Channel Tunnel Rail Link

London and Continental Railways

Oxford Wessex Archaeology Joint Venture

Animal bone from Thurnham Roman Villa, Kent

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with bird and fish bone identifications

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CTRL Specialist Report Series

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1 INTRODUCTION

1.1 The sites

As part of an extensive programme of archaeological investigation carried out in advance of the construction of the Channel Tunnel Rail Link (CTRL), Oxford Archaeology (formerly Oxford Archaeological Unit) was commissioned to undertake an excavation at the Scheduled Ancient Monument (SAM KE 299) of Thurnham Roman Villa (OS NGR 579950 157110) and trench excavation of earthworks located in the adjacent Honeyhills Wood near the village of Thurnham in Kent. In addition, a watching brief was undertaken on the surrounding CTRL route section from Sittingbourne Road, Detling, to Crismill Lane, Thurnham. In the course of the watching brief, a concentration of archaeological features was encountered to the east of Hockers Lane, near Detling (OS NGR 579200 157485).

The first substantive remains were represented by an isolated large ramped waterhole. This appears to be of Middle Bronze Age date (*c* 1600 BC-*c* 1100 BC) and contained a pin and a dagger of that period, possibly deposited as part of a closing ritual when the feature was back-filled.

Evidence for permanent settlement first appears in the Late Iron Age, first at Hockers Lane, followed by the establishment of a large enclosed settlement at Thurnham. Activity at Hockers Lane consisted of a sequence of curving gully enclosures. Little physical remains of structures survived within the enclosed area, although a fairly large material culture assemblage points to probable domestic occupation from the second half of the 2nd century BC at the earliest, extending up to the conquest period but probably not much beyond.

Occupation at Hockers Lane may have been succeeded by, or slightly overlapped with, the earliest settlement at Thurnham. This consisted of a large rectilinear enclosure of two phases, containing traces of two roundhouses and two four-post structures, occupying an area of raised ground. The rectilinear enclosure was modified and extended *c* AD 60. At the same time a Romanised proto-villa building, with a tiled roof and painted plaster walls, was constructed as the settlement focus, complimented by a similar-sized possible temple building to the south. The pottery and other finds from this period hint at continuity of site ownership or tenure on either side of AD 43. Outside the enclosure, another possible religious or ritual focus was present, in the form of a massive free-standing post, raised on the approach to the entrance. The structural changes at this time were accompanied by a large increase in the quantities of charred cereal remains deposited in features, indicating an intensification of agricultural production at the site.

The complex was expanded and re-organised in the course of the 2nd century: A large stone-built villa replaced the proto-villa in the early 2nd century, and two large aisled buildings and a bath-house were added.

No further structural additions were made after the early 3rd century, and later activity at the site is characterised by a distinct change in the character of occupation. None of the boundaries were maintained and the bath house was either demolished or allowed to collapse by the late 3rd century. At this point the central room of the villa was converted into a small smithy that was probably engaged in the recycling of collected scrap iron. The aisled building was no longer standing by the turn of the 3rd century and appears to have been deliberately demolished. However, the estate apparently continued to act as a focus of agricultural production, as a corn drier was built on the site of the 14-post building in the later Roman period. This feature appears to have been the main focus of activity on the site, particularly in the later part of the 4th century and produced large assemblages of associated charred cereals. Combined with the general paucity of clear domestic occupation and associated finds assemblages, these developments suggest that the villa ceased to function as a high status occupation site, possibly being subsumed into a larger estate by this time. A large oven within the main villa building is the only clear evidence for late Roman domestic occupation. The area of the corn drier seems to have provided the focus for continued ritual activity, as wild animals were apparently deliberately buried in the shaft of a well.

There is no evidence for occupation or land-use after the start of the 5th century, until the establishment of Corbier Hall moated manor (SAM KE 309) on the low lying ground to the east of the former villa. Evidence from this area includes peripheral features of the manor, containing artefacts of 12th to 13th century date.

1.2 Method

The animal bone assemblage for Thurnham Villa was recovered from two areas of excavation, Hockers Lane (ARC 420 62+200-63+000 99) and Thurnham Villa (ARC THM98). These are archaeologically and spatially separate sites and the assemblages have accordingly been reported on separately below.

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 HOCKERS LANE

2.1 Species present and quantification

A total of 866 (5264g) fragments of bone were recovered by hand during the excavations at Hockers Lane. A further 667 (696g) fragments of bone were recovered from the sieved bulk samples (Tables 1 and 2).

Sheep/goat are the most abundant species within the assemblage, followed by cattle then pig. The pattern appears to be constant throughout each phase, although the assemblages are very small beyond the late Iron Age phase. Equids are only present within the assemblage within the late pre-Roman Iron Age phase of the site, as are the few fragments of dog and red deer that are represented. Solitary fragments of micro mammals identifiable to species, such as wood mouse, field vole and shrew, are present within the sieved assemblages for the late pre-Roman Iron Age and early Roman phases.

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 for the main period of activity, the assemblages for the later phases provide little further information save the presence of the species.

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 averages within grades 3 and 4, generally moderate to poor. The condition of the bone from the sieved assemblage is in a slightly poorer state falling predominantly within grades 4.

