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The animal bones from 45 Saxon huts at Mucking, Essex - an interim report.

It is unfortunate that the soil conditions at Mucking are inimical to the survival of bone. Fragmentary remanent bone from a total and comprehensive excavation such as this should have greater significance than similar material from a more restricted investigation but it must be emphasised that the actual amount of bone on which this report is based is small relative to the areas of both time and space from which it comes, and the possibilities of error in interpretation are correspondingly great. Quantification as in Table 5 is to be regarded as a means of elucidation rather than an end product and any impression of precision treated with caution.

In spite of unpromising material, certain patterns dimly emerge so that from the bone from 45 huts limited hypothyses can be generated.

In the various counts made a fragment was counted only if it could be reasonably ascertained that it represented a single bone.

In view of the suggested derivation of the hut fills (Jones and Jones 1974) for each hut all levels are considered together.

The proportions of species represented were calculated as percentages of total identifiable fragments. Total bone would include pieces not securely classifiable down to species and also a large amount of unidentifiable material in such poor condition that counting, weighing or other method of measurement was impracticable.

The animals.

The following species were identified:-
Horse, ox ,sheep, pig, dog, rabbit, a small carnivore probably fox, domestic fowl, goose; bones of another unidentified bird and one oyster shell were also found.

Table I shows how the fragments were distributed.

It is impossible to make a reliable assessment of size or type of animal without an adequate number of complete bones. As the tabulated measurements (Tables 2 and 3) show, these are sadly lacking. However, the ox bones indicate a mixed population consisting mainly of animals roughly comparable with the smaller modern breeds such as the Jersey, but with clear signs of some larger beasts. This variability is akin to that encountered in ox bones

from the Roman period (Jewell 1963, Clason 1967) and is well illustrated by the withers heights.

The few measurable sheep bones are small, matching fairly closely those of the Soay and the pigs seem also to have been small, though no valid comparison can be made with modern breeds which have undergone intense selection in recent times.

The two complete horse metatarsals belonged to what would now be considered large ponies. One dog's skull has been described in detail (Harcourt 1974). A second severely compressed head of similar size was found accompanied by part of a forelimb in hut GH 21.

Both fallow and red deer were identified and it is possible that as a source of meat the deer was more important than the bone count suggests. Antler fragments occur frequently, hut GH 23 being especially rich in this respect and containing antler of both species, though the piecemeal nature of the material makes assessment of numbers impossible. A few bones were positively classified but there was often uncertainty, in the known presence of small cattle, about distinguishing between ox and deer. These doubtful bones might lead to some underestimation of deer.

Two fragments incorporating the burr of the naturally shed antler show that antlers were not necessarily obtained from deer killed by hunting.

Age.-- Age assessments were made using modern criteria which may not precisely apply to livestock of the Saxon period. While there is much evidence of animals being killed young, there are also signs of retention beyond dental and epiphyseal maturity in all species. The relationship between age groups cannot be determined on the material so far examined. Dental ages are listed in Table 4. The shoulder blade of a very young piglet, probably less than one month old, one horse incisor of 5 years and another of about 8 were also found.

Butchering and manufacture - Butchering marks were few, probably because cuts have been erased or masked by the deterioration of the bone fabric; slight marks possibly from a knife were noted on a piece of burnt ox metapodial. The presence of jaws, an ox head which must have been complete when discarded, and other bones from heads and feet make it likely that butchering was done on the site.

One slightly rubbed-down antler point was found and another piece of shed antler had been trimmed to a greater extent. It consisted of the burr

with some 5 cms. of beam and the brow tine which had been worked on two sides to give two flat surfaces. The rest of the beam had been cut off and the remaining stub split lengthwise. The general form resembles the antler points found at York, but without decoration or piercing (Waterman 1959).

Disease- Exostosis on the posterior face of a horse metatarsal (a splint) and a similar abnormality on an ox metacarpal were the only signs of disease.

The Economy.

The relative importance of the various species is indicated by the proportions of bones as shown in Table 5 and by the bar diagram. The minimum numbers of animals are as follows:-

horse	2	
ox	I2	(on astragali)
sheep	6	(on mandibles)
pig	9	(on mandibles)

Though small, these are of value, being broadly in agreement with the bone pattern. This is remarkable for revealing the importance of pig vis-à-vis sheep, though cattle are apparently predominant. The overall pattern is repeated in two of the three huts containing most bone and in the totals from the remaining huts, each of which produced very little bone.

