
6 THE ANIMAL BONE G W I HODGSON AND A JONES

An analysis of animal bone from 42 St Paul Street and Queen Street Midden Area

INTRODUCTION

SUMMARY

The relative frequencies of species and of bones at these two medieval sites within the burgh of Aberdeen have been compared with a view to understanding the diet and some of the economic activities of the people. Evidence has been advanced to show that beef was the major source of meat and hides may have been the primary product of cattle raising.

Mutton, goat and pig flesh were also eaten but venison was not in plentiful supply. Bird and fish were eaten but these remains have not been identified as to species. The marked differences between the killing patterns of sheep and goats for the two sites are examined. Prime lamb and young mutton were consumed in greater proportions at 42 St Paul Street as was younger beef. Carcass analysis suggests that the best joints or cuts of beef and mutton were consumed at this site.

At the Queen Street site low meat yield bones and fish remains were more frequent: this may reflect the close proximity of this site to the fish and meat markets.

The sizes of the bones of cattle, sheep, goat and horse fall mainly within the size ranges of these animals reported for medieval Perth. These data confirm the existence in medieval Scotland of cattle, sheep and horses which were smaller in stature and more gracile than their counterparts in medieval England and Holland.

Some large pig bones have been reported on; these may have come from wild boar. The remains of dogs, puppies, cats and kittens have been described. It is argued that some of these animals may have been only loosely associated with the community and have lived a semi-feral existence.

At both sites the number of horn cores of cattle, sheep and goat is less than the number of half mandibles. It seems unlikely therefore that horn cores were imported to either site or that the material represents commercial or industrial waste specifically associated with a horn industry. A single horse metacarpal from 42 St Paul Street was identified as an ice-skate (Cat No 26: Ill 104).

MATERIAL

The animal remains from two sites within the medieval burgh of Aberdeen are reported on according to site, feature and date. The sites are 42 St Paul Street and Queen Street Midden Area.

METHODOLOGY

Identification

The material was identified as to species and bone by direct comparison with modern comparative material. No attempt was made to identify or to record rib fragments, butchers' chippings or vertebrae other than the first two neck vertebrae.

Boessneck's (1964, 1-129) and Payne's (1969, 295-305) criteria were applied to sheep and goat remains in order to distinguish them. Erosion often made this distinction impossible, therefore they are recorded as sheep/goat.

The bones of birds have been identified only as to bone and not by species. The fish bones have not been identified as to species.

Measurements

Measurements were taken in accordance with the scheme proposed by Driesch (1976). These data are lodged in the National Archive at Edinburgh.

Nomenclature

The zoological nomenclature adopted is in accordance with that recommended by Clutton-Brock (1977). For this reason no attempt is made to relate the animal remains to distinct breeds of animals found in Scotland today.

DISCUSSION OF THE MATERIAL

NUMBERS OF BONES IDENTIFIED

Table 35 Numbers of bones identified from each site (excludes fish bones)

42 St Paul Street	Total
Phase 2 (late 12C)	46
Phase 3 (late 12C/early 13c)	99
Phase 4 (13C)	79
Phase 5 (13C)	62
Phase 6 (13C)	19
Phase 7 (1300-1325)	214
Phase 8 (14C)	272
Phase 9 (14C)	474
Phase 10 (14C)	232
Overall total	1,497
Queen Street Midden Area	
Phase 1 (13C)	142
Phase 2 (14C)	784
Overall total	926

SPECIES PRESENT

The following species were present at both sites: cattle, sheep/goat, pig, horse, red deer, dog, cat, bird and fish. There is no evidence of small mammals which is surprising in view of the numbers of small fish bones retrieved.

RELATIVE FREQUENCIES OF SPECIES AS A GUIDE TO DIET

Two methods have been adopted to estimate the contribution of species to diet. These consist of estimating (a) the minimum number of each species present and (b) the percentage of bones from each species present.

