fragments in all phases. Pig remains provide a low but constant proportion throughout the period of settlement and this compares closely with results from Eldon's Seat (Cunliffe & Phillipson 1968,227: Coy, in press). The relative role of cattle and sheep is discussed in the next section.

There are a few bones of domestic horse, dog, and domestic fowl. The first are included in the Phase Tables 3-14. Both dog and fowl appear in Phases IVA, IVB, VIIA and VIIC, dog also appears in Phases IIIA and VIB and fowl in IIIB and V. No butchery was recorded for dog although there was skinning evidence in VIIA. The few bones of wild species (mammals, birds, and amphibians) are detailed in Tables 15 and 16. It is unlikely that the rabbit bone is contemporary with the occupation.

Marine molluscs retrieved by conventional excavation in the different Phases (Table 17) were unevenly deposited in the settlement and consisted mainly of the limpets and periwinkles found on this part of the coast today. In addition there were finds of oyster in period 4 and single shells of common whelk, Buccinum undatum (VIB);

top shell, Gibbula lineata (Phase VIIA); and edible cockle, cardium edule (Phase VIIC).

SPECIFIC RATIOS

The overall ratios for the major domestic species compare well with those which can be calculated from the figures for Eldon's Seat. These comparisons should be treated with some reservations as the methodology used at the two sites was not comparable but they are both presented in Table 18 so that the similar specific ratios and the apparent trend towards a greater importance in sheep in the later period can be seen.

At Eldon's Seat bones not identifiable to species and loose teeth were discarded. The fact that all bones from Rope Lake Hole were saved and are included in these analyses makes it possible to rule out some possible other causes (other than a change in husbandry emphases) for specific ratio changes. These include the type of deposit and the degree of fragmentation, and these will now be examined in turn.

Some deposits, in different periods, have identical specific ratios - Phases I, IIIA, IVB, and VIA. This might be because similar factors went into their accumulation (Table 19 gives details). Chi-squared testing shows no significant difference even at the 75% level (χ^2=2.35, 6 d.f.) between these results for different periods. Deposits II and IVA are not very different but have a slightly lower proportion of sheep .

There is a significant link between the proportions of species and both Phase and Period (at the 0.1% level in both cases) when all the results in Tables 18B and 19 are tested by chi-squared. Most of the contribution to the chi-square value is from the results for cattle and sheep in deposit VIIC where the values for cattle are unexpectedly low and those for sheep high. This deposit has been subjected to ploughing and may also contain medieval contamination and is for these reasons likely to give different results from all other deposits at the site.

Once again, therefore, deposit type is seen to be a major factor in producing apparent changes in specific ratio in the Iron Age, perhaps not so dramatically as for Maltby's results for Winnall Down Hampshire where overall results for Phase 3 and 4 material showed an increase in sheep in the latter phase but

pit results showed little difference in species representation (Maltby 1981, 166). The result of this analysis of deposit type is therefore to cast doubt on the postulated trend for an increase in the importance of sheep in the later periods at Rope Lake Hole.

A number of indices were calculated to see whether the figures for numbers of fragments in the different phases had been influenced by differences in preservation or fragmentation. Table 20, column I, sets the scene by giving the 'indices of identifiability to species' (the percentage of bones in each phase that were identifiable to species) This ranges between 53 and 72% according to the deposit. The accompanying values in Table 20, column II, giving the percentage of bones remaining i.e. those not identifiable to species but judged to come from large or small ungulates, might equally be regarded as an 'index of fragmentation'.

The relative contribution made by the two ungulate size groups was then investigated. There was a range of 4 to 50% for the 'index of unidentifiability to anatomical element' for the different phases - that is the proportion of fragments which could only be classified as 'long bone fragment' of 'fragment' in the two ungulate size classes (Table 21). These figures were calculated as they are available for some earlier studies and give some idea of the fragmentation of this material. Combining results for both size groups the Table 21 figures give a range of 11 to 37% anatomically unidentifiable compared with values of 32 to 50% for a highly fragmented collection from wall trenches on the Iron Age banjo settlement at Groundwell Farm, Wiltshire (Coy n.d.1.) and 7-29% for the rather acid site at Ower, Dorset (Coy n.d.2.).

