

Chop and Change: Specialist Cattle Carcass Processing in Roman Britain

Mark Maltby

Introduction

Full-time professional butchers are found in most complex societies particularly in urban centres. It is likely that specialist butchers, who regularly acquire large numbers of animals, will develop processing methods that will be repetitive and possibly distinctive. In addition, it is possible that waste from their activities will sometimes be deposited in large quantities. Urban *macelli*, where butchers and other specialists plied their trade are known in many Roman towns including examples in Britain such as Wroxeter (Ellis 2000). This paper explores to what extent the presence of these specialist butchers can be traced through the analysis of cattle bone assemblages from towns and other civilian settlements.

One of the features of animal bone assemblages from Roman sites is the distinctive nature of the processing marks found on cattle bones. Certain types of marks recur frequently in some assemblages but are much rarer in others. Similarly, there have been numerous discoveries of substantial dumps of cattle remains, which indicate the disposal of large amounts of processing waste and in some instances the accumulation of specific types of bones for large-scale processing. Both these traits indicate that specialist butchers operated in certain settlements and that they employed standardised methods of butchery using specialist equipment and facilities. In other settlements, however, these processing marks are absent or restricted in their frequency and distribution. This paper will review the evidence for some of these processing marks from Romano-British civilian sites. Particular attention will be made to three types of marks: (1) superficial blade marks on upper limb bone shafts; (2) axially split upper limb bones; and (3) transversely broken metapodials. The first marks were made during the filleting of meat from the bones; the other two provided access to marrow. The reasons for the variations in the frequency of occurrence of these marks will be discussed and the economic and cultural implications arising from the studies will be considered.

General trends in Roman carcass processing

Previous discussions of changes in butchery practices in Roman Britain (Grant 1989; 2000; Maltby 1989; 1998a) have noted the increase in the incidence of cleaver marks on cattle bones on Romano-British sites compared with Iron Age assemblages. Wilson (1978) in his study of bones from Abingdon, Oxfordshire, first illustrated the types of incisions that have since commonly been described on Iron Age sites in southern Britain. However, quantification of butchery marks is fraught with difficulties because of variations in recording methods and differential preservation. Therefore, statements that chop marks tended to become more common in the Roman period have usually not been supported by quantified data. Table 1 partly addresses this by comparing the number of records of cleaver and (occasional) saw marks with the number of bones bearing knife cuts in several assemblages recently quantified by the author.

Table 1: Cattle bones with chop/saw marks and knife cuts from Iron Age and Romano-British assemblages

These results largely support the impression gained from previous studies. Although cattle bones with chop marks have been recorded in Iron Age assemblages, they are largely outnumbered by those damaged by finer incisions. Chop marks become more common in Romano-British assemblages and are particularly prevalent in urban assemblages such as those from Caerwent (Hambleton and Maltby in prep.) and Winchester (Maltby in press). Significantly, in two assemblages from rural settlements that have Iron Age and Romano-British phases (Owslebury and Biddenham Loop, Maltby 1987; nd1), a higher percentage of chopped bones was encountered in the later assemblages. This is a very crude measure, which does not take into account variations in the types of mark occurring in different parts of the body. Nevertheless, it demonstrates that methods used to process cattle changed markedly in Roman towns and to a lesser extent in rural settlements.

The distinctive nature of Roman butchery has been noted by a number of authors, who have studied military and urban assemblages (e.g. Dobney 2001; Dobney *et al.* 1996; Maltby 1989; 1998a; in press; O'Connor 1988; Stallibrass 1999). Table 2 lists a selection of distinctive marks that have been explicitly noted in analyses of bones from major urban sites. More detailed descriptions of these and other marks can be found in Maltby (1989; in press). The traits listed in Table 2 are indicative of various processes including segmentation of the carcass (chopped mandibular ramus; chopped femur caput), filleting (blade marks on upper limb bones and scapula), marrow extraction (axially split upper limb bones) and hanging up meat probably for preserving (scapulae with holes in blade).

Table 2: Recorded observations of some specific butchery marks in major Romano-British towns

It should be emphasised that the list includes only those cases where the butchery trait is specifically mentioned. It is extremely likely that further investigation would reveal that all the types of marks would be encountered in assemblages from major towns. The consistency of the butchery marks and their widespread occurrence suggest that specialist butchers using new methods of carcass processing were operating in these towns. As indicated in Table 3, there is also abundant evidence from these towns for large accumulations of cattle bones discarded after various stages of carcass processing.

Table 3: Recorded observations of large accumulations of cattle bones in major Romano-British towns

These dumps have been found both near the centre of towns (for example Dorchester (Maltby 1993); Wroxeter (Hammon 2005)), in peripheral areas (for example, Chichester (Levitan 1989); Winchester (Maltby in press)) or in both (for example, Colchester (Luff 1993); Exeter (Maltby 1979a); Cirencester (Maltby 1998a)). There are a few cases of waste derived from more than one phase of processing (for example, Chester Street, Cirencester (Maltby 1998a)). However, most consist of discrete accumulations derived from primary processing (heads and feet), joint preparation (femur caput, scapulae) marrow extraction (most of upper limb deposits), bone working (some of upper limb deposits in Victoria Road, Winchester (Maltby in press); scapulae deposits at Crowder Terrace, Winchester (Coy and Bradfield in press)) or horn working. This suggests that discrete stages of processing were often undertaken separately, perhaps in different locations by different specialists.

