APPENDIX C

Faunal-based Studies of Animal Bone Assemblages from the Study Region

For convenience, these sites and their faunal assemblages have been grouped according to their modern county, though this is of course an artificial divide.

West Yorkshire

At Dalton Parlours (SE 4020 4450) located on Magnesian Limestone geology, excluding the animal bones from Well 1 (see Appendix F) and in terms of overall fragment frequency (NISP), in Iron Age contexts sheep/goat dominated the assemblage (71.2%), with far fewer cattle (23.9%) and a very low incidence of pig (4.9%). Dogs formed 30.5% of the identified mammal bone, because of one complete and two partially articulated dog burials. There were also a few fragments of horse (Berg 1990a: 175). The relative frequency of animals was calculated using MNI estimates – sheep were 55.7% (or a minimum of 34 individuals), cattle 36.1% (or 22 individuals), whilst pigs accounted for 8.2% or 5 individuals. So on both counts sheep do seem to have been the most numerous animals, although clearly many animal bones were simply not being recovered.

Some interesting depositional patterns were noted. Ditch contexts produced 70.5% of the cattle NISP, and were mostly represented by head fragments (skull, mandibles and loose teeth), scapula, pelvis and feet bones – in other words, the main meat-bearing bones were very poorly represented. And although they were not numerous, when sheep were present in ditch fills, it was mostly as limb bones – some of their meat-bearing parts (Berg 1990a: 175-176). This suggests differences in social attitudes to the deposition of different parts of different species. In pits, sheep comprised 47.1% of the fragments, dog 50% (because of the burials), and pig 2.1%. In hearths, the sheep NISP was 88.7%, and cattle and pig 5.6% each.

For the Romano-British period contexts at Dalton Parlours, the sheep/goat NISP was 56.5%, cattle 25.8%, and pig 17.7%. In terms of their relative MNI frequencies, sheep were 44.2% (38 individuals), cattle 31.4% (27 individuals) and pig 24.4% (or 21 individuals). A tiny number of horse, deer and hare bones were also recorded. Most of this bone in the Romano-British period was recovered from 'occupation' layers within structures, or their abandonment deposits. So despite the caveat again that the counts of NISP and MNI are clearly too low for a settlement inhabited for any length of time, some broad chronological trends can be identified. Sheep seem to have declined in relative terms to cattle, which increased in NISP over time but were represented by proportionally fewer animals (Berg 1990a: 188-189) and so in fact remained relatively stable, whilst pigs were decidedly more numerous during the Roman period than in Iron Age contexts.

In terms of husbandry practices, the vast majority of the cattle bones from Dalton Parlours were from mature beasts, and some were 'senile' individuals (4 years plus). Although live cattle may have been exported from the site once they were a suitable age for slaughter, this assemblage does suggest that the cattle were not being raised primarily for meat (Berg 1990a: 182), but that milk and other secondary products such as manure were probably important, and perhaps traction too. Some of the oldest animals may have been retained as breeding stock and herd leaders. The majority of sheep too were allowed to reach maturity, beyond the age if they were being raised primarily for meat. This may suggest that wool and manure were important – the artefactual evidence certainly supported the former. The Romano-British sheep assemblage included higher numbers of neonatal and first year deaths, which however they died, may indicate that ewes were brought into pens on or near the site for lambing (ibid.: 184). If they were deliberately culled, this does not suggest a regime raising sheep for prime meat, but rather the slaughtering of unweaned lambs as part of an emphasis on dairy products (q.v. Hambleton 1999: 70). Unsurprisingly, the majority of pig bones that could be aged were from individuals slaughtered in their second or third year, as prime meat animals. The few horse bones recovered were from mature animals, and there was no evidence of butchery.

The faunal assemblage from Well 1 at Dalton Parlours had cattle as 27.4% of the NISP, with an MNI frequency of 19.7% representing 29 individuals, sheep/goat at 21.7% NISP and an MNI of 27.9% or 41 individuals, pig at 7.5% NISP but representing 13.6% or 20 individuals, horse at 12.4% NISP and 9.5% MNI or 14 individuals, dog at 28% NISP and 21.1% MNI or 31 individuals (Berg 1990b: 248-253). Badger and hare bones were also identified, and human bones. Three of the sheep/goat skulls were identified as goat. Given the complex stratigraphic history of Well 1, however, including evidence for placed deposits of animal bone, this feature will be considered separately in Chapter 11 and Appendix F. Indirect evidence for the grazing of animals around the Dalton Parlours settlement came from dung beetle remains preserved in the well, in addition to pollen and plant macrofossil indicators of grassland (Bastow and Murray 1990: 264; Sudell 1990: 270).

