Animal Bones from Weston Road, Portland, Dorset
(Association for Portland Archaeology)

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Methods of Animal Bone Analysis

All bones and teeth recovered from the excavations were recorded individually onto a relational database (Microsoft Access), which forms part of the site archive. In the main table, where appropriate, the following information was recorded for each specimen: species; anatomical element; part of bone present; approximate percentage of bone present; gnawing damage; erosion; weathering; burning; fusion data; other comments. Separate tables linked to the main table by an individual identification number were created for metrical, butchery and tooth ageing data. Where necessary, identifications were confirmed by reference to the comparative skeleton collection housed in the School of Conservation Sciences, Bournemouth University. The fish and the wild bird bones were identified by Sheila Hamilton-Dyer. Tooth eruption and wear descriptions for cattle, sheep/goat and pig follow the method of Grant (1982). Most measurements for mammals and birds are those recommended by von den Driesch (1976) and most of the fish bone measurements follow Morales and Rosenlund (1979).

Sub-Division of the Sample

Animal bones were recorded from a total of 131 contexts. As will be discussed below, the faunal sample is fairly homogeneous across the site, displaying relatively little variation in species and element representation. Although this is a multi-period site, it is believed that the vast majority of the bones are of Romano-British origin. For the purpose of this analysis the sample has been divided into the following 14 groups:

Structure S59 – Oval drystone structure
Structure S60 – Round drystone structure
Structure S97 – Round drystone structure
Structure S200 – Round/oval drystone structure (kiln/furnace)
Structure S299 – Rectangular building (medieval)
Ditch F22 – East-West ditch
Other Linear features
Grave fills
Other walls of structures
Rubble layer context 121 – below S299
Other rubble/demolition layers
Soil/loam layers 12, 100-110
Other soil/loam layers
Other contexts – miscellaneous

The bone-bearing contexts involved are listed in Table 1. The groups are partially based on clearly defined structures and layers but other groupings are more arbitrary, simply amalgamating contexts of similar types. Finds associated with the upper levels of structure S299 are the only one which produced significant numbers of medieval

artefacts. This building may have been built upon an earlier Romano-British structure and most of the bones appear to be from lower levels of this building and therefore of pre-medieval date.

Size of Faunal Assemblage

A substantial sample of 13,649 animal bone fragments was recovered from the excavations (Table 2). Considering the small area excavated, this represents a dense accumulation of material. It is also testament to the high standard of recovery despite the lack of a sieving programme. Samples of over 1,000 fragments were obtained from structures S60, S97 and S200, rubble layer 121, other rubble layers, soil layers 100-110, and other soil layers.

Bone Preservation

General comments on bone preservation were made for each of the 131 contexts. Only two assemblages were categorised as poorly preserved with many fragments displaying significant surface erosion. Five (4%) were designated as quite poorly preserved with slight erosion on many of the bones. Thirty-five (27%) of the assemblages are moderately preserved with good surface preservation but with high percentages of fragmented and gnawed bones. Most contexts (66%) have quite well preserved assemblages with good surface preservation and less fragmentation. Only two samples, however, have excellent preservation. A total of 9,368 (69%) of the bone fragments are from very well or quite well preserved assemblages. Only 54 (0.4%) of the fragments are from poorly or quite poorly preserved context assemblages.

Surface erosion was recorded on only 306 (5%) of the identified elements. This figure varies between 0% and 10% in the 14 groups (Table 3). The highest incidence of eroded fragments is from soil layers 100-110 but there is relatively little variation in surface preservation between different context types. The relatively shallow deposition of the assemblages sometimes in layers that probably accumulated quite slowly accounts largely for the presence of eroded elements.

Gnawing damage, mainly by dogs, is slightly more prevalent than surface erosion, affecting 528 (8%) of the identified elements (Table 3). This figure ranges widely between 2% and 17% in the 14 groups, although the extreme figures derive from small samples. Gnawing damage particularly lessens the survival rate of limb bone extremities and the bodies of vertebrae. In many cases these have been completely destroyed, which has had detrimental effects upon the number of elements that have provided epiphyseal fusion and metrical data. Gnawing damage was observed frequently on the major domestic mammal species. Relatively more (13%) cattle elements are gnawed than those of pig (11%) and sheep/goat (7%). This implies that more cattle bones survived scavenging than those of the smaller species, which have more fragile bones susceptible to total destruction. Gnawing damage was also observed on two bird, four fish and two deer bones.

Only 184 (1%) fragments are burnt, of which 135 are from unidentified elements. High percentages were obtained from S59 (5%) and miscellaneous wall contexts (8%). The possible kiln/furnace S200 assemblage includes 3% burnt fragments. Sheep/goat provides 41 of the 49 burnt fragments amongst the identified material. Small numbers of cattle (3), pig (2), bird (2) and fish (1) elements were also affected. The slightly

higher percentage (0.9%) of burnt fragments in the sheep/goat assemblage may indicate that their bones were more likely to come into contact with fire, either directly during cooking or after food consumption. However, it should be noted that large mammal fragments (41) are quite well represented amongst the burnt fragments unidentified to species.

Modern breaks were visible on many bones accounting for significant amounts of fragmentation beyond breaks made in antiquity. Overall, 6% of the identified elements were recorded as broken. The highest percentages are from assemblages from grave fills (11%) and walls (11%).

A total of 6,919 specimens are unidentified (Table 3). The percentage (51%) of unidentified fragments is indicative of the fragmented nature of the assemblage. The highest incidence of unidentified fragments (66%) was found in the assemblage from grave fills. The small sample from other contexts produced the lowest percentage (38%) of unidentified fragments. Further indicators of preservation will be discussed when reviewing element representation and fragmentation patterns of the major species.

Sheep/Goat Abundance

Although most of the sheep/goat elements could not be further identified, it was possible to distinguish between sheep and goat from some of the better preserved skull, mandibles and limb bones using criteria recommended by Boessneck (1969) and Payne (1985). At least 454 elements belonged to sheep compared with only 19 identified as goat. The dominance of sheep within sheep/goat samples (96%) is typical of Romano-British sites (King 1991; Maltby in press). It is marginally lower than at Greyhound Yard, Dorchester (97.4%) (Maltby 1993).

Sheep/goat elements (NISP = 4,384) dominate the identified portion of the assemblage, providing 71% of the mammal fragments, their contribution varying between 40% and 81% in the 14 sub-groups (Table 4). However, the lowest and highest percentages are from small samples and the lowest percentage is from S299, which is biased by the inclusion of a partial dog skeleton in the counts. The nine largest assemblages have sheep/goat percentages within a narrow range of 65%-80%.

Table 5 compares the NISP counts of sheep/goat, pig and cattle only. The overall percentage of sheep/goat rises to 73%, ranging between 40% and 81% in the 14 sub-groups. Extensive comparisons between the relative percentages of sheep/goat, cattle and pig have been made by various authors (e.g. King 1999; Maltby in press). Results from a variety of Romano-British sites from Dorset, Devon, Somerset and Hampshire are presented in Table 6. These show that the Weston Road assemblage contains one of the highest percentages of sheep/goat. There are several, not necessarily conflicting, explanations that need to be considered to account for such high percentages of sheep/goat elements.

1) Recovery rates were better at Weston Road than on other sites. There is no doubt there was a high standard of retrieval, which could account for higher percentages of sheep/goat than on some sites where their smaller bones are more likely to have been overlooked than those of cattle. However, if one counts only the elements of sheep/goat and pig – species of similar size – the percentage of sheep/goat (87%) is

still among the highest encountered in the samples compared, indicating that other factors are involved.

2) The high percentage of sheep/goat is indicative that the settlement was rural in nature. King (1999) has argued that “unromanised” indigenous rural settlements in Roman Britain tend to have higher percentages of sheep/goat than more “romanised” urban, military and villa sites, perhaps indicating a continuation in dietary preferences of the native communities. The results presented in Table 6 partially support this argument. Nearly all the urban samples have much smaller percentages of sheep/goat than rural sites. However, it is suspected that the site at Weston Road is part of a much larger settlement complex than a rural farmstead and the density of bones could also suggest this. The artefact assemblage is also richer than would normally be expected on such a site.

3) The high percentage of sheep/goat reflects the local, insular pastoral economy that was heavily reliant on sheep production. The historical importance of sheep on the Isle of Portland is well known (Jones 2005) and the generally thin soil conditions on much of the island are much better suited for sheep grazing than for other animals, particularly cattle. People resident on the island in the Roman period, no matter how influenced they were by the Romans, are likely to have relied largely on local food resources.

4) Sheep were very important in the pastoral economy in Dorset during the Romano-British period. Similar very high percentages of sheep/goat in relation to pig have been found at sites such at Rope Lake Hole (Coy 1987a), Whitcombe villa (Buckland-Wright (1990) and the small sample from the Hod Hill fort (Fraser 1968). However, other sites do not have particularly high values compared with sites in Hampshire, for example, particularly if cattle are excluded from the calculations.

5) Some Romano-British temples have a high percentage of sheep/goat bones associated with them (King 2005). Perhaps, the most relevant comparison here is with the assemblage from Hayling Island. However, species representation there is dominated by both sheep and pig with very few bones of cattle (Table 6).

Sheep/Goat Elements Represented

Table 7 provide a summary of the different types of element identified for sheep/goat. Three methods of calculation were carried out. The first involves a simple count of specimens (fragments) identified to each type of element (NISP). The second method records the zones of the element represented, enabling the determination of the minimum number of each element present (MNE). The third method involves the calculation of whole bone equivalents (WBE). This takes into account how much of the complete element has survived. Values of 1.0, 0.75, 0.50, 0.25 and 0.10 were assigned to each specimen based on the approximate proportion of the element present. Table 7 provides the summated totals of these counts for the major bones.

