CHAPTER 4

THE SOCIAL CONTEXT OF ANIMALS AND EXPLOITATION OF WILD RESOURCES

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INTRODUCTION

Humans exist within ecosystems – they are constantly interacting with other species and are well versed at adapting and manipulating their environment to suit their needs. Animals, in particular, are a key source of evidence for understanding how people engaged with the world around them, as has been demonstrated by a wide range of historical, philosophical, anthropological and geographical studies (Wolch and Emel 1998; Mullin 1999; Ingold 2000; Philo and Wilbert 2000; Fudge 2013). Human–animal interactions are mutual exchanges, which not only represent economic exploitation but also reflect patterns of human social behaviour and identity (Mullin 1999; Armstrong Oma 2010; Sykes 2014, 5). However, zooarchaeologists have been comparatively slow to engage in discourse that considers animals beyond their productive capabilities. While zooarchaeological evidence is often used to explore ancient economics, as we have done in Allen *et al.* 2017, it can also provide opportunities for studying the cultural importance of animals (e.g. Russell 2012; Sykes 2014).

In late Iron Age and Roman Britain, as in most other periods, the manner in which animals were treated reflects specific attitudes to farming, food consumption, trade and exchange, landscape, and social status, as well as expressions of group ideology and religious belief (Grant 1984; Sykes 2009; Morris 2011). Ritual exploitation of animals is, of course, key to our understanding of the cultural or symbolic significance of animals and, although there is some overlap in this chapter, this issue will be covered in more detail in Chapter 5. This section focuses on the social context of human–animal relationships by considering five main themes: livestock farming, the social role of horses, companion animals, the introduction of new species, and wild animal exploitation.

While evidence for differing agricultural strategies was previously considered in economic terms (Allen and Lodwick 2017), differences in farming regimes can also help account for significant variations in social practice and lifestyle. The ubiquity of farm animals in late Iron Age and Roman Britain means that they would have fulfilled a range of social customs – their value as living animals extended well beyond their productive capabilities (Ducos 1978, 54). Drawing upon these data, this section discusses how different methods of farming were related to changing social attitudes towards livestock.

While farmed livestock would have been of major importance to all communities in Roman Britain, interactions with other species would also have shaped human behaviour and experience. The changing role of horses as prestige, religious symbolic and companion animals will be considered here in this context. The role of dogs and cats as companion animals has yet to be fully explored by zooarchaeologists working on Roman Britain. MacKinnon (2010) has reviewed the evidence for dog-keeping in the Mediterranean during this period, concluding that, in general, dogs were fairly well kept and cared for by people. In many societies dogs often form close social relationships with humans, which are manifested in their roles in pastoral farming, as vermin controllers, as guardians, and as household pets. Cats, too, have long and complex histories of living with people. This section will consider the evidence for the treatment of both of these animals.

It is now known that a number of new animal (and plant) species were introduced during the Iron Age and Roman periods (Yalden 1999, 122–9; Van der Veen *et al.* 2008; Sykes 2009; Allen and Sykes 2011; Witcher 2013). Some of these animals may have been completely alien to the native Iron Age population and their introduction probably contributed to ecological changes, which impacted on the existing landscape. The variety of species introduced differed in terms of how, when and why they came to Britain, ranging from deliberately imported exotica to commensal animals that travelled alongside people to exploit human environments. The evidence for certain introduced species and their potential impact on society and the landscape of Roman Britain will be reviewed.

In contrast to farmed livestock, companion animals and imported exotica, wild native animal exploitation has quite different social implications. As Sykes (2014, 51) points out, some of the most important changes in human history have been characterised by the interactions between people and wild animals. Of course, wild animals only became 'wild' once people had domesticated

certain types of animal. In farming societies, the killing of wild animals takes on a different meaning because meat is no longer required from hunted sources (*ibid.*). Nonetheless, hunting, fowling and fishing have continued to be important human pursuits in many cultures, including the Roman world, as evidenced by historical and iconographic evidence (Anderson 1985; Tuck 2005). Part of this section focuses upon the analysis of zoo-archaeological data concerning wild mammals, birds, fish and shellfish, but it also incorporates relevant literary and iconographic evidence for wild animal exploitation in order to broaden the context of these activities and to provide a window into human perceptions of nature, and how people perceived their place within it.

LIFE ON THE FARM: THE SOCIAL CONTEXT OF LIVESTOCK HUSBANDRY

Farming underpinned the everyday lives of the vast majority of the population of late Iron Age and Roman Britain (Allen *et al.* 2017). Individual and group identities were formed around life on the farm, through working relationships with livestock and the cultivation of crops. Yet despite the importance of agriculture in Roman Britain, precious little has been said about the ways in which farming – the exploitation of land, animals and plants for food – was central to social organisation and identity. Taylor (2013) is one of the few to have broached the subject of 'agricultural identities'. Drawing upon evidence for material culture consumption and the use of buildings, Taylor stressed the importance of kinship, agricultural occupation and settlement locality as being of greater concern to local communities than the idea of 'being Roman', which may have been of little consequence to most people (*ibid.*, 186–7). For the majority of people in Roman Britain, rural life would have encapsulated a wide range of activities, the primary goal of which would have been to provide food, and their success depended on overcoming several obstacles. Every farmer would have been responsive to the environment, while economic pressures would have impacted on farming practice. Changing patterns of land tenure after the Roman conquest may also have had a significant effect.

Most late Iron Age and Romano-British farmers engaged in a mixture of cereal and livestock husbandry (Allen and Lodwick 2017). However, it is evident that there was much regional variation in the relative abundance of different livestock and crops across the country. This is shown in FIGS 4.1 and 4.2, which highlight the relative proportions of major livestock and cereal taxa. It is important to note these patterns can be affected by differences in recovery strategies and variations in soil acidity, and are not simply reflections of Romano-British

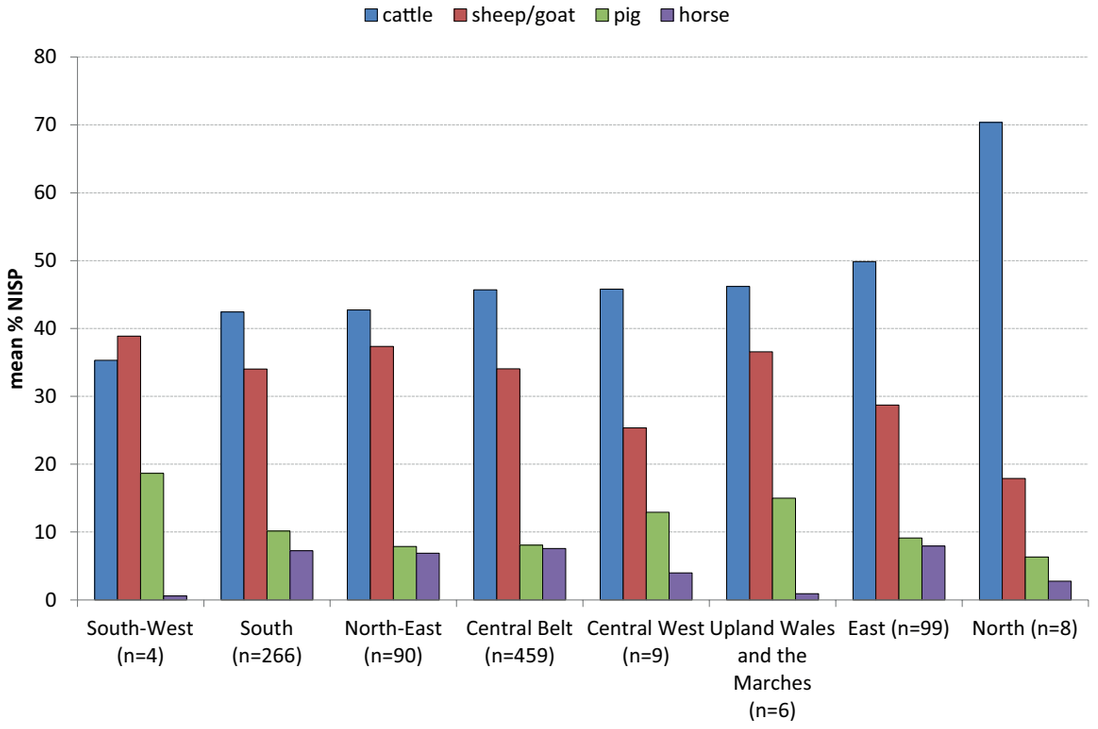


FIG. 4.1. Relative frequency of cattle, sheep/goat, pig and horse bones from rural sites in the eight project regions (n=no. of sites with at least 100 identified specimens (NISP)

farming strategies and consumption patterns (cf. Smith and Fulford 2016, 398). Small sample sizes, particularly in animal bone assemblages, mean that some patterns are not representative of whole regions. Sites in the North, for example, appear to be overwhelmingly dominated by cattle bones. This can be explained by the fact that most faunal assemblages in this region derive from military *vici*, which tend to show evidence for large-scale processing of cattle carcasses (Allen 2017, 122). Many of these animals were probably imported from other sites and were potentially driven over long distances to supply the army (Stallibrass 2009). This observation is important in social terms, as it would suggest that people living in military *vici*, and the associated army garrison, would have had little direct engagement with the livestock being supplied to the settlement, unlike the farmsteads where they were being raised.

In the south and east of England, bio-archaeological data are present in quantities that make it possible to identify individual farming

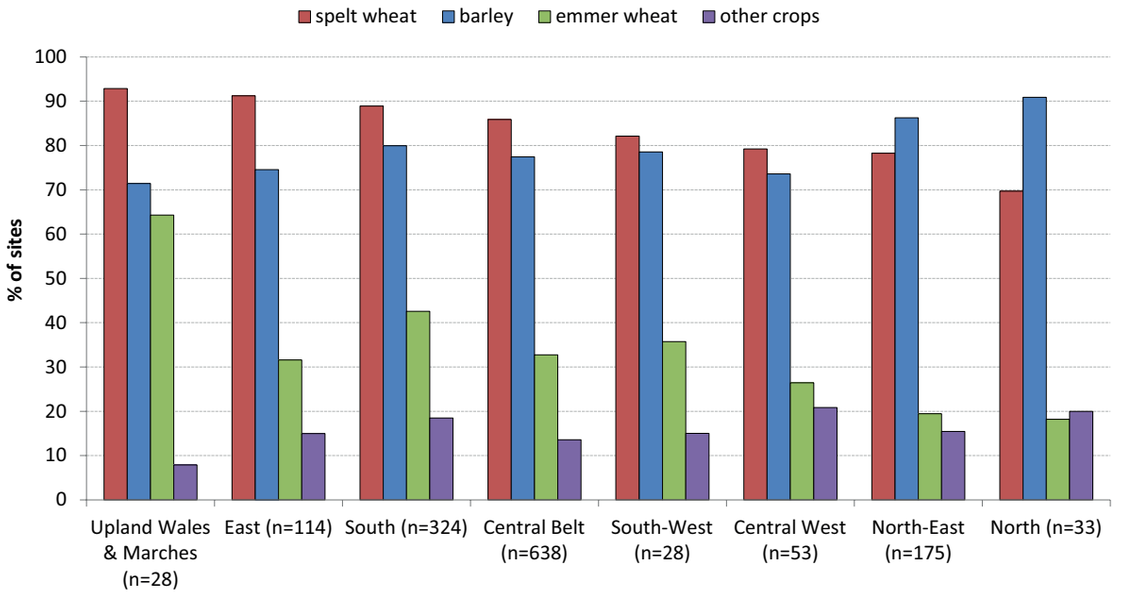


FIG. 4.2. Proportions of sites with evidence for major crops in the eight project regions (n=no. of sites with archaeobotanical evidence)

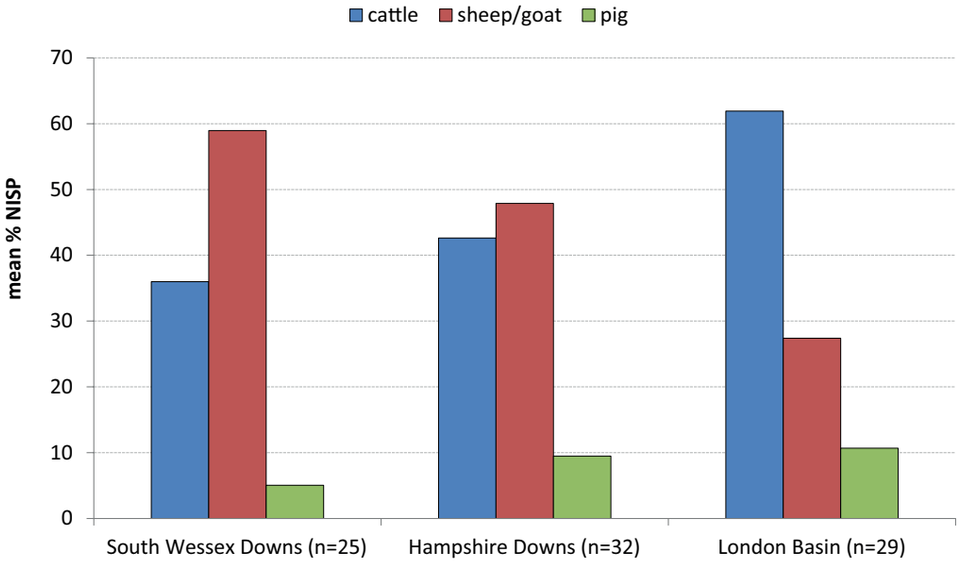


FIG. 4.3. Relative frequency of cattle, sheep/goat and pig bones from rural sites in three landscape zones in the South region

landscape zones. For example, notable differences in the relative frequencies of major livestock species were observed between rural settlements on the chalk downs of South Wessex and Hampshire, and those on the heavy clays and gravel terraces of the London Basin (Allen 2016a, 125–6). FIGURE 4.3 shows the dominance of sheep bones recovered from sites on the South Wessex Downs, with more equal proportions of sheep and cattle bones on the Hampshire Downs, and cattle overwhelmingly dominant in the London Basin. There are also notable differences in cattle slaughter patterns from rural sites in these landscape zones (FIG. 4.4). High proportions of neonates and juveniles have been recovered at rural sites on the South Wessex and Hampshire Downs, whereas they are rare at settlements in the London Basin, where a higher frequency of cattle appear to survive to older ages. Taken together, these livestock frequencies and ageing data indicate that very different strategies of pastoral farming took place in these landscape zones. Furthermore, settlement and landscape evidence in these regions strongly suggest that the Wessex Downs was predominantly exploited for arable, while pastoral farming appears to have been more common in the Middle Thames Valley (Allen 2016a, 129–39). The different ways in which communities in each area farmed the land and treated their livestock may be reflective of strong and perhaps conflicting group identities (Sykes 2014, 12–13).

In Volume 2, the dominant farming strategies of four landscape zones – the West Anglian Plain, the Upper Thames Valley, Kent and the Thames Estuary, and the chalk downland of Wessex – were analysed through the zooarchaeological and archaeobotanical data (Allen and Lodwick 2017). These were supplemented by a fifth case study from Gwynedd in north-west Wales, a region with a distinctive settlement pattern, few environmental data, but with an abundance of landscape and material culture evidence, which shed light on farming practices. In each of these areas it was evident that animal husbandry and arable farming were co-dependent activities. Livestock were essential for maintaining soil fertility through manuring, while cattle appear to have been important as plough animals. Equally, a proportion of cereal produce would no doubt have been utilised as fodder to sustain livestock, particularly through the winter months when fewer resources would have been available. Evidence for hay production in the Roman period also highlights the importance of foddering and the need to maintain herd numbers (Lodwick 2017c, 80–1). In each of the four main case studies, the representation of certain types of livestock was related to specific cereal crops. For example, sheep were notably better represented on the Wessex Downs, where barley also occurs relatively frequently. This was in contrast to the West Anglian Plain, where proportions of cattle increased in tandem with a shift towards spelt wheat cultivation (almost to the exclusion of other cereal crops). It was argued that these variations related to differences in agricultural strategy. The influence of other regional factors also needed to be considered, such as pre-existing Iron Age traditions, local environmental conditions, regional infrastructural developments (e.g. roads), and state demands for agricultural produce.

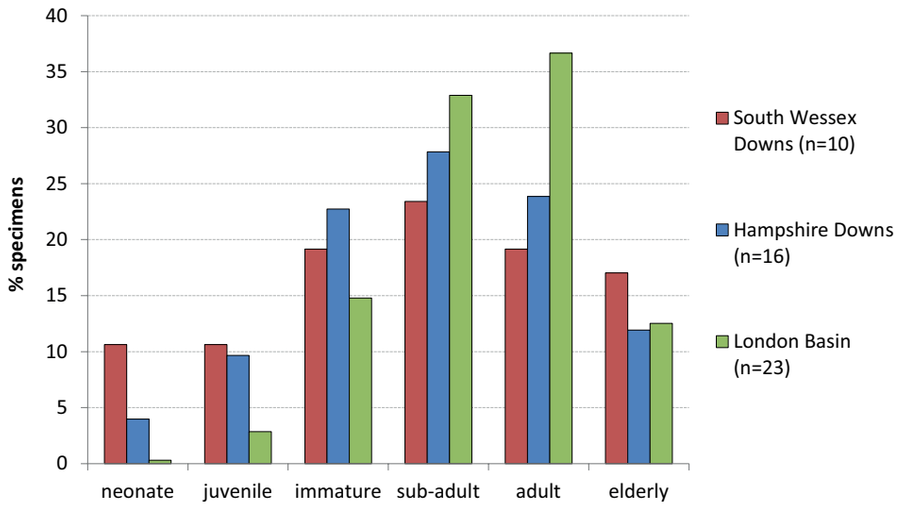


FIG. 4.4. Cattle ageing data from rural sites in three landscape zones in the South region

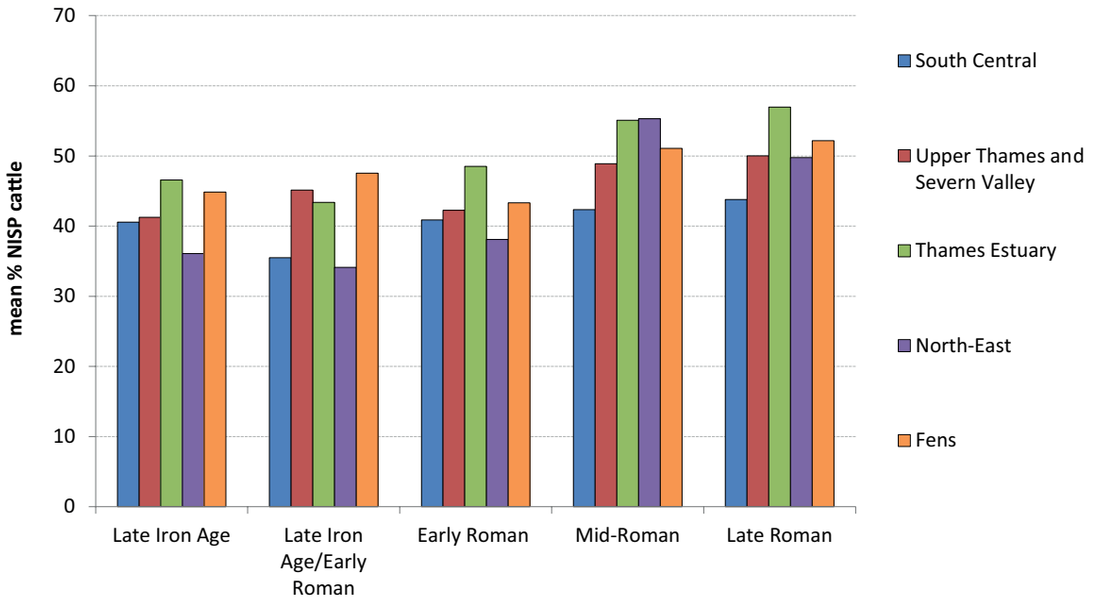


FIG. 4.5. Mean percentages of cattle over time by region (see Volume 2 for definitions of regions and data)

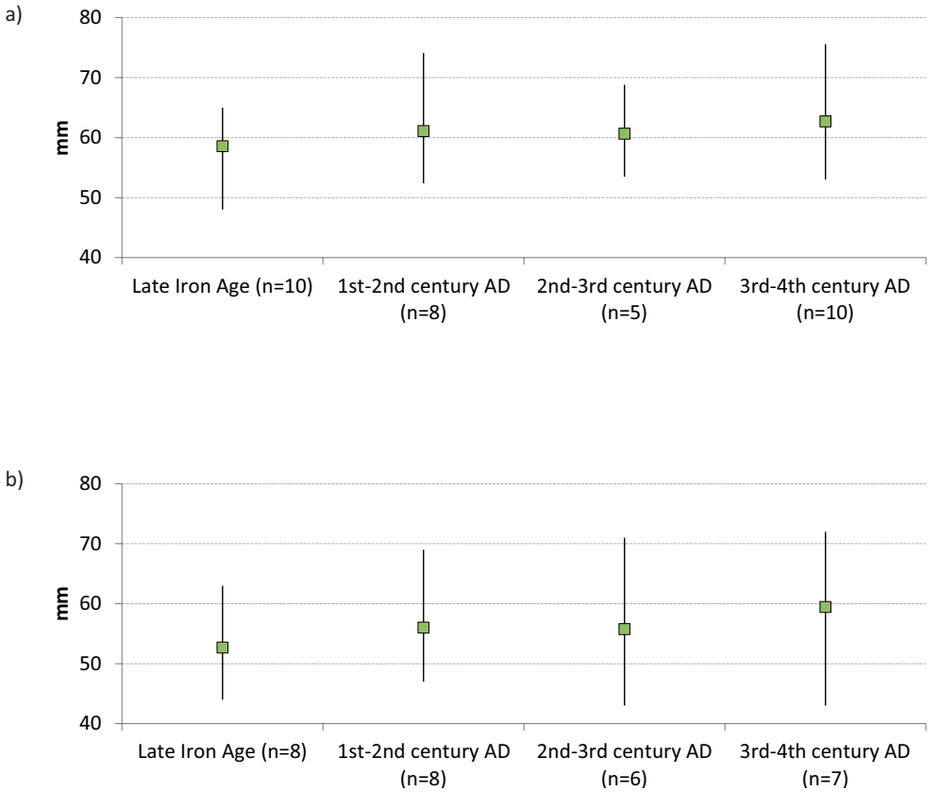


FIG. 4.6. Cattle size over time, shown as (a) mean greatest length of astragalus and (b) mean breadth of distal tibia (n= no. of sites)

THE EXPLOITATION OF CATTLE IN EXTENSIVE ARABLE FARMING REGIMES

In several case study areas of southern and central England, spelt wheat cultivation and cattle husbandry were found to be common and, together, these were argued to reflect extensive arable farming patterns (see Allen and Lodwick 2017, 177). Increased proportions of cattle were observed in many areas, which have largely been attributed to an increased reliance on animal-drawn tillage (Allen 2017, 112). Mean cattle percentages rose from 36–46 per cent in the late Iron Age to 44–57 per cent in the late Roman period (FIG. 4.5). This trend has previously been identified and argued to reflect a widespread response to arable expansion (e.g. Dobney 2001; Albarella 2007).