At the various Iron Age and Romano-British sites excavated along the M1-A1 Link Road, most of which were on Coal Measures geology, preservation problems meant that sheep and pigs were probably proportionally under represented in relation to cattle and horse, with their larger, more robust bones. Examination of all the assemblages showed that on late Iron Age and earliest Romano-British sites, cattle were overwhelmingly dominant in NISP terms (*c*. 85%), with horse at 12%, and sheep/goat at *c*. 4% (Richardson 2001a: 216-217). Overall, on middle and late period Romano-British sites, cattle formed *c*. 20%, sheep *c*. 66%, horse 8-10% and pig 4-5% of the numbers of identifiable fragments. This reverses the trend noted at Dalton Parlours, although again preservation and/or depositional factors may have significantly biased this data. As at Dalton Parlours, cattle and horse bones were most common in ditches, and sheep bones in pits.

Only at Parlington Hollins (SE 4230 3450) located on Magnesian Limestone was it possible to analyse the bone assemblage from one site in any detail. In late Iron Age contexts, cattle were predominant at *c*. 85% of the NISP, with horse at *c*. 12% and sheep/goat at *c*. 3%, but these figures were markedly affected by the recovery of 35 cattle bones from at least 2 individuals all in one pit (pit 2066, see Chapter 11 and Appendix F). Early Romano-British bones were all from the ditches of Enclosure B, with cattle at 50% of the NISP, horse 25%, sheep 15% and pig 10% (Richardson

2001a: 217). But this reflects the same taphonomic trends also identified at Dalton Parlours. In mid-Roman contexts sheep were 76% of the NISP, cattle 14%, horse 7% and pig 3%, although this may be because there were more contexts such as pits and postholes with animal bones, and in these sheep bones dominated. In late Roman contexts, 59% of the NISP were sheep, 29% cattle, 9% horse, and 3% pig.

Clearly, taphonomic factors make interpretation of this data extremely difficult, although it is possible that the proportion of sheep increased over time, and horses might have been slightly more numerous at this site than at other settlements. Although age data was not forthcoming from Iron Age contexts, in all contexts during the Romano-British period most cattle bones were from animals 0.5-1.5 years old, and the majority of sheep at 0.5-1.5 years old, though there was a later mortality peak at 2.5-3.5 years old too (Richardson 2001a: 218-219). Nearly all horse bones that could be aged were around one year old, and pigs were again slaughtered between 2-3 years. The cattle seem to have been slaughtered before their prime meat-bearing age, and this might reflect younger animals killed to ensure the maximum milk production, whilst the sheep mortality pattern may indicate older animals were being maintained for secondary products such as wool and manure. The total absence of cattle and sheep neonate bones, preservation notwithstanding, might suggest that cattle and sheep were raised elsewhere and then imported into the settlement. This was also true of horses. So Parlington Hollins might have been a rural settlement involved primarily with the husbandry and/or consumption of older animals, rather than a production/breeding site. More indirect evidence for pastoralism came from insect remains associated with Grim's Ditch, which indicated quite an open landscape around there by the middle Iron Age, whilst the presence of dung beetle remains suggested the large-scale grazing of animals (Kenward and Large 2001: 231).

At Ferrybridge (SE 4700 2440) where occupation took place on Magnesian Limestone, on all Iron Age and Romano-British sites cattle dominated another fragmentary assemblage and formed between 55-80% of each site's NISP, with sheep/goat at 25-28%, horse at 8-12% and pig at 4-5% (Richardson 2005c: 181-182). Possible domestic fowl bones were also recovered from Enclosure C. Small numbers of shellfish and marine fish were also found. Once again, cattle bones were more

likely to be found in ditches, and sheep bones in pits. Cattle bones were most frequent from Iron Age Enclosure C, whereas sheep bones were more numerous in Iron Age Enclosure A and Romano-British Enclosure D. Sheep, pig and horse bones (in descending order of magnitude) were all more common than cattle bones in the pit alignment. Details of mortality profiles were not provided in the published faunal report, but the cattle were represented mostly by subadult animals between 0.5-2.5 years old, although there were also younger and older animals present too (ibid.: 183). The sheep bones were mainly from subadult individuals between 1-3 years old and adults 4-6 years old, whilst horses seem to have been maintained into adulthood. It was suggested that subadult cattle and sheep were slaughtered for meat consumption, but older animals indicate individuals kept for secondary products such as milk, wool and manure, for traction in the case of cattle, and also for breeding stock.

Other faunal assemblages from West Yorkshire, where they exist at all, are miniscule. At Ledston (SE 4340 2960) on Magnesian Limestone, the bone preservation was poor, with only 1026 fragments recovered, and only *c*. 480 identifiable (though full quantified results were not presented in the report). In NISP terms cattle were most numerous (including a partially articulated burial), followed by sheep/goat, pig, horse and dog (Maltby 2005: 26-27). Two bones of a small domestic fowl were also recovered. Little ageing information could be obtained, but most cattle seem to have been slaughtered when 4 years old, although older and younger animals were present, including a neonate calf. At Upton (SE 4755 1353) located on Magnesian Limestone, 117 animal bone fragments were recovered, again in a poor condition, of which 74 were identifiable (Berg 1995: 18). The majority (52 or 70.3% of the NISP) were cattle, 18 were sheep (24.3%), and 4 were pig (5.4%). Two broken cattle mandibles from the same mature individual and a juvenile scapula were excavated from the lower fills of two excavated segments of ditch on the southern side of the enclosure. At Apple Tree Close near Pontefract (SE 4490 2060) located on Coal Measures Carboniferous sandstone, only 675g of animal bone were recovered, of sheep/goat, cattle, horse and pig in order of fragment abundance (Wrathmell 2001: 23). At Moss Carr, Methley (SE 3650 2650), located on Coal Measures geology with Boulder Clays, sands and gravels, only 8 fragments of animal were recovered from Site 2. Six came from cattle or horse-sized animals (Richardson 2002: 36). At Dale Lane, South