Interpretation of sheep/goat element representation must take into account problems of differential survival and retrieval. Small bones such as the phalanges, carpals and tarsals are nearly always poorly represented because many have been overlooked during excavation. The high incidence of gnawing will also have had a greater detrimental effect on more fragile elements such as vertebrae and limb bone epiphyses.

The high percentage of loose teeth (27%) confirms how fragmentary the sheep/goat assemblage is and its moderate survival. High percentages of loose teeth indicate many jaws have been destroyed leaving only the denser teeth. Apart from teeth the best surviving elements are the mandible (8%), tibia (7%), radius (6%) and metatarsal (5%). Again, this largely reflects the fact that these are relatively robust elements, whose shafts can survive well compared with more fragile elements such as the scapula and femur. MNE counts reveal that at least 146 tibiae are represented by distal shafts. Assuming that there are equal numbers from both sides of the body, this indicates that at least 73 sheep/goat are represented in the assemblage. Other elements with high MNE counts are the humerus (112) and pelvis (104). Mandibles (89) and metatarsals (70) are much less prominent when MNE counts are employed.

If NISP and MNE counts are modified to express them as percentages of the best represented element (excluding loose teeth) (Table 7: columns 18 and 20), it is possible to see that MNE calculations significantly increase the percentages of humerus, ulna, pelvis, tibia, tarsals and neck vertebrae. Conversely, relative percentages of mandible, skull, metatarsal and phalanges are lower than indicated by NISP counts. The reasons for these discrepancies lie in a combination of differential fragmentation and other taphonomic factors. NISP counts tend to favour elements such as the skull that easily fragment but can still often be identified. MNE counts generally have the effect of increasing the percentage of upper limb bones and this sample is no exception. There is, however, no clear indication that there is a heavy bias towards joints of lamb and mutton being imported. Many of these bones belong to animals that were brought to the vicinity of the site for slaughter and processing. However, cranial and foot elements do tend to be less well represented in the MNE counts than the more robust upper limb bones at least, which could imply that some joints of meat were introduced.

There are only modest amounts of variability in sheep/goat element counts in the 14 sub-groups. For example, the percentage of loose teeth only ranges between 22% and 36% in the seven largest assemblages. Gross comparisons of body parts represented (Table 8) show some variations between groups but no clear patterns. Foot bones tend to be slightly less common in structures than in other groups and S97, S200 and S299 all had higher than average percentages of cranial elements. However, the overall impression of the assemblage is one of homogeneity.

Sheep/Goat Fragmentation and Butchery Evidence

Given the fragmentary nature of the sheep/goat assemblage, it is of no surprise that there are very few groups of associated bones. There are only three examples recorded. The first consists of pairs of complete tibiae and metatarsals probably from the same young lamb in S200 (context 199). S60 produced the distal epiphysis of the left tibia, astragalus, calcaneus, centroquartal and metatarsal of an immature sheep (context 202) and the distal epiphysis of a right femur, tibia, astragalus, calcaneus, centroquartal and metatarsal of another immature sheep (context 245). Although neither group has any evidence of cut marks on any of the bones, it does not rule out the possibility that these were deposited after the carcasses had been at least partially processed.

A summary of observations of butchery marks for all the identified species is provided in Table 9. Only 104 elements had cut or chop marks observed on them, representing 3% of the sheep/goat sample excluding loose teeth. High fragmentation

and the destruction of many articular surfaces by canid scavenging partially account for this low figure. These areas are where butchery marks most often occur but any such marks will have been often obliterated. In addition, the majority of butchery particularly on the limbs was carried out using knives. Experienced butchers using knives often do not leave many cuts on the bones.

Butchery marks were most commonly observed on tarsal elements. Twelve astragali, five calcanei and five centroquartals were recorded as butchered. Apart from one astragalus, all the marks were made with knifes. Most of the cuts on the astragali run transversely across the anterior surface. These would have facilitated skinning and enabled the tibia and the rest of the upper hind limb to be separated from the feet. Similar transverse marks were observed on various aspects of the calcanei and centroquartals and reflect the same activity. Very few marks were observed on metapodials and phalanges but transverse cuts on two first phalanges are skinning marks.

Butchery marks were also quite commonly noted on sheep/goat scapulae (9) and pelves (11), reflecting processing associated with segmentation of the carcass and filleting. Two scapulae bear superficial chop marks above the neck associated with separation from the humerus. The remaining marks are incisions found on various parts of the neck and blade. Most of the butchery marks on the pelvis are located on the ilium and all but two consist of knife cuts. The location and nature of most of the incisions suggest they were made during segmentation. Several upper limb bones also bear butchery damage (Table 9). Apart from a humerus and a tibia, which both had been chopped through the shaft during segmentation, all the marks consist of fine incisions, usually located near the ends of the bones.

Butchery marks were rarely observed on cranial elements. However, the horncore of a male sheep has been chopped from the skull near its base presumably to release the horn sheath for working. Three parietal fragments also bear chop marks and in one case the skull had been cleaved open to remove the brain. Chop marks were also observed on the medial aspects of the diastemae (fronts) of two mandibles from S97 (context 198). These were made when the jaws were split. The only other mandible with butchery evidence bears knife cuts on the ramus just below the condyle. These were made when it was detached from the skull.

Butchery marks were observed on 30 vertebrae (Table 9). Evidence for the use of a cleaver is more prevalent on these. All but one of the butchered lumbar and thoracic vertebrae and four of the cervical vertebrae (excluding the atlas and axis) bear chop marks. All are related to the division of the trunk into two sides. In two cases the vertebrae have been chopped through close to the midline but the majority bear marks that are situated off-centre. There is no evidence for transverse chops on any of the lumbar or thoracic vertebrae, although they were found on one cervical vertebra. In contrast, all bar one of the butchery marks on the atlas consist of knife cuts mostly running transversely. These were made during separation from the skull. One atlas from S60 (context 245) has been sawn in half. This is very unusual butchery for a Roman site and it is possible that this bone is a later (possibly post-medieval) intrusion. Butchery marks were observed on or adjacent to six rib heads. In all but one case these were made with knives.

Sheep/|Goat Ageing Evidence

Recording of the eruption and wear of mandibular cheek teeth followed the method of Grant (1982). Mandibles were then assigned to one of seven stages of development. Fifty-three mandibles were complete enough for this assessment to be made. The numbers assigned to each stage are listed in Table 10. It was possible to separate the jaws of immature sheep and goats on the basis of their morphology (Payne 1985) but it was not possible to separate these species in the older mandibles. However, it is likely that most of these belonged to sheep.

Five mandibles belonged to neonatal mortalities (Stages 1). Four of these were identified as goat compared with only one sheep. Given that goats are relatively rare in this assemblage, this may be of some significance. Goats may have been more commonly milked than sheep and this could be reflected in the slaughter of newborn kids. Goats may also have been kept within the settlement making it more likely that the bodies of any neonatal mortalities (either natural deaths or deliberately killed) would be present. All five of these mandibles are associated with structures (S97, S200, S299). Their slaughter and deposition may also have ritual connotations, although they are found amongst large amounts of other material.

A substantial number (28%) of mandibles are at Stage 3, representing animals killed in their first year, mainly between 6-12 months of age. Of those that could be distinguished, 12 belonged to sheep compared with only one of goat. This may indicate a peak of slaughter of surplus lambs not required for breeding, milking or wool. They had not have reached full size, however, and may have been slaughtered to control the size of flocks utilising the available pasture on the island. Ten (19%) of the mandibles are at Stage 4 and would have belonged to sub-adult animals killed in their second year. Seven of these belonged to sheep whereas no goats were identified.

Twenty-two (42%) of the sheep/goat mandibles from the site had all three molars in wear (Stages 5-7) and belonged to animals over two years of age. Eight of these (15%), however, did not possess any heavily worn teeth (Stage 5) and are mostly from animals aged between two and four years old. Animals culled between these ages may have provided some fleeces and offspring prior to slaughter but were killed before old age. Fourteen mandibles of sheep/goat over four years of years of age (Stages 6-7) provided 27% of the sample. These would have been animals kept for breeding, wool production and milk products prior to slaughter. Only one specimen, however, was assigned to Stage 7, indicating that the majority of animals were culled prior to very old age.

It was possible to record large amounts of epiphyseal fusion data (Table 11). Fusion data tend to be less reliable than tooth ageing data in samples that have been subjected to significant amounts of scavenging by dogs, as the unfused bones of younger animals are more prone to destruction. For example, only 16% of the youngest-fusing epiphyses in the sample are unfused. These represent animals that died under a year old and therefore represent a lower estimate of first-year deaths than the mandible data. A substantial number (352) of porous sheep/goat elements were recorded. These belonged to lambs and kids certainly under a year old and many probably were substantially younger. This represents 11% of the sheep/goat elements (excluding teeth) and supports the evidence from the mandibles that the sample includes significant numbers of neonatal and juvenile sheep and goats. In addition a number of

metapodials had shafts that were unfused or just fused, which is indicative of late foetal, or more likely in this case, neonatal mortalities.