At the same, there is also good evidence that livestock increased in size. Using data from a range of sites from across England and Wales, FIG. 4.6 shows the average body size increase in cattle (in both height and breadth) from the late Iron Age to the late Roman period (see Allen 2017 for a more detailed overview of these data). Size increases were particularly marked in eastern England, where notably large cattle have been identified at Great Holts Farm, Essex (Murphy *et al.* 2000), Wavendon Gate, Milton Keynes (Dobney and Jacques 1996), Haddon (Baxter 2003) and Orton Hall Farm, Cambridgeshire (King 1996). The importation of breeding cattle from the Continent also appears likely, as evidenced by significant size changes occurring as early as the late first century A.D. at Elms Farm, Heybridge, Essex (Albarella *et al.* 2008). These cattle broadly mirror the sizes of contemporary livestock found in the Netherlands, and it seems likely that they were imported for cross-breeding with native types to produce improved traction animals.

One of the key aspects of extensive arable farming is that it needs a relatively low labour input per unit area of land compared with intensive farming, but increased workforces in busy periods. During ploughing and harvesting seasons, it is possible that households may have needed to co-operate in order to mobilise larger labour forces of people and livestock (Halstead 1996; 2014, 298–9). On the Salisbury Plain, where there is also evidence for arable expansion, the development of extensive village settlements may have been facilitated by co-operative farming strategies on the surrounding chalk downland (McOmish *et al.* 2002; Fulford *et al.* 2006). Given the increasing pressures of land availability under extensive arable regimes, particularly in relatively highly populated areas such as the West Anglian Plain (Smith 2016d), the sharing of resources may have been a viable option for farmers. This is likely to have been important considering the lack of evidence for large granaries on Romano-British settlements, which means that it would have been necessary to move bulk quantities of surplus grain to their intended markets fairly quickly (Smith 2016b, 59; Lodwick 2017c, 68). Labour-sharing also provides opportunities for uneven distributions of wealth. It is possible that, in some areas, the expansion of private estates seeking to maximise profits through arable production utilised coerced labour or even slave labour (Hingley 1989, 128), though clear evidence for this is currently lacking (see discussion Ch. 8, p. 355).

Further evidence for the increasing use of cattle for traction can be found in the apparent rising incidence of trauma and pathological lesions found on foot and toe bones (Albarella *et al.* 2008, 1836; Allen 2017, 112–13). While these lesions may be associated with old age, they are often a sign of increased burden being placed on plough cattle. Such pathologies may also suggest a lack of welfare being afforded to these animals. Where expansive arable regimes were undertaken, cattle would have been economically valuable, but were probably viewed more as 'commodities'. This has also been suggested by Sykes (2014, 15) who argues that, where livestock improvements occur, animals tend to be seen as 'products' that can be manipulated by people according to their own desires.

PASTORALISM AND LARGE-SCALE HERDING

Pastoralism, defined here as the large-scale herding of livestock, as opposed to household herding, is known to have been an important farming strategy throughout prehistory (Halstead 1996). Communities that practise pastoralism tend to exhibit distinctive cultural identities (e.g. Burton 1981; Abbink 2003; Ivarsdotter 2004). In Roman Britain, arable agriculture was the mainstay of the agrarian economy, and the extent to which pastoralism occurred is uncertain. It is possible that communities in the north and west of the province practised traditional pastoral regimes, perhaps using the upland regions on a seasonal basis to rotate grazing – some of these areas are certainly better suited to livestock husbandry than arable cultivation (Stallibrass 2009, 103). However, without additional higher quality environmental data, agricultural regimes in these regions remain largely invisible.

Evidence for pastoral farming may be identified by cropmarks, where long-distance droveways and associated enclosure systems have been identified. One of the best examples of this type of landscape can be found on the Yorkshire Wolds, where aerial photography has revealed land-use patterns that

FIG. 4.7. Three droveway complexes on the Yorkshire Wolds at Kilham parish (a), Langtoft parish (b) and Rudston parish (c) (Giles 2007, 241, fig. 4, after Stoertz 1997)

appear to be suited to large-scale herding (Stoertz 1997, 52–4; Giles 2007, 237). Domestic sites in this landscape are often referred to as 'ladder settlements' owing to their morphological layout, but most have not been extensively excavated (FIG. 4.7). Small-scale excavations at Burton Fleming (Tabor 2009) and Heslerton (Powlesland *et al.* 2006) suggest that some originated in the later Iron Age and were used throughout the Roman period. The site at Burton Fleming is notable because of a trackway that runs for well over a kilometre, curving around the valley slope following the topography of the hillside (Allen 2016b, 261, fig. 7.26). Cropmarks show many of the droveways linking settlements together, and it seems likely that there was a great deal of movement between communities. In pastoral communities, exchanges of livestock and other goods are facilitated through shared customs and are used to invest in kinship ties (Banks 2001; Barfield 2011). These exchanges would have been essential for establishing how the land would have been managed, perhaps requiring inter-communal co-operation.

Environmental evidence indicates that the slopes of the Wolds began to be cultivated in the later Iron Age (Powlesland 2003), and Giles (2007, 246–7) has argued that the evidence for short-fallow cultivation within enclosed plots by the first century A.D. suggests that systems of land tenure began to change over this period. She suggests that increasing land divisions could be taken as evidence of communities becoming more tightly drawn and less inclined to co-operate with regard to the care and maintenance of the wider landscape. This theory is difficult to substantiate, though an increase in cattle may reflect changes in local farming practice. Unfortunately, there are few large animal bone assemblages from rural settlements on the Yorkshire Wolds, though evidence from High Wold, Bridlington, and Melton A63, suggest that sheep were dominant in the early phases of occupation, but with a distinct shift towards cattle in the mid-Roman period, perhaps reflecting an increased emphasis on arable agriculture (Roberts 2009; Fenton-Thomas 2011). The appearance of a few villas on the periphery of the Wolds, such as at Welton Wold, Langton and Rudston, may also indicate a shift towards arable farming (Allen 2016b, 255–6). There is, for example, considerable evidence for bulk-processing of cereal grain at Welton Wold. It is possible that regional changes in land-use disrupted traditional farming patterns and inter-communal relationships (e.g. Giles 2007), though further evidence is required to substantiate this.

While upland areas tend to be suited to extensive sheep husbandry, river floodplains are generally exploited for cattle grazing, particularly as cattle are less susceptible to parasites such as liver fluke. In the Upper Thames Valley, livestock husbandry was central to the agricultural economy throughout later prehistory and the Roman periods (Allen 2017, 91–4; Hambleton 2008, 58; Hesse 2011). Environmental evidence of dung-enriched grasslands and a relative absence of arable weed flora at sites in middle–late Iron Age deposits at Thornhill Farm and Claydon Pike suggest that livestock husbandry may have been fairly intensive prior to the Roman conquest (Robinson 2004, 141; Booth *et al.* 2007, 278). Some innovations in husbandry occurred in the early Roman period at Barton Court Farm, where larger cattle have been identified in second-century A.D. deposits alongside hornless types of sheep (Wilson 1986; see Allen 2017, 104–7, for a review of the significance of polled livestock). It is also notable that Roman settlements in low-lying areas have tended to produce higher proportions of barley than those on the upper terraces, which may be linked to livestock foddering, while hay production appears to have been fairly prevalent (Lodwick 2017c, 80–1).

A major reorganisation of the settlement landscape in the Upper Thames Valley during the early second century A.D. has been suggested to represent changing patterns of land tenure (Booth *et al.* 2007, 374; Smith 2016d, 148). New complex farming settlements became established within a network of droveways and field systems, which may have impacted upon existing patterns of livestock husbandry. Areas of extensive grazing may have been increasingly defined by ditches and trackways, which suggest that access to certain areas of land became more restricted (Booth 2011a). One possible explanation for these changes is an increasing control over agricultural resources. In the Upper Thames Valley, this would almost certainly have been livestock rather than arable surplus (Allen 2017; Lodwick 2017c). Long-term excavations over 75 ha at Gill Mill, Ducklington, Oxfordshire, have revealed the remains of a nucleated settlement, complete with continuous lines of large, rectilinear enclosures running alongside metalled trackways (Booth and Simmonds 2018). The faunal assemblage from the site is overwhelmingly dominated by cattle bone, despite an extensive sieving programme that usually mitigates for biases in the recovery of bones from smaller animals such as sheep and goats (*ibid.*). Halstead (1996, 24) has suggested that faunal assemblages dominated by one domestic species could indicate large-scale herding. Set within its regional context the proportion of cattle bone against other major livestock taxa is among the highest for settlements

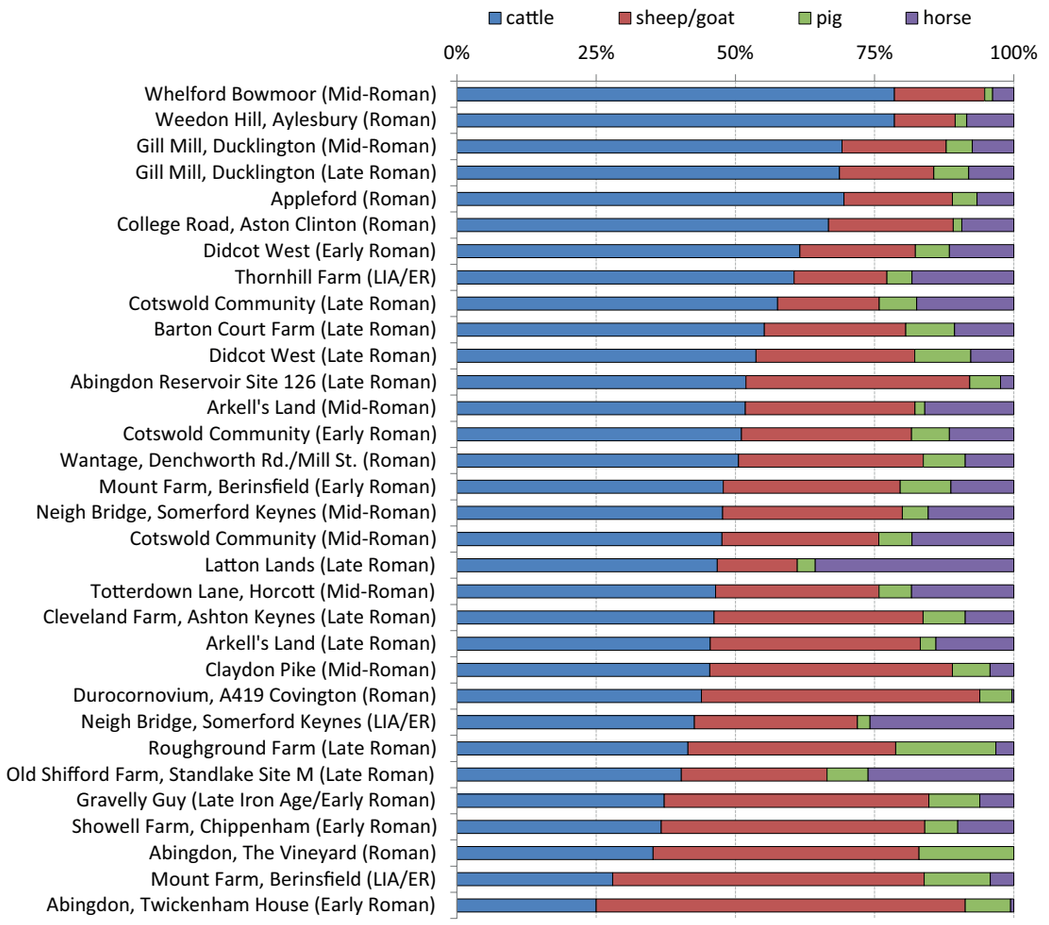


FIG. 4.8. Comparison of relative frequencies of major livestock taxa at nucleated settlements and complex farmsteads in the Upper Thames Valley

in the region. FIGURE 4.8 shows the relative frequency of livestock remains from nucleated settlements and complex farmsteads in the Upper Thames Valley with over 100 identified specimens. Only the farmsteads at Whelford Bowmoor and Weedon Hill, Aylesbury, produced higher frequencies of cattle bone. Gill Mill also produced almost no evidence for cereal processing, which strongly hints that livestock husbandry underpinned the economy of the settlement. Using the available evidence, it has been suggested that the site functioned as a cattle-corralling centre, perhaps as part of a wider estate (Booth 2016, 259–60). This is one of a number of possible interpretations, though the evidence for changing land tenure in this region may indicate that livestock herding was being centralised, possibly for export to towns such as Cirencester, or even further afield to the army (Allen and Lodwick 2017, 174–7).

Organised cattle herding on this scale potentially required the presence of professional drovers, whose job it was to collect livestock from farmsteads and move them between collection points on their way to their intended markets. It is well known that faunal assemblages excavated at the outskirts of towns and at military *vici* are normally dominated by cattle remains, reflecting the regular supply, slaughter and processing of livestock (Dobney 2001; Maltby 2015). Stallibrass (2009) has suggested that cattle were being moved to forts in the north of England, including on Hadrian's Wall, from pastoralists living north of the wall. A contrasting explanation is that cattle were being driven over long distances along the main roads from the Central Belt region, particularly landscapes like the Thames Valley (Allen 2017, 91–4). Cattle may have been moved as part of large collection drives from areas where retired plough cattle were no longer required. The organisation of cattle droving in Roman Britain is poorly understood, though strontium isotope evidence is beginning to show that cattle were being moved around with increasing frequency (Minniti *et al.* 2014), and it is the appearance of professional drovers acting as middle men between rural estates and the army that could have facilitated it.

LIVESTOCK IN TOWNS

While rural communities undoubtedly had close relationships with livestock, it is also worth considering the social importance of animals in urban contexts. As places of relatively dense human populations, towns required regular supplies of livestock for meat and raw materials for product manufacturing (hides, horn and bone). Numerous urban excavations have produced bulk quantities of animal bones, usually far in excess of what is normally found at rural sites (Maltby 2010b; 2015). However, as briefly discussed in the section above, the organisation of urban livestock supply is poorly understood.

In the first instance, the impact of urban demands on the countryside is uncertain and it is not clear how far livestock were driven. The prevailing view of most zooarchaeologists is that cattle were predominantly kept by farmers for traction purposes, for pulling ploughs and carts and producing dung (e.g. Maltby 1984; Dobney 2001; Albarella *et al.* 2008; Allen 2017). There is little evidence that livestock were specifically raised for meat on farmsteads, and it seems likely that urban beef provisioning occurred as a by-product of arable farming. However, the proportions of cattle and sheep bones recovered from rural sites located in the economic hinterlands of Dorchester (Dorset), Winchester, Chichester and Silchester broadly reflect the assemblages that have been excavated from the towns (Allen 2017, 88). It is well known that urban faunal assemblages vary considerably within the same settlement, though it appears that livestock supply to these towns was influenced by local patterns of pastoral farming (Maltby 2010b, 255–63). The high proportion of sheep bones found at Dorchester and at nearby rural settlements is especially notable (see also Maltby 1994, 94–7).

Second, it is uncertain how much of a direct relationship rural farmers had with urban consumers. While it is possible that some rural producers would have been able to exploit free-market trade, it has been argued that such opportunities would have been limited (Allen and Lodwick 2017; Fulford 2017). Instead, agricultural resources may have been aggregated and redistributed at the estate-level, rather than by individual small-holders. O'Connor (1992) has similarly pointed out that urban provisioning in Roman and medieval Britain would have been more complicated than a simple market exchange system. Although a coinage-based economy may have been in place in towns by the second century A.D., facilitating the local redistribution of animals and animal products (e.g. Maltby 1984; O'Connor 1988, 118–19), the mechanism of urban livestock supply remains unclear.

Although it is difficult to understand fully how livestock got from fields to towns, the evidence indicates that urban inhabitants may have had little contact with many of the animals they consumed before they died. Professional butchers may have acted as a buffer between rural producers and the urban consumers. Their presence in towns is indicated by the regular patterns of cleaver marks found on bones, mainly from cattle. These have been excavated in bulk quantities from urban sites, indicating that large numbers of carcasses were being processed rapidly and systematically (Seetah 2004; Maltby 2007). Sykes (2014, 14) suggests that the establishment of towns in Roman Britain may have signalled a complete overhaul in human–animal relationships. In later prehistoric communities, cattle were important as multi-purpose animals reared for dairy and traction and were probably rarely killed primarily for their meat (Seetah 2005, 5). This appears to have been replaced by a value system that focused on meat, hides, horn, bone and marrow, one where livestock were viewed as commodities rather than individuals (Maltby 2007, 72; Sykes 2014, 15).

The establishment of urban environments may have changed the attitudes of some people towards livestock and meat consumption. Symons (2002, 443) suggests many town citizens may never have known where much of the meat they consumed came from. However, urban communities were probably not completely ignorant of all the animals they ate. While the commodification of meat is indicated by the large numbers of heavily butchered carcasses deposited at the outskirts of many towns (Maltby 2010b, 283–7), much would have depended on where individual animals were raised and how they ended up in urban deposits. Towns were undoubtedly net consumers of livestock, yet a certain amount of stock-keeping took place within towns and some animal husbandry may have occurred on land around their periphery (Maltby 1994, 94). There is now increasing evidence of neonatal livestock being found in urban contexts (Ingrem 2012; Maltby 2015, 183–4), as well as signs of herbivore dung (Banerjea 2011, 72–3, 92–3; Robinson 2006, 214). O'Connor (1992, 102) suggests that intensive livestock exploitation is an adaptive strategy, and it is possible that some people saw this as a response to new social and economic conditions brought about by the establishment of towns. Based upon the analysis of biometric and ageing data, Maltby (1994, 94–7; 2010b, 146–52) has forwarded the idea that Winchester was supplied with retired dairy cows. If so, these livestock were probably locally reared under fairly intensive conditions, since milk and cheese are unlikely to have been bulk-produced far from consumer markets.

In much of rural Roman Britain, there is very little zooarchaeological evidence for cattle dairying (Allen 2017, 113), though exploitation closer to towns may have made it more viable.

Signs of tuberculosis appear more frequently in adult human skeletons in the South than in other regions during the Roman period (see Ch. 7). Modern studies of African populations have shown a correlation between *Mycobacterium bovis* infection in cattle and the presence of the disease in the human population (Cosivi *et al.* 1998), and there is some evidence to suggest that inter-species transmission rates are directly related to different husbandry regimes and cross-breeding (Oloya *et al.* 2007; Munyeme *et al.* 2008). Tuberculosis is usually transferred between cattle and people through the consumption of unpasteurised milk. It can also be transmitted through beef consumption, though this is generally less common because of cooking practices. There are no systematic zooarchaeological studies of animal pathologies from Roman Britain, and the prevalence of bovine tuberculosis is poorly understood. However, if the human bone evidence can be taken as a proxy for the distribution of bovine tuberculosis in Roman Britain, this may reflect a higher incidence of cattle dairy consumption in southern Britain, perhaps related to more intensive husbandry practices occurring closer to towns.

A high proportion of juvenile sheep bones has been observed in several major towns and it has been suggested that lamb was considered to be a luxury meat by urban inhabitants (Gidney 2000; Liddle *et al.* 2009; Maltby 2015, 183). While this may be true, such high proportions of young sheep suggest that regular supplies were probably deriving from local flocks being managed under intensive conditions fairly close to the town. Based upon cut and chop-mark evidence, Maltby (2015, 183) has suggested that not all sheep consumed in towns would have been processed by professional butchers; some may have been acquired by individual households, then butchered and eaten on their properties. Whether some of these animals were raised by those people as well is difficult to answer, though some urban sites have produced anomalously high proportions of neonatal sheep bones (Maltby 2010b, 290, fig. 2.228).

Pig-keeping was almost certainly a feature of town life. The identification of neonatal pig bones in several towns attests to pig breeding and rearing in urban environments (Maltby 2015, 184), while preliminary micromorphological data suggest the presence of slurry at Leicester, *Ratae Corieltavorum* (Morris *et al.* 2011, 29). Maltby's (2010b, 203) observation that town pigs tended to be larger than their rural compatriots may be indicative of improved nutrition from stall-feeding; though this may also be accounted for by a preference for male pigs with greater carcass weights (cf. Maltby 1993a, 337; Ingrem 2011, 266). Several studies of urban material of Roman date have shown that evidence for trauma and disease on pig bones is rare (Dobney *et al.* 1996, 45; Maltby 1979, 59; Strid 2011, 11). Where the occasional example has been found it tends to indicate periods of healing (Ingrem 2011, 259, fig. 123). This may suggest that pigs were fairly well kept and cared for in towns, though until more systematic studies of pathologies are undertaken it is uncertain whether the urban pattern differs from that in rural assemblages.

Chickens are another animal that were undoubtedly kept in towns, as attested by the relatively high proportions of domestic fowl bones recovered from urban deposits (Maltby 1997). While they were clearly husbanded for meat and eggs, chicken imagery from Roman contexts suggests that they also performed other roles as religious icons, animal sacrifices, and were kept for cock-fighting (Henig 1993, 92–4; Sykes 2012; see Ch. 5). Since chickens are non-native to Britain, having been imported in the Iron Age, these animals will be assessed in more detail below (p. 99), in the discussion of introduced fauna.

DISCUSSION: THE SOCIAL CONTEXT OF LIVESTOCK HUSBANDRY

The identification of agricultural strategies can increase our understanding of local and regional economies, but it can also provide evidence for social attitudes and group identity. During the Iron Age in southern England, cattle were multipurpose animals, generally kept under non-intensive conditions for traction, breeding and dairy (Hambleton 2008, 65). Overall, cattle do not appear to have been kept primarily for meat, and their slaughter probably only occurred in exceptional circumstances. The care and attention afforded to cattle in this period is also evidenced in the way that their carcasses were butchered, predominantly with knives used for careful dismemberment (*ibid.*, 62). This evidence mirrors anthropological studies of modern agro-pastoral societies where livestock are respected as part of human communities, and are central to many of the social exchanges that take place (Zohary *et al.* 1998; Abbink 2003).

