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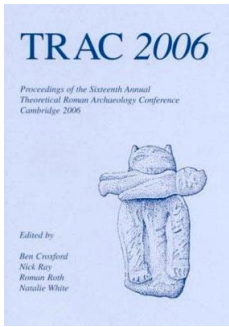

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Chop and Change: Specialist Cattle Carcass Processing in Roman Britain

Mark Maltby

Introduction

Full-time professional butchers are found in most complex societies and 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 the extent to which 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 that indicate the disposal of large amounts of processing waste, and the accumulation of specific types of bones for large-scale processing in some instances. Both of 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 given 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

Site	County	Period	Type	Chopped /Sawn	Knife Cut	% Chopped	Source
Battlesbury Bowl	Wilts	Iron Age	hillfort	38	249	15	Hambleton /Maltby nd
Welling-borough	Northants	Iron Age	rural	12	33	27	Maltby 2003a
Lechlade	Glos	Iron Age	rural	3	11	21	Maltby 2003b
Biddenham Loop	Bedford	Iron Age	rural	0	13	0	Maltby nd1
Biddenham Loop	Bedford	Roman	rural	16	12	57	Maltby nd1
Owslebury	Hants	Iron Age	rural	45	159	22	Maltby 1987
Owslebury	Hants	ERB	rural	121	486	20	Maltby 1987
Owslebury	Hants	LRB	rural	53	107	33	Maltby 1987
Stanstead ACS	Essex	LIA	rural	13	16	45	Mainland 2004
Stanstead ACS	Essex	ERB	rural	17	35	37	Mainland 2004
Holwell Quarry	Herts	LIA-RB	rural	8	21	28	Maltby nd4
Marsh Leys	Bedford	Roman	rural	37	15	71	Maltby nd2
Shefford	Bedford	Roman	rural	14	11	56	Maltby nd3
Wantage	Oxon	Roman	roadside	37	14	73	Maltby 1996
Caerwent	Gwent	Roman	town	1944	268	86	Hambleton/ Maltby in prep.
Winchester	Hants	Roman	town	1869	148	93	Maltby in press

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 contexts 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 were encountered in the later assemblages. This is a very crude measure that 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.

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

Town	Site	Split Up Limb	Blade Up Limb	Chopped Ramus	Trimmed Scapula	Holed Scapula	Chopped Fem Caput	Source
Caerwent	Basilica	11%	18%	x	x	x	x	Hambleton & Maltby in prep.
Chichester	Cattlemarket	x	x	x	x			Levitan 1989
Cirencester	Cemetery	x						Thawley 1982
Cirencester	Chester St	39%	20%	x	x	x		Maltby 1998a
Colchester	Various		x		x			Luff 1982;1993
Dorchester	Colliton Park	x	x		x			Hamilton-Dyer 1993
Dorchester	Greyhound Yard	17%	21%	x	x	x	x	Maltby 1993
Exeter	Various	x	x	x	x			Maltby 1979a
Gloucester	East Gate						x	Maltby 1983
Gloucester	Eastgate St	78%	x					Levine 1986
Leicester	Bonners Lane	x						Baxter 2004
Leicester	Clarence St	x						Baxter 2005
Lincoln	Waterfront	x		x	x	x	x	Dobney *et al.* 1996
Lincoln	Wigford	x			x	x		Dobney *et al.* 1996
London	Mithraeum						x	Macready & Sidell 1998
Southwark	NW Southwark	Low %	x					Pipe 2003
Southwark	199 Borough High St	x					x	Locker 1988
Southwark	Borough High St		x					Ainsley 2002
St Albans	Folly Lane	x						Locker 1999
Silchester	South Gate		x					Maltby 1984
Winchester	Crowder Terrace	x						Coy and Bradfield in press
Winchester	Defences	17%	21%	x	x		x	Maltby in press
Winchester	Staple Gardens	15%	28%	x	x		x	Maltby 1986
Winchester	Hyde Abbey	16%	16%	x	x		x	Maltby in press
Winchester	Victoria Rd G2-4	x	x				x	Pfeiffer in press
Winchester	Victoria Rd IV-VI	18%	18%	x	x		x	Maltby in press
Winchester	Victoria Rd X-XVI	29%	20%	x	x		x	Maltby in press

