

SOME OBSERVATIONS ON THE HOLOCENE MAMMALIAN FAUNAL REMAINS EXCAVATED FROM TWO CAVES IN HARTLE DALE

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INTRODUCTION

Hartle Dale is located between Bradwell and Tideswell in the Derbyshire White Peak (SK165803) (Gilks 1990,6:fig. 1).

Interest in the caves of Hartle Dale, particularly Fissure Cave and New Cave, has been both sporadic and long lived. Initial investigations, in 1872, by Rooke Pennington and the omnipresent William Boyd Dawkins, produced a small collection of prehistoric pottery and associated Holocene fauna, together with several fragments of a Pleistocene fauna (Pennington 1877, Dawkins 1874). Interest then lapsed until the excavations of New and Fissure Cave between 1961-63, carried out by Mr A. L. Pill (Pill 1961a, b; 1963a, b, c). These produced a significant collection of ceramic and faunal material, together with the remains of several human burials from Fissure Cave (Gilks 1990). The faunal material was given scant regard, especially in terms of any zooarchaeological contribution to the interpretation of the use of the caves. Only two rather esoteric zoological papers were produced relating to aspects of the excavated sample (Turk 1964a, b). Once again interest lapsed until the recent publication of the analysis of the pottery (Gilks 1990), and this examination of the faunal material.

In many ways the chequered history of this interest has provoked more questions than it has provided answers. In terms of the faunal material, interest quickly diminished once a Holocene date was established. However, the influence of the earlier discoveries of Pleistocene material continued to be felt, resulting in a series of dubious identifications. No archaeological questions were asked of this faunal sample, and the simplistic assumption of equating animal bones with human domestic activity remained unchallenged. Recent analysis of the pottery has provided a chronological structure for utilization of the caves as well as integrating Hartle Dale into a wider ceramic context (Gilks 1990). Yet the specific nature of the functional role of the caves, in their own right, and within a wider settlement system remains undefined — beyond the simple ritual and domestic.

Problems, potential and taphonomy

The principal aims of this analysis have been firstly to clarify any outstanding problems in the faunal sample, and secondly to attempt to illustrate the nature of the domestic use of the caves in a more precise fashion. This zooarchaeological approach remains largely unused on Peak District sites (Bramwell 1977; Bramwell *et. al.* 1987).

Faunal assemblages excavated from caves are notoriously problematic in terms of their taphonomy, and the caves of Hartle Dale are no exception. The principal problem areas are the mode of accumulation and any post-depositional transformations (including problems associated with the excavation and curation) of the material.

The excavators of New and Fissure Cave were sufficiently enlightened to work in fairly well defined chronological and spatial units, employing the use of sieves (Payne 1972) and marking, where possible, all excavated material to within one square foot. The cramped and difficult nature of the excavations clearly caused problems (Pill 1961a, 4; 1963b, 6). Following the excavation the faunal sample received only cursory attention before being donated to Sheffield City Museum in 1967 (General accession number SHEFM 1967:750). Here the material remained largely un-researched until 1991 (G. Boon *pers. comm.*).

In terms of the *in situ* taphonomic processes the most significant is potential reworking of the deposits by the burrowing, denning or caching activities of a number of animals represented in the sample. The presence of rabbit (*Oryctolagus cuniculus*) in the principal stratigraphic units demonstrates this problem. It is worth noting that the surface texture of these intrusive elements is markedly different to that of the bulk of the sample, demonstrating their different and shorter taphonomic history. Human reworking of the deposits must also be regarded as a potential problem (Gilks 1990).