The prominence of pig bone is especially striking as it is generally 'softer' in quality, being more porous than ruminant bone and so less likely to survive. The inference is perhaps that there was initially a considerable amount of pig bone. In hut GH33, where most bone was found, the predominance of pig was very marked and the pattern here closely resembles that reported, though on a small sample, at Kestan (Harman 1970).

Some consideration was given to the factors influencing bone destruction. The hydrogen ion concentration appears to be always on the acid side but varies almost from one cubic centimetre to the next. It may be that the present bone- bearing areas, for example GH I7 and 33, were originally rich in bone to the extent that what has disappeared due to chemical action has in the process buffered the soil acidity so as to allow the preservation of what remains. GH 33 may in fact truly reflect an original picture of a few cattle and sheep with the pig possibly the important food animal. If grazing were poor this arrangment would make farming sense so that if, on both chemical and

statistical grounds the more bones the better, GH 33 though anomalous may be significant.

Comment.

Within the limitations imposed by the material a case can be made for the pig being an important factor in the economy of Saxon Mucking. The sheep were definitely small, possibly few in number, and though cattle bones predominate, the notable exception of GH 33 suggests that in adverse conditions this may be in part due to a selective survival rate for large bones.

The pig in fact fits very well in to a frontier situation, being, alive, a scavenger well able to look after itself, and dead, almost all eatable and amenable to a variety of preservative processes such as salting and smoking. The traditional pioneer's pork and beans or seafarer's salt pork and biscuit probably have a lengthy ancestry. The Mucking bones tend to support the pig in its position of popular meat producer of early European economies (White 1970, Fussell 1966), a position which archaeological bones perhaps underrate.

Much material has yet to be examined which may modify the interpretation. There is also the interesting possibility that changes to which frontiers have a built-in tendency will be reflected in the animal bone.

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Table I

Distribution of bones.

Location	Horse	Ox	Sheep	Pig	Deer	Dog	Other	Total
GH I	-	5	-	2	-	-	-	7
GH 2	2	44	3	II	2	-	-	62
GH3			Bone present					
GH 4	-	I	-	-	-	-	-	I
GH 5	-	I	I	-	-	-	-	2
GH 6	-	I	-	-	-	-	-	I
GH 7	-	I	-	-	-	-	shell	I
GH 8	-	I	-	-	-	-	-	I
GH 9	I	7	I	I	-	-	-	IO
GH IO	5	I6	I	3	2	5	-	32
GH II	2	I7	4	4	-	-	-	27
GH I2	2	20	2	I	-	-	-	25
GH I3	I	4	-	-	-	-	I	6
GH I5	-	9	2	6	-	-	I	I8
GH I6	-	5	I	I	-	-	8	I5
GH I7	4	4I	9	22	2	-	-	78
GH I9	-	II	-	5	-	-	-	I6
GH 20	2	2	I	-	I	-	-	6
GH 2I	-	I	-	-	-	3	-	4
GH 22	-	4	-	-	-	-	-	4
GH 23	I	o	2	4	2	-	-	I7
GH 24	-	5	-	-	-	-	-	5
GH 26	-	I3	2	5	I	-	-	2I
GH 29	I	4	I	I	-	-	-	7
GH 30	-	4	I	-	-	-	-	5
GH 3I	2	4	-	I	-	-	-	7
GH 32	2	6	2	-	-	-	-	IO
GH 33	2	27	I7	46	I	4	9	I06
GH 34	-	I	-	I	-	-	-	2
GH 35	2	4	2	I	2	-	-	II
GH 36	-	2	2	-	-	-	-	4
GH 37/38	-	-	-	I	-	-	-	I
GH 40	I	I	-	-	-	-	-	2

GH 42	-	2	I	I	2	-	-	6
GH 43	-	I	-	-	-	-	-	I
GH 49	I	I	-	-	-	-	-	2
GH 55	-	5	2	3	-	-	-	I0
GH 56	-	2	-	-	I	-	-	3
GH 57	3	I5	4	4	I	-	3	30
GH 58	-	23	3	9	2	-	-	37
GH 6I	-	2	-	-	-	-	-	2
GH 63	-	-	I	-	-	-	-	I
GH 8I		Bone present						
GH III	I	I	I	2	-	-	-	5
Totals	35	322	66	I35	I9	I2	22	6II