Of the later-fusing epiphyses, results from the second phalanges should be disregarded as they have probably been heavily biased by less efficient retrieval of the smaller unfused specimens. Results from the first phalanges should also be treated with caution for the same reason, although substantial numbers of unfused specimens were recovered, as should be expected. Results from the distal tibia and metapodials are fairly consistent (Table 11). Overall 61% of the surviving specimens have unfused epiphyses. These epiphyses generally fuse between 15 and 28 months, indicating that well over half of the sheep and goats represented were probably under two years of age, an observation that supports the tooth eruption data.

Late-fusing epiphyses, particularly the proximal humerus, are the most susceptible to destruction and the sample sizes are consequently smaller and less reliable. Overall, 64% of the epiphyses are unfused representing animals that died under 3-4 years of age. The results suggest that there was not a significant slaughter of animals aged between two and four years old, which slightly conflicts with the mandibular ageing data. However, both methods indicate that approximately only around a third of the animals represented were older than this.

Interpretation of these results needs to take into account the possibility that some stock may have been imported or exported. High percentages of first year animals, particularly those equivalent to Stage 3 of the tooth ageing sequence, have commonly been found in British Iron Age samples (Maltby 1981; Hambleton 1999; Albarella 2007), including some from sites in Dorset such as Maiden Castle (Armour-Chelu (1991) and Gussage All Saints (Harcourt 1979). On these sites, sheep/goat in the 1-2 year bracket are often less well represented than those aged between 6-12 months. Although there is a lot of variation in Romano-British assemblages, there is often a greater proportion of animals aged between 12 and 36 months (Maltby 1981; in press; King 1991), indicating an increase in the importance of meat production. This is not reflected in this assemblage and contrasts with the Roman assemblages from Dorchester, where there were very few specimens at Stage 3 in the tooth eruption sequence (Maltby 1993; 1994). A greater demand for meat in the town may account for this contrast.

Sheep Metrical Data

Measurements were taken on 333 sheep/goat elements. Details of all measurements are stored in the archive. Table 12 summarises the data from the more common measurements taken and compares some of them with the results from Greyhound Yard, Dorchester (Maltby 1993; in press). Generally, sheep in Roman Dorset appear to have been quite small even by Romano-British standards. The range and variety in size of the sheep from Weston Road is broadly similar to those from Dorchester. All the mean sizes that have been compared, however, show that the average size of the sheep in the Dorchester assemblage is slightly greater than in the sample from Portland. Differences in breadth measurements may simply reflect that there are more bones of larger males and/or slightly older animals in the Dorchester sample rather than any overall differences in the stature of the animals. Males are likely to be less well represented amongst the distal tibiae measured at Weston Road, as it is likely that a higher proportion of males were culled before the epiphysis fused than at

Dorchester. All the other measurements compared are subject to a small degree of post-fusion growth and the higher percentage of immature sheep represented at Weston Road could be reflected in these results.

It is interesting to note, however, that the average withers height estimated from the maximum lengths of complete limb bones, is also slightly lower in the Portland sample (56.3cm) than in the Dorchester assemblage (58.1cm). Unfortunately, the sample is quite small and tests showed that the variation is not statistically significant.

Another factor that needs to be considered is the possibility of chronological variation. There is some evidence to suggest that the average size of sheep became greater in the later Roman period at Dorchester (Maltby 1993). Unfortunately, the nature of the Weston Road sample precludes the investigation of possible diachronic changes.

Sheep Horncore Data

The relative abundance of horned and hornless sheep has been shown to vary between different Romano-British sites, even between those located in the same region. Hornless sheep are largely absent in Iron Age samples but are found in variable numbers on later sites, including Dorchester (Maltby 1993; 1994; in press). At Greyhound Yard, hornless specimens form no more than 5% of the sheep skulls in the earliest Roman samples, a figure that rose to 37% in some later Roman deposits before decreasing to 11% in the latest Roman phases (Maltby 1993).

In addition to the loose horncores (Table 2), horned sheep are represented by 27 skull fragments at Weston Road, including some from neonatal lambs. Only three (10%) skulls of hornless specimens were found (two from soil layers 100-110; one from S97). Again interpretation is difficult because of the problems of chronology but the percentage of hornless sheep falls below the maximum levels found in Dorchester, perhaps implying that the sheep at Weston Road came from less diverse sources.

Cattle Abundance

Cattle elements (960) are fairly poorly represented, providing only 16% of the identified mammal assemblage (Table 4). Apart from the small sample from linear features, in which cattle provide 47% of the identified elements of cattle, sheep/goat and pig (Table 5), none of the sub-groups produced over 29% cattle. The percentage of cattle elements is significantly smaller than in most Roman assemblages from southern England (Table 6). Only the small sample from Hod Hill and the assemblage from Hayling Island have figures below those found on this site. Possible reasons for the high percentages of sheep/goat and the consequent low percentages of cattle and pig have been noted above. Such a low percentage of cattle is generally not typical of a Romano-British urban assemblage. It would be interesting to obtain samples from elsewhere on this settlement to see whether such percentages are reflected more broadly. However, the evidence from these excavations suggests that the inhabitants of this part of the settlement did not rely as heavily on beef as contemporary communities in the region.

Cattle Elements Represented

Table 13 summarises the cattle element data. The best represented elements are loose teeth (249), which provide 26% of the cattle assemblage. This indicates the fragmentary nature and moderate preservation of the cattle bones. Excluding these,

mandibles (79) skull fragments (51) and first phalanges (48) provide the highest NISP counts. Phalanges and other small foot bones such as the carpals and sesamoids are generally much better represented than in the sheep/goat sample, reflecting differential recovery rates and indicating that sheep/goat are probably under-represented in comparison with cattle in the assemblage. The larger numbers of such bones largely accounts for the fact that 34% of the cattle assemblage (excluding teeth) consists of foot elements. Cranial elements are also better represented (25%) than in the sheep/goat assemblage. This could imply that there is a greater bias towards elements of low meat utility in the cattle assemblage. However, this is more likely to be due to better retrieval of foot elements and the greater fragmentation of skull and mandible fragments. The highest MNE counts were obtained from the metacarpal (15), mandible (15) and humerus (15), elements of both low and high utility (Table 13). There is therefore no convincing evidence that the assemblage is biased by the disposal of large amounts of primary processing waste. On the other hand, there is also little evidence that joints of meat of cattle butchered elsewhere were commonly imported. The cattle assemblage is too small to carry out detailed comparisons of body parts found in different sub-groups.

Cattle Fragmentation and Butchery Evidence

No associated bone groups of cattle were recorded. Fragmentation levels of the upper limb bones and mandibles are very high, as indicated by comparisons between the WBEs and NISP counts for these elements (Table 13). The majority of these elements consist of 10% or less of the complete bone. Such fragmentation to an extent indicates that the bones were commonly broken during processing, particularly to release marrow. However, subsequent taphonomic processes such as weathering and trampling probably account for significant amounts of further fragmentation. The metapodials are less fragmented than the upper limb bones indicating that they were not as intensively broken. Although only six (18%) metacarpals and three (11%) metatarsals survived as 75% of more of the complete bone, such relatively complete bones are still more common than in the generally better preserved urban and suburban assemblages from towns such as Caerwent and Winchester (Maltby 2007). This implies that marrow processing may in fact not have been as intensive at this site.

Butchery marks were observed on 37 cattle elements, representing 5% of the total sample excluding teeth (Table 9). This is a low percentage compared with most cattle assemblages. For example, 29% of the cattle elements from Greyhound Yard, Dorchester were recorded as butchered (Maltby 1993). This reflects the very fragmentary nature of the sample from Weston Road. It also reflects the absence of some characteristic processing marks found in abundance on urban sites. Of the butchered specimens, knife cuts were observed on 17 and chop marks on 19. A mandible from context (209) has been sawn through the diastema. The use of cleavers became more prevalent during the Romano-British period but they were used with greater consistency by professional butchers resident on urban sites in particular (Maltby 2007). The relatively low number of bones with cleaver marks is more typical of rural assemblages. The use of knives to disarticulate cattle carcasses was prevalent on Iron Age sites and their use continued into the Roman period at some rural settlements. This is the case at Weston Road. Cuts on the medial aspects of a proximal radius and femur, on the anterior aspects of two astragali and on the lateral aspect of a mandibular ramus are typical of such butchery practices.

Knife cuts were also found on two occipital condyles made during separation from the spine. Seven first phalanges bear knife cuts on the peripheral and/or anterior surfaces of the shaft. These were made during skinning. Knife cuts on the frontal bone on the top of the skull are also likely to have been made during skinning.

All the butchery observed on seven cattle vertebrae are marks made with cleavers. Most, as in the case of sheep/goat, are related to the division of the trunk into two sides. An atlas and axis have been chopped through close to the midline but in three other cases such marks are situated off-centre. Two thoracic vertebrae have been chopped through transversely during segmentation of the spine. Although chop marks were observed on several limb bones, there is only one dubious case (on an ulna) that has evidence for broad blade marks than run longitudinally along the bone. Such skims are characteristic of filleting marks made by specialist butchers who practised in towns such as Dorchester (Maltby 2007). There is also no evidence for longitudinal splitting of upper limb bones. This practice has also been encountered on a number of urban and villa sites. This suggests that bulk processing of marrow was not taking place on this site. There is therefore no evidence for the presence of specialist butchers at this settlement. Generally, the nature of cattle carcass processing is more similar to that encountered on rural settlements such as Owslebury in Hampshire than that found on urban sites (Maltby 2007; in press).