After the Roman conquest, southern England witnessed an expansion of arable cultivation, a change that may have begun in the late Iron Age in some areas (M. Jones 1996). The increasing use of cattle for traction is indicated by the evidence for older and larger animals (Albarella *et al.* 2008; Allen 2017, 100). Based on the controlling and servile nature of plough equipment and the

heightened stress placed on the body, Sykes (2014, 42) argued that the intensive use of cattle for traction highlights a human perception that these animals were effectively thought of as no more than slaves. The apparent increase in cattle foot pathologies seen in Romano-British faunal material (Albarella *et al*. 2008, 1836) also suggests that working animals were treated in a way that caused discomfort. However, this is not to say that herdsmen on the West Anglian Plain or the Wessex Downs did not care for their cattle. On the contrary, their success, indeed their survival, was based on their ability to work together, and it is worth noting that although cattle were probably feeling the pain of increased workloads, the same may have been true of some of the human population. Incidences of spinal and joint degeneration caused by exposure to physical activity have been shown to have been relatively high in Roman Britain compared to earlier periods (Roberts and Cox 2003). Rohnbogner (Ch. 7) has found pathological evidence in adult males that is consistent with accidents related to agricultural labour and working with traction animals. Spinal traumas sustained through falls are common in the East region, while rib fractures caused by blunt force impacts were more prevalent in the South and Central Belt. It would seem that people and cattle began to suffer more from the agrarian changes occurring in the Roman period.

The greater numbers of plough cattle needed for arable expansion would have required increased maintenance, particularly since they were living for longer. It is suggested above that, for this to work, cattle may have become a shared resource. Co-operative livestock management could reduce the pressures of animal maintenance on individual households. It is possible that cattle were being increasingly managed at the estate (villa?) level rather than from individual farmsteads. Evidence for large-scale livestock management at Gill Mill, Oxfordshire, may suggest that cattle were being removed from farmsteads to be trafficked and sold on. Strontium isotope evidence is also beginning to show that cattle were being moved around the landscape with increasing frequency in the Roman period (Minniti *et al*. 2014). The large numbers of cattle bones found in towns and military sites show that there was a great demand for livestock (Seetah 2005; Maltby 2007), and at these consumer settlements we begin to see the commodification of livestock. Butchery patterns clearly change to reflect the rapid and systematic dismemberment of carcasses. There appears to be very little consideration for the individual animal, and it is worth highlighting the discovery of cattle skulls at Vindolanda with numerous square holes made by ballista bolts (Birley 2009, fig. 62). It would appear that Roman soldiers in northern England used livestock as target practice. Regardless of whether these animals were slaughtered prior to being shot, it is inconceivable that such brutal acts would be carried out by a farmer who raised livestock. Clearly, different social groups treated and cared for animals in very different ways.

The agricultural changes in the Roman period may not have been restricted to arable farming and cattle management, but possibly affected other livestock species as well. At Elms Farm, Heybridge, in Essex, Albarella *et al*. (2008) showed quite clearly that sheep, pigs, horses and even chickens all increased in body size after the Roman conquest. While the increase in cattle body size might be related to an emphasis on traction, this cannot explain why other animals also got bigger, though horse breeding may have been related to transport requirements (see below, p. 91). It is notable that when significant changes in livestock husbandry regimes occur in other places and periods, they are usually also associated with social and demographic changes (Albarella 1997; Thomas 2005). Sykes (2014, 48–9) points out that it is worth considering these shifts in terms of cultural ideology. For example, in early modern England, the intensive breeding of larger livestock served to represent the status and social standing of their owners, and many breeds were regularly displayed at markets and in shows (Ritvo 1987). This is not to say that Romano-British animal 'breeds' were sent around the countryside for public display, but it is possible that the appearance of new livestock types was also related to changing social structures and attitudes towards agricultural resources.

While changes in farming practice were occurring in the south and east of England, it is worth considering the situation in the north and west regions of the province. In the South-West, Upland Wales and the Marches, and the North, most people in rural communities lived in fairly small enclosed farmsteads, with little sign of change in settlement types or building styles (Brindle 2016a–c). Although zooarchaeological evidence is sparse in these areas, phosphate analysis from areas within several farmsteads in Gwynedd suggests that people and livestock were living in close proximity. Whether these were cattle, sheep, goats or pigs is uncertain. However, the evidence for close living arrangements strikes a chord with Armstrong Oma's (2010, 181–5) study of Scandinavian longhouse communities in the Bronze Age, where people and livestock also shared internal living spaces. Here, the daily routines of milking, feeding and grooming could be undertaken, with mutual trust being developed

between person and animal. Armstrong Oma (*ibid.*, 182) highlights the fact that milking requires 'a calm and comfortable atmosphere to encourage the animals to relax and let down their milk', and presumably similar conditions are required for other activities, such as wool shearing, breeding and birthing. Shepherds, for example, require intimate knowledge of their flock, knowing when ewes come into heat and when to allow (and encourage) the ram's access to them (*ibid.*, 183).

Overall, it is clear that a better understanding of agricultural strategies can inform upon some aspects of lifestyle and social practices. In many areas of Roman Britain, livestock may have been considered as little more than commodities to be exploited and sold off when their economic value had reduced. This certainly seems to have been the case once livestock had entered urban and military environments, to be unceremoniously slaughtered and butchered, though this is likely to have differed from farming communities themselves, where people and livestock spent their whole lives together, building up mutual trust and emotional connections. It is argued here that such differences would have contributed to the various agrarian identities present in the countryside of Roman Britain.

THE SOCIAL ROLES OF HORSES

Horses were exploited for a range of activities in late Iron Age and Roman Britain, enhancing travel and transport and performing vital roles on the farm. They were also a key element of the *cursus publicus*, ensuring the functioning of state administration and communication across and beyond the province. While the economic importance of horses throughout this period is not in doubt (Allen 2017, 124–31), the considerable time, resources and care that are involved in their upkeep means that they would have formed close social relationships with the people who bred, reared and rode them. Horses would have been used for social recreation, particularly as rides for hunting, and some may have been involved in aspects of public entertainment. The circus at Colchester appears to have hosted chariot-racing (Crummy 2008), while Fulford (1989b, 187–9) has suggested that the high number of horse bones found in the Silchester amphitheatre perhaps represents equestrian spectacles. Clearly horses fulfilled a variety of roles in everyday life, yet there is evidence that the status and perception of the horse altered between the late Iron Age and the Roman period as the province underwent social, political and economic change.

THE HORSE IN THE LATE IRON AGE: SYMBOLS AND STATUS

The frequent depiction of these animals on late Iron Age coins provides some insight into how much they were revered as icons worthy of incorporation into elite imagery. Green (1993, 8–14) has highlighted the common depiction of horses alongside the sun and chariot wheels on many coins, and has interpreted these as representing mythological histories, perhaps involving a solar cult or sun god (see also Green 1992, 46). Creighton (2000, 65–6) has also pointed out the frequent horse imagery on Iron Age coins, and suggests that the animal reflected high-status notions of power. Although horses were primarily used for transportation, they would also have played a central role in warfare, and the use of horses to pull chariots during this period may have provided a context for their association with elite activity (Cross 2011, 191). If, as it seems, the horse was an important cultural icon during this period, it may have been its physical attributes that elite groups were seeking to highlight and associate themselves with; the ability to travel at speed would have been essential for maintaining power and communication over large territories.

At Bury Hill, Hampshire, a middle to late Iron Age hillfort in the Test Valley, horse bones accounted for about 50 per cent of the overall faunal assemblage, becoming comparatively more abundant in the later phase (Hamilton 2000a). The significance of this assemblage is brought into sharper focus when considering the quantity and array of horse fittings and riding gear that were also recovered from the site (Cunliffe and Poole 2000, 62–3). The focus on horses at Bury Hill may have a ritual element, but it suggests a link between riding and high-status groups during this period. It is also notable that these animals were from local stock, as indicated by strontium isotope analysis of horse teeth from the site, though the presence of a non-local animal from a nearby site at Rooksdown suggests that some horses may have travelled over considerable distances during this period (Bendrey *et al.* 2009, 148).

The evidence just outlined provides an impression that the use of horses was elite-controlled to some degree, although there is some debate surrounding the logistics of horse-breeding during the Iron Age. Previously, a lack of reported neonatal horse remains on Iron Age sites led Harcourt (1979) to suggest that horses were not deliberately bred by people, but instead were seasonally rounded up from feral herds and managed from these sites. This view continued to find some support, most notably from Grant (1984), who interpreted the apparent prominence

of male horses at Danebury as evidence for a lack of controlled breeding. More recent finds of perinatal horse remains on Iron Age sites, however, indicates that controlled breeding may have taken place in some areas (e.g. Powell and Clarke 1996; Mulville and Levitan 2004, 472). The dataset from the current project shows that around 15 per cent of late Iron Age sites with evidence for neonatal livestock include bones from immature horses (Allen 2017, 127, fig. 3.50). While these data show that horses probably were deliberately bred at settlements in the Iron Age, the proportion of sites with immature horse bones doubles into the Roman period, featuring on around a third of early Roman and late Roman sites. This suggests that horse-breeding was a comparatively restricted activity during the later Iron Age, which perhaps reflects the special status of the horse during this period.

THE CHANGING STATUS OF THE HORSE IN ROMAN BRITAIN

It is difficult to assess the impact of the Roman conquest on the use of horses. Horse bones are found on the vast majority of rural settlements, and usually contribute between 5 and 10 per cent of most faunal assemblages relative to cattle, sheep/goats and pigs. There are notable regional and chronological differences in the relative proportions of horse bones, which become less abundant on rural settlements after the late Iron Age in the Central Southern and the North-East case study areas, while the opposite is true in the Fens and the Thames Estuary and London Basin areas (Allen 2017, 124, fig. 3.47; see also fig. 3.1 for case study areas in question). The reasons behind these changes are not easy to explain, but are probably complicated by a variety of regional factors.

King (2001, 216–17) has suggested that the Roman conquest brought about an end to the eating of horse meat in Britain. The Romans are thought to have detested its consumption (Pascal 1981, 268), which perhaps provides a context for the lack of evidence for horses being eaten during the Roman period (Cross 2011, 194). However, there is no strong zooarchaeological evidence that horses were consumed before or after the conquest, or that there was a change in cultural attitudes in this regard. Often, cut and chop marks on horse bones are not systematically recorded and quantified, so it is difficult to assess the prevalence of horse butchery over time or the reasons why their carcasses were processed (e.g. skinning, etc.). A few Romano-British rural sites have produced horse bones with filleting marks indicating that the meat may have been eaten (Buckland-Wright 1987; Strid 2015), and Maltby (1989a) has suggested that horses could have been raised for their meat at the early Roman settlement at Easton Lane, Hampshire. Certainly, horse bones are often relatively abundant on rural sites compared with urban settlements (Allen 2017, 124–5; Maltby 2016). However, instances of horse butchery cannot be taken as evidence that horse meat was a common element of the Romano-British diet, and in some cases a ritual or sacrificial explanation for its consumption may be apparent (Cross 2011, 197–200).

The increase in the proportion of Roman-period sites with immature horse bones perhaps indicates that the rearing of young horses became more widespread in the countryside. Not all sites with immature horse bones were necessarily engaged in horse-breeding, owing to the fact that some long bones do not fuse until the animal reaches four years old. However, perinatal horse bones have been identified at several rural settlements (Allen 2017, 126). Horse breeding and rearing requires stabling, though there is remarkably little evidence for such buildings on rural settlements (Smith 2016b, 57). This no doubt owes much to difficulties in interpreting the function of buildings, though there are increasing signs that environmental evidence for stable manure can illuminate the subject further (Hall and Huntley 2007, 54; Large *et al.* 2009, 52–3). The arrival of the Roman army would also have created a demand for horses, perhaps requisitioning or purchasing young animals from rural settlements. That the military trained and broke their own horses is indicated by the discovery of the *gyrus* at the Lunt Fort, Warwickshire, which is the only known cavalry training arena in Britain (Hobley 1975).

The expansion of arable and pastoral farming in Roman Britain may have increased the need for more horses at some rural settlements, particularly in southern, central and eastern regions. The increase in the relative abundance of horse bones at rural sites in the Thames Estuary and London Basin region is notable (Allen 2017, 124, fig. 3.27), and may reflect the development of cattle-droving in lowland areas (e.g. Allen 2016a, 130–5). The fact that horse bones outnumbered pig bones at the probable cattle-corralling centre at Gill Mill, Oxfordshire (Booth 2016, 258), may be a testament to the role that horses had in moving herds over longer distances, as the marketing and supply of livestock to towns and military sites developed. The expansion of larger, complex farmsteads from the second century A.D. may also have required an increased contribution from horses as working animals; in most areas, horse remains were relatively abundant on complex farmsteads compared with enclosed farmsteads

(Allen 2017, 125, fig. 3.49). Horses were undoubtedly important for transporting people, but their use as pack and traction animals in Roman Britain is not well understood. Cattle are thought to have been the predominant draught animal (*ibid.* 112–13), though horses may have had a minor role in moving goods and produce around settlements and on the road.

Hipposandals may be one indicator for the use of horses on the harder surfaces of metalled roads and potentially on the plough (though it is possible that ox-sandals were worn by cattle). Hipposandals are a distinctive type of Roman horseshoe consisting of an iron plate with side wings, a narrowed, hooked back and a raised looped front, which allows the shoe to be tied to the foot of the animal (Manning 1985, 63–6). The iron underside undoubtedly protected the hoof against hardstanding surfaces, but the fact that some horseshoes also had grooved undersides suggests that they were made to help prevent slipping on wet and/or muddy ground (Crummy 2011, 61). It is perhaps unsurprising that hipposandals are most common at military *vici*, being recovered from 7.5 per cent of sites, compared to 6.8 per cent of villages, 2.5 per cent of roadside settlements, 1.2 per cent of villas and 0.3 per cent of farmsteads. The importance of equids (including donkey and mules) to the military is in little doubt, though these protective implements were important enough for their use to spread to other types of settlements in the countryside.

As noted above, horses probably played a role in hunting activities, though direct evidence for this in Britain is lacking. Hunting on horseback is depicted in classical imagery including mosaics, such as those at Piazza Amerina in Sicily, wall paintings and sarcophagi motifs, which show the rural elite chasing and spearing deer, wild boars and other wild animals (Tuck 2005). Evidence for a hunting element involving horses in some cult practices in Roman Britain has previously been suggested by King (2005, 347–8), who highlighted an association of the bones of horse, dog and red deer in ritual deposits at Bancroft villa, Milton Keynes, and horse and dog bones at Folly Lane, Verulamium, Hertfordshire. At Fishbourne, West Sussex, the second-century A.D. burial of a horse with the skull and foot bones from a red deer (presumably representing the skin of the animal) possibly signifies the interment of a horse used for hunting (Allen 2011, 238–9).

SUMMARY: THE HORSE

Horses were evidently important in Roman Britain for their role supporting the local and provincial economies, but it is clear that they also fulfilled a range of social roles. Their status as symbols of power and high-status identity in the late Iron Age is demonstrated by their frequent depiction on coins. The Roman conquest brought about a change to the political status quo, and with it an end to the use of the horse as an icon of elite culture. This appears to coincide with the more widespread evidence for horse breeding and rearing, perhaps reflecting the possibility this activity was not as controlled as it once was. Economic demands for horses may also have influenced this change, particularly in the use of the horse on the farm and for travel between settlements, but also to supply a growing demand from the state, for the *cursus publicus* and the army, and, on a much smaller scale, for performances in the amphitheatre and the circus.

There is very little evidence for the consumption of horsemeat, and the dataset is not currently able to show whether a change in attitudes towards hippophagy occurred between the late Iron Age and the Roman period as has been previously suggested. Butchery marks on horse bones have been found at some sites, though this does not necessarily indicate that the meat was being eaten, and in cases where it was, this may have been undertaken under special circumstances. Future work requires greater attention from zooarchaeologists to record and report butchery marks on horse bones using standard protocol. Evidence of pathologies will also go a long way to understanding how horses were treated (both positively and negatively) by the people in different parts of the province, in different types of settlement, and whether attitudes to horse-care changed over time.

PETS OR PESTS? DOGS AND CATS IN ROMAN BRITAIN

Perhaps more than any other animals, dogs and cats are seen today by western society as the most quintessential companion animals. Our attitudes to pet-keeping can often be seen as a barometer for wider social and cultural attitudes (Serpell 1996, 125–43; Sykes 2014, 139–46). However, the social relationships between people and dogs and cats have not always been as close as they are today. The role of both species in late Iron Age and Roman Britain would have formed part of a much longer and complex history of living with people. This is not only glimpsed through the study of faunal remains, but also, in the Roman period at least, through representative artwork and even the imprints of cat and especially dog paw prints on wet ceramic tiles, which are a persistent, if uncommon, find among Roman artefact assemblages (cf. Cram and Fulford 1979).

DOGS IN LATE IRON AGE AND ROMAN BRITAIN

People and dogs are particularly suited for co-habitation, especially with regards to food acquisition, though it may not always have been the case that dogs in Roman Britain were considered as companion animals. Dogs can be bred or exploited for economic activities such as livestock herding, hunting or vermin control, though they are also able to exploit human environments, for example, in scavenging food from settlements (Morey 2010, 81–5; Russell 2012, 211). The full range of contexts must be considered when examining dog remains.

Compared to the major domestic livestock mammals, dog remains are scarce. Where they have been identified, dog bones average between 2 and 4 per cent in faunal assemblages dating between the late Iron Age and the late Roman period (FIG. 4.9). However, the fact that dog bones occur in over 80 per cent of assemblages across the same period shows that they were fairly common animals and would have been present on most rural settlements. The disparity between the high proportion of sites with dogs and their low relative frequency relates to the fact they were not regularly eaten. It should be pointed out that butchered dog bones are more frequently encountered at rural sites (Clark 2012, 173–4), though this need not imply that dog meat was being consumed (see below). There is little variation in the proportion of sites with dog bones between different settlement types (FIG. 4.10a). It is also worth pointing out here that there is very little regional variation in the proportion of sites with dog remains, though they appear to be most common in the South region and become less common further north.

However, simply treating all dogs as a single, homogeneous group of animals is misleading (cf. Clark 2012). These animals fulfilled a variety of roles on human settlements, and people's attitudes

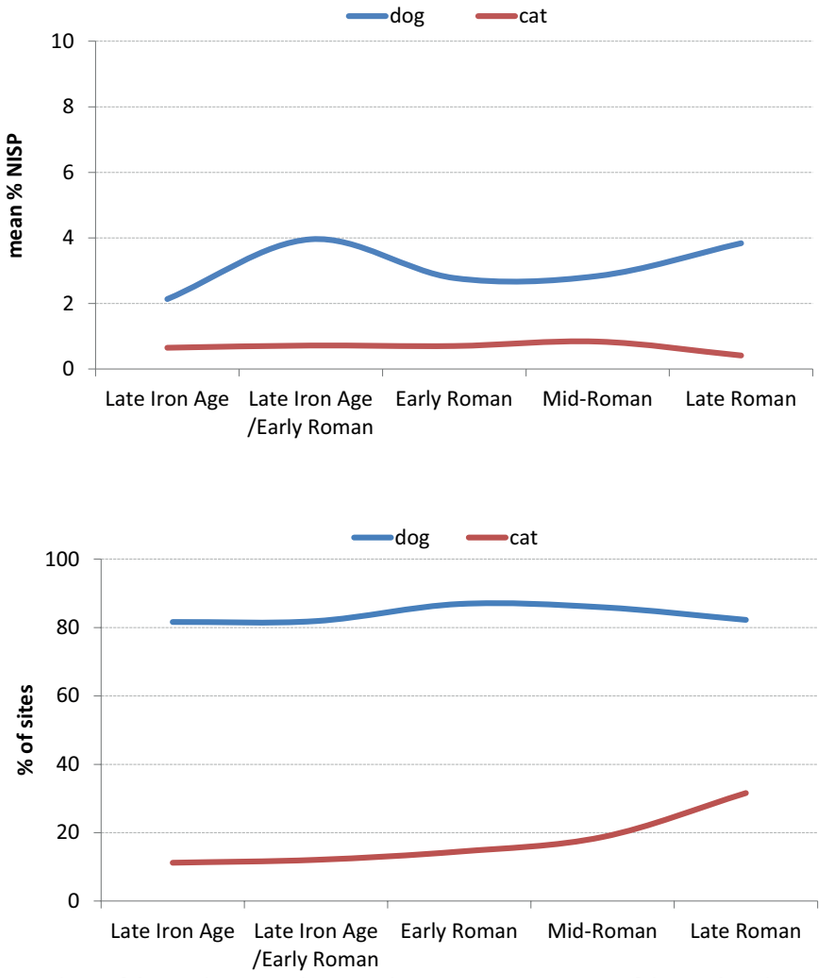


FIG. 4.9. Proportions of dog and cat remains over time: mean percentages of dog and cat bones against cattle, sheep/goat, pig and horse (only assemblages with dog or cat bones present in assemblages with a total of 100 NISP), and the percentage of sites with dog and cat bones present (only assemblages with over 100 NISP)

towards them differed accordingly. Biometric analysis of remains from a late Iron Age/early Roman settlement at Selhurst Park, West Sussex, showed that two distinct dog sizes were present, perhaps representing different types (Allen forthcoming). It was noticeable that some of the bones from the larger type were butchered, while bones from the smaller dogs did not exhibit cut marks, suggesting that the two were treated in very different ways. It is possible that the larger bones derived from wolves or hybrids, though the bone measurements fell within the range of large Romano-British dogs (Clark pers. comm.). Similarly, a large canid humerus from an early Roman feature at Nettlebank Copse, Hampshire, has fine cut marks suggestive of defleshing and perhaps skinning (Hamilton 2000b).

It is now widely accepted that dog-breeding intensified in the Roman period. This is based upon biometrical evidence showing that dogs increasingly varied in size in several provinces, including Britain, after being subsumed by the Roman Empire (Harcourt 1974; Clark 1995; 2000; Bartosiewicz 2000; Cram 2000; De Grozzi Mazorin and Tagliacozzo 2000; Bennett and Timm 2016; MacKinnon 2010). The appearance of both large 'fighting' dogs and small 'lap' dogs is often cited in the literature as evidence for the appearance of specific dog breeds (e.g. Clutton-Brock 1999, 60). As Sykes (2014, 142–4) points out, however, in most cases it is difficult to appreciate how these animals were exploited, considered and treated by people. There is increasing evidence for very small dogs in Roman Britain, particularly at rural sites such as Camp Ground (Higbee 2013) and Longstanton site XX (Evans *et al.* 2006) in Cambridgeshire, and Dicket Mead in Hertfordshire (Rook 1986). Most zooarchaeologists refer to these as pet 'lapdogs', though they may just as easily have been working ratters (Clark 2012, 165–8; Sykes 2014, 143). However, does this mean that the animal was any less cared for by its human companions? Burial contexts sometimes provide useful information.

