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Technical Report: biological remains from excavations at Flat Lane, Barmby Moor (site code: TSEP 254)

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Summary

A series of sediment samples and small quantities of hand-col1ected bone and shell from deposits revealed by excavations at Flat Lane, Barmby Moor, were initially submitted for an evaluation of their bioarchaeological potential.

The hand-collected shell and the biological remains (a few snail shells and shell fragments) recovered from the sample were of no interpretative value, and no plant or other invertebrate remains were recovered from the sediment sample.

A small assemblage of rather poorly preserved vertebrate remains was recovered from mainly 2nd century AD deposits in Trench 2. The bone had been extensively damaged during excavation, resulting in a high degree of fragmentation. Human remains from one context (2014) also suggested some reworking of the deposits.

Cattle and horse remains were predominant, but preservational factors favouring the survival of larger, more robust elements may have resulted in an over-emphasis of their importance. Possible butchery/skinning marks were recorded on several of the horse bones. However, it is likely that the exploitation of horses for meat or skins was only undertaken after the animals were no longer capable of carrying goods or people.

Keywords: FLAT LANE, BARMBY MOOR; EAST RIDING OF YORKSHIRE; LATE IRON AGE; ROMANO-BRITISH; SNAILS; VERTEBRATE REMAINS

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Introduction

A series of sediment samples ('GBA'/'BS' sensu Dobney *et al*. 1992), a small quantity of hand-collected bone, and a very small amount of hand-collected shell (from three contexts), were examined, initially for an evaluation of the potential of the biological remains.

The following report on the samples and shell is based on work undertaken during the initial evaluation as no further analysis was warranted. On the basis of the scarcity of animal bone assemblages from rural sites of this date, the evaluation (Jaques *et al*. 2000) recommended the production of a basic archive of the vertebrate remains, including measurement and tooth wear records.

Methods

Sediment samples

The sediment samples were inspected in the laboratory. One of them was selected for investigation and its lithology was recorded, using a standard *pro forma*, prior to processing, following the procedures of Kenward *et al*. (1980; 1986), for recovery of plant and invertebrate macrofossils. The washover and residue were examined for plant remains. The washover was also examined for invertebrate remains, and the residue was examined for other biological and artefactual remains.

Hand-collected shell

Brief notes were made on the preservational condition of the shell and the remains identified to species where possible.

Vertebrate remains

For the vertebrate remains, data were recorded electronically directly into a series of tables using a purpose-built input system and *Paradox* software. For each context (or sample) containing more than ten fragments, subjective records were made of the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Additionally, semi-quantitative information was recorded concerning fragment size, dog gnawing, burning, butchery and fresh breakage.

Identifications to species or species group were carried out using the PRS comparative reference collection. Detailed recording of the assemblage followed the protocol outlined by Dobney *et al.* (forthcoming). Selected elements were recorded using the diagnostic zones method described by Dobney and Rielly (1988), whilst remaining elements which could be identified to species were only counted. Other fragments (classified as 'unidentified') were, where possible, grouped into categories: large mammal (assumed to be horse, cow or large cervid), medium-sized mammal (assumed to be sheep, pig or small cervid), and totally unidentified. Counts of fragments and total weights were recorded for all identifiable and unidentifiable categories.

Caprovid tooth wear stages were recorded as outlined by Payne (1973; 1987), and those for cattle followed the scheme set out by Grant (1982). Age categories used follow O'Connor (1988) and Payne (1973; 1987).

Where present, epiphyseal fusion data were recorded. Mammal bones were described as 'juvenile' if the epiphyses were unfused and the associated shaft fragment appeared spongy and porous, and as 'neonatal' if they were also of small size.

Measurements followed von den Driesch (1976) unless otherwise specified. Additional measurements, not detailed by von den Driesch, followed those described by Dobney *et al.* (1996). Withers heights were estimated using calculations devised by Foch (1966) for cattle.

Counts were made of all identified fragments (number of individual skeletal parts, or NISP) for each species. Minimum numbers of individuals

(MNI) were determined using the zone system devised by Dobney and Rielly (1988). Unidentifiable fragments were recorded and quantified separately.

Results

Sediment sample

Context 2014 [fill of large ditch; Romano-British (2nd century)]
Sample 2/T (2 kg sieved to 300 microns with washover)

Moist, light grey-brown, unconsolidated, silty sand with small (2 to 20 mm) fragments of flint and chalk common.