Minimum number of animals present

The minimum numbers of each species present at each site are shown in Tables 36a and b.

Table 36a The minimum number of each species present: 42 St Paul Street

Species	Min number	Based on
Cattle	29	Left metatarsal
Sheep/goat	13	Left humerus
Goat	16	Left horn core
Pig	7	Left humerus
Horse	3	Right humerus
Red Deer	2	Right radius
Cat	3	Right innominate
Dog	2	Right mandible
Bird	6	Right femur

Table 36b The minimum number of each species present: Queen Street Midden Area

Species	Min number	Based on
Cattle	16	Right metatarsal
Sheep/goat	9	Right scapula
Goat	6	Right horn core
Pig	12	Left tibia
Horse	1	Left/right metatarsal
Red Deer	1	Left radius
Cat	1	Right ulna
Dog	2	Right mandible
Bird	5	Right humerus

These data indicate the important role of cattle in the economy of both sites. The relatively high numbers of goats may be due to some kind of industry such as horn production. The numbers of cattle are estimated from metapodials which are low meat yield bones therefore they too may be associated with an animal based industry such as the production of neats foot oil and gelatin from hooves or they may be the result of carcass dressing.

The ratios of cattle:pig are strikingly different at the two sites, being 4:1 at 42 St Paul Street and 4:3 at Queen Street. The higher ratio reported at the former site, which is well removed from the market area, suggests that it was a richer part of the burgh. At the medieval High Street sites of Perth (Hodgson 1979) and Elgin (Hodgson and Jones forthcoming) the cattle:pig ratios were 5:2 and 1:1 respectively. The ratios of cattle:sheep and goat are almost the same at both Aberdeen sites (1:1). The ratios at Perth High Street and Elgin High Street are 1:1.1 and 0.75:1 respectively.

The minimum numbers of animals estimated for each phase are given in Table 37a and b.

Table 37a Minimum numbers of animals estimated for each phase: 42 St Paul Street

Phase	Cattle	Sheep/ goat	Goat	Pig	Horse	Deer	Cat	Dog	Bird	Date
2	3	1		1	1					late 12C
3	3	2	1	2	1	1			1	late 12C/early 13C
4	2	2	2	1			1	1	2	13C
5	6	1	1	1	1				1	13C
6	2	1		1						13C
7	5	3	1	3	1	1	1	1	2	1300-1325
8	5	3	4	2	1	1	2	1	2	14C
9	10	6	3	4	2	1	1	2	2	14C
10	5	4	2	1	1	1	1	1	1	14C

Table 37b Minimum numbers of animals estimated for each phase, Queen Street Midden Area

Phase	Cattle	Sheep/ goat	Goat	Pig	Horse	Deer	Cat	Dog	Bird	Date
1	5	3	4	2		1	1	1	2	13C
2	14	9	3	10	1	1	2	1	4	14C

These and other data reflect the heavy economic reliance of the burgesses of Aberdeen and other medieval Scottish burghs, for example Perth (Hodgson 1979) and Elgin (Hodgson and Jones 1979) on cattle. Cattle were a source of meat, milk, blood (iron), horn, neats foot oil, bone, gut, leather, sinew and fat. Fat would provide tallow for candles, and act as a source of food. The crown derived revenue from the export of hides and wool-fells (sheep skins with the wool on them) (Dickinson 1961, 111) and these commodities could only be legally exported from royal burghs such as Aberdeen, Elgin, Perth and Dundee. The royal burghs had a monopoly which was protected by law. Cattle normally came to market alive, ‘on the hoof’, and were slaughtered within sight of the Flesh Market Cross.

