

**Channel Tunnel Rail Link
London and Continental Railways
Oxford Wessex Archaeology Joint Venture**

**Animal bone from Tollgate,
(CTRL Project Area 330, Zone 4)
Gravesham, Kent**

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TABLE OF CONTENTS

1	INTRODUCTION	3
1.1	The site	3
1.2	Method.....	4
2	RESULTS.....	4
2.1	The animal bone	4
2.2	Preservation and alteration	6
2.3	Species descriptions.....	7
3	DISCUSSION.....	11
4	BIBLIOGRAPHY.....	12

LIST OF TABLES

Table 1: Number of fragments of each taxon from the hand collected material, summarised by phase	4
Table 2: Number of fragments of each taxon from the sieved material, summarised by phase	5
Table 3: MNI of identified domestic species by phase.....	6
Table 4: Condition of the hand collected and sieved bone assemblages	6

1 INTRODUCTION

1.1 The site

The Museum of London Archaeology Service (MoLAS) was commissioned by Union Railways (South) Limited (subsequently London and Continental Railways) to undertake a watching brief and detailed excavation between Wrotham Road and Scalers Hill, south of Gravesend, Gravesham, Kent, (the name ‘Tollgate’ is a label assigned to the investigation area originally named CTRL Project Area 330, Zone 4). This work formed part of an extensive programme of archaeological investigation carried out in response to the construction of the Channel Tunnel Rail Link (CTRL).

Distinct spreads of sarsen stones were present to the east of Church Road. These have been considered as potentially the remains of a demolished Neolithic to early Bronze Age megalithic structure, but are more likely to be a natural accumulation, disturbed by medieval and later field clearance. A sub-rectangular cropmark enclosure, identified on aerial photographs to the east of Wrotham Road, is believed to be a Neolithic mortuary enclosure. It was preserved *in situ* beneath landscaping earthworks and not investigated in detail.

Evidence of a settled and cultivated landscape first appears at the end of the Bronze Age. A small scale settlement, established in the Iron Age to the west of Church Road, provides evidence of domesticated and processed crops and livestock, supplemented by foraged foods and game. Iron Age activity around Tollgate persists into the early first century AD, when a possible eastward shift in the focus of settlement and activity to the Henhurst Road area is recorded. Evidence for activity in the Roman period is dispersed along the length of the Tollgate zone, with a particular focus in the Henhurst Road area. A trackway junction including metalled surfaces and recut ditches, was established here *c*AD50 to AD70, apparently falling into disuse shortly thereafter. In the second century the area may lie on the periphery of a small settled area to the south and east of Henhurst Road. The character of Roman activity throughout the zone is agricultural, comprising field boundaries and trackways, with evidence for crop production and processing.

Archaeological evidence fades out by the mid-third century AD and no further features are recorded until the early medieval period, when new field systems and local routeways were established, suggesting renewed intensification in agricultural land-use in the 11th-14th centuries. Isolated pits at this time have produced evidence for wheat production and there is evidence that naturally occurring sarsen boulders were removed and broken up, presumably to improve fields for arable cultivation. Routeways and divisions of the agricultural landscape thereafter appear to remain stable, with little evidence for change to the modern period. Post-

medieval chalk quarries are present across the Tollgate area. A brick kiln recorded near Cobham Service Station dates to the late 17th- to late-18th centuries and is likely to have provided brick and tile to the expanding communities of Gravesend, Singlewell and Cobham.

1.2 Method

Details of the animal bone recording method can be found in the CTRL Section 1 Post-excavation Project Design, Volume 2, Contractor's Method Statements (ADS 2006).

2 RESULTS

2.1 The animal bone

A total of 753 (4429g) fragments of bone were recovered by hand from the watching brief excavations ARC 330 98 Tollgate area. A further 383 (202g) fragments were recovered from the sieved bulk samples.

Species present and quantification

Tables 1 and 2 summarise fragment numbers by phase for hand-collected and sieved material.