Elmsall on Magnesian Limestone (SE 3832 1225), only 43 bone fragments could be identified to species from 373 recovered at an Iron Age enclosure, of which 31 (72%) were from cattle, 5 (12%) from sheep/goat, and 7 (16%) from horse (Richardson 1998). The age data was obviously extremely limited, but no cattle were being slaughtered before one year of age, and some were living to 4 years or beyond.

At Garforth (SE 4200 3400) on Magnesian Limestone, bone preservation ranged from good to very poor, depending on context. Out of the total of 1955 bone fragments recovered from Romano-British and post-Roman (sixth to seventh century) contexts, only around 25% of these could be identified to species. Cattle formed between 67-77% of the NISP in the Romano-British Phases 1 and 2, with sheep/goat at 13-15%, and pig at 11-18% (Jaques 2000: 27, table 8). MNI counts for Phase 1 were 6 cattle, 3 sheep/goats and 1 pig, and for Phase 2 4 cattle, 2 sheep/goats and 2 pigs (ibid.: table 11). A small number of horse and dog bone fragments were recovered; most of the latter from a headless dog burial, and there was a complete skeleton of an immature pig excavated in a Phase 2 pit. Some post-cranial deer bone fragments were also found, indicating some hunting. The age at death estimates for cattle suggested that most were adult or elderly and were allowed to reach maturity before being slaughtered. This might indicate an emphasis on secondary products. Sheep/goats were generally between 2-3 years old when killed, with only a few older individuals represented, and this could imply that these animals had been raised mainly for their meat. The cattle found at Garforth ranged in height from 1.07-1.21m at the withers. The heights of horse withers varied between 13-14.2 hands (1.31-1.44m) (Jaques 2000: 25).

Although not published in time to form part of Table 4 below, it is worth briefly mentioning the faunal evidence recovered during the Oxford Archaeology North investigations along the A1 (M) road corridor. These sites were on Magnesian Limestone, but again relatively low quantities of bone were identifiable to species. Of the animal bone recovered from Iron Age contexts, and excluding those from the carriage burial, the majority from Sites M and Q were cattle (52.73% and 60.70% respectively), followed by sheep/goat (47.27% and 32.10%). Despite the complex pit deposits at Site M, where placed deposits included two partial cattle skeletons found

in pit 2058 along with a complete cow and a complete calk skeleton, no pig bones were identified at that locale, although pig formed 7.10% of the identifiable species at Site Q (Bates 2007: 338-339). In contrast, 22 horse bones were identified at Site M, but only 7 at Site Q. A small number of dog bones, red deer and roe deer remains were also found; some of the dog remains from partial remains in pit 1151 at Site M. The vast majority (75-89%) of bones of cattle, sheep/goat and pig at Site Q were found in ditch contexts, though 25% of pig remains came from pits; whereas much of the animal bone at Site M was from the pit concentration. This again implies varying patterns of intra-site and inter-site carcase and bone disposal.

The majority of Romano-British faunal remains found along the A1 (M) road corridor were recovered from Sites XX15, XX8 and Q. At these, cattle were again the majority of identifiable species (55.71%, 56.99% and 53.25% respectively), with sheep/goat at 37.62%, 38.71% and 42.86%. Pigs were present at these three sites at 6.67%, 4.30% and 3.90% respectively (Bates 2007: 342). Once again, small numbers of dog, horse and deer remains were also found. The apparent overall smaller proportion of cattle in relation to sheep is comparable to the ratios from Parlington Hollins and Dalton Parlours. This may indicate some dietary and husbandry changes taking place during the Romano-British period, with sheep increasing in significance.

The faunal remains from the recent excavations at Wattle Syke have the potential to be more informative. More substantial quantities of animal bones were recovered due to the more rigorous sampling procedures, and the bone itself was generally in good condition (Chadwick pers. obv.). Detailed investigation of the many animal burials will have to form part of the post-excavation analysis of this relatively large assemblage, although this will take some time, however.