Burning

A total of 46 fragments of burnt bone were recovered from the hand collected assemblage with a further 11 fragments recovered from the sieved assemblage. The majority of the remains were unidentifiable to species or size category. From the late Iron Age phase, the burnt fragments were predominantly recovered from the possible palisade trench (255), enclosure ditch (275) and possible beam slot (176). A medium mammal carpal/tarsal was recovered from late Iron Age pit (69) and a partially burnt cattle phalanx was recovered from late Iron Age trample or disturbed

area of ground (184). From the early Roman phase two burnt fragments were recovered from a short segment of enclosure ditch (274). The remaining burnt bone was recovered from the continuous late phase enclosure ditch (134), most of the bone was unidentifiable, fragments of medium mammal skull, rib and femur were recovered from the assemblage.

Butchery

A total of 4 fragments of bone from Hockers lane display evidence of butchery. A cattle navicular-cuboid and cuneiform from the late Iron Age enclosure ditch (245) display evidence of cut marks consistent with disarticulation. A sheep/goat humerus from the late Iron Age possible palisade trench (255) displays evidence of meat removal cut marks. A fragment of large mammal mandible from the early Roman enclosure ditch (134) displayed cut marks consistent with head/tongue removal. Further to these few remains, a single sheep/goat astragalus with cut marks consistent with disarticulation was recovered from the sieved assemblage from the late Iron Age enclosure ditch (275).

Gnawing

A total of 5 fragments of animal bone from the hand collected assemblage display evidence of gnawing. A cattle humerus from late Iron Age possible palisade trench (255), a sheep/goat astragalus from late Iron Age enclosure ditch (245) and a cattle femur from a late Iron Age pit (18) display evidence of carnivore gnawing. A sheep/goat tibia from a late Iron Age ditch (159) and pig humerus from early Roman enclosure ditch (134) both display evidence of carnivore/omnivore gnawing. The presence of gnawed bones suggests that some butchery/ food waste was left accessible to scavengers before becoming incorporated into the ditch fills.

2.3 Species descriptions

Sheep/goat

Sheep/goat are the most abundant taxon in the assemblage. There was no positive evidence for goat within the assemblage. Most skeletal elements are represented suggesting the entire carcass was originally present. Two fragments of bone from the late Iron Age phase of the assemblage display evidence of meat removal and disarticulation cut marks. Sheep/goat withers height was estimated as 0.55m based on a complete metatarsal from a late Iron Age pit (18) (Teichert1975).

The majority of the sheep/goat remains were recovered from the late Iron Age ditches. The possible fence of palisade trench (255) contained a large assemblage of remains representing most skeletal elements of a minimum of 3 individuals. A large number of sheep/goat lower limb

bones (58 fragments) were also recovered from a sieved assemblage of a late Iron Age enclosure ditch (275). A total of 233 fragments of medium mammal skull, most likely sheep/goat, were recovered from the same deposit. These may represent a dump of primary butchery waste.

The ageing data from the assemblage is too limited to provide an age at death profile. A total of four mandibles were able to provide tooth wear age scores. A mandible from an animal aged 3-10 months was recovered from the late Iron Age possible palisade trench (255) accompanied by a mandible from an animal aged 20-34 months. A mandible from an animal aged 5-8 years was recovered from a late Iron Age pit (69). From the early-middle Roman ditch (337) a mandible was recovered from an animal aged 3-5 years. The epiphyseal fusion data adds a little further data than what is established through the tooth wear data. The sheep/goat remains represent a broad range of ages suggesting a mixed economy of milk meat and wool production.

Cattle

Cattle are the next most abundant species within the assemblage after sheep/goat. Most skeletal elements are represented within the assemblage suggesting the entire carcass was present on site. Two bones from the late Iron Age phase displayed evidence of disarticulation cut marks.

A cattle skull was recovered from the sieved assemblage of the late Iron Age enclosure ditch (275). The skull was extremely fragmentary; little further information could be gained. An articulating left lower cattle limb was recovered from the late Iron Age ditch (245), which is possibly from butchery waste. A withers height for cattle was calculated as 1.01 m from a metatarsal recovered from late Iron Age enclosure ditch (245).

A total of two mandibles were able to provide tooth wear scores. A mandible from an adult animal from a late Iron Age pit (18) and an old adult mandible were recovered from a late Iron Age posthole (16). The majority of the elements represented are from skeletally mature individuals. An axis from an animal aged below 6 months was recovered from a late Iron Age enclosure ditch (245). A radius and a tibia from animals aged below 42 months were recovered from the late Iron Age possible palisade trench (255) and pit (69). The presence of these few bones within the assemblage suggests that young animals were present on site. The predominance of adult animals within the assemblage maybe partially due to poor preservation of juvenile remains. However, the presence of adult and older adult remains may suggest an emphasis on cattle utilisation for milk and traction as well as meat.

Pig

Pig remains are represented within the assemblage in smaller quantities than either sheep/goat or cattle. A large number of the identified remains are of loose teeth, 48% of the hand collected

assemblage and 83% from the sieved assemblage. A range of skeletal elements is present within the assemblage that may suggest the entire carcass was present on site although no evidence of butchery was noted on any of the identified pig remains.

