

Finds from Parliament Street and Other Sites in the City Centre

Dominic Tweddle



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Cover illustration Leather sheath (755) from Parliament Street
sewer trench

Photo: M. S. Duffy



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By Dominic Tweddle

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Introduction

In both the Anglo-Scandinavian and medieval periods the Pavement/Low Ousegate area of York, on the approach to the only bridge over the River Ouse, lay at the commercial heart of the city, and formed one of its most populous and prosperous areas (Fig. 81). Since 1972 the York Archaeological Trust has, therefore, conducted several excavations and watching briefs in the area. Some of these sites have been extremely rich in small finds. Described here are finds from the excavations at All Saints Pavement and St Mary Castlegate, and from the watching briefs at 34 Shambles, the Midland Bank, Parliament Street, and on the Parliament Street sewer trench.

Parliament Street Sewer Trench (Fig. 82, 1)

In Parliament Street, replacement of the Victorian sewer in 1976 provided an opportunity for work in the central area of the city and a systematic watching brief was mounted. As the construction of the Victorian sewer had involved tunnelling between manholes, a considerable quantity of the archaeological levels had remained undisturbed and were

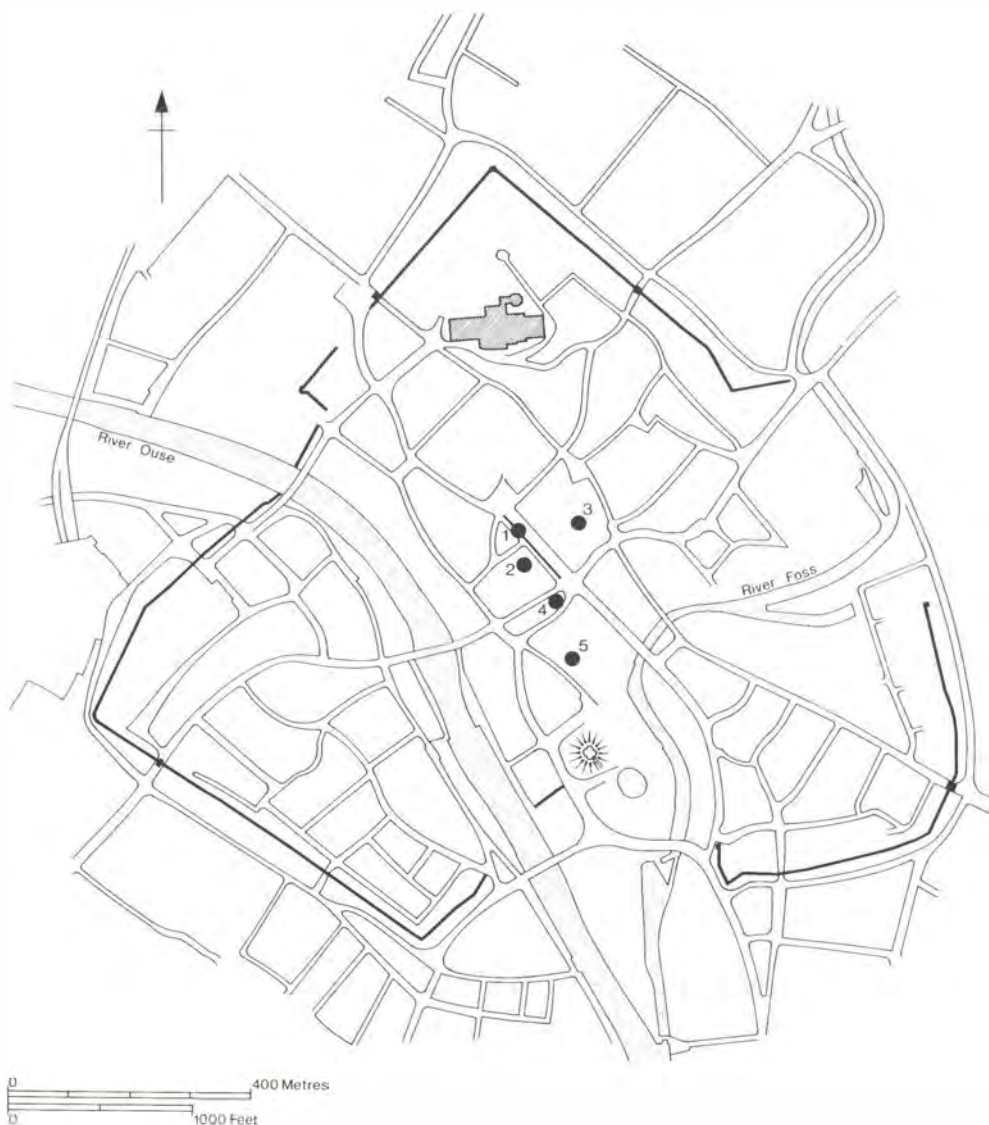


Fig. 81 The city of York showing the location of excavations and watching briefs from which finds discussed in this fascicule have been obtained: (1) Parliament Street sewer trench (1976–77.11); (2) Midland Bank, 11–13 Parliament Street (1971); (3) 34 Shambles (1974–75.12); (4) All Saints Pavement (1975–6.19); (5) St Mary Castlegate (1974–75.25). Scale 1:12,500

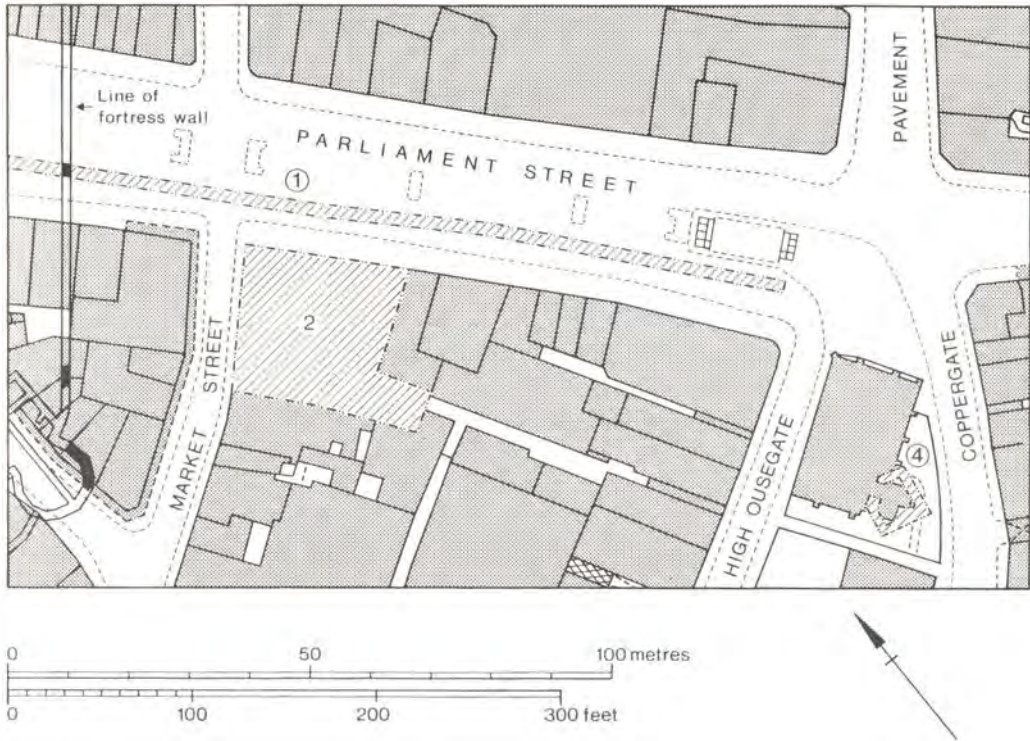


Fig. 82 Plan showing the position of (1) Parliament Street sewer trench; (2) Midland Bank, 11–13 Parliament Street; (4) All Saints Pavement. Scale 1:1,250

removed in the new work. The Roman archaeological sequence is published in AY 3/3 and 6/1, and the Anglo-Scandinavian in AY 8.

Archaeological monitoring of the works began just outside the south-east wall of the Roman fortress, and Roman levels were noted along most of the trench. Outside the Midland Bank, 11–13 Parliament Street, a wall of small gritstone blocks up to five courses high and aligned north-east/south-west was observed. Most of the building with which it was connected apparently lay under the pavement and the bank itself, although this wall bore little relationship to the Roman features recorded there and discussed more fully below. Outside 10 Parliament Street a second wall of mortared small limestone blocks aligned roughly east-west was observed. No dating evidence was recorded for either of these structures. No further structures were noted although quantities of stone, mortar, tile and rubble were present.

Two ditches, also apparently of Roman date, were recorded. The larger, outside 8–9 Parliament Street, was c. 1.2m wide, 2m deep and of flat-bottomed profile. It was aligned roughly north-south and cut into the natural clay, as was the second ditch outside 3 Parliament Street. This was much slighter, being 0.4m deep, 0.6m wide, and of U-shaped section.

Levels of presumed Anglo-Scandinavian date were recorded along most of the trench, the depth increasing towards the valley of the River Foss. Few structures were encountered at the north end of the trench where the area was occupied by large pits, sometimes wicker or timber lined, and by occasional fence posts or lengths of wicker fencing. At the south-east end of the trench timber sill beams of Anglo-Scandinavian date were recognized in association with clay floors and ash and organic spreads, but always after disturbance by the mechanical excavator. The finds were collected from the spoil, principally from the black organic levels of Anglo-Scandinavian date.

Midland Bank, 11–13 Parliament Street (Fig. 82, 2)

South-west of the Parliament Street sewer trench, at 11–13 Parliament Street, undisturbed archaeological layers were encountered in 1971 prior to the reconstruction of the Midland Bank (Fig. 83). Parliament Street was created in 1835 (RCHMY 5, 173) and before this the property had faced north-west on to that part of Jubbergate which is now called Market Street.

In the northern part of the site features of archaeological interest revealed by the foundation trenches were recorded for the Department of the Environment's Inspectorate of Ancient Monuments by J. Hinchliffe. Here levels of Norman and later date had been removed before observation started. Anglo-Scandinavian levels are published in *AY* 8, and Roman material in *AY* 6/1. On the southern part of the site archaeological work by the York Excavation Group involved cleaning the foundation trenches dug by the workmen and recording archaeological features in plan and section. Material recorded here was of post-Conquest date and is reported fully in *AY* 10/2. The pottery is published in *AY* 16/3.

On the northern part of the site the principal Roman features were two parallel lengths of walling approximately 10.5m apart and aligned north-east/south-west. Each was about 0.45m wide and 1.5m long. They were made of neatly coursed limestone blocks facing a rubble core. Between them were at least two layers of cobbling (not marked on the plan) incorporating an inscribed altar (*AY* 6/1, figs. 15–16, pl. VI). Approximately 11m to the west was another fragment of walling of similar type, apparently forming the corner of a structure. The width of these walls suggests that they supported a half-timbered superstructure, but the function of the walls and their dates are unknown.

The foundation trenches did not reveal Anglo-Scandinavian features, but levels probably of this date were found in an area 3.2×6.1 m which was investigated in the north-eastern part of the site. They consisted of an area of clay at least 1.8×1.65 m, bounded on the west by a slot, beyond which was an area of cobbles approximately 2m wide and extending diagonally across the whole of the area. Near its northern edge the clay area was interrupted by two post-holes centred 0.6m apart. These features can be interpreted as the remains of a timber building with a clay floor, and a cobbled path beyond. The post-holes could have belonged to a primary structural phase or, alternatively, might represent a refurbishment.

On the southern part of the site post-medieval and later medieval features were not encountered, but below the construction debris of the previous bank, built in 1835 (RCHMY 5, 173), a stratigraphic sequence of up to 3m deep was recorded dating from the 12th to the

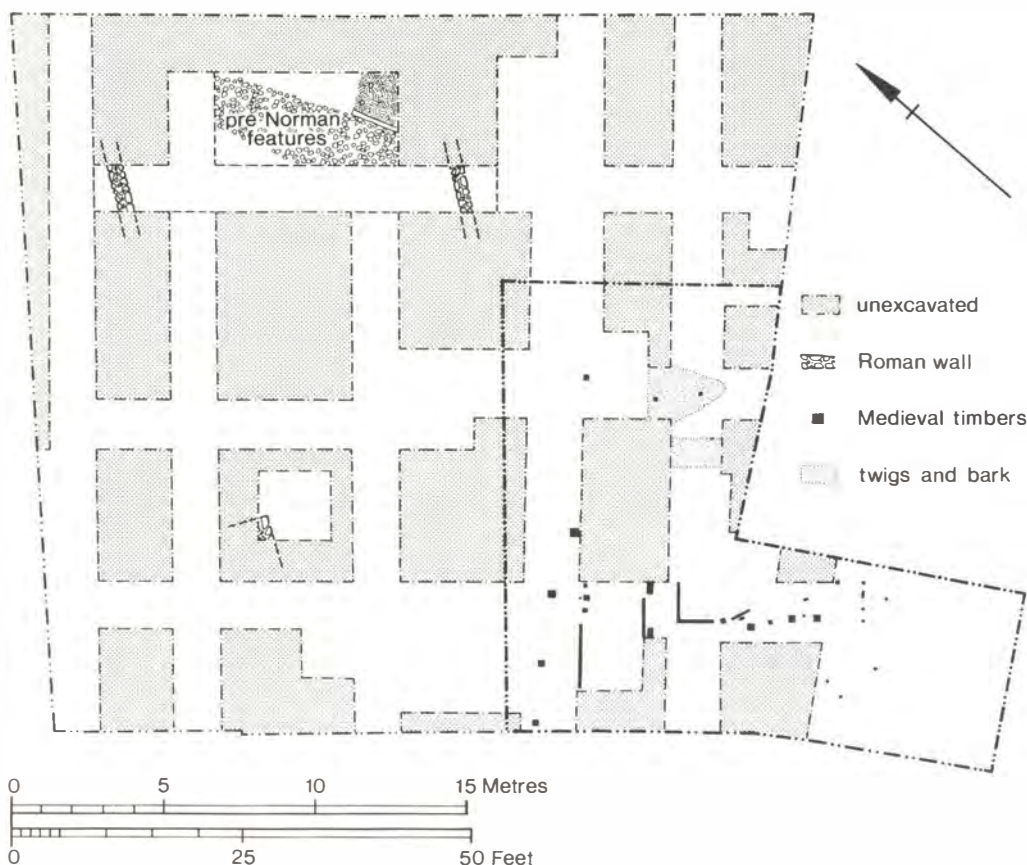


Fig. 83 Plan showing the position of the site of Midland Bank, 11-13 Parliament Street, with the principal features of the excavation. Scale 1:250

14th century. No coherent structures could be recorded from the timbers found in the upper levels but beneath a grey/blue clay sealing layer were a number of charred timber beams and posts dated on pottery evidence to the 12th century. Remains of three buildings constructed in a sill beam technique have been tentatively identified, as have two concentrations of earth-fast posts representing structures built in a different technique.

34 Shambles

In 1974 substantial renovation and rebuilding of 34 Shambles, a largely 19th century structure, included the removal of the existing cellar floor and of approximately 0.5m of black organic deposit below. Archaeological work was confined to the recording of the features exposed, and the retrieval of finds from the spoil. A report on the watching brief is contained in AY 10/2 and the pottery is described in AY 16/3.

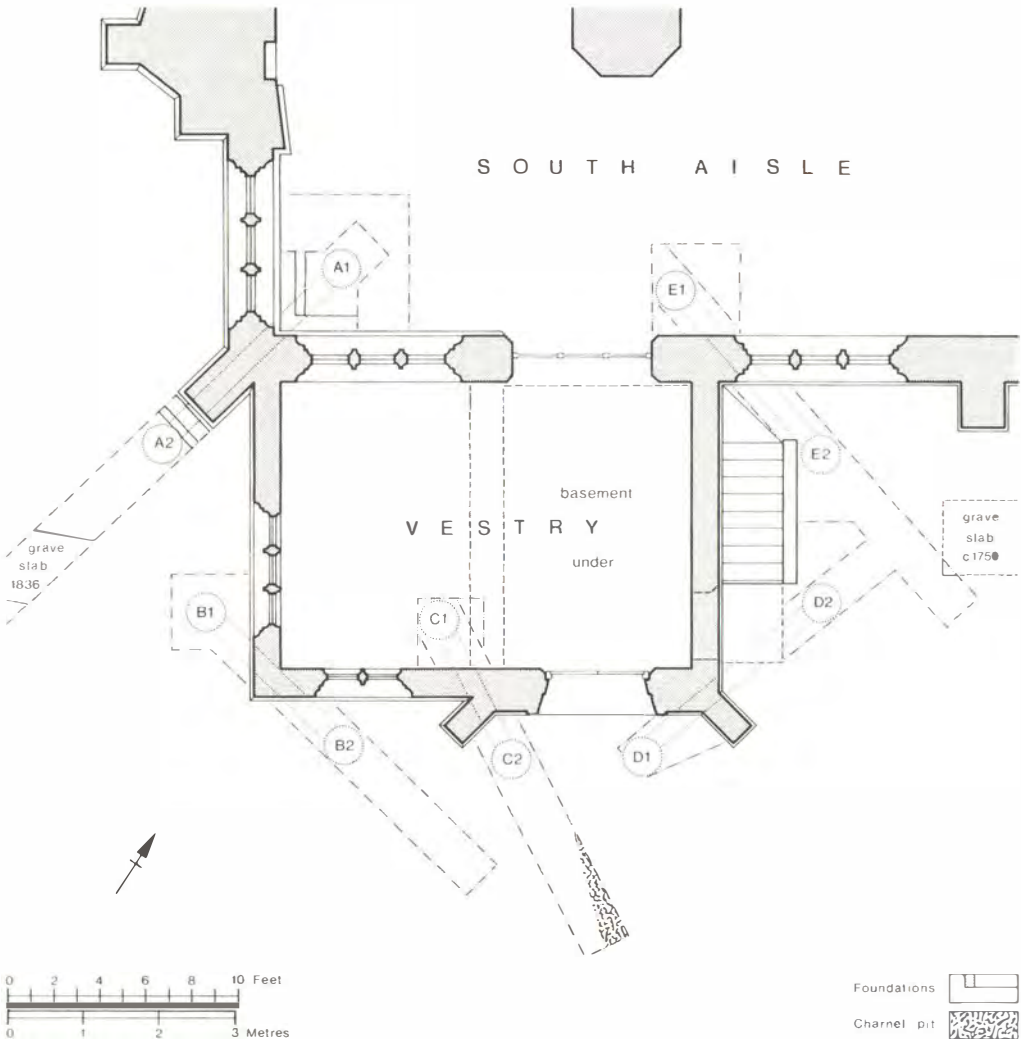


Fig. 84 Plan of excavations at All Saints Pavement showing the principal features. Scale 1:100

Some of the foundations of the pre-existing building were revealed. On the street frontage to the east these consisted of coursed rubble incorporating some tile and supported by wooden piles. A similar foundation, but without piles, was observed at the east end of the south wall. The foundation of an original rear wall of the tenement was traced inside the existing rear wall and 6.16m back from the front wall. The original north wall of the property lay parallel to, but 0.6m inside, the existing north wall. It is evident, therefore, that the property has been considerably extended both to the north and west.

All Saints Pavement (Fig. 82, 4)

At All Saints Pavement excavation in 1976 preceded the underpinning of the south-west corner of the church (Fig. 84). This involved deep piling into the natural clay both inside and outside the building. The piles were then linked together by rolled steel joists. Excavation involved the digging of the trenches in which the joists were manoeuvred into position. Spoil from the piling was also examined.

Outside the church the ground was extensively disturbed both by previous building work and by burials; much Victorian coffin material was recovered. Some of the trenches revealed the wall foundations which extended to 1.2m below present ground level and rested on a mortar and soil packing. Inside the church the ground was equally badly disturbed by earlier underpinning work and by the laying of central heating pipes. The trench for pile A1 exposed some 1.5m of the south aisle wall foundation in the south-west corner. The stones were plastered suggesting that they were originally above the ground with the original floor level at 1.3m below the present.

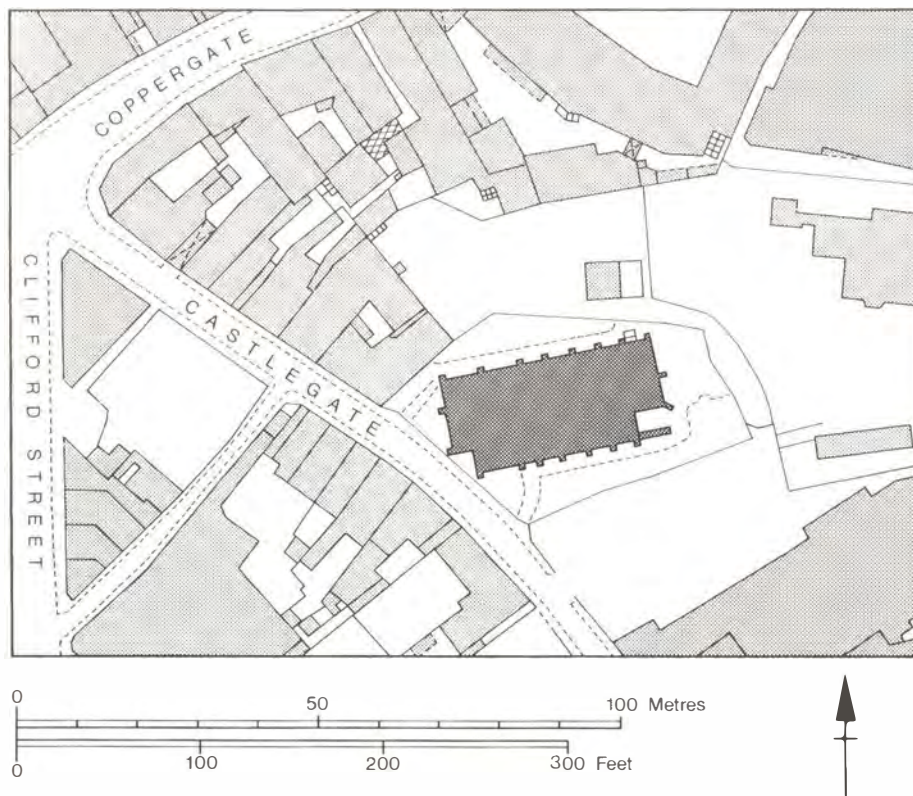


Fig. 85 Plan showing the position of the site of St Mary Castlegate. Scale 1:1,250

The piles reached a maximum depth of around 9.5m where natural clay was encountered. Roman pottery was recovered from immediately above the clay. Overlying this were thick dark humic deposits thought to correspond with the Anglian and Anglo-Scandinavian levels. It was from these levels that the ringed pin 1233 was recovered.

St Mary Castlegate (Fig. 85)

In 1974 small-scale excavations were undertaken at the church of St Mary Castlegate, prior to the conversion of the building into an Architectural Heritage Centre. A complete account of the work is published in AY 8. Archaeological excavation was confined to the liturgical west end of the church where a Roman mosaic had been recorded in 1870. No trace of this was discovered, but work under the tower revealed a row of cobble and limestone footings running north-south 1.8m below existing floor level. Financial problems precluded further excavation, and the removal by workmen of the upper layers in the nave proceeded in 1975. No obvious structural features were noted during sporadic monitoring of the work, but on lowering the floor level under and to the east of the chancel arch workmen revealed structural features which were then fully recorded.

Between the piers of the chancel arch was an alignment of rubble blocks incorporating a number of large capitals and bases of Roman and later date, as well as fragments of Anglo-Scandinavian sculpture. Similar alignments running east from both piers have been interpreted as the footings for the north and south walls of a single-celled pre-Conquest chancel. The alignment spanning the chancel arch is presumably contemporary and may have been intended to stabilize the area between the piers of the pre-Conquest chancel arch.

The Finds

The finds from these five sites add little to our knowledge of the nature of Roman activity within the area of the *canabae*, but there are unusual single objects, in particular the ploughshare and coulter, and the stone mould, all from the Parliament Street sewer trench. The sites do, however, provide important new evidence for the Anglo-Scandinavian and medieval manufacturing industries in this area. There is clear evidence for ferrous and non-ferrous metalworking at both 34 Shambles and in Parliament Street, and there is a considerable quantity of glass working debris from 34 Shambles, probably of 12th century date. The Midland Bank site and the Parliament Street sewer trench have both produced evidence for antler and bone working, and the quantity of leather offcuts and objects from these sites indicates that leather working was being carried out in the area. The other finds are of a domestic or personal nature, except for some of those from the two church sites which are of an ecclesiastical character.

Unfortunately many of the small finds from these sites are unstratified, or at best only poorly stratified, and for this reason most have been discussed in only a summary fashion.

Detailed analysis has been reserved for the most important objects or groups of objects. Post-medieval objects are not discussed although they are catalogued.

Finds from each of these sites are catalogued below (pp. 258–72). The catalogues are arranged first by site and then by material, while objects from all five sites are discussed together in the text according to their class, function or material, as appropriate. Finds are now deposited in the Yorkshire Museum,¹ and their accession numbers are as follows: from All Saints Pavement, 1976.19; from St Mary Castlegate, 1974.25 and 1975.25; from 34 Shambles, 1974.12; from Midland Bank, 1971.288; and from the Parliament Street sewer trench, 1976.11 and 1977.11.

Rotary querns (Fig. 86)

The Parliament Street sewer trench has produced one fragment of a rotary quern, 682. It is apparently part of the upper stone, although no trace of the central perforation survives. The grinding surface is worn smooth. 977 from 34 Shambles is derived from an object which was originally circular with a convex outer edge. These are features typical of rotary quern fragments, but the type of stone used, a fine-grained limestone, is not suited to this purpose. Neither of these pieces is readily datable typologically.

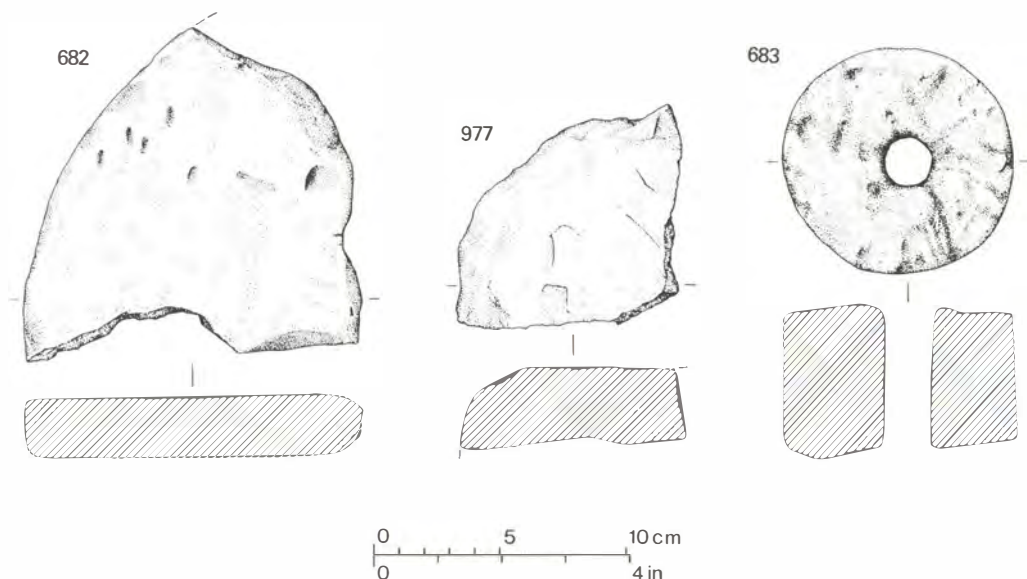


Fig. 86 Rotary querns (682, 977) and rotary grindstone (683). Scale 1:3

Dr N. G. Berridge, of the British Geological Survey, Nottingham, has examined both fragments, and provides the following report.

682 The rock is a pale grey fine-grained sandstone typical of the Millstone Grit and Coal Measures of the Carboniferous in northern England. Outcrops are especially common in the central and south Pennines region.

977 The rock is a compact pale grey fine-grained limestone containing numerous bedding-plane orientated small voids probably left by the preferential solution of finer fossil fragments. It is probably Carboniferous Limestone of Dinantian age. This is worked in numerous quarries in the Pennines, the Mendips and north and south Wales. Palaeontological analysis would probably define the stratigraphical position within the Dinantian, but would not necessarily reduce the number of potential source areas significantly.

Rotary grindstone (Fig. 86)

683, from the Parliament Street sewer trench, is a cylindrical stone with an axial perforation. The faces are roughly dressed flat, but the circumference is worn smooth. This presumably can be identified as an edge grindstone which was turned on an horizontal axle. Similar small edge grindstones have come from Anglo-Scandinavian levels at 16–22 Coppergate (Roesdahl et al., 1981, YDL4–6). Like the sewer trench example these have a diameter of the order of 90–100mm. Larger edge grindstones have been reported from the excavation of Anglo-Scandinavian levels nearby at Barclays Bank, 1–3 Parliament Street (Radley, 1971, 42, 49), and Lloyds Bank, 6–8 Pavement (p. 76, Fig. 38, AY 17/3). The first of these is 265mm in diameter, and again has heavy wear around the circumference. The latter is 540mm in diameter, but lacks peripheral wear.

Dr N. G. Berridge supplies the following comments on the stone type:

The rock is a medium-grained micaceous quartz sandstone, very probably of Carboniferous age and possibly from the Millstone Grit of Derbyshire where this feldspar-poor type of sandstone is commoner than elsewhere.

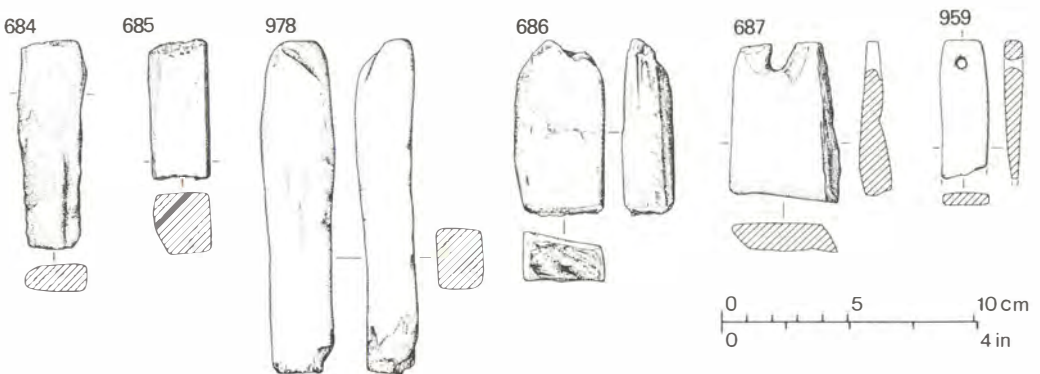


Fig. 87 Hones. Scale 1:3

Hones (Fig. 87)

There are four hones from the Parliament Street sewer (684–7), one from 34 Shambles (978) and one from Midland Bank (959); none is complete. 684 is of rectangular section with the surviving faces dressed flat, as is 959. The long edges and one face of 686 also exhibit signs of working. The faces of 685, 687 and 978 are apparently not worked but are natural cleavages. At one end of 686 the manner in which it was separated from a longer piece can be clearly seen. A groove was first cut with a saw in the same position on each face, and the piece was then simply snapped off. One end of 978 is roughly broken and may have been snapped off in the same manner. Both 687 and 959 have perforations at the upper end.

Petrographically the hones have been separated into three groups by **Dr N. G. Berridge**. 959 was not examined petrographically but appears to belong to group 3:

Group 1 (Ellis, 1969, group IA1)

684 This is composed of a rock closely akin to that of 685, but the texture is slightly coarser and the rock may be termed a schist rather than a phyllite. Like 685 it is probably of Dalradian origin, but could have come to Yorkshire by glacial transportation.

Group 2 (Ellis, 1969, group IB1)

685 This is composed of a mica-quartz-chlorite-feldspar-phyllite containing chlorite porphyroblasts and a strong, dominantly linear foliation. It is of lower Palaeozoic or older age, possibly from the Dalradian, which outcrops from Ireland across the north centre of Scotland to Shetland and Scandinavia. Rocks of this source occur naturally over a large part of eastern England, especially near the coast, as exotic 'erratic' cobbles and boulders in glacially transported boulder clay and associated gravel.

978 This is slightly finer grained but otherwise very similar in composition and origin to 685, above.

Group 3

686 The rock is pale purplish-grey slate, typical of parts of the British lower Palaeozoic, and especially so of the 'slate belt' of north Wales.

687 Like the foregoing specimen this is composed of slate, olive-grey in colour in this case, but also probably of north Wales origin.

'Schist' whetstones, a category embracing the first two groups here, are so abundant that they are unlikely to have been made from glacial erratics, and were probably produced in quantity and widely traded (Ellis, 1969, 180–2; Moore, 1978, 65–6). Ellis (1969, 148–55) has pointed to the Telemark region of south Norway as the source particularly for the types represented here by group 1 which can be matched petrographically in the Eidsborg area. The group 2 hones are much more difficult to provenance, but recent work using Potassium/Argon dating on hones from a number of sites in Scandinavia and the Baltic has suggested an origin in the area from Stavanger and Bergen, extending north-eastwards. This work has also confirmed the origin of the group 1 hones and is now being extended to material from Britain (Mitchell et al., 1984).

Ellis (1969, 182) concluded that schist hones were used predominantly from the 10th century to c. 1300, and only occasionally thereafter. This conclusion is supported by work on material from Flaxengate, Lincoln (Mann, 1982, 30), although Moore (1978, 70–2, fig. 3) has suggested that the use of schist for hones continued at least sporadically into the 14th and 15th centuries. This may serve to provide a broad date for the examples from Parliament Street and 34 Shambles. A date in the later medieval period would probably best suit the examples in group 3, since such slates are apparently not represented among the known Anglo-Scandinavian and earlier material from the city.

Fossil echinoderm

The fossil echinoderm (691) from the Parliament Street sewer trench is one of a number of fossils from archaeological sites in York. There are, for example, seventeen fossils from 16–22 Coppergate including two echinoderms. 691 may have been found in glacial surface deposits in or near the city where such fossils frequently occur. It was presumably collected either as a curio or, more probably, for its supposed magical or medicinal powers (Shackley, 1977, 147; Oakley, 1965, 117–9).²

Amber and jet

In addition to the finger-ring fragment (695), discussed below (p. 209), the Parliament Street sewer trench has produced nine amber fragments (693–4). Of these only 694, with one face dressed roughly flat, exhibits any sign of working. There are two similar featureless amber fragments from 34 Shambles (988–9).

Also from the Parliament Street sewer trench is the jet fragment 692. This has one face dressed flat and the other faces roughly broken. The piece is too large to have formed part of a finished object and it is probably part of a block of jet which had been prepared for working. Close dating of such a featureless fragment is impossible. There was a flourishing jet industry in Roman York, presumably employing the local Whitby jet (RCHMY 1, 141–4, pls. 68–70), and the production of jet objects in the Anglo-Scandinavian period is attested by the material from 16–22 Coppergate (Roesdahl et al., 1981, YAJG6–13). That jet continued to be worked into the medieval period is demonstrated by the discovery of a number of medieval jet objects from the city including gaming pieces from Union Terrace and 1–2 Tower Street, both probably of 13th century date, although as yet no later medieval manufacturing debris has been recognized.

Gaming counters (Fig. 88)

There are two counters from the Parliament Street sewer trench, 688 and 696. 688 has been chipped from a slip of micaceous sandstone, and 696 from a Samian body sherd. Similar simple stone or pottery counters have been reported in York from the Roman sewer in Church Street (pp. 2–3, AY 17/1) and from 58–9 Skeldergate and 37 Bishophill Senior (pp. 33–4, AY 17/2). In each case they are derived from secure Roman contexts. It is, therefore, likely that these examples are of similar date and that they were used in the manner described in the two previous reports.

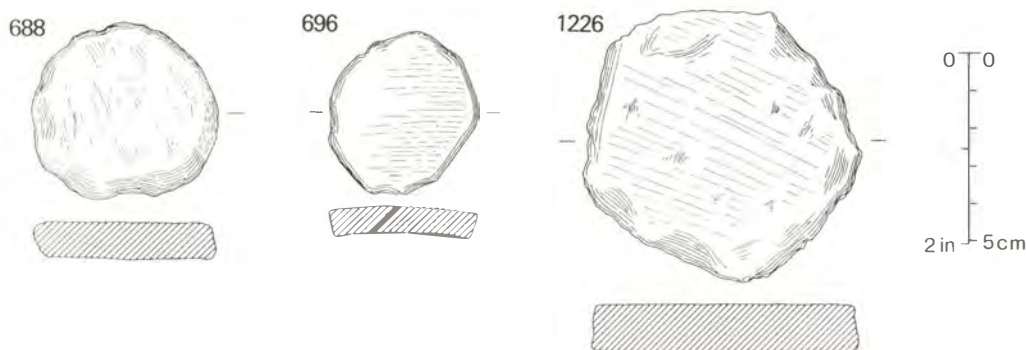


Fig. 88 Gaming counters, of micaceous sandstone (688), Samian body sherd (696), and tile (1226). Scale 1:2

A larger disc from the church of All Saints Pavement (1226) has been chipped from a featureless tile fragment. It may be interpreted as a large gaming counter like those discussed above or, alternatively, as a tally or pot lid (p. 33, *AY* 17/2). Similar objects are found both in Roman and later contexts in York and its date is, therefore, uncertain.

Ironworking implements and debris (Fig. 89)

There are two possible ironworking tools from the Parliament Street sewer trench, 708 and 709. 708 is a punch of rectangular section tapering to a flat tip, and with the upper end burred by repeated blows. Such simple punches were used to make holes in hot iron, or alternatively for driving in nail heads (Goodall, 1980, i, 15–16). There are closely comparable specimens of Anglo-Scandinavian date from 16–22 Coppergate, and from the Crayke hoard (Sheppard, 1939, 280), as well as examples from a number of medieval sites (Goodall, 1980, ii, A59–60+, A71–2+, iii, fig. 27). A second punch (709), of circular section, may also have been associated with ironworking like the similar punch from Gomeldon, Wilts., dated to the 13th/14th century (*ibid.*, ii, A67+, iii, fig. 27). However, the broad upper end is not burred and either has never been struck, or was struck only by something relatively soft like a mallet. Such simple objects cannot readily be dated typologically, and it is evident that similar punches were used throughout the medieval, and into the post-medieval, period.

960 from Midland Bank is an object of square section, tapering to a blunt point at each end. It may be an awl like those from the Anglo-Scandinavian levels at Lloyds Bank, Pavement (pp. 80–1, Fig. 41, *AY* 17/3), but there is much less thickening at the middle than on the Lloyds Bank examples and not enough to hold a handle in place. A more plausible interpretation is that the object is a mood — a blank for knife making (Goodall, 1980, i, 7, 64). Similar blanks are known from Chingley, Kent, Cambokeels, Co. Durham (Hildyard, 1949, 199, fig. 3.21), and from 16–22 Coppergate, York. Such a simple object is not readily datable, but it was found in the same context as the knife (962) which may be dated typologically to the 10th or 11th century.

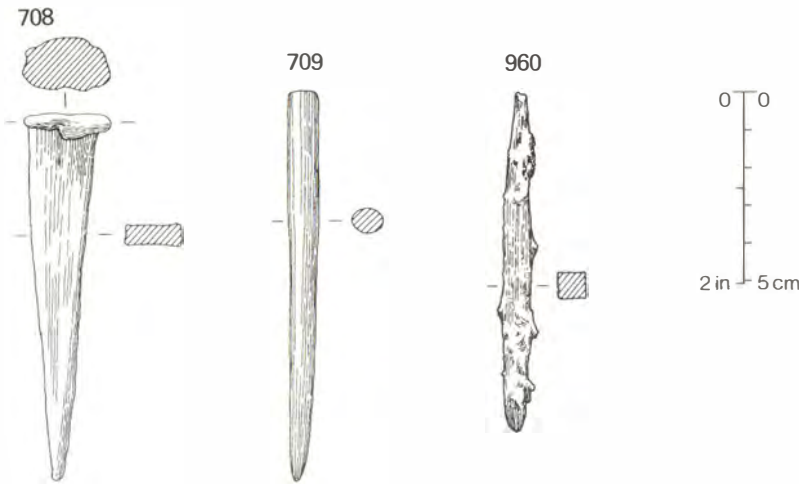


Fig. 89 Ironworking artefacts: iron punches (708–9) and mood (960). Scale 1:2

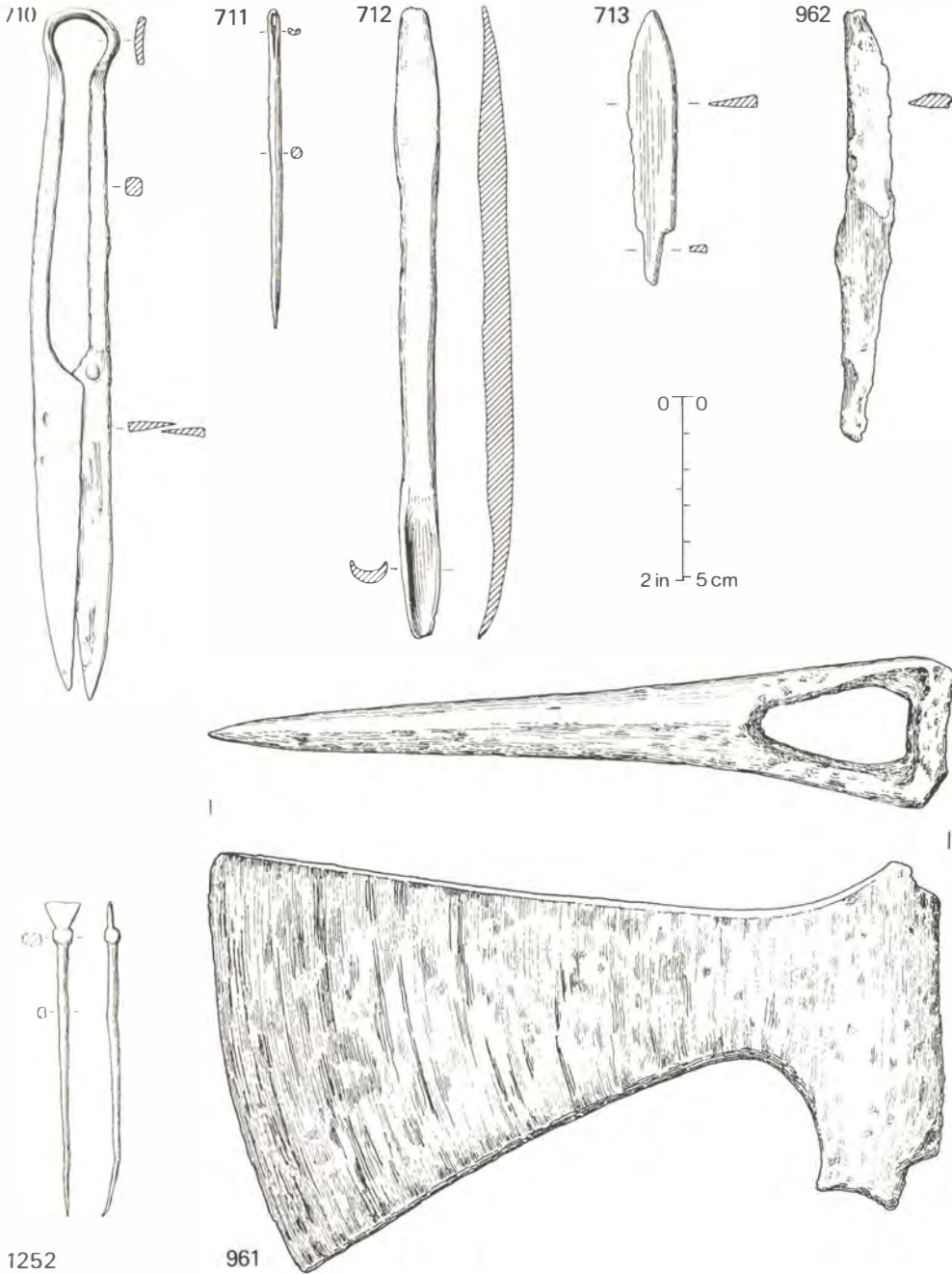
Ironworking on or near 34 Shambles is indicated by the discovery of part of an iron-smithing furnace base (1199).

Iron implements (Fig. 90)

710, from the Parliament Street sewer trench, is a small pair of iron shears with the prominent loop and simple blade of type 2A in Goodall's classification (1980, i, 96, fig. 14). In York two pairs of closely comparable shears are known from 16–22 Coppergate, one with a loop of flat section, as on the Parliament Street example, and the other with a loop of circular section (Roesdahl et al., 1981, YT12); both are of 10th century date. A similar pair of shears from Pavement was associated with Anglo-Scandinavian finds (Waterman, 1959, 104, fig. 25.6). Despite the early dating of the York examples such shears continued in use throughout the medieval period (Goodall, 1980, i, 97), although later examples often have more elaborate shoulders to the blades, and a longer blade in proportion to the overall length of the shears than is seen here (London Museum, 1940, 153–7, figs. 47–8). Such small shears were used in sewing and in the finishing of cloth, and may even have been used for sheep shearing (Goodall, 1980, i, 94).