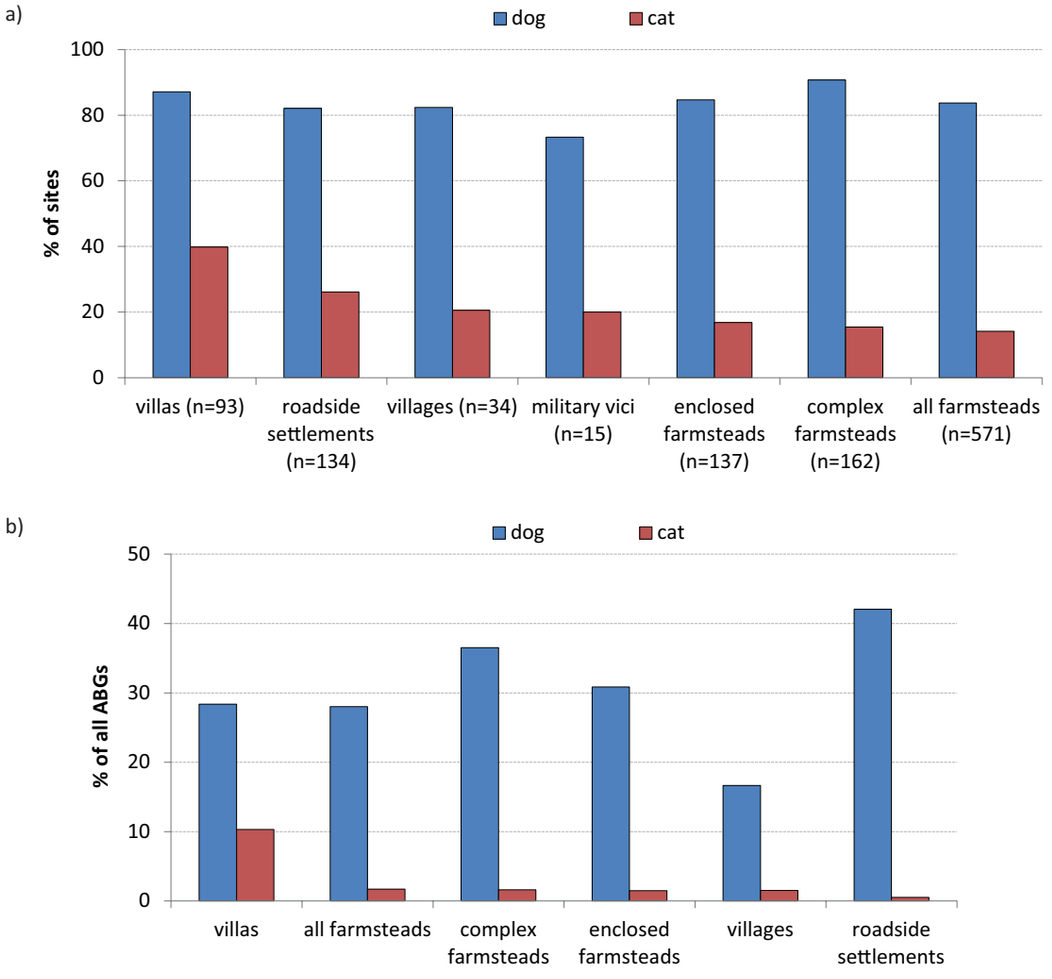


FIG. 4.10. Percentage of sites with dog and cat remains by site type (a) (only assemblages with over 100 NISP) and percentage of dog and cat Associated Bone Groups found at different site types (b)

For example, a very small dog was placed in a fourth-century A.D. human-sized grave at Leicester (Baxter 2002), while another example at Stanwick, Northamptonshire, was buried within its own cist grave (Crosby pers. comm.). In contrast, at Keston villa, Kent, the remains of two cremated lapdogs had been placed in a 'ritual shaft', a deposit claimed by the excavator to have had chthonic associations (Fox 1967; Philp *et al.* 1999).

One area of study that is increasing our understanding of human-dog relationships is isotope analysis. Dogs are often sampled to provide baseline data by researchers hoping to examine human diets, but Sykes (2014, 141–2, fig. 7.2) has shown that these data are also useful for showing linkages between people and dogs. By aggregating nitrogen isotope data from human and canid bones dating between the Mesolithic and the medieval period, the closest average values in both species occurred during the Roman period. While there is a considerable amount of variation within these data, human and dog diets appear to have been more similar in Roman Britain than at any point previously, both apparently being high in protein. While it could be argued that Roman dogs were able to access more meat and bone at human settlements, it is also possible that a degree of food-sharing was occurring.

Comparing animal burials provides some indication of human attitudes towards different species. FIGURE 4.11 shows the proportion of rural sites with evidence for articulated remains or associated bone groups (ABGs) of dogs, cats and sheep/goats, where these taxa have been identified. These data indicate that when dog bones are present at late Iron Age and Romano-British rural settlements, they are found as articulated deposits twice as often as when cats are found. It is possible these data are affected by poor recovery, which would bias against the generally smaller and more fragile bones of cats. However, it is also possible that dogs were more often interred in discrete burial contexts, reflecting an element of human emotional consideration, which would help to preserve their skeletons in articulation. Animals that were, perhaps, less ceremoniously deposited in open ditches, seemingly along with other domestic waste, are far less likely to be recovered as associated bone groups.

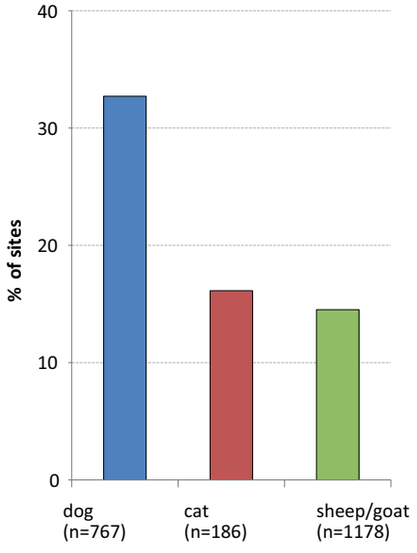


FIG. 4.11. Percentage of sites with dog, cat and sheep/goat Associated Bone Groups (only assemblages with over 100 NISP)

Morris (2011, 67–71) has shown that dog burials were the most common type in the Roman period, marking a change from the Iron Age when other species tended to be favoured. However, this pattern is heavily influenced by deposits in urban settlements, such as Dorchester in Dorset, where large numbers of dogs were found to have been placed in shafts or wells (*ibid.*, 86–90). As Sykes (2014, 142–3) points out, many of these burials are unlikely to have been animals that were cherished pets (see below). At rural settlements, dog burials are slightly less common immediately after the Roman conquest, and then they gradually increase into the late Roman period (FIG. 4.12). However, these data vary when different settlement types are considered. Dog burials form a high proportion of ABGs at roadside settlements, showing similarities to the urban pattern (FIG. 4.10b).

That some dogs were kept as working animals on farmsteads is implied from the evidence for pathologies. A brief survey of pathology data from the South region shows that evidence for trauma, mostly healed fractures in dogs, outnumbers other types of pathologies on farmsteads, whereas the distribution is more equal on other types of settlement (FIG. 4.13). It is also notable that evidence for healed fractures is comparatively rare at villas, where dogs may have been less exposed to the rigorous daily routine of farm life.

It is possible that dogs living in urban environments would have been treated differently from those in the countryside. As noted above, many dogs have been recovered from abandoned wells and pits in towns (Fulford 2001), and some of these have been interpreted as sacrifices associated with foundation deposits (Woodward and Woodward 2004). This may be true, but it is worth considering other evidence from the skeletal remains to highlight what life might have been like for dogs living in towns. Of 23 dog skeletons excavated from *Noviomagus Reginorum*, the *civitas* capital at Chichester, West Sussex, 12 showed signs of pathology and trauma, with some exhibiting signs of multiple fractures (Levitan

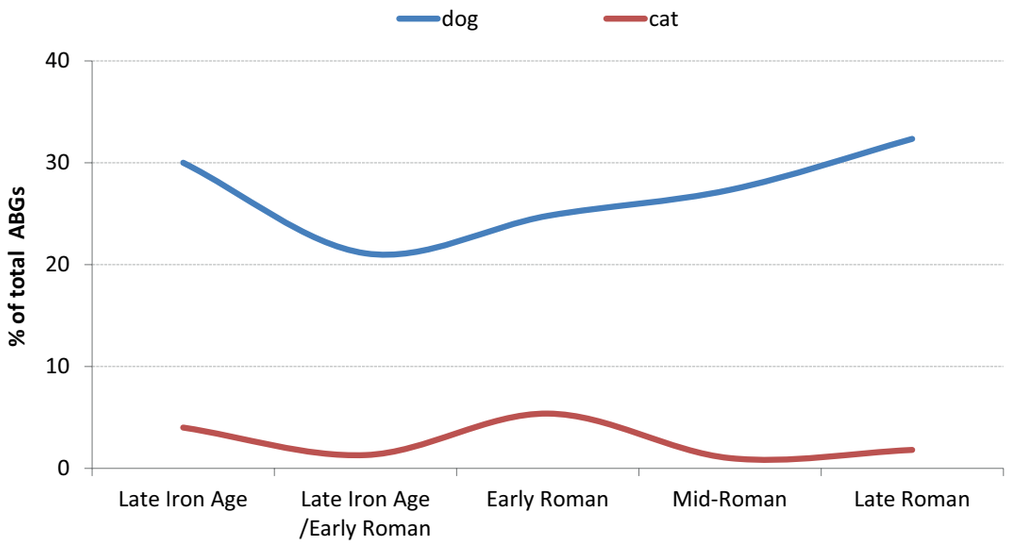


FIG. 4.12. Proportions of dog and cat Associated Bone Groups at rural settlements over time

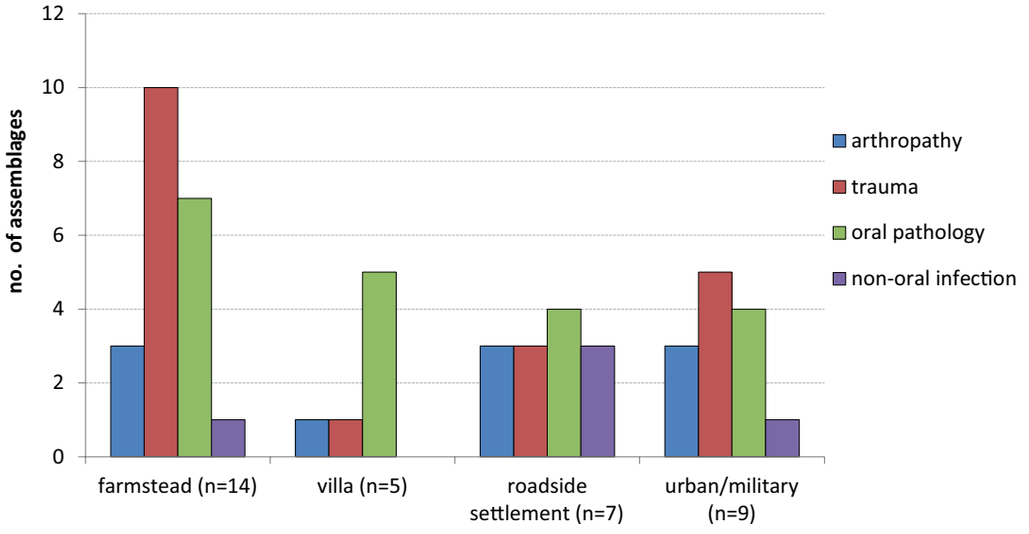


FIG. 4.13. Incidences of dog pathology at sites in the South region

1989, 265–6). One animal appears to have completely lost the lower end of its front leg, while it also received a blow to the head that resulted in it losing several teeth. All the individuals in this sample were adults, some living to comparatively old age and none appear to have been butchered. It seems unlikely (though not implausible) that the Chichester dogs had been deliberately killed. With a high proportion showing signs of trauma and healing, the evidence suggests that they were part of a stray population that were poorly treated, their bodies perhaps being removed from the streets and deposited after death. Evidence of malnutrition in dogs may explain the identification of several bowed-leg dog bones at Staines (*Pontibus*), Surrey (Chapman and Smith 1988), and perhaps supports the idea of a poorly treated stray population. Maltby (2010a; 2010b, 246–7) has argued that the large number of dogs, including puppies and elderly individuals, deposited in wells and shafts at Winchester were put there as a result of deliberate culling in order to manage the stray population.

However, other explanations for dog burials in towns should be considered. Some dogs were found buried with complete pottery vessels at Winchester, which may imply a ritual context (*ibid.*), and at some religious sites, dogs have been argued to have been associated with healing cults (see Ch. 5, p. 192). At Silchester, in contrast, the presence of butchery marks on dog bones found in wells indicates that some carcasses were skinned prior to burial, which perhaps provides a more utilitarian context for their deaths (Clark 2011,

477; 2012, 174–6). It would thus appear that towns and roadside settlements probably attracted communities of stray dogs that were drawn to these places by opportunities for food, and perhaps were a nuisance to local people. However, there are several explanations for their eventual deaths and for the context of their burials, and these must be appreciated when examining dog remains in urban contexts.

CATS IN LATE IRON AGE AND ROMAN BRITAIN

Cats were first domesticated in the Near East, much later than dogs, around 4,000 years ago (Russell 2012, 208, table 6.1). However, the process of cat domestication appears to have been largely due to developments in the social behaviour of their wild progenitor: the wildcat. The common view is that wildcats began to scavenge food sources at larger, nucleated human settlements, where easy pickings at middens could be had, and where they had access to rodent populations that were drawn to grain stores (Todd 1978). Eventually, cats became tolerated by people and, most importantly, by other cats – a key behavioural change – and were able to exploit an abundant food source. In effect, cats were 'self-domesticating' rather than deliberately selected and tamed by people (Kitchener and O'Connor 2010, 88).

Two wild relatives of domestic cats – the lynx and the wildcat – have been resident in Britain since the end of the last Ice Age, though the former is now extinct from these shores and the latter is restricted to a small breeding population in Scotland (Hetherington 2010; Kitchener and O'Connor 2010). It was not always this way – the history of the domestic cat in Britain appears to have been strongly linked with these two species, firstly because they would have competed within the same environments for food, and secondly because wildcats and domestic cats can inter-breed (Kitchener *et al.* 2005). This also causes zooarchaeologists a problem in determining the emergence of domestic cats in Britain. It seems likely that they were present in the Iron Age, as seen by discoveries at Gussage All Saints in Dorset (Harcourt 1979) and Owslebury in Hampshire (Maltby 1987), though their identification as 'domestic' animals rests upon our understanding of their behaviour and relationship with people and this requires an understanding of the context of cat deposition. The comparative rarity of cat remains from Romano-British sites means that there is a lack of biometric data and isotope analysis to investigate feline populations in the same way as dogs. For the most part, we are reliant upon relative frequencies of cat bones, contextual evidence, and signs of pathology and butchery.

Cat remains are present in far fewer assemblages than dogs (FIG. 4.9). This may be partly due to poor recovery or rapid excavation, which can bias against the smaller bones of cats (Kitchener and O'Connor 2010, 91), though the difference between the proportion of sites with dogs and cats is great enough to suggest that the latter simply were not as common on rural settlements. Interestingly, a higher proportion of late Roman sites has produced cat bones than earlier settlements; the ratio increases from around one in ten of late Iron Age and early Roman rural sites to around one in three late Roman sites. This may in part be due to differences between site types. Around 40 per cent of villas produce cat bones, which compares to 20–26 per cent of nucleated settlements and 14–17 per cent of farmsteads (FIG. 4.10a). This pattern is also reflected in the proportions of Associated Bone Groups. Over 10 per cent of partial or whole animal burials at villas are of cats, though the species accounts for less than 2 per cent at all other settlement types (FIG. 4.10b). The association between cats and villas could reflect residents more often keeping cats as pets, or that villa settlements provided more suitable environments for cats to feed. Corndryers and storage buildings at villas (though not limited to villas) may have increased the number of rodents at these sites, giving cats more opportunities to hunt. The arrival of the house mouse in the Iron Age (O'Connor 2010) and the black rat in the first century A.D. (Rielly 2010) must have provided cats with extra incentive to exploit human settlements. Fish-keeping may also have been a factor at some villas, and, though there is less direct evidence for this activity (see below), the lure of easy fish and frogs may also have been tempting to cats.

There is some evidence that cats were cared for by people. The remains of an adult cat recovered from a well at Dalton-on-Tees villa, North Yorkshire, showed signs of a severe fracture of the hip joint, as well as further breakages to the left fore and hind limbs (Buglass and West 2014). These traumatic injuries had largely healed by the time the cat died. However, they surely would have stopped the animal from hunting while it was alive and it seems very likely that it managed to survive through human intervention. The fact that it was deposited in a well indicates that this method of burial may not have been a simple method of waste disposal.

Cats have been recovered from wells at several rural settlements, such as Welton villa in the East Riding of Yorkshire, where the remains of at least 28 cats of varying ages were buried (Mackey 1999). Some cats appear to have been afforded burial in other contexts on rural settlements,

though the evidence is sparse. At Mansfield Woodhouse, Nottinghamshire, a cat was found to have been placed in a wooden coffin and buried during the late first/early second century A.D. (Oswald 1949). The excavator's suggestion that the skeleton could be a polecat is less convincing but raises some doubt over the identification of the skeleton. At Latimer villa, Buckinghamshire, a cat was laid in the foundations of a villa corridor during a period of modification in the early fourth century A.D., and it may well have been of ritual significance related to the development of the house (Hamilton 1971, 163).

At several sites, there are deposits of kitten litters or juvenile cats that appear to have been rounded up and killed. The late Iron Age burial of five kittens at Gussage All Saints, Dorset, is often highlighted as one of the first examples of domestic cat in Britain (Harcourt 1979, 154; Kitchener and O'Connor 2010, 92; Morris 2011, 42). These were argued to have been domestic cats on the basis that it would have been unusual for the inhabitants to capture a litter of wildcat kittens and then bury them at the settlement. The identification of house mouse at Gussage All Saints was also thought to have been an indication that the cats were domestic (Harcourt 1979, 150). At Whitcombe, Dorset, two newborn kittens and five immature cats were placed together in a single pit (Buckland-Wright 1990). The absence of butchery marks on many of these examples and the fact that they were still so young would argue against them being exploited for their fur. Otherwise, it is possible that while domestic cats may have been present on human settlements, not everybody was yet willing to accept them as companion animals; the discovery of cat litters at some sites may not have been a welcome sight.

Cats appear to have been exploited for their fur at some rural sites. At Houghton Down, Hampshire, the body of a skinned cat was placed down a well (Hammon 2008a), while at Royal Manor Arts College, Portland, Dorset, a coastal site involved in shale manufacturing, four discrete groups of cat bones were recovered, one of which included the remains of a hind leg with several cut marks on the bones (Maltby 2009). It is possible that all the specimens at Portland were the result of skinning, though a skilled butcher may not have left any trace of cutting on the bones. This raises some doubt over how many other cats found on Roman rural sites might also have been skinned.

SUMMARY: DOGS AND CATS

It is probably inappropriate to consider dogs and cats in Roman Britain as 'pets' in the modern, western sense of the term. The zooarchaeological and contextual evidence strongly suggests that both animals were treated in a variety of ways. Dogs appear to have been deliberately bred, most likely for different roles, ranging between hunting, livestock management, pest control, and household companions. There is less evidence for the controlled breeding of cats, though kitten litters have been found at some sites. These may not always have been welcomed by people, though the evidence for cats with healed fractures shows that some were cared for, and the fact that certain dogs and cats were buried in ways similar to humans suggests that some were considered in a like vein to people. In towns and other nucleated settlements, stray dogs were probably fairly common sights, perhaps taking advantage of domestic household waste. These animals appear to have been tolerated, if not treated quite so well. There is a growing body of evidence to show that dogs and cats were sacrificed and buried as part of ritual practices, with some perhaps being imbued with medicinal or magical properties (Sykes 2014, 147), and this topic will be considered further in Chapter 5.

NEW ANIMALS, NEW LANDSCAPES: THE SOCIAL CONTEXT OF INTRODUCED SPECIES

It is becoming increasingly recognised that the Roman period witnessed a considerable amount of movement and trade in animals and plants around the empire, and Britain was no exception (Van der Veen *et al*. 2008; Sykes 2009; Witcher 2013). Furthermore, these introductions are likely to have been more than simply an elite desire for exotic fauna and flora. Several studies have shown that, regardless of place or time, the movement of species into new habitats can have profound effects on the environment, giving rise to ecological changes with often dramatic implications for landscapes, identity and diet (Allen and Sykes 2011; Pluskowski *et al*. 2011).

Witcher (2013, 7–9, table 1) lists 47 plants and animal species that are often assumed (correctly or incorrectly) to be Roman introductions. Of the fourteen animals listed, several are now known to have been native, introductions from other periods, or were never introduced at all. Elephants and the edible dormouse (*Glis glis*) are two examples of the last, since no remains of either species have been found in Roman contexts. Rabbits (*Oryctolagus cuniculus*) are popularly thought to have been a Roman introduction (Witcher 2013, 18). Though rabbit bones certainly occur on many Roman sites, most (perhaps all) are from modern intrusions of burrowing animals. The recovery of butchered rabbit bones from an apparently sealed Roman pit at Lynford, Norfolk, has caused much

excitement, with a similar find at Beddingham villa, East Sussex also being rumoured (Sykes and Curl 2010, 120), though without radiocarbon dating, these examples must be viewed with caution.

Some animals, however, were deliberately imported as status symbols. For example, the enigmatic discovery of a Barbary macaque (*Macaca silvanus*) skull at Catterick, North Yorkshire, highlights an animal brought to these shores from north Africa (Stallibrass 2002). The rarity of this species suggests that this may have been a single oddity, reflecting the wealth and status of the owner, or it may have been imported as a skull and kept as a curio. In other instances, animals were imported to enhance the splendour of private residences, such as fallow deer (*Dama dama*) and some exotic bird species, while the importation of the chicken in the later Iron Age may have been associated with several social activities such as cock-fighting and ritual sacrifice. This section examines these species, as they were deliberately imported to reflect attitudes to wealth, landscape and the natural world. Other animals were imported for economic reasons, such as donkeys and mules (see Allen 2017), or were not deliberate introductions, such as the black rat (*Rattus rattus*), which undoubtedly impacted on the lives of many people (Yalden 1999, 125; Rielly 2010).

