

Livestock Remains from Four Medieval Sites in Yorkshire

By M. L. RYDER

THE purpose of this article is to summarize and compare the skeletal remains of livestock from some different medieval sites in Yorkshire. Two of these, Kirkstall Abbey and Pontefract Priory, are similar sites for comparison; the other two, York, a city, and Wharram Percy, a village, provide widely differing contrasts. In fact there were no striking differences between the sites in the animal remains found.

LOCATION OF THE BONE FINDS

Kirkstall Abbey, Leeds, was a Cistercian monastery which in the excavations of 1956-9 yielded bones from a large accumulation that probably began to form about the middle of the fifteenth century, and which may have been added to until the dissolution of the monastery in 1540.¹

Pontefract Priory was a Cluniac monastery, the exact site of which had been lost until the waste land beneath which the ruins lie was levelled in 1932. The present article covers the animal remains found from 1957 to 1959 in the annual excavations led by Mr C. V. Bellamy. The community at Pontefract was always a small one, and the bones, numbering about 300, came from all over the site, no accumulation as at Kirkstall having yet been found. A number of human bones were found among the animal remains indicating disturbance, and although there were monastic 'finds' in the superficial ('plus') level, no conclusions could be drawn from the bones in this level because it was likely that many of them were modern.

The bones of the York collection came from

an excavation in Petergate led by Mr L. P. Wenham in 1957 and 1958. These included more complete bones than found at Kirkstall and Pontefract, but they could be dated only as being between the eleventh and fourteenth centuries. Other finds were a concentration of horn cores that had been almost certainly associated with a horner's workshop, and two accumulations of shells. In addition, there were the remains of three horse skeletons of eleventh-twelfth-century date.

Wharram Percy was a medieval village on the Yorkshire Wolds six miles south of Malton, which became deserted about 1500. The bones discussed here, several thousand in number, came from the annual excavations of 1953-9 led by Mr J. G. Hurst. They came from all parts of the site, no particular accumulation having been found; the bones were on the whole fragmentary, but they were stratified to the thirteenth, fourteenth, and fifteenth centuries.

THE SPECIES FOUND

Most of the bones from all the sites were from the food animals: pig, ox, and sheep. Most bones from sheep cannot easily be distinguished from those of the goat, but the only certain finds from goat were a skull from Kirkstall and a few horn cores from the other sites, and it is likely that many more sheep than goats were kept. Therefore all the other bones that could have been from sheep or goats were assumed to be from sheep. There were a few horse bones from each site, and these were usually in groups indicating burial of the carcase. Bones from the domestic birds,

¹ The remains found up to 1957 were discussed by M. L. Ryder, *A.H.R.*, VII, 1959, pp. 1-5; those of 1958 and 1959 were described by the author in the annual excavation reports published by the Thoresby Society.

goose and fowl, were common on all sites except York. It is noteworthy that there were few remains of duck.

Red and fallow deer bones were found on all the sites, and roe deer remains on all sites except Pontefract. The monastic sites had more deer and wildfowl than the other sites. The only deer remains at York were antlers that are likely to have come from the horner's workshop, and not from food remains. Hardly any remains of wildfowl were found at York and Wharram.

Rabbit and hare bones were found on all sites except York. Other remains were dog, cat, black rat, mouse, and amphibian bones that could have come from either frogs or toads. All sites had fish bones, mainly of cod size, but some smaller bones that were probably from fresh-water fish. Finally, all sites had molluscan shells; oysters were the most common, even at Wharram Percy isolated on the wolds, and all sites except Kirkstall had edible land snails. However, the intention in this article is to discuss the remains from farm animals.

RELATIVE NUMBERS OF THE ANIMALS

It will be evident from the above that the wealthy monastic sites had the greatest variety of food remains, including more from wild animals and birds. The urban nature of York is reflected in the smaller variety of remains from wild animals, although it had the greatest variety of shell-fish.

Wharram Percy was the only site on which it was possible to make counts from different areas and at different levels. The different areas were the cellar of the manor house, some peasant houses from which the bones were stratified to the thirteenth, fourteenth, and fifteenth centuries, and House 10 stratified into seven levels from the late thirteenth century to the early sixteenth century, each level probably corresponding to the life of a house on the site. Counts showed no marked differences between the different areas, and no obvious trends with time.

