

SETTLEMENT, FARMING AND INDUSTRY FROM PREHISTORY TO THE PRESENT IN THE THAMES ESTUARY

ARCHAEOLOGICAL INVESTIGATIONS AT DP WORLD LONDON
GATEWAY PORT AND LOGISTICS PARK, ESSEX,
AND ON THE HOO PENINSULA, KENT

SPECIALIST REPORT 15
MARINE SHELL AND FISH REMAINS
BY REBECCA NICHOLSON

Specialist Report 14

Animal Bones

by Lena Strid

Proposed Development at Great Garlands Farm (COLP15)

A total of 20 hand-collected animal bone fragments were recovered, the majority of which came from an articulated horse skeleton associated with the collapse of the timber wharf (412). The bones are dated to the late medieval/early post-medieval period (Table 14.1).

The bone condition was generally fair. Traces of burning or of animal gnawing were absent. The horse remains included the skull, both mandibles and hyoids (tongue bones), as well as the first six neck vertebrae. The horse tooth from alluvial deposit 403 articulates with the rest of the teeth. A fragment from a large mammal upper humerus in alluvial deposit 404 may also derive from this animal. The presence of canines suggests that it was a male horse. Judging by toothwear on the incisors, the horse would have been c 8-18 years old when it died (Habermehl 1975).

Pipeline Diversion (COLP15)

Nineteen fragments of animal bone, weighing 113g, were recovered from the site. These comprised fragments of sheep and cattle teeth, cattle mandible, large mammal long bones, and a rabbit femur and metatarsal. Except for the rabbit bones, the fragments are associated with Roman-period material and are likely to be of that date. The rabbit bones are more recent.

Access Road (COARD12)

The faunal remains from excavation areas A and H mainly derived from the medieval/post-medieval period. A single middle Bronze Age pit deposit from Area A included five antler fragments from red deer. Excluding a cattle burial from Area H, a total of 518 bones were retrieved. The bone condition was good to fair, suggesting that the bones had not been lying on the surface for long periods of time before being disposed of. Six fragments showed carnivore gnaw marks, probably from dog.

The animal bone assemblage from Area A is dominated by bones from cattle and horse (Table 14.2). Sheep/goat and red deer are the only other identifiable animals. Judging by bone surface structure and epiphyseal fusion, most animals were adults or sub-adults. One humerus from a juvenile cattle or horse was found in a post-medieval pond in Area A (1005). Butchery marks were absent. Pathologies comprised fusion of two cattle tarsal bones from pit 1159, possibly a sign of degenerative joint disease or muscle strain.

Apart from the common domestics, cattle, sheep/goat, pig and horse, the animal bone assemblage from Area H also includes owl, woodmouse and frog (Table 14.3). Bone surface structure and epiphyseal fusion suggest that most, if not all animals were adults or sub-adults. Bones from juveniles were absent from the assemblage. Cut marks proximally on a cattle metacarpal from pond 8008 suggest skinning or disarticulation of the joint. This bone also had large exostoses laterally on the proximal part of the shaft. The aetiology is unclear but may be connected to muscle strain. The only other bone with pathologies was an owl ulna from the same feature, which had fractured mid-shaft. A callus had formed, indicating that the bone was healing when the animal died. Restricted flight ability may have made survival difficult.

Pit 8018 contained the almost complete skeleton of a sub-adult male cattle. The distal epiphyses on the tibia were fusing, suggesting an age at death of 2-2.5 years (Table 14.4). This is consistent with the dental wear analysis, which gives an estimated age at death of 30-36 months (Table 14.5). The bones were in a very good condition. Neither butchery marks nor pathologies could be observed, suggesting that the animal had died of natural causes and the carcass had been dumped in the pit without any recovery of hide or meat.

Salt Fleet Flats, Cooling Marshes (CSCOX13)

The faunal remains comprise a total of 475 bones. As with the Access Road assemblage, the bone condition was good to fair, suggesting that the bones had not been lying on the surface for prolonged periods. Thirteen fragments showed carnivore gnaw marks, probably from dog or fox. A single bone had been gnawed by a rodent. Burnt bones were absent.