Only two mandibles from subadult animals were able to provide tooth wear scores. A mandible was recovered from a late Iron Age pit (18) and a mandible from an enclosure ditch (275) of the same phase. No fusion ageing was available from any of the postcranial bones. The presence of mainly juvenile individuals is unsurprising as pigs are kept for meat and are able to breed regularly and in fairly large numbers allowing a young slaughter age.

Equid

A total of 7 equid remains were recovered from the late Iron Age phase of the assemblage. Articulating remains of left first, second and third phalanges and a single right first phalanx was recovered from the possible palisade trench (255). A single fragment of tibia was recovered from an enclosure ditch (245) and two fragments of femur, probably from the same bone, were recovered from a narrow enclosure ditch (131). No evidence of butchery was noted on any of the remains.

Dog

Three loose dog teeth were recovered from late Iron Age possible palisade trench (255). The teeth were a pair of canines and a lower premolar and probably derive from the same individual.

Red deer

A single fragment of red deer humerus was recovered from a late Iron Age enclosure ditch (131). The presence of this species within the assemblage suggests there is a suitable uncultivated habitat within the locality and red deer were occasionally hunted.

Micro-mammals

A total of 15 fragments of micro mammal remains were recovered from the sieved assemblage. Four fragments were identifiable further to species. A fragment identified as wood mouse was recovered from the late Iron Age possible palisade trench (255). A shrew humerus, a vole humerus and a field vole mandible were recovered from an early Roman enclosure ditch (134). The remaining micro mammal remains were recovered from the same features, but were unidentifiable further to species. The species identified within the assemblage are consistent with a semi-rural environment. The presence of these animals within the assemblage could be intrusive due to the burrowing nature of these species.

2.4 Discussion

The assemblage from Hockers Lane is predominantly from the late Iron Age phase of the site. The later phases of activity produced very small assemblages, which add very little to the interpretation.

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

Taxon	Late pre-Roman Iron Age	Early Roman	Early-middle Roman Phase 1	Unphased	Grand total
Cattle	51	7		9	67
Sheep/Goat	62	10	1	4	75
Pig	20	2		1	23
Equid	7				7
Dog	3				3
Red Deer	1				1
Large Mammal	192	49	1	13	255
Medium Mammal	28	18		1	47
Small Mammal	1				1
Unidentified	314	54	3	14	385
Grand Total	**679**	**140**	**5**	**42**	**866**

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

Taxon	Late Pre-Roman Iron Age	Early Roman	Unphased	Grand Total
Cattle	3			3
Sheep/Goat	80	1		81
Pig	4	2		6
Shrew		1		1
Wood Mouse	1			1
Field Vole		1		1
Vole		1		1
Large Mammal	11			11
Medium Mammal	240			240
Micro Mammal	3	8		11
Unidentified	297	11	3	311
Grand Total	**639**	**25**	**3**	**667**

Table 3: Hockers Lane - MNI of identified domestic species by phase

Taxon	Late pre-Roman Iron Age	Early Roman	Early-middle Roman Phase 1
Cattle	3	1	0
Sheep/Goat	8	1	1
Pig	2	1	0
Equid	1	0	0

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

Condition	Hand collected assemblage	Sieved assemblage
1	0%	0%
2	25%	22%
3	43%	12%
4	30%	65%
5	2%	1%
Total	**100%**	**100%**

3 THURNHAM VILLA

3.1 Species present and quantification

A total of 5356 (59223g) fragments of bone were recovered by hand during the excavations at Thurnham Villa. A further 3006 (2183g) fragments of bone were recovered from the sieved bulk samples.

Tables 5-8 summarise the number of identified species from the hand collected and sieved assemblages by phase. Table 8 summarises the number of identified fish taxa from both the hand collected and sieved assemblages. Only two of these were recovered from the hand collected assemblage and have been annotated within the table.

Cattle are the most abundant species within the assemblage. Closely followed by sheep/goat, pig, equid, red and roe deer and dog. Small numbers of domestic fowl, pigeon, passerines and waterfowl such as Brent goose, teal and woodcock are represented. A partially articulated tawny owl and two roe deer skeletons were recovered from the late Roman deposits of a well (11010) increasing the abundance of these species within the assemblage. Several wild species, aside from deer, are present in small numbers such as badger, hare, and rabbit. Two fragments identified as mole and small numbers of amphibians, house mouse, wood mouse, bank vole, field vole and shrew were recovered from the sieved assemblage.

The fish remains from the assemblage are very limited and were largely recovered from the sieved assemblage with only two fragments recovered by hand. The represented identified species are predominantly marine species comprising herring, flatfish and eel. The eel could derive from either fresh water or marine environments although freshwater/estuarine habitats are most likely.

Table 9 summarises the minimum number of individuals (MNI) of the main domestic species by phase. This suggests sheep/goat were the most predominant species during the late Iron Age and early Roman periods, then are maintained in similar levels to cattle throughout the middle Roman phases. In the late Roman phase sheep/goat are again slightly more predominant. Cattle are constantly maintained at fairly low levels throughout the different phases. Pig appears to be more prominent within the earlier phases of activity followed by a constant low level throughout the middle and late Roman phases.