¹ R. Trow-Smith, *A History of British Livestock Husbandry to 1700*, 1957, p. 221; A. Savine, *English Monasteries on the Eve of the Dissolution*, 1909, pp. 193-7.

From Table I it will be seen that only at Kirkstall was the proportion of ox bones as high as 90 per cent, with only 5 per cent sheep.

TABLE I
PERCENTAGE OF BONES FROM THE DIFFERENT SITES

	Ox	Sheep	Pig	Deer
Kirkstall	90	5	3	2
Pontefract	30	45	20	5
York	60	30	10	negligible
Wharram	30	60	8	2

York had 60 per cent ox and 30 per cent sheep; and whereas Pontefract, like Wharram, had 30 per cent ox, the relatively high proportion of pig bones (20 per cent) at Pontefract had probably reduced the ox percentage, and reduced the sheep proportion to 45 per cent. Nevertheless Wharram apparently had the greatest proportion of sheep bones.

Although it is true that the numbers of the bones from food animals indicate the number of animals eaten rather than the number kept, this high proportion of sheep bones found at Wharram is in keeping with the expected farming pattern of the area. It is possible that on a village site the animals were eaten in roughly the same proportions as those in which they were kept. A striking feature about Wharram was the relatively large proportion of horse bones compared with other sites. The proportions ranged from 2 per cent to 20 per cent in the different levels counted. The horse bones were omitted from Table I in order to make comparisons with the other sites. It is possible that the number of horse bones was artificially increased at Wharram because they came from complete skeletons. Even if this happened, Wharram would still seem to have had the most horses.

An explanation of the high proportion of ox bones at Kirkstall might be found in a comparison with Fountains Abbey. Mr Trow-Smith refers to Savine who stated that at the dissolution, Fountains Abbey had 2,356 horned cattle, but only 1,326 sheep.¹ It is

usual to keep more sheep than cattle, and Mr Trow-Smith thinks that Fountains Abbey must have been in a big way of business, as a breeder of beef and dairy cattle. Possibly Kirkstall Abbey, too, was in a similar position.

AGES AT WHICH THE ANIMALS HAD BEEN KILLED

Any bones lacking epiphyses (ends) indicate young animals. In addition, age is estimated more accurately from the stage of development of the dentition in complete jaws, and the degree of wear and the condition of the roots of individual teeth.

Most pigs on all the sites were killed at about the age of eighteen months. Hardly any remains were found from pigs older than this, but a few were found from young ones. Most cattle and sheep were at least two years old when killed, and cattle were killed at greater ages up to at least ten years. At Kirkstall and York few cattle and sheep were killed under two years of age, whereas at Pontefract and Wharram a fair proportion were killed under two years.

A detailed analysis of the age of killing of the remains in the House 10 area at Wharram was made for each level, but there did not appear to be any change in age of killing over the centuries. The mean percentage killed at each age over the whole period is shown in Table II. These findings apparently do not support Mr Trow-Smith's contention that sheep were kept to a relatively great age in order to obtain as many clips of wool from them as possible.

TABLE II
MEAN PERCENTAGES KILLED AT DIFFERENT AGES
(Wharram Percy House 10)

	Under 2	2 years	2 plus	5 years	5 plus	10 years
Sheep	30	35	39	12	3	—
Cattle	27	25	34	19	4	5

There was a wide range of age among the horses' teeth found at Wharram, from young to very old, presumably indicating that they had died a natural death. Some horse molars

were worn literally to the roots, and in one, wear had exposed the pulp cavity.

THE TYPE OF LIVESTOCK KEPT

On the whole most bones were from smaller animals than those of today, the bones being particularly more slender. The measurements it was possible to make are recorded in the original reports, and it seems that the animals at Wharram were smaller than those at other sites.

There were sufficient ox bones from Kirkstall for a study of the size of the animals to be made. The widths of the upper and lower end of the metapodial bones were measured and the results plotted in the form of a frequency diagram. There was a wide range in the measurements, but three peaks could be distinguished. The peak among the broad widths probably indicated bones from bulls, and that among the narrow widths probably indicated bones from bullocks, i.e. castrated males. One would expect more males than females to have been eaten, but the bullocks were probably not just beef cattle. The great age of some of the animals and the large size of many of the bones suggested draught oxen. Many of the ox ankle bones from Kirkstall were unusual in having wide lower ends, and a few like this were found at Wharram. It may be that the oxen had large feet.