The results in Table 21 were ranked for both size groups and the degree of fragmentation for the two values in each phase thus set in its true relationship to the rest of the material. This made it possible to see whether there was a bias towards one size group caused by greater fragmentation.

Altogether these results demonstrate that the Period 4 deposits (especially phase VIIC) showed higher overall fragmentation than the rest of the material. Bias in fragmentation between large and small species was also visible. For

example, Phases IIIA, IVB, and VIA rank higher for large ungulate fragmentation than for small ungulate fragmentation. Phases IIIB, IVA, and V rank higher for small ungulate fragmentation than for large ungulate fragmentation. Adjustments made to the figures for specific ratios taking this into account would reinforce rather than oppose the theory of an increase in the importance of sheep in the later phases.

The percentage of loose teeth varies enormously from deposit to deposit but provides reinforcing evidence for the overall high fragmentation observable in results for Phases V and VIIC (Table 22).

STATE OF PRESERVATION

Although some of the results discussed above suggest that there was a high degree of fragmentation, the actual state of preservation of much of the bone was good. Carnivore-gnawing was seen on 21 % overall, the values ranging from 9 to 30% in the different deposits. Although the highest value was from Phase VIA which had no dog bones, other Phases with no dog bones (Phase I, II, IVA, and V) showed the lowest levels of gnawing.

A very high proportion of bones were 'ivoried' (16 % overall) compared with most other sites studied in Wessex. In Phase I, IVA, and VIIB deposits up to a third of the bones were ivoried.

In contrast, erosion was recorded on only about 3% of all bones. This figure is quite low compared with that on some other Iron Age sites in Wessex and is an essential monitor of bone condition if detailed site comparisons are to be made.

The tibial index calculated by Maltby (in press) for other Wessex sites shows a high value for shaft fragments of sheep tibia compared with articular ends of the same bone (85%) although the relative preservation of proximal ends to distal is not as low as for some sites (proximal ends tend to disappear before distal ends in this bone).

Altogether these results suggest that fragmentation at Rope Lake Hole was high (much of it probably as a result of action by dogs) but that if bone survived these ravages they may have stood a good chance of preservation in some deposits.

Horse

Of the 7 cases of cuts on horse bones, two from Phase IVB and one from IVA are probably related to jointing and meat removal (scapula, ilium, and proximal ulna, respectively) and the rest might be from skinning practices as they are on the first phalanx, calcaneum, and metapodial. Horse was commonly eaten in the Iron Age in Wessex but the small amount of bone on this settlement suggests that it was not a major part of the diet here.

The horse bones are too few for detailed analysis of the distribution of anatomical elements but the most noticeable point that almost half the 95 fragments (Table 2) were loose teeth.

A horse metapodial in O.P. 192 (Period 3) was probably worked rather than butchered as a sharp blade had been used to trim the central projection of the distal condyle flush with the rest of the condyle surface.

Apart from the incisor of a 1-2 year old horse from the disturbed plough layers in Period 4 only horses aged 8 to 16 years are represented according to the tooth evidence available.

Measurable bones mostly compare well with those of a modern New Forest Pony of c.132 cm withers height (13 hands). There was a much smaller, but unmeasurable, humerus fragment in O.P.105, Period 4.

Cattle, Sheep, and Pig

The figures for the relative balance of meat-bearing and non-meat-bearing bones for the three major species are given in Table 23 and appear to be roughly equal in all Periods for all three species. Closer examination , however, of the figures making up these Period totals demonstrates little pattern in the fluctuations in the different deposit types. Overall, for cattle, the peripheral and thus non-meat-bearing bones are present in slightly higher proportions than for sheep. But the pattern behind these results is complex with the disposal of mandibles being irregular (large numbers in some deposits, none at all in others), possibly a lower efficiency of retrieval on-site for sheep carpals, tarsals,

and phalanges; and a relative dearth of cattle metapodials - perhaps reflecting their usefulness for working.