South Yorkshire

Most South Yorkshire rural sites of the study period have produced no animal remains at all. At Pickburn Leys (SE 5305 0670), located on Magnesian Limestone, approximately 1200 animal bone fragments were recovered, mostly from ditch contexts, with no complete bones surviving (Berg 1985: 11). Although the only report

on these was not quantified, cattle formed the majority of animals, followed by sheep/goat, with some evidence pig and horse. Skull and foot bones seem to have been disposed of and buried relatively quickly. At Campsall Quarry (SE 5340 1340), also on Magnesian Limestone, although the surface condition of the bone was quite good, only 41 bone fragments were identifiable to species (Berg 1992), but as only a few narrow evaluation trenches were excavated this low recovery rate is hardly surprising (Adams 1992). Of these, 32 or 78% were from cattle, and 9 or 22% were sheep/goat, but preservation biases must also be taken into account. At Hazel Lane Quarry, Hampole, the very fragmented and weathered bones of sheep/goat and pigs were identified, but the majority of remains were from juvenile cattle. This might reflect the maintenance of particular herd structures, and even the culling of young male animals (O'Neill and Brown 1999: 108).

At Topham Farm, Sykehouse (SE 6230 1720) located on Sherwood Sandstone geology overlain by alluvial silts and glacio-lacustrine clays, silts and sands, only 374 animal bone fragments were recovered, and preservation clearly biased larger bones and more robust teeth from larger animals (Richardson 2003: 26-27). In the late Iron Age Phase 1, identifiable remains produced NISP values of 37% for cattle, 3% sheep/goat, 2% pig, 5% unidentified 'cattle sized' animals, and 53% of 'sheep sized' animals. In the late Iron Age/Romano-British Phase 2, cattle were 21% of NISP counts, horse 9%, sheep/goat 1%, pig 1%, cattle sized animals 29%, and sheep sized animals 39%. At Billingley Drive, Thurnscoe (SE 4520 0520), located on Coal Measures sandstones, bone preservation was extremely poor. Only a few cattle and horse teeth fragments were identified (Gidney 2004: 58-59). Only a few teeth and some burnt and /or calcined bone fragments from cattle and sheep were excavated at West Moor Park II, Armthorpe (SE 6370 0500), located on Sherwood Sandstones (Richardson 2007).

There was slightly better bone preservation on some of the sites excavated at Balby Carr on the edge of Doncaster (SE 5850 0050), located on low-lying and waterlogged alluvial palaeostagnogley soils on Sherwood Sandstone geology. Of 539 bone fragments recovered from one ASWYAS project, cattle and 'cattle-sized' animals accounted for 73% of the assemblage NISP (Richardson 2005d), though this was

biased because of a partial cattle skeleton buried in a ditch, a probable placed deposit. A partially articulated group of sheep/goat bones from the First Point site at Balby Carr may also be a placed deposit (Richardson 2006). Sheep/goat made up 21% and pig 5% of the bone fragments. Four deer and 4 horse bone fragments were also recovered. The presence of a majority of sub-adult cattle and sheep suggest the slaughter of younger animals for meat, although some older animals were also retained for secondary products. A largely complete but fragmented cattle skull was found along with other animal bone in the base of a ditch at Balby Carr during a more recent phase of work (Muldowney 2008: 4)

Nottinghamshire

At Dunston's Clump (SK 6615 8030) located on Sherwood Sandstones geology with sands and gravels, bone preservation was again extremely poor (Harman 1987: 61). Several bone fragments and teeth from cattle and horse were recovered, including a complete set from a horse left mandible; and a few calcined bones from sheep and pig. At Chainbridge Lane, Lound (SK 7080 8580), on a partially waterlogged site on the Sherwood Sandstones and river gravels, the animal bone was not quantified in the only published report, and only two complete pig skeletons were noted, one with its skin partially preserved in the waterlogged anaerobic conditions (Eccles, Caldwell and Mincher 1988: 17). One was located on the western side of the excavated enclosure, and the waterlogged individual from the eastern side, and they both probably represented placed deposits (see Chapter 11 and Appendix F). Sadly, due to the hurried and salvage nature of the excavations, this unique find was not preserved, and all of the project photographs, including images of the pigs *in situ*, were missing from the rest of the archive I examined in the Bassetlaw Museum, Retford. Their current whereabouts are unknown. Fortunately, one of the original volunteer excavators (Jen Eccles) was able to provide me with some photographs.

At Wild Goose Cottage, Lound (SK 7010 8725) on Sherwood Sandstone and River Idle gravels, a single horse skull was found in the construction backfill of a well (Garton and Salisbury 1995: 22), but this lacked mandibles or teeth. At Menagerie Wood on the Sherwood Sandstones (SK 5768 7850), small amounts of animal bone were recovered from the limited excavations (Garton, Hunt, Jenkinson and Leary

1988: 29), but the prevalence of limb bone fragments suggests preservation biases or taphonomic factors must be considered. Much of the surviving bone was calcined. Of the 1313 fragments recovered, only 104 could be identified, and of these sheep/goat formed 96.2% of the NISP, with cattle just 3.8%. The sheep included burnt and butchered lamb bones, and two other individuals were 1-2 years old, and 3-3.5 years old. The single cow represented was probably between 1-1.5 years old. At Gamston (SK 6020 3690) on River Trent terrace gravels, only 139 bone fragments were recovered. Of the 61 identifiable bones, 44 (72.1%) were of cattle, 15 (24.6%) of sheep/goat, and one pig bone and one horse tooth fragment.