Table 5: Thurnham Villa - Number of fragments of each taxon from the hand collected material from the prehistoric and Roman phases

Taxon	Middle Bronze Age	Late Iron Age	Early Roman	Early-Middle Roman Phase 1	Early Roman-Middle Roman Phase 2	Middle Roman Phase 1	Middle Roman Phase 2	Middle Roman Phase 1-2	Middle Roman Phase 1-Late Roman	Middle Roman Phase 2-Late Roman	Late Roman	Total
Cattle	2	48	146	19	1	41	57	10	6	29	66	425
Sheep/goat		57	157	16	2	26	24	5	3	16	34	340
Sheep		1	2									3
Goat											1	1
Pig		34	80	14	1	5	25	1		20	38	218
Equid		8	14	1		5	7	6	9	9	3	62
Dog			6			5	2			2	2	17
Fowl			4				1			1	1	7
Brent Goose							1					1
Duck			1									1
Teal			1									1
Woodcock			1				1					2
Pigeon							6					6
Owl										9		9
Songbirds											1	1
Bird		3	1				5			5	3	17
Red Deer	1	1	3	1		1				15	19	41
Roe Deer		1	3				1			64	2	71
Deer							1			2	1	4
Badger							2					2
Hare		1					1				1	3
Rabbit			1							1		2
Lagomorph				12								12
Large Mammal	1	76	519	79	5	603	208	30	82	138	352	2093
Medium Mammal		76	272	27	3	37	107	3		77	152	754
Small Mammal			3			1	1	1				6
Unidentified		198	271	62		14	85		17	129	103	879
Grand Total	**4**	**504**	**1485**	**231**	**12**	**738**	**535**	**56**	**117**	**517**	**779**	**4978**

Table 6: Thurnham Villa - Number of fragments of each taxon from the hand collected material from the late Iron Age, Roman and post-Roman phases

Taxon	Late Iron Age-Early Roman	Late Iron Age-Late Roman	Early Roman-Late Roman	Early Medieval	Post Medieval	Unphased	Total
Cattle	7	3	1	9	2	16	38
Sheep/Goat	10	7	2	5	2	23	49
Pig	2	3	2	7		7	21
Equid	1	1		2		2	6
Dog						1	1
Bird						1	1
Roe Deer		1					1
Rabbit					1		1
Large Mammal	8	10	1	59	6	20	104
Medium Mammal	8	13		11		19	51
Small Mammal	1						1
Unidentified	16	60	1	1		24	102
Grand Total	**53**	**98**	**7**	**94**	**11**	**113**	**376**

Table 7: Thurnham Villa - Number of fragments of each taxon from the sieved material, summarised by phase

Taxon	Middle Bronze Age	Late Pre-Roman Iron Age	Late Iron Age-Early Roman	Early Roman	Early-Middle Roman Phase 1	Middle Roman Phase 1	Middle Roman Phase 2	Middle Roman Phase 2-Late Roman	Late Roman	Early Roman-Late Roman	Post Medieval	Un-phased	Total
Cattle		2	1	9					5	2		2	21
Sheep/Goat		21		21	2	1	6		10			11	72
Pig		3		12			4	1	21	2		13	56
Equid				1									1
Dog				2					1	2			5
Fowl				2					2				4
Songbirds				1			1						2
Bird				6			1		3				10
Roe Deer									1				1
Hare												1	1
Rabbit										1			1
Mole									2				2
Amphibian		3											3
Vole				2				1	2				5
Field Vole									1			1	2
Shrew									1				1
Bank Vole				1					1				2
House Mouse				1									1

Taxon	Middle Bronze Age	Late Pre-Roman Iron Age	Late Iron Age-Early Roman	Early Roman	Early-Middle Roman Phase 1	Middle Roman Phase 1	Middle Roman Phase 2	Middle Roman Phase 2-Late Roman	Late Roman	Early Roman-Late Roman	Post Medieval	Un-phased	Total
Wood Mouse				7					5				12
Mouse				1			1		2				4
Large Mammal		7	1	25			3		8	1		3	48
Medium Mammal		11		46	2	1	13	2	38			12	125
Small Mammal		4		8			8		2			1	23
Micro Mammal				32			7	8	85	2			134
Unidentified	5	477	7	637	36	15	140	70	768	7	5	267	2434
Grand Total	**5**	**528**	**9**	**814**	**40**	**17**	**184**	**82**	**958**	**17**	**5**	**311**	**2970**

Table 8: Thurnham Villa - Number of identified fish bones, by taxa and phase

Taxon	Early Roman	Early-middle Roman Phase 1	Middle Roman Phase 2	Middle Roman Phase 2 to late Roman	Late Roman	Unphased	Total
Herring	1						1
Flatfish	3	1*		1*			5
Eel						1	1
Fish	25		4		2		31
Total	29	1	4	1	2	1	38

*From the hand collected assemblage, the remaining fragments were recovered from the sieved assemblage.

Table 9: Thurnham Villa - MNI of identified domestic species by phase

Taxon	Late Iron Age	Early Roman	Middle Roman Phase 1	Middle Roman Phase 2	Middle Roman Phase 2 - Late Roman	Late Roman
Cattle	3	6	2	3	2	3
Sheep/goat	8	14	2	3	2	4
Sheep	1	1	0	0	0	0
Goat	0	0	0	0	0	1
Pig	4	5	1	2	2	2
Equid	1	1	2	1	1	1

3.2 Preservation and alteration

Condition

Table 10 below summarises the condition of the bone from the hand-collected and sieved assemblage using the Lyman criteria (1996). As can be seen the assemblage is quite varied in condition. The overall condition of the assemblage for both hand-collected is around grades 2 and 3, generally in a good to moderate condition. The sieved assemblage is generally in a poorer condition averaging at grade 3.