Table 1: Number of fragments of each taxon from the hand collected material, summarised by phase

Taxon	Late Bronze Age/ Iron Age	Early Iron Age	Early Roman	Middle Roman	Roman	Early Medieval	Un-Phased	Total
Cattle		33	4			5	3	45
Sheep/Goat		40	27	1		29	2	99
Sheep		2				2		4
Goat			1					1
Pig		13	2			2	1	18
Equid		5	1	2	1	3	2	14
Red Deer		7					1	8
Roe Deer		1				1		2
Deer		1						1
Wood Mouse		6						6
Field Vole		11						11
Mouse		10						10
Toad		33*						33
Amphibian		12						12
Large Mammal		32	4			29	6	71
Medium Mammal		53	9	1		11	2	76
Small Mammal		4						4

Taxon	Late Bronze Age/ Iron Age	Early Iron Age	Early Roman	Middle Roman	Roman	Early Medieval	Un-Phased	Total
Micro Mammal		80						80
Unidentified	36	56	68			23	75	258
Grand Total	36	399	116	4	1	105	92	753

* Partially complete skeleton

Table 2: Number of fragments of each taxon from the sieved material, summarised by phase

Taxon	Early Iron Age	Early Roman	Roman	Early Medieval	Un-Phased	Total
Cattle	1				1	2
Sheep/Goat	1		1	1		3
Pig	2			4		6
Dog			1			1
Field Vole	5				1	6
Amphibian	3			1		4
Fowl			1			1
Songbird				1		1
Bird			1		1	2
Eel			3	3		6
Gadidae			2	1		3
Flatfish			1			1
Herring			2			2
Fish			6			6
Large Mammal	1					1
Medium Mammal	14		2	1	1	18
Small Mammal			1			1
Micro Mammal	17				1	18
Unidentified	142	2	53	13	88	298
Grand Total	186	2	74	25	93	380

The majority of the assemblage consists of domestic species, with wild species occurring in small numbers. Sheep/goat dominate the assemblage followed by cattle, pig then equid. Wild species are present in the form of red and roe deer and several micro mammal species and amphibians. The sieved sample yielded further fragments of domestic species and the micro mammal species, in addition to several fish bones.

Table 3 below compares the minimum number of individuals (MNI) for each identified species within each phase. The small size of the assemblage limits the observable patterns throughout the phases of the sites occupation. However, the data clearly displays that sheep/goat dominates the assemblage through out all of the main occupation phases of the site, followed by cattle then by pig and equid. The assemblage although small does not

suggest any fluctuations in the husbandry strategy for the site over the different occupation phases.

Table 3: MNI of identified domestic species by phase

Species	Early Iron Age	Early Roman	Middle Roman	Roman	Early Medieval
Cattle	3	1	0	0	1
Sheep/Goat	6	2	1	0	2
Pig	2	1	0	0	1
Equid	1	1	1	1	1

2.2 Preservation and alteration

Condition

Table 4 summarises the condition ranges within the hand collected and sieved assemblages. The condition of the bone within the hand collected assemblage is quite variable, ranging from grade 2 to grade 5 on the Lyman criteria (where 1 is pristine, 5 is just recognisable). The condition of the bone from the sieved assemblage is in a slightly poorer state falling generally within grades 3 and 4.

Table 4: Condition of the hand collected and sieved bone assemblages

Condition Grade (Lyman 1996)	Percentage of hand collected assemblage	Percentage of sieved assemblage
1	0%	0%
2	31%	9%
3	26%	29%
4	27%	62%
5	16%	0%

Burning

A total of two fragments of burnt bone were recovered from the hand collected assemblage. A further 94 fragments of burnt bone were recovered from the sieved assemblage, 39 of these from un-phased contexts. The remaining 55 fragments were all recovered from the Early Iron Age phase of the site; none of the fragments were identifiable beyond size category. The majority of the fragments were recovered from pit [435]; the rest of the burnt assemblages

were recovered from pits [374], [679], [740], [1172] and [1174]. Four fragments were also recovered from storage pit [414] and three fragments from ditch [554].

Butchery

Six fragments of bone were recorded with butchery marks. A single sheep/goat metatarsal with disarticulation cut marks was recovered from the early medieval cobbled surface [768]. The remaining five fragments were retrieved from early Iron Age deposits. A cattle scapula with defleshing cuts and a cattle horncore with horn removal cut marks at the base were recovered from pit [387]. From pits [1172] and [1174] medium mammal sized ribs with meat removal cuts were recovered. Very little can be established from such a small assemblage, although evidence of secondary butchery and possible horn working can be suggested from these few fragments.