The only other piece of sewing equipment from the site is the iron needle, 711. Excavations at 16–22 Coppergate have produced numerous similar iron needles both from Anglo-Scandinavian and later levels. The simplicity of the form makes comparative dating impossible (AY 17 forthcoming).

The woodworking tools from the five sites comprise an axe head (961) from Midland Bank and a spoon bit (712) from Parliament Street sewer trench.



1252 961
Fig. 90 Iron implements: shears (710), needle (711), spoon bit (712), knives (713, 962), stylus (1252) and axe head (961).
Scale 1:2, 711 1:1

The axe head has a narrow, asymmetrically expanding blade with lugs on the socket and is of type 1 in Goodall's classification (1980, i, 22, fig. 7), a type identified as a woodsman's axe for tree felling and for cutting and splitting timbers (*ibid.*, 22). The ten examples noted by Goodall span the period from the 11th to the 16th century (*ibid.*, ii, B1–10+, iii, fig. 29) but the Midland Bank specimen compares most closely with the example from Baile Hill, York, dated to 1068/9 (Addyman and Priestley, 1977, 139, 143, fig. 105; Goodall, 1980, ii, B1+, iii, fig. 29), and another from Coppergate dated to the 10th or 11th century (Waterman, 1959, 72, fig. 5.6). The Midland Bank axe derives from a context dated on pottery evidence to the 12th century, together with the keys, 963 and 964, and pieces of worked bone and antler. On this basis, therefore, the axe head should be dated to about the 11th or 12th century.

The blade of the axe head has been subjected to metallographic examination by **Mr J. Black**³ of the Institute of Archaeology of the University of London, who writes:

A sample (18 × 8mm) was cut from one corner of the cutting edge of the axe. This was mounted in epoxy resin, the exposed internal section polished and etched in a 2% solution of nitric acid in alcohol (Nital), and the structure examined under a metallurgical microscope. Hardness measurements of particular areas were taken. The sample was then replaced in the body of the axe using a soluble adhesive to facilitate its removal for subsequent studies.

Observations

1. *The macrostructure*

A photograph (mag. approx. × 14) shows the macrostructure of the sample (Pl. VIIa). The section of the sample is triangular; the apex of the triangle is the cutting edge of the axe.

A darker etching banded material in the shape of a deformed ellipse is surrounded by a lighter etching material except at the cutting edge where the lighter material tapers and the darker material is exposed. The lighter material appears to be layered, with the layers delineated by large, directional 'stringers'. The direction of these 'stringers' (approximately parallel to the sides of the axe) indicates that the material has been 'worked' in a direction approximately perpendicular to the sides of the axe.

The darker material contains no large stringers, but this area appears to be almost equally divided into two broad adjacent bands (one etching grey, the other black). This is most apparent at the cutting edge but the difference in colour of the bands becomes less distinct further away from the edge.

At the cutting edge, a patch of lighter etching material is seen within the black band.

2. *The microstructure*

At higher magnification (Pl. VIII), the lighter etching material is revealed as ferrite, and the stringers to be slag. There is a small quantity of pearlite at the grain boundaries of the ferrite. The grain size of the ferrite at the surface decreases towards the middle. This structure is a wrought iron and the apparent recrystallization and grain growth indicate that the axe has been hot forged.

The structure of the darker etching elliptic area consists of smaller grains of ferrite with varying proportions of pearlite. In the grey band, the proportion of ferrite to pearlite suggests a carbon content between 0.2 and 0.3%. The higher proportion of pearlite in the black band suggests a carbon content in the region of 0.5%. The

laminated appearance of this 'wrought steel' suggests that it was made by carburising thin layers of iron, piling them, and forge welding them together.

The presence of a dark carbon bearing interface between the ferritic material and the higher carbon elliptic zone of wrought steel (Pl. IX) is an indication that the higher carbon material could have been inserted between layers of ferritic material and subsequently forge welded together under carburising conditions, possibly on a charcoal fire.

Examination of the cutting edge revealed the presence of martensite in the higher carbon (black etching) band. This shows that the edge has been hardened by heat treatment and quenching. Pearlite, observed in small quantities at the martensite grain boundaries near the cutting edge, is seen in ever increasing proportion towards the body of the axe as the density of martensite grains decreases away from the area of maximum quenching effect.

3. Hardness measurements

The hardness measurements were carried out using a 30kg load on a Gnehm machine. The points at which hardness was tested are shown on Pl. VIIb. The readings, converted into Vicker's hardness number (VHN) are given below:

<i>Point</i>	<i>Structure at this point</i>	<i>VHN</i>
A	Martensite	481
B	Martensite and pearlite	301
C	Ferrite and pearlite	263
D	Ferrite and pearlite	232
E	Ferrite and pearlite	187
F	Ferrite	132

The progressive increase in hardness from the body of the sample to the cutting edge (shown by the hardness values at points E, D, B and A) reinforces the suggestion that the axe has been heat treated and quenched to produce this suitably hard cutting edge.

Conclusions

Examination of this particular sample of the axe shows application of complex techniques and a high standard of workmanship in the manufacture of the axe. From the evidence obtained from this one sample, it seems reasonable to suggest that:

- i) The body of the axe has been forged out of several layers of wrought iron.
- ii) A hard cutting edge has been obtained by forge welding a piece of higher carbon 'wrought steel' between the layers of wrought iron and subsequently heat treating and quenching the edge.
- iii) This 'wrought steel' appears to have been forged from a number of plates of wrought iron which have been surface carburised, piled, and forge welded together.

Verification of the implications of the evidence obtained from this sample would require further examination of the structure at other parts of the cutting edge and body of the axe.

The spoon bit (712) was probably used as an auger with a simple transverse handle like that on the example from Mileham, Norfolk, derived from a 13th century context (Wilson, 1968, 146-7; 1976, 258), or the handle on the medieval specimen from Ragnildsholmen, Sweden, dated to c. 1320 (Goodman, 1964, 165, pl. 165). It has been suggested, however, that some

spoon bits could have been used as reamers for wood turning (MacGregor, 1978, 43-4; Morris, 1982, 254).

The dating of this example is unclear since similar spoon bits were used from the Roman period onwards with little or no change in form. There are, for example, similar Roman spoon bits from the corner of Poultry Lane and Princes Street, London (London Museum, 1930, 76, pl. XXXII.7), and from Silchester, Berkshire (Boon, 1974, fig. 41.7). Anglo-Saxon examples ranging in date from the early Anglo-Saxon period to the 10th/11th century are known from Brundall, Norfolk, Hurbuck, Co. Durham, Thetford, Suffolk, and Westley Waterless, Cambs. (Wilson, 1968, 146-7, fig. 2); to these can be added a number of Anglo-Scandinavian examples from 16-22 Coppergate, York (Roesdahl et al., 1981, YW3; AY 17 forthcoming). That the type continued into the medieval period is demonstrated by the discovery of similar spoon bits from a wide range of sites including Wharram Percy in Yorkshire where there is a 15th/16th century example (Hurst, 1979, 118, fig. 62, no. 55). However, in the absence of other finds dated to the medieval period from the Parliament Street sewer trench the emphasis must be on the earlier part of the date range for this example.

The knife blade (962) from Midland Bank has a straight back, an elongated S-shaped cutting edge, and a drooping shoulder at the junction with the whittle tang. The type is known from several Anglo-Scandinavian sites in York (Waterman, 1959, 73, fig. 7). Similar knives are known also from the late Anglo-Saxon town of Thetford (*ibid.*, 73). The type is also familiar from Viking Age sites in Scandinavia such as Trelleborg (Nørlund, 1948, tav. xxviii) and Fyrkat (Roesdahl, 1977, fig. 211), in Denmark, and the PKbank and Thule sites at Lund, Sweden (Blomqvist and Mårtensson, 1963, 225). These parallels would serve to date the Midland Bank example to the 10th or 11th century.

The small knife blade from Parliament Street (713) has a parallel blade back and cutting edge tapering towards the point, and a whittle tang — type D in Goodall's classification (1980, i, 81, fig. 10, ii, G48-121+, iii, figs. 54-5). This is the second most common medieval knife type. It occurs throughout the medieval period but was particularly common in the 12th and 13th centuries (*ibid.*, i, 81).

1252, from Parliament Street, is an iron stylus. **Mr P. J. Ottaway** writes:

At the head of the shank it has a small V-shaped eraser, below which is a polyhedral moulding. There are traces of non-ferrous plating, probably tin.

Dating this object is not easy since few styluses are known from well-dated post-Roman contexts. There is an iron stylus with a V-shaped eraser, albeit a substantially larger one than that of *1252*, of Anglo-Scandinavian date from 16-22 Coppergate, York (sf9418, AY 17 forthcoming). V-shaped erasers may also be seen on non-ferrous styluses of the Anglian period from Whitby, North Yorkshire (Peers and Radford, 1943, fig. 15, 1-4, 6-7), and on one of equivalent date from Domburg, Netherlands (Capelle, 1976, pl. XIII, 102). The Domburg stylus is perhaps most readily comparable to *1252* in terms of the size of the eraser which also has a small, moulded expansion at its base. By the 12th century, it appears that stylus erasers are usually, but not exclusively, T-shaped. A group of 15th century styluses from Amsterdam, however, include a tinned iron stylus with a small V-shaped eraser which is again similar to *1252* (Baart, 1977, 380, 729).

Locks and keys (Fig. 91)

The Parliament Street sewer trench has produced what is probably part of an embossed padlock (714), a type which consists of a rectangular back-plate and a dished case housing the mechanism. The two parts are riveted together along a narrow flange (Goodall, 1980, i, 133–4; ii, I134–41+; iii, fig. 96). This example is of Goodall's type 2, with a pivoting bolt fixed at the looped end (*ibid.*, i, 134). Unfortunately little more than the bolt and part of the iron outer case survives. Since it is unstratified the dating of the piece presents grave difficulties, but such embossed padlocks are of late medieval date, and type 2 may be an introduction of the 15th or 16th century (*ibid.*). The examples which most closely parallel that from Parliament Street are from King John's hunting lodge, Writtle, Essex, dated to c. 1425–1521 (Rahtz, 1969, 85, fig. 47.48), and from North Elmham, Norfolk, dated to c. 1150–1600 (Wade-Martins, 1980, 509, fig. 265.10).

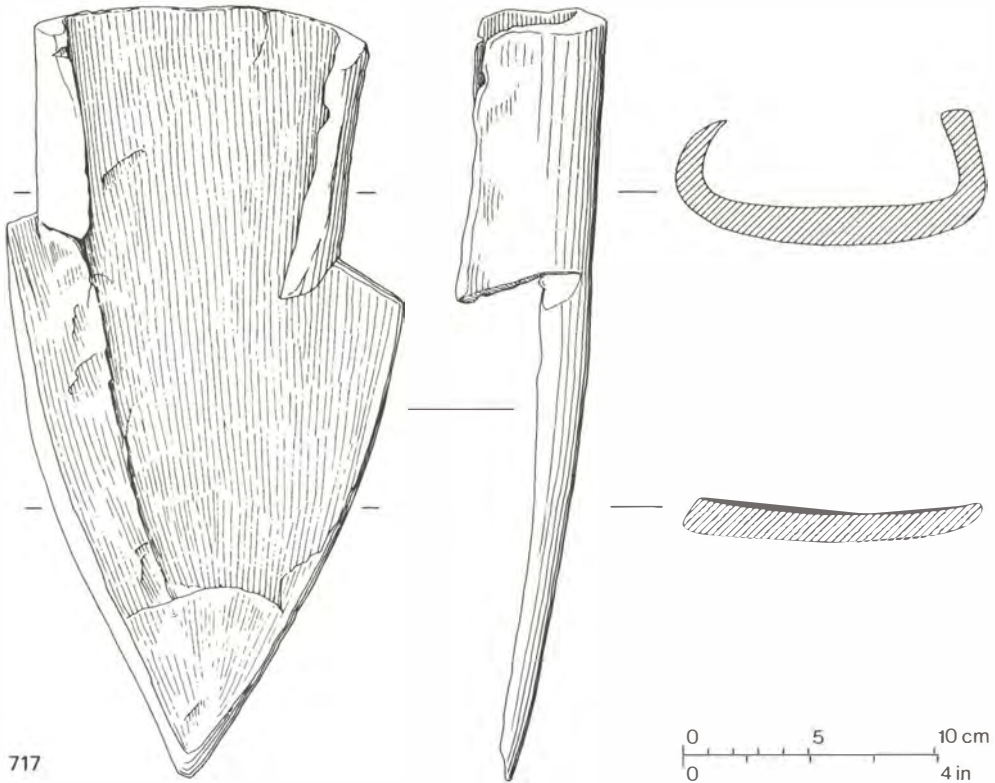
34 Shambles has produced a fine padlock bolt (1200) with a circular end-plate, two leaf springs, and a free arm. There are two applied tubes on the outside of the arm just above the end-plate. The closest parallel to this piece is the bolt from St Peter's Street, Northampton (Williams, 1979, 268, fig. 116.4), which has a very similar form, although here there is another tube applied to the inside of the bolt above the end-plate. Another comparable padlock bolt, although rather more elaborate, is known from Weoley Castle, Warwickshire (Oswald, 1963, 129, fig. 51.2), and there is another similar bolt from 16–22 Coppergate, York (AY 17 forthcoming). The Northampton bolt derives from a feature containing 12th and 13th century pottery. The Weoley Castle bolt comes from a context dated to c. 1200–30. The Coppergate example is from a context dated to between the end of the 11th and the 13th century. It seems likely, therefore, that the bolt from the Shambles should be placed somewhere between the late 11th century and the end of the 13th century.

The arm, end-plate and springs of the Shambles bolt are all coated in a thick layer of copper-alloy. This has been analysed by **Mr C. Caple** who writes:

Several analyses by X-ray fluorescence revealed that the coating is a leaded bronze with a composition of approximately copper 84%, tin 6%, lead 8%, and zinc 1–2%. This alloy, possibly applied by dipping the object into molten metal, has good corrosion resistance, and was readily available in this period.

Similar platings have been observed on numerous other padlocks from York ranging in date from the Anglo-Scandinavian period to the medieval period, including the padlock from 16–22 Coppergate noted above.

The iron key from Parliament Street (715) has a two-pronged bit at right-angles to the stem. Keys of this general type were used with spring locks fitted to small caskets (Ypey, 1964). Specimens are known from a number of Roman sites, for example from Shakenoak, Oxon. (Brodribb et al., 1972, 94, fig. 44; 1978, 102, fig. 42) and Silchester, Berks. (Boon, 1974, fig. 32), but these have a sharp angle between the stem and prongs rather than the curve seen on this example. This curve is apparently characteristic of post-Roman examples of this key type, and is employed on the five comparable keys found in Anglo-Scandinavian contexts at 16–22 Coppergate (Ottaway, AY 17 forthcoming). A similar date can be suggested for the Parliamentary Street example. A second iron object (716) from the sewer trench is almost identical in form to the stem of 715, and is presumably the stem of a similar key, although the bit is lost.



717

Fig. 92 Iron ploughshare. Scale 1:3

fig. 39). The Parliament Street coulter, in contrast, has the longer blade and angled shoulder more characteristic of medieval types (London Museum, 1940, 123–4, pl. XXII). It is unwise, however, to make such typological distinctions when only fourteen Roman, and a handful of post-Roman and medieval, coulters are known from this country.

The share is equally difficult to date typologically. As noted by Rees (1979, 55–6), the symmetrical flanged share was a development of the Roman period, some eight Romano-British examples being known. The closest in form to the Parliament Street example is the 1st or 2nd century share from Bucklersbury House, London (Rees, 1979, 55–6, fig. 62). That this type of share continued in use into the post-Roman period, however, is suggested by the 10th century example from Thetford, Norfolk (Rogerson and Dallas, 1984, 81, fig. 12) as well as by similar shares from Scandinavia, such as those from Trelleborg (Nørlund, 1948, 139, pl. xlvi) and Furnes, Hedemark, Norway (Graham-Campbell, 1980, no. 8). It is unlikely, however, that the Parliament Street share and coulter date to after the Anglo-Scandinavian period, by which time the Roman fortress wall in this area seems to have been destroyed and therefore ceased to have any effect on the topography of the city (Hall, 1978, 32–3, fig. 20). Presumably the ditch in which the share and coulter were found was filled by this time.

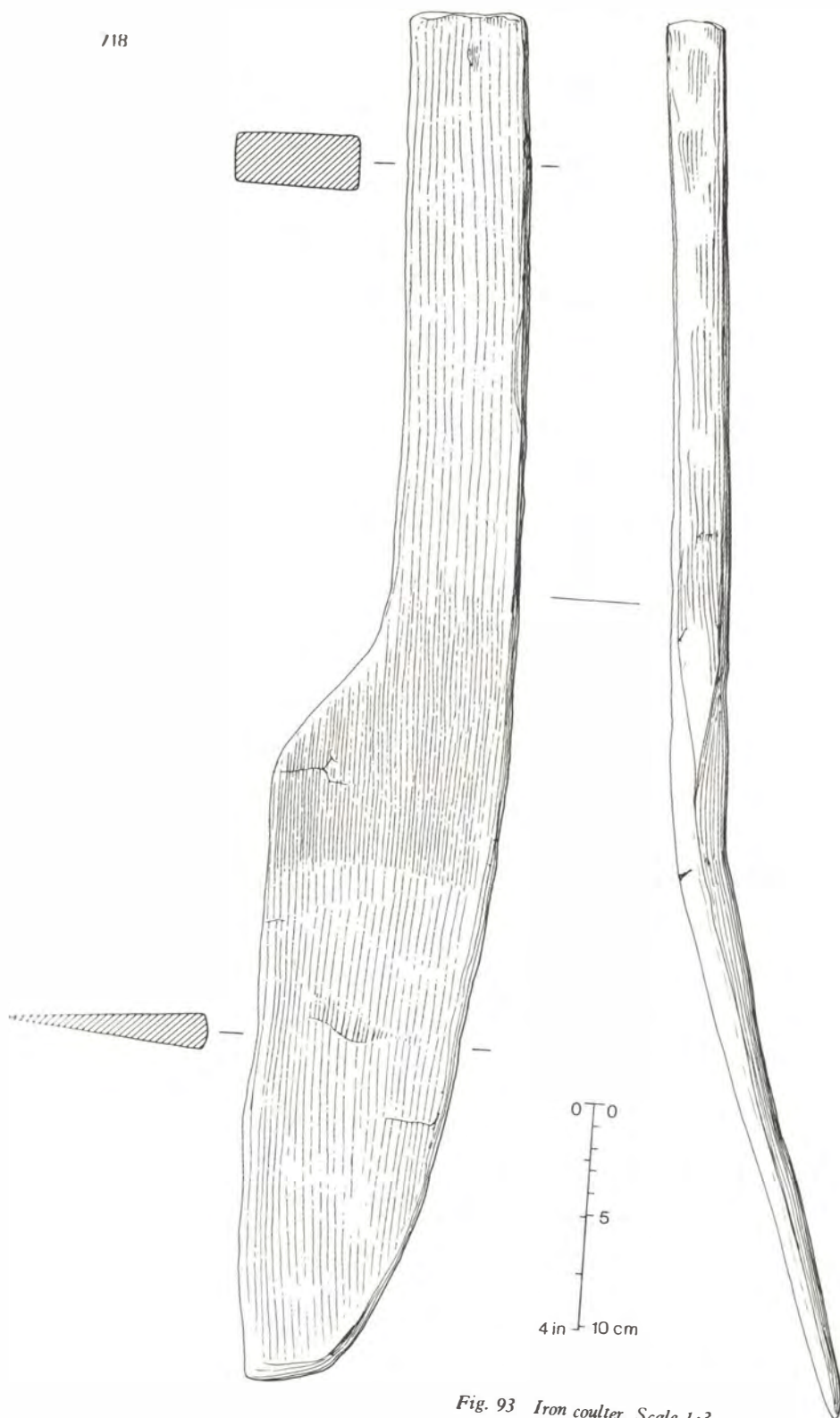


Fig. 93 Iron coulter. Scale 1:3

The prick spur (Fig. 91)

The prick spur from Midland Bank (965) is made of iron with traces of a white metal plating, presumably of tin, a common feature of spurs from the late Anglo-Saxon period onwards (Jope, 1956). It has a pyramidal point, curved arms, and double-lobed terminals, with a rivet through each lobe. These are all features in common use in the 13th century (Ellis, 1982, 233), as, for example, in the closely comparable prick spur of 13th century date from Upper Thames Street, London (London Museum, 1940, 101, fig. 31.3) and a spur found with 13th century pottery at Tetsworth, Oxfordshire (Robinson et al., 1973, 101). An earlier date is possible as there is a closely comparable example from Castle Acre Castle from a sealed context of no later than the 1140s (Ellis, 1982, 233, fig. 41.142). Before the 13th century, however, prick spurs of this type tended to have straight arms, like the two examples from Smithfield, London, which in other respects are similar to the Midland Bank example. These are dated to the second half of the 12th century (London Museum, 1940, 101, fig. 31.1 and 2). At the beginning of the 14th century the double-lobed arm-ends employed here were apparently replaced by circular looped ends (*ibid.*, 99), a type which occurs locally on the effigies of Sir Richard IV de Goldesborough, and Sir Richard V de Goldesborough, at Goldesborough, West Yorks., who died in c. 1307 and c. 1333 respectively. Looped arm-ends continued to be used when the rowel spurs replaced prick spurs (*ibid.*).

Miscellaneous ironwork (Fig. 91)

719 from Parliament Street is a small iron hook, with the hook developing from one side of the shank which expands towards the flat upper end. It can be identified as a small wall hook which was hammered into the wall using the flat upper end of the shank (Goodall, 1980, i, 104; ii, H172-93+; iii, fig. 70). Hooks of similar form were used both in the Anglo-Scandinavian period and throughout the later Middle Ages (Goodall, 1980, i, 104). This example is, therefore, not closely datable.

There are a number of iron nails both from the Shambles site (1202-4, 1207-10) and from the Parliament Street sewer trench (720-1). Most are too badly corroded for comment, but clearly recognizable is a single fiddle-key nail (720) of the type used with horseshoes having countersunk holes. Such horseshoes are known in York from the Anglo-Scandinavian period (p. 83, Fig. 44, AY 17/3) through into the medieval period, and this serves to provide a broad date bracket for the nail. 966, from Midland Bank, is a clench bolt with a lozenge-shaped rove. Such bolts are normally identified as the type used in shipbuilding, but they also probably had a number of other structural uses. Similar bolts, for example, are used to fix together a well cover from Lydford Castle, Devon (Goodall, 1980, i, 108; ii, H404+; iii, fig. 76), and are also used on the church door at Stillingfleet, Yorks., made in a similar ledge-and-batten technique (*ibid.*, i, 108).

Non-ferrous metalworking debris (Figs. 94-5)

Both the Parliament Street sewer trench and 34 Shambles have produced evidence for metalworking. In the case of the Parliament Street sewer this consists of a limestone mould fragment (689), a crucible (697) and a fragment of lead run-off (735), presumably a spillage from melting or casting (Roesdahl et al., 1981, YMW2). Chronologically the earliest of these is 689, the lower part of a Roman two-piece lathe-turned mould for the making of dishes or shallow bowls, c. 21mm in diameter. **Dr N. G. Berridge** comments on the stone type:

The rock is a very pale buff bioclastic limestone possibly from the Upper Jurassic of the Vale of Pickering area. Similar material is currently quarried along the south flanks of the North York Moors.

Despite surface analysis no trace of metal could be detected on the mould, but the most likely metal to have been cast in it is pewter. To make the vessel an upper mould of suitable size and shape was placed over the lower mould. The two were fixed together and the metal poured into the space between the two halves. Once the metal had solidified it was removed from the mould and finished on a lathe (Goodall, 1972, 34-5).

Similar moulds have been reported from a large number of Roman sites, both urban and rural. For example, there are specimens from Silchester, Berkshire (Boon, 1974, 273, fig. 40); Wroxeter, Shropshire (Goodall, 1972, 36); Westbury, Wiltshire (*ibid.*); Brampton, Norfolk (*ibid.*); Oatland Down, Bath, Avon (*ibid.*) and St Just, Cornwall (Brown, 1970). Geographically, the closest example to York, however, is the late 4th century example from the Langton Villa (Goodall, 1972, 34-6), although here there is the impression of a vessel on both faces of the mould, not on just one as on the Parliament Street example.

Also from Parliament Street is the crucible (697) of which **Justine Bayley** of the Historic Buildings and Monuments Commission provides the following account:

The inner and outer surfaces of the crucible were examined under a low power microscope. It was X-radiographed and qualitative, X-ray fluorescence analyses were made of an area just inside the rim and of a small blob of corroded metal removed from the inner surface of the crucible. The elements detected by analysis, apart from those of the fabric of the crucible, were copper, zinc, lead and tin. The relative signal strengths suggest that the metal being melted in the crucible was basically a brass (copper and zinc) although it contained a few per cent of both tin and lead.

The form of the crucible, round-bottomed and straight-sided, is reminiscent of the 'thimble-shaped' crucibles which are found on many Viking period sites in Scandinavia. This shape, however, is not common on English sites of the same period. The crucibles from 16-22 Coppergate are, for example, of very different shapes (Roesdahl et al., 1981, YMW3-5).

The fabric is fairly fine with abundant fine quartz grains which make it sufficiently refractory for use as a crucible. It has been somewhat affected by heat all through but the changes are most marked on the outside near the base. The inner surface is coated with a metalliferous crucible slag containing trapped metal droplets. This slag layer is thin on the walls but has collected in a pool in the base.

34 Shambles has also produced evidence for non-ferrous metalworking including a small piece of lead run-off (1219) and two pieces of scrap lead possibly for remelting (1220-1). Pieces of fuel ash slag (1197-8) indicate that high temperatures were being reached on the site, but whether for metalworking, for glass working or for some other process is uncertain.

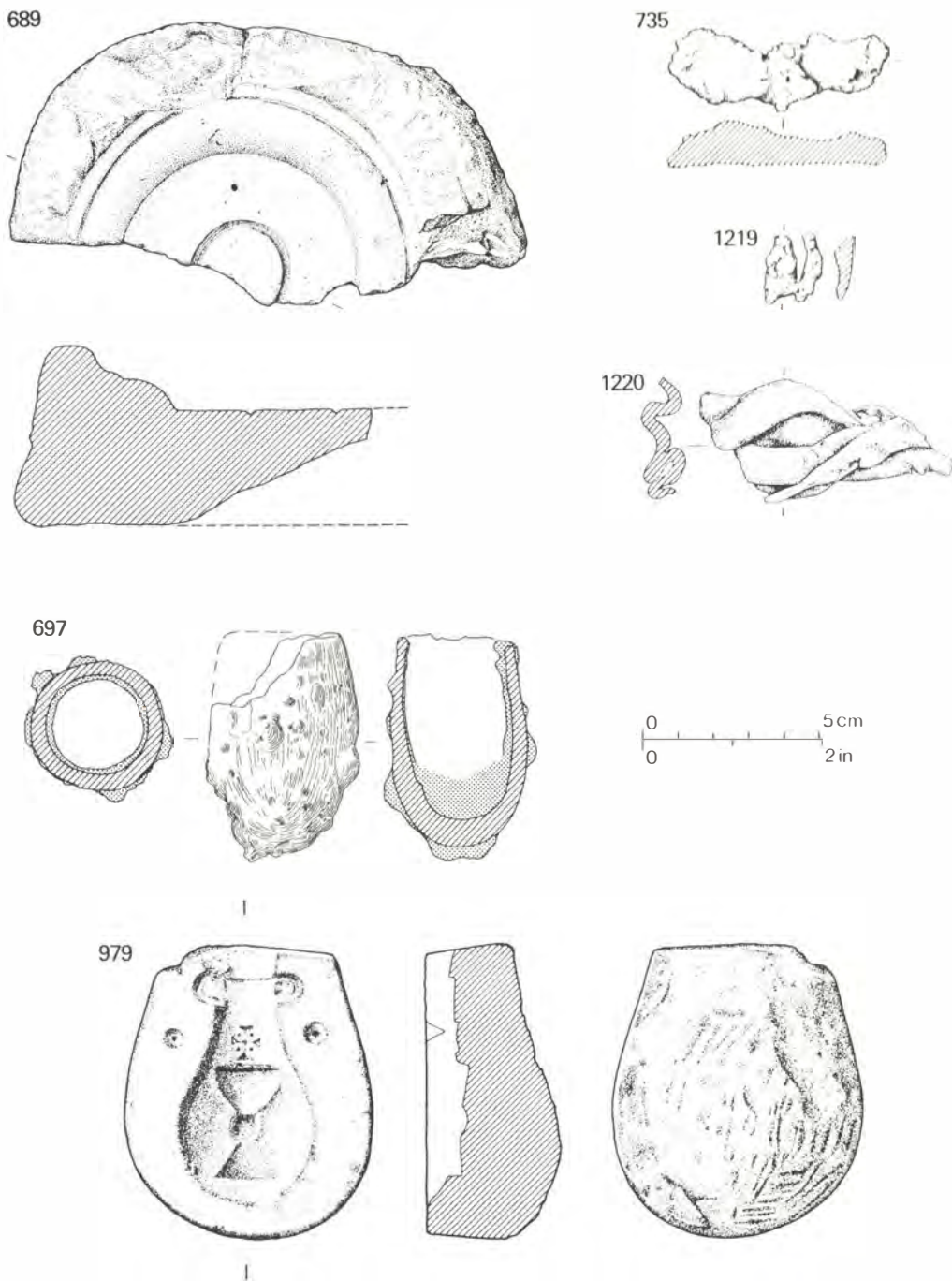


Fig. 94 Non-ferrous metalworking debris: mould (689), crucible (697), ampulla mould (979), lead run-off (735, 1219) and lead sheet (1220). Scale 1:2; 979 1:4

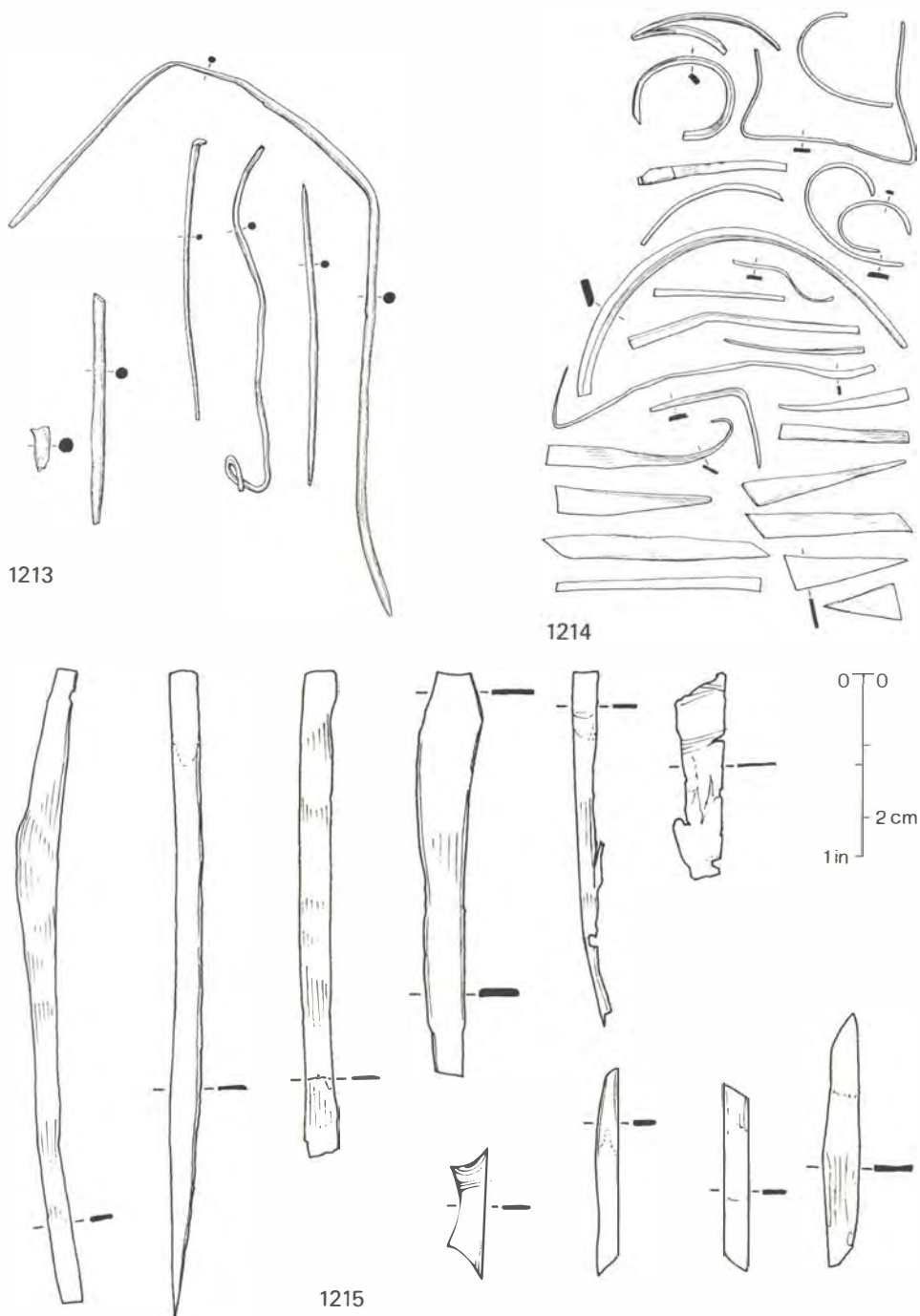


Fig. 95 Copper-alloy offcuts. Scale 1213, 1215 1:1; 1214 1:2

The most important evidence for metalworking on the site, however, is derived from a series of copper-alloy offcuts (1213–15) and part of a stone mould (979). The offcuts were examined by **Mr C. Caple** when in the Postgraduate School of Physics, University of Bradford, who provides the following report:

The group of copper-alloy offcuts, 1213–15, consists of two pieces of rod, four wire fragments, and 37 pieces of cut sheet metal. These appear to be offcuts from larger pieces; the edges are consistent with the use of shears for cutting.

The thickness of each fragment of sheet metal was carefully measured and plotted (Fig. 96). This shows the predominance of two thicknesses of metal, about 0.4mm and 0.9mm. The range of thickness of sheet metal would have been a controlled function of manufacture governed by the amount of metal available, the most suitable thickness for the purpose to which it was to be put, or by deliberate control of rules derived from tradition or laid down by external authorities such as the guild. Any or all of these factors might induce the consistent use of sheet metal of a given thickness.

Comparable results have been obtained from an examination of similar offcuts of 14th century date from the site of the church of St Helen-on-the-Walls, Aldwark (AY 10/1, 26) (Fig. 96). This shows a similar distribution of sheet metal thicknesses with the predominance of sheet metal of approximately 0.4mm thick, and 1.0mm thick. An alternative approach is to place more emphasis on the variation of the thickness within each piece and less on the mean thickness. This produces a similar if more complex pattern of preferred thickness. With both these approaches, however, the number of pieces of sheet metal is too low to permit statistical confidence in the results.

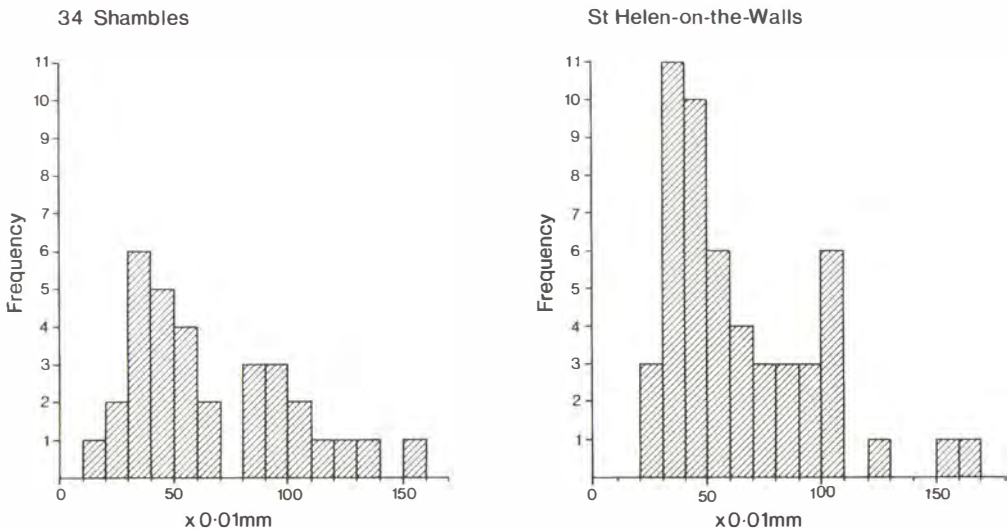


Fig. 96 Graphs showing the thickness of sheet metal fragments from 34 Shambles and from St Helen-on-the-Walls, Aldwark

Table 7* Analysis by X-ray fluorescence of copper-alloy sheet metal offcuts from 34 Shambles indicating the percentages of the component metals of the quaternary alloy.

Offcuts	Percentage of metals			
	Copper	Zinc	Tin	Lead
1	79.6	15.2	4.1	1.1
2	84.2	10.8	3.7	1.4
3	87.8	7.4	3.8	1.0
4	87.1	7.7	4.0	1.1
5	89.9	5.7	3.3	1.1
6	87.8	6.6	4.3	1.2
7	90.8	4.6	3.3	1.3
8	94.8	1.6	3.3	0.9
9	87.1	8.6	3.0	1.3
10	82.5	13.3	3.1	1.2

* All analyses were performed on abraded clean metal surfaces and accuracy limits have been derived from a set of multi-element standards.

Limits to which the quoted accuracy applies

Copper > 60%
 Zinc > 3%
 Tin > 0.1%
 Lead > 1.0%

Percentage error, at the 67% confidence limit, of the stated value

4%
 5%
 6%
 9%

A representative sample of the offcuts of sheet metal was also analysed using X-ray fluorescence for the major alloy components of the metal (Table 7). It was found that the alloy used for most of the pieces of sheet metal was a quaternary alloy of copper, zinc, tin and lead. The piece of sheet metal no. 8 had a much lower zinc content than the rest of the pieces, the amount present being so low that it could not be accurately determined. This piece, being a low-leaded tin bronze, and only 0.19mm thick, is clearly different from the other pieces of sheet metal. Taken together, this alloy, as well as the more usual quaternary alloy, has a very steady lead and tin content, the percentage variations (tin 3.3–4.3%; lead 0.9–1.4%) being unusually small. This suggests deliberate control of the percentage of these alloying elements. Less well controlled, these elements could cause difficulties in working the metal. Too much tin would cause the metal to work-harden excessively, while too much lead might cause weakness resulting in the metal tearing.

The variation in zinc content of 5–15% suggests that this alloying element, which was added to the alloy as brass, was not carefully controlled. An excess of zinc would have no great effect on the mechanical properties of the resultant alloy. It is the variation in the percentage of zinc which suggests that the majority of the pieces of sheet metal were not derived from a single source. However, in the case of nos. 3 and 4 which are of identical thickness and very similar composition it is likely that they were cut from the same sheet.

These analyses are comparable with other analyses of sheet metal, and in the period AD 1100–1400 an alloy containing variable percentages of zinc and small (less than 5%) amounts of tin and lead appears to have been commonly available. It was used, for example, for making cast metal products like memorial brasses (Cameron, 1974) as well

Table 8* Analysis by X-ray fluorescence of copper-alloy wires from 34 Shambles indicating the percentages of the component metals of the quaternary alloy.

Wires	Percentage of metals			
	Copper	Zinc	Tin	Lead
1	83.2	12.1	3.4	1.3
2	98.1	—	1.0	0.9
3	96.1	2.1	0.8	1.0

* See note to Table 7.

as wrought metal manufactures such as buckles. In contrast, during the later medieval period, a pure brass was used for most of these purposes.

Three pieces of wire were also analysed by X-ray fluorescence (Table 8). The first has a similar, quaternary alloy, composition to the sheet metal. The two other wires are mainly composed of copper. The lead content, however, remains at about 1% which suggests that it may be related to the copper content and, rather than being a deliberate alloying addition, may be an impurity in the copper. The low tin and zinc levels suggest that they are also impurities, probably derived from the use of small amounts of scrap metal in addition to the fresh metal supplies. The composition of all these wires differs from the brasses reported for later medieval wires such as those from Sandal Castle, West Yorkshire (Caple, 1983, 277) and Chelmsford, Essex.

Three finished pieces of metalwork from the site were also examined by X-ray fluorescence. The buckle pin (1216) gave a composition similar to that of the sheet metal, as did the brooch (1217). The pieces of folded and riveted metal (1218), however, were found to be composed of pure brass with a zinc content of about 30%.

Also associated with metalworking is 979, which is part of a two-piece stone mould (Fig. 94; Pl. X). **Dr N. G. Berridge** provides the following note on the stone type:

This is composed of a dense fine-grained cream rock covered by a pale brown patina. It is calcitic dolomite, very probably from the Magnesian Limestone, which has a narrow outcrop running north to south between Tynemouth and Nottingham, passing through Ripon, Wetherby and Castleford at its closest approach to York.

The mould was used for the casting of small ampullae probably in pewter or copper-alloy, although no metal remains for analysis in the mould. The front face of the ampulla is decorated with a chalice over which is a Greek cross with a pellet in each of the angles of the arms. In the case of the lower right-hand pellet there is an incised line linking the ends of the cross arms, giving more the appearance of a dot surrounded by a plain moulding.

Small ampullae of this type made of pewter or copper-alloy are relatively common finds and over a hundred are known from England (Spencer, 1968, 139). Most have a round body, and a long expanding neck, with the handles at the shoulders. There are at least two examples of this type from York (Yorkshire Museum, accession numbers 616.47 and 617.47), and other similar ampullae are known from sites nearby including Market Weighton (Yorkshire Museum, accession number 1952.17.1) and Saxton (Yorkshire Museum, accession number 1981.422). On the mould from 34 Shambles, however, the ampulla has a bag-shaped body, and a neck of uniform width, with the handles placed at the mouth. This shape is best

paralleled by two ampullae from 16–22 Coppergate. Both of them have the body of the ampulla decorated with the figure of an archbishop, flanked by the half-length figures of St Peter and St Paul. On one example the figures are on the trapezoidal plate which forms a background to and is integral with the ampulla (Hall, 1984, 145, fig. 174a). On the other the two saints are placed within lentoid fields in an openwork frame which encircles and clasps the ampulla (*ibid.*, fig. 174b). The archbishop can tentatively be identified as St William of York or, alternatively, it may represent Archbishop Scrope (d. 1405) who was widely venerated as a saint after his execution for treason. The positioning of the handles at the ampulla mouth is a usage not easily paralleled elsewhere and the Shambles mould may, therefore, represent a local variant of the normal ampulla shape.

Such small ampullae were current throughout the whole of western Europe in the medieval period, and were used as pilgrimage badges at a large number of shrines, including that of St William of York (Wilson, 1977, 9, n.25). They were worn on the hat or bag, or suspended round the neck (Spencer, 1971, 59) and probably contained holy oil or, more often, water which had been in contact with a saint or his relics. ‘Canterbury water’ or ‘Becket water’, for example, was tinged with blood shed at Becket’s martyrdom (Finucane, 1977, 89–90). Only one ampulla, from Marske-on-Sea, Yorkshire, has been discovered unopened, and this contained a mixture of aromatic herbs and spices in water (Spencer, 1968, 139, fig. 1e and f).

The repertoire of decoration on these ampullae is small. The most common patterns are the scallop shell, a floral device, chevrons, the letter W, the crown and the crescent. There are also some heraldic devices (Spencer, 1971). The decoration on the York mould is highly distinctive and stands outside this tradition, helping to distinguish the cult with which it was associated. A cross with a pellet or circle in each of the re-entrant angles suggests the symbol of the Five Wounds, probably representing the body of Christ. This is a symbol used on other pilgrimage badges such as those from London Wall, Thames Street and Swan Pier, London (London Museum, 1940, 262–3, pl. 1xx 29 and 30). The combination of this symbol with the chalice, possibly representing the blood of Christ, may suggest an association with the cult of Corpus Christi, a cult expressing particular devotion to the consecrated host or body of Christ. This was popular in York, as in other towns, in the later medieval period, and the influential Corpus Christi guild in the city helped to organize the mystery plays and the annual procession in honour of the host held on Corpus Christi day.

