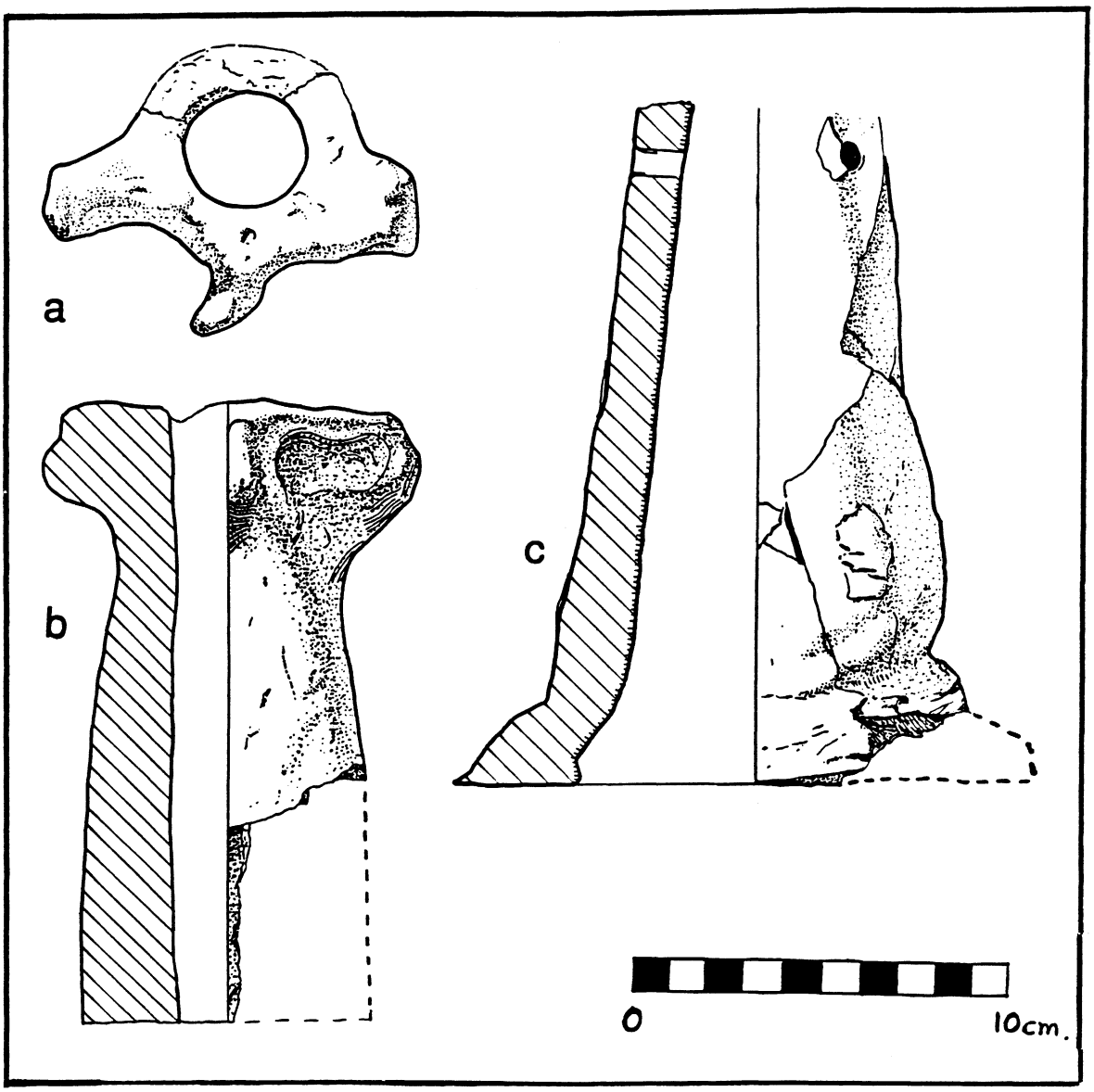
Gloucester, Quay Street Pipe Kiln Dump

Allan Peacey



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GLOUCESTER, QUAY STREET PIPE KILN DUMP.

