4. Zooarchaeology and the Interpretation of Depositions in Shafts

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Abstract

Wells and other shafts are common depositories for animal bones and other environmental data. Interpretations of these depositions have varied greatly. This paper reviews the deposition of animal bone groups (ABGs) in two Romano-British shafts. When examined in detail, there are significant variations in the make-up of these ABGs, and it is argued that they should not be considered as one generic group. To understand such depositions, detailed records of the location and condition of all the finds are required. ABGs should not be considered in isolation and a much more holistic approach is required which should make use of environmental archaeological data.

Introduction

Wells and other shafts have been discovered on a wide range of British archaeological sites. In many instances their interpretation has attracted discussion about the motivations behind their construction, use and infilling. These interpretations have ranged from the exclusively functional (e.g. extraction of water; flint and other raw materials) to the purely ritual with various others combining elements of both. Environmental archaeologists have been involved in the analysis of many of these features. Bones of both humans and other animals have been frequently recovered and subjected to investigation by human osteoarchaeologists and zooarchaeologists. Less consistently, other environmental archaeologists have also been involved in examining a range of materials including soils, insects, wood and other macroscopic plant remains, pollen and snails. A wide range of other archaeological specialists have also been involved in the analysis of the non-environmental artefacts deposited in these features.

This paper is concerned with whether and how the contributions of environmental archaeologists, in particular zooarchaeologists, have been incorporated into the overall interpretations of wells and shafts. It examines to what extent, if at all, their interpretations have been influenced by the results of colleagues examining other materials from the same feature.

Problems of integrating environmental archaeology with other archaeological evidence in the interpretation of shafts are most clearly illustrated in the report of the Wilsford Shaft (Ashbee *et al* 1989). This shaft was originally thought to be an Early Bronze Age pond barrow located just 800m to the south of Stonehenge in Wiltshire. Excavations revealed that the depression represented the cone of a shaft that extended to a depth of 100 feet (30m) through the chalk subsoil. Subsequent clarification of the chronology has shown that the shaft was originally dug in the Neolithic and was in-filled at various times in the Bronze and Iron Age. Within the published report, Martin Bell emphasised a functional interpretation (use as a well; local environmental conditions), whereas Paul Ashbee emphasised the possible ritual motivations behind the construction of the shaft and subsequent depositions. Therefore material deposited in the shaft was interpreted differently by members of the same investigation team.

The larger animal bones from the shaft were examined by Caroline Grigson (1989). These included a number of associated animal bone groups (ABGs) (see Morris this volume for discussion on the general nature of this deposit type). Three groups of neonatal sheep/goat bones from near the base of the shaft were interpreted as remains of animals being bred near the site. Sheep head and foot bones found at a depth of c.44 feet (c.13.4m) were interpreted as either skinning or butchery waste or the ritual deposition of head and hooves. Two sets of sheep/goat thoracic vertebrae located at the base of the weathering cone were interpreted as butchery waste, based on the evidence of cut marks. In the upper cone amongst Iron Age material, Grigson noted the presence of small groups of horse bones and a cattle skull amongst disarticulated human remains. She described this as *"unusual human discard behaviour: whether or not this should be regarded as ritualistic is uncertain"* (Grigson 1989, 115). Disarticulated animal bones from the shaft were generally regarded as the product of *"ordinary domestic refuse"*.

Small vertebrate bones were examined by Yalden and Yalden (1989). The amphibian bones were interpreted as the victims of falls. Bones of swallows were interpreted as the remains of birds nesting in the upper part of the shaft. Therefore different associated bone groups were accorded different interpretations based on their species, completeness and other taphonomic evidence. The analyses from the Wilsford shaft therefore highlight many of the problems associated with interpreting animal remains from such features. The interpretations given are often variable and frequently dependent upon the individual author's preconceptions and favoured paradigms.