Cattle Ageing and Metrical Data

The fact that only four mandibles survived with any cheek teeth still embedded in the jaw is testament to the heavily fragmented nature of the cattle assemblage (Table 10). Larger samples of epiphyseal fusion data were obtained (Table 11). There is quite a high percentage (17%) of unfused early-fusing epiphyses, belonging to calves mainly under a year old. There are also quite large numbers of porous bones (84) that comprise 12% of the cattle elements excluding teeth. This demonstrates that bones of a significant number of juvenile animals were deposited. Some of these calves may have been slaughtered as a by-product of dairy production. Veal may also have been popular, although most Romano-British samples tend to produce high percentages of adult cattle (Maltby in press). However, a significant number of jaws and bones of young calves were also found at Greyhound Yard, Dorchester (Maltby 1993; 1994). Again some cattle may have slaughtered at a young age to preserve pasture.

Although there is only a small sample of distal tibiae and metapodials, there is a high percentage (69%) of unfused specimens indicating that over two-thirds of these bones belonged to cattle aged under 24-30 months old. Similarly, only 19% of the latest-fusing epiphyses are fused, indicating that only a small number of adult cattle are represented. Such a bias towards immature cattle is very unusual on Roman sites, where most samples usually contain high percentages of adult cattle. Unfortunately analysis of epiphyseal fusion data was not carried out on the Dorchester Greyhound Yard sample. However, the analysis of mandibular tooth ageing data showed that half the cattle mandibles belonged to fully mature cattle probably all over four years old (Maltby 1993) and most urban sites have even higher percentages of adult cattle mandibles (Maltby in press). In assemblages from Roman Exeter 69% of the latest-fusing epiphyses have fused (Maltby 1979) and at Winchester this figure is even higher (75% - Maltby in press). High percentages of mature cattle have also been found on rural settlements such as Owslebury (Maltby 1994).

Therefore, to find such high percentages of immature cattle is very unusual. Several explanations can again be put forward:
1) Many of the herds kept on the island may have been sent to Dorchester for slaughter to satisfy demands for prime beef (young adult) cattle.
2) Cattle were not commonly kept on the island and the remains include large numbers of imported animals. However, if this was the case, they were brought to the island alive, as there is no clear evidence for the import of joints. Nor is there evidence for specialist butchery.
3) The exploitation of cattle on Portland was restricted by the lack of good grazing land. To preserve pasture, many cattle were slaughtered at a young age.
4) The slaughter of young cattle and the deposition of their bones reflect special circumstances related to the nature of this part of the settlement. Romano-British temples often have produced unusually large numbers of bones of immature animals, particularly of sheep/goat and pig, perhaps indicating the selection of young animals for sacrifice. However, few of these sites have large numbers of cattle bones and there is no evidence from any of them that high percentages of young cattle were selected for slaughter (King 2005).

Unfortunately, very few cattle bones could be measured to determine whether there was a bias towards males or females amongst the bones from adult animals. A complete metacarpal has a greatest length of 168mm, which is from a small animal with a withers height of 103mm. This lies towards the lower end of the size range of cattle from Dorchester (Maltby 1993). Three horncores are from animals with very small horns.

Pig Abundance
Pig elements (676) provide 11% of the identified mammal assemblage (Table 4). Their remains were found quite consistently in the various sub-groups, providing between 8% and 17% of the cattle, sheep/goat and pig fragments (Table 5). Comparisons with contemporary assemblages from southern England show that the abundance of pig elements from Weston Road is fairly low (Table 6). Most urban samples have higher percentages of pigs perhaps reflecting variations in dietary preference (King 1984) and the availability of pigs (Maltby 1994). However, low percentages of pigs have been found in some suburban as well as rural assemblages. For example, pig percentages from Colliton Park and Alington Avenue, Dorchester are significantly lower than those from Greyhound Yard.

Pig Elements Represented
Loose teeth (148) provide 22% of the pig assemblage (Table 14), indicating only moderate preservation of their bones. Excluding teeth, cranial elements are more abundant than in the sheep/goat and cattle assemblages (33%). This is typical of many faunal assemblages as these elements survive better in pigs. Foot bones are slightly less abundant (19%) than in the sheep/goat assemblage, even though pigs have more bones in their feet. This is also evident in the MNE counts with no foot element having a MNE higher than seven compared with 21 for all the cranial elements. Some of the upper limb bones such as the humerus (MNE=16) are also better represented. This may imply that some joints of pork or bacon were brought in after their trotters were removed. However, several other upper limb bones are no better represented than some of the tarsals and metapodials and there is no conclusive evidence that this practice was particularly common.

Pig Fragmentation and Butchery Evidence
No associated bone groups were identified. The degrees of fragmentation of the upper limb bones are similar to those of sheep/goat. Butchery marks were observed on 32 (6%) pig elements (Table 9). Seventeen of these consisted of knife cuts and 14 of chop marks. A pelvis from S60 (context 223) has been sawn through the acetabulum. The use of saws is unusual in Romano-British butchery. Therefore it is possible that this bone represents a later intrusion. Knife cuts on the anterior surfaces of two pig astragali are similar to those commonly found on sheep/goat and were inflicted when the feet were separated from the upper hind limbs. Knife cuts were also found on a centroquartal. Similar knife cuts were observed on the lower shafts of four tibiae. Knife cuts associated with dismemberment were also observed on a scapula, pelvis and two lumbar vertebrae. However, two other tibiae have evidence of chop marks on the shaft indicating alternative methods of dismemberment were used. Similarly the distal ends of a femur and a humerus have also been chopped through. A mandible has evidence for being split through the symphasis. Two atlases bear superficial transverse chops made when the skull was removed. Another atlas and three other vertebrae and a rib have chop marks associated with the division of the trunk into sides. One skull shows evidence of being chopped open to remove the brain. Three other skull fragments have knife cuts. Overall butchery methods are similar to those observed on the other main species.

Pig Ageing, Sexing and Metrical Data
Tooth eruption data are available from 20 mandibles (Table 10) and 22 maxillae. In contrast to the sheep/goat and cattle samples, there are no neonatal animals represented by these jaws (Stages 1-2). Only 17 (3%) of the pig elements were recorded as porous. As discussed above, the presence of neonatal goats and calves may be by-products of dairying, which would not been an issue in pig husbandry. The near absence of neonatal pigs contrasts with Greyhound Yard, Dorchester, where 25% of the pig mandibles were at Stages 1-2 (Maltby 1993; 1994; in press). It has been suggested that some pigs were kept in Romano-British towns to meet increased demands for pork (Maltby 1994). In contrast there is little evidence to suggest that pigs were kept in the vicinity of Weston Road.

There is, however, evidence for a significant cull of pigs aged between about 6-12 months old (Stage 3). Eight (40%) of the mandibles and nine (41%) of the maxillae belonged to pigs of this age. Assuming that the majority of pigs were born in Spring, this would indicate that many were killed in the autumn and winter. The high kill-off of first year animals is supported by the epiphyseal fusion data, which shows that 35% of the early-fusing epiphyses are unfused (Table 10). Sub-adult animals (Stages 4-5) are represented by nine (45%) of the mandibles (Table 9) indicating that a substantial proportion of second year mortalities are represented. This is also supported by the later-fusing epiphyses, which include 78% unfused specimens (Table 10).

Only three (15%) of the mandibles (Table 9) and three (14%) of the maxillae belonged to adult pigs over two years of age (Stages 6-7) and only one (3%) of the latest-fusing epiphyses have fused (Table 10), indicating that nearly all the pigs were under 36-42 months old. Pigs can tolerate high levels of immature slaughter but the percentage of immature pigs represented here is unusually high. At Greyhound Yard, Dorchester, 25% of the pig mandibles belonged to adults (Maltby 1993; in press).

Adult animals are even more common in most urban samples (Maltby in press). Slightly higher percentages of adult pigs were also found at Hayling Island, although first and second year mortalities are in the majority (King 2005).

Unfortunately only three of the mandibles discussed above have surviving canines to determine whether they belonged to males or females. The oldest mandible belonged to a sow, which presumably was kept for breeding. Two younger specimens belong to males. Five other female and four male mandibles were also recorded. Twenty out of 21 loose lower canines belonged to males. However, these have a much better chance of recovery than the smaller canines of females.

Metrical data of pig bones are restricted because of the high levels of immature slaughter. The lateral lengths of seven astragali range between 36.6mm and 44.2mm (mean = 40.4mm). These represent pigs of similar sizes to those found on other sites in southern England (Maltby in press). Several pig bones belonged to large animals, although unfortunately none could be measured. These probably belonged to large domestic animals, although the presence of wild boar cannot be totally discounted.

Other Mammals

Horse

Although it is possible that equid remains could include mule as well as horse, there is no clear evidence for the presence of the former at this site and it is assumed that the majority or all of the remains belonged to horse. Only 37 elements were identified, representing less than 1% of the mammal assemblage (Table 4). These include a large portion of skull, mandible, humerus, thoracic vertebra, rib and two first phalanges from S97 (contexts 198 and 216). All epiphyses are unfused and it likely that all seven bones belonged to the same foal. The low proportion of horse is more typical of urban assemblages. Comparing counts of horse and cattle only (Table 4), horse provides only 4% of the sample. This, however, is higher than at Greyhound Yard, near the centre of Dorchester (2%) but very similar to percentages obtained from the Colliton Park site, situated near the edge of the town (Maltby 1994; in press; Hamilton-Dyer 1993a). However, percentages of horse are often more common on Romano-British rural settlements, including Alington Avenue on the outskirts of Dorchester (18%). Thirteen (35%) of the other horse elements are loose teeth, indicating poor preservation of their bones. Postcranial elements are mainly from the lower limbs, particularly small elements such as carpals and tarsals (Table 15).