The very large residue of about 500 cm^3 was of chalk and flint gravel (to 25-30 mm) with sand; the tiny washover contained a single *Cepaea* sp. shell and fragments of some other snails including a few *Trichia* sp., a *Vallonia* sp., and many small unidentified shell fragments. No plant or insect remains were recovered.

Hand-collected shell

Three small bags of hand-collected snail shells (from three contexts; 2014, 2020 and 5004) were recovered. Most of the shells were of fairly well preserved (possibly modern) *Cepaea* sp. but Context 5004 also gave a few *Trichia* sp, and fragments of other unidentified snails.

Hand-collected vertebrate remains

Although detailed analysis of the vertebrate data was limited by the small size of the assemblage, some useful information was obtainable. A data archive can be found in the Appendix, below.
A range of elements was present for horses and cattle, but isolated teeth were the most commonly occurring fragment for both (Table 4). The predominance of isolated teeth is likely to be the result of taphonomic biases, whereby enamel survives better than bone under poor preservational conditions.

Only five deposits (Contexts 2008, 2014, 2018, 2020 and 2030), all from Trench 2, produced vertebrate remains (Table 2) and all of these were examined and recorded. This included material from Contexts 2008, 2018 and 2030 for which little dating information was available. However, both Contexts 2018 and 2030, fills from ditches 2023 and 2015 (respectively), were associated with other ditch deposits that were dated to the 2nd century AD. Pottery from Context 2008 included sherds of Iron Age/early Roman and 2nd century pot.

The whole assemblage amounted to 197 fragments (Table 3), of which 56 were identified to species. Overall, vertebrate remains from this site were moderately well preserved, although most fragments were battered in appearance. Material from Context 2014, which produced 80% (157 fragments) of the entire assemblage, contained a small number of acid-etched fragments and evidence of dog gnawing was common, affecting 20-50% of the bones. Bones from this deposit were extensively damaged during excavation, resulting in a high degree of fragmentation. Occasionally this damage precluded identification to species and, in certain cases, prevented measurements being taken, thus limiting the value of the data sets.

Remains of horse were most numerous (46% of the identified fragments), closely followed by those of cattle (39%), with caprovids and pigs represented by only three fragments. Additionally, two dog bones and three poorly preserved human bone fragments (femur and tibia) were identified from Context 2014. The unidentified component included large mammal cranium, mandible, rib and vertebra fragments, but the bulk of the remains were small, completely unidentifiable fragments, a result of fresh breakage during excavation.

A series of vertical knife marks was noted along the basal aspect (border) of the mandibular corpus of a horse mandible, which may be evidence of skinning. A second horse mandible had possibly been chopped across the bone behind the socket for the second premolar, and there were what may have been shallow chop marks on one of the horse pelvis fragments.

However, conclusive evidence of butchery proved elusive because of the extensive damage caused by dog gnawing and the erosion of the bone surfaces. Whether this provides evidence for the use of horse hides, or for the consumption of horse meat by humans or dogs, is not clear; these are unlikely to be the primary reasons for keeping horses, however. The individual represented seems to have been rather elderly and it is suggested that horses were more important as pack or riding animals at this settlement.

Information concerning the age-at-death of the main domesticates was meagre. Unfortunately, many of the isolated teeth were maxillary or other teeth which could not be used for creating age-at-death profiles. Five of the heavily worn horse incisors from Context 2014 (almost certainly representing a single individual) suggested an age of 20+ years. Dental attrition data for cattle was restricted to that from one mandible with the second molar just in wear, suggesting an individual of approximately 18 months. The only caprovid mandible recorded was classified as 'adult' (O'Connor 1988) and aged between 4 and 6 years according to Payne's (1973) categories.