Understanding the range of possibilities in the pre-depositional taphonomy is equally important. In the past there has been an unspoken assumption that mammalian faunal remains, when associated with even the merest evidence of human activity, represent food and domestic refuse. This assumption is untenable. As noted above, a number of species represented in the faunal record are important taphonomic agents (e.g. badger, bear, cat and fox). Given the abundance of fox in the sample it is worth mentioning a few significant aspects of the behaviour of foxes, which in principal apply to several of the other carnivores. Foxes do not, as badgers do, construct their own earths but are more opportunistic utilizing naturally available features such as caves and rock shelters (Harrison-Matthews 1968). If such locations are to be detected in the archaeological record one would expect to find both scattered food debris (Harrison-Matthews 1968) and the remains of any infant mortalities. It has been noted by a number of zooarchaeologists examining carnivore accumulations, that the age pattern of the prey species will not be normal, but skewed in favour of young or old individuals (Klien and Cruz-Urbe 1984), since animals in these age classes are relatively easy prey. However, given the problems of the survival and the recovery of juvenile bones (Brain 1981; Payne 1972), the remains of such mortalities will be under-represented in the analysed sample. In terms of the food refuse, it is interesting to note the study carried out by Southern and Watson (1941) on the diet of foxes. In their Welsh sample, recovered from an area with topographic similarities to Hartle Dale, 38.4% of the foxes' diet consisted of sheep. Foxes are also known to cache surplus food (Corbet and Southern 1977, 318).

Despite these acknowledged problems, a few relatively simple manipulations of the data provide an insight into the assemblage formation processes. Consequently, more may be said about the human use of the caves. It goes without saying that this demands a measured but optimistic perspective.

The question of the Pleistocene fauna

Rooke Pennington details the finding of a milk molar of a young woolly rhinoceros and the (bones of) rhinoceros and bison (*Bison priscus*) with the carpal of a mammoth (Pennington 1877). This material has not been re-examined but has been tentatively traced to Bolton Museum, where it resides following the sale of Pennington's collection in 1888, which had

previously been held at Castleton Museum (Beswick 1969). Given the guiding hand of Dawkins and the very limited nature of the sample, we can assume that the identifications and interpretation (redeposited water-lain residue) are, in this instance, satisfactory.

There is no evidence for any Pleistocene material in the sample excavated by Mr A. Pill. Three large bovid bones (FC /B/3/1, FC /F/3/13, NC /1/B/13/1) originally assigned to *Bison priscus* have been re-identified as coming from a large domestic bull or possibly a small auroch (see Appendix).

The Holocene fauna

In general terms the species representation of the sample is typical of mid-Holocene fauna (Grigson 1981). The major farmyard domesticates are all represented (cow, pig, sheep) as are the less common domesticates, goat, dog and horse. Of the wild relations to these species the presence of *Bos primigenius* cannot be ruled out. The fox bones appear consistent with those of *Vulpes vulpes*, and there is no evidence of *Aloplex lagopus*. The post-cranial bones of hare were not differentiated between *Lepus timidus* and *Lepus capensis* (Turk 1964a). Similarly all identifications of water vole are referred to as *Arvicola terrestris* (Turk 1964b). Within the small sample of cat bones no differentiation was, or could be made, between domestic or wild (the context does, however, suggest *Felis silvestris*). Both red (*Cervus elaphus*) and roe (*Capreolus capreolus*) deer are present, as is badger (*Meles meles*), hedgehog (*Erinaceus europaeus*), brown bear (*Ursus arctos*), beaver (*Castor fiber*) and mole (*Talpa europaea*). The latter was not quantified. There is no evidence of pine marten or stoat (*contra* Pill 1963b, 8).

Detailed palaeoecological reconstruction is not possible owing to the problems of sample size and context. These problems are compounded by the variation in the potential taphonomic pathways involved. Many of the wild animals may have been introduced to the site as scavenged carrion or hunted prey, or the result of human actions. They, therefore, only offer the most general picture of the local ecology. In these terms the fauna presents a picture of predominantly deciduous woodland, possibly bordering open land of moorland and semi-agricultural nature (Corbet and Southern 1977).

The limited species diversity of small mammals is considered to be a taphonomic feature (e.g. sieve mesh size) and not a reflection of poor biodiversity (for this reason quantitative data is not included). Water voles were encountered in significant quantities in all excavated units. This complements a growing body of evidence from archaeological sites (Maltby 1983; Hamshaw-Thomas *in prep.*; Yalden 1992; Bramwell *et. al.* 1990) for the formally greater population and possibly wider distribution of water voles in the past.