CHICKENS

Chickens (*Gallus gallus*) were not a Roman introduction, but were imported in the Iron Age (Poole 2010). As with black rats, the chicken seems to have fared particularly well in Romano-British towns, though it also appears to have flourished in the countryside after the conquest (see Maltby 1997 and Allen 2017 for extensive analyses of the abundance and distribution of chickens). While chickens were certainly around prior to the conquest, their rarity in the Iron Age may indicate that they were comparatively 'alien' to much of the population. It is generally thought that chickens were not often eaten by Iron Age communities, an assumption based primarily upon Caesar's comments about fowl, geese and hares being the focus of pleasure and amusement instead of food, though some justification for this idea may be found in the fact that chicken remains from this period tend to be commonly recovered as whole carcasses, rather than as dismembered remains (Sykes 2014, 84). Some chicken burials may reflect religious activity. For example, Morris (2008) relates that chickens have been found with late Iron Age inhumation burials, perhaps suggesting a close social connection existed between some people and their birds. This does not, however, mean that chickens were not eaten in Iron Age Britain, as the numbers of chicken bones from late Iron Age *oppida* at Braughing, Hertfordshire (Ashdown 1981), Fishbourne, West Sussex (Allen and Sykes 2011), and Silchester, Hampshire (Grant 2000), all suggest that the bird was consumed by high-status groups, perhaps as part of feasts.

An important reason for their initial establishment and spread through Britain in the late Iron Age and early Roman period may have been the increasing popularity of cock-fighting. Sykes (2014, 84–5) has highlighted a number of cases where chickens have been introduced to new places, but were rarely exploited for meat and eggs. As discussed in Volume 2 (Allen 2017), chicken remains in several Roman towns have high male to female ratios, suggesting a preference for cockerels. This has been argued to reflect both cock-fighting and ritual sacrifice (Serjeantson 2000, 499). Serjeantson (2009, 326–30) has suggested that the Roman taste for cock-fighting was adopted from Greek culture, though there is comparatively little evidence for it, save for some depictions in late Roman mosaics (e.g. Sykes 2012, 161, fig. 2).

Based upon contemporary human skeletal evidence from southern Britain, Sykes (2012, 164–5) argued that cock-fighting may have coincided with a reduction in interpersonal violence. Citing anthropological evidence from societies where cock-fighting is common, she suggested that cock-fighting in Roman Britain may have been a mechanism for diffusing male–male violence. Of course, there may be many reasons why changes in interpersonal violence occurred during this time, though cock-fighting in towns is apparent from the finds of artificial cock spurs at Silchester (Serjeantson 2000) and Braughing (Hingley 2006, 231). Studies have shown that close social relationships exist between fighting cocks and their handlers (Dundes 1994), and it seems unlikely that these chickens would have been eaten.

EUROPEAN FALLOW DEER

The European fallow deer (*Dama dama*) was previously thought to have been a Norman introduction to Britain. Over the past fifteen years, however, zooarchaeological evidence for Roman introductions of fallow deer have increasingly come to light (Bendrey 2003; Sykes 2004; 2010). Prior to this, a few records of fallow deer bones on Romano-British sites had been made, but were largely dismissed either because of the possibility of misidentification, since fallow deer bones can be confused with red or roe deer bones, or because of the likelihood of fallow deer bones dating to a

later period being intrusive in Roman contexts. In the 1970s, Grant (1975) identified several specimens of fallow deer from late Roman pit deposits at Portchester Castle, Hampshire. However, a later reanalysis of the specimens by Sykes (2004, 77–8) indicated that these were in fact bones of roe deer. Another example, a calcaneus from Redlands Farm villa, Northamptonshire, was later radiocarbon dated to the eleventh or twelfth centuries A.D. (Davis 1997). This left the remaining few purportedly Romano-British fallow deer specimens in some doubt.

Despite the lack of conclusive evidence in Britain, historical and zooarchaeological evidence on the Continent had long suggested that fallow deer were being traded and maintained by elite groups. Pliny the Elder (*Nat. Hist.* VIII, 78.211), Columella (*Rust.* IX, I.4) and Varro (*Res Rust.* 3.12.1–2), each discuss the management of fallow deer on private estates in Italy and other provinces from the late Republican era onwards, while faunal remains have demonstrated the presence of fallow deer (an animal native to modern Turkey) at Roman sites in Portugal (Davis 2005), Sicily (Wilson 1990) and Italy (MacKinnon 2004). Back in Britain, fallow deer finds have tended to be of antler or foot bones (Sykes 2010, 53–5). These are not necessarily evidence for the importation of live animals, as it is possible that these represent trade in deer antler and feet, perhaps from the trafficking of furs or possibly items considered to have amuletic properties (Sykes 2004, 78–9). Pliny the Elder (*Nat. Hist.* XXVII) noted how deer antlers were thought by some to have had healing properties, while the smell of burning antlers was considered to combat epilepsy. This may have been the case with the large fallow deer antler recovered from the roadside settlement at Scole Dickleburgh, Norfolk, which clearly shows signs of being shaven (Sykes 2010, 54, fig. 12). It is worth noting, however, that antler and foot bones are the easiest deer elements to identify, which may partly explain why they are well represented. Nonetheless, examples of 'live' fallow deer populations in Roman Britain have proved difficult to substantiate.

Excavations of the rural 'village' settlement at Monkton on the Isle of Thanet, Kent, produced several fallow deer remains, including both antler and post-cranial bones, from sealed deposits dating from the late second to early fifth century A.D. (Bendrey 2003). Since this discovery, further excavations on the Isle of Thanet at Tothill Street, Minster (Cotton n.d.), and East Kent Access Road (Strid 2015) have added to the number of Roman-period fallow deer specimens known from the area. The finds on the Isle of Thanet are interesting given that, in the Roman period, it was separated from the mainland by the Wantsum Channel, which later silted up. If live fallow deer were being imported to Britain by elite groups it seems very likely that they would have been intended for enclosure on private land, so that they could be viewed for pleasure by land-owners and their guests. *Vivaria* were game parks specifically set up for managing deer, and, according to Roman historians, these landscape features appear to have become common in Italy and other provinces (Anderson 1985, 86; Starr 1992, 436; Allen 2014, 179–81). Of course, many parks would not have been restricted to one type of animal, and it may be that the Roman linguistic terms for parks were referring to specific areas where animals might be kept separate for feeding or other purposes. For example, Columella (*Rust.* IX, I.1) states that, 'wild creatures, such as roe deer, chamois and also scimitar-horned oryx, fallow deer and wild boars sometimes serve to enhance the splendour and pleasure of their owners'. It is possible that each animal being maintained in parks was well managed and looked after by keepers. Considering that herds of fallow deer may have been trafficked over long distances, presumably at significant cost, their value to their owners would have warranted further investment. The use of the Isle of Thanet for emparkment may have been particularly useful since it was naturally enclosed, and it may also be relevant that the port at Richborough lies to the south of Thanet at the mouth of the Wantsum Channel.

That herds of fallow deer were being imported over long distances for emparkment at high-status residences has also been demonstrated by radiocarbon and strontium isotope analysis of two fallow deer mandibles at Fishbourne, West Sussex (Sykes *et al.* 2006). One dated to A.D. 60 (± 40 years) while the second dated to A.D. 90 (± 40 years). These are currently the earliest, conclusively dated fallow deer remains from Britain (Sykes 2010, 55). Strontium isotope analysis of an early erupting tooth in the A.D. 60 specimen (i.e. within its first eight months of life) gave a non-local signature, and although its precise origin could not be ascertained, it almost certainly lived on the Continent while it was a fawn. Analysis of a later-erupting tooth in the same mandible gave a local signature, which demonstrated that it had been trafficked over some distance before dying at Fishbourne (Sykes *et al.* 2006, 951–3). Significantly, all the teeth analysed from the A.D. 90 specimens gave local signatures, indicating that they derived from a resident breeding population, perhaps one that had been established at Fishbourne 30 or 40 years earlier. Since this study was undertaken, a much larger collection of fallow deer bones has been identified from Fishbourne (Allen 2011).

Any understanding of how these animals were managed in parks is limited due to the relative paucity of known specimens. Elevated nitrogen isotope values ($\delta^{15}N$) from the Fishbourne specimens indicate that they may have been grazing on the salt marshes around Chichester Harbour to the south of Fishbourne (Madgwick *et al*. 2013, 121). Osteometric data suggest that both males and females were kept at Fishbourne and Monkton and there is little evidence for specific selection of either sex (Sykes *et al*. 2011, 162–3). However, the Monkton deer appear to have been particularly small, which prompted Sykes *et al*. (*idem*) to suggest that they were imported from translocated herds in Europe rather than being first-generation animals from Turkey or Greece. This argument is supported by genetic data from the same study. As more fallow deer remains come to light from Roman sites in Britain and beyond, their scientific analysis will undoubtedly improve understanding of how these exotic animals were managed, and will further elucidate patterns in their trade around the empire.

EXOTIC BIRDS

The bones of pheasants (*Phasianus colchius*) and peacocks (*Pavo cristatus*) have been found on Romano-British rural settlements, and are almost certainly imported fauna (Witcher 2013, 9). Pheasants have a natural habitat range stretching from the Pacific Ocean to the Black Sea. They are known in Greece from the fifth century B.C., and are mentioned by Roman writers during the first century A.D. (Poole 2010, 159). It seems likely that, as with fallow deer, pheasants were moved around the empire to furnish private estates. Unfortunately, pheasant bones are exceptionally difficult to distinguish from those of domestic fowl. The surveys of Yalden and Albarella (2009, 107) and Poole (2010) have highlighted eleven Romano-British sites with purported pheasant remains, the majority of which appear to be high-status or urban settlements. None is known from pre-Roman sites. Peacock finds (blue peafowl) are even rarer than pheasants. Toynbee (1973, 250) suggests that the bird was extensively reared in Roman Italy during the late Republic and early Imperial periods. In other provinces, however, peacock bones are exceptionally rare, with Poole (2010, 161, table 10) noting three examples each from Roman Gaul and Britain. Throughout history, peacocks have been kept for the visual splendour of their bright, expansive plumage, and it is possible that this was the reason for their remains being recovered from the villas at Winterton, North Lincolnshire, and Great Stoughton, Cambridgeshire (*ibid*.).

THE CONTEXT OF ANIMAL INTRODUCTIONS

The deliberate introduction of some animals was almost certainly a demonstration of wealth and social power. The sourcing, movement and maintenance of these animals would have required considerable financial investment, with the animals needing to be carefully managed, cared for and fed during their transportation, particularly as some species are sensitive to changes in their local environment.

Once in Britain, animals such as fallow deer and peacocks would have been kept in parks or enclosures from where they could be viewed and enjoyed as spectacles in their own right. The value and expense of their importation suggests that it is very unlikely that these animals would have been simply left to roam the countryside, or used as meat for the table, though some may have been eaten as 'exotic delicacies' at banquets. Perhaps most importantly, the introduction of these new species would have altered the environments and landscapes where they came to reside (Allen and Sykes 2011). These may have been deliberate attempts to demonstrate control and power over the natural world. In this sense, animal introductions should be considered alongside the evidence for wild animal exploitation, a subject to which we now turn.

PEOPLE AND NATURE: THE SOCIAL ROLE OF WILD ANIMALS

Evidence for the exploitation of wild animals in Roman Britain has often been overlooked. The abundance of cattle, sheep, pig and horse remains in most animal bone assemblages usually far outweighs those from non-domestic species, which can give the impression that hunted fauna were of little consequence to Romano-British society (cf. Maltby 2015, 185–6). Traditionally, archaeologists have tended to think about wild animal exploitation as a means of producing meat for the table, with some considering wild resources as a risk-buffering strategy used mostly in times of agricultural stress (e.g. Grant 1981; O'Shea 1989). On the other hand, social anthropologists have often highlighted the cultural and political importance of wild animals, particularly in agricultural societies, where very little food is taken from wild sources (Cartmill 1993; Marvin 2000; Kowalski 2010). In the light of these perspectives, archaeologists are becoming increasingly aware of the potential for understanding past attitudes towards landscapes and social identity through the study of wild animals (Hill 1995a; Hamilakis 2003; Pluskowski 2006; Willis 2007; Sykes 2009; 2014, 51–75; Allen and Sykes 2011; Russell 2012, 144–75; Crummy 2013; Allen 2014).

It is important to recognise that wild animal exploitation can come in a variety of forms. Strictly speaking, hunting is a highly ritualised, symbolic practice, which involves only truly wild animals that are free to run away (i.e. not tame or captive animals), but are killed in a very specific, violent manner (Cartmill 1993, 197; Sykes 2014, 52). This is very different to animal trapping, for example, where the hunter need not be present at the kill. However, if the definition of hunting is restricted to these specific criteria, it arguably accounts for very little animal killing, and does not incorporate the wide range of other activities where animals that are perceived to be wild are caught and slaughtered by people. The problem for archaeologists is that the context of the kill is usually not known. This section examines the evidence for wild animals that would seem to have been hunted, but also considers other activities such as trapping, wildfowling and fishing. As with hunting, these practices would also have had important social and cultural implications.

PERCEPTIONS OF WILD ANIMALS IN THE IRON AGE

Previous studies have highlighted a general lack of wild animal bones on British Iron Age sites (Sykes 2009; Allen and Sykes 2011). This is not restricted to mammals and birds, as a widespread absence of fish bones and marine molluscs has also been noted (Dobney and Ervynck 2007; Willis 2007). In addition, it may be significant that wild plant remains are also comparatively rare, being more often encountered in 'ritual' deposits (Van der Veen *et al.* 2008; see Lodwick Ch. 5). It is possible that this lack of exploitation reflects an Iron Age, cultural attitude towards nature. That pre-Roman communities perceived wild animals differently from farm animals is evidenced by Caesar's often quoted comment that the Britons abstained from eating hare (as well as fowl and geese), believing that it was 'unlawful' to do so, and that instead they reared them purely for 'pleasure and amusement' (*BGall.*, V. 12). Interestingly, this may point to the possibility that hares were coursed with dogs, but not necessarily eaten, and it was Strabo (*Geog.* IV.5.3) who famously mentions the export of British hunting dogs to the Continent. The placement of whole or partial skeletons of wild animals in so-called 'structured deposits' has prompted the suggestion that the consumption of wild fauna may have been prohibited or restricted to special events and gatherings (Hill 1995a, 104), while under 'normal' circumstances it may have been considered taboo (King 1991, 17). However, the treatment of different types of wild animals varies. Corvids, such as crows and ravens, and buzzards are more often found in deposits as associated bone groups, a pattern that led Serjeantson and Morris (2011, 101) to suggest that, as scavengers, these birds may have been associated with death and the transition to other realms, particularly if they were commonly witnessed feeding from human bodies left exposed during excarnation rituals (see Ch. 6).

The association of the wilderness with other realms or unfamiliar landscapes is not such a far-fetched idea. It is widely accepted among social anthropologists and cultural geographers that the wilderness is considered by many (non-western) cultures to be a place beyond the domestic sphere, where the 'normal' rules and rhythms of everyday life do not apply (Helms 1993, 153–7; Ingold 2000; Hamilakis 2003, 240). People with the ability to transcend these boundaries are often imbued with special status, with shamans perhaps being the best-known examples of people with supernatural powers, most notably the ability to change shape and to take on the appearance of wild animals (Helms 1993, 211; Willerslev 2004). This takes place when shamans are in the wild. Hunters may also fall into this category and in some societies there may be little difference between them and shamans.

It is, of course, difficult to simply superimpose the ideology of traditional cultures onto British Iron Age society, though there are some clues that suggest similarities existed. Numerous deposits of metalwork, such as coinage and weaponry, were placed in landscape features that may have been considered liminal to the domestic sphere, particularly rivers, bogs and lakes (Creighton 1995, 297–8; Bradley 2000, 159–60; see Ch. 5, p. 130). Similarly, discoveries of Iron Age human remains in watery contexts appear to follow a long-held, later prehistoric tradition of marking boundary points with deposits of human and animal body parts and high-value items (Bradley 2000, 149–50; Madgwick 2008). The idea that watery places were sacred during this period, owing to their association with the dead, may partly explain why fish were largely avoided during this period (Sykes 2014, 65).

This 'mixing' of humans and animals in liminal contexts is also reflected in Iron Age iconography. Aldhouse-Green (2001b) has traced this artistic tradition across Britain and north-western Europe. Perhaps the most famous example comes from the Danish Gundestrup Cauldron, which dates to the second/first century B.C. and depicts an antler-headed man sat cross-legged, holding a snake in one hand and a torc in the other, while being surrounded by a menagerie of wild beasts (Green 1992, 146, fig. 3.3a). Aldhouse-Green (2001b, 225) argues that images of human–animal hybrids were symbolic of boundary-crossing and shamanic

practices, involving death, warfare, hunting and healing. Hybridised human/animal iconography continued to be a feature of Romano-British and Gallo-Roman society and there is some evidence that offerings continued to be made in watery contexts (Willis 2007; Rogers 2007; Ch. 5, pp. 162, 186). However, contact with the Roman world brought about certain changes. Examples of ritual iconography begin to be found in cult centres, such as the human-faced dog figurine found at the late Roman healing sanctuary at Lydney Park, Gloucestershire (Wheeler and Wheeler 1932, 45, 89, pl. XXVI, no. 119) rather than in natural settings more often used in the Iron Age. An increase in long-distance trade and exchange in the late Iron Age and early Roman period may have changed some people's concept of distance and geography, while cultural exchange no doubt had some effect on religious attitudes.

PERCEPTIONS OF WILD ANIMALS IN THE ROMAN WORLD

Evidence for hunting and attitudes to wild animals in the Roman Mediterranean is supplemented by classical literature, which traces its roots back to ancient Greek culture (Anderson 1985, 115–25; Lane-Fox 1996). Here, hunting is thought of as a form of military training, where the quarry is representative of a human enemy and the hunting landscape is perceived as a foreign land (Cartmill 1993, 32). A military context was pursued by the Trajanic–Hadrianic emperors, who used hunting as a means of displaying *virtus* (virtue). Domitian, in particular, can be seen in numerous reliefs and carvings slaying many wild beasts (Tuck 2005, 239). Suetonius (*Dom.* 19) also notes that Domitian spent much time in his game park outside Rome, where wild animals were hunted. This imperial hunting imagery was no doubt affiliated with the popularity of the beast hunt in the arena, the *venatio*, where the mass slaughter of wild and exotic animals was carried out for the pleasure of citizens across the empire (Lindstrøm 2010).

Of course, very little of this animal killing can really be defined as hunting under the criteria set out above. This is perhaps best exemplified by Pliny the Younger, who derided many of his contemporaries by claiming that they captured animals, not with spear and lance, but with pen and notebook in hand (*Ep.* 1.6, after Anderson 1985, 100). However, it does appear that imperial hunting was used as a device to demonstrate the mastery of Roman culture over the natural world, and, by implication, over the barbarian world. It is quite different to the Iron Age worldview seen across much of northern Europe prior to and during this period. The expansion of the Roman Empire into north-west Europe is likely to have witnessed a clash of these varying attitudes towards nature and wild animals. For example, Sykes (2014, 66) notes that changes in burial traditions for some elements of the population from probable excarnation and deposition in watery contexts to cremation and inhumation (see Ch. 6) would have ensured that the dead were no longer accessible to wild animals, an idea that may have been completely abhorrent to a Roman mind-set. A second point worth mentioning is that while some shamanic iconography continued to be produced and viewed in Roman Britain and in Gaul, Roman deities were regarded as dominant over wild animals and were rarely depicted as hybrids (*ibid.*). Indeed, sexual encounters between people and animals, and human–animal transformations were often described as particularly bad for those involved (Gilhus 2006).

As with the Iron Age, wild animal remains generally make up very small proportions of animal bone assemblages from Roman-period sites in Britain (see below). This was picked up by Cool (2006, 116–18), who noted a discrepancy between the lack of wild fauna in the zooarchaeological record and the regular depictions of hunting in Romano-British artwork. Various hunting scenes of horsemen capturing deer, hares and boars, hunters on foot spearing game, and dogs chasing hares are known from ceramics, glass bowls and metalwork. Cool (*ibid.*) argues that these images tend, on the whole, to be late Roman and overtly religious in nature. Certainly, wild animals are commonplace in Orphic imagery, where Orpheus controlled the animals with music (Allen 2014, 183). The context of these images has been argued to have been used as a theatrical element for social encounters in villas and other high-status buildings (Scott 2004, 47–8). Overall, the Romano-British imagery is quite different to the zoomorphic, Iron Age tradition, stressing instead the division between human and animal (Sykes 2014, 66–7).

HUNTING AND TRAPPING

Wild mammal remains commonly represent between 0.5 per cent and 2 per cent of most animal bone assemblages. Overall, there is an increase in the mean percentage of wild mammal bones recovered from rural sites over time, accounting for 0.8 per cent of the mammalian assemblages dating to the late Iron Age compared with 1.3 per cent in the late Roman period (FIG. 4.14a). This is a fairly minimal rise overall, but it can be partly accounted for by the establishment of villas in Britain after the conquest and their increased number during the later Roman period. On average, wild mammal remains from villa sites

account for over 3 per cent of faunal assemblages, around three times higher than on most other types of rural settlement (FIG. 4.14b).

Red deer were increasingly exploited over time, accounting for less than 1 per cent on late Iron Age sites, but rising to 1.7 per cent on late Roman sites (FIG. 4.15). In contrast, roe deer bones are recovered in similar quantities over the same period of time, usually around 0.5–0.7 per cent of assemblages. Again, this can be largely put down to the increasing number of villas in the landscape, of which over 75 per cent produce red deer remains (FIG. 4.16). Although roe deer remains do not appear to increase in abundance over time, they also occur more frequently at villas than other types of rural settlement.

Analysis of deer body parts from different settlement types appears to confirm an interest in deer hunting by villa inhabitants (cf. Liversidge 1968, 363–7). Post-cranial bones of red and roe deer are, on average, three times as common as antlers at villas (FIG. 4.17). Comparatively high numbers of butchered deer bones at some villas, such as Fishbourne, West Sussex (Allen 2011), Shakenoak, Oxfordshire (Cram 2005), and Keston, Kent (Locker 1991), attest to the fact that venison was fairly regularly consumed. Evidence from Fishbourne, in particular, suggests that large stags were especially targeted, perhaps indicating that hunts were well organised and managed (Allen 2014, 176). At most other types of settlement, post-cranial bones and antlers occur in equal quantities, and it is notable that post-cranial bones are generally poorly represented. At farmsteads and villages, antlers tend to outnumber deer bones. Antlers may, of course, derive from hunted deer, but since stags and bucks shed their antlers every year after the rut (the mating season), they can be collected from the countryside for manufacturing into tools and other useful items.