The animal bone assemblage is dominated by bones from sheep/goat (Tables 14.6-8). Since 13 bones could be identified to sheep and none to goat, it is likely that

most or all of the sheep/goat bones belong to sheep. The sheep/goat remains were mostly found in channel fills, and their semi-articulate state suggest that they represent natural mortalities. Sheep were kept at Halstow marshes in the medieval and post-medieval periods and the size of several of the sheep remains suggest that these animals are post-medieval.

The rest of the assemblage comprises a small number of bones from domestic mammals, as well as one rabbit femur and three wing bones from a wader. It is uncertain to what extent the bones are directly related to human activity. The only butchery mark in the assemblage was found on a medium mammal rib that had been chopped off mid-rib. The wader bones may represent natural mortality, since wings often detach from a floating decomposing carcass (Schäfer 1972).

References

Grant, A, 1982 The use of toothwear as a guide to the age of domestic ungulates, in *Ageing and sexing animal bones from archaeological sites* (eds B Wilson, C Grigson and S Payne), BAR Brit Ser **109**, 91-108, Oxford

Habermehl, K-H, 1975 *Die Altersbestimmung bei Haus- und Labortieren*, Berlin, Hamburg

Halstead, P, 1985 A study of mandibular teeth from Romano-British contexts at Maxey, in *Archaeology and environment in the Lower Welland Valley volume 1* (F M M Pryor and C A I French), E Anglian Archaeol **27**, 219-24

Payne, S, 1973 Kill-off patterns in sheep and goats: the mandibles from Aşwan Kale, *Anatolian Studies* **23**, 281-303

Schäfer, W, 1972 *Ecology and palaeoecology of marine environments*, Oliver and Boyd, Edinburgh

Animal Bone Tables

TABLE 14.1: BONE ASSEMBLAGE FROM PROPOSED DEVELOPMENT AT GREAT GARLANDS FARM (COLP15)

	Context 403	Context 404	Context 405	Total
Cattle			1	1
Horse	1	14		15
Dog			1	1
Large mammal		2	1	3
Total count	1	16	3	20
Weight (g)	28	4018	48	4094

**TABLE 14.2: BONES PER TAXON AND FEATURE IN
ACCESS ROAD AREA A (COORD12)**

	Pit	Pond	Post hole	Ditch	Ditch	Hollow	Pit	Ditch	Ditch	Pit	Ditch
	1004	1005	1024	1049	1081	1146	1159	1163	1184	1188	1195
Cattle				1	8	2	2		1		
Sheep/goat		1					1				
Horse					14		1	1			
Red deer	5										
Medium mammal							1				
Large mammal		3			7	1	2	1			1
Indeterminate		2	1		77	3				5	
Total	5	6	1	1	106	6	7	2	1	5	1
Weight (g)	15	52	0	186	2442	170	143	164	2	7	34

**TABLE 14.3: BONES PER TAXON AND FEATURE IN
ACCESS ROAD AREA H (COARD12)**

	Pond	Pond	Pit	Pit	Ditch	Pit	Pit	Ditch	Hollow
	8008	8015	8018	8023	8027	8030	8039	8041	8101
Cattle	2	1	223*		1				2
Sheep/goat	2							1	
Pig			2	1					
Horse			1						
Owl	3								
Woodmouse			1						
Frog			2						
Medium mammal		2		1				1	1
Large mammal	1	1	36	1					2
Indeterminate	4	1	252			31	11	2	4
Total	12	5	517	3	1	31	11	4	9
Weight (g)	311	318	14504	50	20	27	0	32	138

* includes 218 bones from an articulated cattle skeleton

TABLE 14.4: STATE OF EPIPHYSEAL FUSION OF ARTICULATED CATTLE SKELETON (COARD12)