It is clear, therefore, that distinctive types of large-scale processing of cattle carcasses developed in the Roman period and that evidence for such activities has been found commonly in bone assemblages from major Roman towns. How widespread were these activities? Do similar accumulations appear in other types of settlement in Roman Britain? The following sections will briefly examine three types of processing evidence to examine to what extent processing methods varied.

Blade marks on cattle upper limb bones

These distinctive filleting marks consist of shallow scoops of bone removed from ridges and other protuberances along the shafts of upper limb bones (Fig. 1). In addition to the humerus, radius, femur and tibia (Table 2; Fig. 2), they are also commonly encountered on the ulna and rather less frequently on the astragalus, pelvis and other bones (Maltby 1989; in press). Experiments have suggested that they were created by the use of the tip of a cleaver during the stripping of meat from the bone (Seetah 2006).

Figure 1: Cattle tibia from Winchester showing blade marks near distal end



It has already been established that such marks are frequently observed in assemblages from large towns (Table 2) but relatively few attempts at quantification have been published. There are problems in quantifying blade marks, as they do not appear on all areas of the bones even if they have been filleted by this method. Therefore estimating percentages of fragments with such marks is a fairly crude measure. However, it is interesting to note that where frequencies of such marks have been noted, fairly consistent results have been obtained. In several assemblages around 20% of the total number of fragments of femur, tibia, radius and humerus have been damaged with blade marks. These include assemblages consisting almost entirely of cattle processing waste (Eastgate Street, Gloucester (Levine 1986); Chester Street, Cirencester (Maltby 1998a)) and those that include a much wider range of bones (Basilica, Caerwent (Hambleton and Maltby in prep); Greyhound Yard, Dorchester (Maltby 1993); various Winchester sites (Maltby in press). There are some variations in blade mark frequencies on different bones and between sites in Winchester (Fig. 2). It is perhaps significant that there is a gradual decrease in the percentage of blade marks the further the assemblage was from the centre of the Roman town. The highest percentage (28%) was found in the Staple Gardens assemblage (not illustrated) near the centre of the town. The lowest (16%) was obtained in the assemblage from the Hyde Abbey site, located some distance to the north of the town walls (Maltby in press).

Figure 2: Percentage of cattle upper limb bones with blade marks from later Roman sites in Winchester

There is very little evidence for similar marks on Iron Age sites in Britain (Maltby 1989). They have been recorded on other types of civilian Romano-British site but, where quantified, never to the same extent as in major urban sites (Table 4). They are completely or almost entirely absent from some rural settlements. They have been noted more commonly in villa and larger settlements but unfortunately very few samples have been quantified.

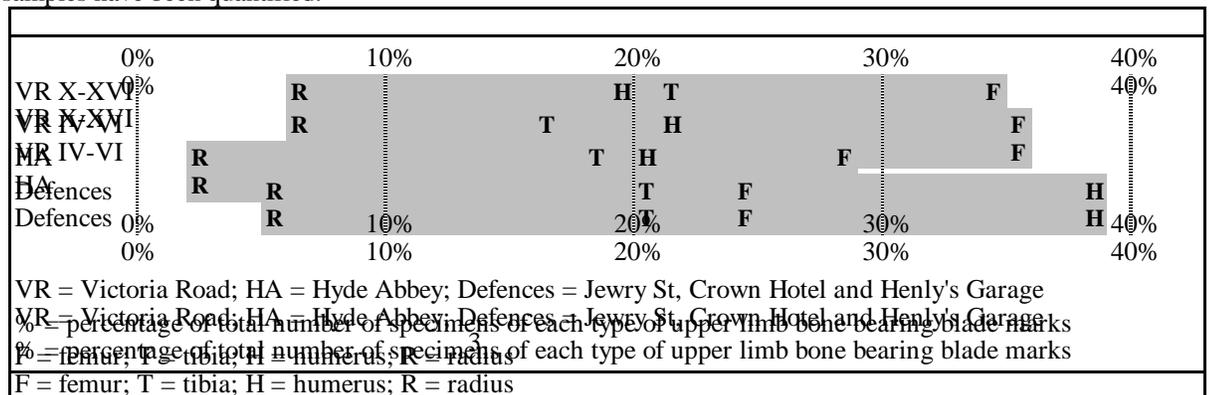


Table 4: Recorded observations of blade marks in assemblages from other Romano-British civilian sites