Ampullae were used as pilgrimage badges from the last quarter of the 12th to the 15th centuries, and outnumber the badges from the late 14th century (Spencer, 1971, 59). If the association of this ampulla mould with the cult of Corpus Christi is accepted, it confirms a date late in this range since the York guild of Corpus Christi was only founded in 1408 (*VCH, Yorkshire 2*, 111) and was dissolved in 1547 (Raine, 1955, 315).

Moulds for pilgrim badges are relatively uncommon finds, but there is a stone mould for casting badges in the form of a chalice from Dunston, Norfolk (Spencer, 1980, 25, ill. 109). In addition there are moulds for casting badges of St Thomas of Canterbury in the British Museum and in the Museum of London. A mould for badges of Our Lady of Walsingham is in King’s Lynn Museum (London Museum, 1940, 255–6), and there is a mould for cross-shaped ampullae of the Waltham Holy Cross, Hertfordshire (Spencer, 1968, 141, pl. IV.4).

The discovery of the copper-alloy offcuts and the stone mould is enough to suggest that there was metalworking at or near 34 Shambles in the medieval period. **Prof. D. M. Palliser** of the Department of History, University of Hull, provides the following note on the historical evidence for metalworking in this area:

Although the Shambles was predominantly a butchers' street throughout the Middle Ages, with a greater concentration of one craft than almost any other in York, it probably housed other craftsmen also. Its alternative names were *Haymongergate*, 'street of the hay sellers' and *Nedelerigate*, 'street of the needle makers' (Palliser, 1978, 14–15). Nedelerigate was recorded by 1394 (Borthwick Institute, probate reg. 1, fo 71), and remained in use until at least 1501 (York City Archives, MS E20 A, fos 171–2). Needlers do not appear among surviving lists of medieval crafts, and may have been identical with the pinners, who are certainly recorded in the area.

The 1381 poll-tax records several metalworkers in the two parishes between which the Shambles was divided, though it does not by itself establish conclusively whether they lived in that street. The taxpayers in St Crux parish included twelve metalworkers (ten pinners, a girdler and a wiredrawer), listed before and after a group of butchers; while the list for Holy Trinity, King's Square, follows the butchers with four girdlers, a bladesmith and a pinner (Bartlett, n.d.). Girdlers did not make girdles or textiles, but a variety of metal objects — belts, buckles, scabbard points, saddle nails, dog collars, book clasps, etc. — while pinners and wiredrawers drew wire and made pins, fish hooks, shoe buckles, bread graters, mousetraps and so on (*York Memorandum Book*, I, 180–7, II, 279; York City Archives, MS E60, fo 8).

Other archaeological evidence for medieval non-ferrous metalworking in this area is derived from the Bedern foundry site between Goodramgate and St Andrewgate, some three hundred metres from 34 Shambles. Here a medieval founder's workshop was excavated in 1973. The site is divided between the parishes of Holy Trinity and Bedern. An analysis of the many thousands of mould fragments from the site suggests that the workshop was producing small copper-alloy bells (Ransome, 1977). Also from the site are two small rectangular stone moulds similar to that from the Shambles and used for making pewter or copper-alloy counters. Evidence for non-ferrous metalworking also comes from a site in Low Petergate, again in the parish of Holy Trinity. Here in 1957–58 Wenham discovered a metalworking hearth made from re-used 13th–14th century roof tiles, and associated with 15th century pottery. A quantity of slag and the remains of a crucible were also recovered. Analysis suggests that the copper-alloys were being melted with charcoal as the fuel (Wenham, 1972; Brinklow, 1975, 26–7).

Non-ferrous metal items of dress (Fig. 97)

729 and 1216–18 and 1243 are apparently all items of dress. 729 from Parliament Street is an undecorated, cast, double buckle frame, with the pin bar broken away. This is a type which became more common from the 14th century (Goodall, 1981, 67). Two examples from Southampton provide close parallels to the Parliament Street piece; one from the High Street is dated to c. 1300–50, and another from Cuckoo Lane to 1375–1425 (Platt and Coleman-Smith, 1975, nos. 1725 and 1753, figs. 240 and 241). There is also a similar buckle from Baker Lane, King's Lynn, Norfolk, dated to c. 1250–1350 (Clarke and Carter, 1977, 289, fig. 130.13). A buckle tongue from 34 Shambles (1216) may be of medieval date.

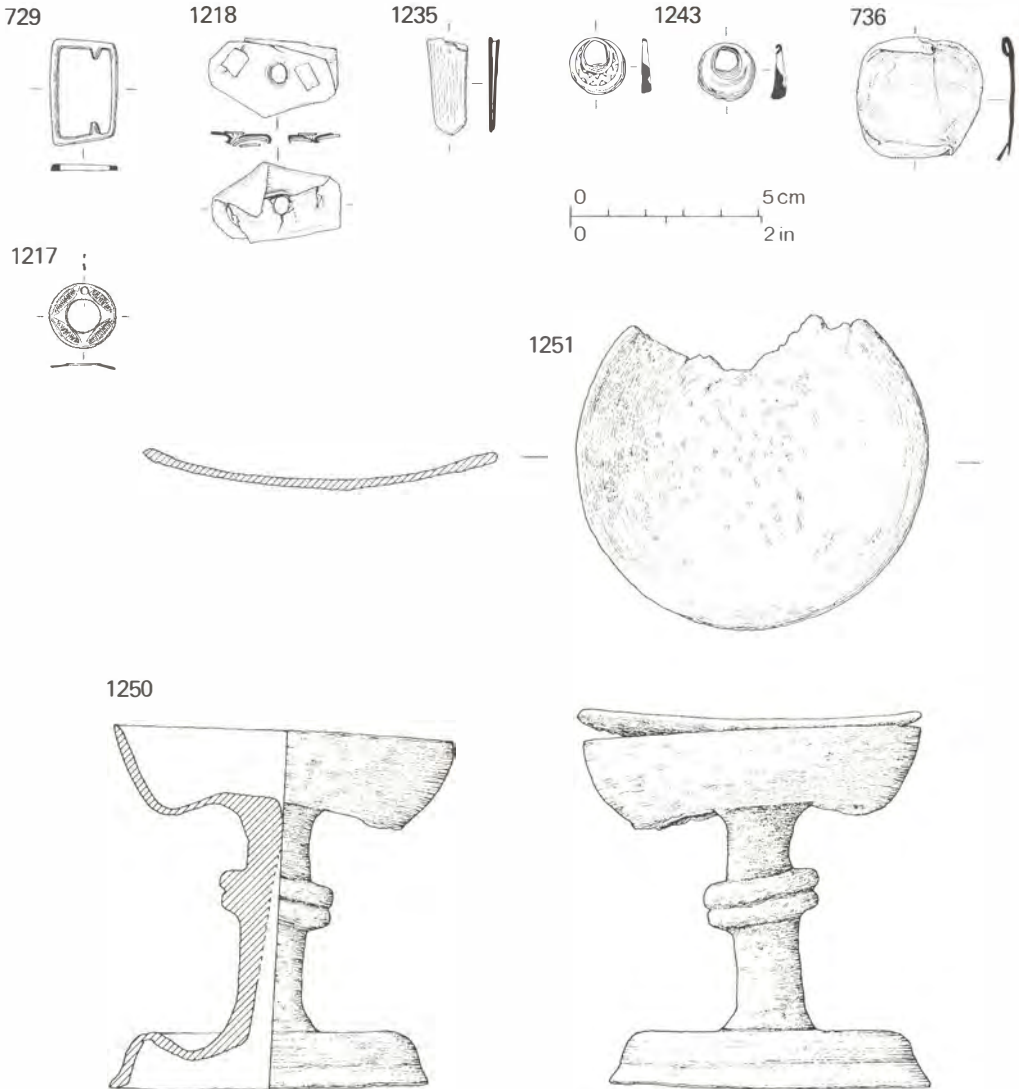


Fig. 97 Copper-alloy items of dress (729, 1217-18, 1235), gold lunate object (1243), pewter chalice and paten (1250-1), lead disc (736). Scale 1:2

Also from 34 Shambles is the small sheet metal annular brooch (1217) with stamped decoration on its front face, and a white metal coating. This type of brooch was frequently used in the medieval period as a dress fastening (Goodall, 1981, 68–9), and there are comparable examples from London, again with simple decoration on the front face (*ibid.*, 69, fig. 68.2). The Shambles example, however, is unusually small. It is probably a later medieval piece, but the simplicity of the ornament does not permit closer dating.

1218 from the same site may be an item of dress. It is a sub-triangular object made from two fragments of copper-alloy sheet folded together, and with a prominent perforation in the centre. It is conceivable that this may have been riveted on to a strap to form a crude, home-made, strap-end. It is probably of medieval date. A strap-end from All Saints Pavement, 1235, is made from two tapering sheets brazed together at the triangular lower end and left open for the inserting of a strap at the square upper end. The mineralized remains of the strap are held in place by a single rivet. There is no comparable example from York but there is a similar strap-end from Sandal Castle, West Yorkshire, derived from a late medieval or post-medieval context (Mayes and Butler, 1983). The date may also be applicable to the York example.

1216–18 were analysed by Mr C. Caple when in the Postgraduate School of Physics, University of Bradford. His report appears above (pp. 202–4).

1243, from All Saints Pavement, is a hollow gold lunate object with the points linked. It is made in two halves, originally soldered together around the circumference. The front face is decorated with incised zigzag ornament. Judging simply by the material used, the object is likely to have been a piece of jewellery, but precisely how it functioned is uncertain. It may have formed part of an ear-ring, dangling from a suspension loop which passed through the ear lobe, or it may have been used as a pendant on a necklace. The date of the piece is also uncertain as no close parallel can be adduced.

Pewter chalice and paten (Fig. 97)

These were found together during clearance work in the church of St Mary Castlegate, close to the second pier from the west in the south arcade. They are unstratified.

The chalice, 1250, has been compressed laterally, distorting its shape, but it appears to have had a broad shallow bowl, a long stem with a knop in the form of a double roll moulding, and a circular foot. In silver this type of chalice predominated from the late 12th until the end of the 13th century (Oman, 1957, 41–2) when it was superseded by a type with a deeper bowl and lobed knop. In the 14th century the use of the polygonal foot also became more common (*ibid.*, 42). In York, simple chalices of the same general type as the St Mary Castlegate example, but in silver, are known from the graves of Archbishop Walter de Gray (d. 1255), and Geoffrey de Ludham (d. 1265) (Ramm et al., 1971, 126–7, 135, pls. LIII, LXV). In both cases, however, the knop takes the form of a single, not a double, roll moulding. Another 13th century chalice of this type, also from the grave of an Archbishop, has a polygonal knop, and a further example has a lobed knop, and a more elaborately treated foot (Oman, 1957, 41, pl. 6).

It is unclear whether the forms of chalices in pewter always reflected contemporary fashions in silver but confirmation of the 13th century date of the St Mary Castlegate example derives from a group of pewter chalices from Lincoln Cathedral. Eight out of nine 13th century graves in the vestibule of the chapter house have yielded pewter chalices, and all of them are of the same general form as that employed here (Bruce-Mitford, 1976, pl. V, fig. 7). There is also a similar chalice from the coffin of Richard of Berkyng (d. 1246) at Westminster Abbey (*ibid.*, fig. 6).

The paten, 1251, is of very simple form, being circular and dished. It does not correspond with either of the two normal medieval forms in silver. In the first of these the central part of the paten is sunk, the depression being either circular or multifoil. In the second type there is a further depression, the first being circular and the second multifoil (Oman, 1957, 47).

It is unlikely that the St Mary Castlegate chalice and paten were intended for use in the celebration of the Mass. The use of pewter Mass vessels had been banned at the Council of Westminster in 1175 (Hatcher and Barker, 1974, 25), but that they continued in use is suggested by the statutes of Fulk Basset, Bishop of London (1245–59), which found it necessary to reiterate the ban on their use. Pewter chalices are recorded in three out of fourteen parish churches in the patronage of St Paul's in 1249, and in as many as eight out of fourteen in 1297, but the overwhelming majority of these churches also had at least one silver chalice and it is evident that the pewter examples were used for other purposes such as for giving communion to the sick, for drinking unconsecrated wine after communion and for burying in the coffin of the priest. A statute of 1229 issued by William of Blois, Bishop of Worcester, for example, specified that every church in the diocese should have two chalices, one of silver for the Mass and another of tin for burial with the priest (Zarnecki et al., 1984, 294). The small size of the chalice, and the fact that chalice and paten were found together, suggests that the St Mary Castlegate example came from the grave of a priest.

Lead disc (Fig. 97)

The lead disc (736) from the Parliament Street sewer trench is of uncertain function. The front face is decorated with an incised double triangle, possibly an identifying mark, but the piece is too thin and insubstantial to have been used as a seal.

Beads and rings (Figs. 98–100)

The Parliament Street sewer trench has yielded a single fragment of an amber finger-ring of D-shaped section (695). Such finger-rings, both fragmentary and complete, are frequent finds in York from the Anglo-Scandinavian period. There is an unfinished example from Lloyds Bank, 6–8 Pavement (pp. 89–90, Fig. 47, AY 17/3), and numerous examples from the excavations at 16–22 Coppergate. Nearby in Clifford Street, building works in the late 19th century produced a substantial quantity of amber working debris including material derived from the manufacture of finger-rings (Waterman, 1959, 94–6, fig. 22, 1–31; Roesdahl et al., 1981, YAJG4, 97). Such finger-rings are not known in York from Roman, Anglian or medieval levels.

The finds from 34 Shambles include an important collection of almost 200 glass beads and fragments (990–1180) and two glass finger-rings (1181–2), probably dating from the 12th century. Only 26 of the beads were intact; the remainder were broken or malformed and these, together with glass globules and other pieces of glass waste, suggest that glass working was taking place on the site. In contrast, the two glass beads from the Parliament Street sewer (705, 706), and one from All Saints Pavement (1232), were intact.

The glass objects from 34 Shambles were examined by **Dr J. Henderson**, of the Research Laboratory for Archaeology and the History of Art, Oxford University, who has contributed the following report.

The glass was examined from the point of view of typology and manufacturing technique and samples were then selected for non-destructive X-ray fluorescence analysis; this work was done in conjunction with Dr S. E. Warren of the Postgraduate School of Studies in Physics, University of Bradford (see the second part of this report, pp. 224–5).

Eleven categories of glass from the site have been distinguished, drawing on the classifications proposed by Beck (1927) and Guido (1978), and to a limited extent on that of Van der Steen (1973). These include eight types of bead: globular, annular, cylindrical, pear-shaped, truncated cone, concave cone, fluted, and malformed beads or fragments of malformed beads. In addition there are finger-rings, globules and other by-products, and glassy waste. Each category is described in turn below, with a discussion of the possible manufacturing technique used. Where appropriate the categories are sub-divided on the basis of colour.

The categories of finger-rings, globules, glassy waste and other by-products are easily defined, but the beads present a much more difficult problem. The beads in four of the categories, truncated cone, concave cone, fluted and malformed, have highly distinctive forms, but these categories embrace only a handful of beads. The majority closely resemble each other and can only be categorized on the basis of detailed measurements taken of the diameters and heights of the beads and of the perforations (P1 and P2, with P1 being the widest end). The data are presented in Table 9. With incomplete beads where sufficient of the bead survives, the diameter has been reconstructed assuming a regular radius of curvature. Where only a small fragment of the bead survives such measurement is impossible, and these beads have been omitted from Fig. 98 which employs diameter and height as discriminating characteristics.

Two major categories, globular and annular, can be distinguished (Fig. 98) although some examples fall close to the interface. Yellow globular beads can be distinguished as squatter than most of the black and green globular beads. A third, smaller, group, the cylindrical beads, can also be isolated. Statistical testing has not been attempted but these groupings are supported by consideration of other characteristics of the beads, such as the degree to which the perforation tapers, which is generally more marked on globular beads. Pear-shaped beads have also been omitted from Fig. 98 as additional dimensions would be necessary to differentiate them from globular beads in such a presentation of the data. The visible groups in Fig. 98 are however a reflection of the degree of control exerted over the manufacture of the bead shapes.

1. Globular beads

These are distinguished from annular beads here by their height being more than half their diameter (after Guido, 1978). The globular beads are further characterized by having broad D-shaped sections, tapering perforations and a regularly curving profile. The manufacturing technique was probably to gather glass from a batch within a

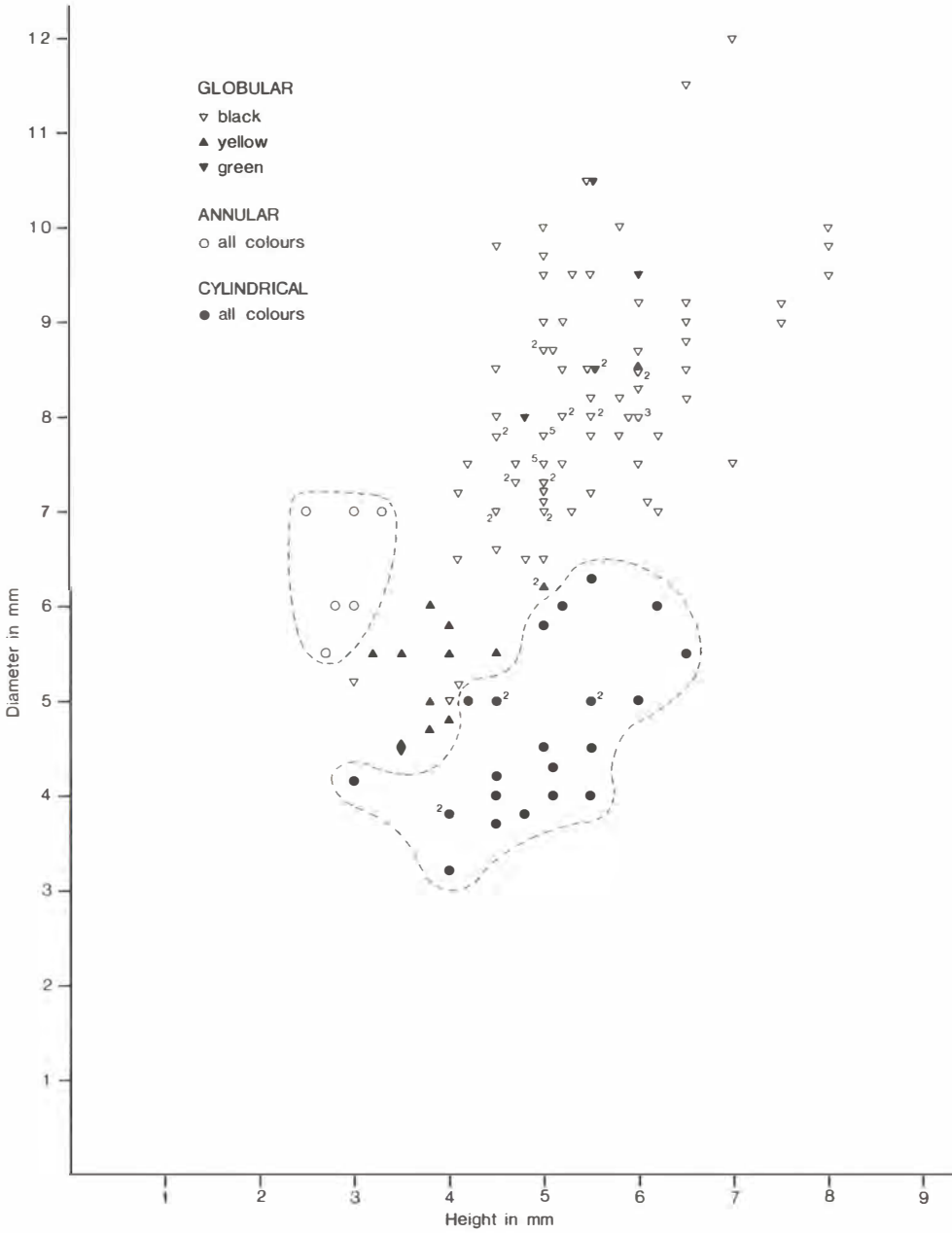


Fig. 98 Scatter diagram showing the discriminating characteristics by which the glass beads are categorized

crucible on a pointed metal object, probably with a wooden handle, to reheat it in order to regularize the shape and then push it off the implement with tongs. Beads displaying the features described here were produced using this method during experimental work (Henderson, 1977). The factors which affect the separation of the bead from the metal rod or wire include the temperature of the glass, whether or not the rod or wire is pre-heated, the type of metal of which the rod or wire is made (which will have a bearing on the relative coefficients of expansion for metal and glass), the extent to which the wire or metal rod tapers, and whether or not the bead is reheated. In some other contexts a granular material, such as sand or baked clay, is used to aid the separation of the bead from the metal. Evidence for the use of an iron implement has come from Viking Ribe (Bencard et al., 1978, fig. 16) and Helgö (Lundström, 1976, fig. 2) and also from the Iron Age contexts of Meare Lake Village, Avon (Henderson, 1981, fig. 44c).

li. 'Black' globular beads (990–1097)

Out of the 108 examples of 'black' globular beads, only three are unbroken (1011, 1048, 1094; see Fig. 99) and of the remaining ones about half or less has survived. Surprisingly none of the fragments will join with each other and this, in part, may be due to post-depositional weathering. The fact that there is such a high proportion of fractured beads from the site also argues that they represent unsuccessful attempts at forming beads. As to the colour, although all the beads appear black (see discussion on the colourants in the second section) there are some fragments which, when viewed through their edge, appear to have an intense brown colour. If other 'black' fragments were broken into smaller pieces it is possible that they would also be seen as brown. For the sake of simplicity all the glass of this 'black' colour has been dealt with in the same section. The glass falls into two sub-groupings according to its surface colour and condition: (lia) those with jet black shiny and apparently unweathered surfaces (990–9, 1023–48, 1071–94 in Table 9), and (lib) those with speckled dark brown weathered surfaces sometimes with golden or silvery iridescence and minute weathered pits, especially on broken sections (1000–22, 1049–70, 1095–7 in Table 9).

These 'black' globular beads tend to have regular profiles, D-shaped cross-sections and tapering perforations (see Fig. 99) consistent with the manufacturing technique suggested above. Some of the beads from both lia and lib have perforations which are contracted in the middle producing an hour-glass shape in section (1023, 1049, 1054–5, 1061, 1082 and 1092 for example). This shape may be caused by problems in attempting to remove the bead from the rod or wire on which it has been made, so that it was necessary to shift the bead sideways while the glass was still workable. In these cases however it has resulted in the fracture of the bead. The complete 'black' globular beads (1011, 1048 and 1094) do not display this characteristic: they all have straight-sided tapering perforations. There are also examples of beads with angled perforations producing off-centre holes (1056 and 1078 for example) and, less usually, beads with parallel-sided perforations (990 for example).

lii. Yellow globular beads (1098–1109)

There are ten yellow globular half beads and two complete examples (1101–2). They can be sub-divided into (liia) translucent globular beads (1098–1102) and (liib) opaque yellow ochre globular beads (1103–9). None of the broken beads fits together and, like the black globular bead fragments, they probably represent by-products of glass bead manufacture on the site (see sections 10 and 11 for further classes of by-products). An alternative but less likely explanation for the large numbers of broken beads on the site is that they result from unsuccessful manufacturing attempts elsewhere and are being remelted (as scrap glass) on the site in order to manufacture a variety of forms. 1109 is of the same basic colour as the other opaque yellow beads but is covered with dark brown streaks.

liii. Brown globular bead (1110)

A single typical example of a globular half bead of a pale transparent brown colour with black accretions on the surface was derived from the site (1110).

liv. Green globular beads (1111–16)

These are transparent apple or chrome green in colour, have tapering perforations and contain small gas bubbles. All have centrally placed perforations apart from 1116. They are also all incomplete: between a third and a half of the original estimated full size of the bead remains.

2. Annular beads

These are defined by their heights being less than half their diameters. They were probably manufactured by winding filaments of glass around a tapering metal rod and then reheating to make the strands fuse. Some factors affecting the separation of the glass bead from the metal rod are outlined in the introduction to globular beads, and apply equally here.

2i. 'Black' annular beads (1117–18)

One of the two 'black' annular beads (1117) is one of the few complete beads from the site. Like the other black glass beads from the site these annular beads have suffered from weathering which shows as blotches of brown on the otherwise shiny surface.

2ii. Yellow annular beads (1119–20)

Both examples (1119–20) are incomplete. 1119 is an opaque yellow ochre colour with circumferential streaks of lemon yellow. 1120 is a transparent pale yellow colour with a D-shaped profile.

2iii. Green annular beads (1121–3)

The two incomplete examples (1121–2) are of apple green bubbly glass with tapering perforations. The only complete example (1123, see Fig. 99) has an off-centre perforation and around the smaller end is a rough gathering of glass which was produced when pushing the glass bead off the metal it was made on; a similar feature was generated in this way during experimental bead production (Henderson, 1977).

3. Cylindrical beads

This type of bead is defined by a diameter to height ratio of close to 1:1 (which in the majority of cases is not found in globular beads) and in a markedly tapering perforation which in most cases tapers by c. 50% or slightly more. Again this ratio generally distinguishes the type from the globular form. The beads also have a D-shaped section but it is narrower than that of the globular or annular types. The beads were probably made by winding filaments of glass around a metal rod.

3i. 'Black' cylindrical beads (1124–30)

The 'black' glass is generally opaque and it has only a light weathering. It is notable that only two of the seven beads are broken (1124 and 1130). Beads 1124–9 have very similar or the same maximum perforation dimensions. Given that there might be a slight change in the shape of a bead of hot workable glass in the process of removing it from the metal rod on which it was made, this may mean that the beads were made using the same pointed piece of metal, possibly in rapid succession. All examples of this colour have markedly tapering perforations.

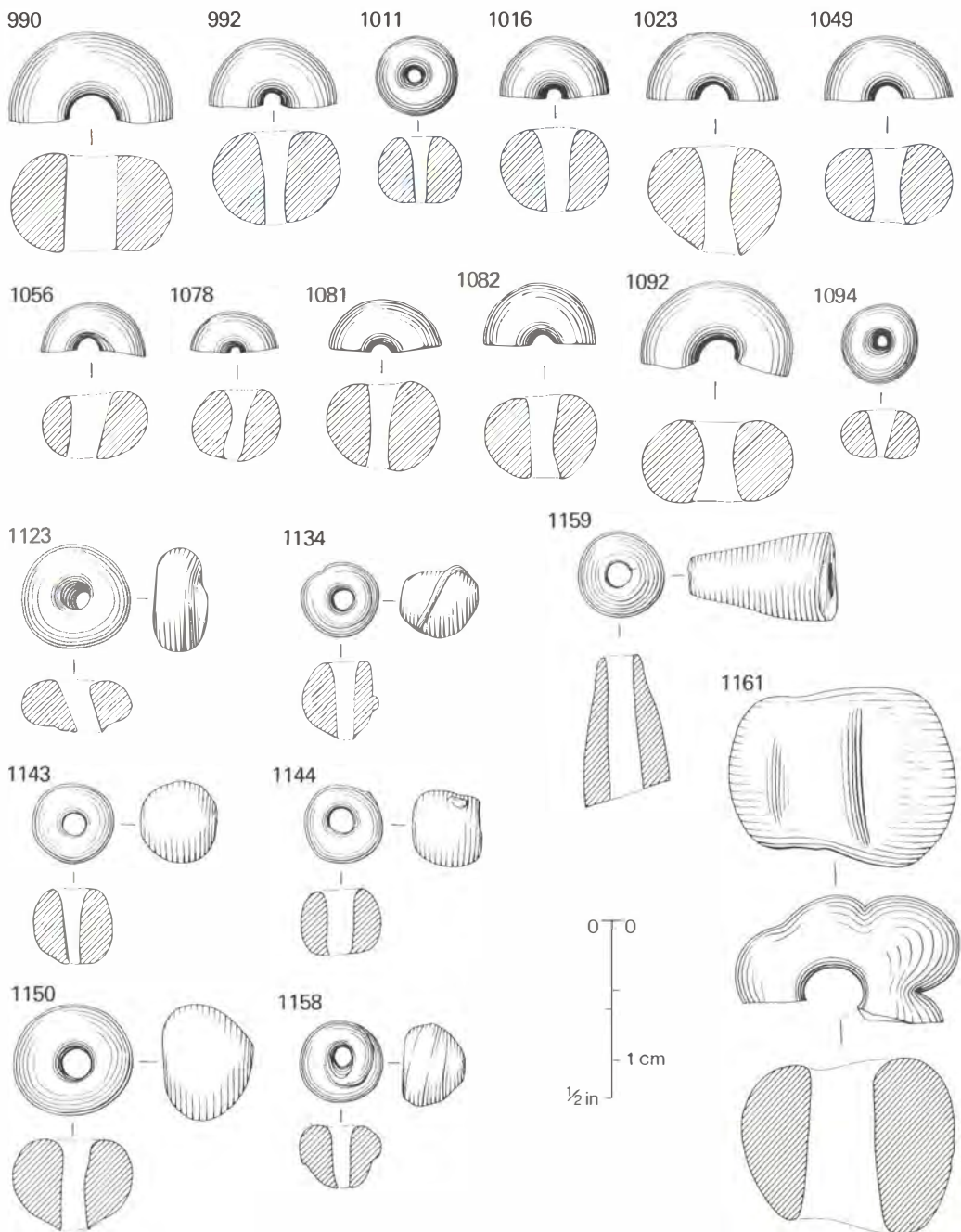


Fig. 99 Glass beads: globular (990–1094), annular (1123), cylindrical (1134, 1143–4), pear-shaped (1150), truncated cone (1158), concave cone (1159), fluted (1161). Scale 2:1

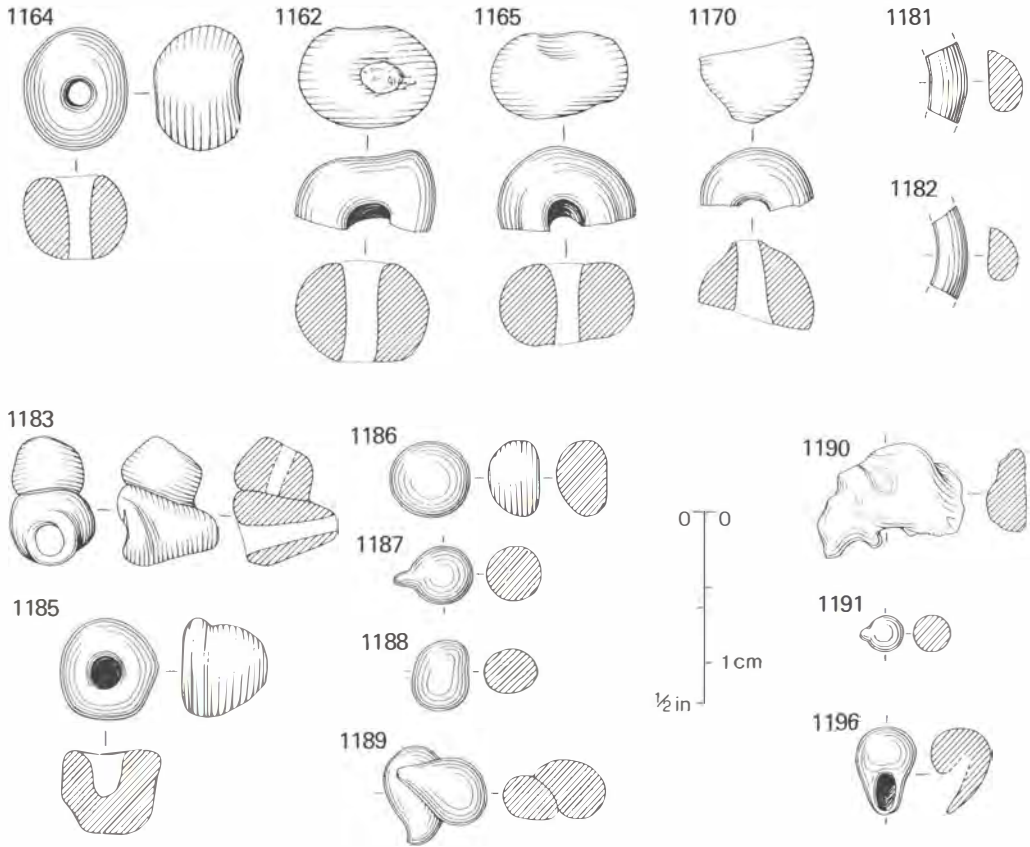


Fig. 100 Glass: malformed beads (1162, 1164-5, 1170), finger-rings (1181-2), by-products (1183-9) and glassy waste (1190-1, 1196). Scale 2:1

3ii. Yellow cylindrical beads (1131-40)

This class of bead includes a range of yellow tints, ranging from opaque yellow ochre (1137 and 1140) through semi-transparent yellow ochre (1132 and 1136) to a pale transparent lemon yellow colour (1134-5). A discussion on the colourants is to be found below, pp. 224-5. There are several beads with similar-sized perforations (1131-5) which are similar in size to those of the 'black' cylindrical beads mentioned above. They are from the same contexts, and it is possible that all were manufactured using the same tool. One of the beads (1134, Fig. 99) has a thin strand of glass running around its outer surface, probably the result of winding glass filaments around a metal core.

3iii. Brown cylindrical bead (1141)

There is a single example of a transparent cylindrical brown glass bead from the site with a silvery weathered surface; it is cracked along its length. The smaller end of the perforation is roughened by being pushed off the rod on which it was made while the glass was still soft.

3iv. Green cylindrical beads (1142–8)

Two examples (1143–4, Fig. 99) are squatter than those typical of the type and, taking the tabulated measurements of diameter and height alone into account, these two beads fall close to the interface with the area on the plot occupied by the globular form (see Fig. 98). However, they have an overall cylindrical shape and their perforation shape is typical of cylindrical beads. 1142 is kinked about a third of the way along its length which may be where two strands of glass originally joined. There are four beads with maximum perforation diameters of c. 2mm (1144–6 and 1148) and these also derive from the context which produced ‘black’ cylindrical beads with similar maximum perforation diameters, perhaps suggesting that they were all manufactured using the same implement.

4. Pear-shaped beads

These are distinguished from the other types solely by their shape. They were probably made by gathering glass on a metal rod directly from the crucible or by winding filaments of glass around the rod and then pressing the bead into shape.

4i. ‘Black’ pear-shaped beads (1149–54)

All the beads in this category have very similar overall dimensions (e.g. 1150, Fig. 99). The beads from contexts 2 and 6 show little corrosion, whereas 1154 from context 7 has a partly mottled pale and medium brown surface. 1153 also has striations around the outside which presumably result from the manufacturing process. The perforations of 1152–4 are the same hour-glass shape in section. It is just conceivable that the perforations of these beads were made by using tongs with inward pointing tapering tips which met in the middle, although extraction of a suitably shaped globule of glass would present practical difficulties. An alternative way of producing this hour-glass shape to the perforation would be to contract the median diameter of the bead in the process of pressing it into shape.

4ii. Green pear-shaped beads (1155–7)

Of these three examples one is the largest bead from the site (1157). There is less than half of the bead to examine and the perforation length is not completely represented in section as a result. The glass is in good condition and contains many small air bubbles.

5. Truncated cone (1158)

There is a single example of this shape of bead from the site (1158, Fig. 99). This ‘black’ bead has a strand of glass which originates at the larger end of the perforation and coils around the bead standing proud of the surface. The overall shape of the bead is irregular, hinting at the positions of other strands of glass used in the manufacturing process of winding filaments of glass around a tapering rod.

6. Concave cone (1159)

The only example of a concave cone-shaped bead from the site is ‘black’ and has apparently been produced by chopping a larger bead in two (Fig. 99). The cut edge is straight whereas the opposite end of the bead has apparently split slightly on removal from the metal rod following shaping.

Table 9 Glass from 34 Shambles. Measurements (mm) of maximum diameter, height and perforation of glass beads and rings, and height of glassy waste.

P1 = larger end of perforation; P2 = smaller end of perforation; A = angled perforation; - = insufficient to make a measurement; R = reconstructed diameter; * = complete

	Context No.	Sf No.	Diam.	Height	P1	P2
li Black globular						
990	2	23	12	7	3.5	3
991			9.5	5	3	2.5
992			9	6.5	2	1.7
993			9	5	3	2.7
994			8	4.5	2.3	2
995			7.8	5	2	1.2
996			7	5	2	1.8
997			7.5	5	2.2	2
998			7.5	4.7	2.2	1.3
999			9R	5	-	-
1000			9.8	8	2.3	1.8
1001			10	5.8	3	2.5
1002			8	5.5	2.5	1.8
1003			8.7	5	2	1.8
1004			7.3	5	2.5	2
1005			7.2R	5.5	2.5	2
1006			7.8	5.8	1.7	1.5
1007			7.8	5	1.7	1.5
1008			7	5	2	1.5
1009			9R	5.5	-	-
1010			5R	5	-	-
1011 *	3	44	5	4	1.5	0.6
1012	4	50	8.5	6.5	2.3	2
1013			9.2	6	3.5	2.5
1014			8	6	2	1.6
1015			7.8	6.2	2.5	1.8
1016			7.5	6	2.5	1.2
1017			7	4.5	2	-
1018			9R	5.7	-	-
1019			7	5.3	2	1.5
1020			8R	5.7	-	-
1021			8.5	5.5	2.5	2.1
1022			8.2	5.5	2	2
1023			9.2	7.5	2.8	2
1024			9.5	8	2.5	1.5
1025			7.2	5.6	2	1.7
1026			7.8	5	2.5	1.5
1027			7.5	5.2	2	1.8
1028			7	6.2	2.5	1.5
1029			8	5.5	3	2
1030			7.3	5	3.5	2
1031			6.5	4.1	1.7	1
1032			10R	6	-	-
1033			8.2	5.8	2	1.5
1034			7.5	6.8	2.2	1.8
1035			7R	5	-	-
1036			7R	4.5	2	1.5
1037			7R	4.2	2	1.7
1038			7R	5	-	-
1039			7.5R	5.2	-	-
1040			8R	6.5	-	-
1041			8R	5	-	-
1042			7R	5.5	-	-
1043			7R	4.3	-	-

Table 9 (contd.)

	Context No.	Sf No.	Diam.	Height	P1	P2
1044			11.5	6.5	4.5	4.5
1045			9.5	5.3	3	2.7
1046			7.5	5	2.5	2.3
1047			8.2	—	—	—
1048 *	4	51	7.8	4.5	2.5	2.2
1049	6	64	9	5.2	2.5	2.3
1050			9.2	6.5	2.3	2
1051			10	5	3.5	3
1052			8.8	6.5	2.3	1.5
1053			8.2	6.5	2.2	2
1054			7.8	5	1.8	1.5
1055	7	72	7.5	5	2.8	2
1056			7.3	4.7	A 2.5	2
1057			8.5	4.5	2.2	1.7
1058			7.8	4.5	—	—
1059			9.5	5.5	2.5	2
1060			7.5	4.2	2.5	2.2
1061			7.5	5	2	2
1062			7.8	5.5	2	1.8
1063			8.7	5	2	1.8
1064			8	6	1.8	1.8
1065			8.7	6	—	—
1066			—	6.8	—	—
1067			7.3	4.7	2.3	1.5
1068			7	4.5	3	1.7
1069			7.5R	4.6	—	—
1070			6.5R	5	—	—
1071			8.5	6	2.6	1
1072			8.5	5.2	2.5	2
1073			10	—	4	—
1074			9.7	5	3	2.5
1075			7.2	4.1	3	2.5
1076			7.5	5	2	2
1077			6.6	4.5	1.7	1.5
1078			6.5	4.8	A 2.5	1.2
1079			6.5	5	—	—
1080			5.2	4.1	1.2	1
1081			8	6	1.8	1.5
1082			8	5.9	2.2	2
1083			8.3	6	2.2	2
1084			9	7.5	—	—
1085			8.7	5.1	2.4	2.2
1086			7.1	5	1.5	1.3
1087			8	5.2	1.7	1.6
1088			8.5	6	2	1.5
1089			7.1	6.1	2	1.8
1090			7.2	5	2	1.3
1091			7.5	4.7	—	—
1092			10.5	5.5	4.2	3
1093			9.8	4.5	3.8	3.5
1094 *			5.2	3	2	1
1095			8	5.2	2.2	2
1096			7.8	5	2.2	2
1097			10	8	2.2	1.8
liia Yellow globular (translucent)						
1098	4	50	8.5	6	2.5	2.3
1099			5.5	4	2.5	1.5
1100	7	73	5.5	3.2	2	1

Table 9 (*contd.*)

	Context No.	Sf No.	Diam.	Height	P1	P2
<i>1101</i> *	7	74	5.5	4.5	2	1.3
<i>1102</i> *			5.8	4	3	1.3
1iib Yellow globular (opaque)						
<i>1103</i>	4	50	5	3.8	1.5	7
<i>1104</i>			4.8	4	1.8	1.2
<i>1105</i>			4.5R	3	—	—
<i>1106</i>	7	73	6.2	5	1.7	1
<i>1107</i>			6	3.8	1.8	1.8
<i>1108</i>			4.5	3.5	2	1
<i>1109</i>			4.7	3.8	1.5	1
1iii Brown globular						
<i>1110</i>	4	50	6.2	5	2	1
1iv Green globular						
<i>1111</i>	4	50	8.5	5.5	2.5	2.5
<i>1112</i>			10.5	5.5	4.5	3.8
<i>1113</i>			8.5	5.5	2.5	2
<i>1114</i>			8	4.8	2.3	2
<i>1115</i>			4.5	3.5	2	1
<i>1116</i>	6	64	9.5	6	3.5	2
2i Black annular						
<i>1117</i> *	2	24	6	2.8	2.2	2
<i>1118</i>	4	50	7	3	3	2.2
2ii Yellow annular						
<i>1119</i>	2	23	6	3	2	0.8
<i>1120</i>			12.2R	4	—	—
2iii Green annular						
<i>1121</i>	4	50	7	3.3	0.8	0.5
<i>1122</i>			5.5	2.7	2	1
<i>1123</i> *	7	74	7	2.5	2.3	2
3i Black cylindrical						
<i>1124</i>	2	23	5	5.5	2.1	0.4
<i>1125</i> *	2	24	4	5.1	2	0.9
<i>1126</i> *	4	51	3.7	4.5	2	1.1
<i>1127</i> *			3.8	4	2	1.2
<i>1128</i> *			4	4.5	2.1	1
<i>1129</i> *			5	4.2	2	1
<i>1130</i>	7	72	6	6.2	3	1.2
3ii Yellow cylindrical						
<i>1131</i> *	2	24	4	5.5	2	1
<i>1132</i>	4	50	5.8	5	2	1.3
<i>1133</i>			6	5.2	2	1.7
<i>1134</i> *	4	51	3.8	4.8	2	1.2
<i>1135</i> *			4.2	4.5	2	1
<i>1136</i>	7	73	5.8	—	1.8	—
<i>1137</i> *			4.3	3	1.7	1
<i>1138</i>			6.3	5.5	2.1	1
<i>1139</i> *	7	74	3.8	4	1.5	0.9
<i>1140</i> *			3.2	4	1.5	0.8
3iii Brown cylindrical						
<i>1141</i> *	4	51	4.5	5.5	1.5	0.8

Table 9 (contd.)

	Context No.	Sf No.	Diam.	Height	P1	P2
3iv Green cylindrical						
1142	2	23	5.5	6.5	3	1.5
1143 *	4	50	5	4.5	1.5	0.8
1144 *	4	51	5	4.5	2	1.2
1145 *			4.3	5.1	2	0.5
1146 *			5	5.5	2	0.8
1147	7	74	4.5	5	1.5	1
1148	7	75	5	6	2.2	1
4i Black pear-shaped						
1149	2	23	8	6.8	2	2
1150 *	2	24	8	5.2	2	1.7
1151	6	64	7.8	6.5	2.2	2
1152	7	72	8.5	6.3	3	2
1153			8.6	7	3	2
1154			8.2	6.8	3	2
4ii Green pear-shaped						
1155 *	7	72	5	6	1.6	0.7
1156	2	23	9.5	7	3	2.2
1157	3	43	16.5	12	—	—
5 Truncated cone						
1158	4	51	5.8	4	2.5	0.8
6 Concave cone						
1159	3	52	6.5	10	2.2	1.7
7 Fluted						
1160	4	50	—	12.7	—	—
1161	7	73	15	12.5	6	4.5
8i Malformed black beads						
1162	2	23	9	7	3	2.5
1163			8.3	5	3	2.3
1164 *	2	24	7.6	5.7	2.5	1.7
1165	4	50	9	5.9	2	2
1166			8.9	4.1	3.5	3
1167	6	64	9	6.5	2.7	2.3
1168			6	5.5	—	—
1169			5.5	5	—	—
1170	6	65	7.5	5	2.3	1.2
1171	7	72	7.5	5	1.7	1.5
1172			5.2	5	1.2	7
1173			6.1	5	2.5	1
1174			6.2	4.8	2.5	1
1175			6.7	6.5	2.2	1
1176			8	5.1	2.2	2
1177			9.5	5.8	2.5	1.5
1178	U/S	76	8.3	6.1	3.5	1.5
8ii Malformed yellow beads						
1179	7	72	7	4.5	1.5	5
8iii Malformed green beads						
1180			6.5	6.6	2.5	7
9i Black finger-rings						
1181	2	25	28.5	5.8–8.0	—	—
9ii Green finger-rings						
1182	U/S	76	22	3.0–4.0	—	—

Table 9 (contd.)