In 1979, demolition of buildings, prior to development, on the corner of Westgate Street and Lower Quay Street extending at one point back to Quay Street made possible an archaeological examination of the site. Two trenches were opened. The first directed at examination of the Roman quayside is reported in Garrod's Gloucester [Garrod & Heighway 1984, 48-51]. The second trench to investigate a surface spread of tobacco pipe kiln material is the subject of this report.

The location of the site is shown in Figure 1B & C. Examination of the archives showed that the pipe kiln material lay within the former confines of the Duke of Gloucester, an alehouse fronting onto Quay Street. Figure 1A shows the property as depicted in a lease plan of 1826 [GBR 1413] with the position of the excavation shown against the eastern boundary.

The excavation was carried out in the winter of 1979-80 by the author. A trench measuring 5m by 2.6m was laid out initially to encompass the surface evidence. A baulk 0.4m wide was left along the east edge of the trench against the walled east boundary of the plot. After an initial trowelling of the designated area it was apparent that a linear excavation along the eastern edge was responsible for the up-cast kiln waste. The remaining surface consisting of demolition rubble mixed with ash and charcoal was cut by two pits containing the articulated skeletons of a pig and a dog. Neither of these features contained any kiln waste. The fill of the linear

feature was removed as layer (2) revealing a disused salt glazed drain. The demolition rubble was next removed down to a metalled yard surface cut by the same three features together with a further pit approximately 0.4m square which contained a pipe bowl fragment dating from the late nineteenth century [Figure 10, 100]. The metalling of the yard surface, approximately 50mm thick, lay over a levelling layer of charcoal and ash which sealed a dished depression containing pipes and kiln debris from the late seventeenth century. This feature, measuring c. 4m by c. 1.6m, lay along the east edge of the property adjacent to the wall [Figure 2].

The fill of the feature was recorded as layers (11) and (12) tentatively interpreted as a working waste deposit and a demolition phase. These are more probably contemporary tip layers of a single phase dump. Before closing the trench an extension 1.0m to the south and a limited cut beneath the salt glaze drain were made to prove the limits of the feature. Material from the latter cut is recorded as layer (15), no distinction being possible due to poor light. This exercise ruled out the remote possibility that the feature might be the stoke pit of a kiln beneath or beyond the wall.

The ground surface into which the shallow depression had been cut is formed in a series of horizontal loamy layers numbered (13) to (18). These layers pre-date the deposit of kiln material.