The remains of cats and dogs apparently all came from domestic animals which may have belonged to the community rather than have been individually owned. Some of the cats may have led a semi-feral existence while the dogs may have roamed the burgh rather like the pariah dogs in Indian villages. Both animals would serve the community as scavengers and by keeping down rats or mice. There is no evidence to suggest either animal was eaten because their bones were not smashed for marrow extraction. Documentary evidence exists to show that there was a considerable import trade in dog skins at London, the skins being Scottish in origin (Record Office (Kew) Manuscript Customs 3, Vol I, part 2, 48). Horses, being valuable animals as a means of transport and traction, were probably raised for these purposes. On death they would be available as food if only to feed dogs and other animals. Armitage (1978, 33) has cited evidence to show that in medieval London the Church forbade the eating of horseflesh by humans.

The birds have not been identified as to species but they range from those which were as large as geese or swans to those as small as pigeons. The bird bones probably constitute the remains of animals eaten as food.

Percentages of bone present

The percentages of deer bones fluctuate from phase to phase but, perhaps surprisingly, the highest percentage at 42 St Paul Street is in Phase 10 (mid-14th century). Deer were subject to the Justinian Law of *res nullius* and as such were the property of no man and could be hunted across another man’s land. Gilbert (1979, 227-34) has traced the erosion of *res nullius* in Scotland from the 12th century when it was almost universally observed to the 14th and 15th centuries when the commoners lost access to a place to hunt rather than the right to hunt. This may have been more true of lowland burghs where the problems of deforestation and overhunting also reduced the amounts of venison available to the burghs.

The Queen Street site was near to both the Flesh Market and the Fish Market crosses while 42 St Paul Street was at a distance from them (Ill 130) yet the percentages of cattle bones at both sites remains fairly constant (Table 38a and b). This may be indirect evidence for supposing that the animal remains represent domestic refuse rather than commercial waste from butchery or hide preparation. Perhaps, significantly, the Queen Street site was rich in fish bones whereas they were present in only small amounts at 42 St Paul Street.

Table 38a Percentages of bones for each species, 42 St Paul Street

Phase	Cattle	Sheep/ goat	Pig	Horse	Deer	Dog	Cat	Bird	Date
2	84.8	8.7	2.2	4.3					12C
3	58.6	21.2	11.1	3.0	2.0			4.0	12C/13C
4	44.3	16.4	8.9			1.3	12.7	16.4	13C
5	79.0	9.7	8.1	1.6				1.6	13C
6	89.4	5.3	5.3						13C

Phase	Cattle	Sheep/ goat	Pig	Horse	Deer	Dog	Cat	Bird	Date
7	70.1	14.5	9.3	1.4	1.9	1.4	0.5	0.9	1300-1325
8	58.4	18.8	9.6	1.1	2.6	1.1	4.4	4.0	14C
9	65.2	22.3	8.4	1.1	0.5	0.7	0.9	0.9	14C
10	67.2	21.1	5.6	1.7	2.6	0.4	0.4	0.9	14C

Table 38b Percentages of bones for each species, Queen Street Midden Area

Phase	Cattle	Sheep/ goat	Pig	Horse	Deer	Dog	Cat	Bird	Date
1	62.7	16.2	7.7		2.8	0.7	2.8	7.0	13C
2	51.6	26.0	13.5	0.3	0.8	1.8	0.9	5.1	14C

Tables 37 and 38 show a shift towards a pig based economy in the 14th century at Queen Street. Such a shift is often associated with times of economic hardship. It is tempting to speculate that the national economic crisis caused by the need to raise a ransom for David II's return would have triggered off such a change in dietary habit but the shift towards pig flesh in the 14th century is not reflected at 42 St Paul Street.

The overall percentages of bones for the main food forming species excluding birds and fish are given in Table 39.

Table 39 Percentages of bone of main food bearing species

	Cattle	Sheep/ goat	Pig	Horse	Deer	Date
42 St Paul Street	68.8	19.5	8.5	1.6	1.5	12C-14C
Queen Street	58.1	26.7	13.7	0.2	1.2	13C-14C

A breakdown of the Queen Street data into two phases (Table 40) shows a dramatic shift from cattle to sheep/goat and pig from the 13th to the 14th century but there is no parallel at 42 St Paul Street.