The presence of teeth and bones of immature equids is unusually high in this assemblage. In addition to the partial skeleton from S97, four of the loose teeth are deciduous and a proximal radius and distal metatarsal are unfused. All these indicate the presence of immature horses. Sub-adult or adult animals are represented by the other teeth, two fused distal metapodials and a fused distal radius. In most Romano-British assemblages very few immature horses or mules are represented (Maltby in press). At Greyhound Yard, Dorchester, a skeleton of a foal was deposited at the bottom of a shaft, which subsequently received large numbers of depositions of other animals, complete pottery vessels and other small finds (Maltby 1993; Woodward and Woodward 2004) along with other material more typical of other deposits. This may have been a votive offering. However, hardly any remains of immature horses were recorded in the rest of the assemblage (Maltby 1993). Horses and mules would have

been valued mainly as pack and riding animals and could expect to have relatively long lives.

No butchery marks were observed on any of the equid bones. Although butchery has been recorded on horse bones from Roman sites, they are uncommon and so their absence here is not unusual. Only two horse bones were measured. A radius and third metacarpal have distal breadths of 75.7mm and 47.3mm respectively. These are comparable in size to specimens found in Dorchester (Maltby 1993).

Dog

Dog remains were found in nine of the sub-groups and in total 102 elements were recorded, representing 2% of the identified mammal assemblage. Most of their elements were found in deposits associated with structures (Table 4). These include a partial skeleton of an adult dog (ABG6) found in S299 (context 140). The group consists of 42 bones that include the skull and jaws, all of the upper limb bones apart from the tibiae, several vertebrae and ribs, and three metacarpals. There is no evidence of butchery on these bones, which are in excellent condition. Some of the bones may not have been recovered. Its location at the base of a wall could indicate it was a foundation deposit.

There are several other possible associated bone groups of dog. S97 produced 22 elements from adjacent contexts (129) and (198). Although at least two dogs are represented by left pelves, most of the bones could have belonged to one small adult dog. Bones from most part of the body are represented and the remains could represent a badly disturbed complete skeleton. A caudal vertebra from this group has evidence of a healed fracture. S200 produced a pair of femora, tibia, fibula, metatarsal and a rib from context (189) that probably belonged to the same sub-adult dog. The shaft of the fibula has fused pathologically with the tibia. The assemblage from S60 includes three metapodials from context (227) probably from another immature dog. The evidence indicates that dog carcasses were treated differently from the mammals discussed previously in that, even when disarticulated, they survive more frequently in groups, indicating that they were probably originally deposited whole. With the exception of the partial skeleton from S299, various taphonomic processes and disturbance have resulted in the disarticulation and diminution of their skeletons.

Four upper limb bones from the skeleton from S299 produced shoulder height estimates (following Harcourt 1974) between 37.1cm and 37.9cm. This animal was about the size of a fox terrier. Several other dogs represented are from smaller animals, although unfortunately few could be measured. A thoracic vertebra from S60 and mandible from ditch F22 are from miniature dogs. A wide range in sizes of dogs has been encountered on Romano-British sites (Harcourt 1974) including in the large assemblage obtained from Dorchester (Maltby 1993).

No bones of neonatal puppies were found but older puppies are represented as well as adult dogs.

Cat

Eighteen bones of cat were found in four of the sub-groups (Table 4). Thirteen of these are from the western part of layer (110). These consist of bones of the left hind limb of an adult (ABG1). Several knife cuts were observed on the distal part of the

tibia shaft. These probably represent incisions made preparatory to skinning, after which the leg was discarded. Although most of the remains are foot bones, the presence of the complete tibia and part of the femur indicates that the limb was not disarticulated and the foot bones did not remain attached to the skin. It is possible that the skinned carcass was deposited complete and subsequently disturbed.

The greatest length of the tibia in this group measured 113.4mm, comparable in size with some of the smaller domestic cats recovered from Greyhound Yard, Dorchester (Maltby 1993). A second metacarpal from S200 is from a much larger cat, having a length of 32.6mm. This is either from a large domestic specimen or possibly a wild cat.

Wild Mammals
Only three red deer elements were identified. One of these consists of a fragment of eroded antler from S97. A calcaneus and a fragment of tibia may represent remains of joints of venison brought to the site. The only element identified as roe deer is a humerus from a rubble layer (context 209). Three bones of hare were also recorded. An atlas of a cetacean was found in context (291). This is from a dolphin or porpoise that was possibly stranded on the Isle of Portland. The most likely species concerned are common dolphin, harbour porpoise or bottle-nosed dolphin.

Twelve small mammal bones were recorded, of which two were further identified (Table 4). A maxilla of a field vole was found in rubble layer (209) and a tibia of a black rat was recovered from soil layer (162). Although black rats have been occasionally recorded in Roman Britain, particularly on urban sites including Dorchester (Maltby 1993), there is a strong possibility that this bone could be intrusive.

Bird
Bird bones are fairly poorly represented in the assemblage. Only 192 were recorded representing 1.4% of the total assemblage (Table 2). This figure never rose above 3% in any sub-group. Fifty-six (29%) of the bird bones could not be further identified (Table 16).

Domestic Fowl
Domestic fowl (chicken) bones (62) are comfortably the most commonly represented, providing 46% of the avian assemblage. Twenty-two of these bones belonged to a skeleton (ABG2) of an adult bird found amongst rubble near a large stone on the south side of the east entrance of S60 (context 186). Most bones of the wings were recovered along with six vertebrae and the pelvis.

Although present on a few British sites from the early Iron Age, they are found, at best, in very small numbers on Iron Age sites in central southern England (Maltby 1981). They are more common in Romano-British samples, although there is a substantial amount of variation in their abundance in assemblages from different types of settlement. They tend to be found most commonly on large urban sites (Maltby 1997). Comparisons with sheep/goat elements show that domestic fowl contributed only 1.4% of the remains of these species (including the partial skeleton). This is more typical of rural assemblages and is much lower than at Greyhound Yard, Dorchester where the mean domestic fowl:sheep/goat percentage was 18% (Maltby

1993; 1997; in press). In contrast, the percentage of domestic fowl is below 1% in occupation deposits at Alington Avenue, a rural settlement just outside Dorchester, (Maltby 1997), although skeletons of domestic fowl were recovered from some of the graves (Maltby 2002). Domestic fowl provides 8% of the total pig and domestic fowl elements at Weston Road. This figure falls to 6% when the partial skeleton from S60 is excluded. This is higher than usually found on rural settlements but still well below the average recorded from other types of Roman settlement (Maltby 1997). At Greyhound Yard, Dorchester, the domestic fowl: pig percentage averaged 25% (Maltby in press). However, comparable calculations at Alington Avenue produced a total of only 3% domestic fowl.

Domestic fowl elements represented (Table 17) reveal the presence of all parts of the body except the head. No identified bird skull fragments were recorded but they are unlikely to have survived intact in these deposits. Only one porous bone of an immature bird was recorded indicating that most of the identified bones are from adults. This again contrasts with Greyhound Yard, Dorchester where 12% of the domestic fowl bones were porous (Maltby 1993). Both hens and cocks are represented at Weston Road. Three unspurred tarsometatarsi belonged to the former and four spurred specimens to the latter. Five fragmented leg bones allowed investigation of the shaft cavity. Two specimens contain medullary bone, showing they belonged to laying hens. Three other bones have no evidence of such deposits. Measurements were taken on 11 domestic fowl bones. All fall within the size range of those from the much larger sample from Greyhound Yard, Dorchester (Maltby 1993). No butchery marks were observed on any of the domestic fowl bones.

Ducks and Geese

Only 17 bones from at least three species were identified. These include seven goose bones, which provide 5% of the bird elements (Table 16). Unfortunately it has not been possible to identify these more specifically because of the close morphological similarities between bones of different species and the fragmentary nature of the material. Some of the bones, such as a tarsometatarsus from ditch F22, are large enough to be from domestic geese, although Albarella (2005) has questioned whether ducks and geese were domesticated in Roman Britain. However, wild grey lag geese (*Anser anser*), usually accepted as the species which was domesticated, are rarely observed in and around Portland (PBO 2002). Indeed the dark-bellied Brent goose (*Branta bernicla*) is the only species nowadays to be more than a rare winter or migrant visitor. Quite large numbers can be found near Ferrybridge in the winter months. It is possible that some of these bones could be from that species. Goose bones form only 1% of the bird bones identified at Greyhound Yard, Dorchester (Maltby 1993).

Ten bones of duck were identified representing 6% of the bird assemblage (Table 16). The bones are all smaller than those of mallard (*Anas platyrhychos*) but larger than those of teal (*Anas crecca*). It is very difficult to distinguish between medium-sized ducks from their fragmentary skeletal remains. Three carpometacarpi have greatest lengths of 50.2mm, 50.4mm and 53.6mm. This size variation could indicate the presence of more than one species. A number of species of sea ducks are found around Portland (PBO 2002). Most of the duck bones, however, are closely comparable with those of wigeon (*Anas penelope*). Large numbers of wigeon nowadays winter on the Fleet lagoon on the mainland side of Chesil Beach. Five of

the duck bones belonged to the left wing of one adult bird (ABG8) found in S60 (context 223). The furcula has been chopped through near its midpoint showing that the carcass has been split. Overall, duck remains are less common at Weston Road than they are in Dorchester, where a wider range of ducks, including mallard/domestic duck, has been found (Maltby 1993).

