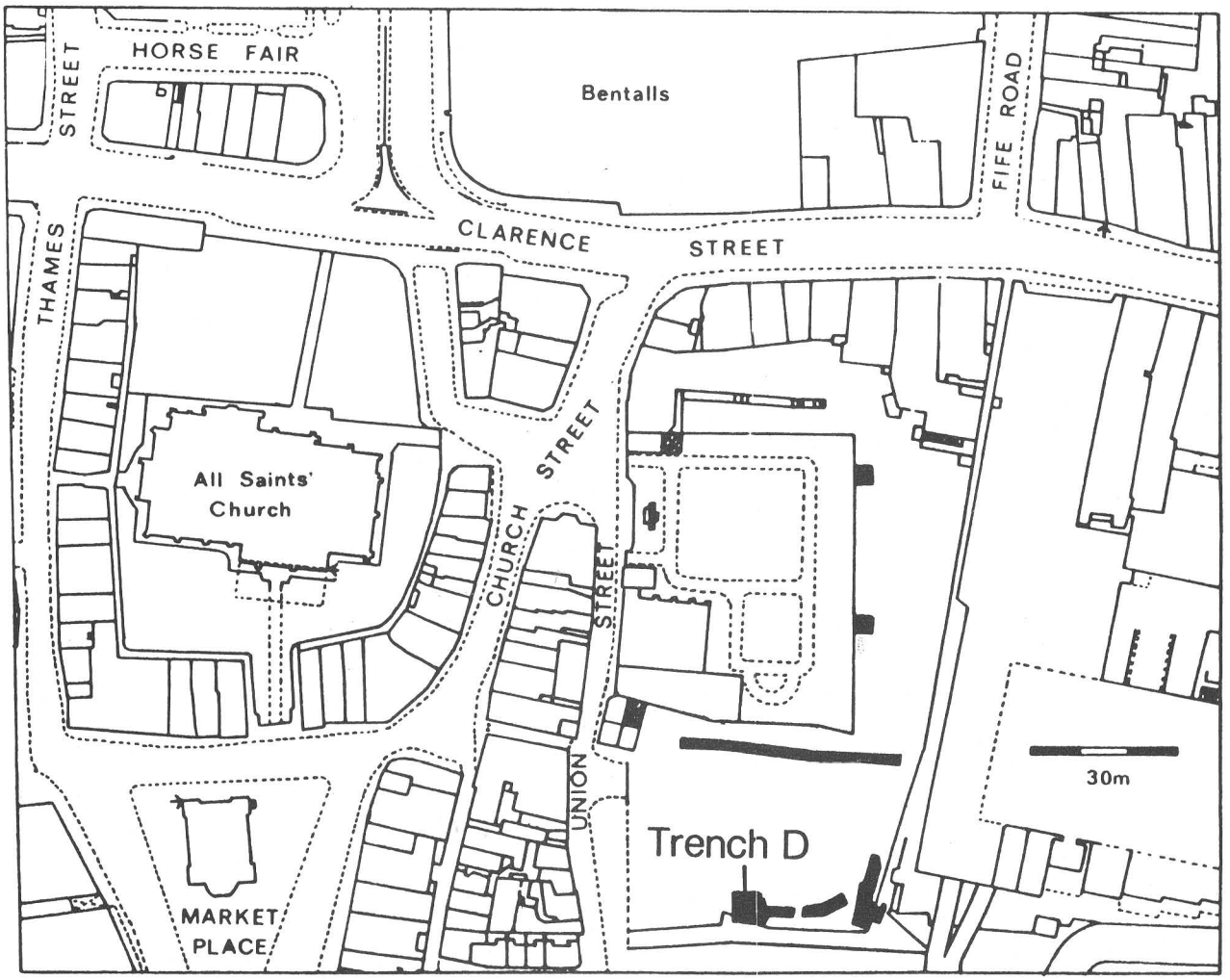

Fig. 1: plan of Kingston showing the location of the Knapp Drewett site.

Veal and calfskin in eighteenth century Kingston?