Town	Site	Split Up Limb	Blade Up Limb	Chopped Ramus	Trimmed Scapula	Holed Scapula	Chopped Fem Caput	Source
Wroxeter	Basilica	21%	x	x	x	x	x	Hammon 2005
York	Blake Street					x		O'Connor 1987
York	Tanner Row	x				x	x	O'Connor 1988

Up Limb = humerus, radius, femur and tibia; Chopped Ramus = chop marks on or near mandibular condyle;
Trimmed Scapula = blade marks on spine or body; Fem cap = femur caput chopped through
x = present but not quantified

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 the 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 most probably for preserving the meat (scapulae with holes in blade).It should be emphasised that the list includes only those cases where the butchery trait is specifically mentioned. It is extremely likely that further investigations 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 that were discarded after various stages of carcass processing.

These dumps have been found both near the centre of towns (for example, Dorchester, Maltby 1993 and Wroxeter, Hammon 2005), in peripheral areas (for example, Chichester, Levitan 1989 and Winchester, Maltby in press), or in both (for example, Colchester, Luff 1993; Exeter, Maltby 1979a; and Cirencester, Maltby 1998a). There are a few cases of waste derived from more than one phase of processing (for example, Chester Street, and 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 (for example, 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 the evidence for such activities has been found commonly within 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.

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

Town	Site	Upper Limbs	Scapulae	Femur Caput	Head/Feet	Feet	Head	Horn Cores	Source
Chichester	Cattlemarket				x				Levitan 1989
Cirencester	Cemetery				x				Thawley 1982
Cirencester	Chester St				x				Maltby 1998a
Cirencester	St Michael's				x				Levitan 1990
Colchester	Balkerne Lane	x	x		x				Luff 1982;1993
Colchester	Culver St				x				Luff 1993
Colchester	Gilberd School		x			x			Luff 1993
Colchester	Long Wyre St		x						Luff 1993
Dorchester	Colliton Park	x							Hamilton-Dyer 1993
Dorchester	Greyhound Yard	x							Maltby 1993
Exeter	Goldsmith St				x				Maltby 1979a
Exeter	Rack St				x				Maltby 1979a
Gloucester	East Gate				x		x		Maltby 1983
Gloucester	Eastgate St	x							Levine 1986
Gloucester	Westgate St			x					Maltby 1979b
Leicester	Bonners Lane	x							Baxter 2004
Leicester	Causeway Lane				x			x	Gidney 2000
Leicester	Clarence St							x	Baxter 2005
Leicester	Newarke St							x	Baxter 1996
Lincoln	Waterfront	x	x				x		Dobney *et al.*1996
Lincoln	Wigford	x							Dobney *et al.* 1996
London	Mithraeum							x	Macready/Sidell 1998
London	Walbrook							x	C-Brock/Armitage 1977
Southwark	Borough High St	x			x				Ainsley 2002
St Albans	Folly Lane	x							Locker 1999
Silchester	Basilica				x				Grant 2000
Silchester	South Gate				x				Maltby 1984
Silchester	Manor Farm		x						Maltby 1984
Winchester	Crowder Terrace		x						Coy/Bradfield in press

Town	Site	Upper Limbs	Scapulae	Femur Caput	Head/Feet	Feet	Head	Horn Cores	Source
Winchester	Hyde Abbey	x							Maltby in press
Winchester	Victoria Rd G2	x							Pfeiffer in press
Winchester	Victoria Rd X-XVI	x					x	x	Maltby in press
Wroxeter	Basilica		x				x	x	Hammon 2005
York	Tanner Row	x	x						O'Connor 1988

x = present

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).

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 the 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; and 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 away 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).

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 the 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, although unfortunately very few samples have been quantified.