Split Upper Limb Bones

Axially split upper limb bones (Fig. 3) also occur commonly in many towns. Table 2 demonstrates that they have been recorded in a large number of urban assemblages. However, their frequency of occurrence appears less consistent than for blade marks on the same elements. In quantified samples, the percentage of split humeri, radii, femora and tibiae ranges between 11% and 78%. The highest percentage is derived from a discrete assemblage consisting almost entirely of these bones recovered from three pits in Eastgate Street, Gloucester (Levine 1986). This clearly demonstrates that such bones were sometimes accumulated in large numbers for secondary processing. Axial splitting allows easy access to the marrow (Seetah 2006). The under-representation of epiphyses in accumulations such as in Gloucester and York would suggest that the bones were gathered to extract marrow as a discrete product rather than the bones being used in large-scale stock production (O'Connor 1988: 117; Stokes 2000; Dobney 2001: 40). Indeed, it should be emphasised that although the vast majority of upper limb bones in urban sites have been broken, it is only a certain proportion that were split axially, indicating they were specially selected for processing marrow in bulk. Similarly, groups of accumulated mandibles have been observed in Lincoln that were also probably processed for marrow (Dobney *et al.* 1996: 25). In some cases split limb bones were reduced further when they were used to produce bone artefacts, for example in Winchester (Maltby in press; Pfeiffer in press). The lower percentages of split upper limb bones found in assemblages such as in the vicinity of the Basilica in Caerwent (Hambleton and Maltby in prep.) probably indicate that the waste from these specialist processes has been redeposited and become mixed with other material. The same explanation would account for the variations in later Roman assemblages from sites in the Winchester Northern Suburb and Defences (Table 2; Fig. 4). The highest percentages of split bones were found in deposits of the Victoria Road site where bone working waste had been deposited (Maltby in press).

Figure 3: Axially split radius from Roman Winchester

Figure 4: Percentage of cattle split upper limb bones later Roman sites in Winchester

Again, comparisons with other settlements (Table 5) show that split upper limb bones are much more likely to be encountered in major towns. Such bones are encountered very rarely in Iron Age assemblages (Maltby 1989) and are often absent from assemblages from Romano-British rural sites such as Owslebury (Maltby 1987) and Biddenham Loop (Maltby nd1). They have been found in some of the assemblages from nucleated settlements, none of which unfortunately have been quantified. One suspects that they are less common than in large urban complexes but further research is required to confirm that impression. They have, however, been recorded on a few villa sites including Wortley, Gloucestershire. Here, although found in some numbers, axially split bones appear to be limited to one or two deposits, suggesting that the practice was restricted both in extent and time.

Table 5: Recorded observations of split upper limb bones in assemblages from other Romano-British civilian sites

Transversely broken metapodials

In contrast with the upper limbs, axially split cattle metapodials are uncommon in Romano-British assemblages. However, most of them have been broken transversely, presumably to extract marrow. Occasionally, cleaver marks are located near the break (Fig. 5). Increased fragmentation of metapodials has been noted in Romano-British assemblages compared with Iron Age samples and preliminary research demonstrated that such an increase was not the result of increased damage due to scavenging animals (Maltby 1985b). Table 6 shows that percentages of complete or largely complete metapodials are very low in urban assemblages compared with those from rural sites. This indicates that marrow extraction from metapodials tended to be more intensive on urban sites. This is reflected even in cases where large numbers of foot bones were discarded after primary butchery, for example in the South

Gate assemblage at Silchester (Maltby 1984). The percentages of complete metapodials from Winchester would have been even lower had the bones from two particular shafts been omitted (Maltby in press). These bones were found in association with a number of partial and complete skeletons of several species. Faunal assemblages in these features are atypical of the rest of the Winchester sites and they may have included a significant amount of structured deposition, which may have incorporated the complete metapodials.

Figure 5: Cattle metatarsal from Late Roman Winchester with transverse cleaver marks on shaft

Table 6: Percentage of cattle metapodials consisting of >75% of the bone from Romano-British settlements

Discussion

The examples of processing evidence outlined above confirm that distinctive butchery methods became employed during the Romano-British period. There is general acceptance that the methods of specialised butchery of cattle carcasses evident particularly in Roman towns were derived from military practices (Grant 1989; Maltby 1989; Stallibrass 1999; Berg 1999; Dobney 2001; Seetah 2006). Although these butchery practices have been recognised for a long time, there has been only limited discussion about how widespread or consistent these practices became. Comparative studies are still severely handicapped by the paucity of quantified data and imprecise descriptions that are characteristic of many faunal reports, particularly with regard to explicitly noting the absence of specific butchery traits. However, it is becoming increasingly evident that such processing was not practised consistently on all Romano-British settlements. By recording the presence, absence and, ideally, the frequency of distinctive butchery traits, it should be possible to trace where specialist processors were operating and begin to consider to what extent they controlled the provision of beef products. In contrast, on settlements where traditional methods of butchery continued to be practised, it could suggest that the residents were less integrated into the new economic systems that prevailed in the major towns.