There were fewer meat bones of cattle and sheep in Phase I, VIB, and VIIC deposits and a higher proportion in IIIB and V but the small samples in some deposits make it unwise to carry out statistical tests of significance.

Knife cuts were recorded on about 5% of bones, overall, and chopping with a heavier instrument on 2%.

Cattle, Sheep, and Pig Ageing Evidence

Using the methods of Grant (1975) and stages which coincide with the earlier methods used for Eldon's Seat (Cunliffe & Phillipson 1968) the same three divisions were used to compare RLH Periods 1 - 3 with Eldon's Seat for sheep jaws (Table 24). The much higher figure at Rope Lake Hole for immature jaws may be a chance one as some deposits at Rope Lake Hole had virtually no immature jaws. The high value for the oldest group in Period 4 is much influenced by the phases disturbed by ploughing. This suggests that a high figure for this older group may merely be indicative of their higher likelihood of preservation.

Results of the detailed tooth wear stage analysis, which allows greater detail to be recorded once all three molar are in wear (stage 32 +) and uses Grant's methods, was compared with results for all three species with other Wessex results. For sheep, the mode for the older animals at Rope Lake Hole was a mandibular wear stage of 38/9 which compared well with the results for Roman Portchester (Grant 1975) and Middle Iron Age Wessex (Maltby 1981,173).

Results for the loose lower third molars of sheep confirmed this, 100% of them were around this stage of wear. The large number of these and of other loose teeth throws great doubt on the validity of such tables as Table 24, for the investigation of mortality data but a preliminary comparison of the details of individual tooth wear stages with those given by Grant in her recent more detailed work (Grant 1982) suggest that detailed tooth wear data is the major way we have of ultimately defining differences in husbandry and genetic relationships in animal stocks in Wessex. Larger samples of jaws from Dorset would be useful. This is also a possible way of eventually detecting seasonal use of settlements.

Although similar details were recorded for cattle and pigs so few jaws produced a mandibular wear stage that it is not wise to comment on these results except to mention a collection of 6 rather elderly cattle mandibles from several layers in Phase IVB. These gave mandibular wear stages of 40-48 corresponding with the Middle Iron Age result modes given by Maltby (1981, 180).

Pigs, sheep and cattle were all undoubtedly domestic and within the size ranges already seen elsewhere in Iron Age Wessex. A detailed review of measurements is not given although these are available in computer archive. Some large bones in Phase VIIC could be later medieval contamination.

PATHOLOGICAL CHANGES

There were a small number of pathologically altered bones recorded, including a dog humerus with a healed fracture and several sheep jaws with periodontal disease.

CONCLUSIONS

The remains described here suggest a husbandry based mainly on cattle and sheep (all 'sheep or goat' bones have been consistently referred to as 'sheep' throughout this account) with a constant minor pig component. There is some evidence that wild species of mammal, bird, fish, and marine molluscs were exploited.

There is a suggestion of an increase in the importance of sheep over cattle in the later periods. This seems to be so even if the more dubious plough collections in VIIC, which may contain medieval contamination, are excluded. This result gives support to the results for Eldon's Seat while providing a carefully collected sample which can, in addition, satisfy some of the essential checks on fragmentation, level of identification, and preservation, necessary when investigating specific ratios. It is still not clear, however, to what extent this apparent increase in sheep is due to the different disposal practices of the later periods (Maltby 1981, Coy and Maltby n.d.).