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

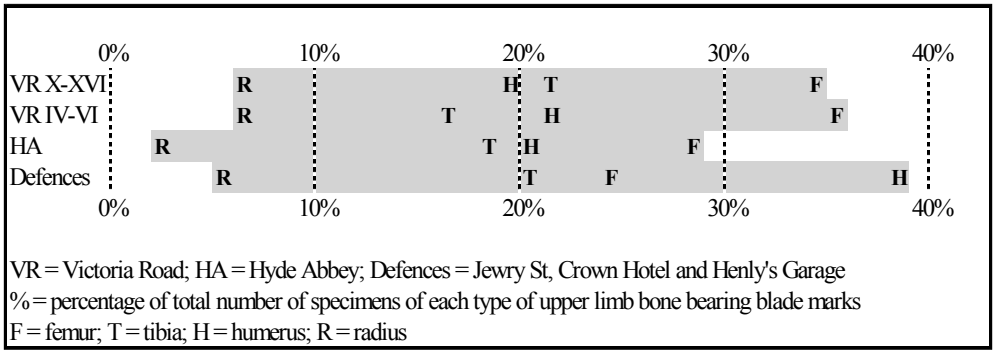

Figure 2: Percentage of cattle upper limb bones with blade marks from later Roman sites in Winchester

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 that 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 had 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).

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

Settlement	Type	Blade Up Limb	Source
Alcester, Warwickshire	small town	x	Maltby 2001a
Alington Avenue, Dorchester	urban hinterland	3%	Maltby 2002a
Asthall, Oxfordshire	small town	x	Powell *et al.* 1997
Biddenham Loop, Beds	rural	0%	Maltby nd1
Home Farm, Bishop's Cleeve	rural	3%	Maltby 1998b
Stoke Road, Bishop's Cleeve	rural	0%	Maltby 2002b
Brighton Hill S. Hampshire	rural	0%	Maltby 1995
Marsh Leys Farm, Beds	rural	4%	Maltby nd2
Neatham, Hampshire	small town	x	Done 1986
Owslebury, Hampshire	rural	0.2%	Maltby 1987
Shefford, Beds	rural	0%	Maltby nd3
Shepton Mallet, Somerset	small town	x	Pinter-Bellows 2001
Snodland, Kent	villa	x	Hamilton-Dyer 1995
Wantage, Oxfordshire	roadside settlement	11–15%	Maltby 1996; 2001b
Wilcote, Oxfordshire	roadside settlement	x	Hamshaw-Thomas *et al.* 1993; 2004
Winnall Down, Hampshire	rural	0%	Maltby 1985a
Wortley, Gloucestershire	villa	x	Maltby/Hambleton in prep.
Wycomb, Gloucestershire	small town	0%	Maltby 1998c

Up Limb = humerus, radius, femur and tibia
x = present but not quantified

Figure 3: Axially split radius from Roman Winchester

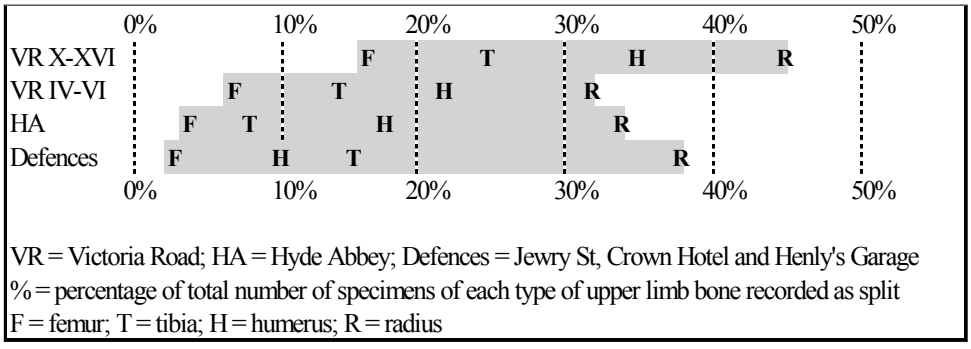

Figure 4: Percentage of cattle split upper limb bones later Roman sites in Winchester