Not a single ox horn core was found at Kirkstall, and I thought at first that the cattle must have been hornless. But when the accumulation of ox horn cores was found at York, it suggested the alternative that the horns had been removed and sent to a horner.

There were nearly two hundred cattle horn cores from York, most of which had moderately large portions of the skull remaining attached to them, but some had been sawn from the skull, and some had had their tip sawn off. They were of interest because of the lack of a complete horn core from any of the other sites. The cores were of short-horned type; most were of similar shape curving gradually upwards, a few curved sharply upwards, and some, after such curving, twisted at their tip to point in a posterior direction.

A few were flattened dorso-ventrally, and were more straight than the rest. These variations would seem to suggest breed differences, but the small number of cores involved tends to lessen the significance of the different shapes, and they might well be variations within a breed.

There were over a hundred cores sufficiently complete to be measured, and in these the length around the curve from the base to the tip, and the circumference at its broadest point near the base, were measured to the nearest centimetre. The circumference of each horn was of a similar value to the length. The lengths ranged from 9 to 22 cm. and a frequency diagram of the lengths had a skew distribution which indicated that most of the cores were short, 13 cm. being the most frequent length. A frequency diagram of the circumferences had a similar pattern. Thus unlike the foot bones at Kirkstall there was not more than one peak, and therefore nothing to suggest that the horn cores were from other than a homogeneous population. On the other hand, it is possible that two or more populations (e.g. males and females) were hidden in the distribution owing to overlapping measurements. However, it seems that the cattle were of a similar breed type showing no marked sex difference in horn size. It is possible that the range of measurements was associated with a range of ages; many of the smaller cores were from young animals.

Hardly anything is known about the appearance of medieval cattle. According to Mr Trow-Smith the famous northern short-horned stock which George Culley wrote about in 1786 originated, at least in part, from Dutch imports into Lincolnshire in the late sixteenth or early seventeenth century. The horn cores found at York apparently represent an even older short-horned stock. Some leather found among the bones was examined microscopically,¹ and well-preserved cattle hairs were revealed embedded in the leather. These had little pigment, and so could have come from a white or grey animal (or patch on an animal).

¹ M. L. Ryder in *Nature*, 182, 1958, pp. 781-3.

In contrast to the cattle horn cores, the *goat* horn cores from York had a marked sex difference in size. There were eleven from females ranging from 130 to 190 mm. in length and twelve from males ranging from 180 to 250 mm. in length.

The finding of both horned and hornless *sheep* skulls at Kirkstall provides support for the generally accepted belief that the Cistercians had long-woolled as well as short-woolled sheep. Whereas short-wools are likely to have horns, long-wools are extremely unlikely to have them.

There was no evidence of hornless sheep at Pontefract, and there was only one skull from a hornless sheep at Wharham. But hornless skulls readily break up into unidentifiable fragments, whereas if a horned skull breaks, the horn core usually remains intact. There were, however, few horn cores from either of these sites. There were equal numbers of finds from horned and polled sheep at York, and as hornless skulls are more likely to have broken, one might argue that here there were relatively fewer horned animals than at Kirkstall, where the horn finds predominated. On the other hand, this may merely represent the true situation, the hornless skulls having been better preserved at York. Most of the horn cores were similar in shape to those of modern sheep, but some at Wharham had a more shallow curve, suggesting the Soay type of sheep. Microscopic work on the wool fibres remaining embedded in medieval parchments has suggested that the Soay type of sheep persisted, along with other types, in England as well as Scotland in the Middle Ages.²

When three sizes of *pig* tusks were found at Kirkstall it was thought that the smallest, having a groove in their upper surface, were so different that they might be from wild pigs. Such teeth were later found in jaws from young animals and were thus shown to be characteristic of young, and not wild, pigs.

The remains of the three *horse* skeletons found at York were of interest because they were of eleventh-twelfth-century date. They were of pony size, and one had a well-pre-

² *Ibid.*, 187, 1960, pp. 130-2.

served skull, the dentition of which showed it to have been between five and seven years of age, i.e. just beginning its working life. Although the upper and lower canine teeth did not meet, both showed wear, suggesting that the animal had worn a bridle or bit.

