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The analysis of animal bone from trial excavations at Milburngate, Durham City. Preliminary Report.

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The excavations on this site uncovered parts of the remains of two tenements. The evidence indicates occupation from the 13th century up until the present day. The total bone sample recovered by handpicking during the excavations consists of 3700 bones and fragments and the partial skeletons of rabbits and a cat.

Materials and Methods

The sample of bone from these excavations has been identified by comparison with known species reference material in the Biological Laboratory, Dept. Archaeology, Durham University. Unidentified material where possible has been assigned to size categories (ox-sized, sheep-sized) or more more closely identified as large ungulate (ox, deer, horse), small ungulate (roe deer, sheep, goat, pig) or carnivore. The material was catalogued using an automated coded recording system (Jones et al , n.d.) and subsequently sorted and analysed on an RML 380Z microprocessor.

The material is discussed within the dated archaeological phases supplied by the excavator (P.A.G.Clack) and where sample size seems sufficient has been sub-divided spatially into the north and south tenements that were identified during the excavation. The later material, 19th and 20th century, from the site has not been catalogued although a sample of over two thousand bones has been recovered.

Mediaeval period

The Mediaeval period is represented by a number of phases, which are here considered within two time periods, the 13th and 14th centuries and the 14th to 16th centuries. Very little mediaeval material was recovered from the north tenement, owing to the limited size of the excavation area within this property, and this was confined to the early period (13th-14th cent.). The southern tenement has eleven identified mediaeval phases beginning in the 12th century, but for the purposes of this report these are considered within the two time periods noted above.

The bone sample from the mediaeval period is small (Table 1). The condition of the bone is average for urban collections and there is no evidence of post-depositional loss through corrosion. Fragmentation of the bones in the collection is not serious and 74.5% of the collected fragments have been identified to species. Although it is possible that some of the material from these levels are derived from earlier deposits there is no evidence that suggests that such contamination is anything more than minimal; and the nature of the layers is such that contemporary accumulation rather than re-working or secondary deposition can be inferred. One or two bones show slight or extensive erosion and it is possible that these are derived specimens.

The 13-14th century samples from both north and south burgages are considered together. The deposits consist of make-up layers with some included rubbish and possible 'domestic' tips. Only domestic species have been identified and among these cattle and sheep (or goat) bones are the most common (Table 1). The counts of the skeletal elements of cattle (& large ungulate) and sheep (goat & small ungulate) are presented in Table 2. The most interesting aspect of this group is a collection of 27 cattle horn cores and a further 35 fragments of horn core, frontal and parietal bones. These all derive from context 133 in the north burgage and represent over 40% of the whole collection from this period.

In the sample from the 14th-16th centuries cattle horn cores are again abundant and all were recovered from context 89, described as a 'domestic' tip. The group consists of 27 intact or partially intact cores and three fragments with four fragments of the frontal bone. In contrast to the earlier collection this group was deposited in the southern tenement. The remainder of the sample consists of post-cranial elements of cattle and sheep with single finds of horse, chicken and goose. There is a change in the relative abundance of the post-cranial bones of cattle and sheep in this period (see Table 2) and fragments of sheep are more abundant than cattle in these layers.

The two deposits with horn cores were by no means exclusively cattle skull debris but contained 82% of the bones from the mediaeval deposits. The post-cranial bones in the collection are consistent with domestic food debris. Most parts of the skeleton are represented to some degree (Table 2) although fragments of the forelimb of both cattle and

TABLE 1

Counts of the identified bone fragments ofeach species from the different periods and burgages.

Species	13-14 N & S	14-16 South	17th North	17th South	18th South	
Man					1	
Horse		1	2	7		
Cattle	76	53	473	156	63	
Sheep			4		4	
Sheep or goat	16	39	138	73	13	
Pig	2		5	3	1	
Cat	1		2		1	
Rabbit, Oryctolagus cuniculus L.			5			
Roe deer Capreolus capreolus L.			1			
Fallow deer Dama dama L.				1		
Chicken		1	6	2	1	
Goose		1	3	2		
Pigeon, Columba sp.				1		
Jackdaw, Corvus monedula L.			1			
Cod, Gadus morhua L.			3	2	1	
Ling, Molva molva L.			1		1	
Haddock, Melanogrammus aeglifinus L.			3		1	
Large mammal	24	4	79	79	2	
Large ungulate	9	10	24	25	8	
Small ungulate	3	14	111	39	7	
Indet. mammal			137	24	1	
Indet. bird		1	2			
Indet. fish			1			
TOTAL	131	124	1001	413	107	1776

sheep are more common than the hindlimb and the vertebrae, ribs and phalanges are relatively under-represented. Although only ten of the bones have visible marks of butchery it is probable that the meat was procured already butchered and jointed rather than as whole carcasses, but the sample size may have been a limiting factor in the recovery of the underrrepresented bones.