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

Settlement	Type	Split Up Limb	Source
Alcester, Warwickshire	small town	x	Maltby 2001a
Alington Avenue, Dorchester	urban hinterland	0%	Maltby 2002a
Asthall, Oxfordshire	small town	x	Powell *et al.*1997
Biddenham Loop, Beds	rural	0%	Maltby nd1
Castleford, Yorkshire	vicus	x	Berg 1999
Home Farm, Bishop's Cleeve	rural	0%	Maltby1998b
Stoke Road, Bishop's Cleeve	rural	0%	Maltby 2002b
Elms Farm, Essex	temple complex	x	Albarella 1998
Keston, Kent	villa	Low %	Locker 1991
Marsh Leys Farm, Beds	rural	0%	Maltby nd2
Owslebury, Hampshire	rural	0%	Maltby 1987
Rocester, Staffordshire	small town	x	Hammon 2000
Shefford, Beds	rural	0%	Maltby nd3
Shepton Mallet, Somerset	small town	x	Pinter-Bellows 2001
Stonea, Cambridgeshire	vicus	x	Stallibrass 1996
Tort Hill East	roadside settlement	x	Albarella 1998
Wantage, Oxfordshire	roadside settlement	0%	Maltby 1996; 2001b
Wilcote, Oxfordshire	roadside settlement	x	Hamshaw-Thomas *et al.* 1993; 2004
Winnall Down, Hampshire	rural	0%	Maltby 1985a
Worcester, Worcestershire	small town	x	Nicholson/Scott 2004
Wortley, Gloucestershire	villa	x	Maltby/Hambleton in prep.
Wycomb, Gloucestershire	small town	0%	Maltby 1998c

Up Limb = humerus, radius, femur and tibia
x = present but not quantified

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 the marrow. Occasionally, cleaver marks are located near the break (Fig. 5). The increased fragmentation of metapodials has been noted in Romano-British assemblages when compared with Iron Age samples, and preliminary research has 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 when 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.

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

Settlement	Type	NISP Metatarsals	% >75% Complete	Source
Caerwent	urban	224	9	Hambleton/Maltby nd
Silchester South Gate	urban	28	4	Maltby 1984; 1985b
Winchester VR X-XVI	urban	277	11	Maltby in press
Winchester VR IV-VI	urban	49	14	Maltby in press
Winchester Hyde Abbey	urban	44	0	Maltby in press
Winchester Defences	urban	42	5	Maltby in press
Brighton Hill South	rural	34	24	Maltby 1995
Holwell Quarry	rural	32	28	Maltby nd4
Marsh Leys Farm	rural	56	18	Maltby nd2
Winnall Down	rural	28	64	Maltby 1985a; 1985b

Settlement	Type	NISP Metacarpals	% >75% Complete	Source
Caerwent	urban	198	7	Hambleton/Maltby nd
Silchester South Gate	urban	22	5	Maltby 1984; 1985b
Winchester VR X-XVI	urban	157	15	Maltby in press
Winchester VR IV-VI	urban	50	4	Maltby in press
Winchester Hyde Abbey	urban	18	11	Maltby in press
Winchester Defences	urban	37	8	Maltby in press
Brighton Hill South	rural	17	41	Maltby 1995
Holwell Quarry	rural	20	30	Maltby nd4
Marsh Leys Farm	rural	37	32	Maltby nd2
Winnall Down	rural	21	52	Maltby 1985a; 1985b
Biddenham Loop	rural	20	45	Maltby nd1

VR = Victoria Road

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

Discussion

The examples of processing evidence outlined above confirm that distinctive butchery methods became employed during the Romano-British period. There is a 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 a 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 the 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, and 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 the 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 that it was uncommon. At Wortley, most of the blade-marks were found on split bones from 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 that 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 that 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 on specimens from Lincoln represent the 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 period in general, as indicated by the increased fragmentation of metapodials. Again, however, the intensity of the exploitation seems to have been greater in the urban settlements than elsewhere. In addition to this general increase, it appears to have been a 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 the processing of large quantities of fresh marrow for a particular (industrial?) project.

It is clear, therefore, that variations in carcass processing are apparent on 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 the 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 sites. 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.

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