Whatever the vicissitudes of cattle and sheep husbandry, pig was a constant factor throughout although fragments were few, as at Eldon's Seat and Tollard Royal (Bird 1968). This contrasts with the much greater importance of pig at some other

Wessex Iron Age sites such as Groundwell Farm, Wiltshire (Coy n.d.1) and Cleavel Point, Ower, Dorset (Coy n.d.2) where rich valleys and saltmarsh may have played their part (Coy in press). Low results for pig are more in line with the results for the Hampshire chalkland sites studied by Maltby(personal communication).

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TABLE 1 LAYERS WITH ANIMAL BONE

Layers underlined also contained marine molluscs

PERIOD 1 Early to Middle Iron Age

Phase I dismantled and collapsed circular stone huts
O.P. 189, 199, 220, 229, 230, 248, 261, 269, 280, 287, 294, 301

Phase II shale and flint waste tips
180, 188, 231, 240, 243, 245, 291, 292, 295, 300, 302

PERIOD 2 Middle Iron Age

Phase IIIA accumulated soils and occupation debris above stone revetment/hut walls

142, 170, 175, 179, 181, 187, 196, 198, 222, 225, 226, 227, 234, 246, 247, 249, 260, 264, 268, 281, 289, 297, 298, 299, 318

Phase IIIB occupation debris below revetments
195, 200. 211, 212, 213, 214, 218, 219, 221, 224, 237, 241

PERIOD 3 Late Iron Age - Durotrigian

Phase IVA robbing across III
162, 164, 178, 182, 191, 193, 232, 242, 263

Phase IVB accumulated occupation soils
129, 143, 145, 147, 148, 151, 152, 153, 154, 161, 168, 169, 174, 176, 192, 216, 238

Phase V circular stone huts on lower terrace
119, 149, 217, 223, 235

TABLE 1 continued

Phase VIB pits cut through accumulated occupation soils
130, 134, 139, 140, 141, 144, 146, 155, 166, 167, 172, 184, 197, 233

PERIOD 4 Romano-British - 2nd - 3rd Century A.D.

Phase VIA yard 135 and occupation debris and structure 319
115, 116, 127, 128, 132, 133, 135

Phase VIIA yard and structure
84, 86, 87, 88, 91, 92, 96, 98, 99, 101, 102, 103, 104, 105, 106, 107, 108, 109, 112, 113, 114, 137

Phase VIIB gulley and pit
85, 97, 111

Phase VIIC occupation debris across phases VIIB & V disturbed by medieval agricultural activity. (Period 5)
4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 59, 60, 61, 64, 65, 66

TABLE 2 BONES OF DOMESTIC MAMMALS

	horse	cattle	sheep*	pig	dog	c-size	s-size	TOTAL
horn core	-	6	12	-	-			18
cranium	1	67	47	7	6	40	17	185
maxilla	2	22	21	14	2	2		63
mandible	5	103	227	30		24	2	391
hyoid		7	3					10
vertebra	2	43	44	1	4	62	22	178
ribs	2	80	68	2		121	230	503
sternum							1	1.
scapula	4	46	44	16	2	37	5	154
humerus	5	40	75	10	2	16	3	151
radius	1	29	163	9		21	1	224
ulna	3	22	27	7		2		61
pelvis	3	40	44	4		9	4	104
femur	1	21	49	2	1	15	18	107
tibia	4	25	259	10		30	7	335
fibula				4				4
carpal/tarsal	4	58	38	7				107
metapodial	8	98	286	12	1	6	3	414
phalanges	3	62	39	6				110
loose teeth	47	233	532	64	4	2		882
l.b.fragment						476	556	1032
other frags		1	3	2		123	112	241
TOTALS	95	1003	1981	207	22	986	981	5275

* sheep includes all identifications to sheep or goat

TABLE 3 PHASE I FRAGMENTS OF THE MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn core			1				1
cranium		6	2		1	1	10
maxilla		3	2	1			6
mandible		4	8	4			16
rib		3			3	8	14
vertebra		2		1	1	1	5
scapula		5	1		2		8
humerus		3	3		1		7
radius			6		1		7
pelvis		3	1				4
femur		3	4		1		8
tibia			11		2	1	14
carpal/tarsal		2	4	1			7
metapodial		10	9				19
phalanges		4	2				6
loose teeth	1	14	21	4			40
l.b.frag					13	16	29
frag					7		7
TOTALS	1	62	75	11	32	27	208

