

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

Animal bone from Mersham, Kent

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CTRL Specialist Report Series

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1 INTRODUCTION

1.1 The site

As part of an extensive programme of archaeological investigation carried out in advance of the construction of the Channel Tunnel Rail Link (CTRL), Canterbury Archaeological Trust was commissioned to undertake a detailed archaeological excavation on land situated to the south of the church of St John the Baptist, in Mersham, Kent (OS NGR 605946 138812). The excavation was carried out between December 1998 and January 1999, under the project management of Rail Link Engineering, on behalf of Union Railways (South) Limited (a subsidiary of London and Continental Railways).

Limited evidence for late Anglo-Saxon settlement activity was indicated by five refuse pits and a shallow gully. Both smelting and smithing evidence were associated with this phase in the form of large quantity of metallurgical debris found in the largest pit.

The medieval period (AD 1050-1250) represented the main phase of occupation of the site with an intensification of both domestic and industrial activity. Domestic features included one possible timber built structure and some probably associated cess and rubbish pits containing domestic refuse. Industrial features included a consecutive sequence of drainage ditches feeding a small pond and refuse pits containing quantities of metallurgical waste. The activities identified in the late Saxon and early medieval periods had largely ceased by the middle of the 12th century.

A new field system was established in the late medieval period and only agricultural related features were found from this phase onwards. It is likely that the focus for domestic/industrial activity moved elsewhere in the late medieval and post-medieval periods.

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).

1.3 The animal bone

A total of 1422 (26331g) fragments of bone were collected by hand during the excavation at Mersham. A further 3356 (1101g) fragments were recovered from environmental samples. Tables 1, 2 and 3 below summarise the identified taxons from the hand collected and sieved remains. Due to the large number of fish remains within the assemblage, this data has been placed in a separate table, (Table 5) all of the fish remains were recovered from samples.

The assemblage contains five fully or partially articulated skeletons, a large number of fish bones and relatively large numbers of bird and micro mammal bones. To gain a true

representation of the assemblage the minimum number of individuals (MNI) were calculated in Table 4.

2 RESULTS

2.1 Minimum Number of Individuals (MNI)

Cattle are the most abundant domestic species within the assemblage, followed sheep/goat, then pig, dog and equid. Within this assemblage fish, bird and micro mammal are fairly well represented. This may be a reflection of the good preservation and sampling strategies.

From the early medieval and medieval phases there are a total of 23 horncores identified from both sheep and goat. These horncores represent a total MNI of 6 for each phase. As this a much greater amount than the MNI calculated for the rest of the assemblage, the larger number of horncores may suggest that they are imported specifically for horn working.

Table 1: Minimum number of individuals, summarised by phase.

	Iron Age/ Roman	Early Medieval	Later Medieval	Post Medieval
Cattle	1	1	5	1
Equid	0	0	2	1
Sheep/Goat	0	1	4	1
Pig	0	1	3	1
Dog	0	1	2	1

2.2 Preservation and alteration

Condition

The preservation of the material from Mersham is generally good to moderate. As can be seen in Table 5, the majority of the assemblage occurs within grade 2 on the Lyman criteria (Lyman 1996). The condition of the sieved material is slightly worse than the hand collected material averaging at grade 3. A total of 79% of the hand collected assemblage has been identified to species or size category.

Table 2: Condition of hand collected and sieved bone

Condition	Hand collected assemblage	Sieved assemblage
1	6%	0%
2	65%	15%
3	27%	68%
4	2%	17%

Distribution

In most phases of activity of the site the majority of the animal bone has been recovered from pits, this is unsurprising as the site encompasses a large number of pits in comparison to the ditch systems.

In the medieval phase a large number of bones can be attributed to two animal burials, a dog burial [1051] and an equid burial [1129].

Within the early medieval and medieval phase a total of 4 cattle, 28 sheep and goat horncores, 12 of which showed clear evidence of horn removal, were recovered from a series of pits within the centre of the enclosure. The majority of the horncores were recovered from pits [1161], [1160], [1172] and [1173], which may suggest a horn working activity area.