Evidence available from epiphyseal fusion data was very limited for all the species represented. Most bones were fused, with the exception of two immature cattle metatarsals, one of which The overall importance of cattle would not be unusual for a Roman settlement of this date and in this area. However, data from the region suggests that high proportions of cattle are usually associated with military sites (King 1978; 1984) or larger urban centres such as York (O'Connor 1988) and Lincoln (Dobney *et al*. 1996). This shift in emphasis to a diet based on beef is seen as an adoption of ideas associated with the incoming Roman military population, although the cultural and dietary traditions represented are more characteristic of the Low Countries and Germany (Dobney 2001). Rural sites generally show a higher frequency of caprovid remains until the later Roman period (3rd to 4th century), which, may be an indication of the degree of 'Romanisation' of a settlement (King 1999). The location of the settlement (less than 1km from a Roman road) may have influenced the early development of differing innovative agricultural practices. The pottery assemblage from the site has been noted as being atypical of those recovered from non-nucleated rural settlements of this period in the area and Didsbury (HFA project design) concludes that this may also be a consequence of the settlement's close proximity to a Roman road.

represented an individual of less than 2 years (age category outlined by O'Connor 1988).

Poor preservation and the extensive fresh breakage damage restricted the number of fragments that could provide biometrical data. A single withers height of 1170.7 mm was calculated from a cattle metatarsal from Context 2008.

Discussion

Sediment samples and hand-collected shell

The hand-collected shell and the biological remains recovered from the sample (a few snail shells and shell fragments) were of no interpretative value.

Vertebrate remains

The small size of the vertebrate assemblage prevented any detailed conclusions being drawn. Cattle and horse remains dominated the assemblage, but their economic significance is difficult to determine because of the taphonomic bias towards the preservation of more durable fragments and hence the probable over-emphasis of larger species.

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Table 1: Complete list of taxa recorded from deposits at Flat Lane, Barmby Moor, East Riding of Yorkshire (TSEP site 254).

Mollusca
Vallonia sp.
Trichia sp.
Cepaea sp.

Vertebrata
Canis f. domestic
Equus f. domestic
Sus f. domestic
Bos f. domestic
Caprovid
Homo sapiens
Large mammal
Medium-sized mammal
Indeterminate bone

Table 2: Number of identified and unidentified animal bone fragments from deposits at Flat Lane, Barmby Moor (TSEP254). **Key**: IA/ER = Iron Age/Early Roman; RB = Romano-British; No. id frags = total number of identified fragments; No. unbd. frags = total number of unidentified fragments.

Phase/ Date	**Context**	**No. id frags**	**No. unbd. frags**	
	2008	3	18	layer with IA/ER, 2ndC RB pot
2ndC AD	2014	49	108	ditch (2015) fill, East-West
	2018	1	1	upper ditch (2023) fill
2ndC AD	2020	2	13	secondary ditch (2023) fill
	2030	1	1	ditch (2015) fill, North-South
Total		**56**	**141**	

Table 3: Hand-collected vertebrate remains from deposits at Flat Lane, Barmby Moor (TSEP254).

Species		**Total**
Canis f. domestic	dog	2
Equus f. domestic	horse	26
Sus f. domestic	pig	1
Bos f. domestic	cattle	22
Caprovid	sheep/goat	2
Homo sapiens	human	3
Sub-total		*56*
Large mammal		51
Medium-sized mammal		14
Unidentified		76
Sub-total		*141*
Total		**197**

Table 4: Skeletal element representation for the main domesticates from deposits at Flat Lane, Barmby Moor (TSEP254).

Element	horse	cow	caprovid	pig
maxilla	1	-	-	-
mandible	2	2	1	-
isolated teeth	7	8	-	1
scapula	3	3	-	-
humerus	2	1	1	-
radius	1	1	-	-
ulna	-	-	-	-
metacarpal	-	-	-	-
pelvis	3	1	-	-
femur	-	-	-	-
tibia	2	1	-	-
astragalus	3	-	-	-
calcaneus	1	1	-	-
metatarsal	1	3	-	-
metapodial	-	-	-	-
phalanx 1	-	-	-	-
phalanx 2	-	1	-	-
phalanx 3	-	-	-	-

Appendix

Archive of identified bone fragments

Key: Id. No. = unique identification number for each bone; No. frags = number of fragments; LT50 = less than 50% of the zone represented; GT50 = greater than 50% of the zone represented; P/F = proximal fusion data; D/F = distal fusion data; df = distal fused; du = distal unfused; pf = proximal fused; a = adult; j = juvenile; sh/g = sheep/goat; l = left; r = right; b = both.