Post-Mediaeval period.

The sample from the post-mediaeval levels on the site is larger than that from the earlier period. In the north tenement archaeological phases 8-10 (Clack, unpubl.) represent phases of activity in the 17th century and no later identifiable deposits apart from recent rubble and make-up and destruction were found.

In the southern tenement phases 12-17 represent the post-mediaeval period. The occupation in this tenement can be divided into a 17th century occupation phase, mid-18th century activity and two later periods from which the animal bone has not been analysed and will not be discussed.

The condition of the bone in these later levels is similar to those from the earlier deposits with little evidence of erosion or re-working. Fragmentation is a little greater (64% identified) although if ribs and vertebrae identified to large and small ungulates are counted as identifiable units then only 21% of the collection could not be identified.

The 17th century deposits from the small area of the north tenement produced two main layers which contained over 94% of the material. Context 70 is described as a domestic deposit and context 77 as industrial (Clack, op cit). These are based upon the quantity of horn cores in the layers, 10% of the fragments in layer 70 are horn cores or fragments but in 77 over 45% are cores and core fragments. Over 83% of the identified cattle bones (Table 2) are horn cores or adjacent fragments of skull. These deposits produced a wider variety of species than the mediaeval levels but this is likely to be a factor of sample size. Species not identified from the earlier levels include rabbit, roe deer, Jackdaw, cod, ling and haddock but these only occur in small numbers (Table 1). Bones of cattle and sheep are the most abundant specimens and reference to Table 2 illustrates that in this period the post-cranial fragments of sheep and small ungulate (222) are much more abundant than those of cattle and large ungulate (66).

TABLE 2 Number of fragments of each bone for cattle and large ungulate, and sheep or goat and small ungulate from each of the periods represented at Milburngate , Durham City.

	13-14th century North & south		14-16th century South		17th cent. North		17th cent. South		18th cent. South	
	cattle	sheep	cattle	sheep	cattle	sheep	cattle	sheep	cattle	sheep
Frontal	4		4		55	2	4	1	7	1
Parietal	1				1	1	1			
Horn core	58		30		290		99		37	
Maxilla					1	3	2			1
Other skull frags			1		70	7	4	1	1	5
Mandible	1	1	2	3	8	8	8	6	1	2
Loose teeth	1		3	1	9	4	7	2		
Cervical vertebrae	3				3	18	1	1		2
Thoracic vertebrae			2	1	5	13	3	5	1	
Lumbar vertebrae	1				4	10	5	3	1	2
Sacrum				1	1					
Caudal vertebrae						1			1	
Ribs	6	3	8	13	19	75	17	31	6	3
Scapula	1		1	2	3	16	4	9	1	1
Humerus	1	2	2	1	1	7	3	7	2	2
Radius	1		1	5	1	17	3	2	1	
Ulna	1		1	1	1	3	2	2	1	
Metacarpus	3	6		7	5	18	2	9	1	
Carpals						1				
1st phalanx			1		1	5		2		
2nd phalanx			1			2				
3rd phalanx			1		1		2			
Innominate	1		3	2	7	11	1	5		2
Femur			2	5	4	8	3	7	1	1
Patella										
Tibia	1	2		3	2	11	3	6	9	3
Astragalus					2		1			
Calcaneum		1			1	1		1		
Tarsals							2			
Metatarsus	1	4		8	2	5	4	12	1	1
Metapodial					3					

All parts of the skeleton are represented, but again fragments of sheep forelimb are nearly twice as abundant as those of the hindlimb and phalanges are again under-represented although the vertebrae are much more abundant than in previous levels (Table 2). The cattle do not reflect this pattern but show a more even incidence of different skeletal elements for all but the skull.

