Excavation at Bartlemas Chapel, BC11: September-November 2011
Report on the Animal Bone
Julie Hamilton with volunteers from the East Oxford Archaeology Project, in particular: Margot Abbot, Anthea Boylston, Julian Dourado, Pam England, Jane Griffin, Anne Grim, Meg Hebbert, Jenni Laird, Tim Lee, Brian Leigh, Denise Leigh, Christopher Lewis, Patricia Marsh, Gillian Mellor, Leigh Mellor, Steve Nicholson, Jane Parkinson, David Pinches, Phil Price, Leon Quelch, Rosamund Renow, Helen Tanqueray, Angela Wenham, Leslie Wilkinson and Daniel Wright

Around 3000 fragments of animal bone were hand-collected during the excavation. These were identified, sorted, counted and weighed by volunteers in a series of workshops.

Volunteers at work

We also recorded details of alterations such as butchery, burning and gnawing by dogs, which could tell us something about what had happened to these fragments after the death of the animal. Time constraints meant that we did not record information on animal size or age consistently, though this could give us some interesting insights into the way people managed their animals if we are able to do so in the future.

What animals were present, and in what proportions?
Overall, less than a quarter of the bone fragments were identified to species. There were many small pieces of bone which it was not possible to identify with certainty. Some of these had been broken while still fresh, perhaps to extract marrow and/or to boil to enrich soups and stews, and some had been broken after discard while they were in the ground, by trampling or other disturbance, such as being dug up and redeposited. Based on the identified bones, the species we found were **cattle, sheep** (some of these might have been goat, but there were no definite goats so all are referred to as sheep), **pig, equid (probably horse)**, **dog, cat** (19th century only) and **deer**. There were a few bird bones: these were mostly domestic fowl, with goose and pigeon also identified.

The majority of the fragments were from sheep, followed by cattle and pig (and in Trench 3 there was also a lot of horse). Elements such as ribs and skulls seem somewhat under-represented, so it is likely that this is not the waste from slaughter of the animals, but from carcass pieces brought to the site for further butchery and consumption. There were **butchery marks on 23% of the cattle bones, 13% of the sheep bones and 4% of the pig bones**, many from dividing the carcass (chopping and sawing) and some from removing meat from the bones (chop- and cut-marks). **Butchery marks were also seen on 18% of the horse bones in Trench 3** – it is possible that horsemeat was fed to dogs, but perhaps it also entered the human food chain! There were only 9 deer bones altogether, and 2 of these had butchery marks (22%). Therefore the bones mainly represent waste from processing and consuming domestic animals.
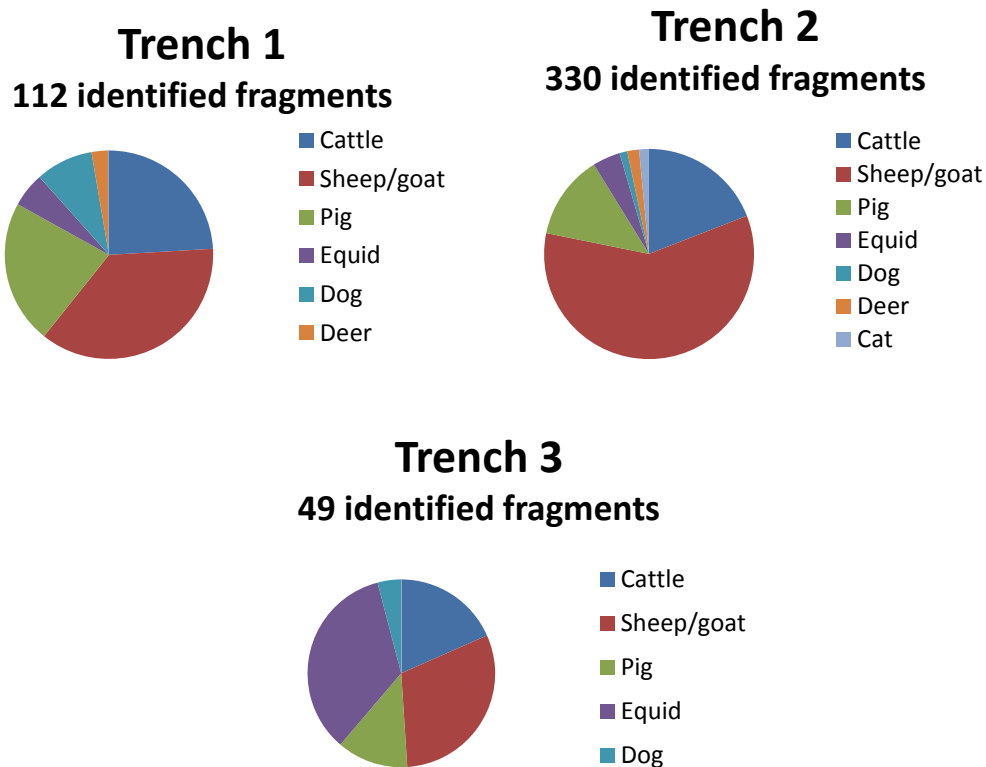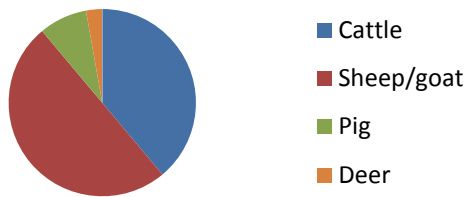
Trench 1
112 identified fragments