This paper will critically review interpretations of faunal remains studied by the author from two other shafts, both of Romano-British date. The validity of the original interpretations will be discussed in relation to general changes in the interpretation of wells and shafts. The sites in question are Greyhound Yard, Dorchester (Woodward *et al* 1993) and Victoria Road, Winchester (Qualmann *et*

al 2010; Maltby 2010).

Greyhound Yard, Dorchester

Dorchester, Dorset was the *civitas* capital of the Durotriges during the Romano-British period. Extensive excavations tool place on the Greyhound Yard site in 1984, incorporating about a third of an *insula* situated to the south of the Forum (Woodward *et al* 1993). Amongst a complex sequence of building developments spanning the Romano-British period, a number of deep shafts were investigated, many producing a rich range of finds. These features included wells, which reached the depth of the water table. Other shafts, although up to five metres in depth, ended well above the water table. Most of these were originally interpreted as cess pits filled with a variety of refuse (*ibid*, 31-83). Subsequently, Woodward and Woodward (2003) have reinterpreted some of these shafts. By reconsidering the location and alignment of the pits, they argue cogently that some of these features were created as part of the original foundation and laying out of the town. They suggest *"that certain shafts...were dug to receive placed deposits of ritual significance"* (*ibid*, 70) and that evidence for repeated acts of deposition *"can be related to the possible enactment of urban foundation rituals, and their continuing celebration"* (*ibid*, 83). They based their arguments on the discovery of complete ceramic vessels, animal burials and rich small finds assemblages within the fills of these features.

Nineteen shafts were reinterpreted, of which three are illustrated and discussed in detail (Woodward *et al* 1993). This section will review the extent to which artefactual and environmental data were utilised in both the original interpretation and subsequent reinterpretation of some of these features. This critique will be restricted to those features described in most detail in Woodward and Woodward (2003)

The original interpretation of these features was partly based on the analyses of diverse specialists who worked on the materials recovered from the site. The excavation monograph is structured in a manner typical of such reports (Woodward *et al* 1993). The first chapters are concerned with a detailed description of the stratigraphic sequence arranged in chronological order and including a chapter on the Roman phases. This is followed by a chapter concerned with the description and interpretation of the small finds. This includes 20 separate reports created by a total of 14 specialists. The next chapter consists of the pottery evidence, which involved the work and reports of six specialists. The finds reports have heavy emphasis on typology and provide general assessments and comparisons between periods. However, they rarely discuss finds or assemblages from individual features.

The work of eight environmental archaeologists forms the framework of the penultimate chapter of the monograph. The analyses that include data from the shafts, however, are restricted to those on the mammal and bird bones (Maltby 1993), the fish bones (Hamilton-Dyer 1993), oysters (Winder 1993), the human remains (Rogers 2003), cess and dog coprolites (Allen 1993) and macroscopic plant remains (Jones and Straker 1993). However, constraints of rescue archaeology severely restricted sieving and other sampling for environmental data. Apart from the animal bones, which were retrieved during hand-excavation from all contexts, environmental data was collected and analysed from a very restricted range of contexts.

As in the case of the artefacts, the emphasis within the published animal bone reports was on general trends between periods rather than analysis of assemblages by feature, property or area. This was an editorial decision made for understandable reasons of keeping the monograph to a reasonable size with regard to publication costs. More details were made available in the form of microfiche, which consists of 24 appendices that includes catalogues of all the metalwork, worked stone, shale, glass and building materials. They also contain summary lists of the Samian, imported finewares and mortaria and various summary tables of the animal bones, marine mollusca and plant remains. However, records of all the other categories of pottery and detailed records of the faunal remains are only available in the archives held at the Dorset County Museum.

The final chapter in the monograph (Woodward 1993) is typical of most excavation reports in that it consists of a discussion, in which the excavation co-ordinator has the unenviable task of synthesising the disparate specialist reports and attempting to integrate these with the stratigraphic evidence.