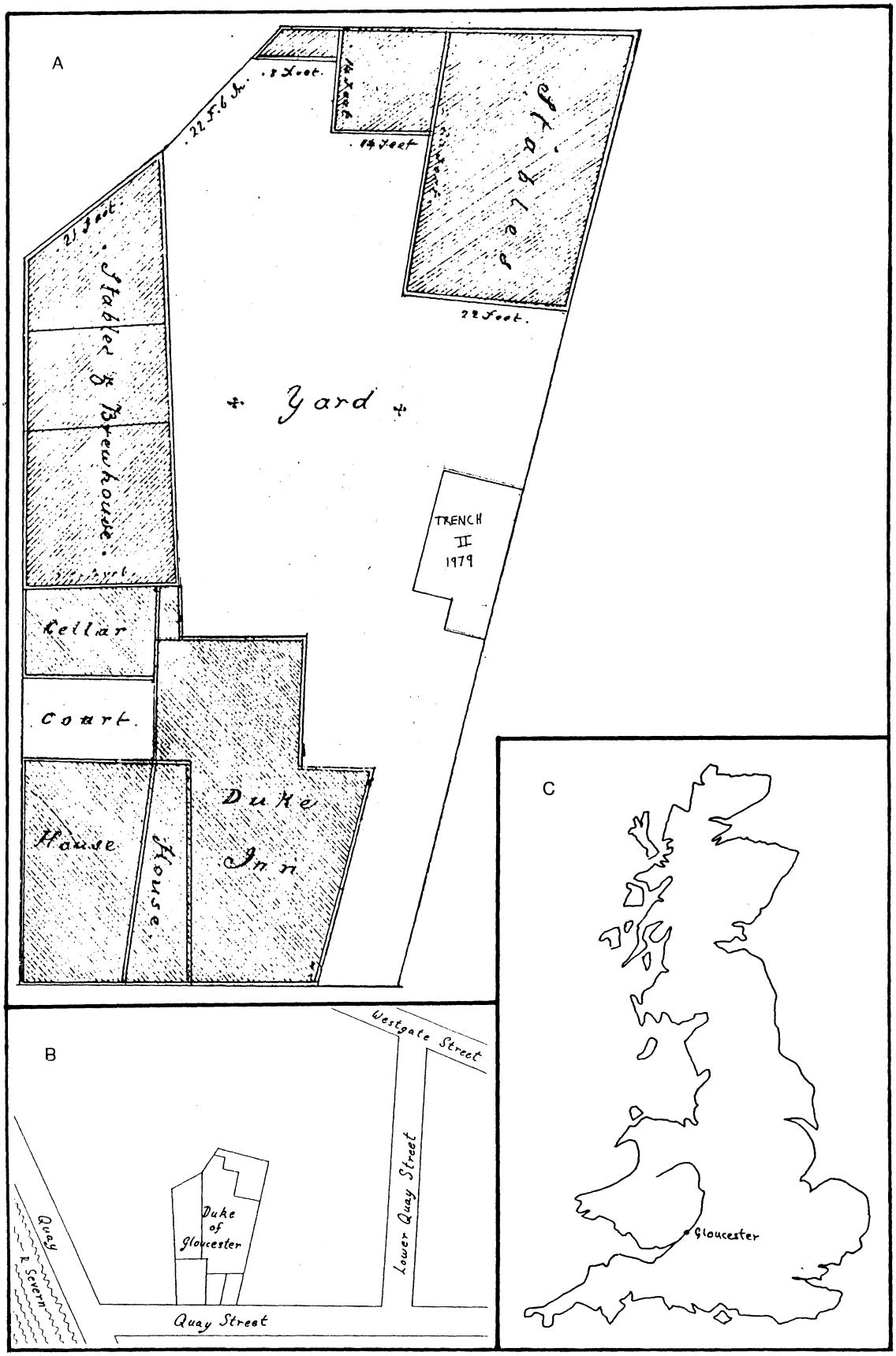
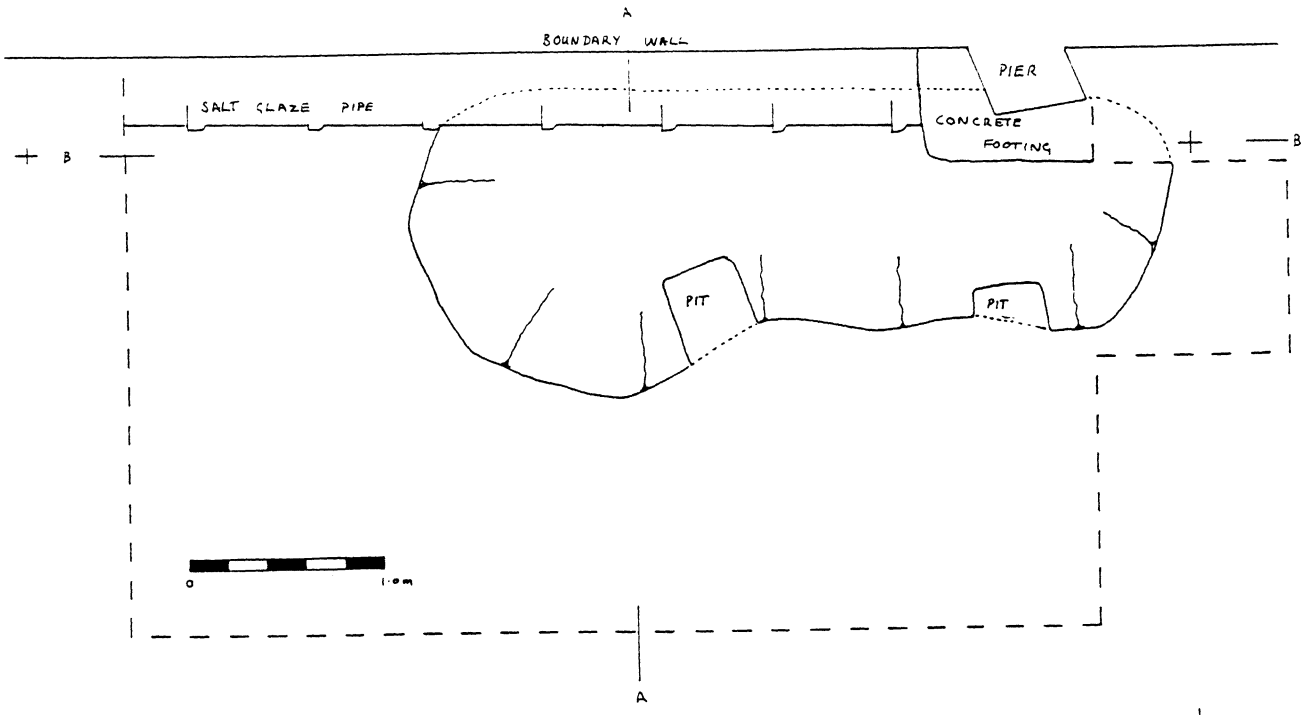