Table 10: Thurnham Villa - Condition of the hand collected and sieved bone assemblages

Condition Grade (Lyman 1996)	Percentage of hand collected assemblage	Percentage of sieved assemblage
0	0%	
1	10%	1%
2	45%	19%
3	41%	64%
4	4%	16%
5	0%	0%
Total	100%	100%

Burning

A total of 100 fragments of burnt bone were recovered from the hand collected assemblage. A further 638 fragments were recovered from the sieved assemblage. 11% of the hand collected assemblage and 2 % of the sieved assemblage could be identified further to species, most fragments were only identifiable to size category or were unidentifiable. The burnt assemblage was scattered in fairly even amounts throughout the site, generally representing domestic waste. A highly fragmented partially burnt red deer antler beam was recovered from the late Roman corn drier (10340).

Butchery

A total of 120 fragments from the hand collected assemblage display evidence of butchery. A further 4 fragments from the sieved assemblage display similar evidence. The remains predominantly represent disarticulation and meat removal from the carcass. A sheep/goat horncore from middle Roman phase 2 gully (11240) and two cattle horncores from the middle Roman phase 2-late Roman well and associated silting (12370) and from a late Roman oven (20036) within the villa building display evidence of horn removal.

From the middle Roman phase 2 to late Roman phase, a fragment of antler from the well and associated silting (12370) has been sawn through the beam and subject to slight secondary reshaping and chamfering to the cut end. A fragment of antler from middle Roman phase 2-late Roman post occupation silts within the north-western end room (15290) of the aisled building (15000) has been sawn through the beam longitudinally and possibly drilled/hollowed through the centre.

Gnawing

A total of 190 fragments of bone from the hand collected, and a further 4 fragments from the sieved assemblage displayed evidence of gnawing. The numbers and species of gnawed bone reflect the general assemblage throughout all phases. The gnawing evidence noted is predominantly by carnivores with only 6 fragments from the hand collected assemblage displaying evidence of rodent gnawing. The gnawing evidence suggests that the bones were often left open to scavengers for a period of time either prior or after deposition.

3.3 Species descriptions

Cattle

Cattle are the most abundant species within the assemblage, as discussed earlier, and appear to have been maintained at a consistent level through out the site phases, although not necessarily as the predominant species.

Most skeletal elements are represented within the assemblage suggesting that the entire carcass was utilised on site. A total of 38 cattle bones from the hand collected assemblage displayed butchery evidence consistent with disarticulation and meat removal.

Cattle withers heights could be calculated from 5 metacarpals. From the early Roman phase enclosure ditch (10660) a metacarpal gave a withers height of 1.2m. A metacarpal from a middle Roman phase 2 ditch (11090) and a metacarpal from a secondary fill of a votive pit (10570) gave withers heights of 1.16m and 1.26m. Two metacarpals from a late Roman soil layer (12725) gave withers heights of 1.14m and 1.25m. The number of withers heights provides limited information although as the heights are generally similar it could be suggested that the breed of cattle retained does not differ greatly throughout the periods of occupation.

A single cattle metatarsal recovered from a posthole (15192) of the aisled building (15000) displayed an extension on the proximal articular surface with evidence of eburnation. This pathology has formed due to possible osteoarthritis or resultant of a trauma to the joint.

Two cattle teeth displayed abnormal wear. A cattle lower incisor recovered from the middle Roman phase 2 posthole (11047) from the 14 post building (11250) showed a v-shaped notch in the labial surface of the tooth. A cattle molar from the middle Roman phase 2-late Roman well and associated silting (12370) displayed extension and additional wear to a broken occlusion surface, suggesting a dental trauma.

A total of 12 mandibles were able to provide an age score. Table 11 summarises the age scorable mandibles by phase.

Table 11: Thurnham Villa - Age scorable cattle mandibles, summarised by phase

Phase	**1-8 months**	**18-30 months**	**30-36 months**	**Young Adult**	**Adult**	**Old Adult**	**Senile**	**Total**
Late pre-Roman Iron Age	1	1		1				3
Early Roman		1	1		1	1		4
Middle Roman P2	1							1
Middle Roman P1-2							1	1
Late Roman				1			1	2
Early medieval					1			1
Grand total	**2**	**2**	**1**	**2**	**2**	**1**	**2**	**12**

The fusion ageing generally reflects the information provided by the tooth wear scores. No evidence of foetal or neonatal remains were recovered, which could be due to preservational factors. The presence of infant mandibles (1-8 months) from the early Roman and middle Roman phase 2 would suggest that breeding is taking place on site or in the locality. The presence of predominantly adult, old adult and senile individuals would suggest that the maintenance of cattle was based on the emphasis of traction and milk production as well as utilisation for meat.