Stratigraphy and context

The stratigraphic subdivisions detailed by Gilks (1990) for both New and Fissure Cave have been used to provide a chronological and cultural framework for the faunal material. Each site can be further subdivided into between two and four excavation areas. New Cave is divided between the two areas outside the cave (A and B) and the area inside the cave. Fissure Cave is more complex, layer 1 has four areas A (exploratory pit inside cave), B (exploratory pit outside cave), D (high level passage) and F (inside the fissure). Layer 2 has A, B and F while layer 3 only has B and F (Pill *pers. comm.*).

NEW CAVE

The small faunal sample from New Cave consists of 249 recorded anatomical units (Hamshaw-Thomas and Bermingham 1993 for methodology) excavated entirely from layer 1 (Table 1). This layer is an irrevocable mix of modern and prehistoric cultural material. The prehistoric material contains a number of sherds of early Bronze Age Collared Urn type, dated to between 1800-1100 bc (Gilks 1990).

As mentioned above, the sample splits between that originating from both within, and outside the cave (Fig. 1). Pills' observations (Pill 1963a, 27) concerning the use of the cave by foxes is borne out in the faunal material as fox represents 48% of the inside sample. Bearing in mind the modern behaviour and diet of foxes, the sample from within the cave looks distinctly like the residue of fox denning and scavenging activities.

The area outside the cave, with the wider species diversity and abundance of domestic animals, may allude to greater human role in the assemblage formation process. However the high incidence of young and neonate caprine bones (Table 2) is likely to be the result of the hunting and scavenging activities of foxes. Cat is relatively abundant and may well have used the cave environs for shelter and breeding, thus adding to the recovered faunal sample.

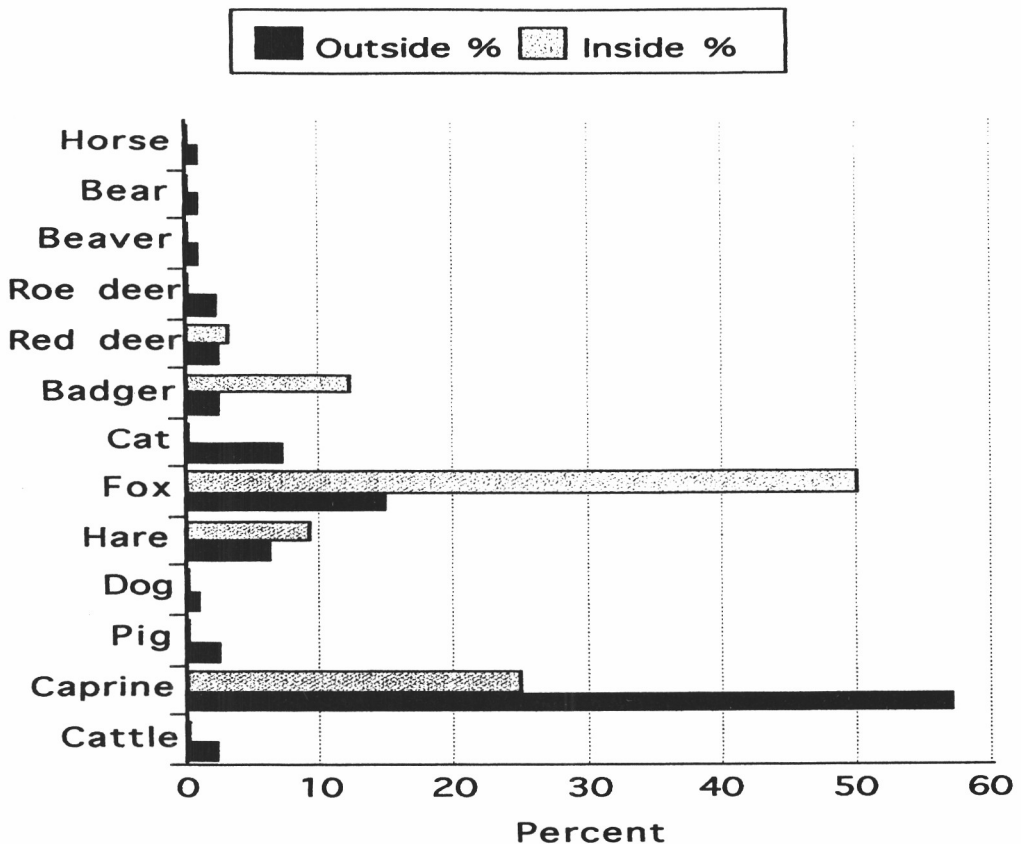


Fig. 1 Hartle Dale cave fauna: New Cave: species abundance.