Table 40 Percentages of bones of main food bearing species by phases at Queen Street Midden Area and 42 St Paul Street.

Queen Street, Midden Area

Phase	Cattle	Sheep/ goat	Pig	Horse	Deer	Date
1	70.1	18.1	8.7		3.1	13C
2	56.0	28.2	14.7	0.3	0.8	14C

42 St Paul Street

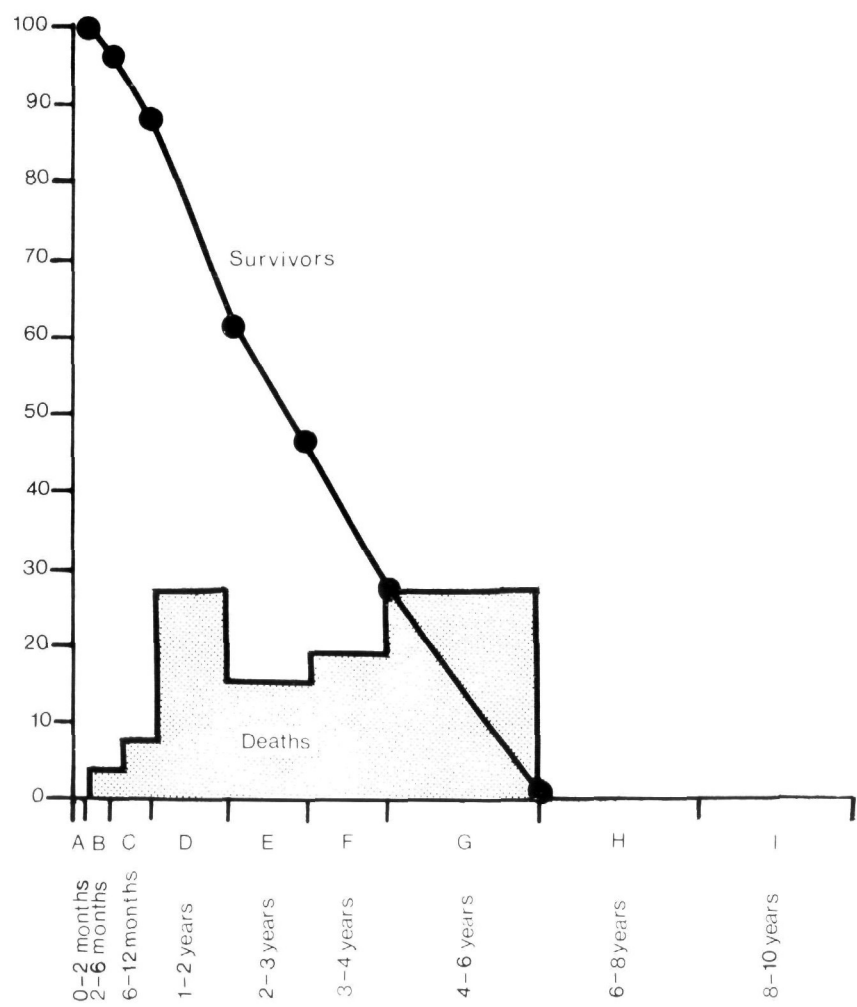
Phase	Cattle	Sheep/ goat	Pig	Horse	Deer	Date
2	84.8	8.7	2.2	4.3		12C
3	61.1	22.1	11.6	3.2	2.1	12C/13C
4	63.6	23.6	12.7			13C
5	80.3	9.8	8.2	1.6		13C
6	89.4	5.3	5.3			13C
7	72.1	14.9	9.6	1.4	1.9	1300-25
8	64.6	20.7	10.6	1.2	2.8	14C
9	66.9	22.8	8.6	1.2	0.4	14C
10	68.4	21.5	5.7	1.8	2.6	14C

AGES OF ANIMALS ON SLAUGHTER

Cattle

Evidence derived from the eruption and wear of teeth and from the frequency of certain long bones which lack fused articular surfaces suggests that most of the cattle were at least five years old when killed.