Although deer were the most prolific wild mammal in the majority of faunal assemblages from rural sites in Roman Britain, there is a range of other species represented. Two species of hare

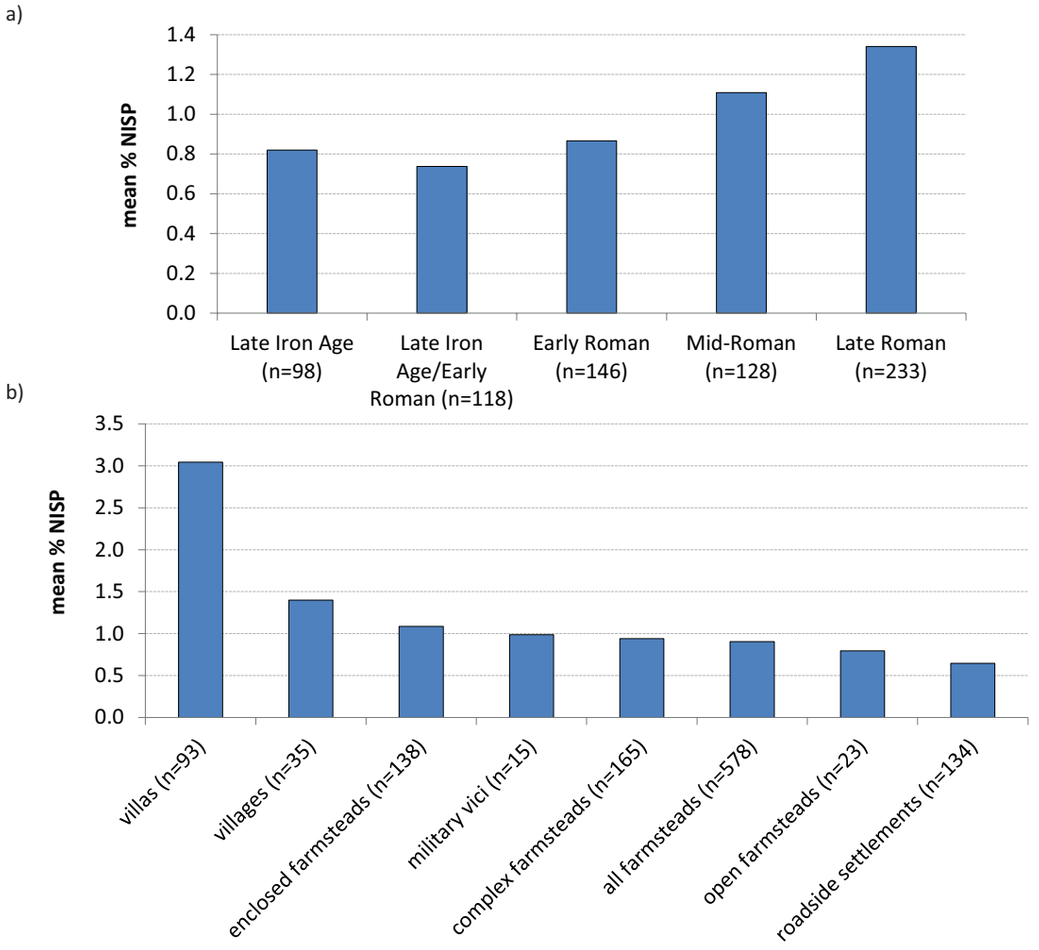


FIG. 4.14. Proportions of wild mammals over time (a) and on different site types (b) (values calculated as the mean percentage of the total mammal assemblage)

were known to the Romans, alongside rabbits: the brown hare *Lepus europaeus* and the mountain hare *Lepus capensis* (Crummy 2013, 111). Although rabbits are often thought to have been introduced during the Roman period (Sykes and Curl 2010), there are as yet no credible examples that have been securely dated (see above, p. 98). Brown hares were probably deliberately imported, and this is now supported by recent DNA evidence, which suggests the establishment of a fairly small, initial group (Stamatis *et al.* 2009). Exactly when this occurred is not known, but they appear to have been widespread by the Iron Age (Sykes 2014, 56, table 3.1). Mountain hares are native to Britain, though their modern ecological distribution suggests that their primary habitat is largely restricted to colder, upland regions (Yalden 1999, 127). If this was also the case in the past, it is likely that many of the bones found on archaeological sites from the Neolithic onwards are probably from brown hares. As noted above, Caesar's comments suggest that hares may have

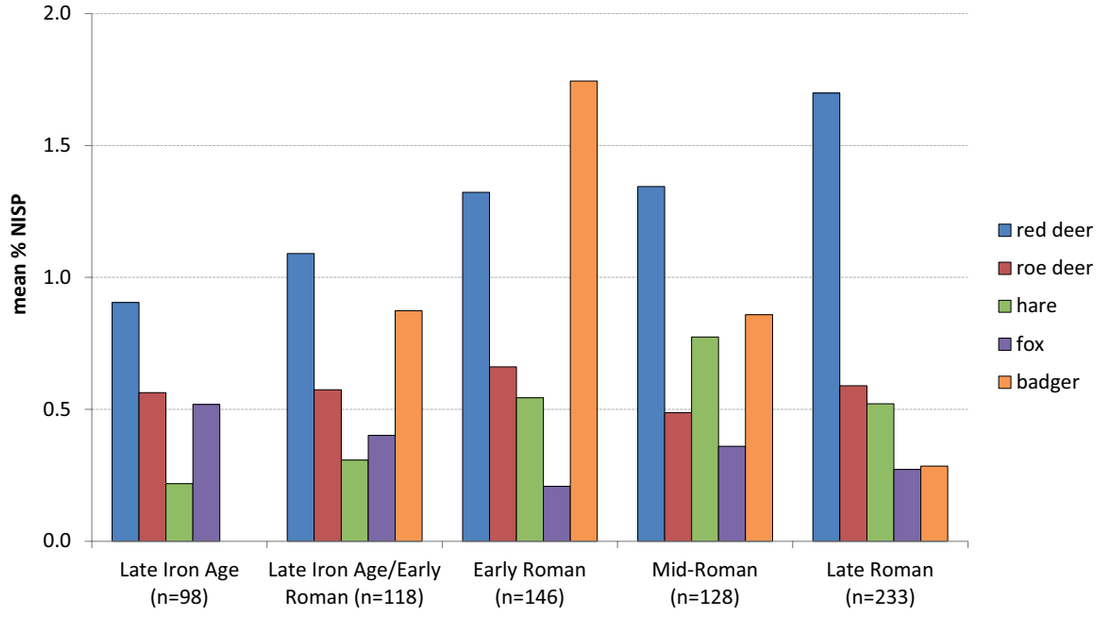


FIG. 4.15. Proportions of main wild mammal species over time (values calculated as the mean percentage of the total mammal assemblage)

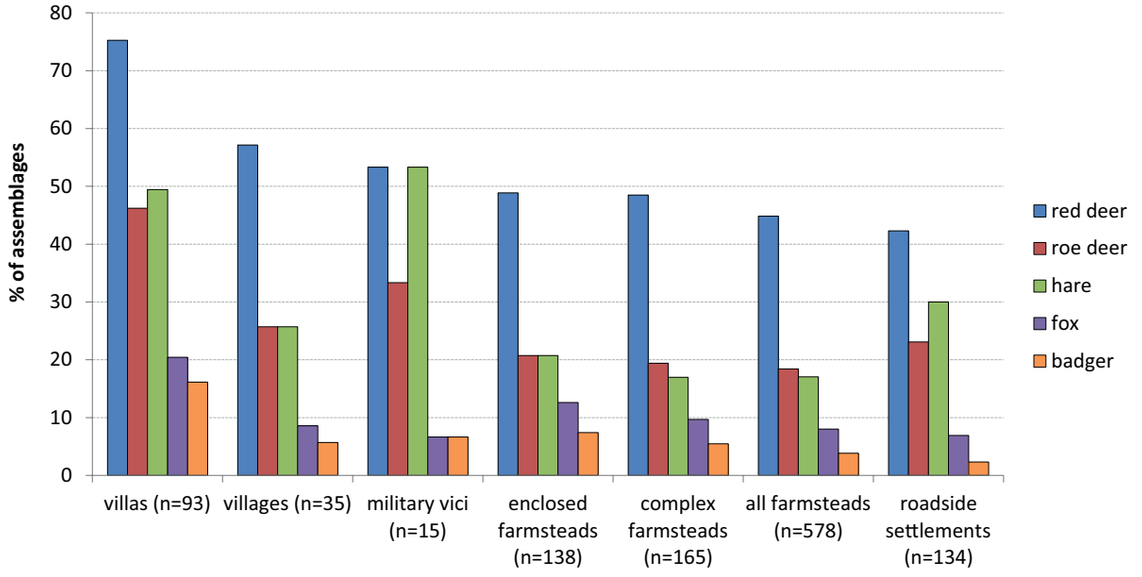


FIG. 4.16. Representation of main wild mammal species at different site types

been revered by late Iron Age communities (Crummy 2013), and it is possible that hare-coursing was a fairly popular pastime during this period, though direct evidence for this is lacking.

Hare bones are fairly frequently found in faunal assemblages throughout the period being examined here, and, as with red deer, they appear to increase in abundance over time. Hare may be under-represented as their bones are small and gracile and fairly fragile. They are morphologically similar to rabbit bones and some misidentification may occur, though hares tend to be much larger, similar in size to domestic cat bones. Again, hares are often found in villa assemblages, though interestingly they are slightly better represented at military *vici*, where they have been identified in over 50 per cent of assemblages, occurring as frequently as red deer, though these data may be partly skewed by a smaller sample size (FIG. 4.16). Hare bones are also better represented at roadside

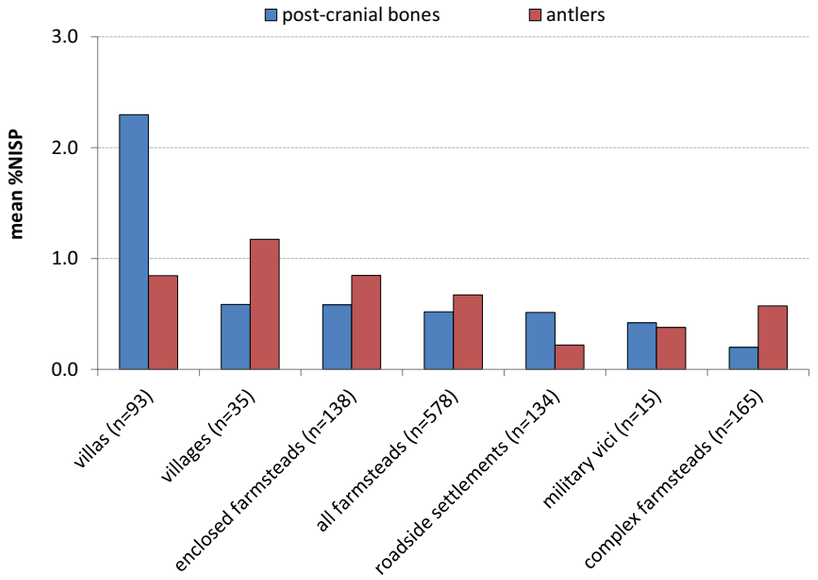


FIG. 4.17. Proportions of red deer and roe deer post-cranial bones and antler specimens at different site types

FIG. 4.18. Mandible from a domestic pig from Roman Chichester, West Sussex (top) and a wild boar mandible from first century A.D. Fishbourne (below) (photo by M. Allen)

settlements compared to farmsteads, where there is a greater disparity between red deer and hare. This general pattern has been observed by Crummy (2013, 115, fig. 7.4) who also noted that hare bones are even more common in major towns, which she put down to continental, dietary influences (*ibid*., 124).

The high representation of red deer, roe deer and hare at military *vici* may have been partly associated with the activities of the army. King (1999b) has shown that wild animals are particularly well represented at many forts, notably in areas such as north Wales, where their populations may have been more abundant (see also Cool 2006, 112). The Vindolanda tablets provide details of orders for roe venison, destined for the *praetorium* (Bowman 1994, 157), and it appears that Caesar preferred roe deer meat over that from other wild animals (Dalby 2000, 248). The remains of red deer and roe deer haunches and bones of hare and wild boar were recovered from deposits associated with a tribune's house at Caerleon (Hamilton-Dyer 1993, 133). While some army garrisons are known to have kept specialist teams of hunters (*venatores immunes*) and trackers (*vestigiatores*) (Epplett 2001, 217), it is possible that a military desire for meat from hunted mammals created a market for their capture among the local civilian populations linked to the forts.

Epigraphic evidence demonstrates the presence of wild boar in Roman Britain, and that that they were hunted by members of some communities, particularly the military (*RIB* 1041). Zooarchaeologically, however, wild boars are notoriously difficult to distinguish from domestic pigs. Although they tend to be larger, there is considerable variation in the size of the bones from animals from different breeding populations (Albarella *et al*. 2009). Eighteen Romano-British sites report the presence of wild boar, which is typically identified from noticeably large *Sus* bones. The reliability of these identifications may be questionable, though some are more secure than others. FIGURE 4.18 shows a large mandible specimen from Fishbourne, West Sussex, which is almost certainly from a wild boar. The width of the mandible is excessively broad, while the third molar is significantly longer than all other examples found at Fishbourne and nearby Chichester.

Remains of fox and badger are also fairly well represented on Romano-British settlements, being most common at villas (FIG. 4.16). Both of these animals burrow and some finds may be the result of later intrusions. Many remains, however, are found in secure contexts. In some cases, there is clear evidence that these animals were exploited for their fur. A badger skull with cut marks made during skinning was recovered from a Roman well at Northfleet, Kent (FIG. 4.19), while at Quinton, Northamptonshire, the skeleton of a decapitated badger from a fourth-century A.D. well may also have been killed for its pelt (Friendship-Taylor 1999).

A range of other mustelid species is known from several late Iron Age and Romano-British contexts, including weasels, polecats, pine martens and stoats. As with foxes and badgers, these are generally found in wells and some may also have been exploited for their pelts. Otters and beavers may have been of some economic importance around the Fens, in particular, with beavers appearing to have been intensively exploited at Haddenham V, Cambridgeshire, during the late Iron Age, Serjeantson (2006, 216–17) noting an abundance of hind leg bones, with many exhibiting cut marks. The butchery evidence suggests that the animals may have been eaten as well as exploited for pelts. Otter bones were fairly common in mid-Roman and late Roman features at the Fenland port at Camp Ground, Cambridgeshire, which Higbee (2013), again attributed to a desire for pelts.

Bones from wolves and bears are exceptionally rare from late Iron Age and Roman sites. Though some may have been exploited for their fur, the dangers involved in hunting these animals would have been considerable. Very little is known of the geographic distributions of wolves and bears during this period, though both were almost certainly present in the British Isles (Yalden 1999, 115, 146–7). Wolves became extinct in England by the beginning of the fifteenth century (Pluskowski 2010), while the date of extinction of bears is

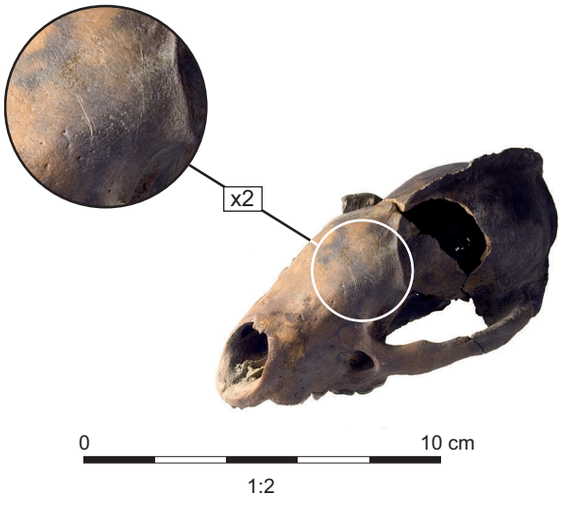


FIG. 4.19 Badger skull with cut marks made during skinning from a Roman well at Northfleet villa, Kent (Grimm and Worley 2011, 49, plate 6). Reproduced with permission HS1, © HS1

unknown (Hammon 2010). As with foxes, wolf bones are also difficult to differentiate on the basis of size from those of large domestic dog types, though the length of the lower carnassial tooth tends to separate north European populations rather well (Yalden 1999, 99, fig. 4.6). Animal bone reports that highlight the possible presence of wolf remains draw attention to the identification of particularly large canid bones (e.g. Hamilton 2000b; Clark 2012, 168–9; Higbee 2013).

Bear bones are better represented than those of wolf. At Fullerton villa, Hampshire, three brown bear upper limb bones (a scapula, humerus and ulna) were recovered from a late Roman ditch (Hammon 2008b), while a single bear phalanx, or toe bone, was recovered from an early Roman ditch at Westward House, close to Fishbourne, West Sussex (Allen 2011). Cut marks were present on the bone suggesting that the animal had been skinned, and it is possible that this example was brought to the site as part of a pelt rather than coming from a local animal. Bear claws are fairly common in late Iron Age, high-status burials in northern Europe, suggesting that bear furs were sometimes worn by elites (Meniel 2002), and contemporary examples have been found at Welwyn Garden City and Baldock, Hertfordshire (Hammon 2010, 98). Elsewhere, a bear tibia was recovered from Catterick, North Yorkshire (Stallibrass 2002), and a mandible from Sheepen, Essex (Luff 1985). These are examples that may have been associated with urban or military populations, including a brown bear skull found in a late fourth/early fifth century drain at Drapers Gardens, London (Rielly 2008), and a possible bear humerus found outside the London amphitheatre, which may hint at the use of bears in staged hunts (Bateman 1997, 58). Specialist military bear-trappers, known as *Ursarii*, would have been utilised in some provinces to capture bears and transport them around the empire for amphitheatre displays (Epplett 2001, 214); the appearance of a Caledonian bear in the arena in Rome during Domitian's reign (A.D. 81–96), suggests that *Ursarii* were at work in the British Isles (Mart., *Spect.* 7). It is also worth pointing out that bears had a ritual significance for some Romano-British communities. Deposits of bear amulets made from jet have been found in a number of child burials in Colchester, York and Malton, which Crummy (2010) interpreted as reflecting protective rituals, aimed at guarding the children into the afterlife.

WILD FOWLING AND HAWKING

Wildfowl remains are comparatively rare in most faunal assemblages, although, as with wild mammals, there is a noticeable rise in their relative frequency over time, increasing from 0.2 per cent to 0.7 per cent between the late Iron Age and the late Roman period (FIG. 4.20a). Typically, higher proportions of wildfowl are found at villas, where they occur in nearly two-thirds of assemblages (FIG. 4.20b). At other types of settlements, wildfowl remains are found in 38–46 per cent of faunal assemblages, and in only 20 per cent of military *vici*, though this figure may be affected by a low sample size.

Although wildfowl are exceptionally rare at late Iron Age sites, some sites have produced a large number of corvids, particularly ravens and crows/rooks (bones of crows and rooks are morphologically indistinct). At Danebury, Hampshire, around one-third of pits containing 'special animal deposits' also produced skeletons of ravens or crows/rooks (Grant 1991, table 6). The special animal deposits tended to contain remains of domestic mammals, usually articulating limbs or other carcass parts, with butchery evidence showing that the meat had been prepared for consumption. Careful reanalysis of the corvid bones, however, showed no evidence of butchery, indicating that none had been eaten by people but, based upon contextual evidence and associated finds, it was argued convincingly that these birds were deliberately placed in the pits (Serjeantson and Morris 2011, 87–9). Danebury appears not to have been an isolated example of this practice, which seems to have occurred across a number of hillforts, *oppida*, and other settlements (*ibid.*, table 4). Interestingly, the practice does not die out with the Roman conquest, and can even be found in several major towns, including Silchester and Dorchester (Dorset), indicating the continuation of an Iron Age tradition in a Romano-British context.

Remains of other wildfowl species are rare in the late Iron Age, and their consumption certainly appears to have been exceptional. The Fen edge, late Iron Age settlement at Haddenham V, Cambridgeshire, produced a high proportion of wildfowl remains from a wide range of species (Serjeantson 2006). Over 40 per cent of all the animal bones at Haddenham V derived from birds, which is much higher than other late Iron Age settlements with notable avian assemblages, including Dragonby, North Lincolnshire (7 per cent; Harman 1996), Danebury, Hampshire (4 per cent; Serjeantson 1991), and Silchester, Hampshire (2 per cent; Serjeantson 2000). This is all the more exceptional given that chicken bones were completely absent. Instead, bones of swan and mallard were particularly abundant and other large birds, such as common crane and pelicans, were also exploited.