DALE SERJEANTSON
TONY WALDRON
SCOTT MCCRACKEN

ANIMAL BONES excavated in Kingston in 1982 provide evidence for how cattle raising was managed in the 18th century. The restricted character of the bones illuminate how specialised urban trades and crafts were at that time.

The excavations at the Knapp Drewett site in Kingston (Fig. 1) were centred mainly on a medieval kiln found at the east end of the site. Trench D, at the west end of the site, contained few features beyond a fairly large, shallow pit (feature 41), which contained brick and tile rubble in the upper layers (F73 and 74) and a very distinctive assemblage of animal bones in the lower layer (F75). The pottery and clay pipes indicate a date in the 18th century.

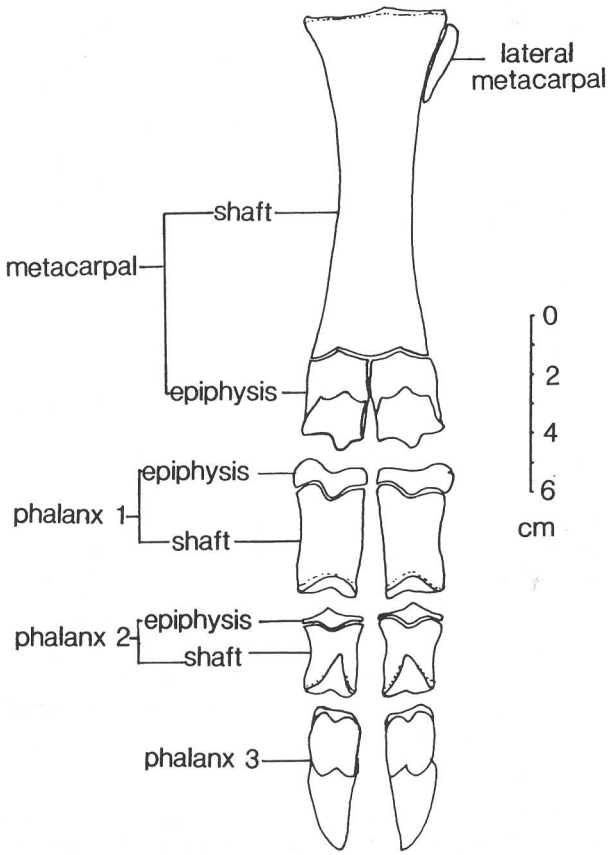

Fig. 2: the bones of the lower front leg of a calf of three months. The dotted lines indicate the point at which the epiphyses separate from the shaft.

There were no other finds which suggested possible uses of the site in the 18th century, and study of the early maps and documentary evidence for the area indicate that the plot, which lay between Brick Lane, later Union Street, on the west and Eden Street on the east was open ground with barns and sheds. The land was used by tradespeople with premises in Market Place and Church Street. In the 18th century trades in Brick Lane included a butchers, a cooperage and a slaughterhouse. In the early 19th century the plot, no. 2046 on the 1840 tithe map[1], together with the adjacent one, no. 2048, was described as a "house, cowhouse and yard"[2], and by 1830 it belonged to Leney's dairy[3].

The 981 animal bones recovered from the pit include 924 bones from the shin and feet of cattle. They are all clearly from calves of much the same age. The stratigraphy suggests that they were discarded in the pit in a single episode. Part only of the pit was excavated; the west and south sides were truncated by a concrete beam and a brick wall built at the beginning of this century, so an unknown portion of the pit and its contents has been destroyed. The maximum dimensions as it survived were 0.9m × 0.7m × *c*0.6m deep, and about ⅔ of this was emptied. When they were excavated it was noted that some of the feet were articulated. In addition to the calf foot bones, there were 31 lower leg and foot bones of other species, and some fragmentary chopped bones which appear to be food remains; they are listed in the site archive. Groups of metapodials or of metapodials and phalanges have been found at other sites, of which the best example is another 18th century assemblage, that from Walmgate, York, where hundreds of foot bones of sheep were recovered[4]. However, we have seen no published reference to a collection of foot bones almost exclusively from calves.