Shaft 13 (Feature F2310)

This feature was the one which was highlighted as an example for evidence of "*repetitive and structured deposition*" (Woodward and Woodward 2003, 74). It consisted of 3.30m of early-mid 2nd Century fills from the lower part of a vertical shaft. The fills mainly consisted of layers of fine clayey loam containing dark organic deposits interspersed with layers of chalk rubble, limestone slabs and a wooden box (Woodward *et al* 1993, 47; Woodward and Woodward, 2003, 74). In the original report attention was drawn to the presence of several dog skeletons and neonatal puppies. The position of two of the adult dog skeletons led to the suggestion that they may have been tied together at the throat when deposited. It was also suggested that two other dogs had been decapitated. Although the significance of these dogs was described as uncertain, this shaft, like the others, was interpreted primarily as a cess-pit (Woodward *et al* 1993, 47).

Table 4.1 Summary of sequence of depositions in Greyhound Yard, Dorchester Shaft 13. Data adapted from Woodward and Woodward (2003, 75). 2313 also includes a wooden box cover, ABG = animal bone groups; s/g= sheep/goat; cw = coarse ware vessels

Context	Approx. Depth (m)	Fill	ABGs	Ceramics	Personal Items
2114		terracing/later infill			
2279		terracing/later infill			
2282		terracing/later infill			
2283		terracing/later infill			
2290	0.00-0.20	organic			
2312	0.20-0.60	chalk seal			
2313	0.60-0.90	loam	4 s/g; 3 dogs; puppy; 2 birds	3 whole cw; 2 half cw	
2328	0.90-1.10	organic			
2316	1.10-1.50	organic above chalk seal	4 dog; puppy; 2 s/g; pig; 2 birds		
2321	1.50-1.80	clayey loam	dog; puppy; rodent		pottery and glass counters
2334	1.80-2.20	organic above limestone	cat; dog		
2335	2.20-2.90	clayey loam	frog; s/g; puppy	2 whole cw; 1 half cw	
2362	2.90-3.30	chalk rubble			

The reinterpretation highlighted the evidence for structured deposition. Table 4.1 summarises the discussion originally presented by Woodward and Woodward (2003, 74-77). Their discussion is supported by a figure, which describes all the animal bone groups (ABGs), complete and half-complete pottery vessels and personal items as votive deposits (*ibid*, 75, Figure 3). This unfortunately oversimplifies the nature of these ABGs, giving the impression that they are all complete skeletons. Although the discussion of the finds makes it clear that, for example, the rodent and frogs probably were victims of falls and some of the remains are joints of meat rather than unbutchered skeletons (*ibid*, 75-77), the impression gained is that all the ABGs are of equal significance.

An examination of the original animal bone analysis demonstrates that this is not the case. Unfortunately space precluded the publication of the details of the ABGs in the text of the original excavation report, although summary data are available in the microfiche (Maltby 1993, mf6). A brief discussion of the faunal remains from this shaft supported by these tables was also produced as an English Heritage, Ancient Monuments Laboratory Report (Maltby 1990). That report did note that an unusually high proportion of the 1,754 animal bone elements in the shaft formed ABGs. Table 4.2 reproduces the summary details recorded in the original analysis. A total of 29 ABGs from 11 species contributed a total of 1,287 animal bone fragments. Undoubtedly, this pit received repeated depositions of a variety of species and the argument that these were of ritual significance, ignored in the original report, certainly deserves serious consideration. However, to obtain a more comprehensive understanding of the nature of these depositions, the completeness of the skeletons and taphonomic evidence also needs to be taken into consideration.