Despite the larger area under excavation the sample from the 17th century deposits in the south tenement produced a much smaller sample but continued to reflect the pattern found in all the other deposits and produced 99 horn core fragments representing 63% of the cattle bones identified, although only thirteen were fairly complete cores, the remainder being ~~fairly~~ small fragments. Many of the bones came from deposits filling a vennel or gulley in this tenement most of which appeared to be domestic rubbish (Clack, op cit). In addition to the bones of cattle and sheep, a small number of bones were identified to pig, fallow deer, chicken, goose, pigeon and cod (Table 1). The post-cranial bones of sheep and cattle occur in similar proportions to the sample from the northern tenement but the distribution of identified skeletal elements is more even although phalanges are under-represented from both species. The metapodials of sheep are somewhat over-represented and most of these specimens are proximal fragments suggesting butchery across the shaft of this bone and perhaps accounting for the absence of feet bones.

The sample of bone from the mid-18th century (archaeological phase 13) comes from the south tenement. The collection, 107 bones, comes from a number of layers within a cobbled, wall-lined structure thought to be an ice house (Clack, op cit). From one layer, a drain in the bottom of the structure thirty three cattle horn cores and four core fragments were recovered. These lay tightly packed in the floor of the drain laid at right angles to the flow and interpreted as a soak-away. This collection was presumably specifically collected for the purpose and need not represent debris from local activity. The sample is smaller than that from previous periods, too small for a discussion of the skeletal elements and species abundance although fragments of the post-cranial elements of cattle are more abundant than those of sheep.

General Discussion.

The horn cores in the collection from this site are considered below, the remainder of the collection appears to be food debris. Pig

bones are perhaps surprisingly infrequent in all periods although this is a pattern already observed from other later mediaeval and post-mediaeval collections from Durham (Rackham, 1980a,1980b,n.d). There is some evidence to suggest changes in the relative abundance of cattle and sheep, from a dominance of cattle in the 13-14th century with sheep becoming more abundant in the later mediaeval period and 17th century and a return of cattle as the most abundant finds among the food debris in the 18th century. This is consistent with the findings from Reredorter, BackSilver Street and Queens Court (Rackham, n.d;1980a;1980b) suggesting that the pattern is probably a reflection of changes to the pastoral economy during this period. Butchery and ageing are not considered in this preliminary report since future work will produce more material for analysis and enhance the interpretability of the somewhat limited data. The rarity of finds of fish, bird and smaller wild mammals may be a factor of recovery, as is perhaps the absence of sheep phalanges and carpals in most of the layers, loss to cats and dogs (these latter only indicated by their tooth marks on chewed bones) or may reflect little dependence on these sources of food.

Cattle horn cores

The abundance of cattle horn cores in all these deposits cannot be explained as a component of the domestic refuse and must be interpreted in terms of some commercial or industrial activity on the site, a particularly obvious conclusion in phases 8-9 of the northern tenement where one of the layers was almost solid horn cores. In addition to the cores and core fragments a fairly large number of skull fragments of cattle, particularly frontals, parietals and temporals were found. These are the bones adjacent to the core and presumably also represent waste from the same activity generating the horn cores.

There are two interpretations for such collections of horn cores, whether cattle or goat, or both. Most British workers have interpreted these collections as waste from horn workshops (Gooder, Woodfield & Chaplin, 1966; Ryder, 1970; Armitage, 1980; Rackham, 1982; Hodgson, n.d.) and collections are not uncommon from urban excavations in England and Scotland. In contrast a similar collection on the continent (Prummel, 1978) is interpreted as refuse from a tannery. To some extent these alternative hypotheses hinge on the archaeological information, Wenham (1964) interpreting the features on the excavations at Petergate, York which included hearths and a clay and wood lined pit