The shin and footbones of a calf are illustrated in Fig. 2, and the numbers of different bones present are shown. The lower leg consists of a metapodial, a metacarpal on the front leg and a metatarsal on the hind leg, and a small lateral metacarpal and metatarsal. There are two first, two second and two third phalanges (hooves). In juvenile mammals the ends (epiphyses) of some bones are joined to the shaft of the bone with cartilage: this allows the bone to grow in length. The cartilage does not survive in the ground, so that the unfused epiphyses separate from the shaft. The points at which the epiphyses separate from the shaft are also shown.

The numbers of the different bones are set out in Table 1. If we take into account relative numbers in the bovine skeleton, the most numerous bone is the metacarpal, of which 58 were present. The second column gives the number of bones expected,

bone	(1)	(2)	(3)
metacarpal (shaft)	58	58	100
lateral metacarpal	14	58	24.1
metatarsal (shaft)	55	58	94.8
metapodial (half epiphysis)	171	232	73.7
1st phalanx (epiphysis)	120	232	51.7
1st phalanx (shaft)	182	232	78.4
2nd phalanx (epiphysis)	69	232	29.7
2nd phalanx (shaft)	122	232	52.6
3rd phalanx	133	232	57.3
	924		

Table 1: numbers of calf foot bones from pit 41 at the Knapp Drewett site. Column (1) shows the numbers of bones present. If the number of bones in the skeleton is taken into account, the metacarpal (58) is the most numerous bone. Column (2) shows the expected numbers of each bone based a minimum number of 29 animals, and column (3) shows the percentage of the expected number present.

1. Surrey Record Office 474 and tithe map of 1840.
2. Kingston Borough Records KG3/2/48.
3. G. Aycliffe *Old Kingston* (1914) 32-3.

assuming a minimum of 29 animals, and the third column shows the relative percentages of the other bones. The epiphyses of the metapodials have been counted as a single group, as have the front and rear phalanges.

On the face of it, very different numbers of the different bones are present. The metapodials, the largest bones, are most numerous, and next is the second largest bone, the shaft of the first phalanx, with 78% of the expected number. The least numerous bones are the lateral metacarpal (24%) and the smallest bone, the epiphysis of the second phalanx, of which 30% are present. the discrepancy could be because some bones were discarded elsewhere. However, some at least of the feet were found complete, and there are discrepancies between numbers of shafts and their epiphyses, though the epiphyseal surfaces are sharp and fresh, showing that the bones were complete when discarded. None of the sesamoid bones, which lie in the tendons at the back of the bone, is present. They may have been removed with the tendons; but they are very small and porous in a three month old calf, and are unlikely to have survived. The relative numbers of bones present are closely related to the size of the bone, so the explanation probably lies partly in differential survival. Smaller bones, and particularly thinner bones such as the phalangeal epiphyses are more vulnerable than stouter bones to destructive organisms in the soil and adverse chemical conditions. Part of the discrepancy will be the result of differential recovery of the bones, especially as the pit was not sieved; many of the smaller bones would look like stones to the untutored eye. However, though sieving the deposits would clearly have increased the numbers of smaller bones in the sample, as it did at Walmgate[4], it would not significantly have added to the information which the bones provide.

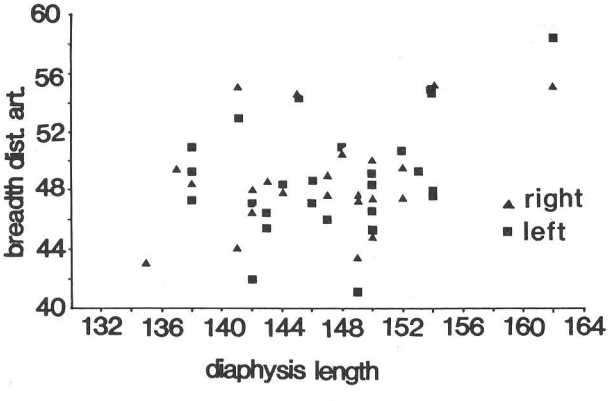

Fig. 3: scattergram of measurements of the metacarpal shaft. The length of the shaft, minus the epiphyses, is plotted against the breadth of the bone at the fusion line.