Figure 1A City lease plan dated 1826 showing the trench location within the bounds of the Duke Inn; B location within the street grid; C location in the country.

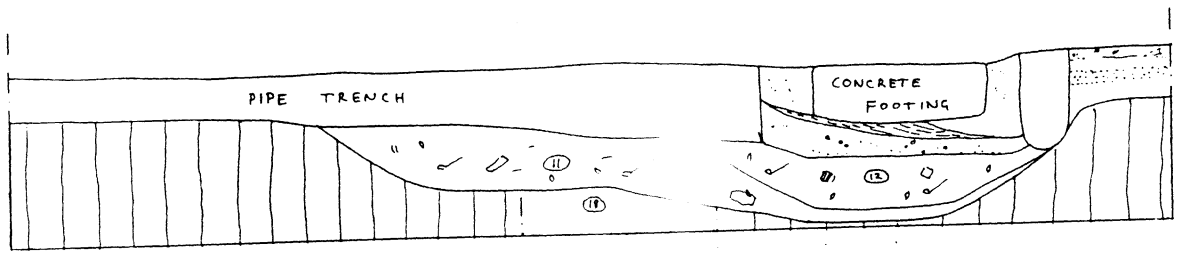
The Finds.

The excavation yielded a total of 1670 pipe bowls of which 1647 conformed to Gloucester Types G4 and G8 (1670-1700 [Peacey 1979, 46-9]). Of these, 1261 came from layers (11) and (12); the dump of waste and structural material from the pipe kiln. These two layers also produced 1559 mouthpieces, 81 stem fragments with milled decoration and 41lb 3oz [18.68kg] of unmarked stem fragments. In order to establish the total length of stem, measurements were made of all stem attached to bowls, all decorated stem and all mouth pieces together with a 6lb [2.73kg] sample of un-decorated stem fragments. This factor was applied to the total weight to obtain an approximate total length for the unmarked stem. The sum of these figures gives a total stem length of 342.81m. From these figures ratios of 27.18cm of stem for each bowl in the context or 21.98cm of stem for each mouthpiece are obtained. The greatest surviving unbroken length of stem measures 21cm. Pipes reconstructed from the Rainford kiln deposit, dated 1630-50 [Davey 1982, 192], have stems varying from 17.2cm to 20.1cm. The slightly later complete pipe from Berrington Street, Hereford [Peacey 1985, M8.A12], dating from the very end of the seventeenth century has a stem 29cm long.

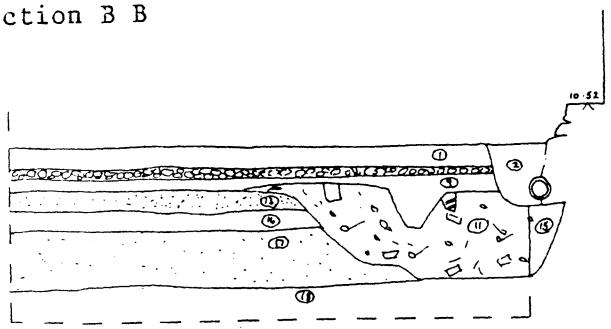
The pipe types are fairly evenly represented, there being 590 Type G4 and 671 Type G8. The majority are probably breakages rather than true wasters of which there are only a handful. These are either underfired, un-trimmed or punctured through the bowl front by the wire [Figure 8, 68-70]. Both types are finished at the bowl rim with a tool rotated in the bowl mouth to form both inside and outside rim profiles. They are additionally embellished with a band of milling