Parker's (1988) review of birds in Roman Britain shows the wide variety of species that were

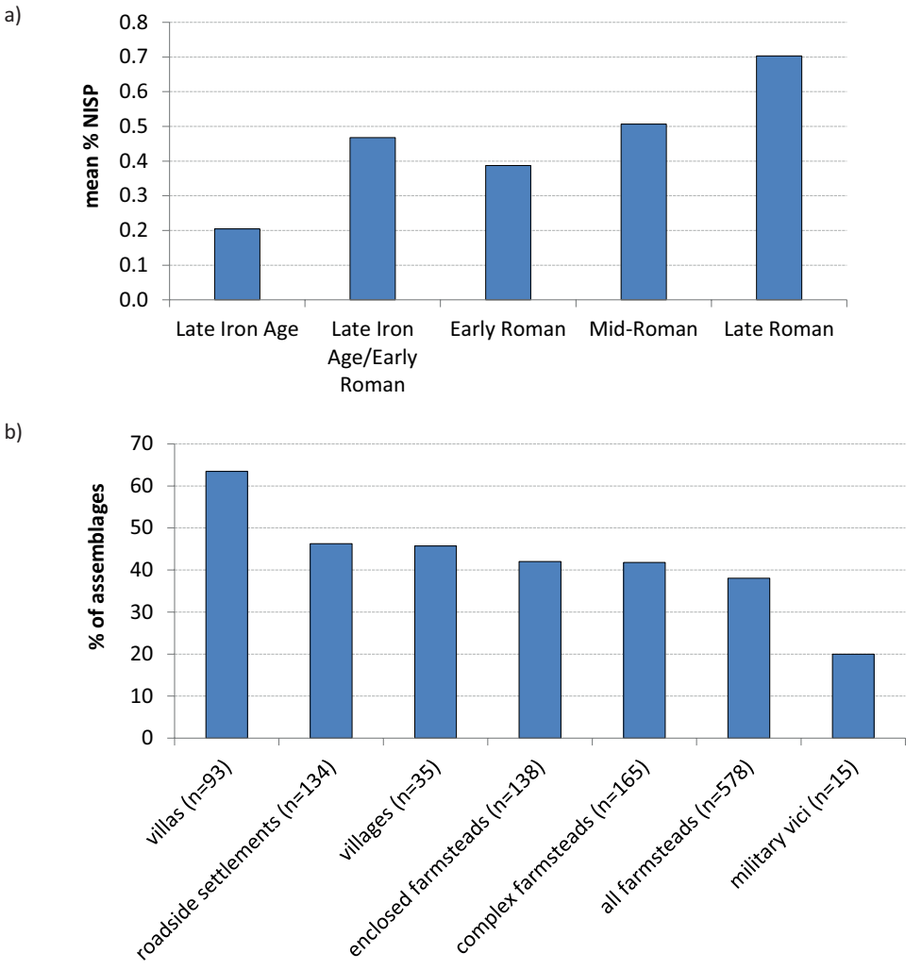
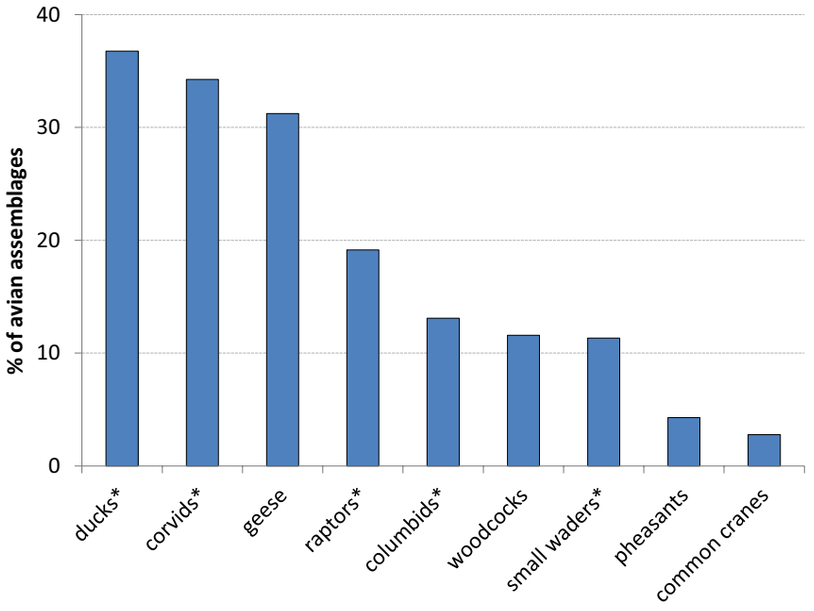


FIG. 4.20. Proportions of wildfowl over time (a) and representation of wildfowl on different site types (b) (graph (a) values calculated as the mean percentage of the total NISP of mammals and birds)

exploited. Ducks and geese were two of the most commonly occurring types of bird found in faunal assemblages (FIG. 4.21). Albarella (2005), however, argues that the low relative frequencies of duck and goose bones found on Roman sites (particularly compared with medieval sites) demonstrates that these birds were not domesticated until well after the Roman period. Woodcock bones have been identified in nearly 12 per cent of assemblages and are fairly common at villas, suggesting that this bird was favoured by some high-status groups. The woodcock is a wader but is frequently found on farmland, particularly where there is hedgerow cover to keep it safe during the day. Today, wildfowlers use beaters to flush woodcocks into the open where they can be shot. Woodcock populations increase in the winter when many migrate from the east to breed. Golden plovers and snipe are also fairly common on Roman sites (Parker 1988, 210–13), and their numbers also increase due to winter migrations. Serjeantson (1998) notes that winter is a traditional time for wildfowling, and it may be that it became more commonplace within certain sections of Romano-British society.

Parker (1988, 203) notes that a range of wildfowling equipment, including nets, snares and baited traps, could have been used to catch birds. The Vindolanda tablets list a number of snares for swans and nets for ducks and thrushes left by one of the garrisons (Bowman *et al.* 2003, 47). Presumably, both large and small birds were targeted, including some species not thought acceptable for consumption today. Bow hunting may also have been undertaken. The recovery of a second-century A.D. 'hunting kit' at Turner's Hall Farm, near St Albans in Hertfordshire, included numerous arrowheads of differing sizes and shapes, which presumably were meant for different types of quarry, including small birds (the find is not published, though see Allen 2011, 329–30, fig. 204). It seems likely that elites were wildfowling on their estates, as indicated by the range and quantity of bird bones found at Fishbourne. Wing



*ducks include mallards, teals, wigeons, pochards, shelducks and tufted ducks
*corvids include crows, rooks, ravens, magpies, choughs and jackdaws
*raptors include buzzards, white-tailed eagles, red kites, peregrine falcons, goshawks, sparrowhawks and kestrels
*columbids include pigeons and dove species
*waders include plovers, coots, lapwings, moorhens, godwits, curlews and snipes

FIG. 4.21. Proportions of different wildfowl taxa found in avian assemblages

TABLE 4.1: NUMBER OF ASSEMBLAGES WITH RAPTOR BONES BY PERIOD

Taxon	*mid–late Iron Age*	*late Iron Age/early Roman*	*late Roman*
Buzzard	16	12	17
White-Tailed Eagle	6	12	5
Red Kite	6	5	6
Peregrine Falcon	1	3	1
Goshawk	2	3	0
Kestrel	2	0	3
Sparrowhawk	0	0	3
Golden Eagle	0	0	1

bones of common crane have been found with numerous butchery marks showing that the meat had been consumed.

Bones from birds of prey (raptors) have also been identified in nearly 20 per cent of bird bone assemblages (FIG. 4.21). Buzzards are the most common bird found on sites between the later Iron Age and the end of the Roman period, followed by white-tailed eagles and red kites (TABLE 4.1). As mentioned above, buzzards were found in many pits at Danebury, and it is possible they too were deliberately deposited in the same way as crows and ravens (Serjeantson and Morris 2011, 101). There is very little evidence that raptors were eaten, though a butchered buzzard bone from Piercebridge and several eagle wing bones with cut marks at Binchester, suggest that consumption may have occurred occasionally (Cool 2006, 115). The use of their feathers may also have been important. The willingness of buzzards and white-tailed eagles to scavenge probably brought them into closer proximity with human settlements, both in rural and urban contexts (Mulkeen and O'Connor 1997, 441–2). It is possible that some bones identified as white-tailed eagle may, in fact, be of its close relative, the golden eagle. The two species can be distinguished on morphological grounds (Yalden and Albarella

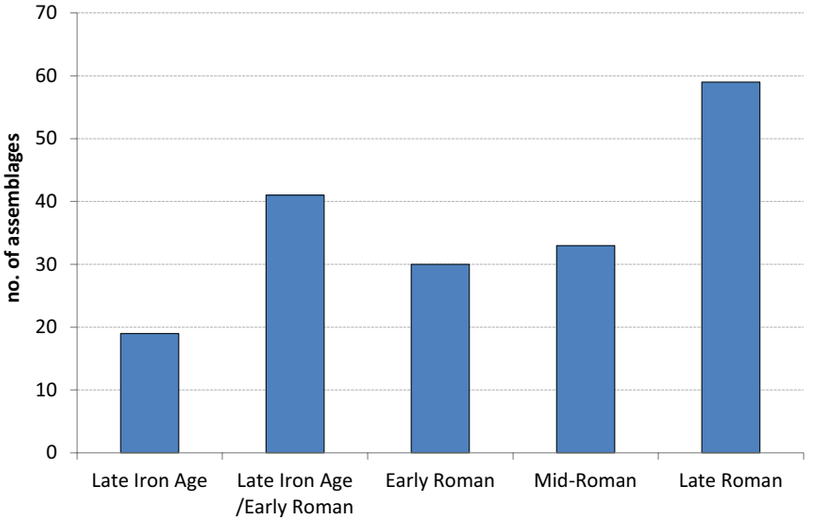


FIG. 4.22. Number of fish bone assemblages over time

2009, 12), though the only known example of the latter comes from the roadside settlement at Bainesse, North Yorkshire (Meddens 2002, 420). Of course, the eagle is often depicted in Roman imagery and sometimes found associated with Jupiter (Durham 2013, 96–100).

There is little evidence that raptors were used for hawking in Roman Britain. However, sparrowhawk remains were found deposited in a third to fourth century A.D. well at Great Holts Farm villa, Essex, alongside bones from numerous thrushes (Murphy *et al.* 2000, 40). Since thrushes are one of the most common prey animals of sparrowhawks, the find raises the possibility that hawking was undertaken here during the late Roman period. Sparrowhawks are certainly very rare in Roman contexts, with the only other known examples coming from the late Roman villa at Barton Court Farm, Oxfordshire (Wilson 1986), and a second-century context at Holme House villa, North Yorkshire (Gidney 2008). There are too few examples to make a conclusive interpretation on the use of sparrowhawks, but their restriction to villas hints at the possibility that they may have been kept by wealthier individuals. The earliest evidence for hawking in Europe comes from the fourth/fifth century A.D. (Prummel 1997). The fourth-century 'small hunt' mosaic at Piazza Armerina in Sicily depicts the use of a raptor as a decoy bird, perhaps used for hare coursing or for driving small birds, rather than conventional falconry (Parker 1988, 205). Certainly, sparrowhawks are not known to scavenge and there is no evidence that they were eaten, so the idea that they were used for hawking as part of late Roman elite practices is not unreasonable.

FISHING

Dobney and Ervynck's (2007) study of late Iron Age fish exploitation in England, Belgium and the Netherlands highlighted a genuine lack of evidence for marine and riverine exploitation in the North Sea region. They point to issues of poor preservation, of shallow contexts on rural settlements, and inconsistent sampling of features having an effect on this pattern. It is true that fish remains suffer from retrieval bias far more than mammal and bird bones. On sites where environmental flotation has been employed, one in three have produced fish bones, which compares to less than one in ten where wet-sieving is absent. Nonetheless, a substantial number of fish bone assemblages are now available from late Iron Age and Romano-British sites that invite further analysis. Although there have been studies of Iron Age and Roman fish remains (Dobney and Ervynck 2007; Locker 2007), rarely have changing patterns of fish exploitation and consumption between the two periods been considered.

The number of rural fish assemblages increases over time, from less than 20 in the late Iron Age to nearly 60 in the late Roman period (FIG. 4.22). This chronological shift is brought into sharper focus when the average number of fish bones per site is considered (FIG. 4.23). Although nearly 20 late Iron Age sites have produced fish bones, these generally only amount to a few isolated fragments, which supports Dobney and Ervynck's (2007, 409) assertion that this was a period when 'fish, it would seem, were hardly exploited'. In the Roman period, there is a greater abundance of fish remains on rural settlements, and, by the third/fourth century, average numbers exceed 100

specimens. Considerable quantities of freshwater fish were recovered from the Fen edge inland port at Camp Ground, Cambridgeshire, while small marine fish were also recovered from the nearby farmstead at Langdale Hale; at both sites, large-scale sampling of contexts was undertaken (Higbee 2013).

The data would suggest that changing attitudes to the consumption of fish were occurring soon after the Roman conquest. By the late Roman period, fish-eating may have been considered fairly normal in some areas, if perhaps only irregularly. Cool (2006, 105) notes that fish would have formed a comparatively small part of the diet in towns, and may have been considered a luxury. The range of species found includes both marine and freshwater taxa. This observation is also supported by Locker's (2007) more wide-ranging study of fish in Roman Britain, which is notably dominated by data from towns, particularly London, where large numbers of bones from sieved samples have been examined. In London there is evidence that fish sauce, or *garum*, was being produced, not necessarily from imported fish, such as Spanish mackerel, but from species caught locally, perhaps from the Thames Estuary (*ibid*., 152). Dobney *et al*. (1999) note the abundance of bones of sand eels and small clupeids (herring sp.) in late Roman contexts at Lincoln waterfront, and in York at St Mary Bishophill, finds that they attribute to local *garum* production, while there is also evidence for fish sauce production from Dorchester, Dorset (Trevarthen 2008).

Fish-hooks have been found at Fishbourne (Allen 2011, 329, fig. 203), Chichester (Down 1979, 200–1) and Portchester (Cunliffe 1975, 212–13), suggesting that the coastal estuaries of Hampshire and West Sussex were being exploited. However, evidence for fish-processing is far less common in the countryside. Considerable quantities of bones from small marine fish retrieved from a well in a complex farmstead at Langdale Hale, Cambridgeshire, were suggested to be the result of *garum* production (Ingrem 2013, 133), as was a mass of small fish bones from a single deposit in the late Roman salt-making site at Stanford Wharf, Essex, on the Thames Estuary (Biddulph *et al.* 2012, 171). At the early Roman salt-making site at Scotney Court, Kent, a large number of halibut and haddock bones were recovered from a single pit, with many including knife-filleting marks suggesting that the fish were being strung for salting (Barber 1998). A wicker-work basket found in a clay-lined 'tank' at Claydon Pike, Gloucestershire, contained the remains of several species of beetle (Elmidae sp.) that are known to frequent fast-flowing freshwater (Robinson 2007, 206). The basket had presumably been placed in a local stream, perhaps as a fish-trap, where the beetles were able to clamber inside, and, once fish had been caught, they were taken back to the settlement to be retained in the tank where the basket was found. The excavators went further, suggesting that a small hypocaust room at the site was used as a smoke-house for preserving fish (finds of pierced cattle scapulae suggest that shoulders of beef were being smoked at the site) (Miles *et al*. 2007, 175; Sykes 2007, 204; Allen 2017, 121).

The frequency of faunal assemblages with fish bones varies markedly between different regions (FIG. 4.24). Fish exploitation appears to have been most common in the South and South-West,

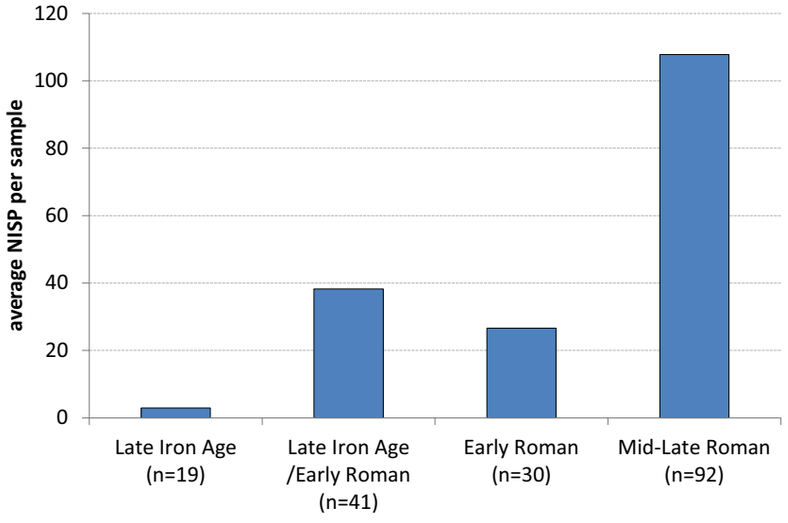


FIG. 4.23 Average number of fish bones per site over time

becoming less frequent further north and into Wales. This pattern may be partly due to soil acidity in the north and in Wales. The South-West region is poorly represented by animal bone assemblages but has a high proportion of sites with fish bones. This may partly reflect a small sample size. Sites with fish bones in this region are, perhaps unsurprisingly, coastal. Particularly high numbers of fish have been recovered from two sites on the Isles of Scilly at Bryher (Johns 2006) and Halangy Down, St Mary's (Ashbee 1996). Both sites also produced exceptional numbers of marine molluscs and bones of sea birds, indicating fairly intensive exploitation of coastal resources. Similar evidence derives from coastal sites on the mainland in Cornwall, Devon and Dorset. At Royal Manor Arts College, Portland, Dorset, excavations over 0.1 ha with very little environmental sampling produced almost 800 fish bones. A wide range of species was identified from the site, including bream, cod, pollock, bass, scad, wrasses, and conger eel, among others (Maltby 2009; Maltby and Hamilton-Dyer 2012). That marine fish were traded to sites further inland, however, is indicated by the recovery of flatfish (plaice or flounder), sea bream and scad in excavations in the suburbs of the walled town at Ilchester in Somerset (Locker 1999).

In the North region, fish bones derive almost exclusively from military *vici*. This could be due to the comparatively deeper stratigraphy at these sites, which may have aided preservation, though it could also relate to links to the military supply network, if fish were being brought in for the army as a food source. However, Locker (2007, 147–8) notes that forts generally produce very little fish bone, even where sampling has been carried out. It is possible, therefore, that fish was reserved for higher-ranking officers.

Variation in the size of fish bone samples between different site types suggests that consumption may have been related to social status and dietary fashions. Villas consistently produce larger fish-bone assemblages than other rural settlements (FIG. 4.25). Imported Spanish mackerel were identified from first/second-century A.D. deposits at Gorhambury villa, Hertfordshire, and probably represent Mediterranean tastes (Locker 1990). At Fishbourne, over 160 fish bones were recovered from a single, late first/early second-century ditch fill (Allen 2011, 97). Most of these could have been caught in the local estuary, though there is good evidence that flatfish were targeted, while eel, bass and mullet were also fairly well represented. The deposit appears to represent the remains of a feast. Of the 487 fish bones recovered at Tarrant Hinton villa, Dorset, 97 per cent were from late Roman deposits, while the remaining 3 per cent were early Roman (Graham 2006). Both Ballan wrasse and sea bream were identified, species that can be found in southern British waters between April and July, and may have been brought up from fisheries in Poole Harbour around 20 km to the south. The same

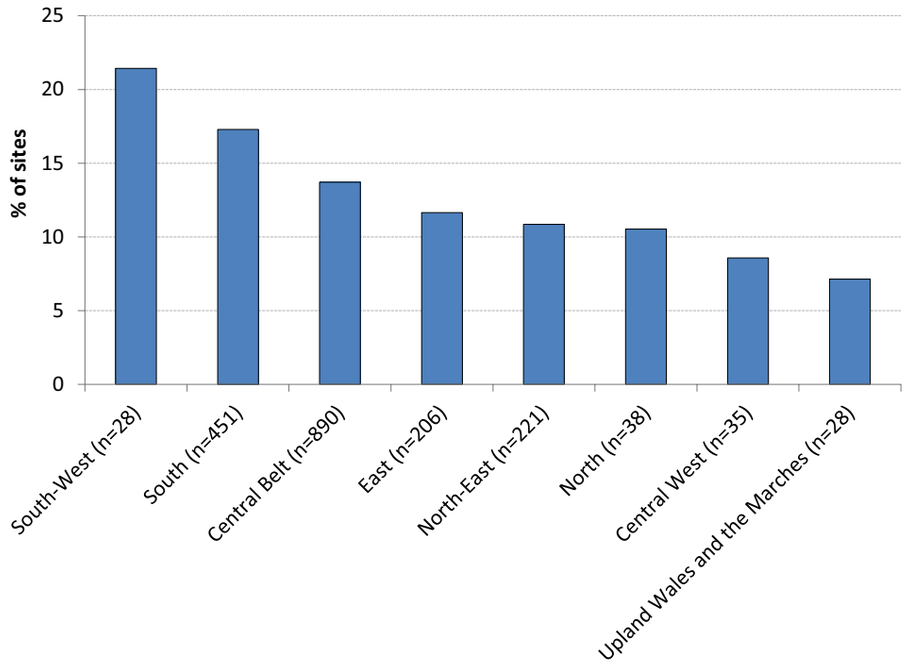


FIG. 4.24. Percentage of sites with fish bones present in faunal assemblages by region

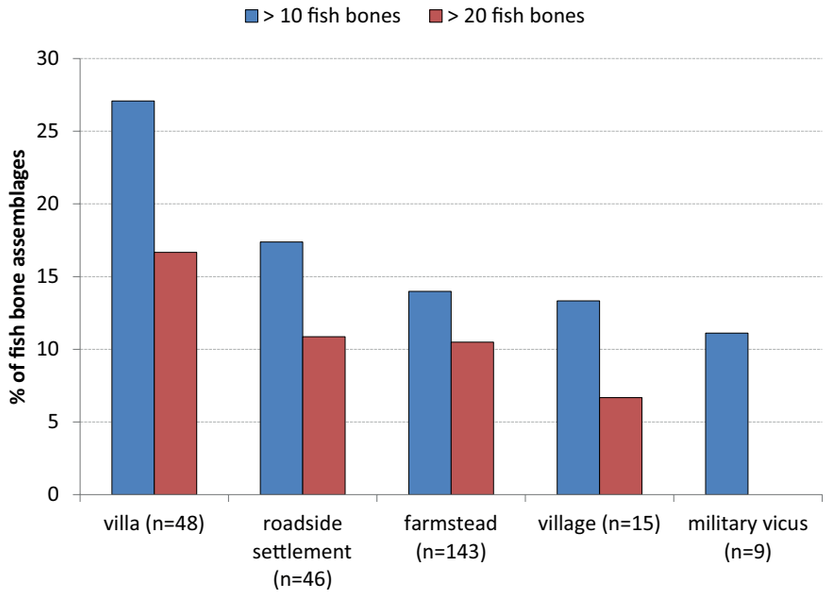


FIG. 4.25. Percentage of assemblages with more than 10 and 20 fish specimens from different site types

fisheries may have supplied the nearby villa at Bucknowle, where sampling produced over 400 late Roman fish bones, with lower quantities coming from early deposits (Light and Ellis 2009).

Excavations at another Dorset villa at Halstock produced evidence for managed water-systems, utilising a local natural spring, which was modified in the third century A.D. to supply an ornamental pond and 'control' tanks within the main courtyard (Lucas 1993). Unfortunately, no environmental sampling was undertaken to recover fish bones, though the structural evidence indicates that fish may have been kept in the garden. A similar water-management system was also identified in the purported 'southern garden' at Fishbourne, though whether this was to supply ponds or other ornamental garden features with water is uncertain (Cunliffe *et al.* 1996; Allen and Sykes 2011, 19). Other possible ponds associated with fish-keeping have been identified at the villas at Shakenoak, Oxfordshire (Cram 2005), Claydon Pike, Gloucestershire (see above), and Bancroft, Milton Keynes (Williams and Zeepvat 1994). Hurst (2016) has recently surveyed the evidence for ponds in Roman Britain, though very few have been interpreted as being used for fish.