To examine these ABGs in the sequence of deposition, *2335* at the base of the shaft contained 4 ABGs along with two complete pots and substantial parts of a third. The frogs referred to by Woodward and Woodward (2003, 74) were in fact partial skeletons of a frog and toad (Table 4.2). The lack of sieving probably accounts for the absence of the remainder of the skeletons and the interpretation that these were pitfall victims is still the most feasible. The puppy remains consisted of just nine bones and without confirmation from sieving, it is unclear whether these were from a complete carcase or from the surviving remains of a partial skeleton that may have been redeposited. Probably of greater significance are the 76 bones of a sheep. The description of this as a sheep joint (*ibid*, 74) is inaccurate as the group consists of bones from most parts of the body of a neonatal lamb, which bears no evidence of butchery. Other bones of this skeleton may have been overlooked during excavation but this cannot be confirmed due to the lack of sieving. However, it is probable that this was a complete carcase that was deposited.

Context *2334*, which consisted mainly of clean chalk rubble and limestone slabs sealing *2335*, produced just two small ABGs. Four bones of an older dog and six bones of an immature cat, which appear to lie on top of a limestone slab, are unlikely to represent the surviving remains of complete carcases. It is possible that the dog

Table 4.2 Associated bone groups (ABG) in Greyhound Yard, Dorchester Shaft 13. Data adapted from Maltby (1990 Table 33). Dog excluding neonatal puppies; Pigeon = pigeon species; N = number of bones in ABGs

	2313		2316		2321		2334		2335		Total	
Species	ABG	N	ABG	N	ABG	N	ABG	N	ABG	N	ABG	N
Sheep	3	68	2	161					1	76	6	305
Goat	1	61									1	61
Pig			1	62							1	62
Dog	3	347	4	46	1	138	1	4			9	535
Puppy	1	26	1	104	1	13			1	9	4	152
Cat							1	6			1	6
Pigeon			1	4							1	4
Raven			1	84							1	84
Rook/Crow	1	30	1	20							2	50
Jackdaw	1	3									1	3
Frog									1	14	1	14
Toad									1	11	1	11
Total	10	535	11	481	2	151	2	10	4	110	29	1287

bones belonged to more complete skeletons recorded in fills above this context. However, both could also represent the redeposited remains of disturbed skeletons.

Context *2321* incorporated the largely complete skeleton of an immature male dog, which does appear to have been buried whole without prior disturbance. Thirteen neonatal puppy bones were also recorded, as well as a bag containing gaming counters. This was sealed by a dump of chalk and clay, above which a substantial organic deposit, *2316*, produced four dog partial ABGs totalling 46 bones, which are not necessarily from four different dogs as implied by the illustration of Woodward & Woodward (2004, 75). The bones are all from adult animals but could be from some of the more complete skeletons located above in *2313*. Over 100 bones from at least three neonatal puppies were also recovered in this context, not one as stated by Woodward and Woodward (*ibid*, 77). Two further fairly complete neonatal lamb skeletons were also found in *2316*, again neither showing any evidence of butchery and therefore should not be regarded as joints of meat. Similarly, the 62 bones of pig belonged to a neonatal mortality, which was also probably deposited as a complete unprocessed carcase. A fairly complete raven (84 bones) represents the disposal of a complete bird. Twenty bones of a rook/crow were also recovered. These mainly consisted of the larger bones of the skeleton but many of the smaller bones may have been overlooked during excavation. Four bones of a pigeon were also retrieved.

Context *2316* was sealed with a wooden box or cover, above which a thick loamy deposit, *2313,* contained several more ABGs as well as five complete or substantially complete coarse ware vessels (Table 4.1). Three complete dog skeletons were deposited, including the two believed to have been tied together (alternatively they could also have been deposited in a bag). Two of these dogs were adults; the third was from an immature animal. Twenty-six bones from at least two neonatal puppies were also retrieved (not one as illustrated in Woodward and Woodward 2004, 75). Four further sheep/goat ABGs were recovered. These are also all described as sheep joints by Woodward and Woodward (*ibid*, 77) but again this disguises the heterogeneity of the groups. Two of them consist solely of the skulls and mandibles of sub-adult sheep, both skulls having being split open to remove the brain prior to deposition. The third consists of 60 bones of another young lamb. Again all parts of the body are represented and this again probably represents the carcase of an unbutchered complete burial. The fourth group consists of a goat rather than a sheep. All 61 bones are from the head, all four feet and the tail. Knife cuts on both astragali, a calcaneus and the distal end of the tibia indicate that the hind feet had been dismembered (Maltby 1990). The bones represented are those often detached with the skin and it therefore appears that this ABG represents the deposition of a goatskin, or bones removed during processing the skin, rather than a joint of meat.