Plan



Section B B



Section A A

Figure 2 Plan and sections of kiln waste deposit.

below the outside edge. Two examples of the type of tool used for this procedure are illustrated by Oswald [Oswald 1975, 15]. The stem tips are knife trimmed to form a simple mouthpiece. This has been done with a rotational movement indicating that a wire was in place in the stem bore when the operation was carried out.

Several moulds were used to produce pipes within each type group. The differences between some of these moulds is very subtle and often masked by slight variations in stem angle, heel trimming and bowl mouth treatment. From the body of material a number of moulds have been isolated by careful examination under strong cross light. These are illustrated in Figures 3, 1-8, and 4, 9-15. A larger quantity of bowls have not been allocated to these moulds nor identified as different moulds. Although the forms are indistinguishable from those illustrated they lack the identifying blemishes. The full variation of form within each type has been illustrated. A small percentage of both types are further embellished by milling on the stem. Of Type G4, 2.6%, and of Type G8 2.8% are decorated in this way. The milling is not placed at the point of balance. Some pipes have a simple band at the junction of bowl and stem whilst others have more complex designs at varying distances, up to 7.7cm, from the bowl [Figures 5-7]. There are even two examples of mouth pieces with this type of decoration [Figure 8, 63 and 64]. Two stem fragments are decorated by alternate pinching at 90^{o} axes [Figure 8, 65 & 67]. One of these is a mouth piece. A further stem fragment is both pinched and milled [Figure 8, 66].

A small number of pipes, not made in Gloucester, were recovered from the same contexts as the kiln product providing useful cross dating

evidence. These are illustrated in Figure 4, 16-18, Figure 8, 74-5 and Figure 9, 78, 85 and 86. The first of these, 16, is a Bristol product, the work of either Philip Edwards I or II, father and son, whoes joint working lives cover the period 1649-1703. A second Bristol product is illustrated in Figure 114, number 86. This is probably the work of Edward Lewis I, who took his freedom in 1631, or his widow Elizabeth, who was a founder member of the Bristol Guild in 1652 [Jackson & Price 1974, 53] Numbers 18, 74, 75, 78 and 85 are products of the Broseley area conforming to Atkinson's Type 2, c.1660-80 [Atkinson 1975, 25]. Number 17 is another product of the Broseley area, a Type 3a, 1670-80. The presence of these Broseley types 2 and 3 together with the total absence of Broseley Types 4 and 5, commonly found in the city, suggests a date for the deposit prior to 1690.

Figure 3 Gloucester Quay Street, tobacco pipes, heeled forms, actual size.

1 Layer (11), Type G4, mould 1 stem bore 7/64".

2 Layer (11), Type G4, mould 2 stem bore 7/64".

3 Layer (11), Type G4, mould 3 stem bore 7/64".

4 Layer (11), Type G4, mould 4 stem bore 7/64".

5 Layer (11), Type G4, mould 5 stem bore 7/64".

6 Layer (11), Type G4, mould 6 stem bore 7/64".

7 Layer (11), Type G4, mould 7 stem bore 7/64".

8 Layer (11), Type G4, mould 8 stem bore 7/64".

Figure 4 Gloucester Quay Street, tobacco pipes,9 with heel, 10-15 with spur, 16-18 from other production centres, actual size.