	Context No.	Sf No.	Length	Height	P1	P2
Other by-products:						
10i Black globules and other by-products						
1183	2	22	7.8	6	—	—
1184	3	52	5	5	—	—
1185			6.2	5.5	2.5	—
1186	7	70	5	2.5	—	—
1187			5	3.7	—	—
1188			4.5	3.6	—	—
1189			6.9	6.7	—	—
10ii Yellow globules and other by-products						
1190	2	22	10	3.5	—	—
1191			8.7	3	—	—
1192	7	74	5	2.5	1.1	—
1193	4	49	5.5	2.8	—	—
10iii Green globules and other by-products						
1194	2	22	5	2	—	—
1195	2	23	7.6	5	—	—
1196	4	49	5	3.3	—	—

7. Fluted beads (1160–1)

There is only one colour combination of bichrome beads and these are also fluted: they are an opaque dark green colour with a circumferential band of opaque yellow ochre. There are two fragments of beads (1160–1) which have almost the same heights and may have been part of the same bead, although they were derived from different contexts. 1161 (Fig. 99) is fluted in two places with grooves extending across the width of the opaque yellow decoration. The fluting was probably produced by pressing a thin metal rod or wire into the yellow glass while it was still workable. Similarly lobed beads, but of different colours, have also been found at Lloyds Bank, Pavement (p. 89, Fig. 47, 410, AY 17/3) and Clifford Street (Waterman, 1959, 96 and fig. 22, no. 32).

8. Malformed beads or fragments of malformed beads

This section will only deal with recognizable beads or bead fragments. Globules and other by-products will be discussed in section 10. The artefacts described here may not have been regarded as badly made by the artisan at the time (see above, introduction) and for the purpose of this report a subjective assessment of the intended shape has been made.

8i. The 'black' glass (1162–78)

The 'black' glass objects in this category (1162–78 in Table 9) vary in shape from complete but odd-shaped beads (see for example 1164, Fig. 100) to pieces which are only identifiable as bead fragments by the presence of a perforation (see for example, 1162, 1165, 1170 and 1178, Fig. 100). Most other fragments have an odd protrusion or dents. All appear to be unweathered apart from 1171 which is covered with a layer of silvery and pale brown iridescence. All the recognizable fragments are by-products from attempts to manufacture globular beads (as defined above) and it is significant that

there are no malformed cylindrical beads, and that the highest proportion of complete beads within a type are cylindrical. A qualification that the sample sizes are quite different should be added.

8ii. *The yellow glass (1179)*

A single badly formed globular opaque yellow bead with black streaks, a dimple and a protrusion came from the site.

8iii. *The green glass (1180)*

1180, with a deep dimple at one end across the bead, is badly weathered with a silvery brown iridescence.

9. Finger-rings

Finger-rings have sharp D-shaped sections and some have striations around the face of their perforation. They may have been manufactured by spinning a gather of glass around a pointed metal rod which had a wooden wrist guard (as described by Theophilus in *De diversis artibus*, Book 2, volume 1, chapter 31) or by wrapping a glass rod with a D- or oval-shaped section around a metal rod. Theophilus (*ibid.*) mentions the use of lead glass for the production of armlets; Table 10, analysis 5, shows that a high lead glass has been used for the production of the technically related finger-rings.

9i. *'Black' finger-rings (1181)*

There are four fragments which join from the same finger-ring (Fig. 100) and all are of different heights. They have sharp D-shaped sections and bear circumferential striations around their inner faces, probably from manufacture by the spinning technique. The 'black' glass has a brown mottled surface from slight weathering.

9ii. *Green finger-rings (1182)*

As in the case of 1181, 1182 (Fig. 100) is of variable height and has a sharp D-shaped section. There are no visible circumferential striations around the face of the perforation and the visible air bubbles in this transparent green glass finger-ring are a spherical shape. This probably means that the ring was not produced by spinning but is more likely to have been made by wrapping a D-shaped section glass rod around a metal or wooden stake. No join is visible on this fragment however.

10. Globules and other by-products

10i. *'Black' glass (1183–9)*

Seven objects (1183–9, Fig. 100) include perforated globules (1185), the result of trying to wind glass on to the end of a wire (1186 and 1188), and tailed globules (1187 and 1189). 1183 is formed from two 'black' beads melted together so that one end of one perforation is sealed by the side of the other bead. Similar globules have been found on other bead-making sites.

10ii. *Yellow glass (1190–3)*

1192 is a partly perforated globule of opaque yellow glass covered with opaque black mottling which is probably the result of weathering. 1190 and 1191 (Fig. 100) are lumps of transparent lemon yellow and amber yellow glass. A flattened sphere of yellow glass in the shape of a counter has an opacified surface due to weathering (1193).

10iii. *Green glass (1194–6)*

1195 is a brilliant green trail of glass, probably from bead manufacture. It contains no visible air bubbles. 1196 (Fig. 100) is a partly perforated globule of green glass.

Table 10 Analysis of glass and glassy waste

Analysis Object	1 1157	2 1112	3 1160	4 1148	5 1182	6 1098	7 1106
Colour	Translucent green	Translucent green	Translucent green matrix	Translucent green	Translucent green	Translucent yellow	Opaque yellow
Context no.	3	4	4	7	–	4	7
Na ₂ O	1.4	1.5	1.1	1.6	2.3	0.4	0.8
MgO	0.6	0.7	1.2	0.7	1.2	0.7	0.7
Al ₂ O ₃	0.9	1.0	1.1	1.0	1.4	0.16	0.01
SiO ₂	18.2	17.7	23.8	16.4	22.7	18.0	19.1
K ₂ O	ND	ND	ND	ND	ND	0.15	0.44
CaO	ND	ND	0.24	0.64	0.28	ND	0.11
MnO	ND	ND	ND	ND	0.02	0.01	ND
Fe ₂ O ₃	0.09	0.17	0.15	0.11	0.26	0.15	0.14
CuO	0.5	0.96	0.64	0.35	0.68	0.09	0.04
SnO ₂	0.17	0.08	ND	0.1	0.1	0.41	1.15
PbO	77.8	77.6	72.0	78.8	70.9	79.8	77.3

Analysis Object	8 1160	9 1181	10 1071	11 1048	12 'Slag'	13 'Slag'
Colour	Opaque yellow decoration	'Black'	'Black'	'Black'	'Black'	
Context no.	4	2	7	4	6	3
Na ₂ O	1.7	1.4	1.5	1.3	1.6	1.5
MgO	0.8	0.6	0.7	1.0	0.7	1.4
Al ₂ O ₃	1.0	0.8	0.9	1.4	1.0	1.0
SiO ₂	14.3	16.8	16.3	21.1	21.1	9.3
K ₂ O	ND	ND	ND	ND	ND	0.12
CaO	0.1	0.28	ND	ND	ND	8.9
MnO	ND	ND	ND	ND	ND	0.13
Fe ₂ O ₃	0.09	2.29	2.86	1.62	2.8	1.15
CuO	0.04	0.05	0.05	0.04	0.05	36.2
SnO ₂	1.13	0.05	0.11	0.3	0.08	0.03
PbO	80.6	77.4	77.4	72.9	72.3	46.0

Notes: ND = Not detected

11. Glassy waste

Most of the so-called 'glass slag' from the site appears to be waste from the manufacture of beads which has fallen on to a variety of surfaces. Two pieces of glassy waste were analysed (see next section) and one has composition which is very similar to that for 'black' glass beads from the site (see analysis 12 in Table 10). The other one from context 3 would seem more likely to be the result of glass making from primary raw materials on the site than of glass working since the composition is atypical of those glasses analysed and if related to the process it may represent a discarded intermediate product. The glassy waste came from contexts 2, 3, 4 and 6. The largest lump, from

context 2, contains a stick of charcoal and this may be a result of the glass falling into the hearth and fusing with the fuel. The so-called 'slags' from context 3 include two lumps which may be the result of dropping a green glaze on the ground or it may be a fuel-ash slag (see Biek and Bayley, 1979, for a summary). Context 4 produced a similar array of glassy waste including 'black' glass lumps and green glazed surfaces. There are however two smaller lumps of glass: one is brilliant opaque yellow and fused to baked clay, and the other is a small opaque orange lump of glass which adheres to a glazed vesiculated fragment. These probably result from working yellow and orange glass on the site. Two amorphous lumps of green glass from context 6 may be cullet.

The following contribution is by **Dr J. Henderson** and **Dr S. E. Warren**

Analysis of the glass and glassy waste

The analyses were carried out using a Philips PV9500 energy-dispersive X-ray fluorescence system incorporating a rhodium X-ray tube collimated to give a 2mm diameter beam. All samples were analysed under vacuum with the tube operated at 45 kV and 300 μ A to optimize the signal for heavier elements.

The method of analysis is essentially a surface technique with analytical depths of the order of 10 microns for sodium and up to about 1000 microns for elements higher in the periodic table. The state of the surface is therefore important, especially for lighter elements, and brownish regions and iridescence on the surfaces of some beads indicated the need for surface polishing in the area selected for analysis.

Discussion of results

The data presented in Table 10 indicate that all the analysed beads, irrespective of colour, are made up from what is essentially a two-component recipe of lead oxide and silica. Taken together these two components comprise on average 95% by weight of the total glass composition with an average lead to silica ratio of 4.2:1 by weight and approximately 1:1.3 by molar content (these figures do not include analysis 13). The residual 5% by weight is accounted for in part by oxides likely to be derived from impurities in the sand (alumina, lime, iron oxides) and in part by oxides contributed by colourants/opacifiers added in making the glass. The alkali contents are so low as to be virtually insignificant, with soda being generally close to the minimum detectable level of about 1% and with potash close to the minimum detectable level of 0.1%. Manganese, often associated with alkalis derived from terrestrial plant, or tree, ash (Geilmann and Brückbauer, 1954; Sanderson and Hunter, 1981), was detected at trace level in only two glasses (excluding analysis 13) while magnesia was detected at levels between 0.6% and 1.4%.

The glass compositions reported here are markedly different from the potash/soda-lime-silica compositions of contemporary window and vessel glass (Cox and Pollard, 1981), but they do reflect the compositions found in jewellery of this period, and those to be expected of high lead glasses produced according to contemporary recipes. Thus analyses of other beads from York and of rings and glass-melting residues from Lincoln (Bayley, 1982), as well as of beads from Sewerby, near York (Biek et al., forthcoming), all indicate the presence of lead at the same and at a slightly lower levels in translucent and opaque ornaments and beads of various colours, shapes and compositions.

High lead glass in the form of beads, arm rings, finger-rings and tesseræ from the 9th to 14th centuries is also reported from contexts in Eastern Europe by Besborodov (1957; 1975), and Dekówna (1979) lists further high lead glasses from medieval Polish

contexts. Thus the occurrence of high lead/low silica glasses in medieval York should be considered as further evidence of the widespread knowledge of the glass-forming properties of lead in which the lower working temperatures and improved fluidity of the material (Weyl and Marboe, 1967, 788) were especially well suited to bead manufacture.

The literary evidence provides some highly informative recipes for making high lead glass. For example the 10th–12th century treatise *De Coloribus et Artibus Romanorum* attributed to Heraclius, gives ‘Take good and shining lead, and put it in a new jar and burn it in the fire until it is reduced to powder . . . Afterwards take sand and mix well with that powder’ (trans. Merrifield, 1849). A 17th century text by Antonio Neri (*L’Arte Vetraria*, 1612, Book 6) stresses the need to calcine the lead; and there is literary evidence for the production of high lead glasses in the Far East with an 8th century recipe of Japanese origin (Harada et al., 1965).

More detailed consideration of the analytical data suggests that there was a fairly close control over the mixing of the lead oxide and silica, the mean and standard deviation of the lead oxide content in analyses 1–12 being $76.3 \pm 3.2\%$. The low content of other oxides suggests that the glass artisan used a basic two-component system of lead oxide and silica to which he deliberately added a colourant. This contrasts with the interpretation placed on other, mostly non-lead, glasses in which the colour may often be attributed to the presence of impurities in the basic raw materials, especially in the ash (cf. Newton, 1978).

No samples were removed from the beads for structural analysis by X-ray diffraction so that the nature of the colourant is inferred from the chemical composition. The opaque yellow glasses have tin contents suggestive of the formation of a lead-tin oxide in the glass and particles of opacifier are clearly visible under the microscope. Antimony was not detected in any of the yellow glasses and a late occurrence of lead antimonate as a yellow colourant would have been considered unusual in the light of previous discussions reviewed by Biek (1983), although it does continue in use as a glaze colourant in the post-medieval period in western Europe (Piccolpasso, 1934, 38).

The tin content in 1098 (analysis 6 in Table 10) is significantly lower than that found in the opaque yellow beads, and the glass is clear and free from particles. Such a translucent yellow colour is commonly due to the presence of the Fe^{3+} ion and a discussion of the changes of oxidation state and colour is given in explanatory footnotes to the treatise by Theophilus on glass making (trans. Hawthorne and Smith, 1979, Book II, Chapter 7, 55–6, n. 1). It should be noted that the iron (oxide) content of bead 1098 is only 0.15%. Schreurs and Brill (1984) have discussed in detail the occurrence of the iron-sulphur chromophore in ancient transparent yellow glasses, and it may be a cause of the colour here.

The ‘black’ glasses are essentially coloured in the same way by the relatively high iron content of up to around 3% expressed conventionally as Fe_2O_3 ; the intrinsic black colour of the glass is really a very deep (‘saturated’) translucent bottle-brown version of the yellow, some parts shading into the deep olive of the more reduced state.

Two pieces of black glassy waste were analysed. One sample (analysis 12) corresponds closely in composition to the ‘black’ glass used for the manufacture of the beads, but the other (analysis 13) is dissimilar, having much higher copper and calcium contents and lower iron, lead and silica contents. This latter sample may indeed be slag associated with metalworking.

The green glasses all have sufficient copper present to account for the resulting colour.

Conclusion

By **J. Henderson**

It is clear from the lack of intact beads and the range of 'failed' beads that the assemblage represents the waste products of a bead making industry.

The glass from 34 Shambles can probably be dated to the 12th or early 13th century on the basis of its stratigraphic position, and on the evidence provided by the associated pottery. The amount of glass found on the site (174 beads or bead fragments), and the evidence for manufacture, is remarkable as the overwhelming majority of published English medieval glass is either vessel or window glass; excavations in medieval Southampton, for example, have produced only six glass beads (Platt and Coleman-Smith, 1975, 276, fig. 249, nos. 1955, 1957-8 and 1960-2). Nor is 34 Shambles the only site in York to have produced glass beads in quantity.

Excavations nearby of Anglo-Scandinavian levels at Lloyds Bank, 6-8 Pavement, York, have produced three finger-rings and some 130 green annular beads as well as other bead types in brown, black and yellow glass (p. 89, Fig. 47, 401-13, AY 17/3). Anglo-Scandinavian beads are also known from 7-13 Pavement (Waterman, 1959) which has numerous finger-rings, 80 globular, c. 165 annular, 20 cylindrical 'wound' beads, and three others including an opaque orange barrel-shaped bead which can be paralleled at Viking Age sites in Scandinavia such as Ribe and Helgö. The wound beads from 7-13 Pavement were probably made by winding glass spirally round the end of a wire to produce a rough cone. Similar beads are known from 6-8 Pavement, but are not represented among the slightly later medieval material from 34 Shambles.

Another major glass working site in the same area, in Clifford Street, was discovered during building work in 1882. The material, of probable Anglo-Scandinavian date, includes finger-rings as well as whole and fragmentary beads in white, pale, milky or dark blue, grey and brown glass. These colours are not represented at 6-8 Pavement, 7-13 Pavement, or 34 Shambles, but are known from Anglo-Scandinavian levels at 16-22 Coppergate. There are also similar beads and finger-rings from Anglo-Scandinavian contexts at Flaxengate, Lincoln (Foley, 1981).

Despite the unsatisfactory dating evidence for the material from Clifford Street and 7-13 Pavement, it is apparent that such simple undecorated beads were produced in York from at least the 10th to the 12th centuries, with little change in the chemical composition.

In addition to bead making on site, evidence for glass working derives from a number of pottery sherds, apparently coated in high lead glass. These were submitted for examination to **Justine Bayley**, whose report follows. The sherds are catalogued and illustrated in AY 16/3.

A total of eleven sherds were submitted for examination. Most were of a coarse red fabric containing a considerable quantity of quartz temper with grain sizes around 1mm. Three sherds appeared buff rather than red but were otherwise similar. One red sherd was far finer than the rest with little temper visible to the naked eye. Most of the sherds were rim fragments with external diameters of about 150mm, though some were from smaller vessels. Wall thicknesses ranged from 6 to 13mm.

All the sherds were covered, more or less completely, with a glassy surface layer which X-ray fluorescence analysis showed to be rich in lead. This covering varied in colour from golden brown to olive green, dark brown and black with more than one colour visible on many sherds. The colours are all due to the presence of small amounts of iron in the glass.

These sherds can be interpreted in two different ways; as glazed pottery or wasters or, alternatively, as pots used to melt high lead glass, some of which was left behind on them. They are, however, unlike any glazed pottery of the period so the first possibility is not considered likely. On the other hand, the excavations did produce a quantity of (high lead) glass beads and waste, discussed in detail above, so the presence of pots used to melt glass of this type is not unexpected. The sherds themselves supply some evidence to support this unusual, though not unique, function.

Glazed pots are normally relatively high-quality tableware so the coarse fabric which is dominant in this collection would be unusual. However, for glass melting the refractory fabric would be an asset, giving the pots greater strength and resistance to the fluxing action of the lead glass at the relatively high temperatures employed. Most of the glassy deposits are fairly uniform in thickness though some pieces have irregular lumpy coverings. These are what might be expected if the glass in the pot had cooled to the point where its viscosity increased dramatically and it was therefore being scraped out. The thin even layers on the majority of pieces suggest a higher temperature which would give the glass sufficient fluidity to run down into a pool in the bottom of the pot. In some cases the glazed surface has broken away from the pot in a fairly regular line parallel to the rim. This may correspond to the surface of the pool of glass, the thicker glass deposits there having subsequently broken away from the rest of the pot.

As noted above, high lead glass was widely used for trinkets in England from the 10th century onwards and several other sites have also produced evidence for their manufacture (Bayley, 1979; 1982).

Pins (Fig. 101)

There is a single pin fragment (742) from the Parliament Street sewer trench. It is of bone with only the spatulate, perforated head and the upper portion of the shank surviving. Pins of this type are commonly found in the city, the simplest examples being made from pig fibulae which are sharpened at one end and perforated at the other. Others are made from cattle tibia or metatarsal, or from antler. Specimens of this pin type are known from Clifford Street (Waterman, 1959, fig. 14), Lloyds Bank, Pavement (pp. 91–2, Fig. 48, AY 17/3) and 16–22 Coppergate (Roesdahl et al., 1981, YAB31). More carefully fashioned examples, like the Parliament Street pin, are also known from Clifford Street (Waterman, 1959, 82, fig. 12) and Pavement (*ibid.*, fig. 14). Pins of this kind have a wide date range (pp. 91–2, AY 17/3), but in York they are most commonly found in the Anglo-Scandinavian period. These objects have been identified (*ibid.*) as pins rather than needles, since there are many unperforated specimens of the type. Moreover, the heads expand markedly, and they lack wear on the perforations. However, Viking Age examples of this type from Hedeby have been found with a length of thread whipped round them, as if they were used with it, and such implements would have been suited to the technique of *nålebinding* (looped needle knitting), which has a very open texture. A single example of a textile made in this technique is known from York, discovered in an Anglo-Scandinavian context at 16–22 Coppergate (AY 17/5, forthcoming).

There is a single intact pin from the Midland Bank site (972). Again this is of simple form with a sub-circular head, and hipped shank. The pecked dot in the centre of the head probably represents the marking out for a perforation which was never executed. This type of simple perforated head is related to that of the Parliament Street sewer example, and specimens are known in York from Pavement and Clifford Street (Waterman, 1959, 85, fig.

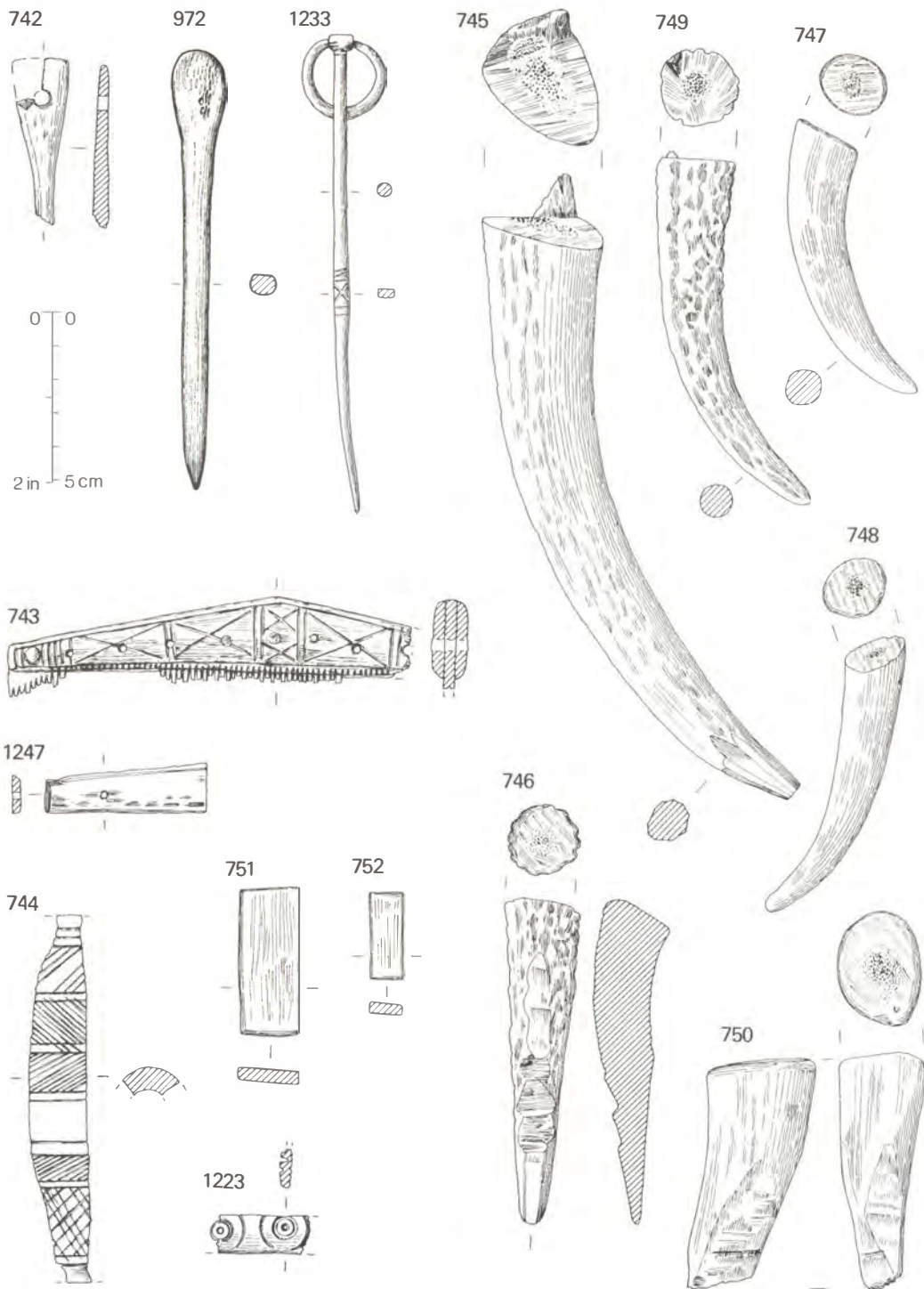


Fig. 101 Pins (742, 972, 1233), comb (743) and miscellaneous antler and bone objects. Scale 1:2

14, 17–25). Both of these sites have yielded a mass of Anglo-Scandinavian objects, although unstratified, and the Midland Bank pin is probably of that date. This is confirmed by the fact that it derives from a context dated on the basis of the pottery to the 12th century.

The pin (1233) from All Saints Pavement is iron with a coating of soft solder to give a finish at once decorative and more resistant to corrosion. It is a ringed pin, one with a swivel ring attached to the pin head, and of the type with a crutch or T-shaped head and stirrup ring in the classification proposed by Fanning (e.g. 1969, 6). The lower part of the shank is flattened and decorated near the top with a punched saltire between two pairs of transverse lines.

The ringed pin is an Irish type which originated as an adaptation by native craftsmen of provincial Roman metalwork (*ibid.*, 9). It survived up until the 12th century when it was superseded by other pin types, and was used to fasten or ornament the cloak (*ibid.*). Within this span of nearly a millennium the All Saints Pavement pin is probably a late example as pins with crutch heads and stirrup rings are known from Ballinderry Crannog no. 1 where they are derived from contexts dated to the 11th century or later (Hencken, 1936, 152, 157, 221, figs. 21B and 26H). Examples of the type are also known from High Street, Dublin, where they derive from late 11th or 12th century levels (Fanning, 1969, 10).

There are seven other copper-alloy ringed pins from the city, four from 16–22 Coppergate (Roesdahl et al., 1981, YTC10 and 12), and one each from Nessgate, Clifford Street (Waterman, 1959, 79, fig. 11), and Tanner Row. Another example from York is not closely provenanced (Waterman, 1959, 79, fig. 11, 14). Unlike the All Saints Pavement example these are of the earlier types with polyhedral or baluster heads, and plain loose or stirrup rings. A single iron ringed pin from 16–22 Coppergate, like that from All Saints Pavement, has a white metal coating in this case of tin and copper with a trace of lead, but differs in form having the upper end of the shank flattened and turned over to form a loop into which fit tenons on the ends of the ring.

Antler and bone working⁴ (Fig. 101)

The Parliament Street sewer trench and the nearby Midland Bank site have both produced slight evidence for the working of antler in the vicinity. In addition, the Midland Bank site has yielded evidence for bone working.

The main evidence for antler working from the Parliament Street sewer trench consists of seven tines (745–50, 1253), each sawn across the base; one is sharpened (745) and three are smoothed (747–9). Such tines are frequent finds in Anglo-Scandinavian and early post-Conquest contexts in York, and examples have been found close to the Parliament Street site at Lloyds Bank, Pavement (p. 100, Fig. 53, AY 17/3), 16–22 Coppergate, Clifford Street (Waterman, 1959, 93, pl. xxi), and High Ousegate (Radley, 1971, 48, 51). It is probable that they are the offcuts left from the manufacture of antler objects, particularly composite combs. As MacGregor has noted (1978, 48), the usual way of making these was for the burr and tines to be cut from the antler. The beam which yielded the long flat strips needed for the tooth and connecting plates could then be cut into shape.

Two of the Parliament Street sewer trench tines (746 and 750) exhibit evidence for further working. On 746 the inner side near the tip has been smoothed flat, and two notches have been cut near the tip on the outer side. 750 has been sawn off at the tip and the sides trimmed

to form a wedge. The notching and shaping to form wedges are both features paralleled among the tines from Lloyds Bank. The function or functions of such worked tines has not been satisfactorily explained. Radley (1971, 21) suggested that they were used for pegging out hides during tanning but some of the larger examples have been identified as fids for splicing rope, and examples have been found at Bryggen (Bergen), Norway, still attached to rope (Herteig, 1975, 68, pl. 11). It is evident that no single explanation of the function of this class of objects suffices, and discarded tines may have served a number of trivial domestic purposes.

That composite comb manufacture was taking place in the Parliament Street area is confirmed by the discovery in the sewer trench of two small, flat, rectangular antler plates (751 and 752). These are tooth plates from the manufacture of single-sided composite combs. The next stage in manufacture would have been to place a number of these plates between two connecting plates, and then to rivet the whole together. Finally when the tooth plates were in situ the teeth would be cut. Similar tooth plates are known from 16–22 Coppergate nearby (Roesdahl et al., 1981, YAB2).

The Midland Bank site⁵ has likewise produced antler fragments including one unworked tine, sawn off, one cortical fragment sawn at one end and with the inner face smoothed, one split beam fragment and two burrs. One of the burrs had been shed naturally, and the other chopped from the skull. As noted above, tines are frequent finds in York. Lengths of beam are less common, but are known from the Clifford Street area (Roesdahl et al., 1981, YAB1). Naturally shed and cut antler burrs are both known from Anglo-Scandinavian and early post-Conquest levels at 16–22 Coppergate.

As well as antler-working debris the Midland Bank site has produced a single rib from a large ungulate (horse or cattle). This had been shaved straight down both sides, possibly before splitting for use in manufacture. Split ribs were used in the manufacture of composite combs, as, for example, in a specimen from Clifford Street (MacGregor, 1978, 48), and in the manufacture of comb cases as at Lead Mill Lane (*ibid.*).

The Midland Bank antler and bone all derived from a context dated to the 12th century on the basis of the pottery. It also contained the axe (961), and the keys (963–4).

Hair combs (Fig. 101)

The Parliament Street sewer trench has produced a solitary single-sided, composite, antler comb (743). Single-sided composite combs are frequent finds from the Anglo-Scandinavian period in York, and well over a hundred examples are now known (pp. 93–5, Fig. 46, Pl. VIa, AY 17/3; Waterman, 1959, 87–90, fig. 16, pl. XVIII; MacGregor, 1978, 48; Roesdahl et al., 1981, YAB5–11). The Parliament Street example is unusual, however, in having connecting plates with a pointed apex, a feature paralleled elsewhere in the city only on a single Anglo-Scandinavian comb from 16–22 Coppergate.

The church of All Saints Pavement has also produced part of a single-sided antler composite comb or comb case (1247). It tapers to the left, has a horizontal lower edge, a curved upper edge and is cut off square at each end. There is a drilled hole for a rivet near the narrow end. It can be identified as one of the connecting plates of a single-sided, composite

comb, or one of the connecting plates from a comb case. As the front face of the piece is only roughly shaped and in places still has the natural surface of the antler, it is likely that it was never finished.

Miscellaneous bone objects (Fig. 101)

The handle from the Parliament Street sewer trench (744) was originally of circular section, although only about one-third of the circumference now survives. The handle is divided into a series of zones of decoration running around the circumference and defined by incised lines. Each zone is either hatched, cross-hatched or undecorated. A knife handle of similar type, dated to the 11th century, is known from Clifford Street (Waterman, 1959, 73, fig. 7), and it is possible that the Parliament Street example is of similar date. However, the decoration is so simple that a medieval or post-medieval date would be equally plausible.

From 34 Shambles is a fragment of a thin bone plate decorated with ring-and-dot (1223). Similar plates or fragments of plates are widely known, and are usually identified as parts of wooden caskets covered in thin bone decorative strips. An Anglo-Scandinavian casket with ring-and-dot decorated applied strips is known from Coppergate (Waterman, 1959, 86–7, pl. XVII) and there is a similar casket lid from Ludgershall Castle, Wiltshire, dated to the 12th century. Fragmentary strips with ring-and-dot decoration are, however, found over a much wider date range. Examples of the early Anglo-Saxon period are known from Spong Hill, Norfolk (Hills, 1977, fig. 138), and Caistor-by-Norwich, Norfolk (Myres and Green, 1973, 87, 191–2). Later Anglo-Saxon specimens are known from South Cadbury, Somerset (Alcock 1975, 200–1, pl. 91) and Northampton (Williams, 1979, 315, fig. 6), and medieval examples known from Southampton (Platt and Coleman-Smith, 1975, 271, fig. 247) and Great Yarmouth (Rogerson, 1976, fig. 51, no. 16).

Spinning and weaving equipment (Fig. 102)

In addition to the textiles 948–58 discussed fully below (pp. 232–4) there are a number of objects associated with their manufacture. These include 690, a plano-convex turned limestone spindle whorl with incised decoration, from the Parliament Street sewer trench. This is a type characteristic of the early post-Conquest period in York. Comparable examples are known from 11th/12th century levels at 16–22 Coppergate. 1222, from 34 Shambles, is disc-shaped and has a central perforation. It may also be a spindle whorl although it is made of lead not bone, fired clay or stone which are the more usual materials. Such simple lead whorls are known from Anglo-Scandinavian levels at 16–22 Coppergate (Roesdahl et al., 1981, Y13), although none is of precisely the form seen here. A third spindle whorl (1224), from 34 Shambles, is made from a perforated bovine femur head. Such whorls are extremely common finds in York from the Anglo-Scandinavian and early post-Conquest periods. In York comparable specimens are known from well-dated Anglo-Scandinavian contexts at Lloyds Bank (p. 100, Fig. 54, AY 17/3), and 16–22 Coppergate (Roesdahl et al., 1981, YAB25). The type is, however, widespread and there are examples from 9th–12th century levels at Flaxengate, Lincoln (Mann, 1982, 22, fig. 21), from 10th century levels at 1 Westgate, Gloucester (Heighway et al., 1979, 201, fig. 18.6), from the 9th–10th century Middle Norse

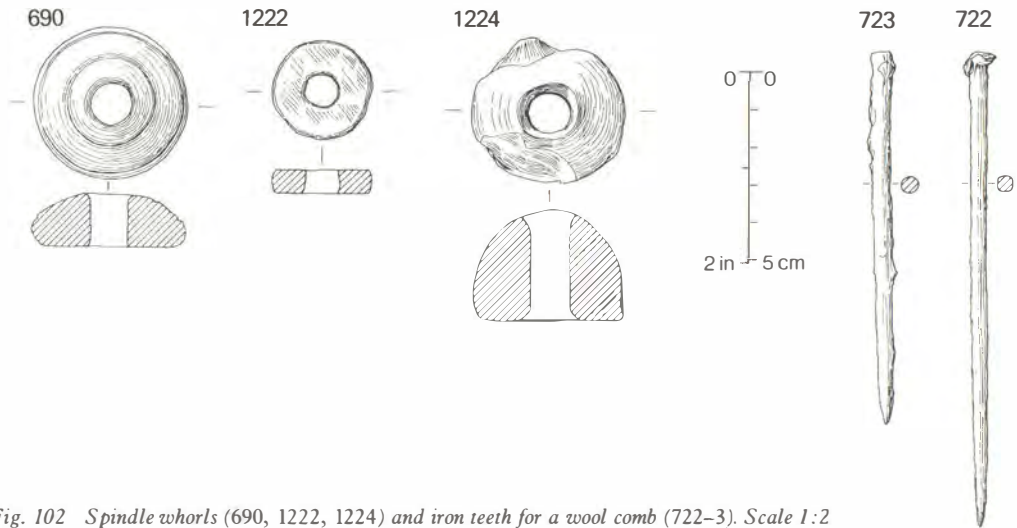


Fig. 102 Spindle whorls (690, 1222, 1224) and iron teeth for a wool comb (722–3). Scale 1:2

horizon at Birsay, Orkney (Curle, 1982, 75, ill.38) and from the Saxo-Norman period at Saddler Street, Durham (Carver, 1979, 24, fig. 14).

Two slender iron spikes from Parliament Street (722–3) may also be associated with textile manufacture. These are 122mm long \times 5.2mm in diameter and 98.5mm long \times 4.8mm in diameter respectively, which means that they are of a similar size to the iron teeth from the wool comb found in a 10th century context at 16–22 Coppergate. These are 105mm long and rectangular in cross-section, c. 7 \times 5mm. They also fall within the average length of Norwegian wool-comb teeth which is 100–130mm (Petersen, 1951, 319f.). 722 also has a fragment of iron sheet adhering to the broad end, which may be part of a sheet iron casing around the wooden block into which the teeth were fixed. Such a metal casing is seen on the Coppergate wool comb, but wool combs often lacked this feature, as does the example from Fyrkat, Denmark (Roesdahl, 1977, 28–9, fig. 21). These comparisons suggest that these teeth are from wool combs, although they are of little help with dating since similar types remained in use down to the 19th century.

Textiles (Fig. 103)

Eleven textile fragments (948–58) were recovered from the spoil of the Parliament Street sewer trench. The following discussion of the fabric types has been provided by P. Walton⁶:

Of the eleven textile fragments from Parliament Street eight (948–55) were found together in a group and are probably contemporary with each other. Seven of these eight are tailor's offcuts, while 954 and 956–8 (found individually) are more ragged and worn. As is common with textiles from waterlogged sites in this country, most of the finds are of wool, 958 being a rare survival of a vegetable bast fibre such as flax.⁷ With the exception of the unusual crêpe weave of 958, these textiles fit in with the date range of the other finds, the late Anglo-Saxon scabbards and the medieval shoes, and are well paralleled by similar finds from elsewhere in England.

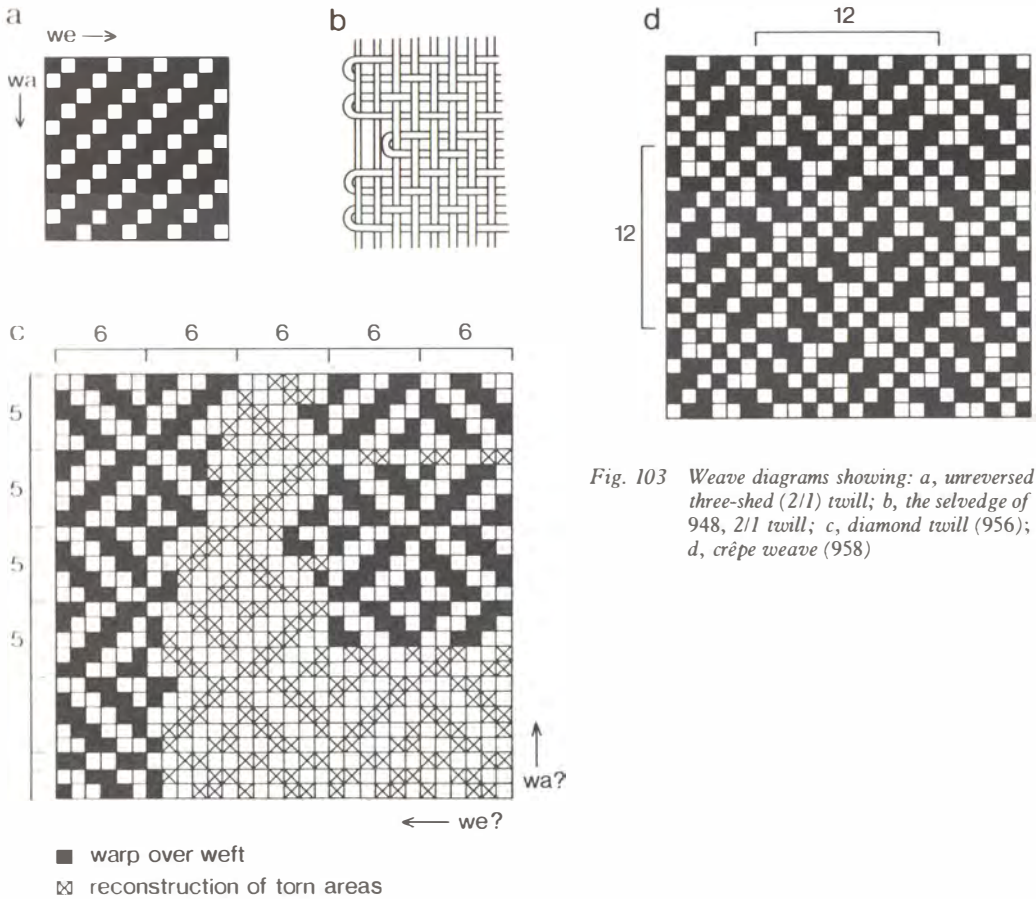


Fig. 103 Weave diagrams showing: a, unreversed three-shed (2/1) twill; b, the selvedge of 948, 2/1 twill; c, diamond twill (956); d, crêpe weave (958)

Seven of the eight textiles found in a group are in unreversed three-shed (2/1) twill (Fig. 103a), a weave which rarely occurs amongst Roman and early Anglo-Saxon finds, but is more common on 11th–14th century sites, such as the Saxo-Norman tenements excavated at Saddler Street, Durham (Crowfoot, 1979, 36–9) and the mid 14th century dock at Baynard’s Castle, London; it is less in evidence in the late 15th to early 16th century finds from the last site (Crowfoot, pers. comm.) and absent in the 15th–16th century finds from Black Gate, Newcastle (Walton, 1981). The Viking Age finds from 10th to 11th century York also contained a number of three-shed weaves, but the majority of these were fine worsted diamond twills, quite unlike the unreversed woollen twills seen here (p. 103, AY 17/3). The Parliament Street finds with their finer, more closely spaced Z-spun threads in one system (generally the warp) and softer, more easily matted S-spun yarns in the other, closely resemble the 2/1 twills from Baynard’s Castle, and three of the finds have the deliberate matting of the weft face seen in many of the textiles from that site (Crowfoot, 1979, 38); the selvedge of 948 (Fig. 103b) is also paralleled by three similar ones from the Baynard’s Castle 14th century dock, although it has fewer paired warp threads (Crowfoot, pers. comm.).

The rise in popularity in northern Europe of three-shed weaves coincided with the arrival, probably in the early 11th century, of the horizontal loom (Hoffman, 1964, 258). Earlier assumptions that its predecessor, the warp-weighted loom, was unsuitable for this weave, are being reconsidered (see Hedges, pp. 116–18, AY 17/3), especially in the light of some Scandinavian finds of 2/1 twills with borders of a type associated with the warp-weighted loom (Lindström, 1976, 279, 288–92, figs. 249–50). The present author has herself woven a 2/1 twill with the typical starting border on a warp-weighted loom set up vertically rather than on the slant, and found that there were no great technical difficulties. However, although the three-shed construction was not necessarily inimical to the warp-weighted loom, as was formerly thought (Hoffman, 1964, 203), the dates of the majority of the finds of this weave post-date the arrival of the horizontal loom and most must have been woven on this implement.

Turning to the remaining fragments from Parliament Street, one (956) is a four-shed diamond twill, one (958) a crêpe weave, and two (955 and 957) are tabbies (plain weave). Four-shed diamond twills are well attested from Roman (Wild, 1970, 48–9), Anglo-Saxon (e.g. Crowfoot, 1976, 31–2; 1978, 99, fig. 110) and Viking (p. 103, AY 17/3) England, but are unknown from post-Conquest sites. The Parliament Street piece is rather tattered and the weave diagram (Fig. 103c), therefore, was difficult to prepare, but the warp displacement appears to occur regularly after every six threads, with the weft displacement in general after every fifth thread, although the order of lifting the heddles has in some places become muddled. A better-preserved piece with the same unit of six warps and five wefts and a similar thread count was found amongst the unstratified but probably 10th/11th century finds from the Lloyds Bank site (p. 129, Fig. 66c, AY 17/3).

The crêpe weave 958 (Fig. 103d) is extremely unusual and no exact parallel could be found for it. Tests to identify any dye remains⁸ suggest that it might not be pre-19th century, but as no modern dye was firmly identified no definite conclusion could be arrived at on this point. The complexity of the weave, requiring a large number of heddles, suggests that the loom used was a relatively sophisticated one and it is unthinkable that it was woven on, for instance, a warp-weighted loom. It is worth pointing out that a textile fragment from 5–7 Coppergate (p. 125, Fig. 64, 643, AY 17/3) which was also unstratified (although thought to have originated from pre-Conquest or medieval layers) was tentatively identified as a six-heddle diamond weave, but may also have been a crêpe.

Wooden objects (Figs. 104–6)

The Midland Bank has produced four fragmentary lathe-turned wooden bowls (967–70). Of these 967 and 968 are small and flat-based with diameters of 177 and 181 mm respectively. 969 and 970 are very incomplete but each reconstructs to c. 300–350 mm in diameter and has a flat base. In 970 numerous cracks have been repaired with metal staples. Similar repairs of wooden bowls with metal fittings or staples have been reported from a number of other sites including Hungate, York, and Winchester, Hampshire (Morris, 1982, 257–8).