Butchery

A total of 31 bones displayed evidence of butchery. Twelve of the bones are sheep and goat horncores from the early medieval and medieval period displaying butchery marks consistent with horn removal. The remaining bone occurs mainly from the early medieval and medieval phases and the butchery evidence is consistent with disarticulation and filleting. An equid femur from pit [1121] is chopped through the third trochanter possibly as a result of filleting. A single goose humerus from post medieval ditch [1180] has cut marks consistent with disarticulation.

A dog humerus from post medieval ditch [1046] appears to have been sawn through longitudinally removing the far lateral aspect of the lateral condyle. It is possible that this post depositional damage rather than actually disarticulation of a dog carcass; as there is the majority of an articulated dog skeleton within the same ditch cut from which this bone may have been disturbed through ditch cleaning etc.

Burning

A total of 78 burnt bones were recovered from this site. The distribution of these bones matches with the general distribution ratios of the rest of the bone assemblage.

Gnawing

A total of 33 fragments displayed signs of gnawing. The majority is consistent with carnivore gnawing. A single song bird humerus, sparrow sized, from medieval pit [1145] displays marking of what appears to be cat gnawing. An eel and a herring vertebra, both recovered from pit [1145] have a crushed appearance typical of human consumption (Jones, 1996), this may suggest that cess is a component of the deposit.

2.3 Species descriptions

Cattle

Cattle are the most abundant species represented within the assemblage. Most skeletal elements are represented within the assemblage indicating that the entire carcass was initially present on site. Five bones displayed signs of butchery all consistent with disarticulation and meat removal. Due to fragmentation, no complete bones were available for the calculations of withers heights.

There are not sufficient data to construct age at death profiles. Two cattle mandibles from animals aged between 8 -18 months an adult aged mandible and a single mandible from a senile individual has been recovered from the medieval phase assemblage. The fusion data where recordable is mainly from skeletally mature individuals. Within the medieval phase there are several remains from younger individuals, 3 scapulas from individuals below 7-10 months and innominate from an animal of the same age. A metacarpal and a tibia from an animal aged below 24 months, a calcaneus from an individual aged below 36months and a femur from an animal aged below 42 months. The presence of these young individuals within the assemblage may suggest the breeding of animals at or near the site, particularly within the main medieval occupation phase.

A single cattle third phalange with osteophytic growth on the margins of the proximal articulation was recovered from medieval pit [1024]. This kind of osteophytic growth on the extremities is often a result from stresses placed on the feet through traction.

Cattle from the assemblage were obviously used to provide meat and were probably used for traction, milk, manure and leather.

Sheep/Goat

Sheep/goat are less well represented within the assemblage. Fifteen fragments of horncore have been positively identified as goat; eight horncores have been positively identified as sheep. None of the post-cranial fragments of sheep/goat has been positively identified to either species.

Sheep/goat is represented by most skeletal elements within the assemblage indicating that the entire carcass was present and processed on site. There does appear to be a disproportionate number of horncores to post-cranial fragments. The MNI calculated from the number of post cranial bones gives a figure of 6 individuals for the entire assemblage, calculating the MNI from horncores gives a figure of 12 animals. This may suggest that horncores were imported into the site for use, rather than being by-product butchery on site.

Most of the cut marks recorded on the sheep/goat remains are from horn removal on the sheep and goat horncores from the early medieval and medieval phases. Only two post-

cranial fragments from medieval phase ditch [1056] and pit [1152] display evidence of butchery, these butchery marks are consistent with disarticulation and meat removal.

No complete bones from the assemblage were present for the calculation of withers heights.

A total of 6 sheep/goat mandibles were able to provide ageing data, all of which were recovered from the medieval phase. A single mandible from an animal aged between 1-3 months was recovered from medieval pit [1105]. A mandible from an animal aged between 10-20 months was recovered from medieval horse burial/pit [1129]. Two mandibles from animals aged between 5 - 8 years were recovered from medieval pits [1060] and [1109]. The epiphyseal fusion data provides further information for the sheep/goat age ranges within the assemblage. Within the early medieval phase there is a radius on an animal aged approximately around 10 months. A single metatarsal from the same phase is from an animal aged below 18 months, possibly neonatal. Within the medieval phase there is a neonatal radius, 3 bones from animals aged below 10 months and two bones from individual aged below 36 months. The remaining assemblage, where possible to assess, is all from skeletally mature individuals. This data is not sufficient to produce formal age at death profiles. However, it is apparent that ranges of individuals from new born to older adults are present within the assemblage. The presence of the very young suggests that sheep/goat are being bred near or on site. Also the presence of the older adults suggests that the animals were not only being kept for meat, wool and meat production would also be important in sheep/goat rearing.