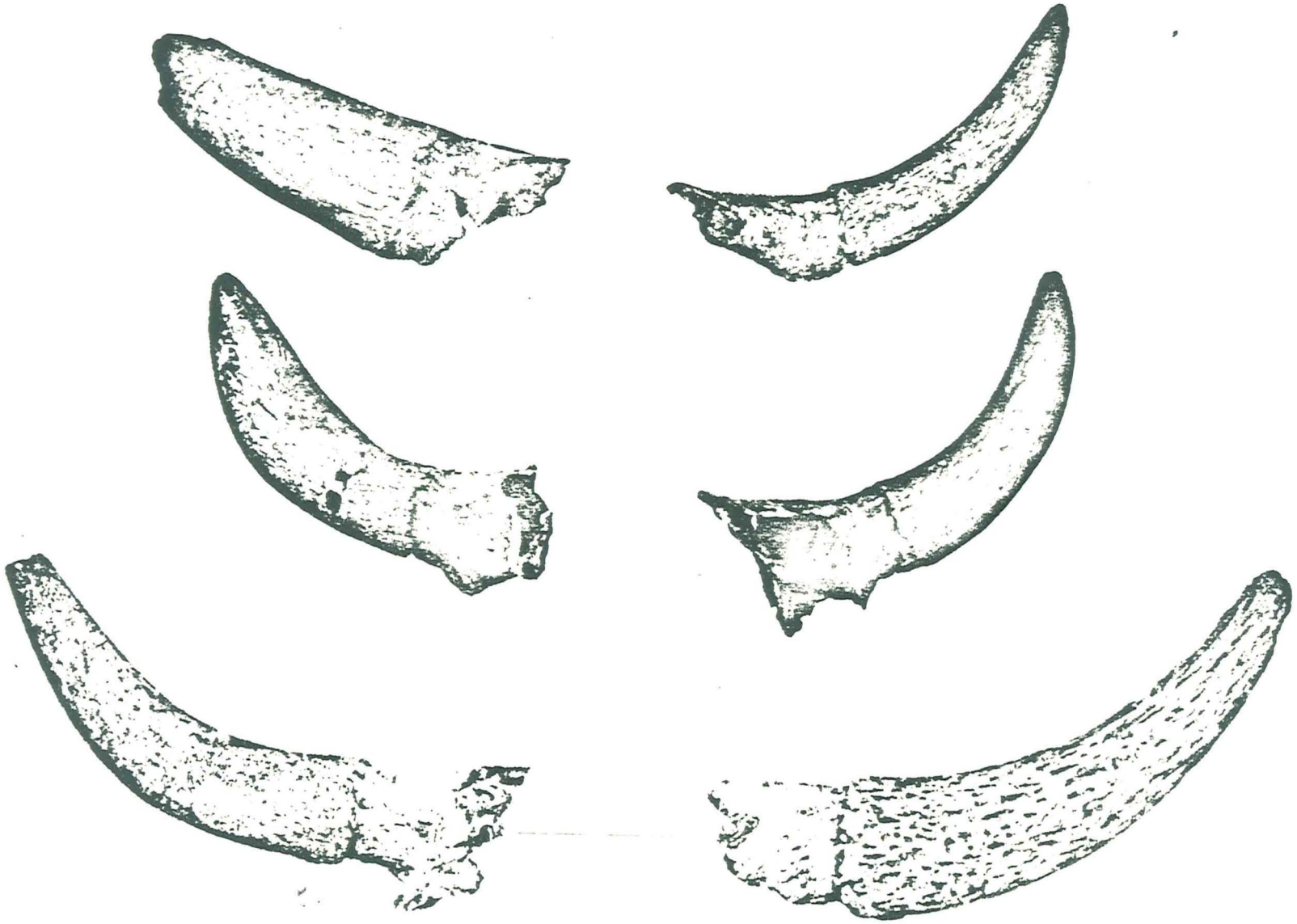
full of cattle and goat horn cores as a horners workshop was further assisted by the adjacent alleyname of 'Hornpot Lane'. Prummel (1978) notes that a collection of pits in the excavations in the area of Gertru in the city of 's-Hertogenbosch were probably part of a tannery and subsequently interprets the collection of cattle and goat cores at this site as debris from this tanning industry. For similar collections at Dorestad and Haitabu (Prummel, 1982) she offers both tanning and the horn industry as possible sources for the cores. Prummel (1978) considers the sawing of the core tips and evidence of cuts at the base of the core produced while trimming the base of the horn sheath to assist removal from the core. as evidence for hornworking.

The cores from Milburngate have generally been removed from the skull by an oblique chop anterio-ventral to the horn which results in a portion of the dorsal posterio-lateral skull (frontal-parietal-temporal margin) remaining attached to the core but the whole of the immediate post-orbital region being removed. Apart from these marks few of the cores bear any other cut or chop marks and no evidence of sawing or skinning marks on the frontals like those observed in the material from Blackgate, Newcastle (Rackham,1982). There is therefore little to indicate the origin of these cores and it is unfortunate that there appears to be no documentary sources that point to the area of the site being occupied by either horners or tanners. The presence of an ivory die (stamp!) among the horn cores in the north tenement may bear on the activities on the site in that it may have been used for impressing a symbol onto leather but is unlikely to have been strong enough to do so on horn. A possible additional clue is the wide range in size and age of the animals and some of their cores may well have been too small to be useful to a horner. It is possible that a horner would exercise some selectivity over the raw material- something not apparent in this collection. On the other hand he may have done his selection on the site in which case the sample would contain all groups.