Despite the fact that they were probably ubiquitous in the medieval period, lathe-turned wooden vessels are not commonly found as they are preserved only where there are waterlogged archaeological deposits. Nevertheless simple lathe-turned wooden bowls similar to 967 and 968 are known from a wide date range. There are 10th century examples from 16–22 Coppergate, York (Roesdahl et al., 1981, YW6–7), 11th or 12th century examples from

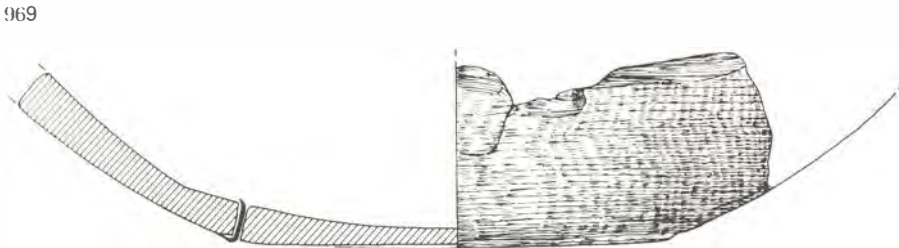
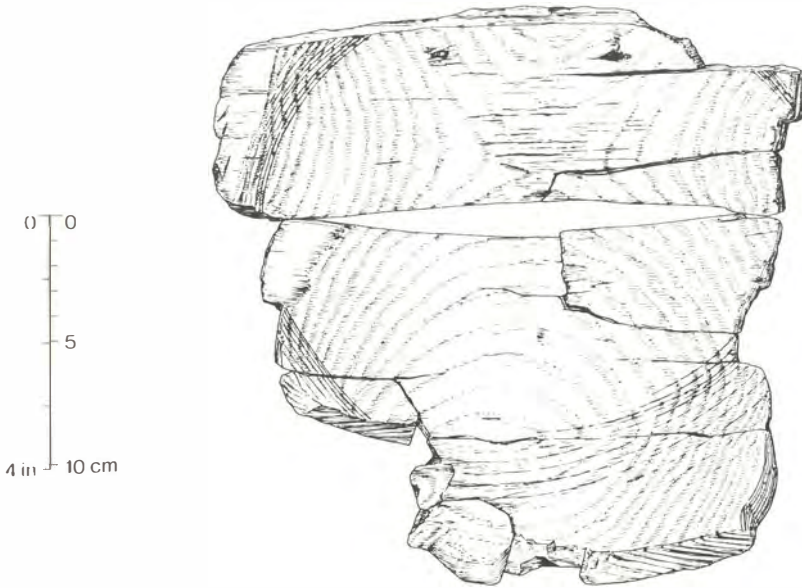
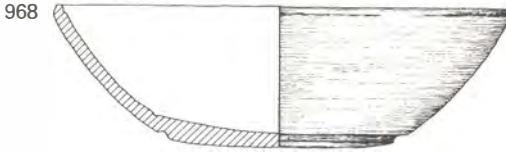
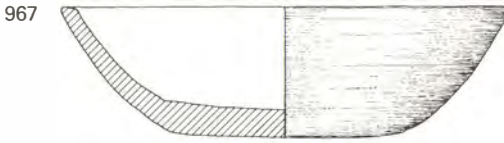
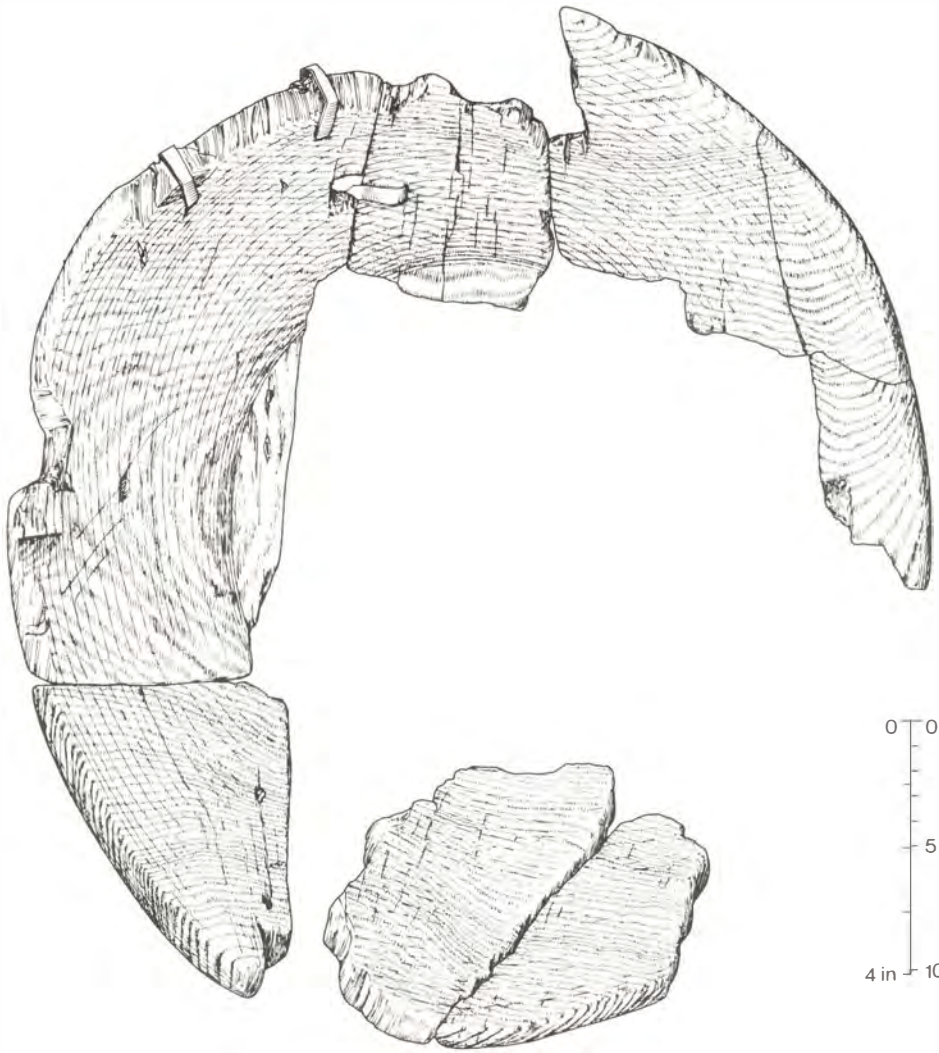


Fig. 104 Turned wooden bowls. Scale 1:3



970

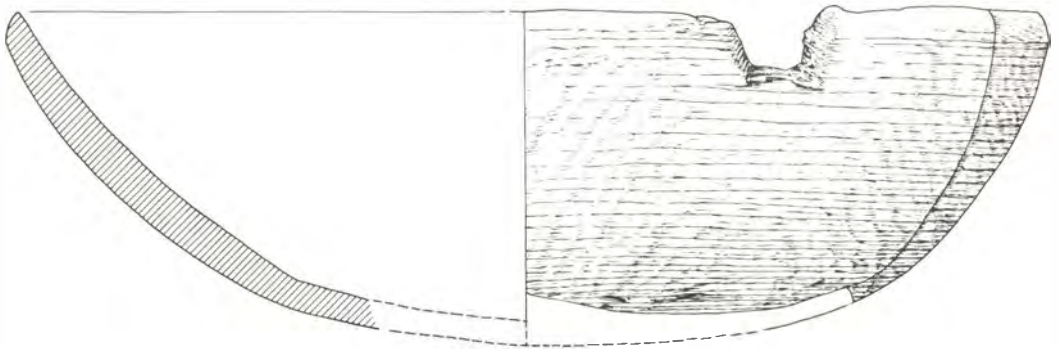


Fig. 105 Wooden bowl. Scale 1:3

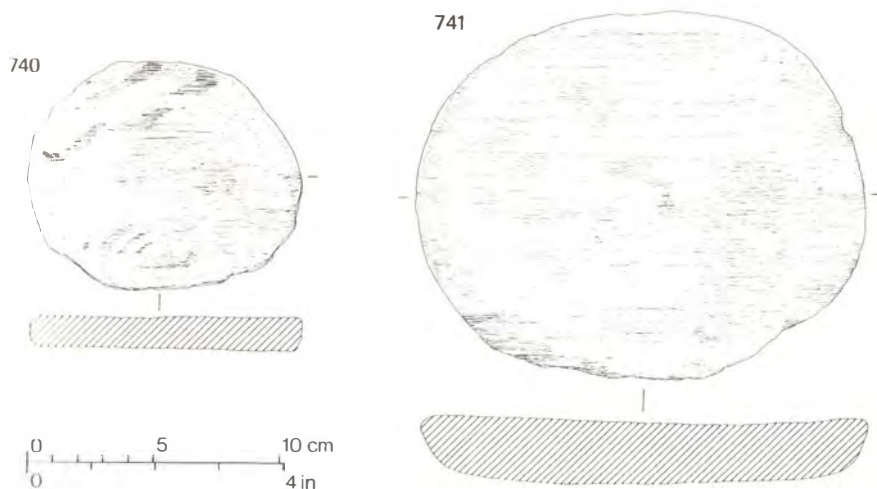


Fig. 106 Oak discs. Scale 1:3

Westgate, Gloucester (Heighway et al., 1979, 200, fig. 17), and Saddler Street, Durham (Carver, 1979, 26, fig. 15, pl. Vc), from the 13th century in Southampton (Platt and Coleman-Smith, 1975, 228, figs. 227 and 228), examples from the 13th and 14th centuries at the Austin Friars, Leicester (Mellor and Pearce, 1981, 139, figs. 52 and 53) and from the 14th century at King's Lynn (Clarke and Carter, 1977, 370, fig. 172). Larger vessels similar to 969 and 970 are less common, but there are hemispherical vessels of a similar size from 13th or 14th century contexts at the Austin Friars, Leicester (Mellor and Pearce, 1981, 139, fig. 52).

The simple wooden discs from the Parliament Street sewer trench (740–1) may be cask heads or even platters, but are not easily paralleled elsewhere.

Leather

Sheaths (Fig. 107)

The Parliament Street sewer trench is remarkable in that it has produced three out of the thirteen known pre-Conquest leather sheaths (753–5). Two of these (753 and 754) are sheaths for a scramasax, an Anglo-Saxon single-edged knife with angled back. 753 (Pl. XI) is intact except for its metal fittings. The sheath was intended to accommodate both the knife blade and its handle with only the pommel projecting, a fact reflected in its decoration. On the front face one decorated field represents the blade, another the handle, and between them a circular field represents the guard. The two main fields are filled with relief zoomorphic interlace, and the third with a crouched animal. Between these panels and the riveted edge is a long narrow

panel decorated with incised interlocking hatched triangles. On the reverse the decoration is simpler, consisting of only two panels, one representing the knife blade and the other the handle, in the corresponding position to those on the front face. Both panels are filled with an incised net pattern.

Wear around the throat suggests that there was originally a metal fitting here, and concentric wear marks half-way along the sheath may indicate the position of another metal mount. This was probably a point of suspension if the sheath was worn in the manner portrayed on the Middleton cross (Bailey, 1980, pl. 14) where it is suspended from the belt and parallel to it, with a point of suspension at the throat and another at the tip. The only difference between the two is that on the Parliament Street sheath the second point of suspension was half-way along its length, not at the tip. On the Middleton cross the pommel of the knife is shown protruding from the throat, exactly the manner in which the Parliament Street sheath must have been used.

There is a very close parallel to this sheath from Gloucester where the fragmentary scramasax sheath from 11–17 Southgate Street also had the open edge riveted, and has similar ornament (Gouge, 1979, fig. 1). On the front face the panel representing the blade largely survives, and is filled with zoomorphic interlace corresponding closely to that on 753; there is also part of a similar flanking field of incised interlocking triangles. On the reverse there is a field representing a blade and filled with an incised net pattern as on 753. Other pre-Conquest sheaths also exhibit this division of the decoration to reflect the shape of the knife inside, a feature seen on the scramasax sheaths from Dublin (Okasha, 1981, 47–9, fig. 6), Aachen (Grimme, 1972, no. 12, 18–19, Bd. 10),⁹ Cheapside, London (Anon, 1927, 526–7, pl. LXV) and 16–22 Coppergate, York. Other scramasax sheaths from Lawrence Lane, London (Dunning, 1932, 177–8, fig. 1), Hexham, Northumberland (Smith, 1923, 106, fig. 129) and Coppergate, York (1906 excavations; *VCH*, 108, figs. 27 and 28) may have had a similar division of the decoration, but they are too fragmentary for this to be certain. In each case the open edge of the sheath was originally riveted. On the example from Aachen rivets and filigree metal fittings survive. Although these are probably continental additions to the imported late Anglo-Saxon sheath they may reflect the sort of metal fitting which originally embellished all these sheaths.

754 (Pl. XII) is also part of a scramasax sheath, but for a knife having a concave rather than a straight-angled back. Only the tip of the sheath survives. On the front face the main decorative panel may reflect the shape of the knife blade within. It contains debased relief foliate ornament within a raised frame slashed obliquely to give a cabled effect. On the reverse there is a blade-shaped panel with a similar edge moulding. The bulk of the panel is filled with a symmetrical acanthus design, but the tip is separated from the rest by a transverse moulding, and the triangular field thus created is filled with a simple scroll. Again the open edge of the sheath was riveted, and one iron rivet survives in situ. There is a good parallel to this sheath in an example from York now in the Yorkshire Museum (*VCH*, 108, fig. 27) which employs on one side the same symmetrical acanthus as on 754, although the frame of the panel is decorated with simple incised frets instead of cabling. The front face of the Yorkshire Museum example, like 754, is decorated with debased plant ornament, but of quite a different character.

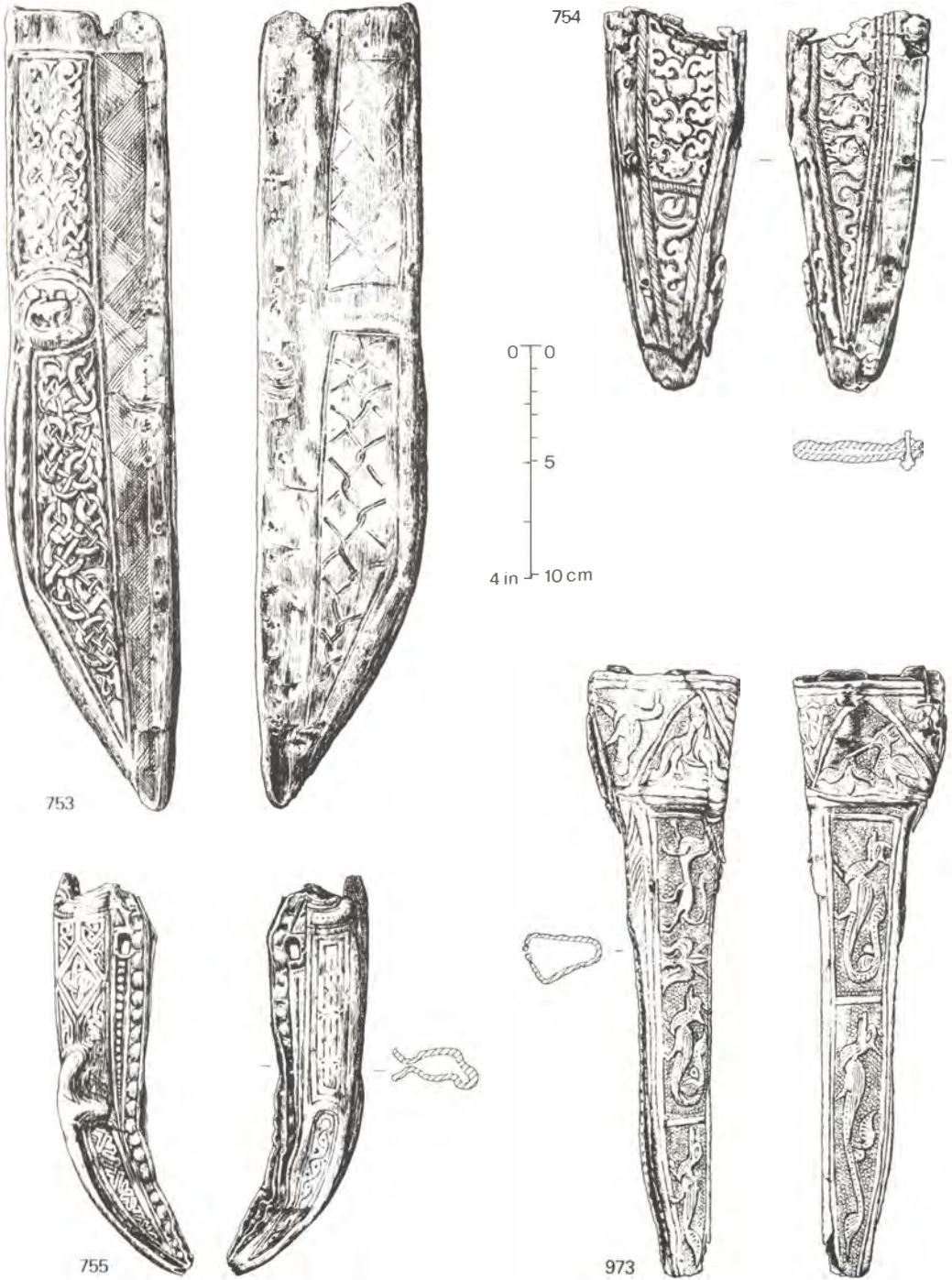


Fig. 107 Leather sheaths. Scale 1:3

Gouge (1979, 126) has pointed out that not only are 753 and the Gloucester scabbard very similar, but that the examples from London and Hexham are almost identical. To these pairs must be added 758 and the example from the Yorkshire Museum (*VCH*, 108, fig. 27). Gouge (*ibid.*) has suggested that such pairs can be explained as the products of different workshops. However, it is difficult to accept that out of only eight surviving pre-Conquest scramasax sheaths it is possible to recognize the products of three different workshops, particularly where some of the pairs are geographically widely separated. Perhaps it is more reasonable to think in terms of there being a limited repertoire of designs which were traditionally used to decorate leather sheaths.

The scramasax was introduced into England in the early Anglo-Saxon period, although the short versions used with 753 and 754 were particularly popular in the 10th and 11th centuries. This provides a broad dating for the scabbards which may be further refined by an analysis of the motifs used in the decoration. The net pattern used on the reverse of 753 cannot be paralleled adequately elsewhere in pre-Conquest art, although it does imitate exactly the structure of textiles made in the technique known as sprang (*AY* 17/5, forthcoming), but the flaccid zoomorphic interlace used on the front face does have some suggestive features.

In particular the zoomorphic interlace on the front face, which is disposed in figure-of-eight-shaped loops interlacing with narrow strands, is reminiscent of English Urnes style metalwork, produced in the second half of the 11th century. An unprovenanced mount in the British Museum, for example, has the animal body disposed in a similar figure-of-eight loop with narrow elements developing from the body and interlacing with it (Backhouse et al., 1984, 112, no. 109 and pl. 109), and a number of other Urnes style mounts from England have similar tightly-curved animal bodies. However, these comparisons cannot be pressed too far since the animals on the sheath lack the three-dimensional heads and spiral joints employed on the metalwork. Moreover, looped animal bodies with narrower interlacing strands were employed in works other than in the Urnes style. A number of Jellinge style sculptures from York, for example, have decoration of this general type (Lang, 1978), although none of this decoration very closely resembles that on the sheath.

The broad 10th/11th century date suggested for 754 on the basis of the knife form is confirmed by the use of acanthus ornament in the decoration, since acanthus ornament was only introduced into pre-Conquest art in the early 10th century. However, there is no adequate parallel for this particular design, and a more precise dating is, therefore, impossible.

The third sheath from Parliament Street (755, Pl. XIII) is for a small knife, again probably accommodating both the blade and the handle. On the front face the decoration is divided by a broad relief moulding running half-way along the back of the sheath from the tip before ending in two lobes running on to the front face. Above this the decoration is divided into fields, with a prominent lozenge-shaped field in the centre, surrounded by four sub-triangular fields. Each field is filled with embossed fret or interlace ornament. Below the lobes is a narrow, tapering, fret-filled field. Near the open edge of the sheath, which was originally sewn, is a row of coarse beading with a second row of finer beading inside it. On the

rear face the decoration reflects the shape of the knife inside. The handle is filled with an incised fret, and the blade area with an incised simple scroll. Again there is a row of embossed beading along the open edge.

There is no close parallel for this sheath since the only other pre-Conquest sheath for a small knife, from Lloyds Bank, Pavement, York (pp. 142–3, 681, Fig. 73, Pl. VIB, AY 17/3), is for the knife type having a drooping shoulder between the blade and handle. The two Saxo-Norman sheaths from Saddler Street, Durham, are also for this knife type although, like the Lloyds Bank example and 755, they are designed to accommodate both the knife and its handle. The nature of the decoration on 755 with simple frets and interlaces may, however, suggest an Anglo-Scandinavian date. Simple frets do occur in this period, as on the shank of an animal-headed bone pin from 16–22 Coppergate. The simple interlace used on the sheath, consisting of a pair of pointed ovoids at right-angles to each other and interlacing where they cross, is paralleled in York on stone sculpture of the Anglo-Scandinavian period, as on the head/foot stone from St Mary Bishophill Senior (RCHMY 3, pl. 25; AY 8/1, 10).

It is, however, possible that the piece is of earlier date. The division of the ornament into small sub-triangular and lozenge-shaped fields, often with beaded borders, is particularly characteristic of the 9th/early 10th century Trewhiddle style. It is, for example, employed in the drinking-horn mounts for the Trewhiddle hoard itself, deposited c. 875 (Wilson, 1984, 96, fig. 104). In Trewhiddle style decoration such fields are usually filled with quadrupeds, but occasionally interlace is used instead, as in one of the mounts from the Trewhiddle hoard (*ibid.*, fig. 104) or, for example, an unprovenanced plate from a house-shaped casket (*ibid.*, fig. 179) which employs simple triquetras as does one of the fields on the sheath. The character of the fret on the front face of the sheath is also more suggestive of an early date. Frets are only infrequently used in the Anglo-Scandinavian period, and where they are employed they are extremely simple and standardized and are on ordinary, everyday objects. They are almost entirely absent from the more luxurious works of the period such as the manuscripts, and the finer metalwork. To find frets of comparable complexity to those on the sheath it is necessary to look to the period before the mid 9th century when such elaborate frets seem to have dropped out of use; there is, for example, only a single manuscript fret for the whole of the period from the mid 9th century to the end of the pre-Conquest period. Particularly close in form to the frets on the sheath are frets in the King David portrait in the *Vespasian Psalter* (BL Cotton Vespasian A.1. fo 30v; Alexander, 1978, 55–6, pl. 146), a work dating to the second quarter of the 8th century (*ibid.*, 55), and on the opening page of *St Luke's Gospel* in BL Royal 1.E.VI (fo 43r; Wilson, 1984, pl. 114), a work of the early 9th century, and one which has a clear relationship with the Trewhiddle style of metalwork decoration (*ibid.*, 94). On this basis it is possible that the sheath is a 9th century piece, and certainly there is no other element in the decoration which would contradict such a hypothesis. Unfortunately, little light is shed on the dating of the sheath by the one object from York which is decorated in an almost identical fashion, namely the saddle bow from 16–22 Coppergate (Hall, 1984, 83, fig. 86). Like the sheath this is decorated with interlocking triangular fields with beaded borders. The object derives from a 10th century context (*ibid.*), but this serves only to provide a *terminus ante quem*, and a 9th century date has been suggested for the piece (Wilson, 1984, 111).

The sheath from Midland Bank (973, Pl. XIV) is of quite a different character from those from the Parliament Street sewer trench. It is for a knife having a long, gently tapering blade with a straight back. Close to the upper end the sheath is stepped out on the front and rear faces to accommodate the guard, and expands towards the throat. On the front face the blade area is divided into two unequal fields having embossed plain frames. The lower, smaller field is decorated with a single embossed upward-facing biped with a foliate tail. In the upper field a similar upward-facing biped and a quadruped are separated with closely packed stamped ring-and-dot. Details of the animals are indicated by engraved lines. On the reverse the face is divided into two roughly equal fields within broad plain embossed frames. Both are filled with single embossed upward-facing bipeds with foliate tails. Again details of the animals are engraved, and the backgrounds are filled with closely packed, stamped ring-and-dot. The upper zone of the scabbard is decorated with a series of interlocking triangles. Each contains an embossed animal with the details engraved, against a background stamped as before.

The dating of this sheath is straightforward since it derives from a context dated to the 13th century on the basis of the pottery. This is supported by a consideration of the decoration as the bipeds are of a form common in 12th and early 13th century art. In York there is a closely comparable sheath from Low Petergate decorated with similar bipeds, and fragments of two others from the same site (Wenham, 1972, 97, fig. 22, 1–3, pl. XV). These were all derived from the same context dated on the evidence of the pottery to the 12th or 13th century (*ibid.*, 97). A sheath from Hungate is of very similar form to the Midland Bank example, although differently decorated and of 15th century date (Richardson, 1959, 103, fig. 29.4).

*Shoes*¹⁰ (Figs. 108–16)

The Parliament Street sewer trench has yielded a single intact shoe (756) and, in addition, some ten intact and 43 fragmentary shoe soles (757–809), four separate seats (810–13) and 35 shoe uppers or fragments of uppers (815–49).

The shoe (756), which is for the right foot, has a semi-straight sole (see below) with a rounded toe. The upper is in one piece (see below) and has a vertical butt seam on the inside between the vamp wing and quarter. The top edge is horizontal and oversewn and there is a small slit in the throat.

From the study of the intact shoe soles three groups can be identified on the basis of their shape — straights, semi-straights, and soles with a marked waist and asymmetrical tread. Straights, as the name suggests, lack a waist and taper slightly towards the seat. They are not shaped to fit the right or left foot; however, some have such a slight waist or shaping that they seem to belong to this category rather than that of semi-straights. There are two intact samples (757 and 758) and two fragmentary examples (759 and 760). Semi-straights are shaped to fit the left or right foot, but have only a slight waist. The complete shoe (756), two intact soles (761 and 762) and two fragmentary specimens (763 and 764) fit into this category. Waisted shoes are also shaped for the left or right foot, but the waist is normally very narrow compared with the width of the tread which is markedly asymmetrical. 770 is the most extreme example of the shape. There are six intact soles of this form (765–70) and fifteen fragmentary examples (771–85). 786 is a separate tread from this type of sole with a butt seam

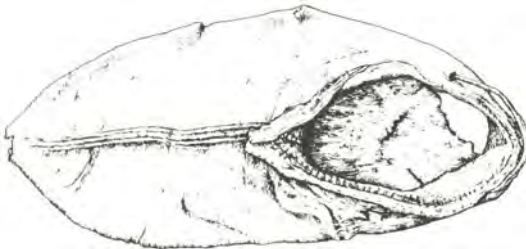
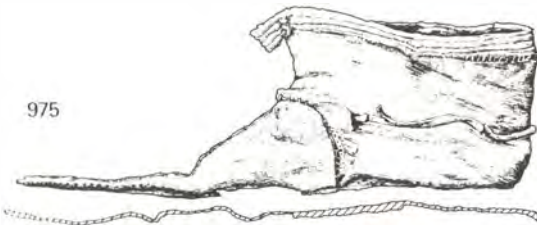
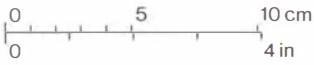
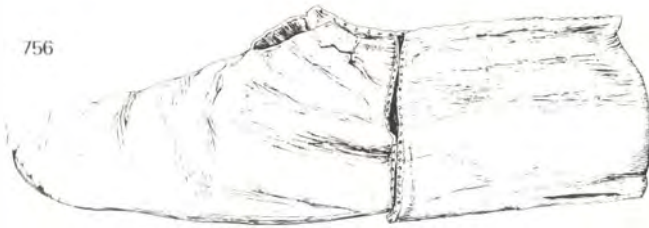


Fig. 108 Intact shoes. Scale 1:3

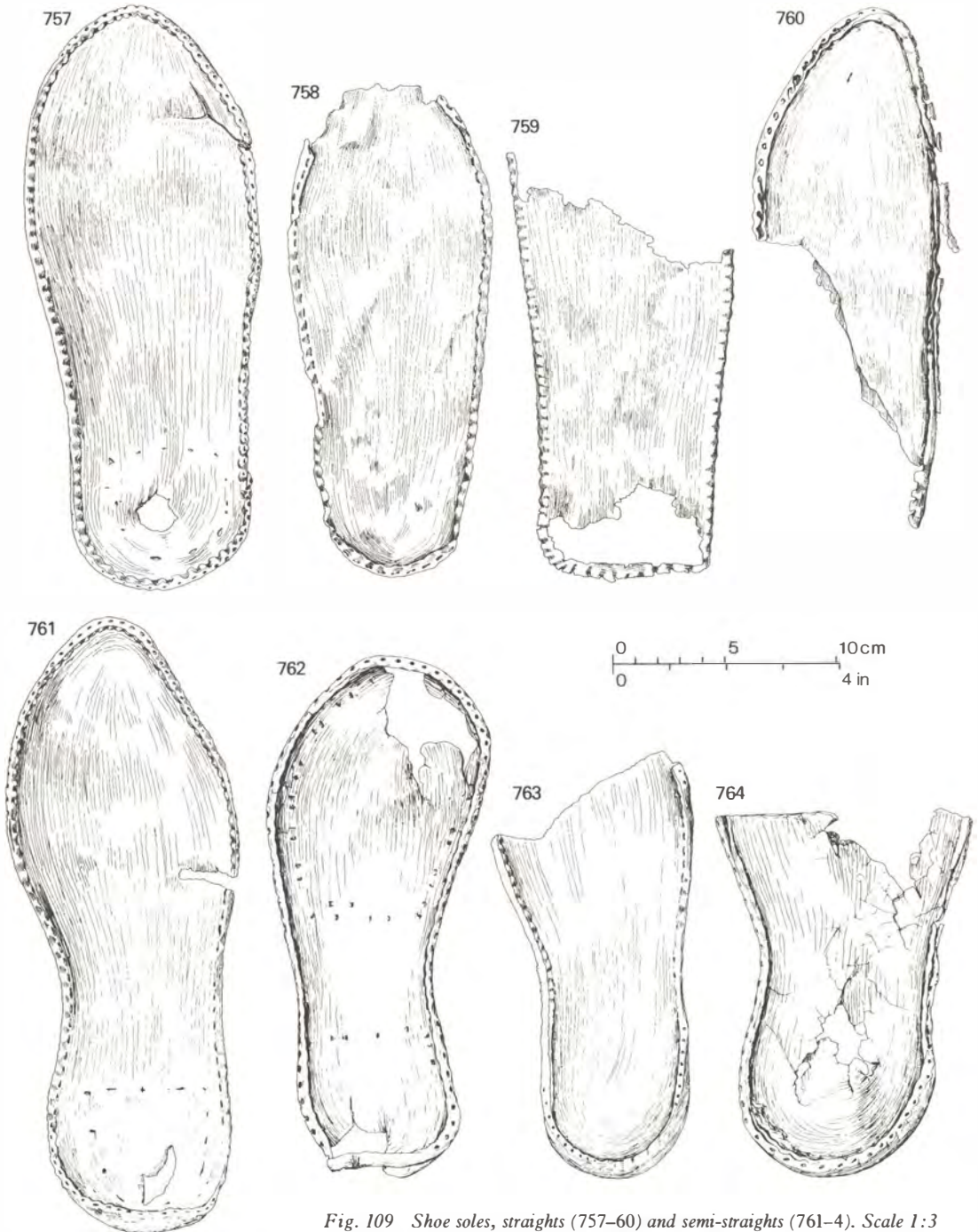


Fig. 109 Shoe soles, straights (757-60) and semi-straights (761-4). Scale 1:3

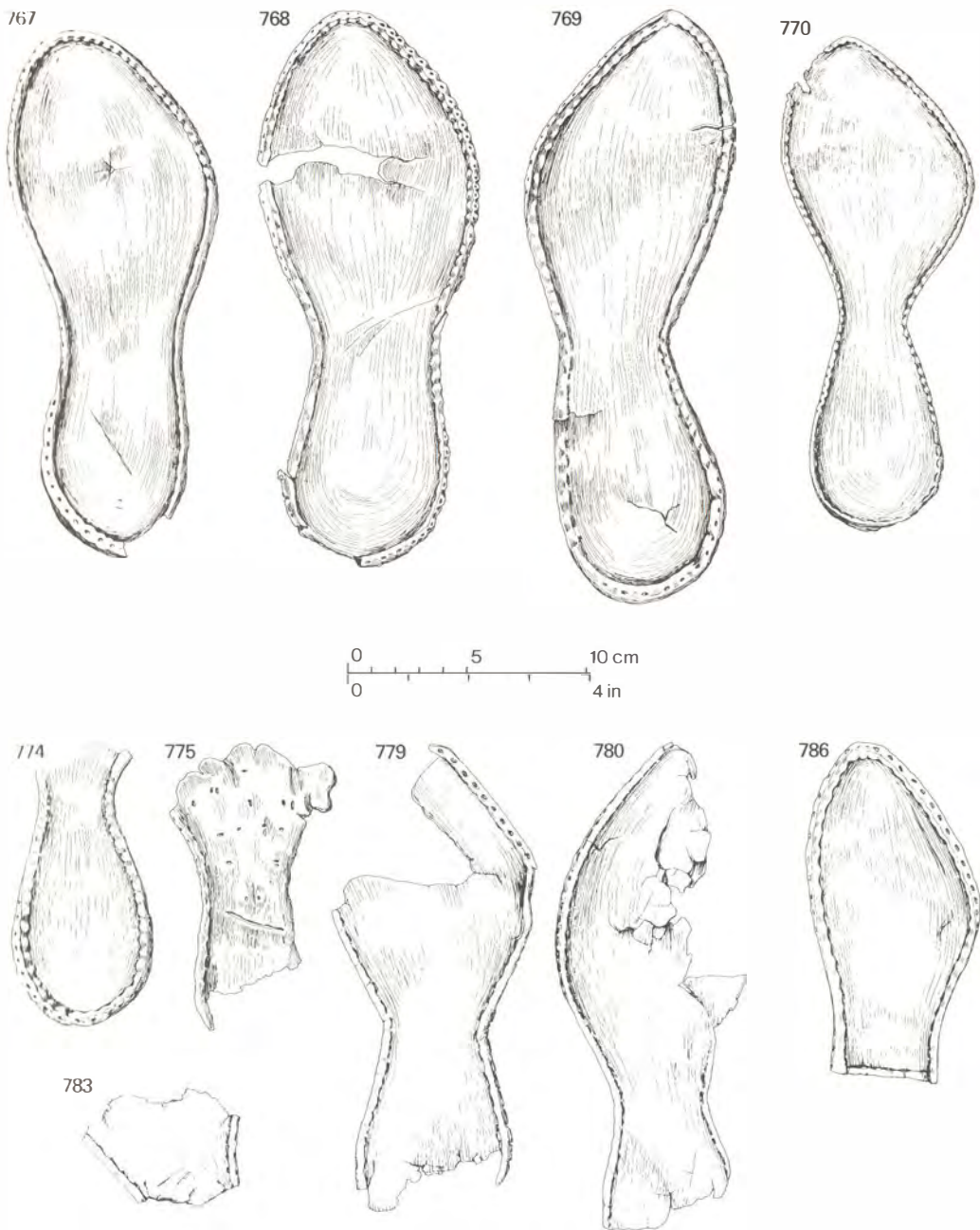


Fig. 110 Shoe soles, waisted. Scale 1:3

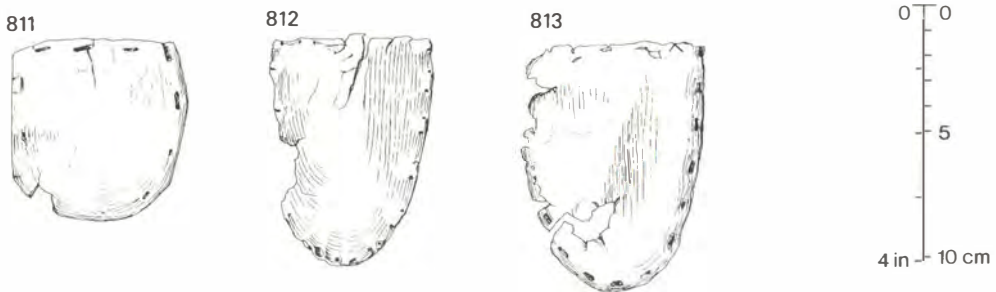


Fig. 111 Shoe seats. Scale 1:3

across the waist. It is evidently part of a sole made in two pieces, a type noted by Thomas (1980, 11). The Parliament Street sewer trench has also yielded eight unclassified seat fragments (787–94), four unclassified tread fragments (795–8) and seven unclassified toe fragments (799–805). In addition, there are four fragments (806–9) which might belong to the seat, tread or toe.

Each of the four separate seats from Parliament Street sewer trench (810–13) has a row of thonging holes running parallel to the edges. This suggests that the seats were applied as repairs or strengthening to existing soles. They are not parts of two-piece soles like 786 since they lack the butt seam at the waist. Several of the shoe soles exhibit evidence of repair, normally in the form of blind stitch holes around the edge of the seat and across the waist, a feature seen on 757, 761 and 763. 762 has a row of grain/flesh stitch holes around the seat and across the rear of the waist. Further grain/flesh stitch holes outline the tread and return across the forepart of the waist. Again these presumably indicate repairs.

There is a typological sequence of soles from straights, through the semi-straights, to the examples with a marked waist, and this may have chronological implications, something Clarke has suggested for the King's Lynn material (Clarke and Carter, 1977, 355). However, other factors such as function or social status of the wearer may have had a bearing on the shape of the sole.

The Parliament Street sewer trench has also yielded 35 fragments of shoe uppers (815–49). These can be divided into three categories — one-piece uppers, vamps, and quarters.

In addition to the intact shoe (756), there are six probable one-piece uppers from the site (815–20). 816, 819 and 820 are intact; all are for the right foot. 816 and 820 are ankle boot uppers and 819 is a shoe upper with a triangular strengthening piece at the heel. The ankle boot upper can be identified both by the height of the quarter on the outside and by the slit-shaped throat which only assumes its correct form when the upper is folded round and joined on the butt seam. They also have holes for thonging near the throat to keep the throat closed. On this basis the incomplete 815 and 817 may be identified as ankle boot uppers, although 817 only has a relatively shallow outside quarter and lacks the thong holes. 818 is so badly damaged that it is unclear whether it was a boot or a shoe upper.

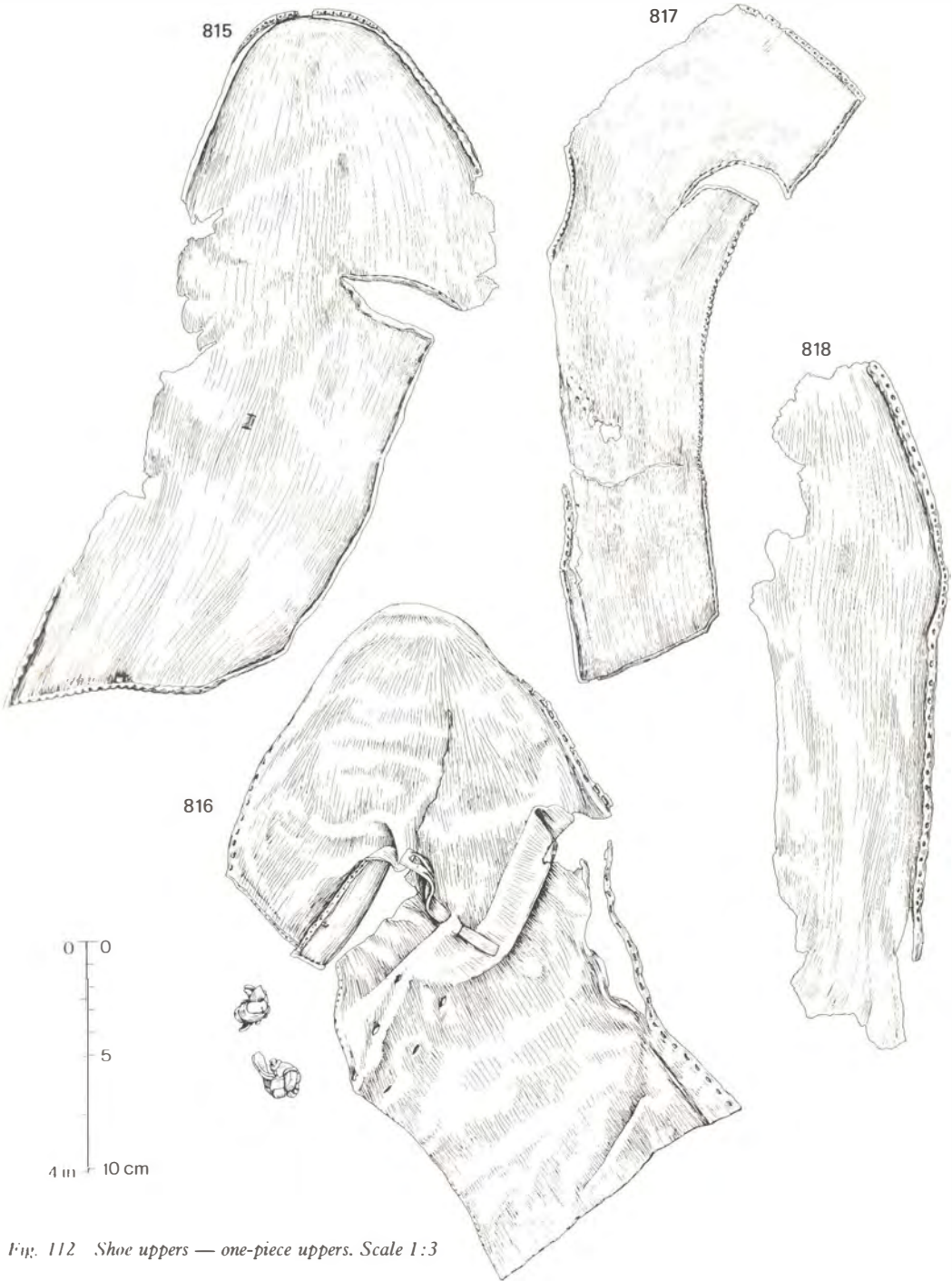


Fig. 112 Shoe uppers — one-piece uppers. Scale 1:3

There are only two recognizable vamp fragments from the Parliament Street sewer trench, 821 and 822. Both have a rounded toe and a single surviving vamp wing with a square butt seam. In each case the other vamp wing is roughly broken away.

There are 20 turnshoe quarters from the Parliament Street sewer trench (823–42). Of these, three (823–5) belong to the type with an inverted V-shaped slot at the heel for the insertion of the pointed rear of the seat which was folded up over the heel. 823 and 825 have thonging holes to one side of the slot so that the extended upper portion of the opposite quarter could be folded over the instep and thonged into position. This feature is particularly apparent on 825 where the extended upper, left-hand edge survives with the point of attachment for the thongs. This closely parallels the form of the intact Anglo-Scandinavian shoe from 5–7 Coppergate (p. 138, AY 17/3). 823 has no surviving seams with the vamp wings, but on 825 these survive. The grain/flesh stitch holes suggest that they were lapped seams. In all three cases the top edge was oversewn. 824 differs slightly from 823 and 825, in that there is a row of thong holes running parallel to the top edge, with a knotted thong partially surviving in situ. Again the top edge was oversewn, and to the left the square butt seam with the vamp wing survives.

Of the remaining quarters, four (826–9) are of the one-piece variety, lacking a vertical seam at the heel. 826, 827 and 829 have a horizontal top edge which is oversewn. 827 has a cut in the right-hand top edge to allow folding over the heel. 828 has the surviving portion of the top edge sloping down towards the seam with the vamp wing and decorated with nine perforations each surrounded by an unpressed ring. The shape of the butt seam with the vamp wing varies. 827 and 828 have square butt seams; 829 has one square butt seam and the other stepped back, whereas 826 has both butt seams stepped back. The site has also produced four single elements from two-piece quarters, a type where there is a vertical seam at the heel, 830–3. 830–2 are right quarters and 833 a left quarter. In each case the seam at the heel is a sewn butt seam, although on 830 only the lower part of the seam is stitched, and the upper part thonged. The height of the quarter suggests that this was part of a boot not a shoe. 832 has a triangular insert at the heel and, judging by the shape of the backseam, 831 must have had a similar insert. There is some variation in the treatment of the top edge. On 833 it is horizontal and oversewn, but on 830 and 832 the top edge is horizontal close to the heel, but then slopes down obliquely towards the butt seam; in each case it is oversewn. 831 probably also took this form but most of the top edge is lost. The treatment of the butt seam with the vamp wing also varies. On 831 it is square; on 832 and 833 the upper portion of the seam is square, but the lower part is stepped back; 830 may have been of either form.