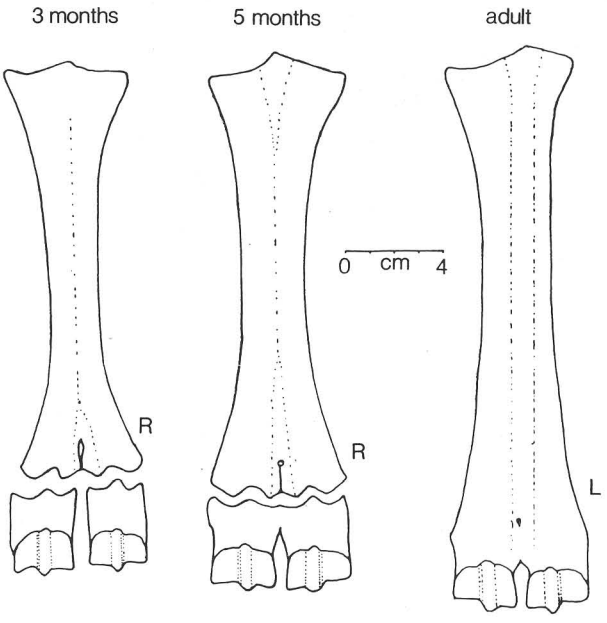

Fig. 4: metatarsals of calf of three months, five months and adult, showing stages of fusion of the distal epiphyses.

Age at death of the calves

In order to estimate the age at death of the calves from which these foot bones came, the state of fusion and the appearance of the bones was considered. As both the length and breadth of the metapodials was quite variable (Fig. 3), size was not a useful guide to age. With the exception of the epiphyses which fuse before birth, all the epiphyses in the assemblage are unfused. Veterinary textbooks[5] give 15 –18 months as the age of fusion of the second phalanx and 20 –24 months for the first phalanx. As none of the bones in this sample had begun to fuse, they are from cattle younger than 18 months.

The bones were compared with those of a newborn calf and calves of two, three, and five months. In the three month calf the two condyles of the distal epiphysis of the metapodials are separate and in those of the five month calf they have united (Fig. 4). None of the pairs of condyles in the Kingston group has united. The articulating surfaces of all the metapodials in the archaeological group

4. T. P. O'Connor 'Selected groups of bones from Skeldergate and Walmgate' *The Archaeology of York* **15** Fascicule 1 (1984) 30-42.

5. S. Sisson & L. Grossman *Anatomy of the Domestic Animals* (4th edn., 1956) 748; K-H. Habermehl *Die Alterbestimmung bei Haus- und Labortieren* (2nd edn., 1975) 104.

are less porous and more distinctly formed than those of the five month old. The comparison shows that the Kingston foot bones are from animals between three and five months, probably nearer the former than the latter age.

Cattle management in the 18th century

An assemblage of bones of cattle of this restricted age range cannot be representative of the cattle slaughtered in Kingston in the 18th century, but must be a highly selected group of the animals killed. The explanation for the restricted age range lies in how cattle were managed at the time. The end of the 18th century and the beginning of the 19th was the time of agricultural 'improvements'. Young's *Tours*, especially the *Six Weeks Tour through the Southern Counties*[6], Marshall's writings[7], and the General Views of the agriculture of the counties round London all contain details of cattle management and the economics of cattle raising as part of their accounts of the agricultural practices the authors encountered.

It is clear that cattle management in the 18th century was highly specialised. Young regularly quotes prices for veal as well as beef and mutton, and also records the economics of butter and cheese manufacture. In the counties around London different farmers specialised in different products. Of the three main types of cattle husbandry, dairying was the most profitable, veal production the next, and raising beef cattle the least[8]. However, the value of the three fluctuated against each other, and in the early 19th century it was stated that "The profit of a cow, in the present high price of all kinds of food, would not be very great, unless the milk were sold well diluted with water"[9]. In the country, dairy farms were managed to produce cheese and butter for sale. On these farms the cows calved annually, and the calves were sold at about a week old to farmers who specialised in raising calves for veal or bullocks for meat.