	Cattle	Caprine	Dog	Hare	Fox	Cat	Rabbit	Badger	Red	Roe	Beaver	Bear	Horse	Pig
Scapula		4			1		1		1					
Humerus p		4			3	3	2	2						
Humerus d	1	6		2	3	3	1	2						1
Radius p		7			3		1			1				
Radius d		8			1		1		2	1				
Ulna		3			2	4	3			1				1
Metacarpal p		6												
Metacarpal d		2												
Pelvis		5				1	4							
Femur p		9		1			6	1						
Femur d		8		2	2		4	1						
Tibia p		4		3	4		8							
Tibia d		3		4	3		7							
Metatarsal p		5												
Metatarsal d		4												
Metapodial p		5			8		4						1	
Metapodial d		3			8		2						1	
Calcaneus		2		1	1		2	1						
Astragalus		5		1										
Phalanx 1		3	1						1					
Phalanx 2	2	9							1				2	
Phalanx 3		1												
Mandible		1	1	1	1	1	1				1			
Mandibular tooth												1		
Horn/Antler														
Total	4	107	2	15	40	12	47	7	5	3	1	1	2	4
%	2	43	0.8	6	16	5	19	3	2	1	0.4	0.4	0.8	2

Table 1 New Cave, number of recorded anatomical units. Layer 1.

	New Cave		Fissure Cave	
	Inside	Outside	Inside	Outside
FOX				
Unfused	38	30	15	0
Neonate	0	0	9	0
CAPRINE				
Unfused	67	83	62	75
Neonate	34	60	19	0

Table 2 Percent distribution of unfused & neonate bones.

Of particular interest are the beaver mandible and the bear mandibular M3. While neither of these animals is especially rare in the prehistoric faunal record they are unusual elements. Given the topographic location of New Cave, the beaver must be an introduction, most probably by an opportunist human exploiting the animal for the pelt or as a dietary supplement. Unfortunately no cut marks were present. The single bear tooth seems to indicate that bears were also occasional residents of New Cave.

The New Cave archaeofauna owes much to the natural activities of wild carnivore. The human input appears primarily concerned with the area outside the cave and is best interpreted as the residue from short and infrequent use of the cave area for some low intensity activity.

FISSURE CAVE

As with the ceramic material, Fissure Cave produced a larger and more useful faunal assemblage. The sample consists of 381 recorded anatomical units, 35% from layer 1, 8% from layer 2 and 53% from layer 3. Layer 1 has been excluded from analysis due to the modern date (Gilks 1990, 7). Of interest in this layer is the only certain identification of goat (a first phalanx from excavation area D).

The cultural assemblage of layer 2 indicates use of the cave in the late Roman period (Gilks 1990, 7) (Table 3). This concurs with the wider pattern for the use of Peakland caves in this period (Branigan and Dearne 1991, 248). Little emphasis can be placed on such a small faunal sample, but it appears to be almost exclusively the result of small scale human use of the cave, presumably as an 'occasional shelter' (Branigan and Dearne 1991, 249).

Layer 3 represents the principal interest of Fissure Cave and has been shown to have three phases of utilization. The Early Neolithic and Early Bronze age saw domestic use, while the later Neolithic is represented in the form of burials (Gilks 1990, 18) (Table 4).

Any interpretation concerning the burials must at present remain tentative. While Gilks (1990) rightly points out the possibility of deposition of complete individuals, there are problems about the context and the number of individuals. Within the unsorted faunal sample a number of human, juvenile long bones and adult extremities were recovered. The relationship of these bones to the individuals noted by Gilks is unknown.