The remaining nine fragments (834–42) are so damaged that it is impossible to be certain whether they derive from one- or two-piece quarters. 839 has a horizontal top edge, originally oversewn, and a sloping forward edge which presumably developed into a seam with the vamp wing. The depth of the slope suggests that the piece must have come from a boot not a shoe. Parallel to the sloping edge is a line of thonging holes with the thong in situ. Two incised lines run parallel to the top edges which, with the ring-and-dot on 828, are the only occurrence of decoration among the shoe uppers from Parliament Street. 840 is broadly similar to 839 but lacks the decoration. Instead it has a deep vertical slit in the top edge, originally sewn and thonged together, and there are the remains of a thong paralleling the top

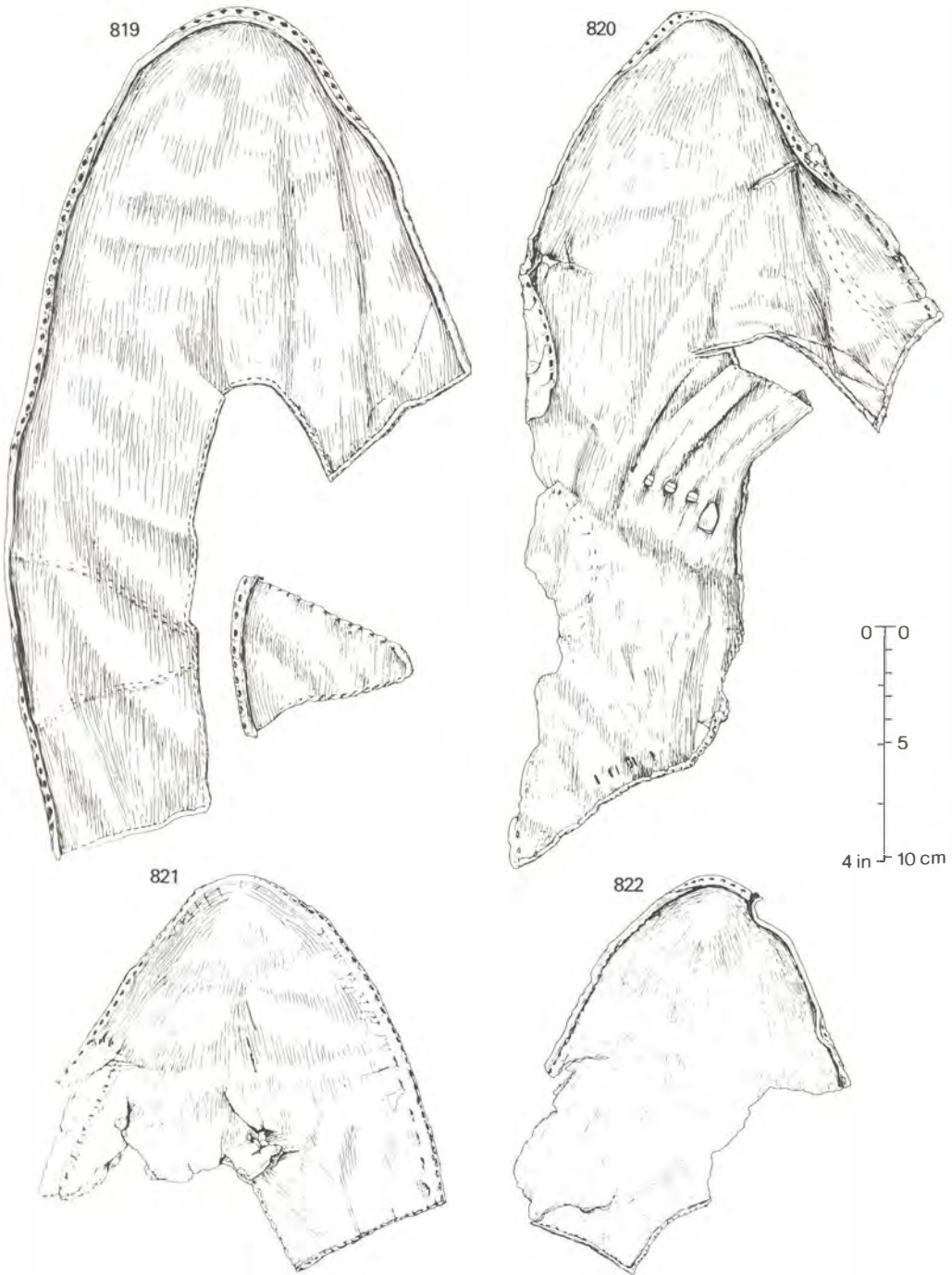


Fig. 113 Shoe uppers — one-piece uppers (819–20) and vamps (821–2). Scale 1:3

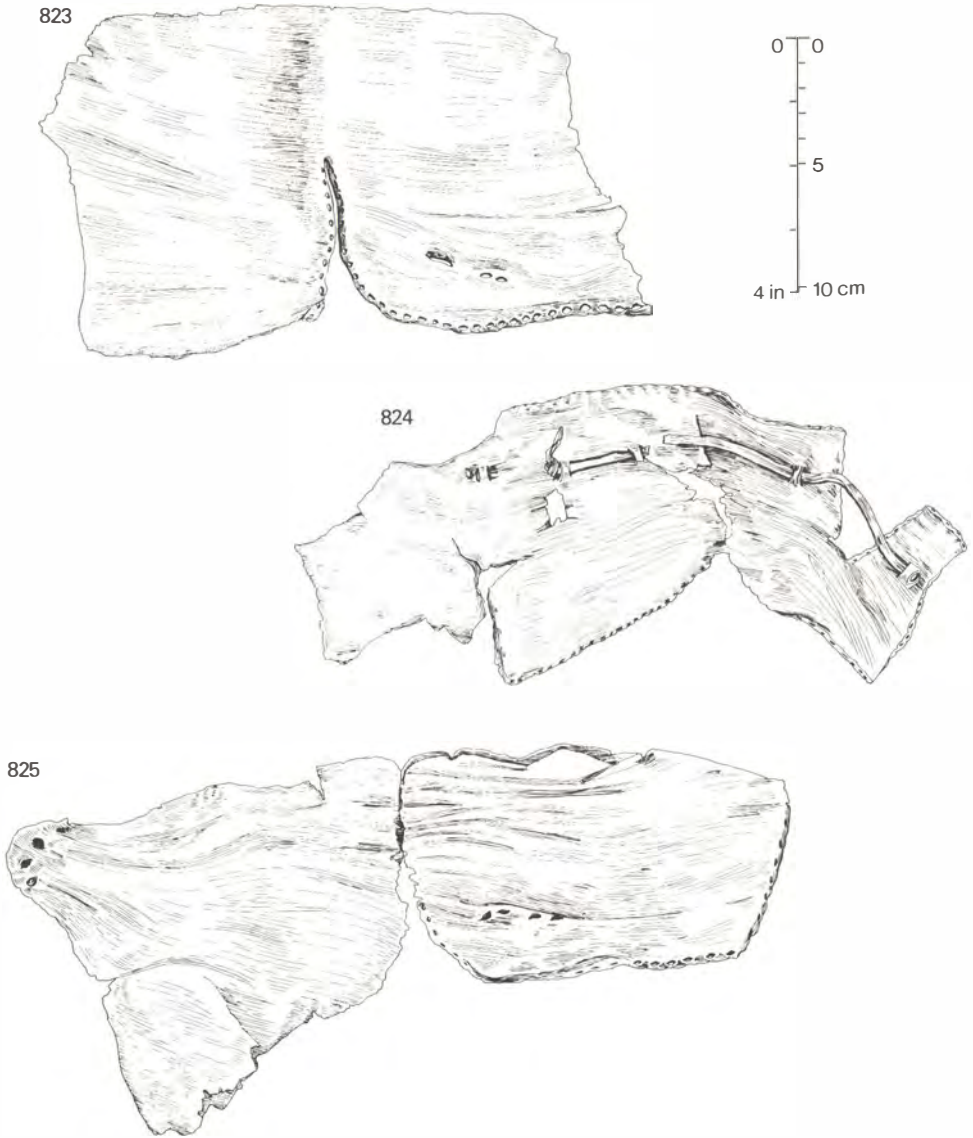


Fig. 114 Shoe uppers — quarters with V-slot at heel. Scale 1:3

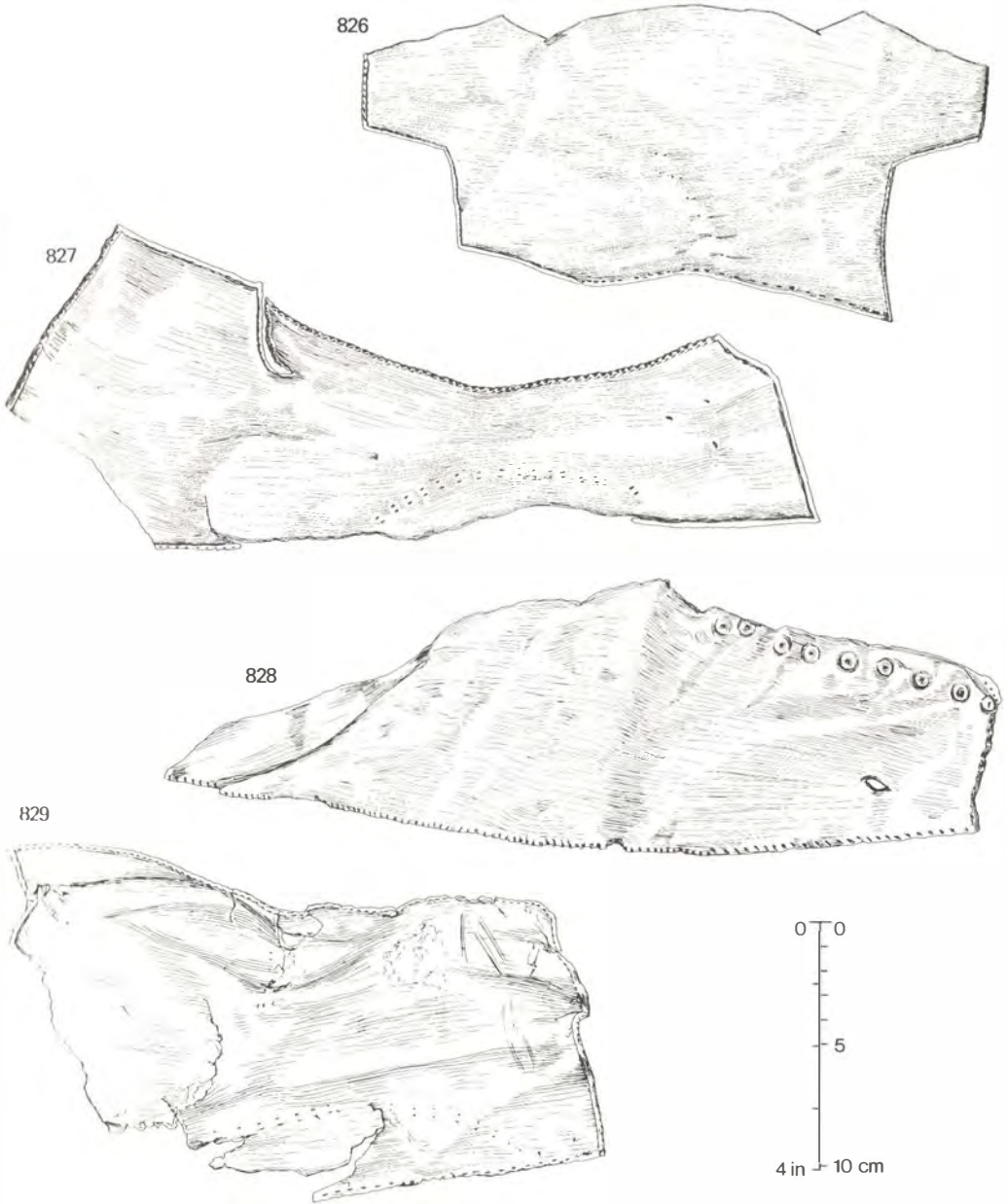


Fig. 115 Shoe uppers — one-piece quarters. Scale 1:3

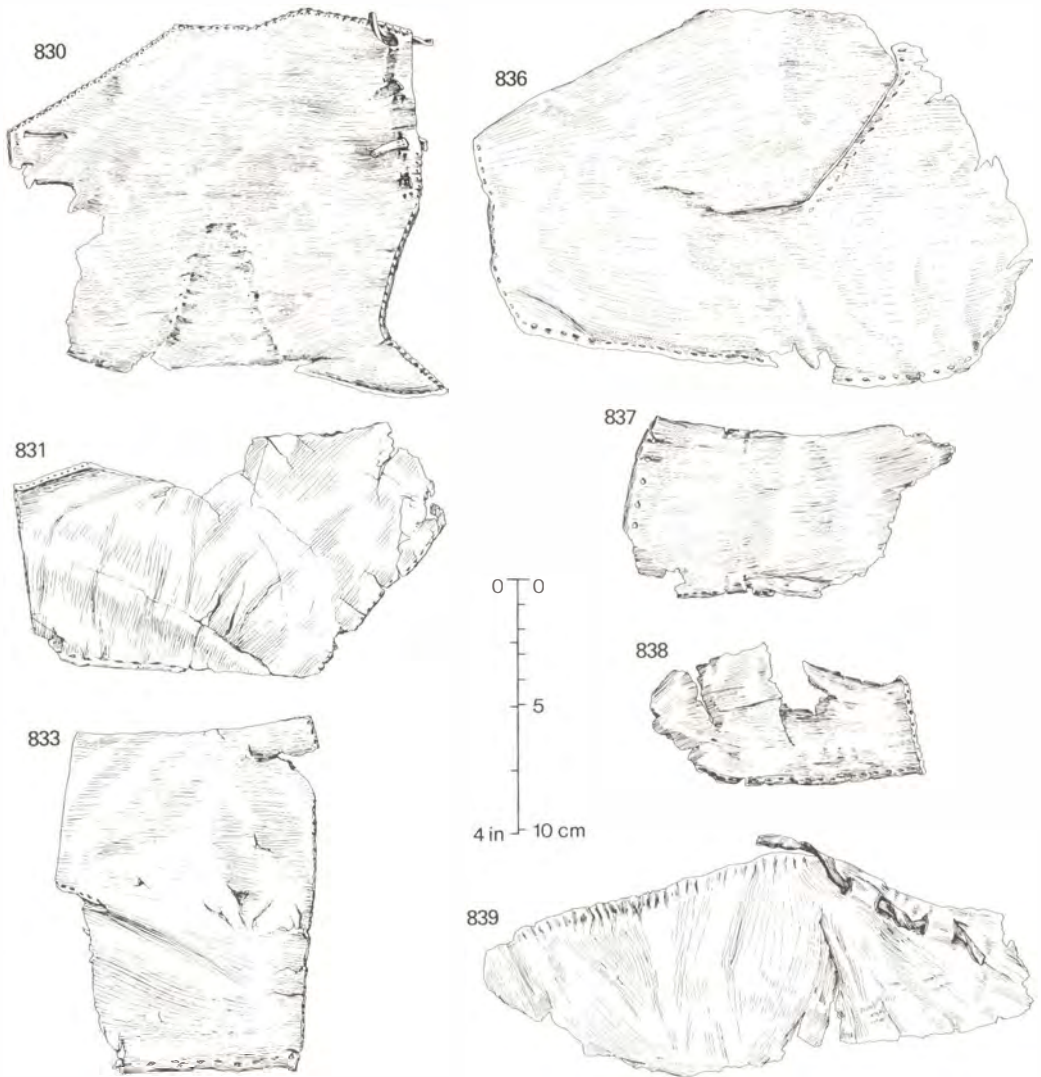


Fig. 116 Shoe uppers — two-piece quarters (830–1, 833) and uncertain (836–9). Scale 1:3

edge. Like 839 it must have formed part of a boot not a shoe. 834 is also probably a fragment of a quarter. The top edge is horizontal and without stitch holes. The butt seam is square above, but below runs obliquely back, a shape more appropriate to a quarter than to a vamp wing. Something similar is seen on 826 for example, where the seam is stepped back.

In addition to the fragments noted above there are seven pieces (843–9) which have lasting margins. They can probably be identified as parts of shoe uppers, although whether they are derived from one-piece uppers, vamps or quarters is unclear.

The dating of the shoes from the Parliament Street sewer trench is problematical, as the pieces are for the most part unstratified. However, some conclusions can be drawn about the date of the shoe fragments taken as a group, if not about individual examples. All of the shoes were made by the turnshoe method of construction, a method finally abandoned by c. 1500 in favour of welted construction, which was itself preceded by a long period of rand development, not represented here. Moreover, the group as a whole lacks any shoes with the long drawn out points and elaborately decorated uppers which occur among the later medieval material. On the other hand, well represented are shoes with a V-shaped slot in the heel into which the pointed rear of the seat was folded and stitched. This type may have been introduced into York before the Viking Age (Hald, 1972, 151), but is typical of Anglo-Scandinavian levels in the city. Examples of this period are known from 5–7 Coppergate (p. 138, Fig. 72, AY 17/3), 16–22 Coppergate (Roesdahl et al., 1981, YL7) and Hungate (Richardson, 1959, 86–90, fig. 22). That it survived the Norman Conquest is suggested by the specimen from Low Petergate (Wenham, 1972, 100, figs. 23.6 and 24.7), but that it outlasted the 13th century is perhaps unlikely. The possibility that the Parliament Street examples are of Anglo-Scandinavian date is reinforced by the presence of Anglo-Scandinavian sheaths among the leatherwork (see p. 237). The presence of this type of shoe on the one hand, and the absence of distinctively later medieval types on the other, provides loose date brackets for the group as a whole, probably between the 10th century and c. 1300.

The Midland Bank site has produced one almost intact shoe (975). The sole is a straight with a pointed toe. The upper is made in a single piece with a curved butt seam between the quarter and the vamp wing on the inside of the foot. There are four parallel incised lines forming three ridges up the middle of the instep. Along the top edge is a narrow, separately applied strip again decorated with a series of horizontal incised lines forming a series of raised mouldings.

The shoe derived from a level which contained pottery of the 13th century.

Miscellaneous leatherwork (Figs. 117–18)

There are twelve probable strap fragments from the Parliament Street sewer trench (850–61). Of these, five (856–7, 859–61) are made by the simple expedient of folding a narrow strip of leather in half along the long axis, and sewing it together with grain/flesh stitches. They are all undecorated. 859 is made in a similar way but in the front face has three parallel rows of closely spaced slits, one along each edge and one on the long axis. This may have held thongs, or even thin cord, possibly coloured. 858 forms the end of a similar strap; at the end it was finished by folding over it another narrow strip of leather. This was thonged into place across the square end, and along the open edge, and sewn on the remaining sides. The strap subsequently broke off at this point.

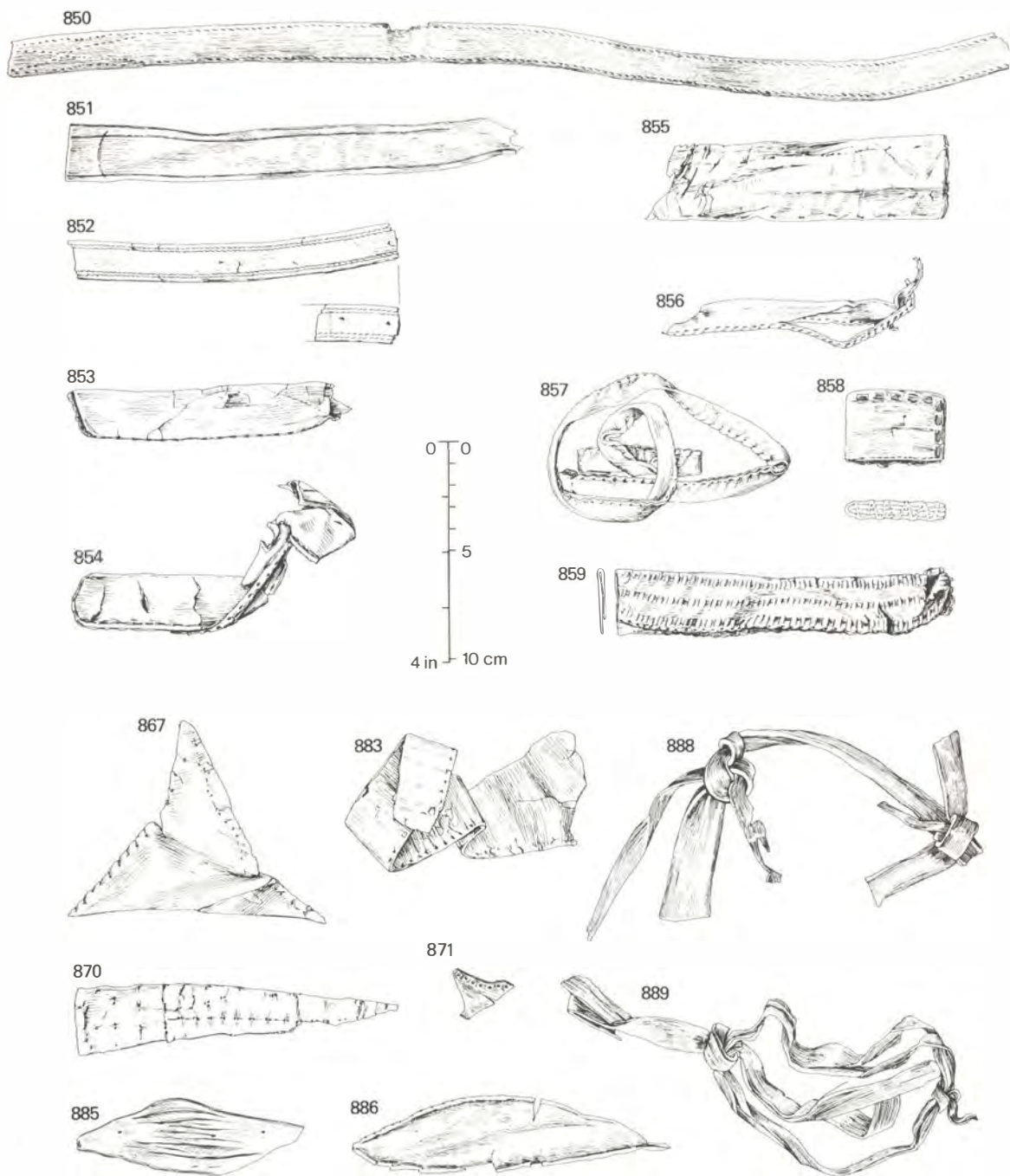


Fig. 117 Leather straps and miscellaneous leatherwork. Scale 1:3



Fig. 118 Leather sleeve. Scale 1:3

The strap fragments 850–5 are simply cut into shape. 850 has a row of oblique stitch holes running parallel to each of the long edges, suggesting that each edge of the strap was oversewn to prevent stretching. At one end of the strap is a rough saltire formed of stitch holes, presumably a decorative motif. The stitching thread may originally have been coloured to heighten the decorative effect, but none now survives. 852 has two rows of stitch holes running parallel to each edge. 851 is similar except that the two rows of stitch holes have been replaced by a single engraved line running parallel to each of the long edges. 855 combines the features of 851 and 852. It has a row of widely spaced thong holes roughly running parallel to each edge. Each row of holes is linked by an incised line which may have been used to lay them out.

Both 853 and 854 have a row of edge/flesh stitches along one edge. These serve no structural purpose, and it is possible that in each case the strap has been cut down from something else. In addition 854 has five rough perforations along the long axis, possibly for

the tongue of the buckle to engage. 854 is undecorated, and 853 has no worked decoration, but along each long edge is a border which is lighter in colour than the body of the strap. This is unlikely to be fortuitous, and the most likely explanation is that the body of the strap was originally decorated with a broad coloured stripe.

Apart from the straps, 30 other pieces exhibit structural features, although in most cases it is impossible to suggest what functions these objects served, although 862 may have formed part of a sleeve. There are also many featureless fragments, with the edges simply torn, and a large number of offcuts, apparently from the manufacture of objects. The discovery of leather-working debris in this area should occasion little surprise since there is evidence for Anglo-Scandinavian leather working nearby at 6–8 Pavement and at 16–22 Coppergate. No date, however, can be assigned to the unstratified material from Parliament Street.

The Midland Bank site has produced a rectangular piece of leather with edge/flesh stitch holes along one of the long edges, and on one of the short edges (976). Its function is uncertain. The site has also produced a number of offcuts from the manufacture or repair of objects. Many more were recorded, particularly in context 110, but not collected. This context is dated on the basis of the pottery to the 13th century.

Vessel glass (Fig. 119)

There are seven fragments of vessel glass from the Parliament Street sewer trench (698–704). Of these, two, 702 and 703, are featureless body sherds of uncertain date, and 704 is a modern handle. The remaining four sherds are of greater interest. 698 is part of the rim and handle of a Roman bath flask of natural green glass. A number of similar flasks have been discovered on other sites in York, including examples from the Roman sewer in Church Street nearby. The type has been discussed by Charlesworth (pp. 15–16, Fig. 13, *AY* 17/1). 699 is a fragment of Roman mould-blown glass; it is too small for the shape of the vessel to be reconstructed but the dimpled surface imitates the facet cutting often employed on Roman vessel glass. A closely comparable example is known from the Church Street sewer (p. 17, *AY* 17/1).

The most interesting of the fragments are 700 and 701. 700 is part of an outspayed vessel rim with two wheel-cut grooves just below the splay. It is Roman, and derives from a small beaker or bowl with straight sides and a flat base, possibly with a foot ring. 701 is part of the body and base of a similar beaker with a pair of wheel-cut concentric grooves on the base. It would appear to be the base belonging with 700 but 701 reconstructs with a much greater diameter than 700, and must be from a different if closely comparable vessel. Such colourless tall bowls or beakers with outspayed rims, straight or tapering sides, a flat base or foot ring, and wheel cuts around the body, originated in the Flavian period and became widespread throughout the 2nd and 3rd centuries (Harden and Price, 1971, 346). In Britain there are numerous examples, most notably from Fishbourne, Surrey (*ibid.*, 345–9, fig. 140, 55–60), Verulamium, Herts. (Charlesworth, 1972, 210, fig. 78.54), Ditchley, Oxfordshire and Crundale, Kent (Harden and Price, 1971, 346). In northern England there is a similar bowl or beaker from Corbridge, Northumberland (Charlesworth, 1959), and there is another specimen from Castlecary, Stirlingshire (*ibid.*, 49).

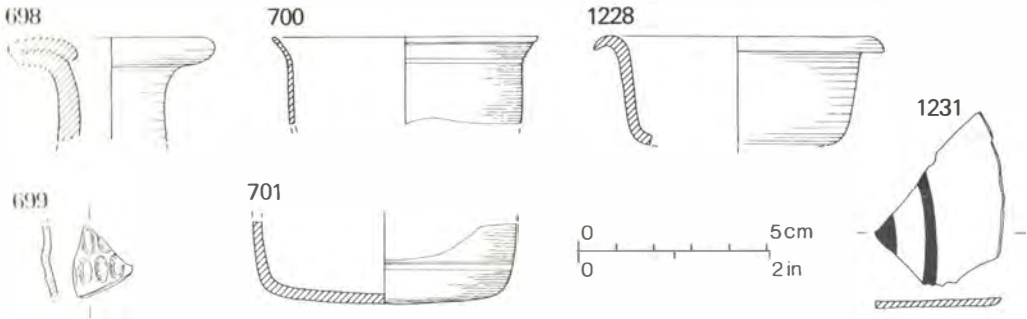


Fig. 119 Vessel glass fragments and sherds (698–9, 700–1, 1228) and stained glass window fragment (1231). Scale 1:2

Window glass (Fig. 119)

There are six fragments of window glass of uncertain date from All Saints Pavement (1227, 1229–30). The uniform thickness of each of the fragments suggests that they are of relatively modern date. 1231, also from All Saints Pavement, is a fragmentary quarry of medieval stained glass. The curved outer edge is grozed, and is therefore original. The remaining edges are roughly broken. The decoration consists of a dark red/brown line running parallel to, but distant from, the grozed edge. Inside it is another area of red/brown paint.

Catalogue of Finds

The catalogue numbers follow consecutively those on p. 164 (AY 17/3). Throughout the catalogue, small find numbers are indicated by the prefix 'sf'; the objects from Midland Bank were excavated before the Trust was founded, and have no small find numbers. Most objects are unstratified, but where context numbers exist these appear before the small find numbers. In the catalogue of leather objects, all pieces which are not otherwise marked are unidentified by microscopic examination.

Finds from the Parliament Street sewer trench

Stone

- 682 Rotary quern of sandstone; fragment only, from the upper stone; grinding surface worn smooth. Original diameter c. 320 × Th. 24.4mm. sf29 (*Fig. 86*)
- 683 Rotary grindstone of sandstone, cylindrical with the faces pecked roughly flat and the grinding surface worn smooth. There is an axial perforation. D. 91.4 × Th. 58.3mm. sf31 (*Fig. 86*)
- 684 Hone of micaceous schist, fragment only, of rectangular section. The faces are natural cleavages, the remaining edges roughly broken. L. 82 × W. 27 × Th. 9mm. sf84 (*Fig. 87*)
- 685 Hone of phyllite, fragment only, of square section, roughly broken at each end. Three of the edges are dressed flat, the fourth roughly broken away. L. 53 × W. 22 × Th. 22mm. sf10 (*Fig. 87*)
- 686 Hone of slate, fragment only; of rectangular section, it is dressed roughly flat at the edges and on one face, but is roughly broken on the other face and at one end. The other end is partially sawn, and partially broken away. L. 78 × W. 36 × Th. 23mm. sf142 (*Fig. 87*)
- 687 Hone of slate, fragment only, of flat rectangular section, expanding towards the lower end. The front face, the upper end and left-hand edge are dressed flat. The lower end is partially sawn and partially broken, and the right-hand edge and rear face are roughly broken. There is a perforation partially broken away, at the upper end. L. 62 × W. 45 × Th. 10mm. sf22 (*Fig. 87*)
- 688 Gaming piece of micaceous sandstone, discoid, undecorated. D. 47.8 × Th. 11mm. 1107. sf63 (*Fig. 88*)
- 689 Mould of limestone, incomplete. It is cylindrical with a mould in the upper face for casting plates or shallow dishes with an elaborate profile. D. 275 × Ht. 97mm. sf28 (*Fig. 94*)
- 690 Spindle whorl, plano-convex turned, with an incised line around the central perforation, and another around the circumference just above the rounded edge. D. 39.5 × Th. 14.6mm. sf83 (*Fig. 102*)
- 691 Fossil echinoderm, incomplete. D. 36.7 × Th. 16.8mm. sf136

Jet

- 692 Irregular fragment with one face dressed flat and the remaining faces roughly broken. L. 30.9 × W. 25 × Th. 21.4mm. sf141

Amber

- 693 Raw amber fragments (8), each broken from a larger piece. L. (largest) 12.6 × W. 7.2 × Th. 5.7mm. sf25
- 694 Raw amber fragment, one face dressed. L. 18 × W. 14.9 × Th. 6.9mm. sf53
- 695 Finger-ring fragment of D-shaped section. L. 13 × W. 9.3 × Th. 5.6mm. sf144

Fired clay

- 696 Gaming counter, discoid, chipped from an undecorated Samian ware body sherd. D. 43.5 × Th. 7.5mm. sf134 (*Fig. 88*)
- 697 Crucible with round bottom and slightly tapering sides, the interior and exterior coated with slag. D. 43 × Ht. 67mm. sf5 (*Fig. 94*)

Glass

- 698 Bath flask rim fragment; pale green and translucent; flat infolded rim with fragmentary small eyelet handle. D. 56.9 × Ht. 26.6 × Th. (rim) 9.3mm. sf49 (*Fig. 119*)
- 699 Vessel sherd; colourless and translucent, decorated with two rows of impressed ovoids. Mould blown. L. 18.8 × W. 15.6 × Th. 2.7mm. sf26 (*Fig. 119*)
- 700 Vessel rim fragment; colourless and translucent with an everted rim rounded and slightly thickened in the flame, a wheel-cut groove below and parallel to the rim, and a pair of parallel cut grooves below this. L. 24 × W. 30.6 × Th. 1.4mm. sf52a (*Fig. 119*)
- 701 Vessel base fragment; colourless, translucent and flat, decorated with a series of concentric, wheel-cut grooves. D. 70 × Ht. 19mm. sf52b (*Fig. 119*)
- 702 Vessel body sherd; pale green, translucent and featureless. L. 29.5 × W. 26 × Th. 3.1mm. sf90
- 703 Vessel body fragment; colourless and translucent. L. 27.2 × W. 27.4 × Th. 2.4mm. sf72

- 704 Handle; colourless and translucent. L. 47.8 × W. 30.8 × D. 11.5mm. sf51
 705 Globular bead; opaque black, intact. D. 9.8 × Ht. 6 × D. (perforation) 2.4mm. sf143
 706 Tubular bead; opaque light brown, intact. D. 9.3 × L. 7.4 × D. (perforation) 3.8mm. sf20

Metalwork

- 707 Iron rod, one half of square section, the other half of slightly flattened rectangular section; tapering to a point at each end. L. 122 × W. 9.6 × Th. 5.2mm. sf126
 708 Iron punch of rectangular section expanding from the point to a flat head which is spread and cracked by repeated blows. L. 97.3 × W. 22.7 × Th. 14.8mm. sf13 (Fig. 89)
 709 Iron punch of circular section, squared at one end and tapering to a point at the other. L. 98.5 × D. 4.8mm. sf19 (Fig. 89)
 710 Iron shears with a prominent loop of flat section, the shoulders of the blades sloping. L. 191 × W. 22mm. sf16 (Fig. 90)
 711 Iron needle. L. 43.5 × D. 1.7mm. sf37 (Fig. 90)
 712 Iron spoon bit. L. 174 × W. 12 × Th. 8mm. sf17 (Fig. 90)
 713 Iron knife blade with a broad, straight back drooping towards the tip, and a shallow S-shaped cutting edge, the whittle tang largely broken away. L. 75 × W. 13.2mm. sf12 (Fig. 90)
 714 Iron embossed padlock, the pivoting bolt consisting of a horizontal strip bent up in a right-angle at one end, and down into a U-shape at the other. It is covered on one side by a fragmentary iron sheet, which to the right is bent at right-angles to cover the end of the bolt. L. 82 × W. 49mm. sf87 (Fig. 91)
 715 Iron key, the two-pronged bit projecting at right-angles to the stem, the lower half of which is of circular section; the upper half is flattened, and tapers towards the upper end which is bent back to form a suspension loop. L. 98.9 × W. 24mm. sf145 (Fig. 91)
 716 Iron key, incomplete; the bit is lost. The lower part of the stem is of circular section, but the upper third is flattened, and tapers towards the upper end which is bent back to form a suspension loop. L. 91.7 × W. 11.2mm. sf87a
 717 Iron ploughshare; asymmetrical with a flanged socket. L. 305 × W. 156mm. sf1 (Fig. 92)
 718 Iron coulter, with a sloping shoulder between the shank and blade. L. 620 × W. 102 × Th. 20mm. sf1 (Fig. 93)
 719 Hook with an expanding shank from the broad end of which develops the angular U-shaped hook. L. 54.1 × W. 42.5mm. sf139 (Fig. 91)
 720 Iron fiddle-key nail. L. 39.4 × W. 13.2mm. sf38b (Fig. 91)
 721 Iron nail. L. 38.7 × W. 12.9mm. sf27b
 722 Iron wool-comb tooth of approximately circular section, tapering to a point at one end, the other end being squared with a fragment of iron sheet attached. L. 122 × D. 5.2mm. sf6 (Fig. 102)
 723 Iron wool-comb tooth of square section with a squared upper end, tapering to a point. L. 98.5 × D. 4.8mm. sf27 (Fig. 102)
 724 Tinned iron spoon with the end of the bowl broken away, and the undecorated stem expanding towards the rounded upper end. L. 138 × W. 29mm. sf33b
 725 Iron strip, fragment only; squared at one end and notched at the other. L. 70.2 × W. 14.8mm. sf38
 726 Iron object of fundamentally rectangular section, terminating at one end in a blunt point and at the other at an oblique angle. L. 98.1 × W. 5.3mm. sf38a
 727 Iron rod, tapering and of square section. L. 66.7 × W. 6 × Th. 6.2mm. sf27a
 728 Iron rod of circular section. L. 180 × D. 8mm. sf62
 729 Copper-alloy trapezoid double buckle; the central bar, largely broken away, is placed close to the narrow end of the buckle creating loops of unequal size. L. 28.3 × W. 17.5mm. sf7 (Fig. 97)
 730 Copper-alloy collar in the shape of a flattened ovoid; decorated on the upper face with coarse beading. L. 43.5 × W. 18 × Th. 2.2mm. sf40
 731 Copper-alloy sheet tubing length. L. 19.4 × D. 13.2mm. sf21
 732 Tinned copper-alloy spoon with a shallow, almost pointed bowl and a handle of pointed ovoid section which expands towards the upper, rounded end, which is flattened. L. 157 × W. 25.7mm. sf33a
 733 Brass collar stud. D. 9 × Th. 4.4mm. sf57
 734 Copper-alloy finger-ring fragment with undecorated faces but one edge nicked alternately on each side to produce a scalloped effect. D. 19mm. sf58
 735 Lead run-off. L. 62.5 × W. 21.4 × Th. 11.7mm. sf89 (Fig. 94)
 736 Lead disc, sub-circular, with a circular impression on each face; on one side is a lightly incised double triangle. L. 34 × W. 32 × Th. 2.7mm. sf54 (Fig. 97)
 737 Fragment of a lead sheet, irregular, partially folded. L. 49 × W. 43 × Th. 7mm. sf9
 738 Lead bar length, narrow and roughly broken at each end, and chamfered along one of the long edges. L. 109 × W. 22 × Th. 5mm. sf9

Wood

- 739 Birch pin of approximately circular section, the upper end cut off square. L. 102.7 × D. 7.6mm. sf36
 740 Oak disc, the edge roughly trimmed and without peg holes. D. 130 × Th. 12.4mm. sf34 (Fig. 106)
 741 Oak disc with a chamfered edge. D. 172 × Th. 26.5mm. sf15 (Fig. 106)

Bone

- 742 Pin or needle, incomplete, the spatulate upper end perforated and partially broken away, and the shank roughly broken. L. 48.5 × W. 14.2mm. sf127 (Fig. 101)

- 743 Single-sided composite comb, incomplete, the two connecting plates with a shallow, triangular form. The surviving end is squared, and the other roughly broken away. The plates are held together by two iron rivets surviving out of an original three, one at each end, and one in the centre. Between the central and each outer rivet are four dowel holes originally filled with antler or bone pegs. At the broken end one of these dowel holes is lost, and another partially so. The connecting plates are decorated at the surviving end with transverse cuts, the rest of the plates being filled with framed incised saltires. Five tooth plates survive out of the original ten. The teeth are broken away. L. 118.7 × W. 24.4 × Th. 10.5mm. sf132 (Fig. 101)
- 744 Handle, fragmentary, originally of hollow circular section, now split longitudinally; decorated with six zones of incised ornament separated by pairs of incised lines running around the circumference. The decorative zones are successively cross-hatched, diagonally hatched, plain, diagonally hatched, diagonally hatched in the opposite direction, and diagonally hatched with groups of three incised lines separated by plain zones. L. 108.5 × W. 15mm. sf133 (Fig. 101)

Antler

- 745 Worked tine, partly sawn, and partly broken off at the base, with marks of sharpening near the point, the extreme end of which has been sawn off. L. 195 × D. 39mm. sf39 (Fig. 101)
- 746 Worked tine sawn off at the base, with the point sharpened, and the convex side notched twice near the point. L. 97.5 × D. 22.7mm. sf68 (Fig. 101)
- 747 Worked tine, sawn off at the base and rubbed smooth. L. 88.8 × D. 19.9mm. sf74 (Fig. 101)
- 748 Worked tine, sawn off at the base and rubbed smooth near the point. L. 110.8 × D. 22.7mm. sf85 (Fig. 101)
- 749 Worked tine, sawn off at the base and rubbed smooth. L. 87.6 × D. 20mm. sf138 (Fig. 101)
- 750 Worked tine, sawn off at the base, faceted longitudinally to form a wedge, with the point broken away. L. 75 × D. 32.2mm. sf86 (Fig. 101)
- 751 Tooth plate for a single-sided composite comb, rectangular. L. 44 × W. 19 × Th. 4mm. sf46 (Fig. 101)
- 752 Tooth plate for a single-sided composite comb, rectangular with saw marks on the long edges. L. 25.5 × W. 9.6 × Th. 3.3mm. sf135 (Fig. 101)
- Between these fields and the riveted edge is a long panel filled with interlocking hatched triangles. On the reverse there are only two fields representing the blade and handle, both filled with an incised net pattern. L. 340 × W. 75mm. sf73 (Fig. 107; Pl. XI)
- 754 Sheath for an angle-backed knife; only the tip survives; it is riveted together along the open edge with iron rivets. The front face is decorated with debased foliate ornament within a raised frame which is obliquely slashed. On the rear face the main panel has a similar frame, but is filled with formalized acanthus ornament. The tip, separated from the rest of the field by a transverse moulding, is filled with a simple plant scroll. L. 175 × W. 64mm. sf48 (Fig. 107; Pl. XII)
- 755 Sheath for a small knife, curved along its length. On the front face a broad relief moulding running half way along the back of the sheath from the tip bifurcates and divides the decoration roughly into two. Above the bifurcations the decoration is sub-divided with a lozenge-shaped field in the centre surrounded by four sub-triangular fields. Each is filled with an embossed interlace or fret. Below the lobes is a narrow, tapering, fret-filled field. Near the open edge of the sheath, which was originally sewn, is a row of coarse beading, with a second half-row of beading inside it. On the rear face the decoration reflects the shape of the knife inside. The handle is filled with an incised fret, and the blade area with an incised simple plant scroll. There is a row of embossed beading along the open edge. L. 175 × W. 74mm. sf47 (Fig. 107; Pl. XIII)
- 756 Intact right turnshoe with a semi-straight sole. The one-piece upper is joined at a vertical butt seam on the inside and the upper has a rounded toe and a vertical gash at the throat with a thong hole to either side. The top edge is oversewn. Leather: cattle. Stitches: grain/flesh on the lasting margin max. 6mm apart, otherwise edge/flesh max. 3mm apart. L. 230 × W. 78mm. sf118 (Fig. 108)
- 757 Turnshoe sole; a straight with a rounded toe and a wear hole in the seat originally covered by a patch now represented by a row of blind stitch holes on the grain side around the edge of the seat and across the waist. Leather: cattle. Stitches: edge/flesh stitch holes max. 6.3mm apart. L. 260 × W. 100 × W. (waist) 79mm. sf44 (Fig. 109)
- 758 Turnshoe sole; a straight, the lasting margin at the toe being torn away. Grain/edge or grain/flesh thong slits max. 6.5mm apart. L. 217 × W. 90mm. sf80 (Fig. 109)
- 759 Turnshoe sole, a straight, with an oblique tear across the tread involving the loss of the toe, and heavy wear causing the loss of all but the edge of the seat. Stitches: edge/flesh stitch holes max. 6.7mm apart. L. 145 × W. 94mm. sf81 (Fig. 109)
- 760 Turnshoe sole; a straight with a rounded toe and without a waist, and with an oblique tear from

Leather

- 753 Sheath for an angle-backed knife, riveted together along the open edge with iron rivets. The decoration on the front face is divided into fields reflecting the shape of the blade and handle of the knife within. Both are filled with flaccid zoomorphic interlace. Separating them is a circular field filled with a crouched animal.