The surprising consistency in the frequency of blade marks on cattle upper limb bones in urban assemblages suggests that perhaps most of the filleted beef consumed in the major towns was obtained from cattle processed by specialist butchers. If that was the case, this has implications on how a major proportion of the meat supply was controlled and redistributed, as noted by Grant (1989) and Maltby (1989). Traditional means of procurement of beef must have been superseded by the emergence of professional traders who acquired large numbers of animals for processing. The proportion of stock slaughtered and butchered by non-specialists must have decreased markedly. The slaughter of large valuable animals and redistribution of their meat (fresh or preserved by salting and/or smoking) must have been significant events for their owners and their families. The process may often have been associated with significant social or ceremonial occasions (for example, commemorations; marking rites of passage; celebrating seasonal events; gatherings of kin or trading partners etc). The emergence of urban centres with the increased demands for food must have led not only to a change of economic emphasis towards wholesale procurement, slaughter and redistribution by professional traders but also probably severely disrupted social and ritual practices associated with traditional means of meat redistribution.

The presence of specialist butchers filleting meat is also attested at a number of small towns. Sadly quantification of their occurrence is generally lacking and it would be interesting to establish whether their frequencies reached the levels encountered in larger towns, thus implying the dominance of wholesale processing of beef in those settlements too. Specialist butchers were certainly present in roadside settlements such as Wantage (Maltby 1996; 2001b) where filleted limb bones have been found in two small excavations in fairly high quantities (Table 4). They were also present in villas such as Wortley (Maltby and Hambleton in prep.), and Snodland (Hamilton-Dyer 1995) but whether that was a widespread phenomenon has yet to be established. The lack of comment regarding such occurrences in a number of faunal reports from villas perhaps suggests it was uncommon. At Wortley, most of the blade-marks were found on split bones found in one major accumulation (see below) and it is possible that this was associated with specific specialist processing that was intensive but perhaps not of long duration. This raises the possibility that some specialist butchers were itinerant.

Blade-marked upper limb bones have been found very infrequently in other rural settlements. Either, specialists only rarely operated in such settlements or, more likely perhaps, the new methods (and

associated technology) were not adopted wholeheartedly by the residents. This is not necessarily to say they were disengaged from the new urban procurement system. It has been suggested, based on ageing and sexing evidence, that some of the cattle from rural settlements such as Owslebury could have been acquired by professional butchers in settlements such as Winchester (Maltby 1994; in press). Filleted beef acquired from urban markets or shops would also leave no trace in the archaeological deposits of the rural settlements.

With regard to the possible acquisition of beef from towns on rural settlements, it is perhaps worth noting that the only limb bone which has types of butchery marks commonly found on both rural and urban assemblages is the scapula. At both Winchester and Owslebury, the most common butchery marks on the cattle scapula were found on the edge of the spine particularly where it rises from neck of the glenoid cavity. Other rural settlements have also produced scapulae chopped in a similar manner, for example Winnall Down (Maltby 1989; in press), Biddenham Loop (Maltby nd1) and Marsh Leys Farm (Maltby nd2). It has been suggested that similar marks found in specimens from Lincoln represent preparation of scapulae and the attached shoulder meat for salting (Dobney *et al.* 1996: 26–27; Dobney 2001: 40–41). Seetah (2006) has demonstrated that the marks were most likely to have been made with the tip of a cleaver blade - a method that urban butchers were also employing on the upper limb bones. This raises the possibility that settlements such as Owslebury were importing cured shoulders of beef on the bone. Longitudinal knife cuts were found on the blades of a few of such scapulae at Owslebury and Biddenham Loop, suggesting that traditional methods of butchery were subsequently carried out to fillet the meat from the bone. Similar marks were found much more rarely in Winchester (Maltby 1989; in press) and Cirencester (Maltby 1998a). An alternative explanation to account for the presence of these distinctively butchered scapulae on rural settlements was that they were processed there in the same manner as in towns. Perhaps it was the methods of curing beef that became more widespread rather than all methods of carcass processing.

Marrow became more important in the Romano-British in general, as indicated by the increased fragmentation of metapodials. Again, however, the intensity of exploitation seems to have been greater in the urban settlements than elsewhere. In addition to this general increase, it appears to have been common practice to accumulate upper limb bones to obtain larger quantities of marrow. This would suggest that most axial splitting was associated with specialist rather than routine processing. Such processing appears to have taken place more frequently in large towns, where, of course, suitable bones would be available in abundance. There is, however, sometimes evidence for similar processing in other types of settlement, although noticeably not on any of the non-villa rural settlements in this survey. Marrow was therefore processed in bulk commonly in major towns and perhaps fairly frequently in small towns and some roadside settlements. The bones were processed either by specialist butchers themselves or by people who obtained filleted bones from them and processed them using cleavers. It has not been clearly established whether the marrow obtained in this way was gathered for a specific purpose or for more general use. Dobney (2001: 40) has suggested some possible uses for marrow, including lamp oil, cosmetics, soaps and medicines, in addition to its value in cooking. Others have suggested that some of the accumulations represent the preparation of quantities of glue. Further research is still required into this topic. The occurrence of the discrete concentrations of split limb bones at Wortley indicates that specialist production took place at the villa at some time during its occupation. However, the quantity of bones required may have been greater than could be provided by the number of cattle routinely butchered there. It is possible that the limb bones were brought in from elsewhere for processing of large quantities of fresh marrow for a particular (industrial?) project.