Two further corvid ABGs were recovered from *2313*. Thirty bones of a rook/crow probably represents the carcase of a complete bird; However, the other group consists of just three bones from a jackdaw, which more likely represents only a partial skeleton that has probably been redeposited.

Although Shaft 13 undoubtedly incorporates an unusually rich ABG assemblage, it is clear that the ABGs vary substantially in their make-up. Some of the material can be interpreted as well preserved primary butchery waste (sheep skulls); other ABGs represent victims of falls (amphibians; rodents) and one group is likely to have been incorporated in a skin (goat). Some of the smaller groups (cat; jackdaw; pigeon) seem unlikely to represent the deposition of complete skeletons and may have been parts of redeposited carcases. Most of the more complete

skeletons are from neonatal or juvenile mortalities of a pig, four sheep and at least seven puppies. Although these could be regarded as sacrifices, the town is likely to have housed a substantial breeding population of dogs and natural peri-natal mortalities or the disposal of unwanted litters could both account for the presence of these skeletons. It has also been argued that some pigs may have been kept and bred in Dorchester (Maltby 1993; 1994), which could explain the presence of the neonatal pig. However, three of the sheep are also neonatal mortalities and it is more difficult to use the same argument to account for their presence, as it is less likely that breeding flocks would have been kept near the centre of the town. Similarly the raven and possibly both the rook/crow skeletons can be interpreted as birds that would be attracted to the town's rubbish heaps and they could have died or been killed as scavengers, as has been suggested in some reports (e.g. Maltby 1979; 1993). However, some Roman urban settlements have produced substantial numbers of raven skeletons in shafts (Maltby 2010), and Fulford (2001) and Woodward and Woodward (2004) have plausibly argued that these depositions might represent the continuation of Iron Age ritual practices. Similarly, the presence of several skeletons of dogs of various ages (in addition to neonatal puppies) can be interpreted in different ways. They could be simply representative of the mortality rates of dogs resident in the town, whose bodies were deposited in suitable open shafts. However, although dog ABGs occur commonly in other pits and shafts in Dorchester, it is true that they are present in large numbers in some features including Shafts 13 and 6 (Maltby 1993; Woodward and Woodward 2004) and this may be ritually significant, particularly as two of the dogs do appear to have been decapitated before deposition, either tied together or within a bag. However, even these, it could be argued, simply represent evidence for the disposal of animals not required for processing. Some of the dog ABGs in the lower fills of Shaft 13 are small and could indicate redeposition of dog skeletons originally deposited above ground.