- the inside joint of the seat to the outside joint of the tread, involving the loss of the seat and part of the waist and tread. Stitches: edge/flesh max. 8.9mm apart. L. 234 × W. 80mm. sf82 (Fig. 109)
- 761 Right turnshoe sole with a pointed toe and broad asymmetrical tread which narrows only slightly to the waist. There is a tear across the rear of the tread from the outside joint, and a wear hole in the seat originally covered by a patch of which only a row of grain/flesh holes around the edge of the seat and across the waist survive. Leather: cattle. Stitches: edge/flesh max. 8.1mm apart. L. 270 × W. 100 × W. (waist) 70mm. sf45 (Fig. 109)
- 762 Left turnshoe sole with a rounded toe, asymmetrical tread, narrowing to the waist, and wear holes in the tread near the toe, and to the rear of the seat. Rows of grain/flesh stitch holes indicate where separate strengthening pieces were stitched over the tread and seat. Stitches: on the joints edge/flesh max. 8.6mm apart; otherwise grain/flesh max. 11.2mm apart. L. 239 × W. (max.) 92.5 × W. (waist) 53.8mm. sf238 (Fig. 109)
- 763 Right turnshoe sole with a broad waist, but broken across the tread so that the toe is lost. On the grain side there is a row of blind stitch holes around the seat and across the waist indicating where a heel was attached. Stitches: edge/flesh max. 5.5mm apart. L. 174 × W. 89 × W. (waist) 66mm. sf96 (Fig. 109)
- 764 Right turnshoe sole with most of the tread roughly torn away, and an area of damage near the centre of the seat. Stitches: edge/flesh max. 7mm apart. L. 166 × W. (max.) 80 × W. (waist) 74.7mm. sf240 (Fig. 109)
- 765 Right turnshoe sole with a slightly pointed toe, broad asymmetrical tread, and narrow waist; some damage to the inside joint near the toe. Stitches: edge/flesh max. 6.1mm apart. L. 180 × W. 58 × W. (waist) 34mm. 1003. sf69
- 766 Right turnshoe sole with a pointed toe, broad, slightly asymmetrical tread and narrow waist. Stitches: edge/flesh max. 7.5mm apart with occasional grain/flesh stitch holes on the outside joint. L. 230 × W. 82 × W. (waist) 44.2mm. sf95
- 767 Right turnshoe sole with a rounded toe, asymmetrical tread and a narrow waist; part of the stitching on the outside joint of the seat is torn away; wear hole in the tread. Stitches: edge/flesh max. 6.1mm apart. L. 221 × W. 83 × W. (waist) 49mm. 903. sf70a (Fig. 110)
- 768 Right turnshoe sole with a slightly pointed toe, broad asymmetrical tread, and narrow waist, a rectangular piece torn out of the tread and inside joint. Leather: cattle. Stitches: edge/flesh max. 7.3mm apart. L. 229 × W. 91 × W. (waist) 51mm. sf4 (Fig. 110)
- 769 Left turnshoe sole with a pointed toe, and a narrow, markedly asymmetrical tread and narrow waist. Stitches: edge/flesh max. 8mm apart. L. 247 × W. 84 × W. (waist) 44.4mm. sf94 (Fig. 110)
- 770 Right turnshoe sole with a slightly pointed toe, broad asymmetrical tread, and narrow waist; some damage to the inner joint near the toe. Stitches: edge/flesh max. 5.2mm apart. L. 209 × W. (max.) 91 × W. (waist) 31mm. sf3 (Fig. 110)
- 771 Turnshoe sole; seat only, broken across the waist with the stitch holes broken away at the rear of the seat, and cut marks on the inner, flesh, side. Stitches: edge/flesh max. 7.6mm apart. L. 75 × W. (max.) 45 × W. (waist) 36mm. sf105
- 772 Right turnshoe sole broken across the narrow waist, the seat lost; broad tread; damaged toe and stitch holes along the inside and outside joints. Stitches: edge/flesh max. 6.7mm apart. L. 159 × W. (max.) 77 × W. (waist) 38mm. sf103
- 773 Right turnshoe sole with a pointed toe, broad tread and narrow waist, the rear part of the seat and part of the inner joint broken away. Stitches: edge/flesh, max. 9.5mm apart except at the toe where there is grain/flesh stitching. L. 213 × W. (max.) 92 × W. (waist) 58mm. sf128
- 774 Left turnshoe sole; seat only, broken just forward of the narrow waist. Leather: cattle. Stitches: edge/flesh max. 6.3mm apart. L. 115 × W. (max.) 57 × W. (waist) 30mm. sf129 (Fig. 110)
- 775 Turnshoe sole with a narrow waist, roughly broken across the tread and seat, with one joint also torn away. Stitches: edge/flesh max. 6.9mm apart. L. 95 × W. 67mm. sf97 (Fig. 110)
- 776 Left turnshoe sole with a narrow waist and broad, roughly broken, tread; part of the inside seat is lost, and both joints are damaged. Stitches: edge/flesh max. 8.7mm apart. L. 193 × W. 83 × W. (waist) 44mm. sf42
- 777 Right turnshoe sole roughly broken across the tread and waist so that the seat and toe are lost. Stitches: edge/flesh max. 5.6mm apart. L. 109 × W. 83 × W. (waist) 44mm. sf43
- 778 Right turnshoe sole with a narrow waist, roughly torn across the rear of the seat and across the tread; the outside joint is largely torn away. Stitches: edge/flesh max. 8.3mm apart. L. 147 × W. 55 × W. (waist, incomplete) 40mm. 903. sf70b
- 779 Turnshoe sole with a rough tear involving the loss of the forepart of the tread; the rear of the seat roughly torn away. Stitches: edge/flesh max. 9mm apart. L. 173 × W. (max.) 81.3 × W. (waist) 42.5mm. sf218 (Fig. 110)
- 780 Left turnshoe sole with a pointed toe, markedly asymmetrical tread, and narrow waist; much of the inner joint of the tread and the rear of the seat torn away. Stitches: edge/flesh max. 6mm apart. L. 203 × W. (max.) 79 × W. (waist) 38.7mm. sf229 (Fig. 110)
- 781 Right turnshoe sole, roughly broken across the tread; part of the inner joint of the seat roughly torn away. Stitches: edge/flesh stitches max. 9mm apart. L. 190 × W. (max.) 70 × W. (waist) 53mm. sf248
- 782 Turnshoe sole; only part of the waist survives roughly broken towards the front and rear.

- Leather: cattle. Stitches: edge/flesh max. 6.5mm apart. L. (max.) 80 × W. 60mm. sf301
- 783 Turnshoe sole; only part of the narrow waist survives, roughly torn towards the tread and seat; a row of blind stitch holes across the waist, and edge/flesh stitch holes. Stitches: blind max. 13mm apart; edge/flesh max. 8mm apart. L. 56.5 × W. 64mm. sf205
- 784 Left turnshoe sole, with a rounded toe, slightly asymmetrical tread, narrowing to the waist; the seat is lost. Stitches: edge/flesh max. 5.8mm apart. L. 179 × W. (max.) 92 × W. (waist) 65mm. sf67a
- 785 Turnshoe sole; seat only, roughly broken across the waist. Leather: cattle. Stitch holes: edge/flesh max. 6.1mm apart. L. 100 × W. 51 × W. (waist) 36mm. sf2
- 786 Right turnshoe sole with slightly pointed asymmetrical tread, narrowing to the waist which is cut square and has edge/flesh stitch holes. Stitches: edge/flesh stitch holes max. 7.5mm apart. L. 140 × W. (max.) 70.8 × W. (waist) 43.8mm. sf201 (Fig. 110)
- 787 Turnshoe sole roughly torn across the waist so that only the seat survives; the joints are partially detached, and in the rear of the seat there is a thong looped through a tear and knotted. Stitch holes: edge/flesh max. 8.5mm apart. L. 100 × W. 84mm. sf212
- 788 Turnshoe sole; only part of the joint of the seat survives. Stitches: edge/flesh max. 7mm apart. L. 126 × W. (max.) 100mm. sf242
- 789 Turnshoe sole; only part of the outer joint and rear of the seat survives, the rest is roughly broken away. Stitch holes: grain/flesh max. 9.4mm apart. L. 78.3 × W. 36.1mm. sf266
- 790 Turnshoe sole; only part of the left-hand and rear joint of the seat survives. Stitch holes: edge/flesh max. 9.8mm apart. L. (max.) 83 × W. 26mm. sf300
- 791 Turnshoe sole; only part of the left-hand joint of the seat survives, with other edges roughly broken. Leather: sheepskin(?). Stitch holes: edge/flesh max. 4.6mm apart. L. (max.) 108 × W. 38mm. sf295
- 792 Turnshoe sole, seat only, cut square at the waist. Leather: cattle (?). Stitch holes: edge/flesh max. 6.1mm apart. L. 92 × W. (max.) 70.2 × W. (waist) 53.8mm. sf239
- 793 Turnshoe sole; incomplete seat. Leather: cattle. Stitch holes: edge/flesh max. 6.9mm apart. L. 75 × W. 25mm. sf8p
- 794 Turnshoe sole, seat only, broken across the waist and partially worn through, with grain/flesh thong or stitch holes running parallel to the joints, with a row partially surviving across the waist. Stitches: edge/flesh max. 6mm apart, grain/flesh max. 14.3mm apart. L. 90 × W. 71 × W. (waist) 69mm. sf81
- 795 Turnshoe sole fragment; only part of the tread survives. The toe has been roughly torn away, and there is a square cut across the rear of the tread. The right-hand joint is lost. Stitches: edge/flesh max. 7.5mm apart. L. 111 × W. 97mm. sf217
- 796 Turnshoe sole; only part of the waist and the right-hand joint survives; the remaining edges are roughly broken. Stitches: edge/flesh max. 8.9mm apart. L. (max.) 112 × W. 77mm. sf290
- 797 Turnshoe sole; only the rear part of the tread survives, roughly broken to the front and rear. On the grain side there are blind stitch holes max. 9.5mm apart possibly for a separately applied piece covering the seat and part of the tread. Stitches: edge/flesh max. 7.5mm apart. L. (max.) 135 × W. 104mm. sf306
- 798 Turnshoe sole; only part of the right-hand joint survives. Stitches: grain/flesh max. 8.9mm apart. L. (max.) 74 × W. 61.5mm. sf307
- 799 Turnshoe sole; only the toe survives. Stitches: edge/flesh max. 6.3mm apart. L. 80 × W. 45mm. sf234
- 800 Left (?) turnshoe sole with a pointed toe, roughly broken across the tread; a row of blind stitch holes max. 11mm apart on the grain side running roughly parallel to the edges. Stitches: edge/flesh max. 4.5mm apart. L. 115 × W. 102mm. sf270
- 801 Turnshoe sole; only the rounded toe and part of the tread survive. Stitches: edge/flesh max. 5.1mm apart. L. 73 × W. 100mm. sf8m
- 802 Right turnshoe sole; only the slightly pointed toe and part of the tread survive. Edge/flesh stitch holes max. 7mm apart with a semicircle of grain/flesh thong or stitch holes max. 12.5mm apart near the outside joint. L. 63 × W. 74mm. sf8n
- 803 Left (?) turnshoe sole fragment with thong or stitch holes, a maximum of 12mm apart, running parallel to the outside joint and curving round short of the pointed toe. Stitches: edge/flesh max. 5.3mm apart. L. 98 × W. 57mm. sf8o
- 804 Left turnshoe sole with a slightly pointed toe, roughly broken across the tread. Stitches: edge/flesh max. 6.6mm apart. L. (max.) 106 × W. 99mm. sf291
- 805 Right turnshoe sole with a slightly pointed toe, roughly broken across the tread; a row of blind stitch holes max. 13mm apart on the grain side running parallel to the joints. Stitches: edge/flesh max. 7.3mm apart. L. (max.) 131 × W. 85mm. sf292
- 806 Left (?) turnshoe sole fragment. Stitches: edge/flesh max. 7mm apart. L. (max.) 119 × W. 107mm. sf293
- 807 Turnshoe sole fragment. Stitches: edge/flesh max. 6.3mm apart. L. 215 × W. (waist) 75mm. sf225
- 808 Turnshoe sole; either the seat or toe. Leather: cattle (?). Stitches: edge/flesh stitching or thonging too damaged for measurement. L. 110 × W. 85mm. sf8b
- 809 Turnshoe sole; fragment cut from the joint. Stitches: edge/flesh max. 7.2mm apart. L. 85 × W. 89mm. 903. sf70c
- 810 Separate turnshoe seat cut square at the waist, without stitch holes. L. 74 × W. (max.) 50 × W. (waist) 42mm. sf104

- 811 Separate turnshoe seat, the waist cut square and with stitch holes. Stitch holes: grain/flesh max. 13.1mm apart. L. 70.7 × W. 69.2mm. sf202 (Fig. 111)
- 812 Separate turnshoe seat with some damage to the left-hand joint. Stitch holes: blind max. 12.6mm apart. L. (max.) 92 × W. 64mm. sf304 (Fig. 111)
- 813 Separate turnshoe seat or strengthening for the toe. Stitch holes: grain/flesh max. 13.8mm apart. L. 98 × W. 71mm. sf230 (Fig. 111)
- 814 Turnshoe rand fragment, the inner edge cut obliquely to produce a sub-triangular section with stitch holes along it. Stitch holes: edge/flesh max. 7.5mm apart. L. (max.) 170 × W. 9mm. sf296
- 815 Right turnshoe ankle boot upper made in one piece with an oblique butt seam on the inside quarter; heavy damage to the vamp wing side of this seam and to the lasting margins, particularly around the outside quarter; two loops for thonging, one on the outside quarter, and one on the inside quarter near the butt seam. Leather: cattle. Stitch holes: edge/flesh 5.8mm apart. L. 340 × W. 180mm. sf106 (Fig. 112)
- 816 Right one-piece ankle boot upper joined by a sloping butt seam on the inside. To the outer side of the opening to the front are two parallel rows of thonging holes, a single thong surviving in situ. There are two detached knotted thongs. Leather: sheepskin. Stitches: lasting margin grain/flesh 7mm apart otherwise edge/flesh max. 3mm apart. L. 300 × W. 150mm. sf130 (Fig. 112)
- 817 Right turnshoe upper made in one piece with a seam on the inside, sloping back slightly towards the top margin in which there are stitch holes. A deep cut curves down from the centre of the throat with stitch holes on both edges. The lasting margin on the rounded toe and both joints is heavily damaged. Leather: cattle. Stitch holes: edge/flesh max. 4mm apart. L. 260 × W. 125mm. sf100 (Fig. 112)
- 818 Turnshoe upper originally made in one piece; torn at each end with part of one quarter, the vamp wing and vamp surviving. Leather: cattle. Stitch holes: edge/flesh max. 7.7mm apart. L. 280 × W. 84mm. sf66 (Fig. 112)
- 819 Right turnshoe upper made in one piece, with a triangular insert at the butt seam. Leather: sheepskin. Stitch holes: grain/flesh 8mm apart. L. 377 × W. 195mm. sf119 (Fig. 113)
- 820 Right turnshoe ankle boot upper made in one piece, with an oblique butt seam on the inside. There are thong holes but no thong in place to the right of the heel, and further thong holes just to the right of the butt seam. Leather: cattle. Stitches: lasting margin, grain/flesh max. 5mm apart; otherwise edge/flesh 3.5mm apart. L. 374 × W. 76mm. sf (unnumbered). (Fig. 113)
- 821 Right (?) turnshoe vamp with a rounded toe, and vertical outside seam with the quarters; the inside seam with part of the curved throat is torn away. There are stitch holes for a narrow rectangular patch with one of the long edges abutting the lasting margin on the inside vamp wing. Leather: cattle. Stitches: lasting margin, grain/flesh max. 5.1mm apart; otherwise edge/flesh max. 5.1mm apart. L. 165 × W. 169mm. sf99 (Fig. 113)
- 822 Turnshoe vamp with a rounded toe, one wing and part of the throat lost, with stitch holes on the remaining part of the throat. The surviving wing has a straight seam with the quarter, but is heavily damaged as is the adjoining lasting margin. Leather: cattle. Stitches: lasting margin, grain/flesh max. 5mm apart; otherwise edge/flesh max. 5mm apart. L. 172 × W. 125mm. sf8f (Fig. 113)
- 823 Turnshoe quarters with a horizontal top margin on which a few stitch holes survive; seams with the vamp wings have been roughly torn away. There is a deep, narrow, triangular indentation in the lasting margin into which fitted the pointed rear of the seat to one side of which are two slits to accommodate thonging. Leather: cattle (?). Stitch holes: lasting margin, grain/flesh max. 5.9mm apart; otherwise edge/flesh 5.9mm apart. L. 225 × W. 118mm. sf79 (Fig. 114)
- 824 Turnshoe quarters extensively torn and broken, the top margin horizontal, with stitch holes and pairs of vertical slots to accommodate a thong running parallel to and just below it, the thong partially surviving. The surviving seam with the vamp is vertical but the opposing seam is torn away. There is a prominent triangular notch on the lasting margin to accommodate the pointed rear of the seat. Leather: cattle. Stitch holes: edge/flesh max. 5mm apart. L. 250 × W. 89mm. 1004. sf32 (Fig. 114)
- 825 Turnshoe quarters, with the top margin approximately horizontal and an oblique seam on the inside with the vamp, running forwards towards the top margin. On the outside any seam with the vamp is lost, but the upper forepart of the quarter has a triangular extension to fold over the instep, to which are attached the remnants of a thong which at the upper end engaged with two pairs of slits placed low down to the rear of the inside quarter. In the heel of the quarters is a triangular notch to accommodate the triangular seat of the sole. Leather: cattle. Stitch holes: grain/flesh max. 8.4mm apart. L. 282 × W. 135mm. sf131 (Fig. 114)
- 826 Right (?) turnshoe quarters, the top margin irregularly cut. Each of the seams with the vamp wings is stepped back towards the lasting margin. Leather: sheepskin. Stitch holes: lasting margin, grain/flesh max. 7.1mm apart; otherwise edge/flesh max. 2.7mm apart. L. 252 × W. 122mm. sf102 (Fig. 115)
- 827 Left turnshoe quarters, the horizontal top margin with stitch holes, and the butt joints straight, the stitch holes at the lasting margin largely torn away. On the inside, just behind the seam, an oblique cut runs back towards the heel from the top margin, originally sewn. Leather:

- sheepskin. Stitch holes: edge/flesh max. 5mm apart. L. 320 × W. 110mm. sf107 (*Fig. 115*)
- 828 Turnshoe quarter. The top margin slopes to the right towards the square seam with the vamp wing and parallel to it are nine perforations, each surrounded by an impressed ring. To the left the quarter is roughly cut away. Leather: cattle. Stitches: lasting margin grain/flesh max. 4.5mm apart. L. 317 × W. 110mm. sf8a (*Fig. 115*)
- 829 Turnshoe quarters made in one piece, the top margin horizontal, the right-hand seam with the vamp wing stepped back towards the lasting margin; the left-hand seam with the vamp wing is square. Part of the lasting margin and the lower part of the right-hand seam with the vamp wing are roughly torn away. Leather: sheepskin (?). Stitches: edge/flesh max. 5.7mm apart. L. (max.) 243 × W. 115mm. sf305 (*Fig. 115*)
- 830 Turnshoe quarter (?) with horizontal top margin sloping down towards the top of the seam with the vamp wing which is heavily damaged, as is the lasting margin. The upper half of the backseam is thonged together, and the lower half stitched. A narrow triangular tongue projects from the base of the backseam. On the flesh side are the stitch holes for a triangular strengthening piece with its base on the lasting margin. Leather: cattle. Stitch holes: lasting margin, grain/flesh max. 5.6mm apart; otherwise edge/flesh 5.6mm apart. Stitch holes max. 5.6mm apart. L. 159 × W. 137mm. sf101 (*Fig. 116*)
- 831 Turnshoe quarter with the top margin, along which is a row of stitch holes, sloping down towards the square seam with the vamp wing. The lower part of the backseam survives, but the upper part is roughly broken away. Leather: sheepskin (?). Stitches: lasting margin, grain/flesh max. 7mm apart; otherwise edge/flesh max. 4.5mm apart. L. (max.) 166 × W. 95mm. sf309 (*Fig. 116*)
- 832 Turnshoe quarter. The top margin has stitch holes and is approximately horizontal before sloping in a concave curve towards the seam with the vamp. This is stepped back towards the lasting margin. The backseam is irregular, and still attached to it by a single thong is a small triangular insert at the heel. There is a point of attachment for thonging near the lower end of the top edge. Leather: cattle. Stitches: lasting margin, grain/flesh max. 6.7mm apart; otherwise edge/flesh max. 3.6mm apart. L. 265 × W. 130mm. sf108
- 833 Left turnshoe quarter with an horizontal oversewn top edge and vertical backseam. The butt seam with the vamp wing is stepped back. Leather: cattle. Stitches: lasting margin, grain/flesh max. 7mm apart. L. 135 × W. 101mm. sf256 (*Fig. 116*)
- 834 Turnshoe quarter with only part of the seam with the vamp wing and lasting margin surviving. The seam is straight but breaks back obliquely towards the lower end. Leather: cattle. Stitches: edge/flesh max. 4.7mm apart. L. 134 × W. 82mm. sf245
- 835 Turnshoe boot quarter, the top margin horizontal, with stitch holes, and the seam and area adjoining the vamp cut away. There is a vertical backseam with two oblique slits for thonging near the ankle, the lower one of which has been torn down to the lasting margin. Another long oblique tear runs down from the top of the backseam. Leather: cattle. Stitch holes: grain/flesh max. 4.6mm apart. L. 209 × W. 198mm. sf110
- 836 Turnshoe quarter with horizontal top margin sloping towards the vertical seam with the vamp wing. The backseam is largely destroyed, but survives towards the lower end where it curves gently into the lasting margin to allow the pointed seat of the sole to be inserted. A long oblique cut runs down from the horizontal part of the upper edge near the backseam. Leather: sheepskin. Stitch holes: grain/flesh max. 6mm apart. L. 207 × W. 148mm. sf120 (*Fig. 116*)
- 837 Turnshoe quarter with the top margin approximately horizontal, with stitch holes. The seam abutting the vamp wing has a row of lace holes; the lasting margin is damaged, and the remaining edge roughly torn. Leather: cattle. Stitch holes: lasting margin, grain/flesh; otherwise edge/flesh max. 5mm apart. L. 115 × W. 64mm. sf8e (*Fig. 116*)
- 838 Turnshoe quarter; only part of the lasting margin and the seam with the vamp wing survive, the other edges roughly broken. Leather: cattle. Stitch holes: grain/flesh max. 4.5mm apart. L. 105 × W. 53mm. sf8h (*Fig. 116*)
- 839 Turnshoe quarter with horizontal top margin sloping towards the seam with the vamp wing which, with the lasting margin and lower part of the quarter, is torn away, the tear curving up towards the rear of the top margin. There are stitch holes on the horizontal part of the top margin which is also paralleled by three incised lines. Pairs of slits accommodating a thong run parallel to the unstitched sloping part. Leather: cattle. Stitches: grain/flesh stitch holes max. 8.7mm apart. L. 196 × W. 80mm. 1105. sf64 (*Fig. 116*)
- 840 Turnshoe quarter (?) with a horizontal top margin with stitch holes. In this is a deep cut with stitch holes on either side and a thong fixed in position on the left edge. There is another thong below the top margin to the right. The seam with the vamp wing slopes forwards towards the lasting margin before dropping almost vertically. An oblique tear links the rear of the top margin with the lasting margin near the seam with the vamp wing, and has involved the loss of any backseam. Leather: cattle. Stitches: edge/flesh max. 5.4mm apart. L. 245 × W. 115mm. 604. sf67b
- 841 Turnshoe quarter with horizontal top margin; the butt seam with the vamp wing is square. Leather: cattle. Stitches: edge/flesh max. 3.25mm apart. L. 14.8 × W. 61mm. sf279
- 842 Turnshoe quarter with a row of stitch holes along the horizontal top margin. The lower part of the

- seam with the vamp wing is stepped back, the stitch holes only partially surviving. The lasting margin is torn away, and an oblique, irregular tear from near the foot of the seam with the vamp wing to the top margin has involved the loss of any backseam. Stitches: grain/flesh max. 4.8mm apart. L. 128 × W. 110mm. sf262
- 843 Turnshoe upper fragment; either a vamp wing or quarter. There are stitch holes on the horizontal top margin, on the vertical joint between the vamp wing and the quarter, and on the lasting margin, the remaining edge being roughly broken. Leather: cattle (?). Stitches: edge/flesh max. 4.9mm apart. L. 73 × W. 67.3mm. sf209
- 844 Turnshoe upper fragment, the edges irregularly torn or cut except on the lasting margin. Leather: sheepskin. Stitches: grain/flesh max. 9.3mm apart. L. 90.3 × W. 46.6mm. sf220
- 845 Turnshoe upper fragment, sub-triangular with part of the curved lasting margin surviving; the remaining edges are roughly torn. Leather: cattle. Stitches: grain/flesh max. 8.7mm apart. L. 92.1 × W. 43.4mm. sf232
- 846 Turnshoe upper fragment, the edges irregularly cut or torn, except the lasting margin where the stitch holes survive. Leather: cattle. Stitches: grain/flesh max. 8.7mm apart. L. 103 × W. 75mm. sf233
- 847 Turnshoe upper fragment, rhomboidal, with two of the edges roughly torn and stitch holes along the remaining edges. Leather: cattle. Stitches: grain/flesh and edge/flesh max. 5mm apart. L. 135 × W. 61mm. sf235
- 848 Turnshoe upper fragment (?), possibly part of a vamp wing or quarter, approximately rectangular with stitch holes along the top margin, and along the left-hand and lower edges. Leather: cattle. Stitches: top margin, edge/flesh max 7.5mm apart; otherwise grain/flesh stitch holes max. 10.6mm apart. L. (max.) 112 × W. 76mm. sf298
- 849 Lasting margin fragment, sub-rectangular, with stitch holes along one of the edges. Stitches: grain/flesh max. 8.2mm apart. L. 41 × W. 21mm. sf252
- 850 Strap roughly broken at each end, with a row of stitch holes parallel to each edge. Leather: cattle. Stitches: grain/flesh max. 4.2mm apart. L. 460 × W. 16mm. sf113 (Fig. 117)
- 851 Strap cut square at one end and roughly broken at the other, an incised line running parallel to each edge. Leather: sheepskin. L. 205 × W. 25mm. sf114 (Fig. 117)
- 852 Strap fragment, roughly broken at either end. Parallel to each edge are two closely spaced rows of stitch holes 3mm apart. Stitches: grain/flesh max. 2mm apart. L. (max.) 151 × W. 17mm. sf310 (Fig. 117)
- 853 Strap fragment, roughly broken at the ends with stitch holes along the upper edge. On the grain side there is a broad, dark stripe along the long axis, possibly the remains of colouring. Leather: cattle. Stitches: edge/flesh max. 7mm apart. L. (max.) 126 × W. 22mm. sf299 (Fig. 117)
- 854 Strap fragment, roughly broken at the ends, with stitch holes along one edge. On the horizontal axis near one end is a series of irregular perforations. Leather: cattle. Stitches: edge/flesh max. 7.7mm apart. L. 240 × W. 25mm. sf274 (Fig. 117)
- 855 Strap cut off square at one end and roughly broken at the other, with a row of slits running parallel to each of the long edges. Leather: sheepskin. Slits: grain/flesh max. 14mm apart. L. 140 × W. 36mm. sf271 (Fig. 117)
- 856 Strap consisting of a strip of leather folded in half lengthwise and stitched along the open edge. Leather: sheepskin. Stitches: grain/flesh max. 5mm apart. L. 137 × W. 14mm. sf267 (Fig. 117)
- 857 Strap consisting of a strip of leather folded lengthwise and stitched along the open edge. Stitches: grain/flesh max. 4.5mm apart. L. 515 × W. 11mm. sf219 (Fig. 117)
- 858 Strap consisting of two pieces, one on top of the other, folded in half and thonged together along one edge, and across the end. On the other edge the outer piece of leather has a cut and finished edge, but the inner piece is roughly broken. Leather: cattle. L. 45 × W. 34mm. sf93 (Fig. 117)
- 859 Strap fragment, cut square at one end and roughly broken at the other, made from a strip of leather folded in half lengthwise and with the open edge stitched, three parallel rows of thonging holes along the front face. Leather: sheepskin. Stitches: grain/flesh max. 5mm apart. L. 160 × W. 29.6mm. sf115 (Fig. 117)
- 860 Strap fragment composed of a strip folded in half lengthwise and stitched along the open edge and on one of the ends, the other end roughly torn. Stitches: grain/flesh max. 7.7mm apart. L. 132 × 50mm. sf269
- 861 Strap fragment cut at both ends, made from a narrow strip of leather folded in half lengthwise and stitched along the open edge. Stitches: grain/flesh max. 4mm apart. L. 46.1 × W. 9mm. 604. sf67c
- 862 Sleeve (?), rectangular with edge/flesh stitches along the upper and grain/flesh stitches along the lower edge, roughly broken to the left. The right-hand edge is also roughly torn, but at the corner with the lower edge is a concave shaping with grain/flesh stitch holes. Above this two rows of grain/flesh stitch holes emerge from the torn right-hand edge and converge; a single row of stitch holes returns at right-angles towards the lower edge. Leather: sheepskin. Stitches: edge/flesh max. 3mm apart, grain/flesh max. 6.3mm apart. L. 366 × W. 278mm. sf111 (Fig. 118)
- 863 Unidentified object, roughly rectangular with edge/flesh stitches along one edge and on either side of a deep cut developing from the edge. The remaining edges are either torn or cut. There is an oblique row of thong holes near the centre of the fragment. Stitches: edge/flesh max. 4.9mm apart. Leather: sheepskin. L. 242 × W. 163mm. sf241

- 864 Unidentified object, an undulating strip cut off square at either end, and with stitch holes along each long edge. There is a horizontal cut with stitch holes parallel to each long edge near the right-hand end. Leather: cattle. Stitches: grain/flesh 15mm apart. L. 240 × W. 58mm. sf121
- 865 Unidentified object, triangular with stitch holes on the edges. Leather: sheepskin (?). Stitches: grain/flesh max. 5.8mm apart. L. (max.) 140 × W. 40mm. sf308
- 866 Unidentified object, turnshoe seat joint (?), sub-triangular with stitch holes along one edge. Stitches: edge/flesh max. 7.6mm apart. L. (max.) 62.6 × W. 29.5mm. sf311
- 867 Unidentified object, triangular with concave edges, a row of stitch holes along each edge. Leather: sheepskin (?). Stitches: grain/flesh max. 8.1mm apart. L. (max.) 120 × W. 110mm. sf312 (*Fig. 117*)
- 868 Unidentified object, irregularly shaped, long and narrow and cut off square at either end with stitch holes along the edges. Leather: sheepskin (?). Stitches: grain/flesh max. 7.5mm apart. L. (max.) 106 × W. 23mm. sf302
- 869 Unidentified object, sub-rectangular with stitch holes along each edge. Leather: cattle. Stitches: edge/flesh max. 5mm apart. L. (max.) 106 × W. 80mm. sf297
- 870 Unidentified object tapering to a point and cut off square at the broad end, with several irregular rows of stitch holes along the long axis. Stitches: grain/flesh max. 1mm apart. L. 151 × W. 32mm. sf286 (*Fig. 117*)
- 871 Unidentified object, sub-triangular with a row of stitch holes along one edge. Leather: sheepskin (?). Stitches: grain/flesh max. 4.3mm apart. L. 28 × W. 17mm. sf117a (*Fig. 117*)
- 872 Unidentified object, irregular, with the edges roughly torn except for a short row of stitch holes on one edge. Leather: sheepskin. Stitches: grain/flesh max. 2.5mm apart. L. 297 × W. 143mm. 604. sf71
- 873 Unidentified object, sub-rectangular, expanding marginally towards a slightly convex end on which there are stitch holes. The other end is roughly broken away, and at the median point on the broken edge is a pair of slits to take a thong which, on the flesh side, partially survives. Leather: cattle (?). Stitches: edge/flesh max. 3.8mm apart. L. 69 × W. 48.8mm. sf92
- 874 Unidentified object, irregular with the remains of stitching on one edge. Leather: sheepskin (?). Stitches: grain/flesh max. 7.3mm apart. L. 290 × W. 95mm. sf246
- 875 Unidentified object, approximately trapezoidal with the upper left- and lower right-hand corners cut off, with all but the right-hand edge having stitch holes. Two rows of large circular holes run parallel to the right-hand edge, max. 18.9mm apart. Leather: cattle (?). Stitches: edge/flesh max. 4mm apart. L. 128 × W. 74mm. sf288
- 876 Unidentified object, sub-rectangular, with stitch holes along each of the edges. Two rows of large perforations run parallel to the longer edge. Stitches: one edge grain/flesh max. 3mm apart; otherwise edge/flesh max. 3.2mm apart. Perforations: max. 13mm apart. L. 74 × W. 55mm. sf263
- 877 Unidentified object, sub-rectangular with stitch holes along each edge. Leather: cattle. Stitches: edge/flesh max. 4.8mm apart. L. 110 × W. 68mm. sf268
- 878 Unidentified object, irregular, with stitch holes along one edge. Leather: sheepskin (?). Stitches: edge/flesh max. 3.6mm apart. L. 129 × 48mm. sf273
- 879 Unidentified object expanding towards the square end, and roughly broken at the narrow end near which is a row of thong holes placed roughly along the long axis, max. 10mm apart. L. 72 × W. 60mm. sf278
- 880 Unidentified object of irregular shape with the upper and left-hand edges cut square, the lower edge roughly torn, the right-hand edge shaped, with a rounded projection, and the upper and left-hand edges paralleled on the flesh side by a row of stitch holes. Stitches: blind, max. 9mm apart. L. 130 × W. 83mm. sf281
- 881 Unidentified object approximately trapezoidal with blind stitch holes parallel to all but the longest edge on the grain side. Leather: cattle. Stitches: blind, max. 11mm apart. L. 110 × W. 54mm. sf282
- 882 Unidentified object, a narrow strip, pointed at each end and with stitch holes along the edges. Leather: cattle. Stitches: grain/flesh, max. 6.5mm apart. L. 280 × W. 30.2mm. sf237
- 883 Unidentified object, the upper edge straight with stitch holes, the lower edge irregularly cut, and the narrow ends roughly torn. Stitches: edge/flesh max. 5.6mm apart. L. 240 × W. 52mm. sf280 (*Fig. 117*)
- 884 Disc with a central perforation; delaminated. Leather: cattle. D. 37mm. sf123
- 885 Pointed ovoid, partly delaminated, with a series of longitudinal cuts and a perforation near each end. Leather: cattle. L. 102 × W. 33mm. sf117 (*Fig. 117*)
- 886 Narrow pointed oval with a row of stitch holes around the edge. Leather: cattle. Stitches: edge/flesh on one edge, grain/flesh stitches on the other, max. 7.2mm apart. L. 132 × W. 34mm. sf146 (*Fig. 117*)
- 887 Thong tapering to a point perforated at the broad end, the broad end of a second thong, also tapering to a point, passing through the perforation. The end of this second thong then loops back through a perforation in its own body and is pulled tight. L. 1100 × W. 18mm. sf41
- 888 Thong, knotted close to each end to another shorter thong. Leather: cattle. L. 260 × W. 21mm. sf8g (*Fig. 117*)
- 889 Two tapering thongs of equal length knotted together near their pointed ends, and again two-thirds of the way along their length. Leather: cattle. L. 300 × W. 18mm. sf50 (*Fig. 117*)
- 890 Thong, knotted near one end. Leather: cattle (?). L. (max.) 240 × W. 7mm. sf303

- 891 Offcut, without stitch holes. Leather: goat. L. 164 × W. 137mm. sf109
- 892 Offcut without stitch holes. Leather: cattle. L. 475 × W. 116mm. sf122
- 893 Offcut without stitch holes. Leather: cattle (udder). L. 220 × W. 49mm. sf116
- 894 Offcut; sub-rectangular, without stitch holes. Leather: cattle. L. 260 × W. 146mm. sf112
- 895 Offcut; irregular, without stitch holes. Leather: cattle (udder). L. 168 × W. 71mm. sf8c
- 896 Offcut; sub-rectangular, without stitch holes. Leather: cattle (udder). L. 105 × W. 51mm. sf8d
- 897 Offcut, strap-like, cut square at one end and on one of the edges, but the other edge is only roughly trimmed; the remaining end is roughly broken. Leather: cattle. L. 125 × W. 17mm. sf81
- 898 Offcut without stitch holes. Leather: cattle. L. 144 × W. 100mm. 1003. sf65
- 899 Offcut. Leather: cattle (udder). L. 95 × W. 65mm. sf23
- 900 Offcut, long and narrow, cut square at one end and tapering to the other. Leather: goat (?). L. 270 × W. 35.4mm. sf203
- 901 Offcut, irregular. Leather: cattle. L. 206 × W. 60.1mm. sf204
- 902 Offcut, sub-triangular. Leather: cattle. L. 79.7 × W. 50.1mm. sf206
- 903 Offcut, irregular with cut marks. Leather: cattle. L. 117 × W. 65.3mm. sf207
- 904 Offcut, sub-triangular. Leather: cattle. L. 110.6 × W. 61.7mm. sf208
- 905 Offcut, sub-rectangular. Leather: sheepskin. L. 78.5 × W. 65.5mm. sf213
- 906 Offcut, irregular. Leather: cattle (udder). L. 160 × W. 79.8mm. sf214
- 907 Offcut, long, narrow and irregular. L. 540 × W. 32mm. sf215
- 908 Offcut. L. 62.3 × W. 39.5mm. sf224
- 909 Offcut; sub-triangular, roughly torn along two edges and cut square along the third. Leather: cattle. L. 177 × W. 125mm. sf226
- 910 Offcut, partially trimmed and partially torn. Leather: sheepskin. L. 100 × W. 95mm. sf228
- 911 Offcut, sub-rectangular. Leather: sheepskin. L. 120 × W. 62mm. sf231
- 912 Offcuts (33), one with incised laying-out lines. Leather: cattle. L. (largest) 195 × W. 43mm. sf91
- 913 Offcuts (3). Leather: cattle. L. (largest) 184 × W. 9mm. sf211
- 914 Offcuts (5). Leather: cattle. L. (largest) 168 × W. 25mm. sf216
- 915 Offcuts (8). Leather: cattle. L. (largest) 117 × W. 71mm. sf221
- 916 Offcuts (3), one with a number of random awl holes. Leather: cattle. L. (largest) 150 × W. 73mm. sf243
- 917 Offcuts (7). Leather: cattle. L. (largest) 215 × W. 39mm. sf250
- 918 Offcuts (5). Leather: cattle. L. (largest) 227 × W. 28mm. sf254
- 919 Offcuts (14). Leather: cattle (8). L. (largest) 282 × W. 21mm. sf255 and 258
- 920 Offcuts (8). Leather: cattle (7). L. (largest) 580 × W. 21mm. sf260
- 921 Offcuts (9). Leather: cattle (3). L. (largest) 690 × W. 58mm. sf275
- 922 Offcuts (6). Leather: cattle. L. (largest) 415 × W. 17mm. sf276
- 923 Offcuts (9). Leather: cattle (7). L. (largest) 212 × W. 110mm. sf277 and 283
- 924 Offcut. Leather: cattle. L. 115 × W. 24.6mm. sf70c
- 925 Offcut, cut square at one end and along one of the long edges, but the other long edge is only roughly trimmed and the remaining edge is roughly broken. Leather: cattle. L. 125 × W. 17mm. sf8i
- 926 Offcuts (10) and fragments (4). Leather: cattle (3). L. (largest) 255 × W. 70mm. sf257
- 927 Offcuts and fragments (16). Leather: cattle. L. (largest) 160 × W. 40mm. sf227
- 928 Offcuts and fragments (10). Leather: cattle. L. (largest) 150 × W. 55mm. sf236
- 929 Offcuts and fragments (6). Leather: cattle. L. (largest) 235 × W. 62mm. sf247
- 930 Offcuts and fragments (14). Leather: cattle (8), sheepskin (3). L. (largest) 420 × W. 10mm. sf249
- 931 Offcuts and fragments (14). Leather: cattle (3). L. (largest) 255 × W. 70mm. sf256
- 932 Offcuts and fragments (14). Leather: cattle (1). L. (largest) 260 × W. 51mm. sf259
- 933 Offcuts and fragments (7). Leather: cattle (5), sheepskin (1). L. (largest) 127 × W. 121mm. sf261
- 934 Offcuts and fragments (20). Leather: cattle (5), sheepskin (3). L. (largest) 409 × W. 25mm. sf264
- 935 Offcuts and fragments (17). Leather: cattle (2), sheepskin (2). L. (largest) 395 × W. 73mm. sf272 and 284
- 936 Offcuts and fragments (5). Leather: cattle (1), sheepskin (2). L. (largest) 150 × W. 70mm. sf285
- 937 Fragment, sub-triangular with the long edge roughly torn and the other edges cut square, a row of closely spaced oblique cuts running parallel to one of the cut edges. Leather: cattle. L. (max.) 98 × W. 67mm. sf294
- 938 Fragment, sub-rectangular, without stitch holes. Leather: cattle. L. 107.3 × W. 72.7mm. sf200
- 939 Fragment, irregular. L. 120 × W. 48mm. sf210
- 940 Fragment, badly cut and torn. Leather: cattle (?). L. 390 × W. 165mm. sf244
- 941 Fragment, sub-rectangular with grain/flesh stitch holes along one of the short edges, max. 9.8mm apart. Leather: cattle. L. 146 × W. 73mm. sf253
- 942 Fragment. L. 100 × W. 65mm. sf287
- 943 Fragment. Leather: cattle. L. 280 × W. 183mm. sf289
- 944 Fragments (3). L. (largest) 32.6 × W. 28mm. sf222
- 945 Fragments (4), partially cut and partially torn. Leather: cattle. L. (largest) 119 × W. 28mm. sf223

- 946 Fragments (6). Leather: cattle (3). L. (largest) 350 × W. 81mm. sf251
 947 Fragments (6). L. (largest) 190 × W. 104mm. sf265

Textiles (by P. Walton)

- 948 Offcut (125 × 70mm) of dark brown woollen 2/1 twill with selvage (*Fig. 103b*). Thread count: wa/15/Z/0.5mm × we/S/0.75–1.0mm. sf35
 949 Offcut (370 × 30mm) of a chestnut coloured woollen 2/1 twill; the S-spun threads lie flat and are obscured by the Z-spun threads which weave around them; heavily matted on one side. Thread count: wa?/12/tight Z/0.75mm × we?/4/tight S/2.0mm. sf35
 950 Offcut (140 × 20mm) of mid-brown woollen 2/1 twill, slightly matted on one side. Thread count: wa?/13/v tight Z/0.75mm × we?/9/v tight S/2.0mm. sf35
 951 Offcut (220 × 15mm) of mid-brown woollen 2/1 twill. Thread count: wa?/17/Z/0.5mm × we?/14/S/0.75mm. sf35
 952 Offcut, triangular (140 × 40mm), of mid-brown woollen 2/1 twill. Thread count: wa?/17/Z/0.5mm × we?/15/S/0.6–0.75mm. sf35

- 953 Offcut (85 × 15mm) of mid-brown woollen twill, slightly matted. Thread count: wa?/14/Z/0.5–0.6mm × we?/10/S/0.5–0.75mm. sf35
 954 Torn fragment (55 × 45mm) of mid-brown woollen 2/1 twill. Several double threads in both warp and weft and occasional weaving faults, probably the result of mistakes in the order of lifting the heddles. Thread count: wa?/14/v tight Z/0.75 × we?/7/S/1.0mm. sf35
 955 Strip (offcut 160 × 8mm) of mid-brown woollen tabby (plain weave), heavily matted, probably as deliberate finishing. Thread count: wa?/8/Z/1.0mm × we?/5/S/1.5mm. sf35
 956 Fragment (200 × 90mm) of mid-brown woollen 2/2 diamond twill (*Fig. 103c*). Remains of possible seam down one edge. Thread count: wa?/12–14/Z/0.75mm × we?/10/S/0.75mm. sf75
 957 Scrap (45 × 10mm) of tabby; the fibre is carbonized and unidentifiable. Thread count: 8/Z/0.75mm × 4–5/Z/1.0mm. sf18
 958 Fragment (85 × 75mm) of crêpe weave (*Fig. 103d*) in vegetable bast fibre. The pattern repeats after every twelve threads of warp and weft. Thread count: 18–20/Z/0.5mm × 16/Z/0.5mm. sf11

Finds from Midland Bank, 11–13 Parliament Street

Stone

- 959 Hone of mica-quartz phyllite, rectangular in section, worn on both faces, roughly broken at the lower end, and squared at the upper with a perforation drilled from both sides near the upper end. L. 54.8 × W. 18.2 × Th. 8.1mm. 3. (*Fig. 87*)

Metalwork

- 960 Mood (?), an iron bar of square section, tapering to a blunt point at each end. L. 88.7 × W. 7.5 × Th. 7mm. 105. (*Fig. 89*)
 961 Iron axe head with a narrow, asymmetrically expanding blade with a convex cutting edge, the socket of sub-triangular section with triangular projections from the upper and lower edges. L. 201 × W. (max.) 118 × Th. (max.) 42mm. 11. (*Fig. 90; Pls. VII–IX*)
 962 Iron knife, the point broken away, the blade with a straight back, and a shallow, reversed S-shaped cutting edge, a drooping shoulder at the junction between the blade and the whittle tang. L. 118.2 × W. 14.8mm. 105. (*Fig. 90*)
 963 Iron key, the stem of square section, shouldered at the upper end before developing into a flat, circular extension perforated to form a suspension loop, the circular bit projecting at right-angles to the stem and having a rectangular slot. L. 107.4mm. 11 (*Fig. 91*)
 964 Iron key, the flattened stem tapering towards the upper end where it assumes a circular section before terminating in a circular suspension loop. The bit projects at right-angles to the stem, and

is fundamentally rectangular with a square median notch in three of the edges. L. 101.2mm. 11 (*Fig. 91*)

- 965 Tinned iron prick spur with a pyramidal point on a long stem of circular section, each of the curving arms having a double-lobed terminal. There is an iron rivet through each lobe, and each pair of rivets also passes through a rectangular copper-alloy plate. A leather strap originally passed between these plates and the lobed terminals of the spur. L. 137 × W. 94.4mm. (*Fig. 91*)
 966 Iron clench bolt with a circular head, a shank of square section, and a lozenge-shaped plate. L. 36.2mm. 105. (*Fig. 91*)

Wood

- 967 Turned bowl with a flat base; undecorated. D. 177 × Ht. 52mm. 4. (*Fig. 104*)
 968 Turned bowl with a shallow foot, and a groove encircling the flattened interior base, a second groove encircling the bowl just inside the rim. D. 181 × Ht. 56mm. 4. (*Fig. 104*)
 969 Turned wooden bowl with a flat base. 4. (*Fig. 104*)
 970 Turned wooden bowl with a flat base, the ancient cracks repaired with metal staples. Ht. 132mm. 4. (*Fig. 105*)

Bone

- 971 Rib fragment roughly broken at both ends, with two transverse cut marks near the proximal end. L. 175mm. 11.