At Staunton near the northern edge of the Vale of Belvoir (SK 8030 4470), east of the river Witham and located on Keuper Marl, bone preservation was better (Todd 1975). Most bones were unstratified, but the 103 identifiable fragments were dominated by cattle (44.7% of the NISP) and sheep/goat (27.2%), with pig (13.6%), horse (5.8%) and dog (5.8%); and 2 chicken and 1 fox bone fragments also present (Harman 1975: 37). No bones from neonate or juvenile individuals less than a year old were recovered, although it was noted that some of the cattle, sheep and pigs were not fully mature at their age of death. At Besthorpe Quarry (SK 8130 6320) on the terrace gravels of the River Trent overlying Keuper Marl, the small animal bone assemblage recovered from excavations in 1992 was not quantified in the publication (Locker 2000: 114-115), but cattle and sheep/goat apparently predominated.

At Raymoth Lane, Worksop (SK 5800 8150), located on Permian Sandstones, Marls and Upper Magnesian Limestone, 1955 animal bone fragments were recovered from late Iron Age and Romano-British contexts, of which 630 were identifiable to species (Kitch 2004b: 79-80). In late Iron Age and early Romano-British contexts, only 7 bone fragments were identified to species, of which 5 were cattle and 2 sheep/goat. In the more numerous second to fourth century Romano-British assemblage, cattle were the most common species in NISP counts (38%), followed by dog at 27.5% (biased by a partially articulated puppy burial), sheep/goat (22.5%), pig (5.4%) and horse (4.5%). Small numbers of red and roe deer bone fragments were also identified, in addition to some corvid bird bones and a single badger bone fragment. Many bone fragments could only be attributed to large, medium or small mammals though. The cattle were

mainly older beasts with no evidence of younger animals, indicating an emphasis on secondary products, and also perhaps that the cattle were not being bred within the actual site (ibid.). The sheep had a greater range of ages, including some foetal and neonatal individuals, but also some older than 5 years. Milk, wool, lambs and possibly manure might thus have been as important as meat. The horse remains were all from mature animals where age assessment was possible – one tooth came from an individual aged 4.5-6.5 years, and another from a horse aged 10-14 years.

More significant faunal assemblages in Nottinghamshire came from the Iron Age and Romano-British sites at Aslockton (Palmer-Brown and Knight 1993: 147) and Moor Pool Close, Rampton (Knight 2000). Unfortunately, no final specialist archive report has yet been completed for Moor Pool Close (D. Knight pers. comm.). Aslockton (SK 7385 4100) was located in the Vale of Belvoir on a low gravely ridge above Mercia Mudstone, separating the River Smite from the Car Dyke. The unpublished Aslockton archive faunal report lists 2000 bone fragments (Hamshaw-Thomas 1992), a fact that is even more significant given the extremely small part of this enclosure complex that was evaluated (Palmer-Brown and Knight 1993). Of these, 439 fragments were identifiable – 391 from Iron Age contexts, and 157 from Romano-British deposits. Of the Iron Age bone fragments, 156 of the NISP or 39.8% were of cattle, 205 (52%) sheep/goat (including 3 definite goat), 12 (3%) pig, 16 (4.3%) horse, and 1 dog (0.2%). In the smaller Romano-British assemblage, 60 (38.2%) were cattle, 76 (48.4%) sheep/goat, 9 (5.7%) pig, 10 (6.3%) horse, and 2 (1.2%) dog (Hamshaw-Thomas 1992: 16, table 3). As with Dalton Parlours and some of the M1-A1 sites in West Yorkshire, it was noted that the remains of smaller animals were more prevalent in features such as pits and postholes, whereas larger species were better represented in ditches. This suggested that smaller animal species would be under represented in some contexts because of taphonomic and preservation factors. Interestingly, 43% of the animal bones also had traces of gnawing by dogs.

The age profiles of the Iron Age cattle suggested that the highest mortality occurred at 3-4 years, or at prime meat-bearing age (Hamshaw-Thomas 1992: 6). Of the Iron Age sheep/goat remains, there was a relatively high incidence of infant (less than 1 year) and juvenile (less than 3 year) mortality. Although preservation problems are

undoubtedly significant, this might reflect more meat-orientated caprine husbandry. Alternatively, some of this might indicate yearlings dying in their first winter, or being culled to keep flocks at a desired size (Hambleton 1999: 70). It is interesting that horse bone fragments were recovered in higher numbers than from many other sites, and two of the Iron Age individuals may have come from animals less than 3.5 and 1 year old (Hamshaw-Thomas 1992: 6). This could be evidence for horse breeding on or near the site. Unfortunately, the Romano-British faunal assemblage was too small for any meaningful age and mortality analyses to be carried out.