It is clear therefore that variations in carcass processing are apparent in Romano-British sites. The evidence for changes in cattle carcass processing has implications both in economic and social terms. Beef production became more important in the Roman period (King 1999) and the need to provision towns in particular led to significant changes in how animals were acquired, processed and their products distributed. It is possible to trace the activities of specialist processors and to recognise where they operated. It is also possible to observe on which settlements traditional butchery practices, and perhaps traditional forms of meat redistribution, were maintained, at least in relation to cattle slaughtered at those settlements. Wholesale beef processing resulted in the loss of identity of the animals involved. People who ate beef processed by urban butchers are much less likely to have known who originally owned the animal, in contrast to traditional forms of processing. The social dimensions of the relationship between the cattle owner and the recipients of the meat and other products therefore changed fundamentally.

It is hoped that this research will encourage further explicit statements to be made about the presence, absence and frequency of various butchery traits encountered on different types of Romano-British site. Such studies have the potential to shed further light upon far-reaching changes in the economic and social spheres in Britain subsequent to the Roman invasion.

School of Conservation Sciences, Bournemouth University

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Bibliography

- Ainsley, C. 2002. The animal bones. In J. Drummond-Murray and P. Thompson with C. Cowan *Settlement in Roman Southwark: Archaeological Excavations (1991–8) for the London Underground Limited Jubilee Line Extension Project*. London: Museum of London Archaeology Service Monograph 12: 259–280.
- Albarella, U. 1998 The animal bones. In P. Ellis, G. Hughes, P. Leach, C. Mould and J. Sterenberg *Excavations alongside Roman Ermine Street, Cambridgeshire, 1996*. Oxford: British Archaeological Reports (British Series) 276/ Birmingham University Field Archaeology Unit Monograph Series 1: 99–104.
- Baxter, I. 1996. Animal bone. In L. Cooper, A Roman cemetery in Newarke Street, Leicester. *Transactions of the Leicestershire Archaeological and Historical Society* 70: 79–84.
- Baxter, I. 2004. Animal, bird, reptile and amphibian bones. In N. Finn, *The Origins of a Leicester Suburb: Roman, Anglo-Saxon, Medieval and Post-medieval Occupation on Bonners Lane*. Oxford: British Archaeological Reports (British Series) 372: 132–148.
- Baxter, I. 2005. Animal bone. In R. Gardner, A Roman cemetery in Clarence Street, Leicester. *Transactions of the Leicestershire Archaeological and Historical Society* 79: 68–71.
- Berg, D.S. 1999. The mammal bones. In P. Abramson, D.S. Berg and M.R. Fossick *Roman Castleford: Excavations 1974–85 Volume II: the Structural and Environmental Evidence*. Wakefield: West Yorkshire Archaeological Service Monograph 5: 223–81.
- Clutton-Brock, J. and Armitage, P.L. 1977. Mammal bones from Trench A. In T.R. Blurton, Excavations at Angel Court, Walbrook, 1974. *Transactions of the London and Middlesex Archaeological Society* 28: 88–97.
- Coy, J. and Bradfield, J. in press. Faunal remains from Roman deposits in the Western Suburb. In M. Maltby *Feeding a Roman Town: Environmental Evidence from Excavations in Winchester 1972–1985*. Winchester: Winchester Museum Service Archaeological Report Monograph.
- Dobney, K. 2001. A place at the table: the role of vertebrate zooarchaeology within a Roman research agenda for Britain. In S. James and M. Millett (eds.) *Britons and Romans: Advancing an Archaeological Agenda*. London: Council for British Archaeology Research Report 125: 36–45.
- Dobney, K., Jacques, D. and Irving, B. 1996. *Of Butchers and Breeds: Report on Vertebrate Remains from Various Sites in the City of Lincoln*. Lincoln: Lincoln Archaeological Studies 5.
- Done, G. 1986. The bones. In M. Millett and D. Graham *Excavations on the Romano-British Small Town at Neatham, Hampshire, 1969-1979*. Hampshire Field Club and Archaeological Society Monograph 3: 141-147.
- Ellis, P. 2000. *The Roman Baths and Macellum at Wroxeter: Excavations by Graham Webster 1955-85*. London: English Heritage Archaeological Report 9.
- Gidney, L. 2000. Economic trends, craft specialisation and social status: bone assemblages from Leicester. In P. Rowley-Conwy (ed.) *Animal Bones, Human Societies*. Oxford: Oxbow: 170–178.
- Grant, A. 1989. Animals in Roman Britain. In M. Todd (ed.) *Research on Roman Britain: 1960–1989*. London: Britannia Monograph Series 11: 135–146.
- Grant, A. 2000. Diet, economy and ritual: evidence from the faunal remains. In M. Fulford and J. Timby *Late Iron Age and Roman Silchester: Excavations on the Site of the Forum-Basilica 1977, 1980–86*. London: Britannia Monograph 15: 425–500.
- Hambleton, E. and Maltby, M. nd. The animal bones. In C. Ellis and M. Rawlings *Excavations at Battlesbury Bowl, Wiltshire*. Forthcoming Wessex Monograph.
- Hambleton, E. and Maltby, M. in prep. The animal bones from the Forum-Basilica excavations in Caerwent. National Museum of Wales.
- Hamilton-Dyer, S. 1993. Animal bones. In R.J.C. Smith *Excavations at County Hall, Colliton Park, Dorchester, Dorset, 1988 in the North-West Quarter of Durnovaria*. Salisbury: Wessex Archaeology Report 4: 77–82.