Pig

The number of fragments identified as pig is dominated by the presence of a partially articulated piglet skeleton recovered from medieval pit [1141]. The majority of the animal is present; epiphyseal fusion data ages the animal to be below 12 months. No evidence of butchery or gnawing was noted on the carcass.

The remaining pig assemblage is well represented by most skeletal elements, indicating that the entire carcass was present on site for utilisation. No evidence of butchery was noted on any of the pig remains. Several of the bones from the early medieval, medieval and post medieval phases display signs of carnivore gnawing. This indicates that the remains were left exposed where they could be scavenged.

The number of pig remains that were possible to provide an age score was limited. Only two mandible fragments were able to provide teeth wear scores. A mandible from an animal aged between 12 - 16 months and an adult mandible were recovered from the medieval phase. The epiphyseal fusion data provides a little further data. Some skeletally mature individuals were present within the assemblage. A large number of bones belonged to

juvenile animals some aged below 12 months. The majority of the remains were recovered from the medieval phase. The presence of both adult and juvenile remains may suggest that pig breeding took place close to site. Pig remains within archaeological contexts are generally juvenile, the pigs are often slaughtered at the most economical point, when the balance between the food consumed and the body weight achieved was at the most favourable point (Grant 1988).

Equid

The equid remains from the assemblage are represented by a complete skeleton from the medieval pit/burial [1129] and a total of 18 fragments from the remaining assemblage, 17 of which are from the medieval phase. The 17 fragments from the medieval phase are fairly well distributed across the site, and represent most skeletal elements. Within this small number of bones there is a radius from an individual aged below 3.5 years old. A single fragment of equid innominate was recovered from post medieval ditch [1046].

An equid femur recovered from medieval pit [1152] has been chopped, possibly as part of dismembering of the carcass. Although consumption of equids by the medieval period is rare, it is possible for an animal to be processed for food for dogs after death. Measurements taken from the complete bones of the horse burial, calculated as according to Kieserwalter (Boessneck and von den Driesch 1974, 334), give the withers height of the animal as between 13.2 and 14.4 hands. This makes the equid more pony sized rather than horse sized. The tooth height measurement (Levine, 1982) gives an age for the animal between 10.25 - 14 years old.

The equid from [1152] displayed several pathologies. On the skull a rounded hole stands proud of the surface of the palatine bone, the hollow can be viewed further through the nasal aperture, the rounded edges of the bone would suggest the bone had formed around an abscess or cyst. On the fourth and fifth cervical vertebra there is osteophytic lipping extensions in the process of fusing the two vertebrae. Also on the fifth and sixth lumbar vertebra extensive osteophytic growth has caused the vertebra to fuse. This may be an age-related change, although it is likely that this is a response to stresses caused by regular use as a traction animal. The equid also had a broken rib, in the process of healing at the time of death. One fragment of ossified costal cartilage, from the equid skeleton's rib cage, shows several poorly aligned healed fractures. These traumas may be a result of heavy traction work.

The equid remains within the assemblage are dominated by the presence of a single individual, however, the scattered remains that add to the assemblage indicate that more than one equid was present. The complete skeleton appears to have belonged to an animal, which was possibly used for traction. From the 12th century onwards equids increasingly took the place of oxen for haulage (Langdon 1984 in Grant, 1988).

Dog

In the assemblage there is a complete adult male dog skeleton from medieval burial [1051] incorporated within the burial is the scapulae and maxilla of a smaller possibly younger dog. A fragment of dog mandible was recovered from medieval pit [1063], a single dog ulna from medieval ditch [1052] and a partially complete adult dog skeleton from post medieval ditch [1046].