Roman military and urban animal bone assemblages

Castleford in West Yorkshire (SE 4260 2570), situated on a ridge on the south bank of the River Aire below its confluence with the River Calder, lay on variable geology with Magnesian Limestone immediately to the east, and mixed sands overlying Carboniferous Sandstone giving way to Coal Measures lithology to the south (Fossick and Abramson 1999: 1). On this ridge, several phases of Roman fort were constructed, with a civilian *vicus* immediately to the south. Fort I was thought to have been in use between AD 70/71 to *c*. AD 86, with the second phase Fort II garrisoned between AD 85/90 to *c*. AD 95/100, after which the site was abandoned, though this Phase III saw soil build ups and dumps of refuse within the former fort area. However, there was later civilian occupation of this area between *c*. AD 250-400. The area of the Phase 1 *vicus* was also occupied between AD 71 to AD 85, but like the fort it was then rebuilt and occupied in Phase 2 between AD 85/90 to *c*. AD 135/140. Phase 3 was between AD140-180, and Phase 4 occupation was the same as that for the fort Phase IV, when occupation had spread over a much wider area. Rescue excavations between 1974 and 1985 on deeply stratified urban deposits recovered nearly 40 000 bone fragments from two phases of military occupation approximately 30 years long, and from the civilian settlement which lasted roughly 40 years. This is the largest faunal assemblage ever found in Britain from a first century military or second century *vicus* site (Berg 1999: 223).

For the bone fragments recovered from the area of the forts, cattle formed between 60-72% of the NISP, peaking in Phase III, with sheep/goat between 14-25%, at its highest in Phase I and lowest in Phase III. Pigs were between 7-11%, at their highest incidence in Phase I, with another peak in Phase IV. For the *vicus*, cattle were between 45-60% of the NISP, at their highest in Phase 3, with sheep/goat at 21-38%, most numerous in Phases 1 and 2. Pigs were between 12-16% of the assemblage, at the highest levels in Phase 4 (Berg 1999: 225, 252-259). The age profiles of the cattle indicated that a majority were killed when mature or senile, indicating 'a husbandry system that maintained working and breeding stock and was not concerned with the production and slaughter of prime meat animals' (ibid.: 228). This pattern was especially marked in Phase II of the fort, and has been reported at some other sites, notably York (O'Connor 1988) and Doncaster (Turner 1986, see below). However, the *vicus* age profiles and those of the Phase I fort had more immature or young adult animals, and although not in the majority this suggests that some at least were slaughtered during their prime meat-bearing stage. Sheep though do seem to have been killed mostly at a prime age for meat, during their second or third year.

The high frequency of sheep in the Fort I deposits was interpreted as consistent with a short-term military site dependant on local resources, perhaps even as a result of forcible requisition (Fulford 1989: 181; King 1984: 193). After the establishment of secure supply lines in the Phase II fort, both local native settlements and military supply lines could provide more cattle, and the high proportion of cattle in Phase II of the fort and the Phase 3 *vicus* is typical of Roman military assemblages in Britain (Coy and Maltby 1987; King 1978). The higher frequencies of sheep in Phases 1 and 2 of the *vicus* compared to the forts might have also reflected economic and dietary differences amongst a more civilian population (Berg 1999: 225). Also of significance was the recognition of clearly identifiable goat remains from Castleford, both as skeletal elements and in terms of preserved leather fragments (Berg 1999; van Driel-Murray 1998). This suggests that their importance to the Roman military has been considerably downplayed in previous discussions of animal husbandry in Roman Britain (*contra* Coy and Maltby 1987; Fifield 1979).

The cattle from the faunal assemblage excavated at Castleford in the different phases of Roman forts and *vicus* were not polled, though they were taller on average than modern Dexters and Kerrys at 1.04m to 1.12m at the withers (Berg 1999: 230). There also seems to have been a mean increase in height during the Romano-British period, with the cattle from the earliest phase of occupation similar to cattle from Gussage All Saints and Garton Slack. This might suggest that initially, local unimproved animals supplied the bulk of the beef consumed, but that later selective breeding had increased the mean size of the cattle, which is a pattern noted elsewhere (Luff 1982: 152-153; O'Connor 1988: 1988: 93).

In stark contrast to Castleford, the excavations of the sequence of Roman forts at Templeborough, Rotherham in South Yorkshire during 1916-1917 only recovered a boar's tusk, a few horse teeth and oyster shells (May 1922: 126-127). 'Jaw bones of pig' in the shaft of a well might have represented a placed deposit. This lack of bone might be due to poor preservation, and/or recovery. At Doncaster, the Roman fort and civil settlement was located on a mixture of alluvial silts and gravels, and Sherwood Sandstone geology. Excavations from stratified Roman contexts within the civil settlement at Doncaster during the 1960s and 1970s recovered 1236 mammalian and bird bone fragments, of which 28.8% or 356 were identified to species. Of these, 174 or 48.88% were cattle, 61 or 17.13% were sheep/goat, 36 or 10.11% were pig, 32 or 8.99% were horse, 17 or 4.78% were dog, 31 or 8.71% were bird, whilst 3 red deer bones and single hare and cat bones were also identified (Turner 1986: 202-203). These gave MNI estimates of 21 cattle, 15 sheep/goat and 13 pigs. At Doncaster, it appears that most cattle were allowed to reach full maturity, with around a third slaughtered between 2-4 years, and none less than 1.5 years old were identified (ibid.: 204). This suggests that cattle were kept mainly for secondary products. Although the sheep bone assemblage did not allow detailed age estimates to be made, the majority of animals seemed to be at least 3 years old at death, again suggesting secondary products were important.