- Hamilton-Dyer, S. 1995. Animal bones. In V. Birbeck, Excavations on a Romano-British villa at Churchfield, Snodland, 1992–94. *Archaeologia Cantiana* 115: 113–115.
- Hammon, A. 2000. The animal bones. In I.M. Ferris, L. Bevan and R. Cuttler *The Excavation of a Romano-British Shrine at Orton's Pasture, Rocester, Staffordshire*. Oxford: British Archaeological Reports (British Series) 314/ Birmingham University Field Archaeology Unit Monograph Series 3: 61–67.
- Hammon, A. 2005. Late Romano-British-early medieval socio-economic and cultural change: Analysis of the mammal and bird bone assemblages from the Roman city of *Viroconium Cornoviorum*, Shropshire. Sheffield: Unpublished PhD Thesis, University of Sheffield, Department of Archaeology.
- Hamshaw-Thomas, J.F. and Bermingham, N., 1993. The faunal remains. In A. Hands *The Romano-British Roadside Settlement at Wilcote, Oxfordshire II: Excavations 1993–96*. Oxford: British Archaeological Reports (British Series) 232: 167–211.
- Hamshaw-Thomas, J.F., Isaakidou, V., Smith, I., Thornton, C.V. and Watson, D. 2004. The animal bones from F.77 level 1 and South of F.90. In A. Hands and Cotswold Archaeology *The Romano-British Roadside Settlement at Wilcote, Oxfordshire III: Excavations 1997–2000*. Oxford: British Archaeological Reports (British Series) 370: 212–255.
- King, A. 1999. Meat diet in the Roman world: a regional inter-site comparison of the mammal bones. *Journal of Roman Archaeology* 12: 168–202.
- Levine, M. 1986. Animal remains. In H.R. Hurst *Gloucester: the Roman and later Defences*. Gloucester: Gloucester Archaeological Report 2: 81–84.
- Levitan, B. 1989. The vertebrate remains from Chichester Cattlemarket. In A. Down *Chichester Excavations 6*. Chichester: Phillimore: 242–276.
- Levitan, B. 1990. The vertebrate remains from St. Michael's Field, Cirencester, Gloucestershire: 1974–80. London: Ancient Monuments Laboratory Report.
- Locker, A. 1988 The animal bone. In P. Hinton (ed.) *Excavations in Southwark 1973–1976: Lambeth 1973–79*. London: London and Middlesex Archaeological Society and Surrey Archaeological Society Joint Publication 3: 427–442.
- Locker, A. 1991. The animal bone. In B. Philp, K. Parfitt, J. Willson, M. Dutto and W. Williams *The Roman Villa Site at Keston, Kent: First Report (Excavations 1968–1978)*. Dover: Kent Archaeological Rescue Unit: 285–292.
- Locker, A. 1999. The animal bone. In R. Niblett *The Excavation of a Ceremonial Site at Folly Lane, Verulamium*. London: Britannia Monograph 14: 324–345.
- Luff, R.-M. 1982. *A Zooarchaeological Study of the Roman North-Western Provinces*. Oxford: British Archaeological Reports (International Series) 137.
- Luff, R.-M. 1993. *Animal Bones from Excavations in Colchester, 1971–85*. Colchester: Colchester Archaeological Trust Report 12.
- Macready, S. and Sidell, J. 1998. The animal bones. In J. Shepherd *The Temple of Mithras, London: Excavations by W.F. Grimes and A. Williams at the Walbrook*. London: English Heritage Archaeological Report 12: 208–215.
- Mainland, I. 2004. Animal bone (Airport Catering Site). In R. Havis and H. Brooks *Excavations at Stanstead Airport, 1986–91 Volume 1: Prehistoric and Romano-British*. Chelmsford: East Anglian Archaeology Report 107: 176–187.
- Maltby, M. 1979a. *Faunal Studies on Urban Sites: the Animal Bones from Exeter*. Sheffield: University of Sheffield. Department of Prehistory and Archaeology/Exeter Archaeological Reports 2.
- Maltby, M. 1979b. The animal bones. In C.M. Heighway, A.P. Garrod and A.G. Vince, Excavations at 1 Westgate St, Gloucester 1975. *Medieval Archaeology* 23: 182–185.
- Maltby, M. 1983. The animal bones. In C.M. Heighway *The East and North Gate of Gloucester*. Bristol: Western Archaeological Trust Excavation Monograph 4: 228–245.
- Maltby, M. 1984. The animal bones. In M. Fulford *Silchester: Excavations on the Defences 1974–80*. London: Britannia Monograph 5: 199–212.
- Maltby, M. 1985a. The animal bones. In P.J. Fasham *The Prehistoric Settlement at Winnall Down, Winchester*. Winchester: Hampshire Field Club Monograph 2: 97–112.
- Maltby, M. 1985b. Patterns in faunal assemblage variability. In G. Barker and C. Gamble (eds.) *Beyond Domestication in Prehistoric Europe*. London: Academic Press: 33–74.
- Maltby, M. 1986. Animal bones from the Iron Age and Romano-British phases of the Staple Gardens Excavations, Winchester, Hampshire. London: Ancient Monuments Laboratory Report 4908.
- Maltby, M. 1987. The animal bones from the excavations at Owslebury, Hampshire: an Iron Age and Romano-British settlement. London: Ancient Monuments Laboratory Report 6/87.
- Maltby, M. 1989. Urban-rural variation in the butchering of cattle in Romano-British Hampshire. In D. Serjeantson and T. Waldron (eds.). *Diets and Crafts in Towns*. Oxford: British Archaeological Reports (British Series) 199: 75–106.
- Maltby, M. 1993. Animal bones. In P.J. Woodward, S.M. Davies and A.H. Graham *Excavations at the Old Methodist Chapel and Greyhound Yard, Dorchester 1981–1984*. Dorchester: Dorset Natural History and Archaeological Society Monograph 12: 315–340.