Gnawing

A total of thirteen fragments of bone were recovered with evidence of gnawing on them. Where identifiable the gnawing appears to have been by carnivores. A single fragment of sheep/goat tibia was identified with rodent gnawing on the shaft, from the early Iron Age pit [1174] (which also contained numerous micro mammals). The remaining assemblage has all been recovered from pits and pit quarry deposits from the early Iron Age and early medieval phases. A single carnivore-gnawed ulna was recovered from the early Roman layer (1148). The presence of gnawed bones suggests that some butchery/ food waste was left accessible to scavengers for a while. In the case of pit [1174] and the rodent gnawing, this evidence is supported by the presence of at least one field vole and a mouse skeleton.

Skeletal representation

All skeletal elements of the domestic species are fairly well represented within the assemblage throughout the occupation of the site, suggesting butchery of entire carcasses takes place on site rather than joints being imported or traded in.

2.3 Species descriptions

Sheep/goat

Sheep/goat are the most abundant taxon. A single fragment of goat horncore was identified from an early Roman pit [508]. Four fragments of bone from early Iron Age and Early Medieval contexts were positively identified as sheep. No differentiation could be made for the remaining fragments.

Sheep withers height was estimated as 0.58m based on complete metapodials from the early Iron Age pits [1172] and [1174] (Teichert1975).

Most skeletal elements were present indicating that the whole carcass was butchered and disposed of on site. A single sheep/goat metatarsal from the early medieval cobbled surface [768] displayed disarticulation butchery marks.

The ageing data from the assemblage is too limited to provide an age at death profile. The majority of the age scorable bone appears to be from skeletally mature individuals. A single unfused scapula from an animal aged under six months old was recovered from the early Iron Age pit [163]. The tooth wear, of a total of eight mandibles, indicates that the individuals represented within the assemblage cover a range of ages between 1 year and 5-8 years old. No evidence of very young individuals was found. This may be due to preservational biases towards the more robust adult bones or may suggest that the breeding of the sheep/goat flocks takes place off site. Sheep/goats were most likely utilised for milk, meat and wool.

Cattle

Cattle are considerably less abundant within the assemblage than sheep/goat. Most skeletal elements are represented, suggesting that the entire carcass was present. Two cattle bones from early Iron Age pit [387] display butchery marks consistent with meat and horn removal. There are not sufficient data to construct age at death profiles. The majority of the bone fragments are from skeletally mature individuals. A single tibia from early Iron Age pit [1172] was from an individual aged <24 months. A single mandible from an individual aged between 1 and 8 months was recovered from early Iron Age Pit [387]. The presence of fairly young individuals within the assemblage may suggest the breeding of animals at or near the site. Cattle from the assemblage were obviously used to provide meat and horn and were probably used for traction, milk, manure and leather.

Pig

Pig remains within the assemblage is very limited. A range of skeletal elements is present within the assemblage, which may suggest the entire carcass was present on site. No evidence of butchery was noted on any of the identified pig remains.

No tooth wear ageing data was recorded. Four fragments had recordable fusion age data; a tibia from an individual aged over 2 years was recovered from early Iron Age storage pit [414]. Two fragments from an individual aged under 2 years were recovered from early Iron Age pit [1172] and a single scapula from an animal aged below 1 year was recovered from the same pit. The identified pig remains appear to be generally from young individuals, which may suggest the low number of pig bones is due to preservational factors. The presence of both juvenile and adult bones suggests the rearing of pigs for meat with a few adults retained for breeding.

Equid

Equid remains are present in very small numbers through almost every phase of the site occupation. No differentiation has been made between horse, donkey and mule. Several fragments of equid bones were recovered from early Iron Age deposits from pits [387], [414], [702] and [1172]; all of the age scorable bones were from skeletally mature individuals. A single tooth from an animal aged between 7 and 9.5 years was recovered from the early roman layer [1148]. Another solitary tooth was recovered from the middle roman layer [748]. A fragment of equid humerus was recovered from roman ditch [1048]. From the early medieval period and equid astragalus was recovered from pit [163], a femur fragment was recovered from ditch [808] and a metapodial was recovered from the cobbled surface [768]. No evidence of butchery was noted. The fragments are too fragmentary and scattered for further interpretation. Equids would probably be used for traction and/or riding and may be an indication of the status of the site.

Dog

A single dog 1st phalanx was recovered from the sieved samples from roman pit [161]. No further evidence of dog was identified within the assemblage.