Trench 2
330 identified fragments

Legend (Trench 1): Cattle, Sheep/goat, Pig, Equid, Dog, Deer

Legend (Trench 2): Cattle, Sheep/goat, Pig, Equid, Dog, Deer, Cat

Trench 3
49 identified fragments

Legend (Trench 3): Cattle, Sheep/goat, Pig, Equid, Dog

Fig.1 Numbers of identified fragments (NISP) in Trenches 1-3

The differences between the trenches are partly because they include different amounts of bone from different periods – for instance, the equid (horse) bone in Trench 3 is all from the topsoil layers dating to the 18th/19th century, including the period when the site had become part of a farm. In Trench 2 we can compare the medieval period with the 19th century, and it looks as if there was a higher proportion of cattle compared to sheep in the medieval period. This might reflect a difference in the meat eaten at the two periods, but it could also be because the larger, more robust bones of cattle have survived better over the centuries. In fact, if we look at the weight of identified bones (which, other things being equal, probably is a better guide to the amount of meat provided by each species), cattle and sheep are providing the great majority of the meat at each period, and in similar quantities, with only a little pork and venison. The difference between the two methods of counting is partly because there are more, small - but still identifiable - fragments of sheep in the 19th century layers - perhaps those from the medieval layers simply haven't survived so well.
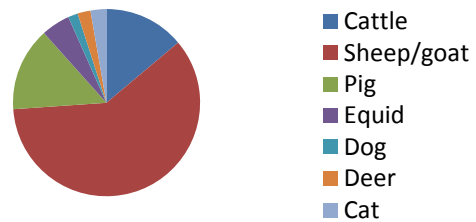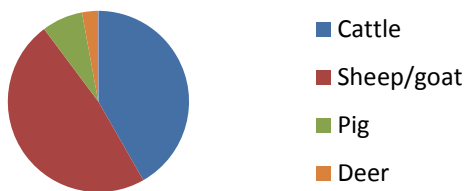
BC11: Context 1015

Trench 2 medieval
36 identified fragments

- Cattle
- Sheep/goat
- Pig
- Deer

Trench 2 19th century
180 identified fragments

- Cattle
- Sheep/goat
- Pig
- Equid
- Dog
- Deer
- Cat

Trench 2 medieval
381 g identified bone

- Cattle
- Sheep/goat
- Pig
- Deer

Trench 2 19th century
1705 g identified bone

- Cattle
- Sheep/goat
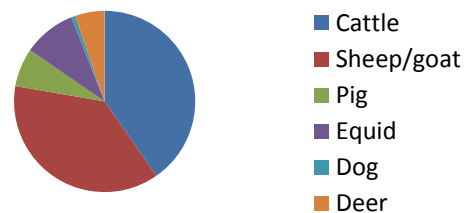- Pig
- Equid
- Dog
- Deer

Fig.2 Weight of identified fragments (g) in Trenches 1-3

Bone preservation and distribution
As the previous discussion shows, it is impossible to interpret the bone assemblage without considering how well the bone is preserved, its distribution and the possible biases in preservation and recovery. This could also tell us something about how people were dealing with waste, as well as how they were preparing their meat (as mentioned above).