- Maltby, M. 1994. The meat supply in Roman Dorchester and Winchester. In A.R. Hall and H. K. Kenward (eds.) *Urban-Rural Connexions: Perspectives from Environmental Archaeology*. Oxford: Oxbow Monograph 47/ Symposia of the Association of Environmental Archaeologists 12: 85–102.
- Maltby, M. 1995. The animal bones. In P.J. Fasham and G. Keevil with D. Coe, *Brighton Hill South (Hatch Warren): an Iron Age Farmstead and Deserted Medieval Village in Hampshire*. Salisbury: Wessex Archaeology Report 7: 49–56.
- Maltby, M. 1996. Animal bone. In N. Holbrook and A. Thomas, The Roman and early Anglo-Saxon settlement at Wantage, Oxfordshire: Excavations at Mill Street, 1993–4. *Oxoniensia* 61: 155–163.
- Maltby, M. 1998a. Animal bones from Romano-British deposits in Cirencester. In N. Holbrook (ed.) *Cirencester Excavations V: the Roman Town Defences, Public Buildings and Shops*. Cirencester: Cotswold Archaeological Trust: 352–370.
- Maltby, M. 1998b. Animal bone. In A.J. Barber and G.T. Walker, Home Farm, Bishop’s Cleeve: excavation of a Romano-British occupation site 1993–4. *Transactions of the Bristol and Gloucestershire Archaeological Society* 116: 134.
- Maltby, M. 1998c. The animal bones from Roman small towns in the Cotswolds. In J.R. Timby *Excavations at Kingscote and Wycomb, Gloucestershire*. Cirencester: Cotswold Archaeological Trust: 421–428.
- Maltby, M. 2001a. Faunal remains (AES76-7). In P. Booth and J. Evans, *Roman Alcester: Northern Extramural Area*. London: Council for British Archaeology Research Report 127: 265–90.
- Maltby, M. 2001b. Animal bone. In A. Barber and N. Holbrook, A Romano-British settlement to the rear of Denchworth Road, Wantage, Oxfordshire: evaluation and excavation in 1996 and 1998. *Oxoniensia* 66: 320–325.
- Maltby, M. 2002a. Animal bones. In S. Davies, P. Bellamy, M. Heaton and P. Woodward *Excavations at Alington Avenue, Fordington, Dorset, 1984–87*. Dorchester: Dorset Natural History and Archaeological Society Monograph 15: 53–55, 111–116, 168–170, 182–183.
- Maltby, M. 2002b. The animal bone. In D. Enright and M. Watts *A Romano-British and Medieval Settlement Site at Stoke Road, Bishop’s Cleeve, Gloucestershire*. Cirencester: Cotswold Archaeology/Bristol and Gloucestershire Archaeological Report 1: 44–49.
- Maltby, M. 2003a. The animal bone. In A. Thomas and D. Enright, Excavation of an Iron Age settlement at Wilby Way, Great Doddington. *Northamptonshire Archaeology* 31: 48–56.
- Maltby, M. 2003b. The animal bones. In C. Bateman, D. Enright and N. Oakey, Prehistoric and Anglo-Saxon settlements to the rear of Sherborne House, Lechlade: excavations in 1997. *Transactions of the Bristol and Gloucestershire Archaeological Society* 121: 71–76.
- Maltby, M. in press. *Feeding a Roman Town: Environmental Evidence from Excavations in Winchester 1972–1985*. Winchester: Winchester Museum Service Archaeological Report Monograph.
- Maltby, M. nd1. Biddenham Loop (BL402) Animal Bones Report. Report for Albion Archaeology.
- Maltby, M. nd2. Marsh Leys Farm Animal Bones Report. Report for Albion Archaeology.
- Maltby, M. nd3. Report on the Animal Bones from Amphthill Road (ASH773) and Shefford Lower School (Sites SLS893 and RB365/445), Shefford, Bedfordshire. Report for Albion Archaeology.
- Maltby, M. nd4. Holwell Quarry Animal Bones. Report for Albion Archaeology.
- Maltby, M. and Hambleton, E. in prep. Animal bones from Wortley Roman Villa, near Stroud, Gloucestershire.
- Nicholson, R.A. and Scott, S.A. 2004. Animal remains. In H. Dalwood and R. Edwards *Excavations at Deansway, Worcester, 1988–89: Romano-British Small Town to late Medieval City*. London: Council for British Archaeology Research Report 139: 506–535.
- O’Connor, T. 1987. Bones from Roman to medieval deposits at the City Garage, 9 Blake Street, York (1975–6). London: Ancient Monuments Laboratory Report 196/87.
- O’Connor, T.P. 1988. *Bones from the General Accident Site, Tanner Row*. (The Archaeology of York Volume 15/2). London: Council for British Archaeology: 61–136.
- Pfeiffer, J. in press. Early Roman faunal assemblages from Victoria Road. In M. Maltby *Feeding a Roman Town: Environmental Evidence from Excavations in Winchester 1972–1985*. Winchester: Winchester Museum Service Archaeological Report Monograph.
- Pinter-Bellows, S. 2001. Animal bone. In P. Leach with C.J. Evans *Fosse Lane, Shepton Mallet 1990: Excavations of a Romano-British Roadside Settlement in Somerset*. London: Britannia Monograph Series 18: 289–303.
- Pipe, A. 2003. The animal bone. In C. Cowan *Urban Development in North-West Roman Southwark: Excavations 1974–90*. London: Museum of London Archaeology Service Monograph 16: 175–182.
- Powell, A., Clark, K. and Serjeantson, D. 1997. Animal bones. In P.M. Booth *Asthall, Oxfordshire: Excavations in a Roman ‘Small Town’, 1992*. Oxford: Oxford Archaeology Unit, Thames Valley Monograph 9: 141–147.
- Seetah, K. 2006. Multidisciplinary approach to Romano-British cattle butchery. In M. Maltby (ed.) *Integrating Zooarchaeology*. Oxford: Oxbow 109–116.
- Stallibrass, S. 1996. Animal bones. In R.P.J. Jackson and T.W. Potter *Excavations at Stonea, Cambridgeshire 1980–85*. London: British Museum Press: 587–612.