Element	Fusion age	Unfused	Fusing	Fused
Acetabulum	7-10 months			x
Scapula	7-10 months			x
Radius (px)	12-15 months			x
Humerus (di)	15-20 months			x
Phalanx 2	15-18 months			x
Phalanx 1	20-24 months			x
Metacarpal (di)	2-2.5 years	x		
Metatarsal (di)	2-2.5 years	x		
Tibia (di)	2-2.5 years		x	
Calcaneus	3 years	x		
Femur (px)	3.5 years	x		
Humerus (px)	3.5-4 years	x		
Radius (di)	3.5-4 years	x		
Ulna (px)	3.5-4 years	x		
Ulna (di)	3.5-4 years	x		
Femur (di)	3.5-4 years	x		
Tibia (px)	3.5-4 years	x		

Fusion age according to Habermehl (1975, 104-105)

TABLE 14.5: DENTAL WEAR STAGES OF ARTICULATED CATTLE SKELETON (COARD12), USING GRANT'S (1982) TOOTH WEAR STAGES. ESTIMATED AGE ACCORDING TO HALSTEAD (1985)

	Tooth wear stages				Estimated age
	dp4	M1	M2	M3	
Left	k	j	f	b	30-36 months
Right	k	j	g	b	30-36 months

**TABLE 14.6: BONES PER TAXON AND FEATURE TYPE
(CSCOX13)**

	Pit	Pond	Field drain	Ditch/ channel	Channel	Layer	Alluvial	Topsoil	Subsoil
Cattle					1		1		
Sheep/goat	3	7			145	7		1	1
Sheep		2			13				
Pig					1	3			1
Horse					3			1	1
Dog					1				
Rabbit					1				
Wader				3					
Passerine						2			
Indet. bird	1					1			
Medium mammal					149	14			5
Large mammal	1				40				1
Indeterminate			1		61	3			
Total	5	9	1	3	415	30	1	2	9
Weight (g)	92	476	1	0	4358	110	49	318	57

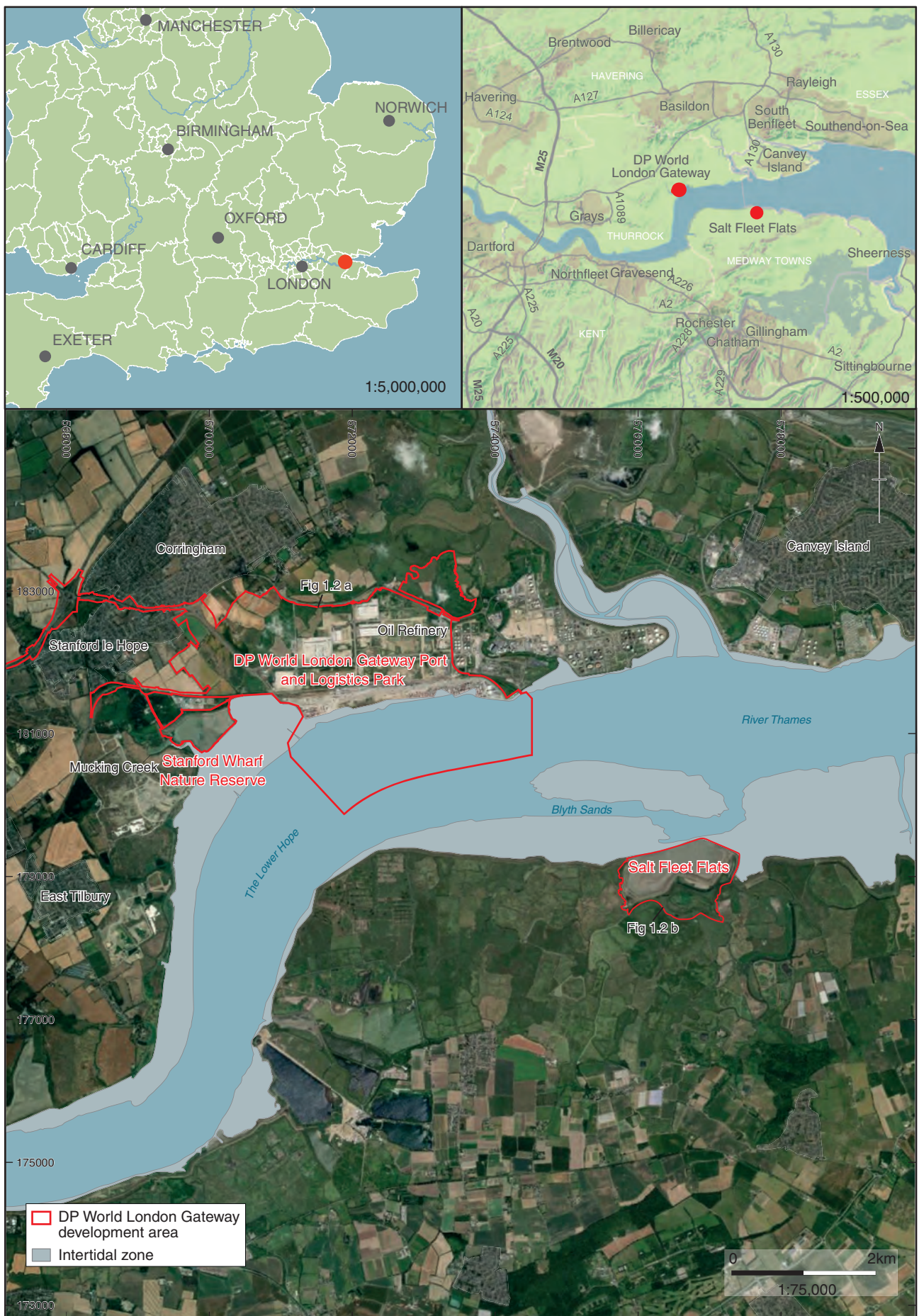
**TABLE 14.7: REMAINS FROM SHEEP AND SHEEP/GOATS
RECOVERED FROM CHANNELS AND POND (CSCOX13)**