Sheep/goat

Sheep/goat are the next most abundant species within the assemblage after cattle. Three fragments from the late Iron Age enclosure ditch (12585) and an early Roman clay levelling deposit (11670) and pit (15270), were positively identified as sheep. A single horncore from a late Roman soil layer (12725) was positively identified as goat. No differentiation between species was noted within the remaining assemblage. Most skeletal elements are represented within the assemblage suggesting the entire carcass was present onsite for utilisation.

A total of 6 sheep/goat bones displayed evidence of butchery marks consistent with disarticulation and meat removal. A single sheep/goat horncore was recovered from a middle

Roman phase 2 drainage gully (11240) displaying cut marks around the base consistent with horn removal.

Sheep/goat withers height of 0.65m could be calculated from a single metatarsal recovered from the middle Roman Phase 2 drainage gully (11240).

A single sheep/goat tibia from middle Roman phase 1 ditch (12545) displayed a pathology of patches of newly woven bone of the surface of the shaft. A possible periostitis that can be caused through ossification of the periosteum through trauma or disease. A tooth from middle Roman phase 2-late Roman silts within the end room (15290) of the aisled building (15000) displayed abnormal wear of the occlusal surface of the molar, possibly a result of crowding of the teeth.

A total of 17 mandibles from the hand collected assemblage were able to provide an age score and are summarised in Table 12 by phase. The epiphyseal fusion evidence supports the data provided by the sheep/goat mandible age scores. The presence of very young individuals during the early Roman phase suggests that sheep/goat were being raised near or on site. The mandibles are predominantly from adult/ older adult individuals which would suggests that sheep/goat were raised with an emphasis on wool and milk production rather than just meat. This rule seems to be generally applicable to most phases of activity.

Table 12: Thurnham Villa - Age scorable sheep/goat mandibles, summarised by phase

Phase	**1-3 months**	**3-10 months**	**10-20 months**	**20-34 months**	**3-5 years**	**5-8 years**	**Total**
Late pre-Roman Iron Age						1	1
Early Roman	2		4		1	1	8
Middle Roman P1				1	2		3
Middle Roman P2					1		1
Middle Roman P1-2						1	1
Late Iron Age-Late Roman		1	1				2
Early medieval				1			1
Total	**2**	**1**	**5**	**2**	**4**	**3**	**17**

Pig

Pig remains are much less abundant within the assemblage than cattle or sheep/goat. Most skeletal elements are represented suggesting the entire carcass was on site. Loose teeth represent 38% of the total hand collected assemblage and only 8 bone fragments display evidence of butchery. Most significant of these was a pig skull recovered from the late Roman waterlogged silts infilling the well (11010) to the east of the 14 post building (11250) that displays evidence of

being split down the saggital plane for removal of the brain. The adjoining mandible from the same feature also displays cut marks consistent with head removal. The remaining pig assemblage displays butchery evidence consistent with disarticulation and meat removal.

The pig skull recovered from the well (11010), has a large patch of newly woven bone on the frontal bone. A possible periostitis caused by the ossification of the periosteum membrane surrounding the bone, through disease or trauma; such as the animal butting it's head or being struck.

Table 13 summarises the age scorable pig mandibles by phase. The majority of the remains are from young and sub adult individuals with single cases of adult animals occurring within the early Roman, late Roman and early medieval phases. The fusion evidence supports the data provided by the tooth wear age scores.

The presence of neonatal animals within the early Roman phase suggests that breeding was taking place on site. The predominance of young individuals within the assemblage is not usual. As pigs produce little in the form of secondary products, the animals are often bred regularly and slaughtered young for the provision of meat with the exception of a few adults would have been retained for breeding. As can be seen in Table 13, the numbers of individual pigs are much higher in the late Iron Age and early Roman phases and diminish to more modest numbers in the middle and late Roman phases suggesting less intensive pig husbandry. This could possibly be due to a reduction of available woodland grazing in favour of more cultivated land although the environmental evidence from the site suggests woodland regeneration rather than reduction in the later periods.

Table 13: Thurnham Villa - Age scorable pig mandibles,summarised by phase.

Phase	**Neonatal**	**Immature**	**Juvenile**	**Subadult**	**Adult**	**Total**
Late Pre-Roman Iron Age				1		1
Early Roman	1	1	1	2	1	6
Early-Middle Roman P1				1		1
Middle Roman P2				2		2
Middle Roman P2-Late Roman		1		2		3
Late Roman					1	1
Early Medieval		1			1	2
Total	**1**	**3**	**1**	**8**	**3**	**16**

Equid

A total of 62 equid remains were recovered from the hand collected assemblage. Equids are present in small numbers in most phases of activity. Most skeletal elements are represented within

the assemblage suggesting that the entire carcass was initially present on site. No evidence of butchery or pathology was noted on any of the bones.

Withers heights could be calculated for equids from two bones. A metatarsal from a probable late Iron Age soil layer (15329) gave a withers height of 1.28m and a metatarsal from the silting layer over an early Roman soil terrace and surface (11640) gave a withers height 1.28m. Both measurements indicated an animal of pony size rather than horse.