Context	Id. No.	Species	Element	No. frags	Side	LT50	GT50	P/F	D/F	Notes
2014	1	horse	mandible	1	l	6	13			some fresh breakage but broken in antiquity as well. Very worn M3
2014	2	horse	isolated teeth	7						isolated teeth mainly (5) very worn incisors, at least 4 from the same individual. Some teeth suggest 20+years. Two upper teeth, 1 P2, other also possibly premolar
2014	3	horse	mandible	1	b	1	27			
2014	4	horse	maxilla	1	l					includes 2 incisors similar to loose ones - aged individual
2014	5	horse	scapula	1	l	189	234567		df	heavily damaged by fresh breakage and surface of bone eroded by root etch
2014	6	horse	scapula	1	r		12345		df	several fragments joined - lots of fresh breaks
2014	7	horse	humerus	1	r	9X	345678			slight traces of dog gnawing
2014	8	horse	tibia	1	r		456789 X	pf	df	proximal articulation damaged on excavation
2014	9	horse	tibia	1	r		5689X		df	some concretions on the bone and some root etching
2014	10	horse	astragalus	1	l		1234	a		probably same individual as calcaneus (id 11)

Context	Id. No.	Species	Element	No. frags	Side	LT50	GT50	P/F	D/F	Notes
2014	11	horse	calcaneus	1	l		2345	a		probably same individual as astragalus (id 10). Zone 2 heavily gnawed
2014	12	horse	femur	1	l	2	3678			shaft only, dog gnawed distal articulation, fresh breakage proximal arctic. Probably adult
2014	13	horse	femur	1	l		3678			shaft only, dog gnawed and fresh breakage. Porous shaft so probably immature/sub-adult
2014	14	horse	pelvis	1	r	7X	15			possible shallow chop marks
2014	15	horse	pelvis	1	r	7X	5			
2014	16	horse	pelvis	1	r		26Y			
2014	17	horse	radius	1	r		567			shaft only
2014	18	cattle	mandible	1	r		27			no teeth
2014	19	cattle	isolated teeth	5						DP3, and 4 upper molars
2014	20	cattle	DP4	1	l					
2014	21	cattle	M1/M2	1	l					
2014	22	cattle	scapula	1	l	67	12345		df	
2014	23	cattle	scapula	1	r		1234		df	
2014	24	cattle	humerus	1	r		345678		df	
2014	25	cattle	tibia	1	l		123567 89X	pf	df	damage to both articulations. Bone surface slightly damaged by root etching

Context	Id. No.	Species	Element	No. frags	Side	LT50	GT50	P/F	D/F	Notes
2014	26	cattle	calcaneus	1	r		2345			rather battered bone, dog gnawed and eroded bone surface.
2014	27	cattle	phalanx 2	1	l	2	1	pf		
2014	28	cattle	pelvis	1	l	9	38	a		
2014	29	cattle	radius	1	l	2	5678			proximal articulation and distal diaphysis heavily dog gnawed
2014	30	cattle	metatarsal	1	l		125678		du	immature/sub-adult individual - quite porous bone
2014	31	cattle	metatarsal	1			5678	j		shaft only
2014	32	sh/g	mandible	1	l		12			
2014	33	sh/g	humerus	1	r		345678		df	acid etched - rather eroded
2014	34	dog	tibia	1	r		78	a		dog gnawed. Has part of fibula fused to shaft
2014	35	dog	metatarsal 5	1	r		123		df	
2014	36	pig	canine	1						sliver of enamel from male pig canine
2014	37	human	femur	1						shaft fragment
2014	38	human	femur	1						caput fragment - very eroded and poorly preserved
2014	39	human	tibia	1						shaft fragment only
2018	40	horse	humerus	1	r	34	56789 XY		df	both ends gnawed - none of the proximal articulation remaining.
2008	41	horse	scapula	1	r		1234567		df	lots of fragments - fresh breakage of blade. Root etched bone surface

Context	Id. No.	Species	Element	No. frags	Side	LT50	GT50	P/F	D/F	Notes
2008	42	cattle	scapula	1	l	9	123457		df	bone surface rather battered - some fresh breakage. Dog gnawing around the glenoid
2008	43	cattle	metatarsal	1	r		12345678		df	
2020	44	cattle	mandible	1		15	36			juvenile mandible with M2 just in wear
2020	45	cattle	isolated teeth	1	l					upper molar
2030	46	horse	tibia	1	r		5689X		df	