TABLE 4 PHASE II MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
cranium		5	4		1		10
hyoid		1					1
maxilla				3	1		4
mandible		9	5		3		17
rib		1	3	1	10	10	25
vertebra		1	1		1	2	5
scapula		7	6		3		16
humerus		5	3	3	2		13
radius		3	10		1		14
ulna		3	1				4
pelvis	1	1	2				4
femur		3	4		1	1	9
tibia		2	13		1	1	17
carpal/tarsal		6	1	1			8
metapodial	1	4	7				12
phalanges	1	4	2				7
loose teeth	2	20	15	3	1		41
l.b. fragment					24	17	41
fragment					7	3	10
TOTALS	5	75	77	11	56	34	258

TABLE 5 PHASE IIIA MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn core		3					3
cranium		11	2		6	3	22
hyoid		2					2
maxilla		2	1	2			5
mandible		7	17	5	1		30
rib		12	10		20	28	70
vertebra		8	4		8	2	22
scapula	1	8	7	1	4		21
humerus	1	1	7	1	1		11
radius		4	11		4		19
ulna		1	5				6
pelvis		3	5	2	1		11
femur			2		4	3	9
tibia		4	22	2	7	1	36
fibula				2			2
carpal/tarsal		3	4				7
metapodial		5	18	1		2	26
phalanges		5	1	1			7
loose teeth	3	15	26	4			48
l.b. fragment					45	27	72
fragment					6		6
TOTALS	5	94	142	21	107	66	435

TABLE 6 PHASE IIIB MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn cores			2				2
cranium		3	5		4	1	13
maxilla		1	2				3
mandible		3	5	1			9
rib		4			11	31	46
vertebra		10			4		14
scapula	1		3	1	1		6
humerus				1			1
radius		1	11			1	13
ulna		2	2				4
pelvis			5				5
femur			6		1		7
tibia		1	8				9
carpal/tarsal		2					2
metapodial		2	12	1	2		17
phalanx		2	2				4
loose teeth	1	9	17	4			31
l.b.fragment					14	27	41
fragment					1	5	6
TOTALS	2	40	80	8	38	65	233

TABLE 7

PHASE IVA MAJOR DOMESTICATES

	cattle	sheep	pig	c-size	s-size	totals
horn cores	1					1
cranium			2			2
mandible	5					5
rib	1	2	1	1	5	10
vertebra		2		1		3
scapula		1				1
humerus	2	1		1		4
radius		1				1
ulna		1				1
pelvis	2			2		4
femur	1	1			1	3
tibia		3		2		5
carpal/tarsal	1					1
metapodial	1	1				2
loose teeth	1	4	1			6
l.b.fragment				3	4	7
TOTALS	15	17	4	10	10	56

TABLE 8

PHASE IVB MAJOR DOMESTIC ATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn core			6				6
cranium		24	7	1	3	2	37
hyoid		2	1				3
maxilla	1	4	3	6			14
mandible	4	23	53	11	10		101
rib	2	17	8		25	45	97
vertebra		8	11		19	1	39
scapula	2	7	9	5	4		27
humerus	2	8	14	1	6		31
radius	1	8	30	4	6		49
ulna	2	3	1	2	1		9
pelvis	2	12	9	1		1	25
femur	1	7	9	1	2	1	21
tibia	3	9	52	4	6	1	75
fibula				1			1
carpal/tarsal	2	16	2	1			21
metapodial	3	20	50	5			78
phalanges	1	10		2			13
loose teeth	19	40	53	6	1		119
l.b.fragment					57	17	74
fragment					14	3	17
TOTALS	45	218	318	51	154	71	857