	Channel						Pond
	3005	3208	3303	5404	5506	5607	2202
Skull	17	5	3	1	3	1	
Mandible	9	5	2		1	2	
Loose teeth	6		1	2	13		
Atlas	2		1				
Axis	2		1				
Vertebra	6	8	1	5	1	14	
Sacrum	1						
Rib	3	7		55		34	
Sternum				2		4	
Scapula	2			1	2		1
Humerus	3	2			1	1	1
Radius	1	2	2	1			1
Ulna	1						1
Carpals					1		
Metacarpal	1	4		1	2		1
Pelvis	2	3			4		
Femur	1	1			5		1
Tibia		3	1	1	6	1	2
Calcaneus	1				2		
Astragalus					1		
Tarsals							
Metatarsal		4	1	2	3		
Phalanx 1	1	3			1		1
Phalanx 2		1			1		
Phalanx 3							
Indet. metapodial		1			2		
Long bone	3			1	2		
Total	62	51	13	72	51	57	9
MNI	2	4	1	2	4	1	1
Age estimate	1 sub-adult, 1 adult	1 sub-adult, 2 adults, 1 indet.	1 sub-adult/ adult*	1 neonatal, 1 adult	1 juvenile, 2 sub-adults, 1 adult	1 adult	1 adult

Vertebrae, ribs, sternum and long bones could only be identified to medium mammal but are most likely sheep/goat. Age estimation follows epiphyseal fusion and tooth wear (Habermehl 1975; Payne 1973).

TABLE 14.8: DENTAL WEAR STAGES OF SHEEP/GOAT MANDIBLES FROM CHANNEL FILLS (CSCOX13), USING GRANT'S (1982) TOOTH WEAR STAGES. ESTIMATED AGE ACCORDING TO PAYNE (1973)

Channel	Tooth wear stages				Mandible Wear Stage	Estimated age group
	dp4	M1	M2	M3		
3005		g	e	E	25	1-2 years
3005			g	g	36-41	4-6 years
3208	g	f	E		14-15	0.5-1 year
3208		k	g	g	39	4-6 years
3303		m	j	g	43	6-8 years
5607		k	g	g	39	



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