Specifically, on the assumption that the third permanent lower molar did not begin to wear until after the age of five, it appears that 93.7% of cattle from the Queen Street site (14th-century levels) and 83.3% from 42 St Paul Street were at least five years old when they were slaughtered. Clutton-Brock (1976, 21) argues that, in a medieval context, cattle were not slaughtered until they were mature (between 5 and 6 years old) in order that the hides were in optimum condition.



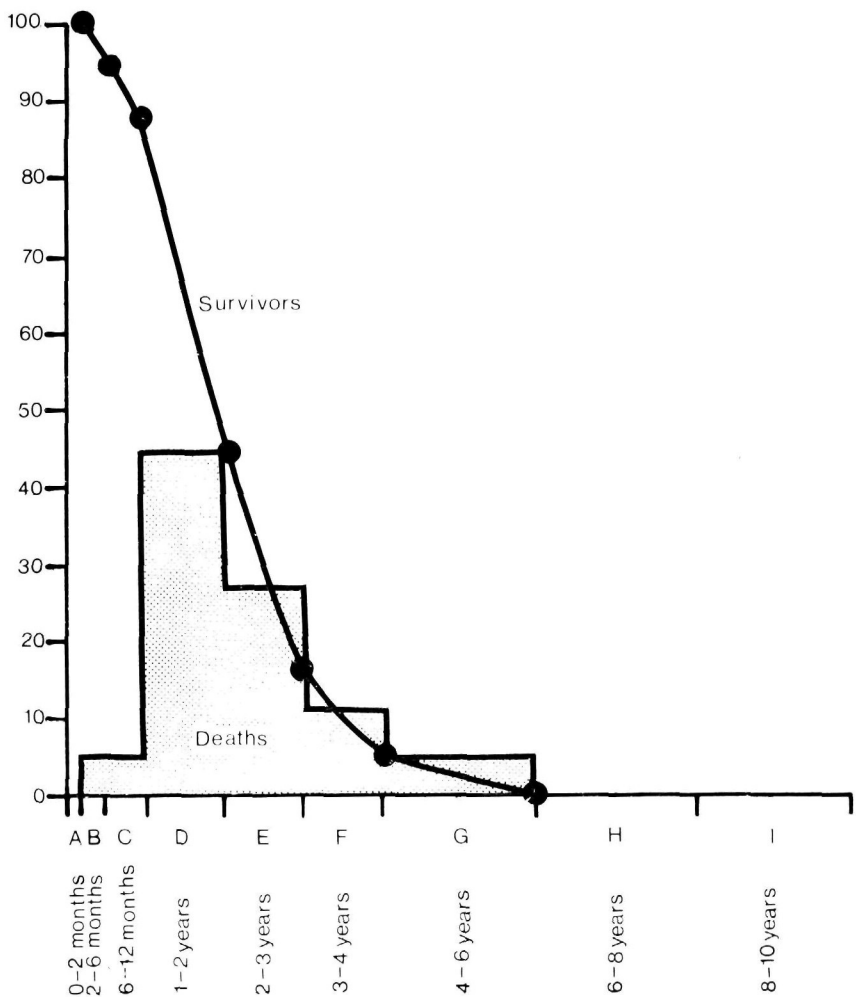
n = 28		A	B	C	D	E	F	G	H	I
%	Deaths	—	3.8	7.7	26.9	15.4	19.2	26.9	—	—
%	Survivors	100	96.2	88.5	61.6	46.2	27.0	0.1	—	—

Ill 128 : Animal bone. The kill-off pattern of sheep and goats. Queen Street Midden Area (after Payne, 1969)

The late killing ages reported for both sites are taken as evidence that the cattle were raised primarily for the production of hides and that meat was merely a by-product. 12.5% of the cattle at 42 St Paul Street were killed between the ages of 4 and 5 years while only 4.2% died under the age of nine months.