The apparent high proportion of horse bones at Wharram is interesting, but what the horses were used for is not clear. It is thought that the predominant draught animal in the Middle Ages was the ox, and in any case these animals were of only pony size. They may have been pack or riding animals, and it is possible that Wharram may have been a breeding centre for such ponies. Mr Trow-Smith says that horses, and even whole stud farms, are mentioned in wills as early as the tenth century. But in order to substantiate this suggestion of Wharram as a breeding centre it will be necessary to make sure that other medieval villages do not have a similar high proportion of horse bones.

The *fowl* bones were on the whole little smaller than those of modern fowls, except at Wharram where most were of only bantam size. Some of the leg bones had spurs, suggesting that they had come from fighting cocks. There were two sizes of *goose* bones, which could indicate that wild as well as domestic geese were eaten.

ABNORMAL AND DISEASED BONES

An abnormality in the well-preserved *horse* skull from York was a small subsidiary tooth behind the lower left lateral incisor. This moved independently from the incisor, and was therefore not part of it. The same skull had a small circular area on the maxillary plate supporting the roof of the mouth in which the texture was porous and the surface uneven. This could have been associated with an inflammation of the mucous membrane of the mouth, and although it might have arisen from any ulcer, it could have been caused by an ulcer of a disease like glanders. This may be a clue to the cause of death.

There were a number of cases of arthritis and osteitis. The first and second phalanges from a *sheep's* foot found at Wharram had a

peri-osteitis (extra growth of bone on the surface). The first bone was badly affected over the whole of its length, but the second bone was only affected in the upper part, although the two bones were not fused together. In the original report it was thought that this condition could have been caused by foot-rot; it is now realized that it could have had a number of causes. A foot joint of a *horse* from Wharram was so badly affected that the first and second phalanges, the bones on either side of the joint, had become fused rigidly together. This condition is known as high ringbone, and is still common today, often causing lameness, but not usually preventing the horse from working; the cause is unknown. The first phalanx of an *ox* from Wharram had an articular surface showing erosion and new growth of bone around the edge. This suggested a severe septic process in the foot.

An ulna of a young *ox* from Wharram had an arthritis and osteitis of the elbow joint. The immaturity of this animal suggests that this condition might have been caused by joint-ill. The distal end of an *ox* metatarsal from Kirkstall had an osteitis around the edge of the articular surface. This arthritis may have affected the articular cartilage, but the underlying bone of the articular surface was unchanged.

Kirkstall also yielded the body of a vertebra, probably from an *ox*, which had a spondylitis in which new growth had resulted in bone extending over the intervertebral disk to produce a 'lipping' effect. At Wharram there was a vertebra from a sheep or a dog which had been deformed in such a way that the anterior end had a slant instead of being vertical. There was also a *pig's* lower jaw with the seventh (trilobed) molar erupting (surface unworn and roots only beginning to form) almost upside down in the jaw. It is thought that this could have turned over as a result of unusual pressures, e.g. from the angle of the jaw adjacent to it, possibly caused by shortness in the jaw, and that the tooth would probably eventually have acquired its normal orientation. A *pig* tusk was found at Kirkstall

with an unusual bend about 1 cm. from its root end. This suggested that an injury had affected the growth. In addition, there was an incrustation of bone around the part normally exposed in the mouth.

The most unusual abnormality found was some holes in portions of the skull remaining attached to the *cattle* horn cores from York; the cause of these is unknown. At least five of the skull parts had one to three of these holes in the parietal bone on the posterior aspect of the skull not far below the suture between the frontal and parietal bones. The holes penetrated the outer plate of the bone and entered the central cavity which is continuous with the cavity of the frontal bone and the horn core. The inner plate of the bone was not pierced. These holes had not been made after death, nor had they been caused by decay during burial.

Some of the skulls had holes which were in line with a smaller hole, 1 mm. or less in diameter, that was often at the base of a dimple, and was probably the opening for a blood vessel, but may have been an unnatural hole. Some of the holes were oval, being 1-2 mm. wide, and up to 8 mm. long; in this the bone at the edges was thin. The largest holes, apparently in the older skulls, were about 8 mm. across, being oval, triangular, or circular in shape, and one of these had a short branch which appeared as if the edge had been eaten away. These holes passed vertically through 2-3 mm. of bone, and although the edges were straight they were somewhat rounded, apparently by growth.