TABLE 9 PHASE V MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	total
horn core		1	1				2
cranium		5	5		9	4	23
hyoid		1	1				2
maxilla		2	2		1		5
mandible		9	18		1		28
rib		7	15		7	15	44
vertebra		5	2		5	1	13
scapula		6	5	1	4		16
humerus		4	5			2	11
radius		5	11		2		18
ulna		6	2	1	1		10
pelvis		9	4				13
femur		1	4		1	3	9
patella			2				2
tibia	1	1	18	1	4	2	27
carpal/tarsal		5	3				8
metapodial		7	24	1	1		33
phalanx		8	7	2			17
loose teeth	5	37	70	7			119
l.b.fragment					36	59	95
fragment					9	19	28
TOTALS	6	119	199	13	81	105	523

TABLE 10

PHASE VIB MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	total
cranium		3	2				5
maxilla	1		1				2
mandible		10	12	1			23
rib		12	10		5	10	37
vertebra	1	1			1	2	5
scapula		1	1		3	1	6
humerus		2			2		4
radius		2	9	1	1		13
pelvis		1	1		1		3
X femur		1				3	4
tibia			8	1	1		10
carpal/tarsal		1	2	1			4
metapodial		5	22	1		1	29
phalanges		6	2				8
loose teeth	1	5	12	1			19
l.b. fragment					12	11	23
fragment						1	1
TOTAL	3	50	82	6	26	29	196

TABLE 11

PHASE VIA MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn core		1					1
cranium		1	1	1	1		4
maxilla		1					1
mandible			5		1		6
rib		2				2	4
vertebra	1	2			1		4
scapula			2	1			3
humerus		2	2			1	5
radius		1	3		1		5
ulna	1	1					2
tibia		1	9				10
carpal/tarsal		2					2
metapodial		5	6				11
phalanges		1					1
loose teeth	1	3	6	1			11
l.b.fragment					13	11	24
fragment					4		4
TOTAL	3	23	34	3	21	14	98

TABLE 12

PHASE VIIA MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn core			1				1
cranium	1	3	10	3	4	3	24
hyoid			1				1
maxilla		6	6				12
mandible	1	19	57	6	2		85
rib		12	14		17	46	89
costal cart					1	1	2
vertebra		5	13		9	2	29
scapula		10	4	4	4		22
humerus	2	8	23	1			34
radius		2	28	1	2		33
ulna		4	1	2			7
pelvis		6	10	1	1		18
femur			14	1	4	4	23
patella				1			1
tibia		5	65		4		74
fibula				1			1
carpal/tarsal	2	10	7				19
metapodial	1	20	60	1	2		84
phalanges		10	5				15
loose teeth	6	32	92	6			136
l.b.fragment				1	80	127	208
fragment					16	28	44
TOTAL	13	152	411	29	146	211	962

TABLE 13 PHASE VIIB MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
cranium			2		1		3
mandible			4				4
rib					1		1
vertebra						1	1
scapula					2		2
humerus			1				1
radius			1	1			2
pelvis		1					1
femur		1			1	1	3
tibia			1				1
carpal/tarsal		2	2	1			5
metapodial	1	1	3				5
loose teeth		2	13				15
l.b.fragment					8	9	17
TOTAL	1	7	27	2	13	11	61

TABLE 14

PHASE VIIC MAJOR DOMESTICATES

	horse	cattle	sheep	pig	c-size	s-size	totals
horn core			1				1
cranium		6	7		10	3	26
hyoid		1					1
maxilla		3	4	2			9
mandible		14	43	2	6	2	67
rib		9	6		20	29	64
vertebra		1	11		12	10	34
sternum						1	1
scapula		2	5	3	10	4	24
humerus		5	16	3	3		27
radius		3	42	2	3		50
ulna		2	14	2			18
pelvis		2	7		4	3	16
femur		4	5			1	10
patella		1	1	1			3
tibia		2	49	2	3	1	57
carpal/tarsal		8	13	2			23
metapodial	2	18	74	2	1		97
phalanges	1	12	18	1			32
loose teeth	8	55	203	27			293
l.b.fragment			2	1	171	227	401
fragment					59	53	112
TOTAL	11	148	521	50	302	334	1366