Seabirds

Bones from at least seven species were recovered (Table 16). Most of these belonged to the auk family. Six bones of razorbill (*Alca torda*) were identified. A seventh bone could have belonged either to a razorbill or a guillemot (*Uria aalge*). Breeding colonies of both species are now found around Portland Bill (PBO 2002) and their distribution could have been more widespread in the past. All the bones are from adult birds.

Eleven bones were identified by Sheila Hamilton-Dyer as great auk (*Pinguinus impennis*). The bones were found in three contexts in the vicinity of structure S200. Seven of these consist of pairs of coracoids, scapulae and humeri and part of the furcula of an adult bird (ABG7) in a demolition layer (context 189). None of the bones have survived complete and ancient breaks were observed on the humeri, only the proximal parts of which were found. The left humerus bears knife cuts just above the break on the medial aspect of the shaft. The cuts are deep and would have facilitated the removal of the lower parts of the wing. A shallower oblique knife cut was probably a trial cut. A vertebra in the same context could have belonged to the same bird. Similarly, a complete right femur and a small portion of sternum from context (199), and the posterior part of a left mandible in context (205) could have belonged to the same great auk.

The discovery of great auk on the Isle of Portland is a significant find. This large (60cm long) flightless bird became extinct in the 19th century largely due to human over-exploitation. Its distribution ranged across the Northern Atlantic (Serjeantson 2001). Although there are both pictorial and archaeological records of great auks from the Isle of Man as late as the 17th century (Fisher 1997), nearly all of the archaeological finds from Britain are from Scotland, particularly from sites in the Orkney Islands and the Outer Hebrides. Even in those areas, finds of great auk become very scarce in the historic period (Serjeantson 2001). The only other example recorded from the British Isles is from 3rd century AD deposits from Halangy Down, St Mary's, one of the Scilly Isles (Locker 1996; Serjeantson 2001). Bones of great auks have also been found on four Roman sites in the coastal zone of the Netherlands (Groot 2005). Here, given the lack of suitable nesting sites (low rocky shores), it was suggested that the remains were from weakened birds that were washed ashore in the winter.

However, in the cases of Halangy Down and Portland, it is more likely that the great auk bones are from birds that were nesting on the islands alongside other colonies of seabirds. They would be very difficult to catch at sea. This indicates that the breeding range of the species extended to the southern English coast in the Roman period. The Weston Road find indicates that at least one bird was butchered. Auks and other seabirds could also have been exploited for their feathers, oil and eggs.

A left humerus of a gannet (*Morus bassana*) was identified from a possible midden deposit (context 293). This species does not now breed on the island but is frequently seen offshore (PBO 2002). Although the bird involved may have been caught offshore on the fishing grounds, it is more likely to have been either a weak or dead bird that was washed ashore or a bird that was captured on land on or near its nesting site. Gannets nest on cliff tops and it is plausible that colonies did reside on Portland in Roman times. A number of archaeological sites in Scotland have produced both great auk and gannet remains (Serjeantson 2001). The humerus bears a superficial chop mark near its distal end, inflicted when the lower part of the wing was removed.

Great blacked gull (*Larus marinus*) is represented by seven bones, including a pair of mandibles. Nowadays birds of this species on Portland include breeding residents supplemented by winter visitors and migrating birds. Six bones from smaller gulls were recorded, four of them from S200. These belong either to herring gull (*Larus argentatus*) or lesser black-backed gull (*Larus fuscus*), both of which can be found commonly on and around Portland throughout the year (PBO 2002). A humerus of a fulmar (*Fulmarus glacialis*) was also found in S200. Nowadays this species breeds in small numbers on Portland (PBO 2002).

Six wing bones of great northern diver (*Gavia immer*) were identified. These include the slightly charred remains of a left humerus and ulna, probably from the same bird in S200. Great northern divers currently winter in small numbers around Portland harbour (PBO 2002).

Seabird species therefore provide 29% of the identified bird bones. This is a very high figure for a Romano-British settlement and shows how local coastal resources supplemented the food supply. None of the species discussed in this section were present in the sample of over 2,500 identified bird bones from Dorchester Greyhound Yard, although there was one bone of a shag (*Phalocrocorax aristotelis*) (Maltby 1993). The rarity of great auk from Roman sites has already been noted. In addition, in his survey of bird bones from Roman Britain, Parker (1988) listed only one site which has records of the presence of great northern diver. This was the Saxon shore fort at Portchester Castle and the remains there consisted of a partial skeleton (Eastham 1975). This was found in a well along with complete pottery vessels and several complete animal skulls of several species. Fulford (2001) has suggested these may have been ritual depositions. Guillemot has been identified in Romano-British levels at Ower on the edge of Poole Harbour (Coy 1987a) but not on other sites listed by Parker (1988). A single bone of an auk (*cf* guillemot) has been found in recent excavations at Caerwent (Maltby in press). None of the sites surveyed by Parker (1988) produced identifications of razorbill, gannet or fulmar. The only record of herring gull came from the fort at Caerleon (O'Connor 1986) and the only find of greater back-blacked gull was noted from early excavations in Exeter (Bell 1915) but not from the much more substantial (and reliable) later excavations of the Roman fortress and town (Maltby 1979). A recent survey of bones from Romano-British major towns has failed to add to the records listed above (Maltby in press).

Other Bird Species

The only bone of a wader identified at Weston Road is an ulna of a woodcock (*Scolopax rusticola*). This species is now a relatively uncommon winter visitor to the island (PBO 2002). However, it appears to have been one of the most common game

birds exploited in Roman Britain. Parker (1988) listed 28 sites where it has been recorded and the number of sites has been expanded substantially in recent years. At Greyhound Yard, Dorchester, woodcock was the fifth most common bird species identified, providing 4% of the identified bird bones (Maltby 1993; in press). Its presence has also been recorded in other excavations in Dorchester including those at Colliton Park (Hamilton-Dyer 1993a; Maltby in press).

Seven bones identified as those of the pigeon family were recorded. Although it is possible that these are from domestic birds, most of the bones are from small and slender birds comparable with those of the wild rock dove (*Columba livia*), which could have been nesting on the same cliffs as the auks and other seabirds. Bones of doves and pigeons have been found on many Romano-British sites (Parker 1988) including towns such as Dorchester, where they formed 3% of the bird assemblage from Greyhound Yard (Maltby in press).

Two bones of raven (*Corvus corax*) were found in S97, one of which was from an immature bird. There was one resident breeding pair of raven on the island in 2002 (PBO 2002) but numbers of this species are likely to have been much greater in the Roman period. Parker (1988) recorded them on 39 sites, which made them the third most frequently occurring species behind domestic fowl and mallard-sized ducks. They would certainly have been attracted as scavengers to settlement sites, although their ubiquity on Romano-British sites has also led to suggestions that they were sometimes deposited as votive offerings (Fulford 2001; Woodward and Woodward 2004; Maltby in press).

Five bones of smaller corvids were identified (Table 16). An ulna is from a bird the size of a rook (*Corvus frugilegus*) or crow (*Corvus corone*). The other four bones are all from smaller birds, with jackdaw (*Corvus monedula*) being the closest match for three and magpie (*Pica pica*) a good match for the other. These species are all likely to have been resident on the island.

Three bones of the thrush family (*Turdus* sp.) were identified. Two are a good match for song thrush (*Turdus philomelos*) and the other is very similar to blackbird (*Turdus merula*). Although these are the most likely species to be represented, the close similarities between the skeletons of different Turdidae means that other species cannot be totally ruled out

Fish

Despite the lack of sieving, surprisingly large numbers of fish bones were recovered. From all deposits, 763 fish bones were recorded, providing 6% of the total assemblage (Table 2). By comparison, fish bones formed only 2% of the faunal assemblage from Greyhound Yard, Dorchester in hand-collected samples (Hamilton-Dyer 1993b). The higher percentage of fish at Weston Road cannot be the result of better preservation as bone survival at Greyhound Yard was generally much better. It may reflect more effective retrieval of bones and/or the fact that fish were consumed and their remains deposited on the site more frequently. It must be emphasised, however, that the percentage of fish bones is almost certainly an underestimation. Similarly, it is likely that the sample is biased significantly towards the retrieval of bones of larger fish. Four hundred of the fish bones could be further identified (Table 18).

Sea Bream (Sparidae)
Bones from at least four species of sea bream were recovered from nearly all the sub-groups. A total of 107 bones were recorded, representing 27% of the identified fish (Table 18). Most of these are vertebrae, which were not identified to species. However, it was possible to identify a number of other bones (Table 19). Eight jaw elements were identified as Couch's sea bream (*Sparus pagrus*). Eight other elements were identified as red sea bream (*Pagellus bogaraveo*). Three jaws belonged to gilthead (*Sparus aurata*) and a parasphenoid of a black sea bream (*Spondyliosoma cantharus*) was also identified. General estimates of the sizes of the sea bream ranged from medium to very large, with most towards the larger end of the range. It should be remembered, however, that the sample will be biased towards the recovery of bones of larger fish.

Locker (2007) noted that sea bream have been found more commonly on sites in SW England than elsewhere in Roman Britain. They were listed on seven of the 13 sites she surveyed from this area. Significantly in nearby Dorchester, they are well represented in the Greyhound Yard assemblage and are also present in the Colliton Park sample (Hamilton-Dyer 1993b; 1993a). They are warm water fishes and their greatest concentrations around Britain nowadays are around the SW coast. Red and black sea bream are the species currently most likely to be caught in the area around Portland. Red sea bream is the most common of the Sparidae in southern British waters. Most of the bones recovered belonged to fish of between 40cm and 50cm long, which are towards the top end of the size range for this species. Red sea bream can be found inshore but larger fish are often found in deeper offshore waters. The black sea bream parasphenoid is from a very large specimen towards the top of the species' size range of 50-60cm. This species can be found around wrecks and rocky outcrops (Wheeler 1978).