- 972 Pin made from a rib, the shank of sub-circular section and a drill mark near the centre of the bulbous head. L. 130.3 × W. 15.3mm. 11. (*Fig. 101*)

Leather

- 973 Sheath for a knife with a long tapering blade and straight back; close to the upper end the sheath is stepped out to the front and rear to accommodate the guard, and it expands towards the throat. The front face of the blade area is decorated with a field having embossed plain frames; near the tip a transverse moulding splits the field into two. The lower one is decorated with a single upward-facing biped with a foliate tail. In the upper field a similar upward-facing quadruped and biped are separated by a symmetrical plant. On the reverse the face is divided into two approximately equal fields with plain frames. Both are filled with single upward-facing bipeds with foliate tails. The upper zone of the scabbard is decorated with a series of interlocking triangular fields each filled with an

animal. In every case the animals on the sheath are embossed with the details picked out by incised lines, and the backgrounds are filled with closely packed punched ring-and-dot. L. 258 × W. 59 × Th. 32mm. 4. (*Fig. 107; Pl. XIV*)

- 974 Leather offcuts (3), without stitch holes. Leather: cattle. L. (longest) 75.4mm. 110.
- 975 Right turnshoe with a pointed toe, the sole heavily damaged along both lasting margins. The upper is made in one piece, with a seam on the inside curving forwards on to the instep before running up vertically, a thong attached to the outside quarter. Along the upper edge of the quarter is a narrow applied band decorated with horizontal grooving, and there is a further zone of grooving running down the instep to the toe. Leather: sheepskin (upper). Edge/flesh stitch holes, max. 3.6mm apart. L. 200 × W. 88mm. 3. (*Fig. 108*)
- 976 Leather fragment, delaminated, rectangular with stitch holes on one long edge, and on both short edges. Leather: sheepskin. Stitch holes edge/flesh max. 1.5mm apart. L. 146 × W. 74mm.

Finds from 34 Shambles

Stone

- 977 Rotary quern fragment of limestone, the upper face dressed flat, the lower face roughly broken away, the edge having a curved profile. L. 118 × W. 78 × Th. 35mm. 1. sf16 (*Fig. 86*)
- 978 Hone of phyllite, incomplete, of square section, rounded at one end, and roughly broken at the other. The faces are natural cleavages, one of which shows signs of wear. L. 132 × W. 28 × Th. 20mm. 3. sf40 (*Fig. 87*)
- 979 Ampulla mould of limestone, one part of the two-piece mould surviving; of semicircular section with a square upper end, expanding towards the rounded lower end. On the front face is the mould for an ampulla decorated with an equal-armed cross above a chalice. On either side of the neck is a circular drilled hole. Ht. 84 × W. 67 × Th. 52mm. sf3 (*Fig. 94; Pl. X*)
- 980 Flint flakes (2). L. (largest) 30 × W. 23 × Th. 6mm. 2. sf21
- 981 Flint flake. L. 22 × W. 14 × Th. 4mm. 1. sf14
- 982 Flint flake with possible secondary working on one edge. L. 32 × W. 25 × Th. 6mm. 6. sf61
- 983 Flint fragment; featureless. L. 57 × W. 41 × Th. 16mm. 7. sf67
- 984 Flint fragments (39); featureless. L. (largest) 56 × W. 31 × Th. 17mm. 4. sf59
- 985 Flint fragment; featureless. L. 73 × W. 57 × Th. 18mm. 3. sf41
- 986 Flint fragments (2); featureless. L. (largest) 46.4 × W. 33 × Th. 13.4mm. 4. sf58
- 987 Flint core. L. 43 × W. 25 × Th. 26mm. 4. sf57

Amber

- 988 Fragment chipped from a larger piece of raw amber. L. 28.3 × W. 12 × Th. 3.3mm. 6. sf63
- 989 Fragment broken from a larger piece. L. 18.3 × W. 11.2 × Th. 4.9mm. 7. sf69

Glass (*Figs. 98–100; Table 9*)

- 990–1097 Globular beads of black glass (108). D. (largest) 10.5 × Ht. 5.5mm. Parts of sf23, 44, 50, 51, 64, and 72
- 1098–1102 Globular beads of yellow translucent glass (5). D. (largest) 8.5 × Ht. 6.0mm. Parts of sf50, 73 and 74
- 1103–9 Globular beads of opaque yellow glass (7). D. (largest) 6.2 × Ht. 5.0mm. Parts of sf50 and 73
- 1110 Globular bead of brown glass. D. 6.2 × Ht. 5.0mm. Part of sf9
- 1111–16 Globular beads of green glass (6). D. (largest) 10.5 × Ht. 5.5mm. Parts of sf60 and 54
- 1117–18 Annular beads of black glass (2). D. (largest) 7.0 × Ht. 3.0mm. Parts of sf24 and 60
- 1119–20 Annular beads of yellow glass (2). D. (largest) 12.2 × Ht. 4.0mm. Part of sf23
- 1121–3 Annular beads of green glass (3). D. (largest) 7.0 × Ht. 3.3mm. Parts of sf50 and 74
- 1124–30 Cylindrical beads of black glass (7). D. (largest) 6.0 × Ht. 6.2mm. Parts of sf23, 24, 51 and 72
- 1131–40 Cylindrical beads of yellow glass (10). D. (largest) 6.3 × Ht. 5.5mm. Parts of sf24, 50, 51, 73 and 74

- 1141 Cylindrical bead of brown glass. D. 4.5 × Ht. 5.5mm. Part of sf51
- 1142–8 Cylindrical beads of green glass (7). D. (largest) 5.5 × Ht. 6.5mm. Parts of sf23, 50, 51, 74 and 75
- 1149–54 Pear-shaped beads of black glass (6). D. (largest) 8.6 × Ht. 7.0mm. Parts of sf23, 24, 64 and 72
- 1155–7 Pear-shaped beads of green glass (3). D. (largest) 16.5 × Ht. 12mm. Parts of sf23, 43 and 72
- 1158 Truncated cone-shaped bead of black glass. D. 5.8 × Ht. 4.0mm
- 1159 Concave cone-shaped bead of black glass. D. 6.5 × Ht. 10mm. Part of sf72
- 1160–1 Fluted bichrome beads of green and yellow glass (2). D. (largest) 15.0 × Ht. 12.5mm. Parts of sf23 and 50
- 1162–78 Malformed beads of black glass (17). D. (largest) 9.5 × Ht. 5.8mm. Parts of sf75 and 76
- 1179 Malformed bead of yellow glass. D. 7.0 × Ht. 4.5mm. Part of sf72
- 1180 Malformed bead of green glass. D. 6.5 × Ht. 6.6mm. Part of sf23
- 1181 Finger-ring of black glass, four fragments D-shaped in section. D. 28.5 × Ht. 5.8–8.0mm.
- 1182 Finger-ring of green glass, D-shaped in section. D. 22.0 × Ht. 3.0–4.0mm.
- 1183–9 Globules and other by-products of black glass (7). L. (largest) 7.8 × W. 6.0mm. Parts of sf22, 52 and 70
- 1190–3 Globules and other by-products of yellow glass (4). L. (largest) 10.0 × W. 3.5mm. Parts of sf49 and 74
- 1194–6 Globules and other by-products of green glass (3). L. (largest) 7.6 × 5.0mm. Parts of sf22, 23 and 49
- Metalwork**
- 1197 Fuel ash slag, irregular fragment. L. 60 × W. 40 × Th. 22mm. sf77
- 1198 Fuel ash slag, irregular fragment. L. 75 × W. 50 × Th. 35mm. 2. sf32
- 1199 Iron-smithing base, hemispherical; incomplete. L. 90 × W. 105 × Th. 55mm. 2. sf31
- 1200 Iron U-shaped loop for a barrel padlock, tapering to a blunt point at one end. At the other end the loop bifurcates where it passes through a flat, circular plate to form two flat tapering prongs, parallel to each other and slightly separated. These form the cores of the leaf springs. There are two tubes applied to the outer face of the loop, one above the other. The lower rests on the circular plate. The surfaces of the plate, the tubes and the loop are plated with copper-alloy. L. 58.3 × W. 44.9mm. 1. sf13 (Fig. 91)
- 1201 Iron wire of square section. L. 31.7 × W. 1.4 × Th. 1.7mm. 6. sf62
- 1202 Iron nail shank of square section. L. 42.1 × W. 5.7 × Th. 5.1mm. 1. sf9
- 1203 Iron nail shank of approximately square section. L. 59 × W. 6 × Th. 7mm. 1. sf9a
- 1204 Iron nail with a shank of rectangular section driven into a wooden wall plug. L. 25.3mm. 7. sf68
- 1205 Iron rod of indeterminate section, heavily corroded. Nail shank (?). L. 63mm. 1. sf10
- 1206 Iron rod, originally of square section, broken into four heavily corroded fragments. Nail shank (?). L. c.60mm. 1. sf10a
- 1207 Iron nail with a flat circular head, and shank of indeterminate section; heavily corroded. L. 42mm. 4. sf56
- 1208 Iron nail with a flat ovoid head, and a shank of square section. L. 39.1 × D. (head) 13.2mm. 2. sf29
- 1209 Iron nail shank of indeterminate section, bent at right-angles. L. 29.5mm. 1. sf11
- 1210 Iron nail shank of indeterminate section, heavily corroded. L. 42.6mm. 1. sf1a
- 1211 Iron object, a wedge-shaped block tapering to a point, to each of the broad sides of which is fixed a flat plate, also tapering to a point, but projecting in a curve beyond the main block at the other end. Both of the plates are roughly broken, one shorter than the other. L. 99.2 × W. 7.7 × Th. 8.9mm. 2. sf28
- 1212 Iron object, partly of circular section, with a rounded end. About a third of the way along, the object assumes a flat, rectangular section and this end is roughly broken. The flat section is pierced by four, regularly spaced, countersunk holes, one partially broken away. The penultimate hole is filled with a rivet with its head hammered flat. L. 305 × W. 23.4mm. 4. sf55
- 1213 Copper-alloy wire fragments (6). L. (largest) 77.6 × D. 0.9mm. 1. sf8n (Fig. 95)
- 1214 Copper-alloy sheet offcuts (25). L. (largest) 87.9 × W. 4 × Th. 1.1mm. 1. sf8b (Fig. 95)
- 1215 Copper-alloy sheet offcuts (10). L. (largest) 87.9 × W. 5.3 × Th. 0.5mm. 1. sf8c (Fig. 95)
- 1216 Copper-alloy sheet buckle tongue with a blunt point at one end, bent into a loop at the other. There is a median groove over the loop, and an uneven incised median line running down the tongue. L. 24.2 × W. 3.2mm. 1. sf7
- 1217 Copper-alloy flat annular brooch, the front face with a beaded edge and decorated with four narrow pointed ovoid fields forming a square. Each of the fields is hatched. The pin is lost. D. 17mm. 6. sf6 (Fig. 97)
- 1218 Copper-alloy strap-end composed of two irregular sheets, crudely riveted together. The rectangular rivet heads are visible on the inside. A perforation has been driven through from the outside between the rivets. L. 34.4 × W. 20.5mm. sf78 (Fig. 97)
- 1219 Leadrun-off, fragment. L. 20 × W. 16.2mm. 2. sf26 (Fig. 94)
- 1220 Sheet lead fragment folded and crushed, and with a number of deep cuts. L. 34 × W. 34.7 × Th. (max.) 3.0mm. sf4 (Fig. 94)
- 1221 Lead bar, bent, of rectangular section with a narrow flange projecting from one of the long edges. L. 99.6 × W. 17.5mm. sf53

1222 Lead spindle whorl, discoid, undecorated, with hammer marks around the edge. D. 26.5 × Ht. 6.5mm. sf54 (Fig. 102)

Bone

1223 Sub-rectangular fragment roughly broken on all four sides, and decorated with ring-and-dot. L. 28.3 × W. 12 × Th. 3.3mm. 3. sf37 (Fig. 101)

Finds from All Saints Pavement

Fired Clay

1226 Gaming counter, discoid, chipped from a Roman tile fragment. D. 71.7 × Th. 14.5mm. sf32 (Fig. 88)

Glass

1227 Fragments (3). Rim fragment rounded and slightly thickened in the flame, pale green and translucent with iridescence; featureless window-glass fragment, colourless and translucent with iridescence; and a fragment of a polygonal bottle, dark green and translucent. L. (largest) 68.1 × W. 26.5 × Th. 3.8mm. E2 trench. sf5

1228 Vessel fragments (3). Fragment of an everted rim, pale green and translucent; and featureless body sherds, pale green and translucent (2). L. (largest) 40 × W. 30.2 × Th. 4.3mm. 15. sf29 (Fig. 119)

1229 Window glass fragments (3); pale green, translucent and featureless. L. (largest) 38.3 × W. 25.2 × Th. 1.5mm. 25. sf28

1230 Window glass fragments (2), colourless and translucent with iridescence. L. (largest) 31.8 × W. 19.6 × Th. 1.4mm. 3. sf23

1231 Stained glass fragment, sub-triangular with one curved edge which is grozed, decorated on one face with two dark brown/red lines running parallel to, but distant from, the curved edge. L. 42.9 × W. 28.7 × Th. 1.8mm. sf7 (Fig. 119)

1232 Globular bead, intact, blue/green and opaque. D. 8.1 × Ht. 7.6 × D. (perforation) 2.4mm. 5. sf17

Metalwork

1233 Iron ringed pin coated in a layer of soft solder, now heavily rubbed, with a crutch head and a plain stirrup ring with tenons at the end which engage with hollows at either side of the solid head. The lower half of the shank is flattened, and decorated near the top with a punched saltire between two pairs of transverse parallel lines. L. (excluding ring) 141 × D. (ring) 24mm. sf92 (Fig. 101)

1234 Iron objects (2), each of ovoid section and tapering asymmetrically to a point at either end so that the lower edge is flat. L. (largest) 74 × W. 10.7 × Ht. 14.4mm. 3. sf20

1235 Strap-end of copper-alloy made from two metal sheets brazed together at the slightly pointed lower end, expanding towards the square upper

1224 Spindle whorl made from a bovine femur head, a piece removed from one side leaving a circular facet. D. 39.3 × Ht. 29.8mm. 2. sf19 (Fig. 102)

1225 Antler tine length cut off square at each end, with polished exterior, the medullary tissue removed to form a longitudinal perforation. There are marks of working on the cut ends. L. 34 × D. 24mm. 7. sf68

end where the mineralized remains of the leather strap in the gap between the sheets are held in place by a single rivet. L. 25.0 × W. 10.0 × Th. 2.5mm. 5. sf16 (Fig. 97)

1236 Stud of copper-alloy with a hollow, domed head and short shank of square section. D. 12 × L. 9.9mm. 25. sf25

1237 Studs of copper-alloy (2), similar to 1236, with the shanks embedded in a wood fragment. L. (whole fragment) 23.7 × W. 14 × Th. 9.6mm. 25. sf26

1238 Studs of copper-alloy (3), similar to 1236. D. (largest) 14.6 × L. 12.1mm. 43. sf4

1239 Stud of copper-alloy similar to 1236, incomplete. D. 12.4 × L. 10.6mm. 51. sf19

1240 Studs of copper-alloy (24) similar to 1236; four groups each composed of two or more studs arranged in a row and fixed into leather-covered wood; a group of five studs driven into leather-covered wood and arranged in a right-angle; and four loose studs, one of which is still fixed into a piece of wood. L. (largest piece) 52 × W. 17mm. D. (largest stud) 7.3 × L. 8.2mm. sf21

1241 Rod, of copper-alloy, of circular section. L. 54.7 × D. 3.8mm. 5. sf18

1242 Thumbpiece of copper-alloy, incomplete, with a flat upper surface which expands towards the outer end. On the underside the hole for the pivot survives on one side but is broken away on the other. Behind the pivot is a solid projection of V-shaped profile. L. 40.9 × W. 15.7mm. 51. sf19a

1243 Gold sheet lunate object with the points linked; hollow and made in two halves soldered together around the circumference. The front face is decorated with incised zigzag ornamentation. D. 15.0 × Th. 5.5mm. 5. sf16 (Fig. 97)

1244 Button of copper-alloy. D. 13.4 × Th. 7.0mm. 5. sf16

1245 Button of silver-alloy, incomplete. D. 17 × Th. 3.5mm. 5. sf16

Bone

1246 Parasol handle. L. 69 × W. 11.3 × Ht. 17.6mm. 51. sf1

Antler

1247 Connecting plate fragment cut off square at either end and tapering to the left, a drilled hole near the narrow end. L. 46.6 × W. 13.5 × Th. 3.9mm. 21. sf22 (Fig. 101)

Finds from St Mary Castlegate

Fired Clay

1248 Clay pipe bowl stamped RS. D. 17mm. sf13

Metalwork

1249 Lead window came. L. 71mm. sf12

1250 Pewter chalice with a hemispherical bowl and foot, distorted by pressure, with a knob composed of two narrow roll mouldings encircling the stem. Ht. 90 × D. 91mm. sf20 (*Fig. 97*)

1251 Pewter paten, circular and dished. D. 92mm. sf21 (*Fig. 97*)

Addenda, from the Parliament Street sewer trench

Metalwork

1252 Iron stylus, with shank of rounded cross-section. At the head is polyhedral moulding surmounted by a V-shaped eraser. Non-ferrous plating, probably tin. L. 87mm. sf24 (*Fig. 90*).

Antler

1253 Antler tine and base, with the main beam cut. Naturally shed. L. 292 × D. (base) 77mm.

Provenances

Finds were recovered from contexts on each site as follows; context numbers are given in Roman characters, find numbers (catalogue numbers) in italics. All the other finds were unstratified.

Parliament Street sewer trench

604: 840, 861, 872; 903: 767, 778, 809; 1003: 765, 898; 1004: 824; 1105: 839; 1107: 688; 1206: 818.

Midland Bank

3: 959, 975; 4: 967, 968, 969, 970, 973; 11: 961, 963, 964, 971, 972; 105: 960, 962, 966; 110: 974.

34 Shambles

1: 977, 981, 1200, 1202, 1203, 1205, 1206, 1209, 1210, 1213, 1214, 1215, 1216; 2: 980, 1198, 1199, 1208, 1211, 1219, 1224; 3: 978, 985, 1223; 4: 984, 986, 987, 1207, 1212; 6: 982, 988, 1201, 1217; 7: 983, 989, 1204, 1225.

All Saints Pavement

E2 trench: 1227; 3: 1230, 1234; 5: 1232, 1235, 1241, 1243, 1244, 1245; 15: 1228; 21: 1247; 25: 1229, 1234, 1236, 1237; 43: 1238; 51: 1239, 1242, 1246.

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Summary

The finds discussed here are derived from excavations and/or watching briefs at the Parliament Street sewer trench, Midland Bank (11–13 Parliament Street), 34 Shambles, and the churches of All Saints Pavement and St Mary Castlegate, all these sites being close to one another in the commercial heart of the Anglo-Scandinavian and later medieval city. Observations at the Parliament Street sewer trench are discussed in *AY* 3, *AY* 6/1 and *AY* 8, the results of the work at St Mary Castlegate in *AY* 8/2, and an account of the excavations and observations at All Saints Pavement, 34 Shambles, and 11–13 Parliament Street appears in *AY* 10/2. The pottery from 11–13 Parliament Street and 34 Shambles is published in *AY* 16/3.

At All Saints Pavement excavations preceded underpinning of part of the structure. Finds were derived from the later medieval to modern levels in the churchyard, and from the black organic levels of presumed Anglo-Scandinavian date encountered beneath. At St Mary Castlegate the two principal finds (*I250* and *I251*) were discovered during clearance by workmen of the upper levels in the nave, rather than from the area of the excavation. At 34 Shambles the finds derived from workmen's excavations in organic deposits underlying the cellar floor of a standing building. At 11–13 Parliament Street recording of workmen's trenches revealed parts of three 12th century timber buildings sealed by a grey/blue clay layer. Medieval deposits above this lacked clear evidence of structures. Finds were collected during recording, and by the workmen. In the Parliament Street sewer trench black organic levels of the Anglo-Scandinavian period were encountered along its whole length. To the north-west there were only pits and fence lines; to the south-east remains of timber structures were found. The trench also sectioned the underlying Roman fortress wall. Finds were collected from the spoil.

Most of these finds are formally unstratified, but many can be dated on the basis of their form and function, sometimes in conjunction with the meagre evidence provided by the archaeology.

Roman finds from the five sites are few, the most important being the well-preserved ploughshare and coulter (*717* and *718*), and the stone mould (*689*) for making pewter dishes, both from the Parliament Street sewer trench. The other finds are of a purely domestic nature like the gaming counters (*688* and *696*) and the vessel glass from the same site which includes the rim and handle from a bath flask (*698*), part of a mould-blown vessel (*699*), and fragments of two wheel-cut beakers (*700* and *701*).

Anglo-Scandinavian finds are more abundant and include evidence for manufacturing. Waste antler tines from the Parliament Street sewer trench and the Midland Bank site, and the tooth plates (*751* and *752*) from the Parliament Street sewer trench, probably derive from the manufacture of single-sided composite combs like *743*. The crucible (*697*) from the Parliament Street sewer trench was used for melting brass. Leather offcuts and fragments of possible Anglo-Scandinavian date from the Parliament Street sewer trench suggest that leather working was taking place in the area. Some of the shoes from the site are of this date as are three decorated sheaths, *753–5*. Other finds include a pair of shears (*710*), a spoon bit (*712*) and key (*715*), all from the Parliament Street sewer trench, and an iron ringed pin (*I233*) from All Saints Pavement.

Medieval finds are the most abundant from these five sites and include important industrial evidence. The ampulla mould (979) and copper-alloy offcuts and wires (1213–15) from 34 Shambles indicate that metalworking was taking place there. That glass was being worked on or near the site in the 12th century is suggested by the discovery of nearly 200 beads, many of them malformed, together with glassy waste of similar chemical composition. A blank for making an iron knife (960) from the Parliament Street sewer trench indicates that ironworking was taking place, and there is an iron-smithing furnace base (1199) from 34 Shambles. In addition there are medieval tools such as the axe from Midland Bank, items of dress such as a buckle loop, annular brooch and strap-end from 34 Shambles, and domestic items like the wooden bowls and the keys from Midland Bank and the padlock bolt from 34 Shambles. A chalice and paten (1250 and 1251) from St Mary Castlegate have probably come from the grave of a priest.

The numerous post-medieval finds from these sites are catalogued but not discussed.

Résumé

Le mobilier étudié ici provient des fouilles et des observations effectuées à Parliament Street, lors des travaux d'assainissement, à la Midland Bank (11–13 Parliament Street), au 34 Shambles, et sur les églises d'All Saints Pavement et de Saint Mary Castlegate, tous ces sites étant très proches les uns des autres, dans le centre commercial de la ville anglo-scandinave et médiévale. Les données des observations faites au cours des travaux d'assainissement de Parliament Street sont publiées dans les volumes *AY* 3, *AY* 6/1, et *AY* 8, celles des travaux de Saint Mary Castlegate dans *AY* 8/2, et un compte rendu des fouilles et observations d'All Saints Pavement, de 34 Shambles, et du 11–13 Parliament Street se trouve dans *AY* 10/2. La céramique du 11–13 Parliament Street et du 34 Shambles est publiée dans *AY* 16/3.

Les fouilles à All Saints Pavement ont été entreprises préalablement à des travaux de forage sous le bâtiment. Le mobilier provient des niveaux médiévaux et modernes du cimetière de l'église et des niveaux organiques noirs sous-jacents, attribués à la période anglo-scandinave. Les deux principaux objets (1250 et 1251) découverts à Saint Mary Castlegate proviennent plus du déblaiement des niveaux supérieurs de la nef par les terrassiers que de la zone de fouilles. Le mobilier du 34 Shambles a été découvert dans les terrassements des niveaux organiques situés sous le sol de la cave d'un bâtiment existant. Au 11–13 Parliament Street, l'enregistrement des tranchées a révélé trois bâtiments en bois du XIIe siècle, scellés par une couche d'argile gris bleu; les dépôts médiévaux supérieurs n'ont livré aucune trace nette de structures. Le mobilier a été collecté pendant l'enregistrement des structures et par les ouvriers. Les niveaux noirs organiques de la période anglo-scandinave ont été rencontrés sur toute la longueur des tranchées d'assainissement de Parliament Street, avec au nord-ouest seulement des fosses et des traces de palissades et au sud-est des restes des structures en bois. La tranchée a également recoupé le mur de la forteresse romaine antérieure. Le mobilier a été récolté dans les déblais des terrassements.

Ces objets sont donc, pour la plupart, non stratifiés, mais beaucoup peuvent être datés sur des critères morphologiques ou fonctionnels, parfois en relation avec le peu d'informations fournies par l'archéologie.

Ces cinq sites ont livré peu de matériel de l'époque romaine, les objets les mieux conservés étant un soc et un coutre de charrue (717 et 718), ainsi qu'un moule en pierre servant à la fabrication de plats d'étain (689), provenant tous de la tranchée d'assainissement de Parliament Street. Les autres objets sont de nature domestique comme les pièces de jeu (688 et 696), et les fragments de verre du même site comprenant la lèvre et l'anse d'un flacon de bain (698), un fragment de vase soufflé au moule (699) et des fragments de deux gobelets incisés à la meule (700 et 701).

Le matériel anglo-scandinave est plus abondant et témoigne également de l'existence d'un artisanat. Les déchets de branches d'andouillers trouvés dans la tranchée d'assainissement de Parliament Street et sur le site de la Midland Bank, ainsi que les plaques à dents (751 et 752) trouvées lors des travaux d'assainissement de Parliament Street, attestent probablement la fabrication de peignes composites comme 743. Le creuset découvert à Parliament Street a servi pour la fonte du laiton, et les chutes de cuir provenant du même site suggèrent la présence, dans les environs, d'un artisanat du cuir. Quelques unes des chaussures trouvées sur ce site ainsi que trois fourreaux décorés (753–5) appartiennent à cette période. Les autres objets comprennent une paire de cisailles (710), une mèche-gouge (712), une clé (715) trouvés à Parliament Street, et une épingle à anneau en fer (1233) trouvée à All Saints Pavement.

Le mobilier médiéval est le plus abondant sur les cinq sites, et il atteste une intense activité industrielle. Le moule à ampoules (979) et les chutes et morceaux de fil d'alliage cuivreux (1213–15) découverts au 34 Shambles indiquent la présence à cet endroit d'un artisanat du métal. Un artisanat du verre a également existé, au XIIe siècle, sur le site ou à proximité immédiate, comme le montre la découverte d'environ 200 perles, pour la plupart malformées, associées à des déchets de verre de composition chimique semblable. Un flan pour la fabrication d'un couteau en fer (960) à Parliament Street témoigne d'un artisanat du métal, un bloc de scories solidifiées à la base d'un four (1199) a également été trouvée au 34 Shambles. Ont en outre été découverts des outils de la période médiévale comme une hache à Midland Bank, des éléments de vêtement tels qu'un anneau de boucle, une broche annulaire et un passant de ceinture au 34 Shambles, et des objets domestiques comme des bols de bois et des clés à Midland Bank et la cheville de cadenas du 34 Shambles. Le calice et la patène (1250 et 1251) du site de Saint Mary Castlegate proviennent vraisemblablement de la sépulture d'un prêtre.

Les nombreux objets de la période post-médiévale livrés par ces sites sont ici simplement catalogués, mais ne font l'objet d'aucune étude particulière.

Zusammenfassung

Die hier diskutierten Funde entstammen den Ausgrabungen und den Überwachungsaufträgen beim Bau des Abwässergrabens in der Parliament Street, der Midland Bank (11–13 Parliament Street), 34 Shambles und den Kirchen All Saints Pavement und St Mary Castlegate. Alle diese Fundstätten liegen in enger Nachbarschaft im Handelsviertel der anglo-skandinavischen und später der mittelalterlichen Stadt. Die Beobachtungen im Abwässergraben in der Parliament Street werden in *AY 3*, *AY 6/1* und *AY 8*, die Ergebnisse der Arbeiten in St Mary Castlegate in *AY 8/2* diskutiert; ein Bericht über die Ausgrabungen und Beobachtungen in All Saints Pavement, 34 Shambles und 11–13 Parliament Street erscheint in *AY 10/2*. Die Keramik aus Parliament Street und 34 Shambles ist in *AY 16/3* veröffentlicht.

Im Fall von All Saints Pavement wurden die Ausgrabungen vor der Untermuerung der Baustruktur durchgeführt. Die Funde entstammen den mittelalterlichen und modernen Schichten des Friedhofs und den schwarzen organischen Schichten möglichen anglo-skandinavischen Datums, die unterhalb der jüngeren Schichten gefunden wurden. In St Mary Castlegate dagegen wurden die beiden hauptsächlichen Funde (*1250* und *1251*), während Aufräumungsarbeiten durch Bauarbeiter in den oberen Schichten im Kirchenschiff, und nicht in der Ausgrabungsstelle, gefunden. Im Fall von 34 Shambles stammen die Funde aus Ausgrabungen durch Bauarbeiter in den organischen Ablagerungen unterhalb des Kellerbodens eines stehenden Hauses. 11–13 Parliament Street zeigte bei der Begehung von Baugruben Teile dreier Holzbauten aus dem 12. Jahrhundert, die von einer Schicht graublauen Tones abgedeckt waren. Die mittelalterlichen Ablagerungen oberhalb dieser Tonschicht enthielten keine klaren Bauspuren. Die Funde wurden während der Aufnahme und durch die Arbeiter gesammelt. In dem Abwässergraben in der Parliament Street waren die schwarzen organischen Schichten des anglo-skandinavischen Zeitraumes auf der ganzen Länge hin vorhanden. Gegen Nordwest waren nur Gruben und Zaunführungen feststellbar. Der Graben schnitt auch durch die unterliegende römische Festungsmauer. Funde wurden aus dem Schutt geborgen.

Die meisten der Funde sind formell unstratifiziert, aber viele können auf Grund ihrer Form und Funktion datiert werden, manchmal im Zusammenhang mit dem geringen Befund, den die Archäologie liefert.

Römische Funde aus den fünf Fundstellen sind gering. Als bedeutendste Funde können eine guterhaltene Pflugschar und ein Pflugmesser (*717* und *718*), sowie eine Steinform (*689*) zur Herstellung von Zinnschalen angesehen werden. Beide stammen aus dem Abwässergraben in der Parliament Street. Die übrigen Funde sind rein häuslichen Charakters, wie etwa Spielmarken (*688* und *696*), Scherben von Glasgefäßen aus derselben Fundstelle, unter denen sich der Rand und Griff eines Badeflakons (*698*), ein Teil eines formgeblasenen Gefäßes (*699*) und Reste von zwei geschliffenen Bechern (*700* und *701*) befanden.

Die anglo-skandinavischen Funde sind zahlreicher und enthalten Beweise für handwerkliche Betriebe. Abfall von Geweihzinken aus dem Abwässergraben in der Parliament Street und der Ausgrabungsstätte an der Midland Bank, und die Zahnplatten

(751 und 752) aus dem Abfallgraben in der Parliament Street stammen höchstwahrscheinlich aus der Herstellung von einseitigen, zusammengesetzten Kämmen wie etwa (743). Der Schmelztiegel (697) aus dem Abwässergraben in Parliament Street war zum Schmelzen von Bronze benutzt worden. Lederabschnitte und Überreste aus dem Abwässergraben in Parliament Street, möglicherweise in die anglo-skandinavische Zeit datierend, sind Zeugnis dafür, daß Lederverarbeitung in dieser Gegend stattgefunden hat. Einige der Schuhe von dieser Fundstelle datieren in diese Zeit, ebenso drei Scheiden (753–5). Unter den weiteren Funden befinden sich eine Schafsschere (710), ein löffelförmiges Stechzeug (712), und ein Schlüssel (715). Alle kamen aus dem Abwässergraben in der Parliament Street. Ein eiserner Bolzen (1233) stammt aus All Saints Pavement.

Mittelalterliche Funde aus den fünf Fundstellen sind am zahlreichsten und enthalten wichtige Beweise für industrielle Betätigung. Die Form (979), die Kupferlegierungsabschnitte und Drähte (1213–15) aus 34 Shambles weisen darauf hin, daß dort Metall verarbeitet wurde. Daß Glasverarbeitung im 12. Jahrhundert dort oder doch nahebei durchgeführt wurde, ergibt sich aus der Entdeckung von nahezu 200 Perlen, von denen viele verformt waren, und dem Glasabfall von gleicher chemischer Zusammensetzung. Ein Rohling für die Fertigung eines Messers (960) aus dem Abwässergraben in Parliament Street weist auf Eisenverarbeitung am Ort hin, und in 34 Shambles wurde Eisenschlacke (1199) gefunden. Weiterhin wurden gefunden: mittelalterliches Werkzeug wie die Axt aus der Midland Bank und Bekleidungszubehör wie etwa eine Schnallenschlaufe, eine ringförmige Brosche und Riemenbeschläge aus 34 Shambles. Auch wurden häusliche Gegenstände wie Holzschüsseln und Schlüssel in der Midland Bank und ein Schloßbolzen in 34 Shambles gefunden. Ein Kelch (1250) und ein Hostienteller (1251) in St Mary Castlegate stammen wahrscheinlich aus einem Priestergrab.

Die zahlreichen neuzeitlichen Funde aus diesen Fundstellen sind katalogisiert, sie werden aber nicht diskutiert.

Notes

- 1 Finds have been deposited in the Yorkshire Museum by courtesy of the site owners of 11–13 Parliament Street, Midland Bank PLC, and of 34 Shambles, Shepherd Homes Ltd, and those from All Saints Pavement by permission of the vicar and churchwardens.
- 2 I am grateful to Miss B. Pyrah, Keeper of Geology at the Yorkshire Museum, for much of this information.
- 3 Mr J. Black extends thanks for the use of laboratory facilities within his department to Professor J. Nutting, Head of the Department of Metallurgy, Leeds University, and to Professor Nutting's staff and colleagues, in particular Dr A. J. Baker, for their help. The hardness tests and macrophotographs were carried out at Bradford University by J. R. Price of the Department of Metallurgy.
- 4 T. P. O'Connor has kindly distinguished between the bone and antler objects.
- 5 The material from Midland Bank was examined by D. J. Rackham on whose report this paragraph is based; by the time this had been written, the unstratified material had been discarded.
- 6 P. Walton wishes to express her thanks to Miss Elizabeth Crowfoot for generous help in the preparation of this report.
- 7 Thanks are due to Dr P. Blakey and Dr D. Raven of the Undergraduate School of Studies in Textile Technology and Textile Design at Bradford University for the extensive tests which identified 958 as bast fibre.
- 8 958 was tested for dye by Professor M. Whiting of the Department of Organic Chemistry at Bristol University. Tests were also carried out on the other textile fragments by Dr G. Taylor in the YAT laboratory (using Prof. Whiting's techniques), but no remains of dye were found.
- 9 Both the Aachen and Dublin sheaths are of probable Anglo-Saxon manufacture since each has an inscription with an Old English name, BYRHZIGÉ on the Aachen, and EADRIC on the Dublin, example.
- 10 The terminology used here follows that in Thomas, 1980, with minor modifications.

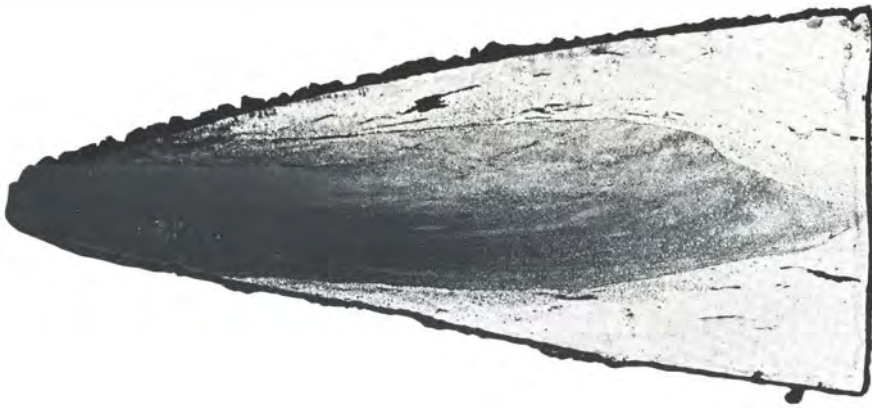
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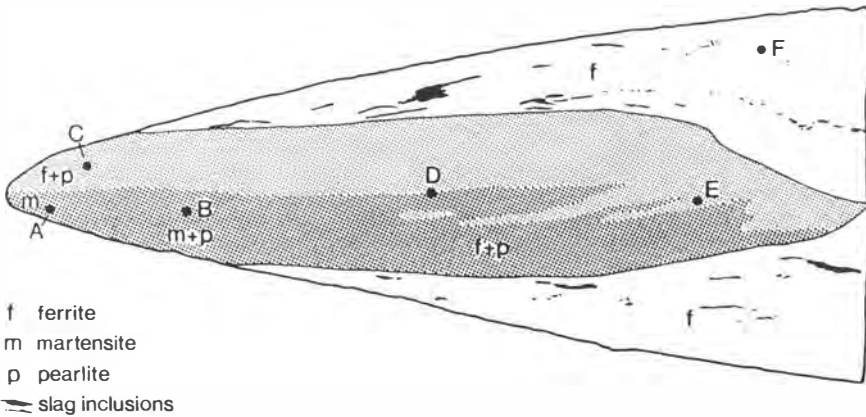
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a Photomicrograph of section of sample from the cutting edge. Etched in Nital. Original Mag. $\times 14$ approx., shown 1:2



b Diagram showing the points on the sample where the hardness was measured

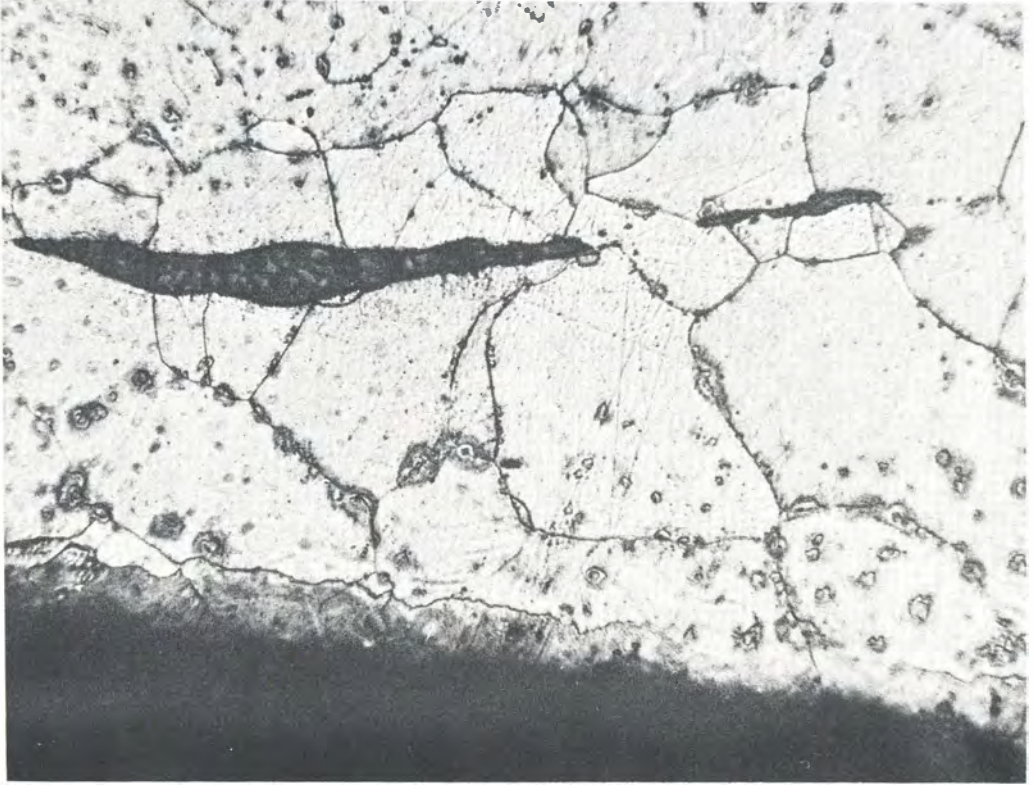


Plate VIII Axe head from Midland Bank, Parliament Street (961). Sample from the cutting edge. Photomicrograph showing the large ferrite grains and slag 'stringers' adjacent to the surface of the sides of the axe. Mag. $\times 450$ approx.

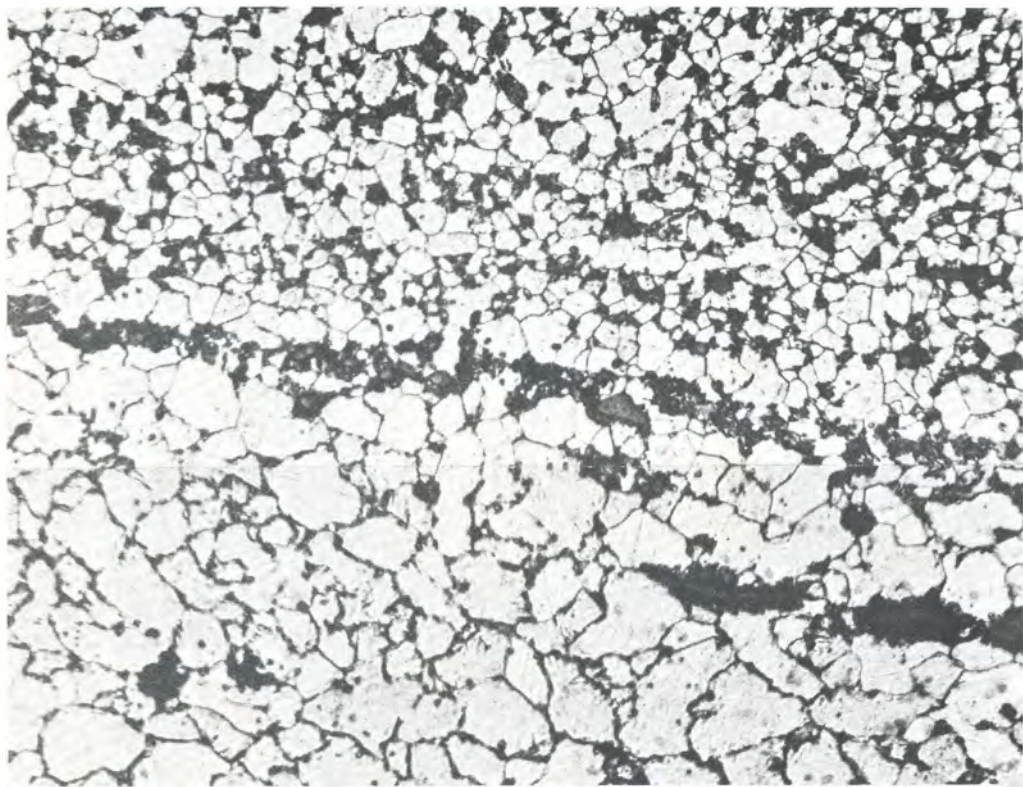


Plate IX Axe head from Midland Bank, Parliament Street (961), Sample from the cutting edge. Photomicrograph showing the interface between the lower carbon wrought iron, wrought iron structure and the higher carbon 'steel' structure. Mag. \times 450 approx.



a Interior of mould for front face of ampulla



b Exterior of mould



Plate XI Leather scramasax sheath (753) from Parliament Street sewer trench. L. 340mm



Plate XII Leather scramasax sheath (754) for a concave-bladed knife, from Parliament Street sewer trench. L. 175mm



Plate XIII Leather sheath (755) from Parliament Street sewer trench. L. 175mm



Plate XIV Leather sheath (973) from Midland Bank, Parliament Street. L. 258mm

The Archaeology of York

General Editor P. V. Addyman

Reports on the work of the York Archaeological Trust for Excavation and Research are published as separate parts or fascicules making up a series of nineteen volumes entitled **The Archaeology of York**

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