The Roman roadside small town of *Margidunum* in Nottinghamshire lay on sand drift deposits over Keuper Marl and Mercia Mudstone on the eastern side of the Trent Valley, and parts of it were excavated in 1910, 1913-1914, 1920-1936, 1948, 1952,

1958 and 1966-1968 (Oswald 1927, 1941, 1948, 1952; Todd 1969). The settlement may have contained a *mansio*, as it was located astride the Fosse Way, and may originally have consisted of a small military station or fort, though so far this has been surmised on artefactual evidence alone (Knight, Howard and Leary 2004: 133). The late 1960s excavations recovered small amounts of animal bone. In period I (*c*. AD 55-75), cattle formed 33% of the MNI, sheep/goat 58%, and pig 9% (Harman 1969: 99). Two horse and 3 dog bone fragments were also found. Period II (*c*. AD 75-150) did not produce any stratified bone, but in Phase III (*c*. AD 75-150) cattle formed 44% of the MNI, sheep/goat 36%, pig 9%, and there were 2 dog bone and 18 horse bone fragments. In period IV (*c*. AD 250-400) cattle were 58% of the MNI, sheep/goat 19% and pig 23%. Fifteen dog bone fragments and 18 horse fragments were also represented.

In Period I at *Margidunum*, most of the sheep/goat bones were from animals 1 or 2.5 years old, and it was suggested that these had probably been kept mainly for their meat (Harman 1969: 97). This would then be a similar pattern to the high incidence of sheep/goat in the earliest fort phase at Castleford. However, to me the two peaks in ages at death suggest an early cull of young animals followed by a second cull of slightly older beasts that might already have produced some lambs, milk, wool and manure. Some sheep less than 0.5 years old were also present, possibly indicating breeding on or near the site. The cattle seem to have been all 4-5 years old at least in Period I, with no younger animals represented. This too might suggest an emphasis on meat. In later periods more sheep were killed when older than 2 years, whilst cattle seem to have increased in importance, and seem to have been mostly killed when at least 5 years old. This suggests that over time both cattle and sheep became more important for their secondary products, and these changes could have been linked to an early phase of military occupation followed by a transition to mostly civilian use.

The Roman site of *Derventio* or Little Chester (SK 3500 3700) was a small fort that later developed an extra-mural settlement, and which is now located on the northern edge of modern Derby on the east bank of the River Derwent. There have been many investigations over the years, especially in the 1920s and 1960s (e.g. Brassington 1982; Dool and Wheeler 1985; Todd 1967; Webster 1961), but a more recent

investigation concentrated on the defences, and also summarised previously published and unpublished work on them (Langley and Drage 2000). The animal bone assemblage from this more recent work was recovered from deposits associated with the construction of a stone building and ancillary timber structures, and with pre- and post-rampart activities (Harman 2000: 274). Of the *c*. 1415 larger mammal bones that were identifiable to species, cattle formed around 51% of the NISP, with sheep/goat 36.3%, pig 10.9%, dog 1.4% and horse just 0.5%, with a few fragments of hare bones also recovered from the structures. Relatively large numbers of domestic fowl and duck bone fragments were also recovered, and some wildfowl too. Though not quantified, it was reported that most of the bones were of 'mature animals' (ibid.: 276), but no assertions were made concerning potential husbandry regimes.

Published faunal data from the investigations conducted within the area of the forts and fort annexe at Chesterfield in Derbyshire is limited. The area of the forts seems to have encompassed both Coal Measures and Magnesian Limestone geologies (Ellis 1989: 52). From rescue excavations directed by Terry Courtney during 1974-1978, 499 bone fragments were recovered of which 338 were identifiable to species (Stallibrass 1989: 120-121). Of these, cattle formed 50% of the NISP, dog 12.8% (from one individual burial), sheep/goat 3.4%, pig 1.2%, and horse and hare less than 1% each. The limited age data seemed to indicate that both cattle and sheep were mostly older individuals, and were thus probably not raised primarily for meat.

NISP percentages and MNI estimates for faunal remains from Iron Age and Romano-British sites in the study region

Tables 4-10 present the evidence from the study region as a series of NISP and/or MNI estimates. They do not include any faunal information from unpublished client reports received by the various county SMRs after May 2007, or detailed results from the A1 (M) investigations.