Urban dairies developed in the towns and round the fringes of London in the 17th century. They were established mainly to produce liquid milk for the London market, and "quantity, independent of quality, is their object"[8]. The urban cow keepers bought cows when they were three or four years old and in calf. These too calved annually and would "stand to the pail for nine months"[10] or longer. In the most specialised dairies, the calves born each year were sold at a few days old to graziers, who raised them for veal, but some dairies raised their own veal calves. In summer, the cows grazed in meadows outside the town, and they received artificial feeding for most of the year. In Kingston itself, Leney, the owner of the dairy in Brick Lane, rented two acres of meadowland at Bonner Hill[3], a mile or so from the dairy, no doubt where the cows grazed.

Veal was in great demand in towns; Surrey farmers specialised in raising calves, and many reared elsewhere were raised in Surrey. They were bought by "calve-merchants, who attend the different fairs, and purchase calves for the Surrey farmers"[9]. In Middlesex "most of the calves bred here are suckled until they are about 10 weeks old, and then sold to the butchers, for the supply of the London and other markets, in the article of veal"[8]. According to Young, calves were raised to 12 weeks of age, and were worth £4 or £5, or 5d a pound[6].

According to the agricultural writers, the ages at which cattle were culled can be summarised as follows. Calves were sold to the butchers for veal at 10 – 12 weeks. Some bullocks were raised solely for the beef market; those which were driven to the markets were three or four years old at death. Cows from the town dairies were kept until they were about seven to nine years old, before being sold for fattening. Even draught oxen were used for a few years only, so that the carcase would still fetch a good price for beef. On the rural dairy farms, and also no doubt on some of the dairies nearer the London market, a dairy cow which had proved to be a good milker was kept to a greater age. These old animals were purchased "at very low prices, to make sausages of"[10].

The descriptions of cattle management in the 18th century make it clear that cattle bones from urban sites will mainly be either of calves slaughtered for veal or of animals slaughtered for beef, which will be at least three years old and usually older. The bones from the pit in Kingston clearly fall into the former category. There is a discrepancy, however, in that they are more developed than those of the three month calf, yet the agricultural reports regularly quote 10 – 12 weeks as the age at which calves were sold to the butcher. Is the age at death of the calves in this sample for some reason not entirely typical? Or is it more likely that the agricultural reports quote the ideal or the best examples in the county,

6. A. Young *Six Weeks Tour through the Southern Counties* (2nd edn., 1792).

7. *A General View of the Agriculture of the County of Essex* by the Secretary of the Board of Agriculture [A. Young] (1807) 270-95.

8. W. Stevenson *A General View of the Agriculture of the County of Surrey* (1794) 519-25.

9. J. Middleton *A General View of the Agriculture of the County of Middlesex* (2nd edn., 1807) 409-27.

10. *Mrs Beeton's Book of Household Management* (1861, facsimile edn. 1982) 408.

and do not in fact report the actual practice of the time?

Butchery evidence

Cut marks on the metapodials show where the foot bones were disarticulated. The proximal ends of the bones have cut marks of two types. There are short linear cuts on the back of the shaft near the articulation. A cut in this region severs the flexor tendon, so that the lower leg can be dismembered. The eminences on the articular surface of about a third of the metacarpals and over half the metatarsals have been nicked, apparently by a knife, used to cut through the joint between the tarsals and the metatarsals (Fig. 5). Two cuneiform bones from the tarsal joint were found with the foot bones, but otherwise carpal and tarsal bones were absent from the assemblage. None of the other calf bones had cut marks on. The sheep metacarpals from Walmgate[4] were also dismembered at the carpal joint, but the relative abundance of the different bones and the lack of cutmarks on the articular surface of the metapodials suggests that some were severed above the joint, as well as through it.

Who threw away the feet?

We have still to consider whether the feet were discarded when the calves were slaughtered or whether they were discarded after being assembled for some other purpose. The bones found were from a minimum of 29 animals and as not much more than half or possibly less of the contents of the pit was excavated, it is likely that the foot bones of as many as 60 animals were discarded in the pit at one time.

Was it a dairyman or a butcher?