Another aspect partially overlooked by Woodward and Woodward (2004), is that these ABGs, complete pots and small finds were not found in isolation within any of the shafts considered. Within Shaft 13, there were over 500 animal bones not assigned to ABGs (Maltby 1990). Although many of these came from layers above the ABGs, substantial numbers were found in the same contexts. The identified material included cattle (NISP 96), sheep/goat (83), pig (59), domestic fowl (28), duck (6), jackdaw (5), rook/crow (4), pigeon (5), roe deer (1), hare (1) and horse (1). Therefore most of the species represented as ABGs (with the notable exceptions of dog and raven) were also present amongst disarticulated material. Butchery marks were found on around 100 fragments and at least 89 of the bones were damaged by gnawing prior to their final deposition. There were also a few fish bones (Hamilton-Dyer 1993) and marine mollusca (Winder 1993). In addition to the fairly complete small finds, there were also fragments of glass vessels, shale armlets, a copper bracelet and brooch. There were substantial numbers of small pottery sherds. It should not be overlooked that many of the ABGs were found amongst cess deposits and dog coprolites were also identified (Allen 1993). It seems therefore that substantial amounts of the material deposited in the shaft (including some of the ABGs) were derived from middens or other dumps. If the ABGs and complete pots do represent acts of ritual deposition, they were accompanied with, or at least interspersed with, substantial amounts of previously discarded material and excrement. Concretions on some of the bones of several ABGs indicate that they had lain within cess deposits. Therefore the depositional processes involved in the accumulation of material in Shaft 13 are complex and cannot be easily separated into ritual and non-ritual categories.

Victoria Road, Winchester

The second Romano-British example is from excavations of another *civitas* capital in southern England, Winchester, Hampshire. Excavations of the northern suburb in the 1970s unearthed cemeteries and occupation deposits of an adjacent suburb that developed in the later Roman period (Qualmann *et al* 2010). Several shafts and wells were discovered. The one where there is the best evidence for possible ritual deposits is pit F814, which was created and in-filled in the middle of the fourth century AD (Maltby 2010). The shaft was 3.8m deep but did not reach the water table. There were only two fills. The lower fill (context *3262*) of silty clay extended to within 0.7m of the top and contained around 2,500 of the 2,819 animal bones recovered from the pit by hand and in sieved samples (Table 4.3).

At least 925 bones were in ABGs but again these differ in their composition. Sieving produced large numbers of amphibian bones, mainly of frogs, and it must be assumed that many more were not recovered. These were found mainly in the lowest part of the pit and represent a period when frogs, which were probably colonising the area, were prone to being victims of falls. The numbers imply that the pit must have lain open at one point for some considerable time. The major group of complete ABGs consisted of over 300 bones belonging to a minimum of eight dogs. Unfortunately, the bones of these burials were not separated and it was not possible to assign all the bones to individuals. Nor is it clear from the excavation records whether the skeletons were originally found in groups or admixed together, although one photograph of the pit during excavation shows that at least one of the dogs formed a discrete burial. All but one of the dogs were adult, the other was immature. No neonatal puppies were found in this pit (but are present in some of the other shafts – Maltby, 2010). There is no evidence of butchery or gnawing on any of their bones. Two small groups of associated cat bones were found in *3262*. A pair of femora and a tibia from an immature animal formed the first group; eight ribs from an adult cat

Table 4.3 Animal bones from Winchester Victoria Road pit F814. Data adapted from Maltby (2010). * unsieved counts probably include some bones from ABGs

	NISP Unsieved		NISP Sieved		Total	MNI of
Species	ABG	Other	ABGs	Other	NISP	ABG
Cattle		658		3	661	
Sheep/Goat		273	5	2	280	1
Pig		73		2	75	
Horse		17			17	
Dog	330	4		1	335	8
Cat	11				11	2
Mouse				2	2	
Rodent		2		2	4	
Frog			201		201	
Toad			10		10	
Frog/Toad			281		281	
Domestic Fowl*		33	62	1	96	1(+)
Duck		3			3	
Raven	25				25	1
Sea Eagle		1			1	
Large Mammal		493		13	506	
Medium Mammal		197		23	220	
Unid. Mammal		71		19	90	
Unid. Bird				1	1	
Total	366	1825	559	69	2819	13 (+)

formed the second. No evidence of butchery was found and it is therefore probable that these represent only partial skeletons, perhaps of carcases that were originally deposited elsewhere. The only ABG of the major food species consisted of the complete skull, mandibles, and hyoids of an adult hornless sheep recovered from a soil sample selected for sieving. Although the skull was not split open, it may still represent the deposition of primary processing waste. The presence of several pairs of sheep metapodials in the same context also raises the possibility that sheepskins, or bones (feet and heads) removed from sheepskins after processing, were deposited.