Rural settlement sites

Table 4

WEST YORKSHIRE												
Site name	**Animal species NISP percentages**						**Animal species MNI estimates**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Dalton Parlours												
IA	23.9	71.2	4.9	<1	30.5	-	22	34	5	1	3	-
R-B	25.8	56.5	17.7	<1	-	Deer <1 Hare <1 Hare <1 Badg. <1	27	38	21	1	-	Deer 1+ Hare 1+
Well 1	27.4	27.9	7.5	12.4	28		29	41	20	14	31	Hare 1+ Badg. 1+
Parlington Hollins												
LIA	85	3	-	12	-	-	-	-	-	-	-	-
ER-B	50	15	10	25	-	-	-	-	-	-	-	-
MR-B	14	76	3	7	-	-	-	-	-	-	-	-
LR-B	29	59	3	9	-	-	-	-	-	-	-	-
Other M1-A1 sites												
LIA – ER-B	85	4	-	12	-	-	-	-	-	-	-	-
MR-B – LR-B	20	66	4-5	9	-	-	-	-	-	-	-	-
Ferrybridge	55-80	25-28	4-5	8-12	-	Fowl <1	-	-	-	-	-	-
Upton	70.3	24.3	5.4	-	-	-	-	-	-	-	-	-
Garforth (Ph. 1 and 2)	67-77	13-15	11-18	-	-	-	4-6	2-3	1-2	-	-	-

Table 5

SOUTH YORKSHIRE												
Site name	**Animal species NISP percentages**						**Animal species MNI estimates**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Campsall Quarry	78	22	-	-	-	-	-	-	-	-	-	-
Topham Farm, Sykehouse												
LIA	37	3	2	-	-	-	-	-	-	-	-	-
LIA – ER-B	21	1	1	9	-	-	-	-	-	-	-	-
Balby Carr	73	21	5	<1	-	Deer <1	-	-	-	-	-	-

Table 6

NOTTS.												
Site name	**Animal species NISP percentages**						**Animal species MNI estimates**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Menagerie Wood	3.8	96.2	-	-	-	-	-	-	-	-	-	-
Staunton	44.7	27.2	13.6	5.8	5.8	Fowl <1 Fox <1	-	-	-	-	-	-
Raymoth Lane, Worksop	38	22.5	5.4	4.5	27.5	Deer <2 Corvid <1 Badg. <1	-	-	-	-	-	-
Aslockton												
LIA	39.8	52	3	4.3	0.2	-	-	-	-	-	-	-
R-B	38.2	48.4	5.7	6.3	1.2	-	-	-	-	-	-	-

'Romanised' urban centres and Roman military sites

Table 7

WEST YORKSHIRE												
Site name	**Animal species NISP**						**Animal species MNI**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Castleford fort												
Phase I	60.9	25.8	10.5	0.7	0.9	Deer 0.4 Hare0.1	-	-	-	-	-	-
Phase II	65	22.9	8.1	1.8	0.4	Deer 0.3 Hare 0.1	-	-	-	-	-	-
Phase III	72.7	13.9	7.2	4.1	0.6	Deer 0.5 Hare 0.1	-	-	-	-	-	-
Phase IV	60.4	18.9	8.5	6.9	1.3	Deer 1.0 Hare 0.1	-	-	-	-	-	-
Castleford *vicus*												
Phase 1	45.7	33	12.8	4.2	4.2	-	-	-	-	-	-	-
Phase 2	44.7	37.7	14.1	0.8	2.1	Deer 0.1 Hare 0.2	-	-	-	-	-	-
Phase 3	59.9	21.6	11.8	0.5	4.2	Deer 0.1 Hare 0.4	-	-	-	-	-	-
Phase 4	52.5	25.3	16.3	1.2	3.7	Deer 0.1 Hare 0.6	-	-	-	-	-	-

Table 8

SOUTH YORKSHIRE												
Site name	**Animal species NISP percentages**						**Animal species MNI estimates**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Doncaster civil settlement	48.88	17.13	10.11	8.99	4.78	Bird 8.71 Deer <1	21	15	13	-	-	-

Table 9

NOTTS.												
Site name	**Animal species NISP percentages**						**Animal species MNI percentages**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Margidunum												
Phase I	-	-	-	-	-	-	33	58	9	<1	<1	-
Phase II	-	-	-	-	-	-	-	-	-	-	-	-
Phase III	-	-	-	-	-	-	44	36	9	<1	2	-
Phase IV	-	-	-	-	-	-	58	19	23	-	-	-

Table 10

DERBYSHIRE												
Site name	**Animal species NISP percentages**						**Animal species MNI estimates**					
	Cattle	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**	**Cattle**	**Sheep**	**Pig**	**Horse**	**Dog**	**Other**
Derventio	51	36.3	10.9	0.5	1.4	Hare <1	-	-	-	-	-	-
Chesterfield	50	3.4	1.2	<1	12.8	Hare <1	-	-	-	-	-	-