Table 2

Ox bone measurements. (in centimetres)

	Length	Proximal width	Distal width	Minimum shaft width	
Humerus			6.I		
			c.6.5		
			6.75		
			c.6.8		
			6.8		
			7.4+		
Radius	26.2	6.9	6.6	3.3	
			5.75		
			6.6		
		6.9			
			c.5.2		
			c.6.5		
		8.0			
		6.9			
			6.9		
Metacarpals	I9 [1]	5.2	5.I	3.3	
		5.2			
	I9 [2]		5.2		
			5.8		
		5.5			
		4.6			
			5.7		
	I8.I [3]	c.4.I	5.I	2.75	
			c.4.6		
	I7.3 [4]	5.3		3.I	
	c.18.0	4.6		c.7	
	I8.7 [5]	5.I	5.I	2.8	
			5.I		
			c.4.9		
			6.4		
		c.6.0			
		4.5			
		5.9			
	I8.4	4.95	4.7	2.7	(immature)

Table 2 continued

	Length	Proximal width	Distal width	Minimum shaft width
Tibia			c.6.4	
			5.0	
			c.5.3	
			5.2	
			5.6	
			5.5	
			c.5.5	
	c.27.5		c.4.7	
			c.6.65	
Astragalus	6.3			
	6.I			
	5.9			
	c.6.2			
Metatarsal	22.3	4.2	4.9	2.I5
		5.0		
			4.5	
		5.3		
			5.5	
		4.2		
			5.I	
		4.0		
	[redacted]	4.0		
	20.5	4.25		2.3
Ist phalanx	6.65	2.8	2.8	
	5.6	2.8	2.75	
	6.9	3.0	2.6	
	6.7	2.8	2.9	
	c.5.7			
	c.5.7			
	6.I	2.6	2.5	
	5.45	2.3		
	6.35	2.65	2.55	
	c.5.7	2.7		
	5.5	2.4	2.3	

Table 2 end

	Length	Proximal width	Distal width
1st phalanx	5.5	2.4	
	5.5		
		3.0	
	c.6.0	2.9	
	5.8	2.3	2.3
2nd phalanx	4.4	3.1	2.3
	2.5	2.5	1.85
	4.3	2.35	2.6
	c.4.0	2.9	2.5

Withers Heights (using Boessneck's factor for steers) :-

Metacarpal 1 - 121.6 cms.
2 - 121.6
3 - 115.8
4 - 110.7
5 - 119.7
Metatarsal 6 - 127.3

Table 3

Horse, pig and sheep bone measurements. (in centimetres.)

	Length	Proximal width	Distal width	Minimum shaft breadth
Horse.				
Humerus			7.7	
Radius			5.9	
			6.9	
Astragalus	6.0			
	5.0			
Metatarsal	27.2		4.9	3.4
	*26.7	4.3	4.4	2.9
Ist Phalanx			3.9	
	* 8.6	4.75	3.7	
Sheep.				
Metacarpal	I2.5	2.0	2.2	I.3
	c.II.5	I.9		I.2
	7.4	I.88	I.85	0.95 Immature
	c.IO.5	I.95		I.3
			2.5	
			2.I	
		2.2		
Tibia			2.6	
			2.3	
Pig				
Humerus			3.2	
Radius		2.5		
		2.8		
		2.65		
Tibia		4.3		
			2.6	
			3.0	
Os calcis	7.6			
Metapodial	8.9			
	7.7			

* these articulate.