One way of measuring preservation is to score each piece of bone for surface preservation. We used a scale of 1-5, where "1" meant that 20% or less of the surface was well-preserved, and "5" meant that 80% or more of the surface was well preserved. Overall, surface condition was generally scored at between 4.0 and 4.5 (averaged over each context), so we should have been able to see surface alterations such as butchery or animal gnawing quite consistently. The relatively low percentage identified could be explained by the fragmentation of the bone – although it is likely that most of, say, the pieces of large long bones came from cattle, unless there is a distinct, diagnostic feature on the fragment it is not possible to be sure that an individual piece cattle rather than horse or red deer.

Another measure of preservation, fragment size, was summarised for each species or context by dividing the weight of bone by the number of fragments, giving an average fragment weight. In Trench 2 it was possible to compare the sizes of fragments from the medieval and 19th-century contexts.
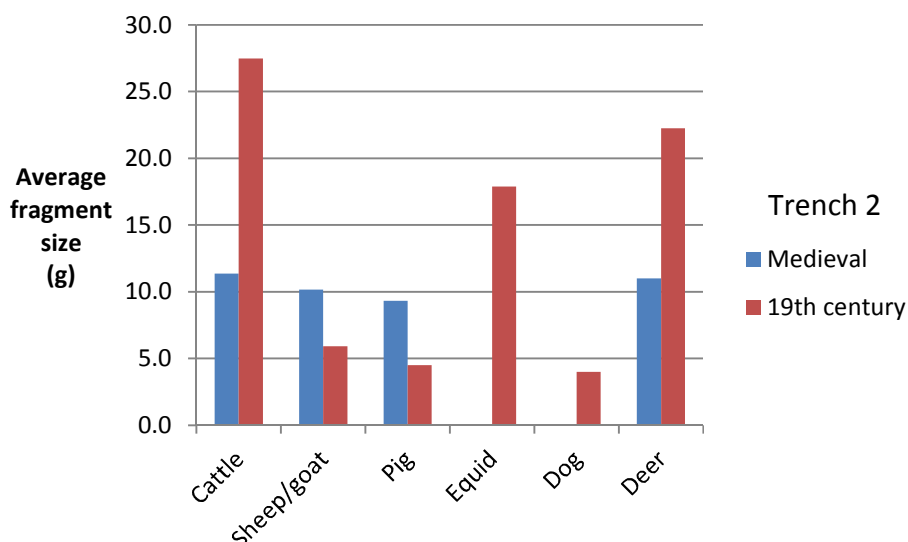
Fig.3 Average fragment size (g) in medieval and 19th-century contexts in Trench 2

It's clear from the diagram of fragment sizes that in the 19th-century bone, fragment size is much larger for the large animals than the small ones. Perhaps the medieval bone also looked like this originally, with subsequent disturbance leading to breakup of the larger bones, although it's also possible that in the earlier period large bones were more broken up before discard, to extract the marrow and/or to boil for soups and stews.

Few of the identified bone fragments (10 altogether, 2%) showed signs of burning, and these were almost all from the uppermost layers. More of the unidentified fragments were burnt (12%) – maybe because burnt fragments are harder to identify – again mostly from the upper layers, particularly the digger layers in Trench 1. In this case it seems likely that burning is generally related to rubbish disposal rather than cooking, as there is no obvious patterning by species or skeletal element, either for the older or the more recent bone.