A total of 5 teeth were able to provide age wear scores. A single tooth from an animal aged 6.5-9 years was recovered from the late Iron Age- early Roman soil horizon (20360) sealed by the construction of the stone villa building (20510). Three teeth from the early Roman proto villa rear boundary ditch (20400) were from an animal aged between 8.5-14 years old. A single tooth from an animal aged between 8.25-10.25 years was recovered from middle Roman phase2-late Roman well and associated silts (12370). The epiphyseal fusion ageing provides additional data to the tooth wear scores. A femur from an animal aged below 3 years was recovered from late Iron Age/early Roman tree hole (15199). A radius from an animal aged below 3.5 years was recovered from middle Roman phase 2 votive pit (10570). A femur from the middle Roman phase 1-late Roman layer group (11650) was from an animal aged below 3 years of age. The presence of these young animals, below 3 years, would suggest that equids were being bred nearby. Equids would have been maintained primarily for transport and traction.

Dog

A total of 18 fragments of dog remains were recovered from the hand collected assemblage and 5 fragments from the sieved assemblage. All of the remains were recovered from the Roman phases. The majority of the dog remains are solitary finds from a range of contexts across the site. The fill of a middle Roman phase 1 ditch (12595) contained 5 bones from the right side of a single individual that are skeletally mature and likely to reflect a disturbed burial. From the middle Roman phase 2, two fragments were recovered from the votive pit (10570) and ditch (11090) associated with the 14 post building (11250). All of the dog remains appear to be from skeletally mature individuals. No evidence of butchery or pathology was noted on any of the bones. Dogs would have been present on site as scavengers, pets and very likely as working animals guarding, hunting and herding.

Birds

The bird remains represented within the assemblage include both domestic fowl and wild fowl. A total of 7 fragments of domestic fowl remains were recovered from the hand collected assemblage with 4 additional fragments retrieved from the sieved assemblage. The domestic fowl remains are

only present within the Roman phases. No evidence of butchery or pathology was noted on any of the bones. Domestic fowl would have been retained as a ready source of meat, eggs and feathers.

There are a small number of wild birds within the hand collected assemblage. Two fragments identified as passerines were recovered from the sieved assemblages from the early Roman and middle Roman phase 2 assemblages. Most of the wild birds represent edible waders and waterfowl such as woodcock, Brent goose, duck and teal. The duck was recovered from the early Roman proto-villa floor surface levels (20350) with the teal and woodcock remains recovered from the associated rear boundary ditch (20400). The Brent goose was recovered from the middle Roman Phase 2 oven (15280) within the aisled building (15000). The presence of these species suggests that there was a water source in the locality allowing for these birds to be readily hunted.

The remains of a partially complete large tawny owl skeleton, possible female, was recovered from the late Roman waterlogged silts of a well (11010). A total of 6 fragments of pigeon remains, possibly from the same individual, were recovered from a middle Roman phase 2 layer within the room (15290) at the end of the aisled building (15000).

Deer

A total of 117 fragments identified as deer were recovered from the hand collected assemblage and a single roe deer tooth was recovered from the sieved assemblage from a late Roman silting layer (20000) within the villa building. Roe deer accounts for 62% of the total hand-collected deer remains. The majority of the roe deer remains derive from a complete adult skeleton and a partial juvenile skeleton recovered from the late Roman waterlogged fills of the well (11010) located to the east the 14 post building (11250). This is discussed in more detail below. The remaining fragments are all isolated, consisting primarily of metapodials. No evidence of butchery was noted on the remains.

Red deer are present within most phases of activity, 63% of this species total being represented by antler fragments. Red deer antler was recovered from the late Roman infills of the well (11010) and a soil layer (10528) infilling the hollow to the east of this and likely to be of the same phase. Also from the late Roman phase, antler was recovered from the corn drier (10340), layer (20000), oven (20036) within the villa building and from the silting layer sealing the cobbled surfaces around the well (12370) associated with the aisled building (15000). A red deer tibia, metatarsal and first phalanx were also recovered from the silts sealing the well and surfaces (12370) and may have originated from the same animal. Several postcranial bones are present within the assemblage occurring as isolated fragments.

Wild species

Several wild species are represented within the assemblage as one or two fragments. A badger mandible and a tooth were recovered from the drainage gully (11240) associated with the 14 post building (11250) during the middle Roman phase 2.

Three fragments of hare remains were recovered from the hand collected assemblage. A radius was recovered from a late Iron Age ditch (12585), a scapula from a middle Roman phase 2 layer within the aisled building room (15290) and a tibia from late Roman layer (20000) within the villa building. The presence of the remains suggests that hare were occasionally hunted throughout several phases of activity.

A total of 3 bones identified as rabbit were recovered from the hand collected assemblage. A single rabbit tooth was recovered from a relatively insecure soil layer context (15412). A rabbit tibia was recovered from the surface levels within the early Roman proto-villa (20350) and rabbit phalanx was recovered from the late Roman infilling of the well (11010) to the east of the 14 post building (11250). As the introduction of rabbit into Britain is generally accepted as after the Norman Conquest these bones are probably intrusive. This seems acceptable for the layer contexts as each of these was relatively close to the surface level and could easily have been impacted upon or disturbed by animal burrowing and more recent plough mixing. However, the bone recovered from the well is slightly more problematic and it may be possible that this is hare rather than rabbit. Additionally a rabbit tibia was recovered from a post medieval field boundary ditch (11770).

From the sieved assemblage two fragments identified as mole were recovered from the late Roman phase, from layers (20000) and (15352). Due to the burrowing nature of these animals, the presence of these species within the assemblage are possible intrusive.