While the evidence for fish-keeping in Britain is sparse, it is worth noting its popularity as an elite past-time in Roman Italy. The construction of fishponds on villa estates was common at continental villas dating to the first centuries B.C. and A.D., in which a number of species are known to have been kept (Bergmann 1994, 50). Varro (*Res Rust.* 3.17.2–3) also notes that saltwater pisciculture was the reserve of the elite, perhaps due to the investment required for constructing water channels from the sea or estuaries. Thomas and Wilson (1994, 166–7) detail the logistics involved in these ancient practices. Garden ponds were deliberately flooded in order to support saltwater fish: '…while he was building he became so enthused that he allowed the architect to run a tunnel from his ponds to the sea so that the tide might run to the pond and back to the sea twice a day and cool off the ponds' (Varro, *Res Rust.* 3.17.9). According to Columella (*Rust.* 8.16–7), the *piscinarii* of the late Republic are not to be seen as simply fanciful features but a deliberate elaboration of villa fashions, and the development of coastal fishponds was integrated into the philosophy of the elite pastoral villa (Purcell 1994, 158).

SHELLFISH EXPLOITATION

Oysters are often thought of as one of the most quintessential of Roman foods. Although they are frequently found in large quantities on Roman sites, rarely are they examined and reported in sufficient detail (see FIG. 4.26 for distribution of all marine shell, but mostly oyster, on rural sites from current project). It is thus very difficult to assess their distribution and quantity accurately on a regional or chronological basis. Cool (2006, 106–8) similarly lambasts the situation as frustrating. She highlights the work of Winder (1992), whose studies have shown that much can be gained from more detailed analysis, most notably in detecting the locations of oyster beds. Some specialists have been able to provide insights into the movement of oysters from their tidal beds to major towns (Cool 2006, 107), such as shellfish

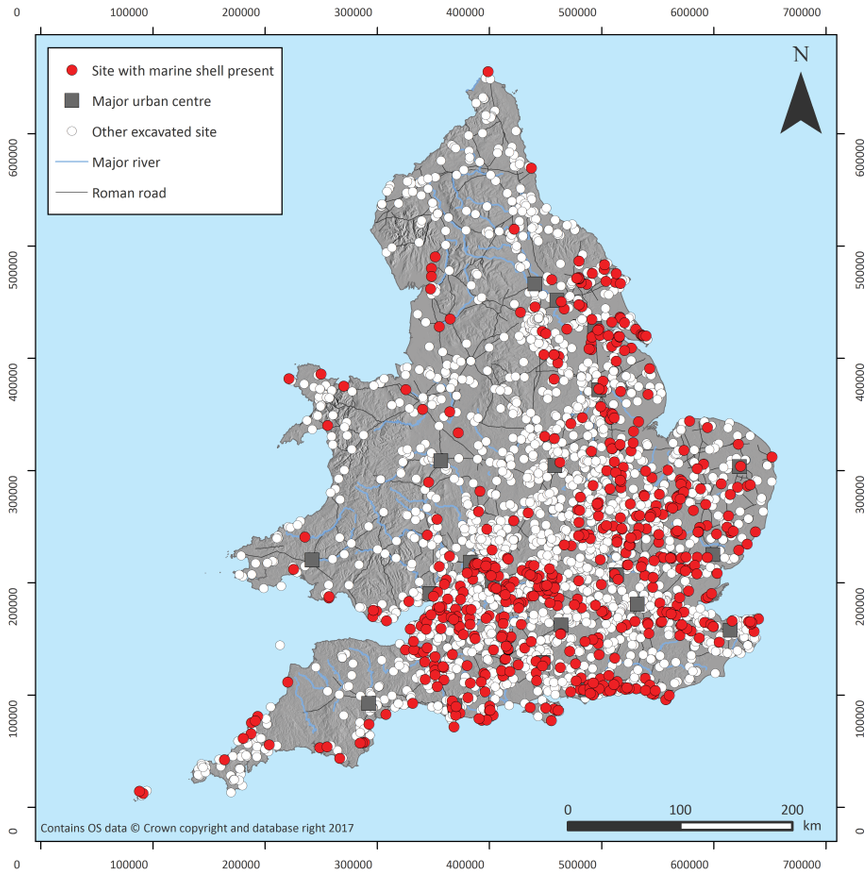


FIG. 4.26. Distribution of records with evidence for marine shell

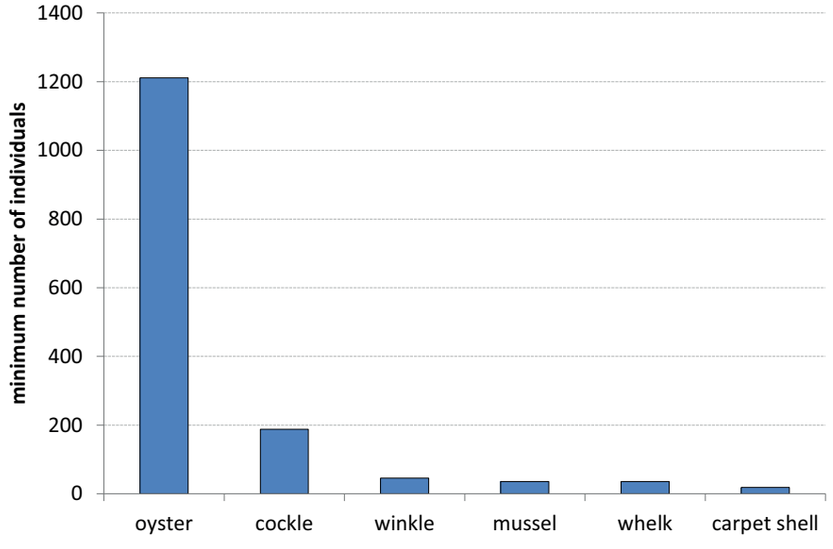


FIG. 4.27. Quantities of marine molluscs recovered from excavations at Fishbourne (Area C) in 2002 (all phases – data from Somerville and Bonell 2006, 95, table 6)

at Silchester, which came from the south coast (Somerville 1997, 135–9), while those eaten at Leicester travelled over longer distances from the Thames Estuary (Monckton 1999, 340). Unfortunately, the lack of consideration given to oysters by archaeologists is true of all marine molluscs; if oyster exploitation and its role in the Romano-British diet is to be fully understood it must be compared to other taxa via quantitative analysis.

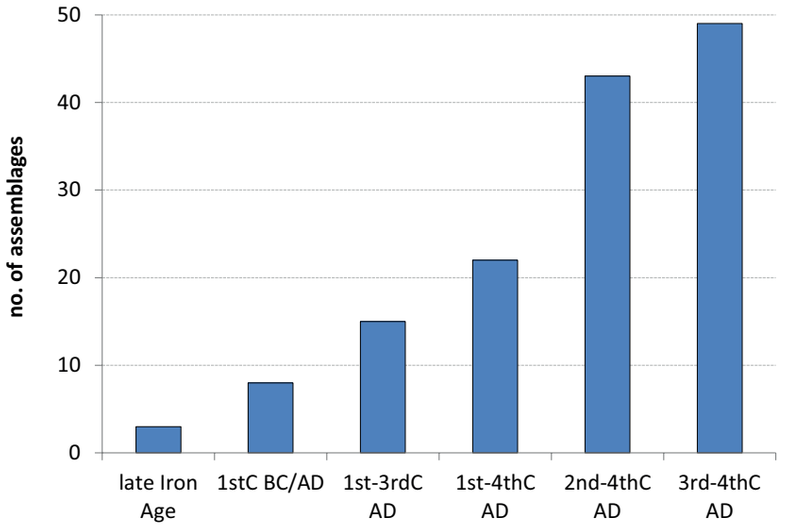


FIG. 4.28. Number of marine mollusc assemblages over time in south-west England

Shellfish no doubt flourished around the British coastline during the Iron Age and could have been a very useful food source during certain times of the year. In this period, however, marine molluscs only tend to be found at coastal sites, and are comparatively sparse inland. Willis (2007, 111–12) notes that even at coastal settlements shellfish would have provided only a small contribution to the Iron Age diet. There appears to have been little evidence for the selection of particular mollusc species in Iron Age assemblages. Excavations at Rookery Hill, Bishopstone, East Sussex, for example, produced large quantities of mussels, limpets and periwinkles among other species, including a crab claw from a late Iron Age ditch (Bell 1977). Oysters were recovered, but did not become more common until the Roman phase of occupation, and this also appears to have been the case at other Iron Age sites that continued to be occupied post-conquest.

Early traces of a cultural ('Romanised') preference for oysters over other species are detectable in an assemblage recovered from a pre-conquest ditch at Fishbourne, West Sussex (Somerville 2005, 91; Sykes 2005, 84). Shellfish continued to be eaten at the site over the next 350 years and it is clear that oysters were selected over other species (FIG. 4.27; see also Somerville and Bonell 2005). Analysis of the morphology of the Fishbourne oyster shells suggests that they were being managed locally in shallow waters, so that the beds could be exploited on a regular basis (Somerville and Bonell 2006, 96).

Using the south-west of England as a case study area, it is possible to detect the increasing exploitation of marine molluscs over time, both in terms of the regional distribution of shellfish and the growing discrimination in favour of oyster over

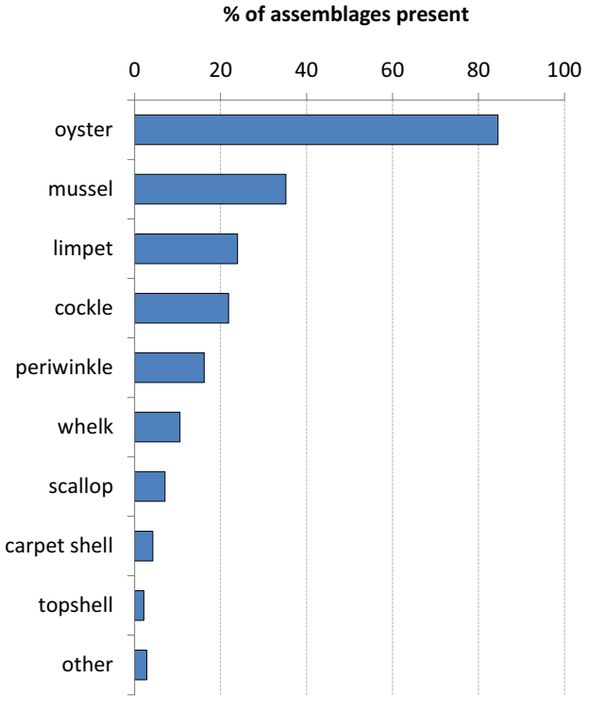


FIG. 4.29. Frequency of different marine mollusc taxa in south-west England

other species. The case study area extends beyond the project's South-West region of Cornwall and Devon to include the counties of Dorset, Somerset, Wiltshire and Gloucestershire. Based only on the number of dated marine shell assemblages recovered from the area, it is clear that the exploitation of shellfish as a food source increased over time (FIG. 4.28). Oysters were by far the most common species identified, being found in nearly 85 per cent of mollusc assemblages (FIG. 4.29). Mussels were the next best-represented species,

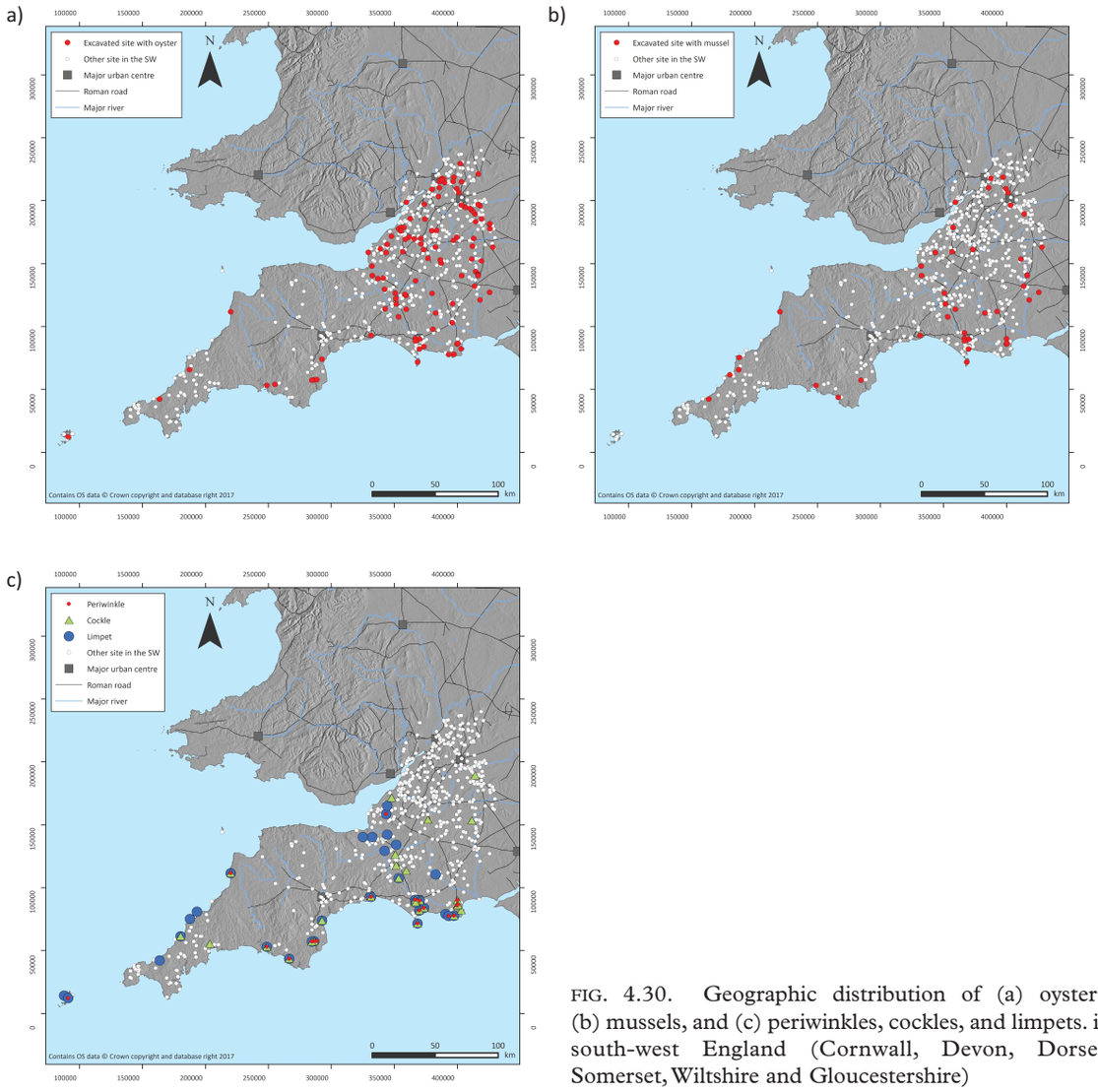


FIG. 4.30. Geographic distribution of (a) oysters, (b) mussels, and (c) periwinkles, cockles, and limpets. in south-west England (Cornwall, Devon, Dorset, Somerset, Wiltshire and Gloucestershire)

occurring in 35 per cent of assemblages, and these were followed by limpet, cockle and periwinkle, which occurred in 16–24 per cent of assemblages. Other species included scallops, whelks and carpet shells, all of which are edible. Unfortunately, it was not possible to quantify individual assemblages for comparative analysis, though the available data suggest that oysters become more frequently targeted after the Roman conquest. It is notable that sites with oysters are fairly evenly distributed between coastal and inland areas in the region (FIG. 4.30). It is important to consider the increased soil acidity of Devon and Cornwall, which provides unfavourable conditions for shell preservation and undoubtedly biases their distribution towards the eastern half of the case study area. Nonetheless, it is instructive to compare the distribution of different mollusc species. Mussels are also found at inland sites, but not to the same extent as oysters. Cockles and winkles are found at coastal sites and at a few inland sites, notably between Ilchester, Somerset, and Dorchester, Dorset, while periwinkles are completely restricted to the coast. The varied distribution of different mollusc species suggests that most taxa were being exploited close to the coast, though only oysters and, to a lesser extent, mussels appear to have been desired by the inhabitants of inland settlements, with all the transport costs that this would bring.

Compared to molluscs, there is a notable lack of evidence for the consumption of crustacea. Crab remains are recorded at three sites, including the late Iron Age phase at Rookery Hill, Bishopstone, East Sussex (Bell 1977), Atlantic Road, Newquay, Cornwall (Reynolds 2001) and Holme House villa, North Yorkshire (Harding 2008). Only one site in the database, the villa at Magor Farm, Illogan, Cornwall, records the presence of lobster claws (O'Neill 1933), which may reflect the consumption of a locally caught delicacy.

The synthesis presented above is restricted by the available data. However, evidence for the exploitation of marine and estuarine resources will benefit from standardised sampling strategies and an increasing recognition of the potential for the analysis and quantification of mollusc remains. Only with an improved dataset can the importance of marine resources be more fully considered in terms of the Romano-British economy and social attitudes to the consumption of shellfish.

CONCLUSIONS

Human–animal relationships in Roman Britain were wide-ranging. People certainly came into contact with a considerable number of animal species, far more than could be covered here, and it is clear that these interactions extended far beyond the simple need to produce food. As stated at the beginning of this chapter, zooarchaeological studies that focus solely on the productive capabilities of animals restrict us to a very small part of the human–animal relationship. By drawing upon a range of zooarchaeological data, alongside material culture, iconographic and documentary evidence, it is possible to move discussion beyond the economy to consider people's attitudes to animals, reflecting the cultural diversity of Roman Britain.

Cattle are an interesting case study for understanding aspects of late Iron Age and Romano-British society. By far the most important animal in the Romano-British economy, cattle became steadily more common than other livestock species, at least from the second century A.D. onwards, and their remains are found in large quantities at towns and military sites. The growth in cattle numbers was in response to a widespread expansion of arable agriculture across southern and central England, as indicated by changing patterns of cattle slaughter. In the late Iron Age, a relatively high proportion of immature cattle were slaughtered at rural sites, whereas in the Roman period cattle more often lived to adult and elderly ages (Allen 2017, 110, fig. 3.34). Older cattle are often a sign of an increased emphasis on traction, but it also reflects a change in the way that people and cattle were living together. It is possible that the culling of young cattle in the Iron Age was due to feasting, where livestock are utilised as a form of wealth, only to be slaughtered during social exchanges, such as bridewealth, to settle differences, or to cement client–patron relations. There is a wide range of anthropological literature that discusses these phenomena in many societies where animals are kept as stores of wealth (cf. Russell 2012, 297–357). That this was the case in the Iron Age finds some support from Tacitus (*Germ.* 5) who talks of the Celts of northern Europe keeping large numbers of cattle as a reflection of their wealth and status (Green 1992, 14). Animals of such value are unlikely to be slaughtered frequently, and such an event may only be reserved for gatherings and seen as a sacrifice.

After the conquest, it seems likely that socio-political changes concerning matters such as land tenure, urbanisation, and military supply, affected the way that rural communities were organised and how they engaged with each other. The lack of evidence for immature cattle slaughter may be a sign of such change. By switching to 'beasts of burden' in areas where arable expansion was occurring, cattle may have become less important as stores of social wealth. It has been hypothesised in this chapter that cattle became a shared resource between Romano-British households in order to undertake the work needed to produce enough grain to supply the estate and eventually the army (see also Allen and Lodwick 2017). Signs of foot pathologies appear to reflect the increasing pressures being placed on plough cattle. However, this should not necessarily be seen as a reduction in animal welfare, as the human bone evidence also indicates that some rural folk had to work harder and suffered alongside their cattle (see Ch. 7). In the Roman period, cattle were generally living longer and were probably spending more time toiling in the fields with people. Armstrong Oma (2010, 181) argues that plough animals and their handlers build up years of trust through the mutual rhythms of their daily movements. Rather than thinking of cattle as commodities in these contexts, it is perhaps more likely that farmers and cattle were able to build up stronger social bonds. It is only when cattle reached the end of their productive life that they were sent to urban or military markets, and it is here that the evidence for intensive butchery patterns has become evident, reflecting the commodification of meat and a lack of mutual respect between people and domestic animals. It is in the towns, forts and villas where attitudes toward livestock, including sheep, goats, pigs and horse, may have been quite different to elsewhere in the countryside.

The symbolism of animals is an important element of human–animal relationships. The frequent use of horse imagery by late Iron Age elites is testament to the social role this animal played in demonstrating power and political identity. It seems likely that the physical attributes of the animal, its speed and strength, contributed to its position as an icon, and horse images may have played a significant role in the creation of mythologies. However, the Roman conquest brought about changes in human–equid relationships. Zooarchaeological evidence has

demonstrated that horses increased in size during the Roman period (Allen 2017, 129–30), perhaps reflecting variously a demand of the military and the *cursus publicus* for larger horses, a need for animals that could withstand harder workloads on the farm, and, perhaps, for larger, faster animals for the arena. Horses may have become particularly revered in some urban quarters as chariot-racers, and these animals were probably afforded higher quality care and maintenance than many of those on rural settlements.

Differences between rural and urban environments may have influenced perceptions of dogs and cats. As with other animals, there is good evidence for more intensive breeding of dogs after the Roman conquest. This development may have been undertaken for a variety of reasons, though it is difficult to establish the specific reasons why dogs were kept by people. The appearance of small 'lapdogs' is often cited as representing pampered pets, though small working animals may also have been important on farmsteads and no less cared for, as suggested by the ceremonious burials afforded to some dogs on rural settlements. Greater incidences of pathologies in dog skeletons found in urban deposits suggests that stray populations were probably fairly widespread in towns. Instances of broken bones and cracked skulls suggest that these animals came in for some particularly tough treatment at the hands of townspeople.

Changing perceptions of the natural world are also hinted at through the zooarchaeological evidence for animal introductions and the exploitation of wild fauna. The importation of fallow deer and exotic birds certainly points to the establishment and maintenance of parks and gardens. Deer hunting and wildfowling appear to have become more common in the Roman period, alongside an increase in fishing and in the consumption of shellfish. In other societies, where increased exploitation of wild resources is seen, it is usually consistent with political changes where there is an increased emphasis on landed wealth (e.g. Wickham 1994). Under Roman law, hunting of wild animals was restricted on private land (McLeod 1989), and it may be that deer hunting became a means of expressing land rights. At sites of exceptional high status, the introduction of exotic species, such as fallow deer, and the establishment of parks, only served to further articulate notions of status and wealth. This marks a very clear change in ideology from the Iron Age worldview, where wild animals appear to have been viewed with reverence. Iron Age iconography suggests that the wilderness was cosmologically separate from the domestic sphere, and only those with supernatural powers were able to cross such boundaries and engage with animals on the other side (Aldhouse-Green 2001b). The introduction of wild animal enclosures, fish ponds and, indeed, formal gardens in the Roman period, marks a very different attitude to the way in which the natural world could be approached and treated (Allen and Sykes 2011, 20).