TABLE 15 BIRD BONES

	1	2	3	4	5	6	7	8	9	TOTALS
sternum	1									1
coracoid				1						1
scapula	2									2
humerus		1			1					2
radius	1						1	1		3
ulna						1		1	1	3
carpometacarpus	1		3							4
femur	1									1
tibiotarsus	1							1		2
tarsometatarsus								2		2
TOTAL	7	1	3	1	1	1	1	5	1	21

Key to species

1 domestic fowl, Gallus (domestic) sp.
2 curlew, Numenius arquata
3 woodcock, Scolopax rusticola
4 herring or lesser black-backed gull, Larus argentatus/fuscus
5 guillemot, Uria aalge
6 duck, Anas sp
7 buzzard, Buteo sp
8 wagtail cf Motacilla sp
9 unidentifiable bird

TABLE 16 OTHER WILD VERTEBRATES

	1	2	3	4	5	6	7	8	9	TOTAL
antler	7									7
scapula		1	1							2
humerus				1						1
tibia						1				1
other					1		1	1	1	4
TOTAL	7	1	1	1	1	1	1	1	1	15

Key to species

1 red deer, Cervus elaphus
2 roe deer, Capreolus capreolus
3 rabbit, Oryctolagus cuniculus
4 badger, Meles meles
5 fragment of a large whale
6 frog, Rana sp
7 frog or toad, Rana/Bufo
8 Ballan wrasse, Labrus bergylta
9 unidentified fish

TABLE 17 MARINE MOLLUSCS - NUMBERS OF INDIVIDUALS

phase	oyster Ostrea edulis	winkle Littorina littorea	limpet Patella vulgata
I			13
II			9
IIIA			43
IIIB			59
IVA		4	76
IVB		46	566
V		398	270
VIB		5	805
VIA		5	7
VIIA	1	256	41
VIIB		4	7
VIIC	7	728	321
TOTALS	8	1,446	2,217

TABLE 18 SPECIFIC PROPORTIONS PERIOD BY PERIOD

Figures given are fragment numbers (percentages in brackets)

A. ROPE LAKE HOLE

period	date	cattle	sheep	pig	total
1	early-mid I.A.	137(44)	152(49)	22(7)	311
2	middle I.A.	134(35)	222(58)	29(7)	385
3	L.I.A. Durotrigian	402(37)	616(56)	74(7)	1092
4	R.B. 2nd-3rd C A.D.	330(23)	994(71)	84(6)	1408
overall		1003(31)	1984(62)	209(7)	3196

(see Table 19 for a detailed breakdown of these figures)

B. ELDON'S SEAT

period	date	cattle	sheep	pig	total
I	LBA	508(53)	408(43)	35(4)	951
II	Durotrigian	140(29)	305(64)	31(7)	476
overall		648(45)	713(50)	66(5)	1427

TABLE 19 SPECIFIC PROPORTIONS IN DIFFERENT CONTEXT TYPES

Figures given are fragment numbers (percentages in brackets)

period	phase	cattle	sheep	pig	totals	context type
1	I	62(42)	75(51)	11(7)	148	stone huts
	II	75(46)	77(47)	11(7)	163	waste tips
2	IIIA	94(37)	142(55)	21(8)	257	accum/occup
	IIIB	40(31)	80(62)	8(7)	128	occup below A
3	IVA	15(42)	17(47)	4(11)	36	robbing III
	IVB	218(37)	318(54)	51(9)	587	acc occup
	V	119(36)	199(60)	13(4)	331	stone huts
	VIB	50(36)	82(59)	6(4)	138	pits
4	VIA	23(38)	35(57)	3(5)	61	yard/structure/occ
	VIIA	152(26)	411(69)	29(5)	592	yard/structure
	VIIB	7(19)	27(75)	2(6)	36	gulley & pit
	VIIC	148(21)	521(72)	50(7)	719	occ + ploughing
overall		1003(31)	1984(62)	209(7)	3196	