Marks of dog gnawing were seen on 10% of fragments overall. There was some variation between contexts, but no clear pattern between medieval/post-medieval layers or different context types. Gnawing marks were commoner on identified fragments than unidentified ones – this may have been because we looked more carefully and they were easier to see, or because smaller fragments may have been swallowed and digested by dogs. (We did find a few fragments which showed signs of having been through a dog). Among the identified bones, gnawing marks were commoner on the bones of the larger species than the smaller ones, which probably reflected better survival of the larger pieces. It seems that quite a few bones had been fed to and/or scavenged by dogs, which implies that all food waste was not instantly tidied away and deposited in sealed contexts, but was available to dogs and other scavengers before being buried.

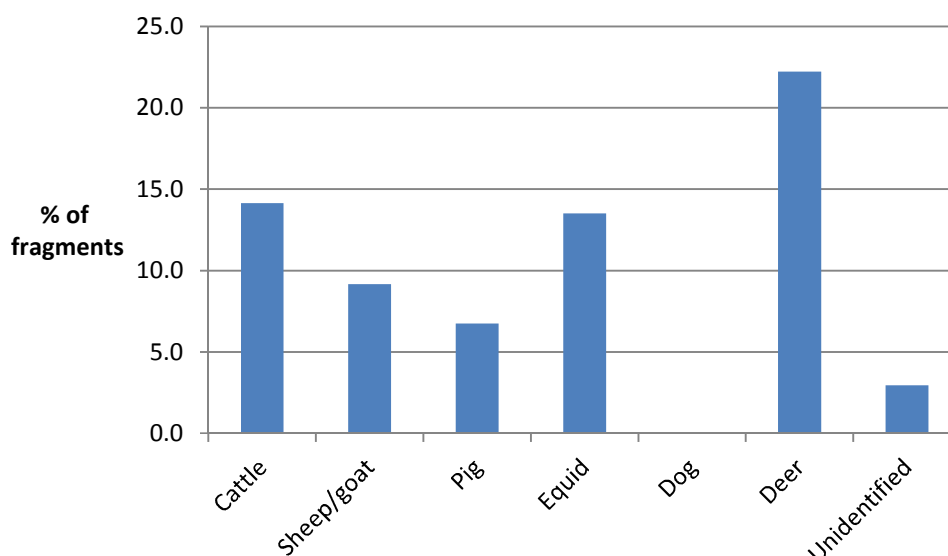**BC11 Trench 1: Context 1026, dog skull and cattle bones in charnel pit**

Gnawing

Fig.4 Percentage of fragments with marks from gnawing by dogs

There are several hints here that smaller pieces of bone have a greater tendency to disappear from the archaeological record, which suggests that we should be cautious about estimating the relative proportions of the different species: we are likely to underestimate the amount of sheep and pig compared to cattle.

Conclusions

Species present were cattle, sheep, pig, horse, dog, deer (red deer where identified) and cat. Of these, cat was only present in the 19th-century layers, and horse mainly in the uppermost layers, particularly of Trench 3.

Bone preservation was generally good. There was some variation between different contexts and periods, but it was difficult to see clear patterns. This is partly because of disturbance at various periods, which meant that some bone had been disturbed and redeposited, and partly because not all contexts were closely datable – they were analysed in broad groups (see summary table). It seems that larger pieces of bone survived better than small pieces, so we should keep in mind that we are likely to underestimate the proportions of the smaller species present, sheep and pig, compared to the larger species, cattle and horse.

The bone seems generally to have been waste from butchery and consumption. Butchery marks were common, particularly on larger bones, and originated both from carcase division and meat removal. Bone from the earlier, medieval period may have been more intensively processed – broken up for marrow extraction and perhaps for boiling in soups and stews. Marks of dog gnawing were common, suggesting that bone was sometimes accessible to scavengers for a while after discard.

In terms of meat consumed, mutton and beef were roughly equal, with a little pork and even less venison. Considering that sheep and pig bone is likely to be less well preserved, it may be that more mutton than beef was being consumed, and more pork than at first appears. Venison was a high-status food in medieval times so it is interesting that it appears here, albeit in small quantities. Most of the horse bones come from the latest layers, and while they show traces of both butchery and dog gnawing, it is not certain whether they represent part of the human diet or not.