Measurements from the complete long bones from the medieval skeleton were used to calculate a shoulder height of 0.55-0.58m (Harcourt 1974). The measurements from the post medieval skeleton calculate the animals shoulder height as 0.43-0.44m. The medieval animal would be a large size dog; the post medieval dog would be more medium sized.

The mandibles from the medieval dog show well-worn teeth, with slight periodontal disease and dental traumas on the third and fourth premolars on the right and left sides. These dental problems may be an indicator of older age. However, it is more an indication that the dog possibly survived on a more scavenger type diet. Dogs were often kept for herding, guarding and often for hunting and as pets.

Cat

A relatively complete cat skeleton was recovered from the early medieval pit [1173]. Additionally a cat humerus and tibia were recovered from medieval pit [1023].

The complete skeleton is of a young adult, the fusion line of the epiphyses are still visible on the late fusing bones, humeri, femurs and tibiae. There is no evidence of butchery or gnawing on the bones. Cats were probably present on site as working animals, as ratters and mousers, cats could also be present as scavengers.

Bird

The bird bones within the assemblage are mainly from domestic fowl, largely from the medieval phase. A single duck carpo-metacarpus was recovered from medieval pit [1105] and a goose femur and humerus were recovered from post medieval ditch [1065]. A sparrow-sized humerus was recovered from medieval pit [1145] the humerus displayed signs of cat gnawing. A sparrow-sized coracoid was recovered from medieval pit [1027] and a passerine carpo-metacarpus was recovered from medieval pit [1130].

Several of the fowls bones are from hens' killed/died during the laying season (S. Hamilton-Dyer Pers.com). Domestic fowl are commonly raised in medieval contexts for the provision of meat and eggs.

Domestic duck appears to have a very limited role in the diet at Mersham.

Goose occurs in very small number within the post medieval phase. The goose humerus from ditch [1065] displays butchery marks consistent with disarticulation.

Passerines are known to have been eaten in the medieval period especially at high status sites. However, with such as small number and no evidence of butchery, these birds are probably just natural casualties. The cat gnawing on the bone from [1145] may indicate that they are predation remains.

Fish

A total of 1122 fragments of fish bone were recovered from the assemblage. Of these fragments 771 of the fragments are unidentifiable to taxon. As can be seen from Table 5, the majority of the remains are recovered from the medieval phase. A total of 203 of the remains are from the common eel, which can be either fresh water or marine in its origin. The remaining identified fish taxa are all marine, both coastal and deep-sea species including very large cod. The assemblage would suggest that there was a good fish trade from the coast. The represented assemblage consists of most skeletal elements. There is no evidence to suggest whether the fish had been preserved. Marine fish were often transported inland dried, salted or smoked (Grant 1988).

Micro-mammal and amphibians

The micro mammals and amphibians recovered from the sieved assemblage are quite taxa rich. The species found would indicate a semi-rural environment. The majority of the remains were recovered from the pits of the early medieval and medieval phases.

The abundance of species within the assemblage would suggest that rubbish in pits might have been left open attracting scavengers and insects. The presence of the species within the assemblage may have been aided by the predatory nature of cats. However, due to the burrowing nature of most of the species, intrusion into the assemblage should not be ruled out.

2.4 Medieval horse burial [1129]

Feature [1129] is dominated by the presence of the complete equid skeleton. Within the feature as also a large amount of animal bone which is consistent with domestic butchery and food waste. Additionally micro mammal and amphibian remains were also recovered from the feature, which would suggest that the feature may not have been back filled straight away.

It is possible that the equid was disposed with the rest of the refuse from the site, rather than being specifically buried.

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 medieval phase, and to a slightly lesser extent the early medieval phase. Smaller assemblages are present from the post medieval phase. Three fragments of cattle bone were recovered from the Iron Age/Roman phase, which provides little information save the presence of the species.

In the most active phases in the terms of the animal bone the pattern of species representation remains relatively constant. Cattle dominate the assemblages for each phase, followed by Sheep/goat and pig. The limited ageing data suggests that the maintenance of cattle would have possibly been for traction milk, meat and leather. Pig would have been primarily raised for meat as they produce little in the form of secondary products. Sheep/goats would have been kept for wool and milk, as well as meat. At Mersham, sheep and goat horncores display evidence to suggest horn working took place on site, to the extent where horncores may have been imported for this activity.