In the early 19th century, the Brick Lane plot was a yard associated with a cowhouse, and we have seen that cowkeepers in towns raised the calves born at the dairy until the age of about three months, the age of the bones found. If the plot belonged to a dairy in the earlier century, it seems reasonable to suppose that the bones are from calves which were raised and eventually slaughtered at the dairy, with the feet being discarded because they were part of the carcase. Though this is an attractive hypothesis, there are reasons why we should look for other possible sources for the discarded bones. The number of calves involved is more than would be slaughtered at a dairy at one time. Furthermore, the feet of cattle were of value, so they would not have been thrown away lightly. Nor are they likely to be waste from a butcher's shop, as this would contain bones from a wider range of species.

11. Robert Hunt *Ure's dictionary of arts, manufacturers and mines* (7th edn., 1875-8) **13** 450; *Leather Technicians Handbook* (1983).

12. W. D. John *Modern Shoe Dressing* (1934).

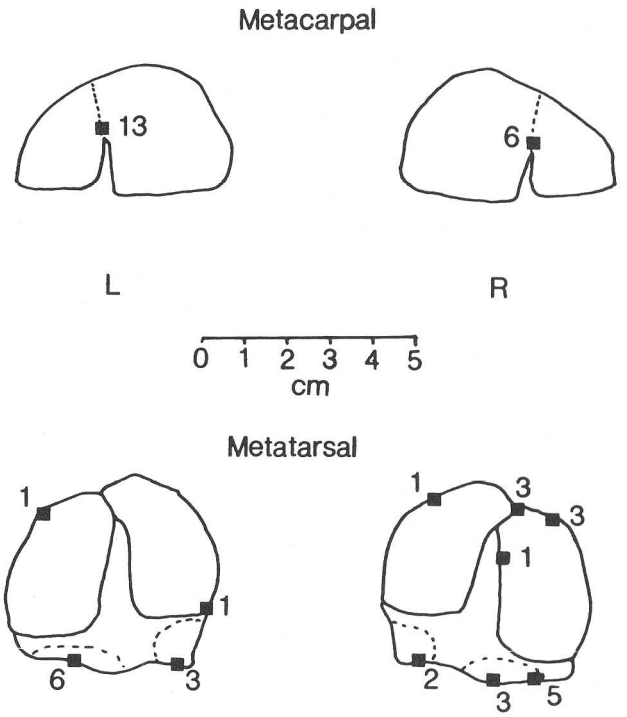

Fig. 5: articular surface of left and right metacarpal and metatarsal, showing location of cuts. The number of cuts is shown.

Calves' foot jelly or neatsfoot oil?

It is possible that the bones were collected for making calves' foot jelly, but this too is unlikely because of the number of bones involved. Calves' feet were cooked for sale in small numbers[11] or in the home, but were not prepared on a commercial scale. To make the jelly "the foot was dehaired and then stewed for three hours" until the bones "come easily away"[10]. But the Knapp Drewett bones were articulated when found, showing that the feet were complete when discarded. Neatsfoot oil is made from the foot bones of cattle, and sometimes the foot bones of sheep and horses may be used as well[11]. The bones are boiled in vats of water to yield a high quality thin yellow oil. In the recent past butchers in the north of England who specialised in the sale of tripe and cows heels also sold neatsfoot oil, for use as a dressing for boots and shoes[12]. Rendering bones for neatsfoot oil is a likely reason for assembling a large number, and may be the origin of the Kingston group. But, as already pointed out, the bones were still articulated and the epiphyses attached to the shafts when the bones were discarded, which would seem to rule out prolonged boiling.

Was it the tanner or fellmonger?

In the past it was common for the skin or hide to

be removed with the horns, tail and foot bones still attached, and delivered to the tanner by the butcher or fellmonger in that condition[13]. A tanner who started work in the 1920s in his family business wrote "The writer remembers when there were horns on the hide when bought and also foot bones but this must have been 50 or 60 years ago at least"[14]. In a watercolour sketch (Fig. 6) made between about 1860 and 1873 of a skin cart from Kingston[15] the feet can clearly be seen on the skins. Leather dressers have traditionally been divided into tanners, who treated the hides of mature cattle and horses, and tawyers who treated the skins of sheep, goats, calves and other smaller animals. In the Middle Ages vellum was made from calf skin, but only skins of calves younger than six weeks were considered suitable[16]. By the 18th century vellum was little used, so the bones are not likely to derive from vellum manufacture. It is very likely however that they are from calf skins, collected over a period from butchers in Kingston and further afield. They would be assembled until a quantity was ready to be sold or treated. At that stage the bones attached to the skins were disposed of[14].