- Stallibrass, S. 1999. Cattle, culture, status and soldiers in Northern England. In G. Fincham, G. Harrison, R. Holland and L. Revell (eds.) *TRAC 1999: Proceedings of the Tenth Annual Theoretical Roman Archaeology Conference, Durham 1999*. Oxford: Oxbow: 64–73.
- Stokes, P. 2000. A cut above the rest? Officers and men at South Shields Roman fort. In P. Rowley-Conwy (ed.) *Animal Bones, Human Societies*. Oxford: Oxbow: 146–51.
- Thawley, C.R. 1982. The animal bones. In A McWhirr *Cirencester Excavations II: Roman Cemeteries at Cirencester*. Cirencester: Cirencester Excavation Committee Monograph 1: microfiche E13–G10.
- Wilson, B. 1978. The animal bones. In M. Parrington *The Excavation of an Iron Age Settlement, Bronze Age Ring-ditches and Roman Features at Ashville Trading Estate, Abingdon, Oxfordshire 1974–6*. London: Council for British Archaeology Research Report 28: 110–37.

Chop and Change: Specialist Cattle Carcass Processing in Roman Britain (pp. 59–76) Mark Maltby. A Local Barrow for Local People? The Ferry Fryston Cattle in Context (pp. 77–91) David Orton. New Images for Old Rituals: Stelae of Saturn and Personal Cult in Roman North Africa (pp. 92–102) Günther Schürner (translated by Roman Roth). The Appearance of Health: The Symbolic Construction of the Healthy Body through Urban Cemetery Evidence from Late Iron Age and Early Roman Britain (pp. 103–114) Angela Turner-Wilson. Chop and Change: Specialist Cattle Carcass Processing in Roman Britain. Mark Maltby. Introduction. Full-time professional butchers are found in most complex societies particularly in urban centres. It is likely that specialist butchers, who regularly acquire large numbers of animals, will develop processing methods that will be repetitive and possibly distinctive. In addition, it is possible that waste from their activities will sometimes be deposited in large quantities. Urban macelli, where butchers and other specialists plied their trade are known in many Roman towns including examples in B... The Romans in Britain 43 AD to 410 AD. The Romans came to Britain nearly 2000 years ago and changed our country. Even today, evidence of the Romans being here, can be seen in the ruins of Roman buildings, forts, roads, and baths can be found all over Britain. The Romans invaded other countries too. The Roman Empire covered much of Europe, north Africa, and the Middle East. (see map). Who were the Romans? The Romans lived in Rome, a city in the centre of the country of Italy . One day, some years before Jesus Christ was born, the Romans came to Britain. Britain before the Romans (The Celts). Who founded Rome? When did the Romans invade Britain? In which year did the Romans invade Britain? Why did the Romans invade Britain?