	Digger Layers	Charnel pit	Burial	Tr 1 Other	Trench 1 Total	Tr2 11/12th C +Medieval	Tr 2 16-18th C	Tr 2 19th C	Tr 2 Other	Tr 2 Graves	Trench 2 Total	Tr 3 11/12 C + Medieval	Tr 3 18/19 th C	Trench 3 Total	Grand Total
Cattle	11	3	0	13	27	14	2	25	18	4	63	3	6	9	99
Sheep/goat	16	9	2	14	41	18	6	108	49	14	195	3	12	15	251
Pig	6	10	0	9	25	3	1	26	12	1	43	2	4	6	74
Equid	4	1	0	1	6	0	0	9	5	0	14	0	17	17	37
Dog	8	0	0	2	10	0	0	3	1	0	4	0	2	2	16
Deer	2	1	0	0	3	1	0	4	1	0	6	0	0	0	9
Cat	0	0	0	0	0	0	0	5	0	0	5	0	0	0	5
Total	47	24	2	39	112	36	9	180	86	19	330	8	41	49	491
Large mammal	0	1	0	4	5	8	0	29	27	2	66	1	0	1	72
Medium mammal	5	7	0	15	27	8	4	33	37	9	91	0	1	1	119
Small Mammal	0	0	0	1	1	0	0	6	2	0	8	0	0	0	9
Total	5	8	0	20	33	16	4	68	66	11	165	1	1	2	200
Bird	6	8	0	5	19	7	0	13	0	3	23	0	4	4	46
Unidentified	192	27	10	121	350	216	49	914	321	76	1576	63	215	278	2204
Total Fragments	250	67	12	185	514	275	62	1175	473	109	2094	72	261	333	2941

Table 1: Summary of fragment numbers (Number of Identified Specimens, NISP)

	Digger Layers	Charnel pit	Burial	Tr 1 Other	Trench 1 Total	Tr2 11/12th C + Medieval	Tr 2 16-18th C	Tr 2 19th C	Tr 2 Other	Tr 2 Graves	Trench 2 Total	Tr 3 11/12th C + Medieval	Tr 3 18/19th C	Trench 3 Total	Grand Total
Cattle	220	165	0	232	**617**	159	61	687	448	95	**1450**	335	125	**460**	**2527**
Sheep/goat	110	120	7	95	**332**	183	16	638	401	99	**1337**	21	94	**115**	**1784**
Pig	52	35	0	25	**112**	28	2	117	124	4	**275**	10	24	**34**	**421**
Equid	114	91	0	213	**418**	0	0	161	157	0	**318**	0	436	**436**	**1172**
Dog	51	0	0	270	**321**	0	0	12	7	0	**19**	0	10	**10**	**350**
Deer	50	173	0	0	**223**	11	0	89	9	0	**109**	0	0	**0**	**332**
Cat	0	0	0	0	**0**	0	0	1	0	0	**1**	0	0	**0**	**1**
Total	**597**	**584**	**7**	**835**	**2023**	**381**	**79**	**1705**	**1146**	**198**	**3509**	**366**	**689**	**1055**	**6587**
Large mammal	0	19	0	319	**338**	126	0	628	172	33	**959**	25	0	**25**	**1322**
Medium mammal	50	18	0	76	**144**	25	7	172	189	72	**465**	0	0	**0**	**609**
Small Mammal	0	0	0	1	**1**	0	0	65	2	0	**67**	0	0	**0**	**68**
Total	**50**	**37**	**0**	**396**	**483**	**151**	**7**	**865**	**363**	**105**	**1491**	**25**	**0**	**25**	**1999**
Bird	18	10	0	11	**39**	10	0	13	0	3	**26**	0	6	**6**	**71**
Unidentified	622	15	10	244	**891**	574	119	2564	968	226	**4451**	94	686	**780**	**6122**
Total Weight	**1287**	**646**	**17**	**1486**	**3436**	**1116**	**205**	**5147**	**2477**	**532**	**9477**	**485**	**1381**	**1866**	**14779**

Table 2: Summary of fragment weights (g)