An adult raven ABG in *3262* was represented by 26 bones from all parts of the body, indicating the deposition of a complete bird. A sieved sample produced 62 bones from an immature domestic fowl. There is no evidence that this chicken was processed and it seems likely that the complete carcase was deposited. At least six probable pairs of domestic fowl bones were recorded amongst the hand-collected material. Although these could not be assigned to ABGs, it is probable that other domestic fowl ABGs were deposited.

Excluding amphibians, at least thirteen partial or complete animal burials were deposited in pit F814 (Table 4.3). Apart from the sheep and the chickens, all the ABGs in this pit were from animals rarely processed for meat. Again it is the dogs and the raven skeletons that represent the best cases for ritual deposition, using the same arguments outlined above for the ABGs in Shaft 13 at Dorchester. If the dogs were deposited together (although there is no conclusive evidence that they were), the probability of eight dogs all dying of natural causes at about the same time and deposited in the same context seems remote, although an epidemic of, for example, canine distemper cannot be ruled out. It is more likely, however, that these dogs were deliberately killed. It is plausible that this was ritually motivated but the possibility that there may have been a purge on stray dogs in an attempt to control their numbers also needs consideration. The abundance of gnawed bones in all deposits (this pit included) testifies that many dogs had free access to processing waste in the town. If their numbers became too large, they may have been deemed a health hazard, particularly in areas where a lot of rubbish was dumped. The numbers of dog ABGs increase significantly in the Romano-British period in southern England, particularly in towns (Morris 2008, 187) and this might imply that stray dogs had become more of a problem within densely occupied areas. Such an explanation could also account for the presence of the raven, perhaps also a victim of the same purge of scavenging animals.

However, other finds lend support to the possibility of ritual deposition. As in Shaft 13 at Dorchester, complete pottery vessels were found in the lower layer of the pit. These include ten complete or near complete colour-coated beakers, a glass vessel and stone roofing tiles (Rees *et al* 2008). Another unusual find was the humerus of a white-tailed eagle. A skull of the same species was found in a Roman well in Droitwich, where a ritual interpretation was attributed (Baxter 1993). However, Mulkeen and O'Connor (1997) note that white-tailed eagles could also have been attracted to urban sites as scavengers.

However, more mundane finds were also deposited in this pit. There were many more small sherds of pottery than complete vessels and over 1,900 animal bone fragments not assigned to ABGs were also recorded (Table 4.3). Cattle dominated this assemblage, their numbers enhanced by evidence for the large-scale disposal of certain parts of their carcases. At least 24 cattle were represented by the area of the skull situated at the junction of the horn core. Butchery marks showed that the horns had been systematically removed. Although other parts of the body were less well represented, 11 cattle were represented by metatarsals, ten by tibiae, and nine each by metacarpals and mandibles.

Another unusual feature about the cattle assemblage was the large number (21) of complete metacarpals and metatarsals. These have been rarely encountered elsewhere in Roman Winchester because these bones were systematically broken open for marrow. The metapodials from F814 also included an unusually high proportion of male specimens, whereas those of cows were usually much more common in other deposits in the area. Since the shape of the surviving horn cores also indicated that steers were commonly represented in F814, it is feasible that these metapodials and adjoining phalanges were associated with some of the skulls. It seems possible that cattle hides were being processed in the vicinity. A substantial part of the assemblage could therefore be the waste from tanning and horn-working specialists. Raw material for these specialist activities may have relied on sources of stock not usually as well represented in the rest of the assemblages.

Sheep/goat elements were moderately frequent, and at least 12 were represented by mandibles and radii. Pig and horse were very poorly represented. Small numbers of duck and rodent bones were also found (Table 4.3). Over 270 of the identified bones had been butchered and at least 212 of the identified fragments from the hand-excavated sample had been damaged by gnawing, indicating a high incidence of secondary deposition.