It is apparent in the distribution of the horn cores across the site that the focus is in the northern tenement- whether this represents a concentration of the industrial activity in this burgage or merely the concentration of the waste cannot be determined and the archaeological evidence does not assist in the interpretation of the material. One of the most interesting aspects of the collection is the continuity of activity- the horn cores being present from the earliest layers on the site and still present in numbers in the unanalysed material from the 19th century deposits. Such continuity on the site of a craft industry

Fig 1. Cattle bone cores from context 77, 17th century, at Hillingdon, Denham City

Posterior view



Ventral view

Plate 3 Langdon type.

be it hornworking or tanning is extremely interesting and the site may well repay further archaeological work particularly in the northern tenement and adjacent areas.

There is considerable variety in the age of the animals from which the cores derive and also in the shape and size of the core and fronto-parietal area (Plates 1 & 2). In particular the suture line of the frontal varies from flat to a pronounced ridge and the shape of the intercornual (intercornual protuberance) crest also varies. Marked differences in skull size can be observed but owing to the considerable fragmentation of the frontal and parietal bones this is not easy to quantify. No detailed morphological analysis is presented in this preliminary report but the samples from the different periods are compared using metrical criteria.

Fig.1 presents a plot of the maximum basal diameter against minimum basal diameter of the cores. The relationship between these two measures is linear with a high degree of correlation (coeff.=0.94, n=39) for the early periods and these distributions are absorbed within that of the cores from the 17th century deposits in the northern tenement (coeff.=0.93, n=65). These distributions are based upon all the measurable cores and take no account of the age or sex of the animals. The 17th and 18th century specimens from the south tenement show a more restricted range (Fig.1) and a lower correlation between the two measures (17th-0.64, n=10; 18th 0.58, n=30), and fall in the lower half of the range for the sample from the north tenement. It should be noted that since some selectivity must have been exercised in the choosing of cores for the drain floor in phase 13 of the south tenement this sample must be viewed as anomalous and certainly biassed in favour of small core size if not in conformation. Furthermore a discontinuous linear relationship due to sexual dimorphism might well produce anomalies in samples where one sex only is present. It is therefore difficult to assess the variation observed in these distributions without a detailed consideration of the age and sex of the individual cores.

Armitage (1980) has described a number of archaeological cattle horn core samples from England and notes the occurrence of cores of long horn type in the 15th century in southern England which he believes have developed from local stock and do not represent importation. In this sample there is a slight increase in the upper range of the length of the cores between the 13th and 17th centuries with one exceptional specimen with an outer curvature of 522 mms (Table 4). The subsequent reduction in the 18th century must be attributed to selection of the sample as suggested

above rather than a more general feature.

Table 3

Cattle horn cores from Milburngate, Durham City.

Maximum basal diameter in mms.

Period	No.	Min.	Max.	Mean	SD
13-14th North & South	12	45.8	74.0	56.2	8.93
14-16th South	18	39.3	83.7	57.0	13.53
17th North	66	39.8	94.8	59.9	10.28
17th South	10	49.6	60.1	55.1	3.62
18th South	30	39.6	65.5	50.6	6.08

Length of outer curvature in mms.

13-14th North & South	4	160.0	184.0	172.0	12.75
14-16th South	7	127.0	272.0	176.9	47.45
17th North	21	108.0	522.0	217.5	95.5
17th South	2	190.0	264.0		
18th South	20	125.0	230.0	180.7	25.8

Only the single exceptional specimen from context 77 can be classed as a long horn (Plate 3) and is the first find of this type of animal in the north east. The occurrence of animals with this long horn conformation appears to occur much earlier in southern England, the collections of late mediaeval date from Blackgate, Newcastle, with well over a thousand cattle horn cores produced none of the long horn variety.