Sheep and goats

In our present state of knowledge it is not possible to distinguish sheep and goat mandibles. The ages of death (culling) of the sheep and goats was assessed by applying Payne's criteria (1973, 281-303) to the teeth in the lower jaws (mandibles). The killing curves for the two sites are markedly different and may reflect a different standard of living at them (Ill 128, 129). The 42 St Paul Street site shows a higher incidence of sheep aged between 1 and 3 years old, ie of prime lamb and young mutton.



n = 18		A	B	C	D	E	F	G	H	I
%	Deaths	—	5.6	5.6	44.4	27.8	11.1	5.6	—	—
%	Survivors	100	94.4	88.8	44.4	16.6	5.5	0	—	—

Ill 129 : Animal bone. The kill-off pattern of sheep and goats. 42 St Paul Street, medieval levels (after Payne, 1969)

These animals would include the castrated male lambs and possibly some young ewes which were not able to hold the service.

The Queen Street site shows a higher incidence of older mutton, ie animals aged between 3 and 6 years of age. The animals probably represent barren ewes or those which had become broken mouthed or otherwise prevented from remaining part of the breeding stock.

Pig

The pig mandibles were aged according to criteria proposed by Silver (1963, 264). The distribution by age and site is given in Table 41.

Table 41 Frequencies of pigs by age and site

	Ages of Pigs			
	>3 years	2-3 years	1½-2 years	<1 year
Queen Street	33.3%	16.7%	50.0%	—
42 St Paul Street	50.0%	8.3%	25.0%	16.7%

The presence of young pigs including piglets is limited to 42 St Paul Street, this agains suggests that this site was a richer area than Queen Street. At 42 St Paul Street the oldest pigs occurred in Phases 7 and 9 while piglets occurred in Phase 10. These were all 14th-century levels.

Horse

There is no evidence of young horses being killed or dying at Broad Street but at 42 St Paul Street a single horse femur was from a young animal. A half mandible had the third permanent molar in wear and presumably came from an animal approaching five years of age.

Deer

There is no evidence of young red deer at either site; all the cervine remains apparently came from mature animals.

Dog

26 dog bones were recovered; 11 from 42 St Paul Street and 15 from Queen Street. The latter included 3 half mandibles from puppies, these being the only evidence of young dogs. The puppy jaw bones came from a 14th-century midden area.

Cat

There is evidence of young cats being killed at both sites. More cat bones were recovered from 42 St Paul Street. The percentage of cat long bones with unfused articular surfaces (ie young cats) from this site are shown in Table 42.

Table 42 Percentages of cat long bones with unfused epiphyses at 42 St Paul Street

Bone	No	% Unfused	Articular surface
Humerus	5	20	proximal end
Femur	4	50	proximal end
Tibia	5	40	distal end

At the Queen Street site, two out of seven cat long bones lacked fused articular surfaces.

SEX, SIZE AND TYPE OF ANIMALS

Cattle

11 horn cores from the Queen Street site and 27 from 42 St Paul Street were assessed as to sex in accordance with the scheme proposed by Armitage and Clutton-Brock (1976, 331-2).

Most of these horn cores apparently came from oxen and a few came from cows. None of the horn cores were attributed to bulls.

Most of the cattle bones fall within the size ranges reported from the medieval levels at Perth High Street (Hodgson 1979). In thirteen cases the lower limits of these size ranges are extended by the Aberdeen cattle while in only four cases the Perth upper limits are exceeded. These few larger bones are a scapula, a radius, a metatarsal and an atlas vertebra which are all wider than similar bones from Perth.

Even with these exceptions the bones appear to come from small, light boned cattle probably of a Celtic shorthorn variety.