The faunal assemblage from pit F814 is the most likely candidate to justify the label of a 'special deposit' as defined by Grant (1984) of any of the faunal assemblages from shafts in the Winchester excavations. However, although a case can be made to argue that there was a ritual significance to at least some of the ABGs, particularly in that they were associated with a number of complete artefacts and a bone of a rare species of bird, they were also associated with waste from specialist processing and other discarded material, much of which appears to have been redeposited in the pit. The presence of concretions on many of the bones again indicates that cess was also amongst the material deposited. Unfortunately the sequence of deposition of various components of the faunal and artefact assemblages in this substantial deposit cannot now be ascertained.

Conclusions

The two case studies have demonstrated that animal depositions in shafts are often complex and not easily categorised as ritual or non-ritual. Indeed, these terms are inadequately vague labels as Morris (2008, 349; Waddington, this volume) have pointed out. As is demonstrated in a number of papers in this volume, detailed contextual analysis is required to better understand the taphonomic history of different depositions. Many interpretations of these depositions are handicapped by the lack of an adequate sieving programme. The Winchester case study demonstrated that sieving significantly increased the numbers of amphibians recovered, providing some information about the history of infilling, and providing additional ABGs. However, in many cases it is impossible to be certain whether partial ABGs, particularly of smaller mammals and birds, represent all the bones deposited or just a biased selection of the larger bones of a more complete carcase. This information is crucial in determining whether the internment was primary or secondary.

The inadequacies of environmental sampling within shafts in general are also apparent. Depositions of plants may have potentially had as much symbolic significance as depositions of animals. Admittedly, their potential survival is more limited, but, particularly where waterlogged conditions prevail, possible depositions should be recognised. Similarly, mineralised material might survive in cess deposits. In addition, much more rigorous and detailed scientific examination of each individual fill is required, to gain a fuller understanding of their depositional history (Randall, this volume). Of course, there are significant cost implications. In many cases, developer funding restricts the excavation of deep shafts to the upper fills, although, as these and other studies have demonstrated, it is often the lowest fills that provide the largest number of ABGs, complete artefacts and other significant finds. In addition, it is important to know whether a shaft reached the water table and functioned originally as a well.

It is also abundantly clear that successful interpretation of the nature of ABGs relies on them being recognised at source. Excavation teams need some personnel who have received training in animal bone identification, in order to recognise the completeness or otherwise of such deposits, particularly in deposits rich in bones containing multiple ABGs. Some ABGs may represent loosely associated rather than articulated groups and this is important information to record. Interpretation of the Winchester shaft, in particular, is handicapped by the failure to adequately separate out different ABGs, accurately record their location within the fills, and determine their spatial relationship with the specialist processing waste and the complete pottery vessels.

The studies have also demonstrated that ABGs vary enormously in their composition. Within a single feature,

ABGs can represent several different types of deposition event. They should not be treated as a single category and they should not be studied in isolation from other faunal remains deposited within the same feature. They need to be recorded fully. Ancillary data such as butchery marks, gnawing damage, surface condition, evidence for weathering, erosion and burning and fragmentation patterns need to be recorded and it is just as important to explicitly note the absence of these taphonomic indicators as well as their presence.

As Fulford (2001) and Woodward and Woodward (2004) have demonstrated, understanding deposition in shafts needs a holistic approach that incorporates the study of different find categories. Here we are faced with the problems, as demonstrated at Greyhound Yard, Dorchester, that these find categories are studied by a large number of different independent specialists, who produce separate reports often in isolation from studies of other materials from the same features. To reconstruct an overall interpretation from these disparate sources is a difficult task but one which needs to be tackled (preferably in consultation with the specialists), if we are to advance our understanding of deposition in shafts. Environmental archaeologists have an important part to play in improving these interpretations.

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