	Cattle	Caprine	Dog	Hare	Rabbit	Pig
Scapula						
Humerus p		1				
Humerus d		2		1		1
Radius p		2				
Radius d		1				
Ulna		2				
Metacarpal p	1	1				
Metacarpal d		1				
Pelvis					1	
Femur p					2	
Femur d		2			2	
Tibia p						
Tibia d						
Metatarsal p		1				
Metatarsal d						
Metapodial p		1				
Metapodial d						
Calcaneus						
Astragalus						1
Phalanx 1		4				
Phalanx 2						
Phalanx 3						
Mandible			1			
Mandibular tooth						
Horn/Antler						
Total	1	18	1	1	5	2
%	2	64	3	3	18	7

Table 3. Fissure Cave, number of recorded anatomical units, layer 3

The faunal sample could not be further subdivided on chronological grounds but could be divided into excavation areas (Fig. 2). The larger sample from within the cave is dominated by wild species, particularly fox. As with so much of the Hartle Dale material there was a high incidence of both young animals (Table 2) and considerable modification of bones by carnivore gnawing. This, and the almost complete lack of signs of human modification (cut marks and burning), suggest that this sample is again primarily the result of carnivore accumulations. The apparent associations of a number of animal bones with the human skull fragments, excavated from deep (12-15ft.) within the fissure (Pill 1961), may imply some ritual link. This is especially true when considering that they are cattle phalanges, implying similarities with contemporaneous head and hoof burials (Davis and Payne 1993). It is, however, more probable that these bones were scavenged debris.

The area outside the cave, which is indeed the area likely to have been the focus for activity considering the small size of the cave aperture (0.46m wide and 1.22m high) (Gilks 1990), has a sample with a greater abundance of domestic animals and a reduced incidence of fox. This would suggest a more significant role was played by humans as the agents for accumulation.

	Cattle	Caprine	Dog	Hare	Fox	Cat	Rabbit	Badger	Red	Roe	Horse	Pig
Scapula		1			3	1				1		2
Humerus p	1	4		2	2		5		1			8
Humerus d		4		2	3		4		1			5
Radius p		6		2			2			1		
Radius d		5		2			2			1		
Ulna		1			3		1					
Metacarpal p	1	2										
Metacarpal d	3	1									1	
Pelvis		5			2		1					
Femur p		5		1			2					1
Femur d	1	7					2					2
Tibia p		2	1				1					1
Tibia d	1	2		1								1
Metatarsal p		2							1			
Metatarsal d		3			16							
Metapodial p		2			16							
Metapodial d		1			5							
Calcaneus		5		3	2							
Astragalus		7										1
Phalanx 1	3	10							1			1
Phalanx 2	4	6							2			1
Phalanx 3		1										1
Mandible		1					1		1			
Mandibular tooth					5							
Horn/Antler												
Total	14	83	1	13	57	1	21	1	7	3	1	24
%	6	36	0.5	6	25	0.5	9	0.5	3	1	0.5	9

Table 4 Fissure Cave, number of recorded anatomical units. Layer 3.