A tanner or a fellmonger is the most likely origin of this assemblage. The sheep foot bones from Walmgate were found in a shallow pit near tanning pits; however as the Brick Lane properties did not have access to a good water supply, it is unlikely that there was a tannery on the site. Historically, in Kingston the tannery was near the River Thames. Perhaps we should invoke an intermediary, a fellmonger, who bought calf skins from butchers and dairymen, and removed the feet before passing the skins on to the tanner.

13. R. Thompson 'Leather manufacture in the post-medieval period with special reference to Northamptonshire' *Post-Medieval Archaeol* **15** (1981) 161-75.

14. J. Baker *pers. comm.*

15. W. F. Freelove *Victorian Horses and Carriages* (ed. D. L. Jens Smith) (1979).

16. G. Peignot *Essai sur l'histoire du parchemin et du vélin* (1812) 27; A. & D. Diderot *Encyclopédie* (1754).

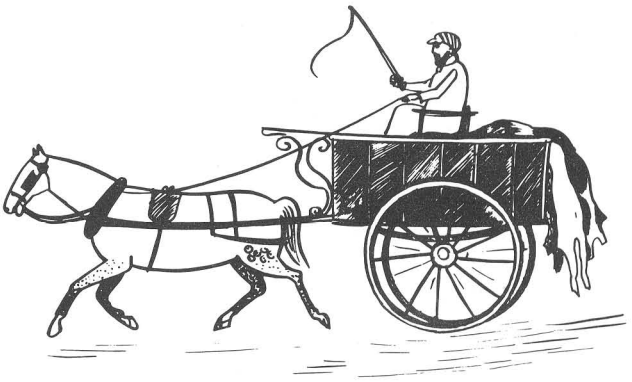

Fig. 6: skin cart, Kingston upon Thames, redrawn from a watercolour sketch by William Freelove between about 1865 and 1873. The feet can be seen on the skins hanging over the back of the cart.

Conclusion

The western area of the Knapp Drewett site where feature 41 was situated appeared to have little archaeological potential, as it was well back from the street frontage and had been subjected to a considerable amount of post-medieval destruction. For this reason the post-medieval pits in the area were sampled only. The animal bones from the pit proved to be of greater importance than was at first realised as they were able to illustrate aspects of economic life in 18th century Kingston. It is a reminder that excavators need to be alert to the significance of groups of bones of a single type, for on urban excavations it is assemblages like these which may be the most informative.

Acknowledgements

We are especially grateful to Joan Wakeford for allowing us to draw on her research into the history of Kingston and to Mr J. Baker, English Oak Bark Tanners, Colyton, Devon, for information about traditional tanneries. We also thank Dr J. Baker, Department of Veterinary Pathology, University of Liverpool, for providing modern reference material; and Mark Bracegirdle, Val Sellins, Jo Jones, Julie Wileman, David Legg and Andrew Penrose who contributed useful information.

Letters

ANNE MOWBRAY

WE WERE VERY interested to read Professor Roger Warwick's description of the skeleton of Anne Mowbray (Vol. 5, 176-9) but we would like to take issue with him over one small matter. When noting that both first metacarpals had distal epiphyses, Warwick (in the caption to Fig. 4) states that this is rare abnormality. A survey of radiographs of the hands of 200 children aged between 4 and 8 years carried out by Weddell in 1939[1], however, showed that 80% had distal epiphyses on their first metacarpal.

When examining bones from archaeological sites we have also found a considerable proportion of juvenile first metacarpals with distal epiphyses from sites ranging in time from the neolithic to the 18th century. It is not possible to give an accurate prevalence since the small bones of the hand often do not survive, but this condition is certainly not rare and has probably not changed its frequency much over time.

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1. G. Weddell, 'The frequency of double epiphyses in the metacarpals and metatarsals of Man', *J Anatomy* **73** (1939) 360.