There are several possible explanations for the holes, not one of which is entirely satisfactory. It is inconceivable that they had been bored by a parasite, but the holes may have been man-made, i.e. bored while the animal was still alive in a primitive custom designed

to drain the sinus within the bone. One could interpret those with straight edges through thick bone as having been bored not long before death, which may have been the result of making the holes; these appeared to have had something in them preventing the edges of the bone from meeting; those through thin bone would be in the process of healing. This explanation is opposed by the fact that sometimes part of the edge of a hole was continuous with one of the septa between the inner and outer plates of the bone, thus suggesting that they had not been bored. I am indebted to Mr M. M. McKinnon, Lecturer in Preventive Medicine at the University of New England, for the suggestion that they may have been caused by an acute inflammatory condition, and that the holes were the result of increased vascularization. Oxen wearing a yoke might be predisposed to this type of condition.

Finally, one might mention several lower halves of sheep tibiae from Wharram which had a hole near the lower end. The holes did not usually go right through the bone, and it was not clear whether or not they were man-made. Bone implements have not been described in this article, but it is interesting to speculate on the possible use of these. Mr Megaw illustrates similar bones with one and more holes which were in fact whistles and pipes, the hole formed at the point at which the bone was broken in two being the blow-hole.¹ Could it be that these bones from Wharram represented attempts at making shepherd's whistles?

This article has shown the way in which medieval archaeology can help agricultural historians by throwing light on the livestock of the period, and I hope that it will stimulate the examination of animal remains from other sites.

¹ J. V. S. Megaw, 'Penny Whistles and Pre-history', *Antiquity*, xxxiv, 1960, pp. 6-13.

Letter to the Editor

SIR,—I read with interest Dr Ryder's letter on sheep treatment in Volume IX of the REVIEW. I can assure him that the practice he describes is far from extinct, and can possibly add a little to his observations.

This operation is in use by the great majority of the farmers who run fell flocks in the dales of Durham. I would estimate that 65 per cent of flocks are so treated regularly while those who use it occasionally must bring the numbers to over 75 per cent. It is used in the treatment of 'Double Scaup'. The hogs (lambs) are 'scauped', 'cracked', or 'knocked' as Dr Ryder indicates, on the frontal bone. Some farmers use a rounded pebble, some the butt of a penknife, but most use their knuckles. The bone cracks audibly if at all. In practice every sheep knocked by an experienced shepherd 'cracks'; this is a matter of 'eye'. An almost uncanny knack of predicting can be learned and although they are usually 'knocked' at dipping or some such time of gathering, it is very common to catch odd hogs that are not doing well and 'knock' them on the spot. I have seen this done and have noted the progress of the lamb in the next few weeks without change of pasture or any dosing.

I have heard members of the veterinary profession condemn the practice and deny that 'Double Scaup' was a disease in itself. It is often held that the thinness of the outer plate of the frontal bone is possibly symptomatic of other conditions which are causing unthriftiness, e.g. worm infestation. Many flockmasters hold a contrary view and regard the condition as a disease in its own right. I must admit that my own observation of the accuracy with which they can diagnose, or

possibly I should say predict, the condition, and the universal account of the benefits, incline me to think that there is at least a case for investigation.

I am dubious about the association with Sheep Nostril Fly (*Oestrus ovis*) attack. Not one of my informants has mentioned this pest in this connection; nor have I any indication that it has even been prevalent in this area. The increased secretion of hormones is an interesting suggestion. I have had several attempted explanations. Many say that it is done to break an air bubble which forms and stunts growth. More compare it to 'cutting' a cow for felon (this is the practice of making an incision, usually in the brisket, and inserting a leaf, either fresh or dried, of 'felon grass' (*Helleborus viridis*), securing with a stitch, and later removing the leaf and the consequent pus), thus supporting to some degree a theory of increased secretion of hormones or white blood corpuscles. By far the most of those who use the practice advance no explanation except that it is a matter of common knowledge and that it works.

It may be of interest to note that while it is almost invariably the hogs that are 'cracked', some shepherds will say that odd shearlings may need a 'crack', though this seems a rather controversial view.

I can add nothing to the tale of the distribution of the practice. As far as I know it is in current use throughout the northern Pennines.

Yours faithfully,

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