The gilthead bones consist of a pair of maxillae from a large fish and a very large premaxilla (greatest height = 40.5mm), which must have been from a fish towards the top of its 70cm long size range. This species is found infrequently in British waters, although it has been increasing in numbers recently around the Channel Islands and off the Cornish coast. It schools in quite shallow waters preferring sandy substrates (Wheeler 1978). It has been identified only on three of the 109 Romano-British sites surveyed by Locker (2007). One of these was from a fish imported to the villa at Castle Copse in Wiltshire (Jones 1997). Another was from Halangy Down (Locker 1996) and two were found at Ower, Dorset (Coy 1987b).

The Couch's sea bream bones belonged to fish of various sizes but most are from large specimens. One of the largest is represented by an articular and dentary probably from the same individual found in S200. The articular has an anterior width of 9.0mm; the dentary has an anterior height of 15.0mm and a tooth pad width of 8.7mm (Morales and Rosenlund 1979). An even larger dentary, also from S200, has a tooth pad width of 10.5mm. Four premaxillae from S200 have tooth pad widths of 5.9mm, 11.6mm, 11.8mm and 12.6mm. Couch's sea bream rarely exceed 50cm in length, although fishes as large as 75cm have been recorded (Wheeler 1978). Unfortunately reference material for specimens as large as those found at Weston Road was not available but the largest bones could be from fish from near the top end of the range. They have been until very recently been infrequently caught in the English Channel

but large specimens have been found recently near the Channel Isles and off the Cornish coast.

Although Locker (2007) does not list Couch's sea bream amongst the species found on Romano-British sites, bones of this species were identified at Silchester and Greyhound Yard, Dorchester (Hamilton-Dyer 2000). However, Weston Road has produced the largest sample of bones of this species.

There is no evidence from the elements represented that these were preserved fish that were caught in more southerly waters and imported. Bones from all parts of the fish are represented. It is possible that a greater range of sea bream including large adult fish was available for exploitation in the seas off Portland. This infers that northward migrations of some species of sea bream must have been more extensive in the Roman period. This may be due to warmer sea temperatures.

Cod Family (Gadidae)
Bones of gadids (154) were the most commonly identified, providing 39% of the fish elements (Table 18). Many of the vertebrae and some other elements could not be identified beyond family level (Table 19). Of those that could be further identified, most (67) belonged to cod (*Gadus morhua*). They ranged in size between medium and large specimens. Most of the bones fall into the latter category and belonged to fish over a metre long. These cod are therefore substantially larger than those than are currently caught around the inshore waters of Portland. Adult fish of this size are often found in deep waters and can migrate large distances. The Atlantic and North Sea populations were increasingly exploited from the medieval period onwards. However, some groups of cod are known to be more stationary and remain relatively close inshore and it most likely that these fish are from such a group. It implies that the waters around Portland were substantially better stocked with larger cod than they are now. Cod bones have been identified on 21 of the sites listed by Locker (2007), with the largest numbers coming from sites in London. They have not, however, been previously recorded on other sites in the south and SW of England

There are substantially more precaudal than caudal vertebrae in the gadid assemblage (Table 19), although their skeletons contain twice of many of the latter. This is almost certainly a consequence of retrieval rates. Precaudal vertebrae are larger than caudal vertebrae and are more likely to have been recovered. Nevertheless, the presence of substantial numbers of precaudal vertebrae and head bones does suggest that whole fish tended to be brought to the site, which again supports the argument that these were local catches.

Pollack (*Pollachius pollachius*) is the other gadid species identified in some numbers with 17 elements identified. The specimens at Weston Road range widely between those from small immature fish (likely to be under-represented) to those from very large adults. At least five specimens fall into the latter category, and were from fish probably over a metre long. Although pollack can grow up to 130cm, fish of about 50cm are much more common (Wheeler 1978). Such large fish are found most commonly above rocky reefs and wrecks including those around the Isle of Portland. Although they are currently found quite commonly around the southern and western coasts of Britain, the only other specific identifications of pollack from Roman Britain are from two sites in the Scillies (Locker 2007).

Four other gadid species are each represented by a single bone (Tables 18-19). A vomer of a large saithe (*Pollachius virens*) was found in a soil layer. The size, habitat and range of this species are similar to those of pollack and fish of this size are more likely to be encountered above rocky reefs and wrecks. The only other specific identification of saithe from a Romano-British site is from Elm's Farm, Essex (Locker 2007). An articular of a large hake (*Merluccius merluccius*) was found in S97. This species can reach 180cm, although it rarely grows larger than a metre. It has a wide distribution but is most common off the south and west coasts where it is usually caught in deep waters today, although this is a consequence of overfishing. It is more likely to be found in shallower waters in summer and rises near the surface at night (Wheeler 1978). Although found quite commonly on medieval sites in SW England (Locker 2001), only three Romano-British sites have produced hake bones (Locker 2007). These include five bones from Exeter (Wilkinson 1979). A post-temporal of a large ling (*Molva molva*) was found in rubble layer (121). Again this species generally inhabits deep waters but also occur near rocky grounds and wrecks (Wheeler 1978). It has only been recorded on two Romano-British sites, one of which is from St Martins in the Scillies (Locker 2007).

Most of the gadid bones not identified to species are probably mainly from medium to large pollack and cod. A few of the smaller specimens, however, could have belonged to whiting (*Merlangius merlangus*), a species commonly found around the island.

Bass

Fifteen bones of bass (*Dicentrarchus labrax*) provide 4% of the identified fish bones. This species is commonly fished both commercially and by other anglers around Portland, particularly in the summer. The largest fish grow to about a metre but usually are no larger than 60cm long (Wheeler 1978). The bass represented from Weston Road range between medium and large in size, although smaller fish are probably under-represented. Bass bones were present on 11 of the Romano-British sites surveyed by Locker (2007), mainly from the south of England. The largest assemblage of bass has been found at Greyhound Yard, Dorchester (Hamilton-Dyer 1993b), although most of these were from a minimum of six fish deposited together in a shaft. They were not present in the Colliton Park assemblage (Hamilton-Dyer 1993a) but small numbers have been found in Exeter (Wilkinson 1979) and at the Uley shrine in Gloucestershire (Locker 2007).

Scad

Scad (*Trachurus trachurus*) provides a significant proportion of the fish bones. They were found in ten of the sub-groups and a total of 76 bones represent 19% of the identified fish elements (Table 18). Nearly all of the elements are vertebrae (Table 19). This is because the caudal vertebrae in particular survive particularly well. This survival is enhanced by the fact that most of the vertebrae have evidence of hyperostosis, a condition that develops in many older fish and is not uncommon in the vertebrae of adult scad. The thickening of the bone makes them more dense and robust. A knife cut was observed on one of the caudal vertebrae. Large schools of scad can be found in inshore waters including those around the Dorset coast. Locker (2007) listed six Romano-British sites where scad have been identified. However, these total only 20 bones. This therefore is the largest assemblage of scad as yet found in Roman Britain. With the exception of one bone from York, all the sites that have

produced scad are located in the south of England. Ten bones were identified in the sample from Greyhound Yard, Dorchester (Hamilton-Dyer 1993b).

Wrasses(Labridae)
Twenty-five bones of wrasses provide 6% of the identified fish. Vertebrae were not identified to species but all the jaw and pharynx bones belonged to ballan wrasse (*Labrus bergylta*). It is likely that all the vertebrae belonged to the species. The distinctive and robust inferior pharyngeal was the most common element found (9). Most of the wrasse bones found belonged to fish of 30-40cm length, although three bones of smaller fish are also represented. Such fish are abundant around Portland. Their preferred habitat is in areas containing large amounts of algae (Wheeler 1978). Wrasse bones have been found on seven other Romano-British sites in SW England (Locker 2007) and over a hundred were found at Greyhound Yard, Dorchester, including two partial skeletons in a shaft (Hamilton-Dyer 1993b).

Eels
All but one of the 17 eel bones belonged to conger (*Conger conger*). The bones are from fish ranging between 50cm and 200cm long. They are commonly found near rocks, reefs and wrecks (Wheeler 1978). Conger bones were only identified on five sites in the 109 surveyed by Locker (2007), three of them in the SW region, in Exeter (Wilkinson 1979), Greyhound Yard, Dorchester (Hamilton-Dyer 1993b) and Halangy Down (Locker 2007). Although a specimen from East Gate, Gloucester can be added to this list (Maltby in press), conger is still a fairly rare species in Romano-British assemblages. Common eel (*Anguilla anguilla*) on the other hand has been one of the most common species encountered in Romano-British assemblages (Locker 2007), being recorded on 72 sites in her survey. They have been found in large numbers on several sites where sieving programmes have been undertaken. Significantly perhaps, their bones were rarely found in the hand-collected sample from Greyhound Yard, Dorchester but were recovered in soil samples and are abundant in the sieved samples from Colliton Park (Hamilton-Dyer 1993a; 1993b). A single vertebra of common eel was retrieved from Weston Road. It is from a fish of about 60cm in length.

Other Fish Species
Two bones of John Dory (*Zeus faber*) were found in S60. A dentary belonged to a medium-sized fish of about 40cm. However, a precaudal vertebra is from a large fish of about 60cm in length. John Dory are usually found near the surface of inshore waters (Wheeler 1978). The only other record of its presence on a Romano-British site is from St Martins in the Scillies (Locker 2007).