Micro-mammals and amphibians

A total 161 micro mammal fragments were recovered from the sieved assemblage of which 17 % could be identified to taxa. The species represented are field vole, bank vole, shrew, house mouse and wood mouse. The micro mammal species are predominantly recovered from the early Roman and the late Roman phases. A large number of the micro mammal remains (58%) were recovered from the late Roman silting horizons sealing the metalworking deposits within a room of the villa (20000). During this phase occupation of the villa appears to have undergone a fundamental change and may have been sporadic or seasonal and possibly no longer functioned as a primary high status domestic dwelling. It is possible that owl pellets may have added to the micro

mammal assemblage in a partially abandoned building. The species represented are typical of a semi rural settlement site.

A total of three amphibian bones were recovered from late Iron Age layer (15329). Little further information can be gained save the presence of the species.

Fish

A total of 36 fragments of fish remains were recovered from the sieved assemblage with only 2 fragments recovered from the hand collected items. All, save one, of the fish remains were recovered from the Roman phases and predominantly from the early Roman phase. A single fragment of eel was recovered from an unphased layer (15201). Overall 18% of the assemblage could be identified to species with herring, flatfish and eel all represented. Herring and flatfish are marine species and their presence on site demonstrates trading links with the coast. Eel can be either fresh water or marine fish. although a freshwater or estuarine habitat seems most likely.

3.4 Features of particular interest

Middle Roman phase 2-late Roman Well (11010)

A large and well-preserved assemblage of animal bone was recovered from the deposits filling a well (11010) associated with the 14 post building (11250). This was constructed in the middle Roman period, although the excavated waterlogged in-fills date to the late Roman phase. The assemblage includes:

- A complete adult male roe deer skeleton
- A partially complete juvenile roe deer skeleton, less than 12 months of age.
- A partially complete female tawny owl Skeleton.
- A fairly complete red deer antler with some skull attached and 9 additional fragments of red deer antler.
- Single red deer first phalanx
- A cattle tibia, patella, scapula and two loose teeth.
- A sheep/goat tooth
- The right side of a large male pig skull that had been split. The mandible also displayed head removal cut marks.

- A loose pig tooth, a fragment of mandible and an ulna.
- A equid tooth and scapula
- A hare first phalanx

Some of this assemblage could be considered as either domestic waste or incidental inclusions, incorporated into the well fills during the later stages of its infilling. However, consideration of the more complete remains within the context, and the unusual nature of the well fill sequence, suggest that the complete or part complete portions of wild and domestic animals could reflect a ritual use of the well. The inclusion of the roe deer and the tawny owl remains is an interesting feature. Such species and complete remains are not typical of waste or accidental inclusions and strongly support a different form of activity that led to their introduction into the well. It is possible to entertain the theory that these remains are large 'pit-fall' victims although this seems very unlikely. The association with a split pig skull and a complete red deer antler and the substantial rubble backfill that buried the animals strongly suggests that these items were purposefully introduced to the well.

Examples of wells from the Roman period with partially articulated and complete animal remains are well known. Within CTRL Section 1, from the Pepper hill cemetery site, a set of horse teeth thought to belong to a poorly preserved skull was recovered from the sieved samples of the Roman well (Kitch, 2006).

3.5 Discussion

The assemblage spans several phases of activity. However, the main phases of activity in the terms of the animal bone assemblage are the late Iron Age and Roman phases, with smaller assemblages from the Middle Bronze Age, medieval and post-medieval phases. The assemblages from the Middle Bronze Age and medieval period provide little information save the presence of particular species.

Throughout the late Iron Age and Roman phases, the animal bone assemblage suggests that Thurnham Villa was a minor producer site, raising animals for utilisation on site. The faunal assemblages from the main phases suggest that changes in husbandry practice took place throughout occupation of the site. In the late Iron Age and early Roman phases sheep/goat are the dominant species in the husbandry strategy. They are retained in more balanced numbers with cattle during the middle and late Roman phases. Pigs are most abundant in the late Iron Age and early Roman being retained in much smaller numbers in the middle and late Roman phases.

The age patterns from each of the phases suggest that there was a mixed husbandry strategy. Cattle were maintained for traction and dairy as well as meat, leather and horn. Sheep/goat were retained for wool and milk as well as meat. Pigs were maintained for meat production. Equids and dogs are maintained in small numbers throughout most phases of the site. Equids would have been retained for traction and transport. Dogs would have been present as pets, scavengers or working animals used for guarding, hunting and herding. Domestic fowl would have been retained as a ready source of meat, eggs and feathers.

Deer appear to have been occasionally hunted, and antler was collected for working in most phases of the site's occupation. The presence of these species within the assemblage suggests that there was a suitable uncultivated habitat within reach of the site. Wild birds appear to have been exploited as a food source, especially in the early Roman phase, suggesting either the presence of a suitable wetland habitat in the locality, or local trade links.

Micro-mammals are present within the assemblage, primarily within the late Roman silting deposits sealing the 3rd century metalworking site in the main villa building (20000). It is possible that the number of these micro-mammals has been increased through owl predation.

Small numbers of fish from the Roman phases suggest that there is an element of trade with the coast, which provides marine fish to the villa.

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