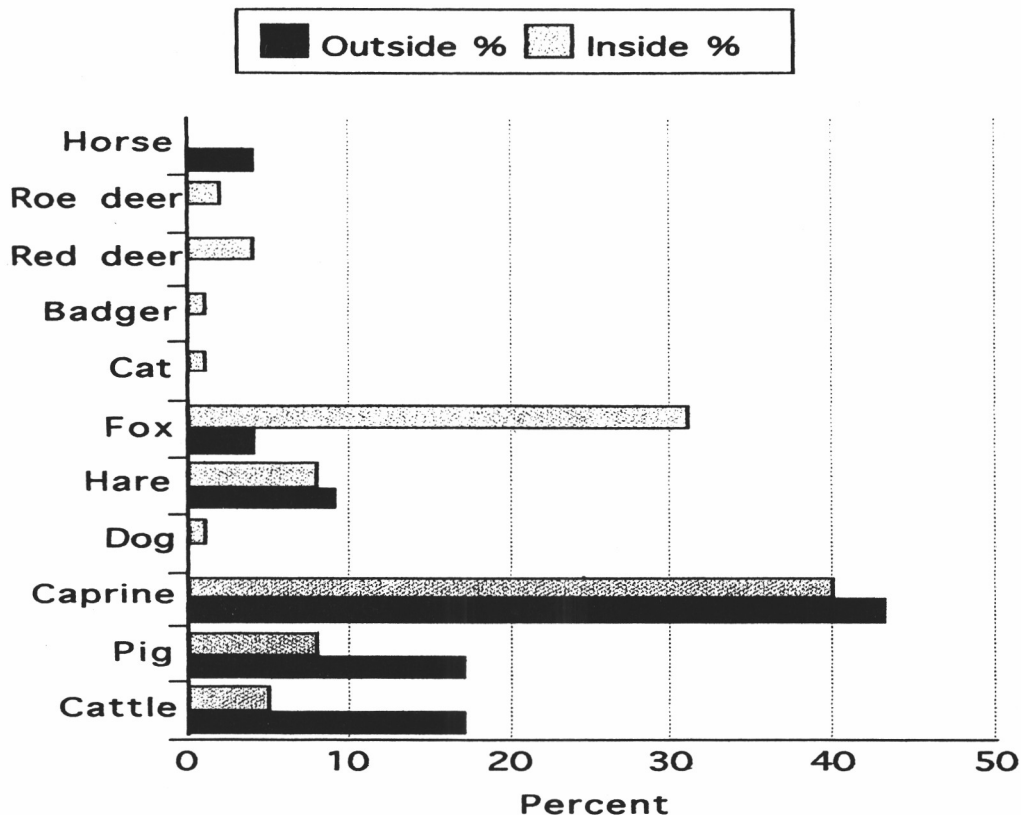


Fig. 2 Hartle Dale cave fauna: Fissure Cave: species abundance.

DISCUSSION

The excavated faunal assemblage is clearly a mixture of the residue of both human and carnivore use of the caves. The high incidence of juveniles (of both residents and prey) and the almost total absence of any indication of human modification of the bones suggests that carnivores played the prominent role. Unfortunately the small sample size precludes many of the comparative 'middle-range' type analyses that might confirm this conclusion (Stallibrass 1984).

Human use of the cave for ritual activities remains poorly understood, mainly due to a poor contextual understanding of the human burials and the associated animal bones. In this instance the animal remains are of little use in elucidating the pattern of the burial tradition. The 'domestic' use of the caves clearly had only a limited role in the formation of the archaeofauna. To satisfactorily account for this a model similar to Branigan and Dearnies' (1991, 249) 'occasional shelter' seems appropriate. This implies sporadic, short-lived and possibly opportunistic use of the cave environs as shelter. The significance of cave sites in the wider settlement pattern seems to have been overestimated, partly because of their greater archaeological visibility when compared to contemporaneous domestic sites (e.g. Lismore

Fields: Garton 1987), but also through an uncritical examination of the excavated material. Such occasional shelters as Fissure Cave are best viewed as peripheral to the settlement system and not fulfilling a long term economically significant role.

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APPENDIX: A REAPPRAISAL OF SOME ORIGINAL IDENTIFICATION

1. A total of three large bovid bones was originally assigned to *Bison priscus*. Two are referred to in Pill (1963a): FC/F/3/13 (a tibia?) and NC/1/B/13/1 (distal radius); and one FC/B/3/1 (metacarpal) is marked 'bison'. The tibia? is in fact a femur.

When compared to both modern cattle and fossil bison reference material the Hartle Dale material was morphologically inseparable from the domestic cattle, despite their greater size. The only measurable bone, the metacarpal had a Bd measurement of 707mm (Dreisch 1976). This is within the overlap zone between large domestic bulls and small female aurochs (Jewell 1963, 81). A large bovid patella (NC/1/C/14) is also in this overlap zone, indicating the possibility of *Bos primigenius* in the Hartle Dale material.

2. Wolf (*Canis lupus*) was considered to be present (Pill 1963b, 8). No post cranial material of wolf was recorded. A large canid mandible (FC/B/2) was marked as wolf. In this instance the only possible metrical criteria for comparison is the size of the mandibular M1. The Hartle Dale specimen (210mm) is within Harcourts' (1974) size range for dog and is considerably smaller than comparative wolf reference material (283-87mm).

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