Two opercular of mullet were recorded (Table 18). It was not possible to identify these to species. Mullet bones have been found fairly commonly on Romano-British sites (Locker 2007). Over 50 were recorded at Greyhound Yard, Dorchester, although most of them belonged to a single skeleton of a golden grey mullet (*Liza aurata*) recovered from a shaft (Hamilton-Dyer 1993b).

Surprisingly, only one bone of a flatfish was identified. This was an anal pterygrophore probably of a plaice (*Pleuronectes platessa*). Plaice and other flatfish can be found around Portland. Flatfish bones have been recovered in fairly small numbers on sites in Dorchester (Hamilton-Dyer 1993a; 1993b).

A vertebra of a small shark was found in a soil layer. It was not identifiable to species. The most likely species involved would be the dogfish (*Scyliorhinus canicula*), which is commonly caught today in the shallow waters around Portland.

There is no evidence of bones associated with the production and consumption of fish sauces, which have been found in a few Romano-British sites, particularly in towns (Locker 2007). A large deposit of bones of very small herring (*Clupea harengus*) and sprat *(Sprattus sprattus*) has recently been discovered at the Dorchester Hospital site and is thought to represent the waste from the production of *allec*, a fish sauce (containing bones) produced from the fermentation of small fish (Hamilton-Dyer pers. comm.).

Conclusions

Despite its moderate preservation and its very fragmentary nature, the excavations have produced an important bone assemblage of distinctive character, which has a number of very unusual features. Any conclusions must be tempered with the observation that only a very small portion of what was probably a much larger settlement has been investigated. Large amounts of intra-settlement variability is a feature of Romano-British faunal assemblages (Maltby 2007; in press) and there is no guarantee that the assemblage from Weston Road will necessarily be replicated in other areas, particularly as it appears the site was used on occasions during the Roman period for the burial of children and perhaps may have been regarded as a special place associated with burial and other rituals.

Comparisons have been throughout this report with the faunal assemblages from Dorchester and it is perhaps appropriate to conclude by highlighting the similarities and differences between the assemblages from these sites.

Although we must accept that bones of smaller species are under-represented, it is clear that the majority of the meat consumed in the areas excavated of both settlements was derived from domestic mammals. At Weston Road, 93% of the bone fragments belonged to mammals (Table 2) and 98% of the identified mammal fragments belonged to sheep/goat, cattle and pig (Table 4). At Greyhound Yard, Dorchester, 95% of the identified mammal fragments belonged to these species, the slightly lower figure being largely attributable to a larger number of dog skeletons (Maltby 1993). The equivalent figure at Colliton Park is 97% (Hamilton-Dyer 1993a) and an identical percentage was obtained from an assemblage from Charles Street in the town (Maltby in press).

However, there are significant differences in the relative abundance of the three major species. There is evidence from the NISP counts that suggest strongly that relatively more sheep were being deposited at Weston Road than in Dorchester (Table 6). If one adapts the MNE counts to produce estimates of minimum numbers of individuals, there are a minimum of 73 sheep/goat represented compared with 11 pig and only eight cattle. Even allowing for the fact that cattle produce about eight times the amount of meat than sheep of similar ages, this still suggests that more lamb and mutton was being processed than veal and beef. This is very unusual for a site of this date. The contrast with the evidence from Dorchester is clear. In only one of the assemblages from sites in the town and in the neighbouring rural settlement at

Alington Avenue do sheep/goat elements form over half of the total of sheep/goat, cattle and pig (Table 6).

A higher percentage of the sheep bones deposited at Weston Road belonged to lambs, particularly those slaughtered in the autumn and winter. Most of the these lambs were probably males. Whilst residents of Dorchester also ate lambs of 6-12 months of age, they obtained more meat from sub-adult sheep killed between 18-24 months than appears to have been the case on Portland. Mutton from older sheep was consumed in quantity at both settlements. However, it appears that the bones of relatively more sheep over two years of age (55%) were deposited at Greyhound Yard, Dorchester than at Weston Road (42%).

There is evidence that a wider range of sheep was available to the inhabitants of Dorchester. They obtained meat from both horned and hornless types of sheep, and possibly hybrids of the two types (Maltby 1993). From Weston Road there is much less evidence for hornless sheep, although they are represented in small numbers. Most of the sheep, however, were small, slender and horned, of a type and stature found widely in Iron Age Britain. It is likely that most of the sheep represented are from flocks raised on the island. These were adapted to the relatively poor grazing available.

As noted above, the current evidence suggests that beef formed a much more substantial part of the meat diet at least in the central areas of the town for those in Dorchester than at Weston Road. Of course, it is feasible that filleted beef could have been imported to Weston Road. This would leave little zooarchaeological trace. In the town, the acquisition and distribution of beef was largely in the control of specialist butchers. There is no evidence for the presence of such butchers on Portland. Although cleavers were being used for some of the butchery, there is no evidence for the very consistent butchery methods practised in Dorchester.

Both settlements have evidence for the presence of calves and the consumption of veal. However, there are relatively more calves represented at Weston Road than in Dorchester. This may imply that milk production was of greater importance on the island. However, if the animals were mainly drawn from stock kept on the island, it could also reflect the need to keep the numbers of cattle within its carrying capacity. The cattle found generally had very small horns and this may indicate most were from a single, local type. In Dorchester most beef came from adult but not elderly animals. Metrical analysis has indicated that most of these were cows (Maltby 1993; 1994). The majority of cattle represented at Weston Road had not reached adulthood. Possible explanations for this contrast have been discussed above.

More pork and bacon appears to have been consumed in Dorchester, at least in the central areas of the town. There are remains of many more neonatal pigs in Dorchester, which could reflect a preference for the consumption of suckling pig but could also indicate the keeping of pigs within the town. Most of the pigs represented at Weston Road were killed between six months and two years of age. There are relatively fewer elements from older pigs than there are in Dorchester.

Goats are represented on both sites in small numbers and the presence of neonatal mortalities indicates that they were probably kept at both settlements and that their milk may have been an important factor in their exploitation.

Overall, there is evidence for the deposition of higher percentages of immature domestic mammals at Weston Road than in Dorchester. Whether this reflects local husbandry practices adapting to the particular conditions of the island or is a phenomenon associated with the special nature of the site remains to be tested by further excavation.

Horse bones form only a small percentage of the mammal remains at Weston Road. There is no evidence that they were eaten. Again, they include an unusually high proportion of bones from immature animals, including a partial skeleton of a foal.

A partial skeleton of a dog associated with the lower (Romano-British) walls of S299 could be a foundation burial. Dorchester produced a large number of dog skeletons, mainly from pits and it has been argued that at least some of these were ritual depositions (Woodward and Woodward 2002; Maltby in press). There are several other associated dog bones, all of which could have belonged to heavily disturbed carcasses. There are no deposits of neonatal puppies in evidence at Weston Road, whereas they were found in several features in Dorchester. The abundant evidence for gnawing on bones is another indication for the presence of dogs, which clearly had access to the discarded remains of animals after processing. The presence of bones of miniature dogs represents evidence that new breeds of dog found commonly on Romano-British sites including Dorchester were also found on the island.

Domestic cats were also probably introduced to the Isle of Portland in the Romano-British period, although an earlier introduction cannot be ruled out. The excavations produced evidence for skinning of at least one individual. Although several cat skeletons have also been found in Dorchester, none of them have as yet produced similar processing evidence.

There is very limited evidence for the exploitation of wild mammals at Weston Road, although red deer, roe deer and hare bones were identified. There is also evidence that (probably stranded) cetaceans were occasionally exploited. It is unlikely that there would have been large herds of deer on the island and it possible that these are from imported joints of meat and antler. A slightly richer assemblage of wild mammal remains was obtained from Greyhound Yard, Dorchester, although they still formed only a very small proportion of the overall assemblage.

Domestic fowl appear to have been more commonly exploited in Dorchester than at Weston Road, although they were probably also kept on the island. Eggs as well as meat were exploited at both settlements. However, the rest of the bird assemblage from the two settlements is significantly different. At Greyhound Yard, Dorchester, the rank order of the most abundant bird species is domestic fowl; ducks; ravens and other corvids; woodcock; pigeon family and geese. The only seabird represented is shag. By contrast, the species order at Weston Road is domestic fowl; seabirds; duck; goose=corvids=pigeon family (Table 16). The greater emphasis on seabirds again reflects local adaptations on the island. There is evidence that several species were exploited including winter visitors such as the great northern diver and breeding

species such as the razorbill and gulls. The presence of butchered bones of gannet and the extinct great auk indicates that they were eaten. Their discovery can best be explained by the presence of breeding birds on the island, which probably supported a much greater abundance of nesting colonies at that time.

The seabirds may have been part of a generally richer marine environment. Another unusual feature of the Weston Road assemblage is the relatively high numbers of fish bones. Fishing both from shore and offshore from boats is indicated. Even though their recovery was favoured by retrieval methods, the sizes of the largest bream and particularly cod are well beyond the size of the catches usually taken in modern times. Several species represented are now rare or absent from the seas around Portland. This, however, does not necessarily mean they were imported from elsewhere. Indeed, the elements represented would suggest the contrary with complete fish being processed at the site. A combination of slightly warmer sea temperatures and fish stocks not adversely affected by overexploitation would account for this surprisingly rich marine fish assemblage. Some of the fish caught off Portland were taken to Dorchester, as several of the same species were found there, albeit in smaller numbers. There is as yet no evidence for substantial exploitation of common eel or the production of fish sauces on the island, in contrast to Dorchester.

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