Sheep/goat

The bones of the two species, apart from horn cores, are treated together because they are eroded and therefore difficult to distinguish on the basis of Boessneck's (1964, 1-129) criteria.

Five skull or major skull fragments of sheep were all horned. No polled skulls were found. It is assumed that roughly equal numbers of male and female lambs were born and that most of the male lambs were castrated in their first year. In some primitive breeds of sheep the presence of horns is not sex limited therefore the presence of horns cannot be taken as a guide to sex.

None of the horn cores were sufficiently entire to be assessed as to sexual status by Hatting's method (1975, 345-51). No evidence of four-horned sheep was found. The long bones are mainly within the size ranges reported from the medieval levels of the High Street site at Perth (Hodgson 1979) and seen to have come from small spindly legged animals. Four bones are narrower than any reported from Perth, these being a scapula, a humerus, a metacarpal and a metatarsal.

Four bones were wider or longer than the Perth material but they may have come from goats rather than sheep. Two types of goat horn cores were found, these were a large scimitar type and a second, shorter, straight spiked type. These compare in size and shape with the two types of goat horn core reported from Perth (Hodgson 1979) and interpreted by Ryder and Woolliams (1978 pers comm) to be males and females of the same variety rather than different breeds.

Pig

It is not possible to distinguish male and female pigs by direct measurement (Armitage 1978, 95) mainly because pig bones recovered from archaeological sites are eroded. No sexual differences could be detected in the lower canines because of damage by butchery.

The presence of large pig bones is often taken to indicate the presence of breeding boars whether wild or domestic. Three pig bones are significantly wider than those reported from the medieval levels at Perth High Street (Hodgson 1979) and may be from such animals. The bones are: a scapula (G.L.P. = 3.1 cm), a femur (Bd. = 4.6 cm) and a tibia (Bd. = 3.3 cm). Whether these bones came from wild or domestic animals is impossible to say but they do come from large pigs in a Scottish medieval context. When pigs were put out into the forests for *pannage* to feed on mast and acorns they would have been serviced by wild boars therefore it seems unlikely that large domestic boars would have been kept locally.

Horse

Only 20 horse bones were recovered. One of these was a half mandible (lower jaw) which lacked a canine and therefore may have been female. The horses were apparently small in stature, ranging in size from a pony to a small horse. There were no signs of large draught animals being present.

Deer

The deer remains were all from red deer. Several fragments of skull bearing antlers indicate that male deer were hunted. None of the deer remains are from large animals.

Dog

No evidence as to the sex of the dog remains is available. Two heavily butchered skulls were recovered; one being a small domed skull, the other being a long skull bearing a long narrow muzzle.

Cat

No evidence as to the sex of the cats is available. None of the remains came from wild cat.

CARCASS ANALYSIS

The frequencies of bones of cattle, sheep/goat, pig, horse and deer arranged by species are shown in Tables 43mf and 44mf. From this data it is possible to compare the numbers of high meat yield bones (ie joints or cuts of meat) with those of low meat yield bones. High ratios seem to indicate a higher standard of living while low ratios suggest that carcasses were butchered or dressed near to the site and the better joints were exported from it.

When the ratios of the numbers of femur, humerus, tibia and radius (high meat yield bones) are compared with the number of mandibles (low meat yield bones) the higher ratios for cattle and sheep are obtained for 42 St Paul Street. It seems that the inhabitants of this site were better off than those of the Queen Street site.

Pathology

None of the bones examined showed any signs of disease or injury sustained during life.

Butchery

None of the bone or horn cores shows signs of having been sawn. Where bones are broken this has been achieved by chopping blows. There were no signs of knife marks on bones as would be expected if metapodials (cannon bones), scapulae (shoulder blades) and innominate (aitch) bones had been 'boned out' with a knife.

Whole skulls are lacking, even those of dogs have been smashed.