Wild species

Antler fragments dominate the red and roe deer remains within the assemblage. A total of 6 red deer antler fragments were recovered from early Iron Age pit [1174], in addition to a juvenile roe deer mandible. A single fragment of deer antler was also recovered from early Iron Age pit [740]. A red deer tibia fragment was recovered from the early Iron Age storage pit [414]. From the early medieval period a fragment of roe deer humerus was recovered from the cobbled surface [768]. A single fragment of red deer antler was recovered from an un-phased pit [435]. The presence of juvenile material and limb bone suggests that deer were present near the site.

Bird

Two fragments of bird bone were recovered from the sieved samples from roman pit [161]. A single sparrow humerus was recovered from an early medieval pit [163].

Micro-mammals and amphibians

A comparatively large amount of 'micro' sized remains were recovered from both the hand- and sieve-collected assemblages. The majority were from early Iron Age pits [1172] and [1174]. The animals appear to be represented by most skeletal elements suggesting that the entire skeleton was present. The 'micro' remains within pit [1172] represent a minimum of 2 wood mice, 2 field voles, and 1 toad. The remains from pit [1174] represent a minimum of 3

field voles, 1 mouse and 1 amphibian. Out side of these pits only solitary fragments of the micro taxons have been recovered, from which little interpretation can be made. The remains from [1172] and [1174] may represent 'pit-fall' from the pits being left open for a length of time. However, the presence of these animals within the assemblage may also be intrusive due to the burrowing nature of these species.

Fish

A total of 18 fish fragments were recovered from the assemblage, 14 of which were from the sieved sample from roman pit [161]. The pit contained 2 herring bones, 3 eel, 1 flat fish, 2 gadidae family and 6 fragments of fish unidentifiable to species. All of the species are marine fish, apart from the eel, which can be both fresh water or marine in origin. These fish species are not uncommon within a roman assemblage. A gadidae and three fragments of eel bones were recovered from the sieved samples from the early medieval pit [163].

Early Iron Age pit [1172]

A total of 170 fragments were recovered by hand from pit [1172], representing 42% of the early Iron Age hand-collected assemblage. A further 8 fragments were recovered by sieving. The skeletal element representation of the domestic species within the pit suggest the pit may be have been used for butchery and food waste. A single medium mammal sized rib displayed meat removal cut marks. 126 fragments from the pit [1172] hand-collected assemblage were amphibians and micro mammals, probably as a result of 'pit-fall'. This suggests that the pit was open for some time before being filled.

Early Iron Age pit [1174]

Pit [1174] is next to pit [1172]. A total of 63 fragments of bone were recovered by hand, with an additional 58 fragments recovered from the sieved samples. As in pit [1172] the skeletal elements from the domestic species represented appear to be from butchery and food waste. Two medium mammal sized ribs with meat removal cut marks were noted. As with pit [1172] skeletal elements from fairly complete micro mammal and amphibian skeletons were also recovered, possibly as a result of 'pit-fall'. This pit may have been left open for some time before filling. Red deer antler fragments and a roe deer mandible were recovered, indicating that wild species were occasionally used to supplement diet and secondary products produced by the domestic species. There may have been suitable uncultivated habitat within range of the site.

3 DISCUSSION

The assemblage for the site spans several phases of activity. However, the main period of activity in the terms of the animal bone assemblage is the early Iron Age phase, with smaller assemblages from the early roman and early medieval phases. The late Bronze Age/ Iron Age and middle Roman phases produced tiny assemblages, which provide little information on the utilisation of animals.

In the most active phases in the terms of the animal bone the pattern of species representation remains relatively constant. Sheep/goat dominate the assemblages for each phase, followed by cattle and pig. The limited ageing data suggests that the maintenance of sheep/goats for wool and milk, as well as meat, may have been of importance. Cattle would have possibly been kept for traction and milk. Butchery evidence supports that cattle were utilised for meat and horn, especially within the early Iron Age period. Pig would have been primarily raised for meat as they produce little in the form of secondary products. Equids are present within small numbers throughout most of the phases of the site activity. Equids would possibly be kept as working animals.

Wild species (red and roe deer) are represented by a small number of fragments from the early Iron Age phase, mainly in the form of antler. A single fragments of juvenile roe deer mandible suggest that other parts of the animal, not only antler, were utilised on site. The presence of these species on site also suggests that a suitable environment was within range of the site.

The small number of bird remains does not provide any real additional information to the dietary or environmental evidence for this site, save their presence. Similarly the small mammal and fish remains give little information beyond their presence on the site. Amphibian, wood mouse and vole remains are to be expected on any semi-rural site with open refuse or waterlogged features. The relatively large numbers may indicate that features remained open for a length of time.

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