Table 4

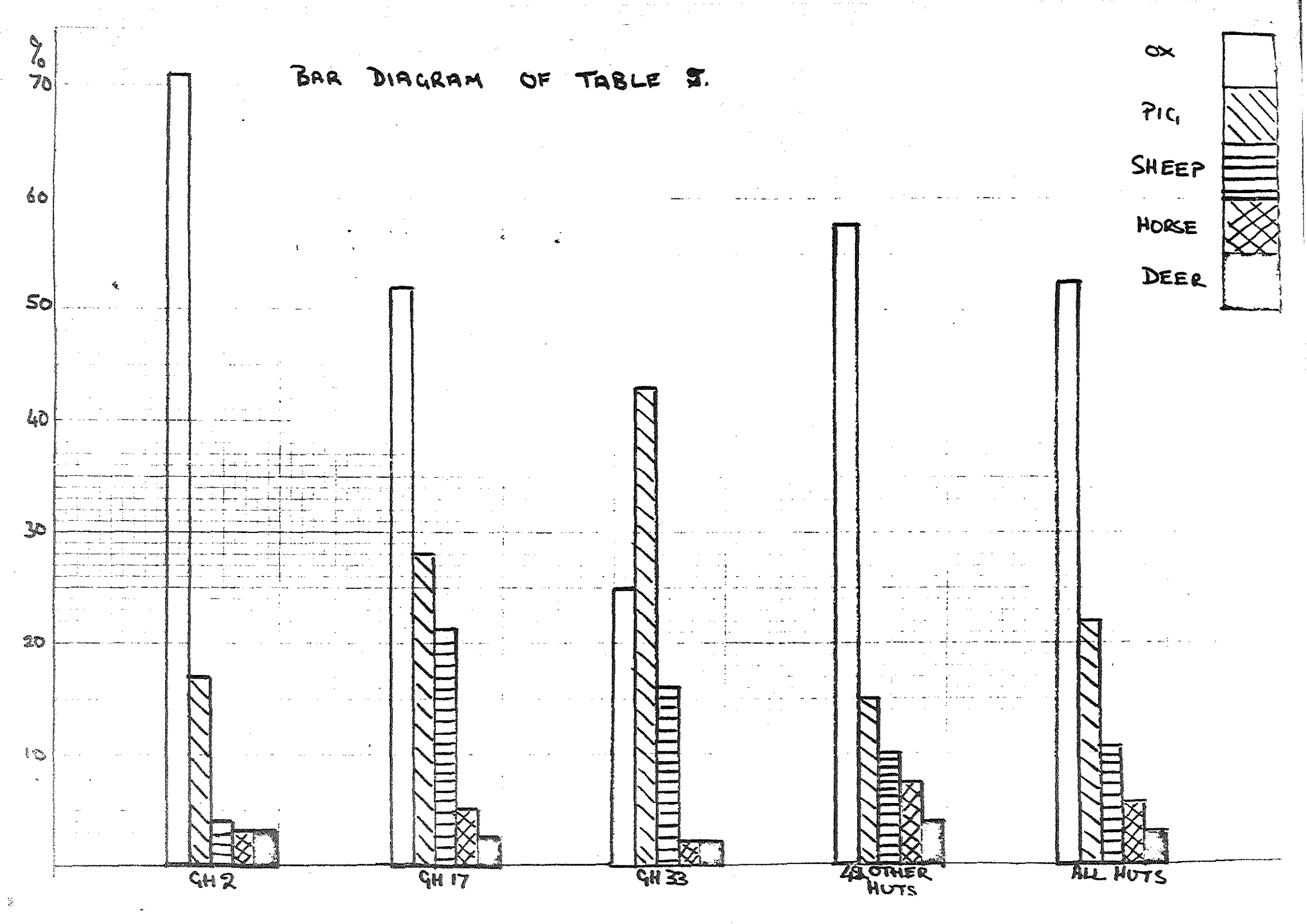
Ages from available dental evidence

	Ox	Sheep	Pig
Adult	I	4	2
c. 2½ years	2		
c.2 years	I		
c. I8 months	I		3
c. I2 months		2	3
c. 9 months		I	I
c. 6 months		I	
c. I month			I

Table 5

Analysis of bone by species

	Horse	Ox	Sheep	Pig	Deer	Total identified bone
Overall	5.7%	52.7%	I0.8%	22.0%	3.0%	6II
GH 2	3.0%	7I.0%	4.0%	I7.0%	3.0%	62
GH I7	5.0%	5I.9%	II.4%	27.8%	2.5%	79
GH33	2.0%	25.0%	I6.0%	43.0%	2.0%	I06
42 others	7.4%	57.6%	I0.0%	I5.0%	3.8%	364


BAR DIAGRAM OF TABLE 9.
%
70
60
50
40
30
20
10
OX
PIG
SHEEP
HORSE
DEER
GH 2
GH 17
GH 33
48 OTHER HUTS
ALL HUTS