Equids, dogs and cats are all present within the assemblage and would have been kept primarily as working animals. Equids would have been used for traction and possibly riding. Dogs would have been kept as guarding, hunting and herding animals. Cats would have been kept as mousers and ratters. It is also possible cats and dogs may have been present as pets or scavengers.

Domestic fowl appear to have been kept on site as a source of meat and eggs, this diet would have been occasionally supplemented with duck and in the post medieval phase there is evidence for the consumption of goose.

Fish appears to have been an important part of the diet at Mersham, with fish being imported from the coast either fresh or preserved. This may reflect the religious views of the medieval period. The flesh of most four legged animals was banned on up to three days a week and through lent, as fish and birds were in general not seen as meat, they would have become regular supplements to the medieval diet (Grant 1988).

The presence of quite an abundance of micro mammals and amphibians within the assemblage might be due to the good preservation of bone on site and rigorous sampling strategies. However, the incorporation of a large number of these micro species within the assemblage may indicate that frequently refuse have been left open to scavengers.

The nature of the assemblage is slightly unusual. There is a large number of articulated remains and a mix of domestic food waste and horn working activity waste. Distribution analysis of the area does not suggest any real patterns in the disposal of the different types of assemblages. Although there may be a concentration in the disposal of horncores as previously mentioned. It could be possible that the area excavated was an area

that was preferentially used for the disposal of waste, which may explain the unceremonious burial of several work animals. And the large number of pits containing working domestic waste that may have been left open.

Table 3: Number of fragments of each taxon from the hand collected material, by phase

	Phase					
Taxon	Iron Age/Roman	Early medieval	Medieval	Post-medieval	Unphased	Total number of fragments
Cattle	3	12	97	9	7	128
Equid			283*	1		284
Pig		3	90*	3	3	99
Sheep/Goat		4	48	8	1	61
Sheep		4	4			8
Goat		9	6			15
Cat		48*	2			50
Dog			48*	32*		80
Fowl		1	23			23
Duck			1			1
Goose				2		2
Bird		1	5			7
Large Mammal		12	193	7	8	220
Medium Mammal		21	119		3	143
Small Mammal		1				1
Unidentified		28	261	1	10	300
Grand Total	3	144	1180	63	32	1422

*Contain partial and complete skeletons

Table 4: Number of fragments of each taxon from the sieved material, by phase

	Phase				
Taxon	Early medieval	Medieval	Post-medieval	Unphased	Total number of fragments
Cattle		11			11
Sheep/Goat	2	20			22
Pig	3	11			14
Fowl		9			9
Songbird		3			3
Bird	4	121			125
Amphibian	1	105			106
Bank Vole		1			1
Field Vole	2	6			8
Pygmy Shrew		2			2

	Phase				
Taxon	Early medieval	Medieval	Post-medieval	Unphased	Total number of fragments
Shrew		2			2
Vole	1	9			10
Wood Mouse		4			4
Mouse			1		1
Rodent		2			2
Large Mammal	8	30			38
Medium Mammal	15	48		4	67
Small Mammal		5			5
Micro Mammal	14	101	2	1	118
Unidentified	147	1497	29	13	1686
Total	197	1987	32	18	2234

Table 5: Number of fish identified to taxon, summarised by phase.

	Phase				
Taxon	Early medieval	Medieval	Post-medieval	Unphased	Total number of fragments
Cod (<i>Gadus morhua</i>)		32	2		34
Cod Family (<i>Gadidae</i>)		29			29
Eel (<i>Anguilla anguilla</i>)	1	203			204
Herring (<i>Clupea harengus</i>)	1	15			16
Whiting (<i>Merlangius merlangus</i>)		23			23
Flatfish (<i>Pleuronectes platessa</i>)	1	32		1	34
Mullet (<i>Mugillidae</i> family)		1			1
Scad (<i>Trachurus trachurus</i>)		2			2
Thornback (<i>Raja clavata</i>)		1			1
Shark/Ray (Elasombranch)	2	2			4
Ray (<i>Raja</i> family)		3			3
Fish	56	715			771
Grand Total	61	1058	2	1	1122

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