Archive of unidentified bone fragments

Context	Species	Element	No. frags	Notes
2008	Large mammal	cranium	1	
2008	Medium-sized mammal	shaft	1	Caprovid radius shaft fragment
2008	Large mammal	shaft	2	
2008	Unidentifiable	unidentified	14	
2014	Equus f. domestic	atlas	1	
2014	Medium mammal 1	vertebrae	2	
2014	Large mammal	mandible	4	
2014	Large mammal	cranium	5	
2014	Large mammal	rib	6	mostly small fragments - 2 with articulations
2014	Large mammal	scapula	6	most small freshly broken fragments, 1 large scapula blade fragment, probably cow
2014	Medium-sized mammal	shaft	8	
2014	Large mammal	shaft	14	surfaces quite eroded - couple with fresh breaks
2014	Unidentifiable	unidentified	62	some fresh breakage
2018	Medium-sized mammal	shaft	1	Metacarpal shaft fragment
2020	Medium-sized	pelvis	1	probably sheep - acetabulum chopped

Context	Species	Element	No. frags	Notes
	mammal			
2020	Medium-sized mammal	rib	1	
2020	Large mammal	scapula	2	
2020	Large mammal	vertebrae	9	all thoracic fragments - 2 unfused, 1 fused
2030	Large mammal	scapula	1	represent one bone but are 30+ freshly broken small fragments

Butchery records

Key: kns = knife marks; ch = chop mark; ?chs = possible chop marks

Context	Bone id	Species	Element	Type	Zone	Notes
2014	1	horse	mandible	kns	1	
2014	3	horse	mandible	ch	1	possibly chopped across the bone behind P2
2014	14	horse	pelvis	?chs	57	possible shallow chop marks, poor preservation makes marks ambiguous
2014	18	cow	mandible	ch	27	
2014	24	cow	humerus	ch	78	chopped across shaft

Mandible and teeth records
*After O'Connor (1988); **After Payne (1973, 1987).

Context	Id. No.	Species	Element	P4	M1	M2	M3	General age category*	Detailed age category**
2014	32	sheep/goat	mandible	14S	12A	9A	11G	Adult 3	G (4-6 yrs)
2020	44	cow	mandible			B			

Context	Id. No.	Species	Tooth	Wear stage
2014	20	cow	DP4	J
2014	21	cow	M1/M2	G

Measurements
Measurements follow those outlined by von den Driesch (1976) and Dobney *et al*. (1996).

Astragalus													
Date	**Context**	**Id. No.**	**Species**	**Element**	**BFd**	**GB**	**GH**	**LmT**					
2nd C	2014	10	horse	astragalus	47.4	55.79	52.28	49.8					
Humerus													
Date	**Context**	**Id. No.**	**Species**	**Element**	**BT**	**HT**	**HTC**						

2nd C	2014	24	cow	humerus	65.69	38.95	28.32						
2nd C	2014	7	horse	humerus	-	41.63	32.54						
2nd C	2014	33	sh/g	humerus	23.27	14.77	11.35						
IA/RB	2018	40	horse	humerus	62.82	-	-						
Metatarsal													
Date	**Context**	**Id. No.**	**Species**	**Element**	**GL**	**SD**	**BFp**	**DFp**	**BAD**	**Dd**	**Dem**	**Dvm**	**Dim**
IA/RB	2008	43	cow	metatarsal	214.8	25.05	45.87	46.14	55.62	30.88	22.64	30.75	27.07
Scapula													
Date	**Context**	**Id. No.**	**Species**	**Element**	**GLP**	**SLC**							
IA/RB	2008	41	horse	scapula	80.31	58.96							
2nd C	2014	22	cow	scapula	70.95	59.27							
2nd C	2014	6	horse	scapula	76.8	-							
Tibia													
Date	**Context**	**Bone id**	**Species**	**Element**	**SD+**	**Bd**	**Dd**	**SD++**					
2nd C	2014	25	cow	tibia	-	58.44	-	-					
2nd C	2014	8	horse	tibia	26.72	63.38	39.2	35.9					
2nd C	2014	9	horse	tibia	23.83	59.39	38	32.22					

?2nd C	2030	46	horse	tibia	-	58.98	37.5	-					

+ SD measurement according to Dobney *et al*. (1996); ++SD measurement according to von den Driesch (1976).