TABLE 20 INDICES OF IDENTIFIABILITY TO SPECIES

period	phase	I cow/sheep/pig	II c-size/s-size	total
1	I	148(71)	59(29)	207
	II	163(64)	90(36)	253
2	IIIA	257(60)	173(40)	430
	IIIB	128(55)	103(45)	231
3	IVA	36(64)	20(36)	56
	IVB	587(72)	225(28)	812
	V	331(64)	186(36)	517
	VIB	138(72)	55(28)	193
4	VIA	61(64)	34(36)	95
	VIIA	592(62)	357(38)	949
	VIIB	36(60)	24(40)	60
	VIIC	719(53)	636(47)	1355
overall		3196(62)	1962(38)	5158

This table gives fragment numbers with percentages in brackets.

TABLE 21

PROPORTION OF BONES UNIDENTIFIABLE TO ANATOMICAL ELEMENT

This gives the percentage of bones in the two size classes - horse/cattle/c-size and sheep/pig/s-size - which can only be identified to 'long bone fragment' or 'fragment'

period	phase	large ungulate %	small ungulate %	BOTH
1	I	21%	14%	17%
	II	23	16	20
2	IIIA	25	12	18
	IIIB	19	20	20
3	IVA	12	13	13
	IVB	17	4	11
	V	22	25	24
	VIB	15	10	12
4	VIA	36	20	29
	VIIA	31	24	26
	VIIB	38	23	28
	VIIC	50	31	37
	overall	29	21	24

TABLE 22 PERCENTAGE OF LOOSE TEETH IN IDENTIFIABLE FRAGMENTS
(The number of fragments in each category is given in brackets)

period	phase	cattle	sheep	pig
1	I	23(62)	28(75)	36(11)
	II	27(75)	19(77)	27(11)
2	IIIA	16(94)	18(142)	19(21)
	IIIB	23(40)	21(80)	50(8)
3	IVA	7(15)	17(17)	25(4)
	IVB	18(218)	17(318)	12(51)
	V	31(119)	35(199)	54(13)
	VIB	10(50)	15(82)	17(6)
4	VIA	13(23)	18(35)	33(3)
	VIIA	21(152)	22(411)	21(29)
	VIIB	29(7)	48(27)	- (2)
	VIIC	37(148)	39(521)	54(50)

TABLE 23 THE DISTRIBUTION OF MEAT-BEARING AND PERIPHERAL BONES (LOOSE TEETH EXCLUDED) IN THE BONES IDENTIFIED TO SPECIES

PERIOD 1	CATTLE	SHEEP	PIG
no. of fragments	103	116	15
% meat-bearing	44%	55%	33%
% non-meat	56%	45%	67%
PERIOD 2			
no. fragments	110	179	21
% meat-bearing	51%	59%	43%
% non-meat	49%	41%	57%
PERIOD 3			
no. fragments	318	477	59
% meat-bearing	46%	48%	42%
% non-meat	54%	52%	58%
PERIOD 4			
no. Fragments	238	677	48
% meat-bearing	39%	49%	54%
% non-meat	61%	51%	46%
OVERALL			
no. fragments	769	1449	143
% meat-bearing	44%	50%	45%
% non-meat	56%	50%	55%

Note Non-meat-bearing bones are cranial and jaw fragments and limbs including and below distal tibia and distal radius.

TABLE 24 SHEEP JAW AGEING DATA COMPARED WITH THAT FROM ELDON'S SEAT

			Rope Lake Hole			
	Eldon's Seat		Periods 1-3		Period 4	
Stage (Grant)	No.	%	No.	%	No.	%
1-17	5	9	23	33	9	19
18-31	26	48	24	35	11	23.5
32+	23	43	22	32	27	57.5