Conclusions

This preliminary report has dealt with the domestic food debris and industrial remains from the site. There is evidence in combination with the material from other sites in the city that suggests a change in the pastoral economy of the local catchment area through the late mediaeval and post mediaeval periods. The analysis supports a conclusion that the site has been a tanners or horners for much of the occupation of the site, the traditional interpretation being that of a horners workshop. A more detailed analysis of this collection particularly the evidence for possible stock improvements should perhaps wait upon the decision to excavate the site further.

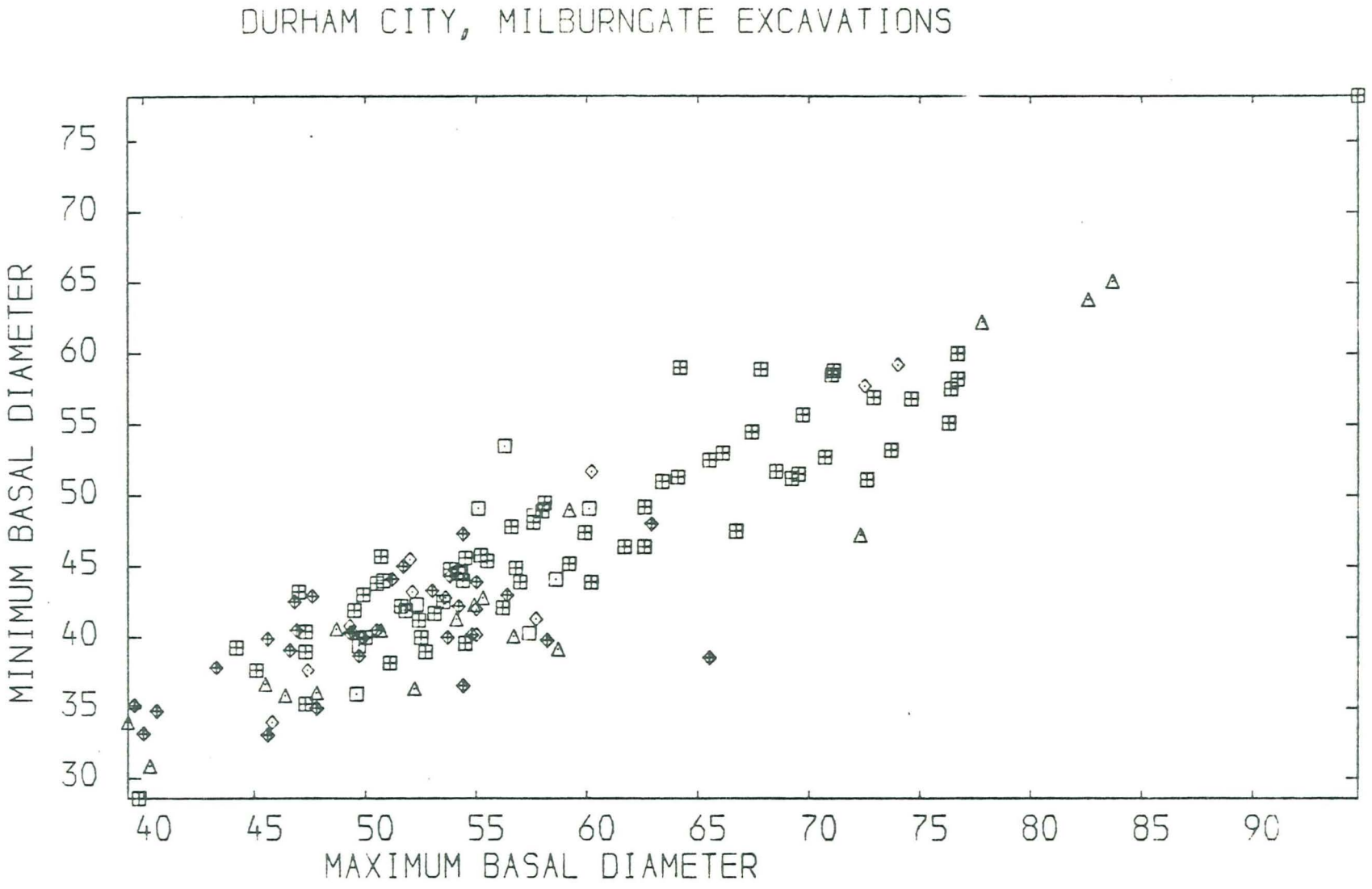


fig.1 graph of the maximum basal diameter against the minimum basal diameter of cattle horn cores from excavations at milburngate, durham city.

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