9 Layer (11), Type G4, mould 9 stem bore 7/64".

10 Layer (11), Type G8, mould 1 stem bore 7/64".

11 Layer (11), Type G8, mould 2 stem bore 7/64".

12 Layer (11), Type G8, mould 3 stem bore 7/64".

13 Layer (11), Type G8, mould 4 stem bore 7/64".

14 Layer (11), Type G8, mould 5 stem bore 7/64".

15 Layer (11), Type G8, mould 6 stem bore 7/64".

16 Layer (11), Bristol Type, Mark PE, Philip Edwards I or II, stem bore 1/8".

17 Layer (12), Broseley Type 3, Mark GRFE POVEL, stem bore 7/64".

18 Layer (11), Broseley Type 2, Mark MD, stem bore 7/64".

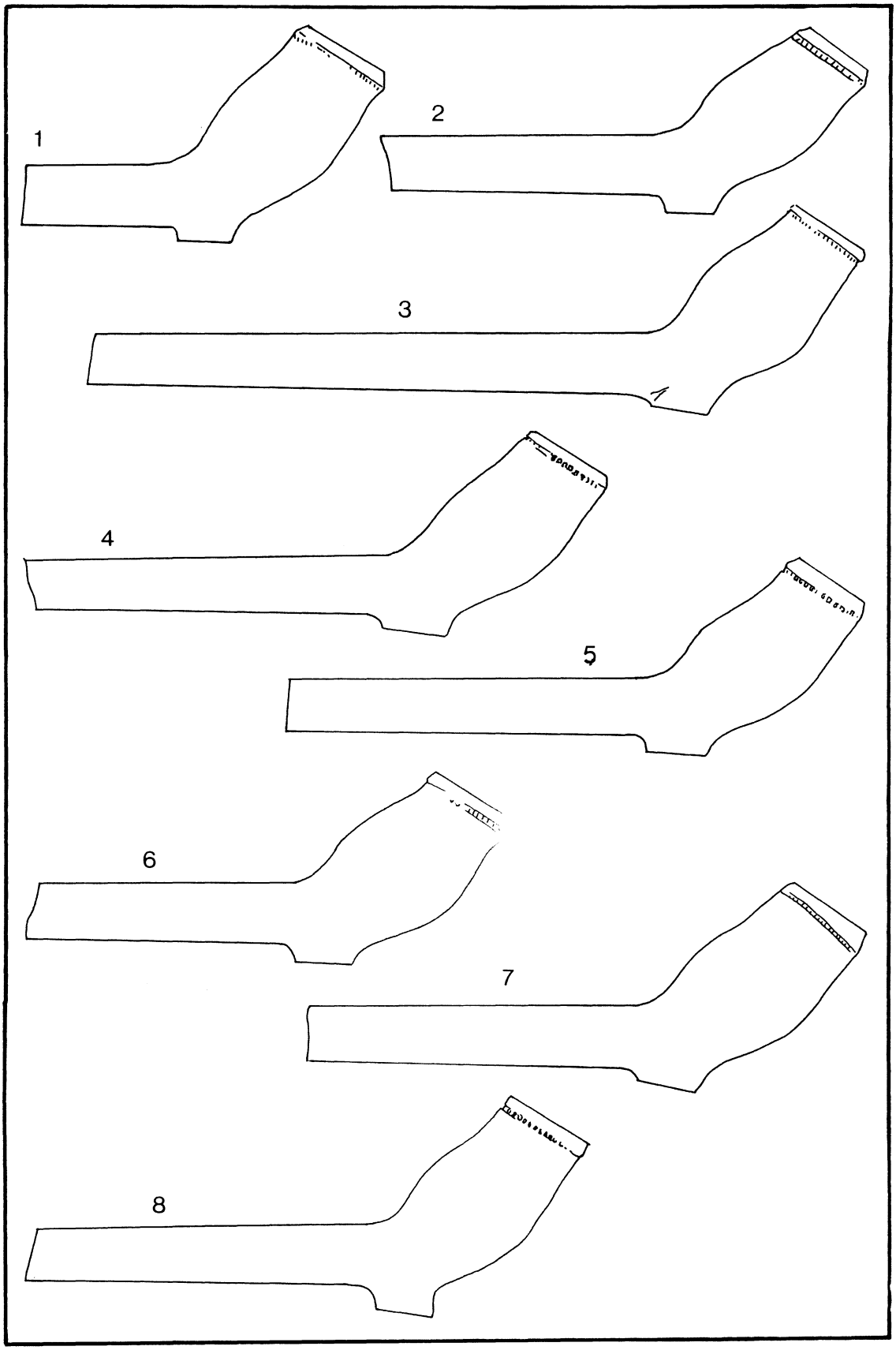


Figure 3 Gloucester Quay Street, tobacco pipes, heeled forms, actual size.

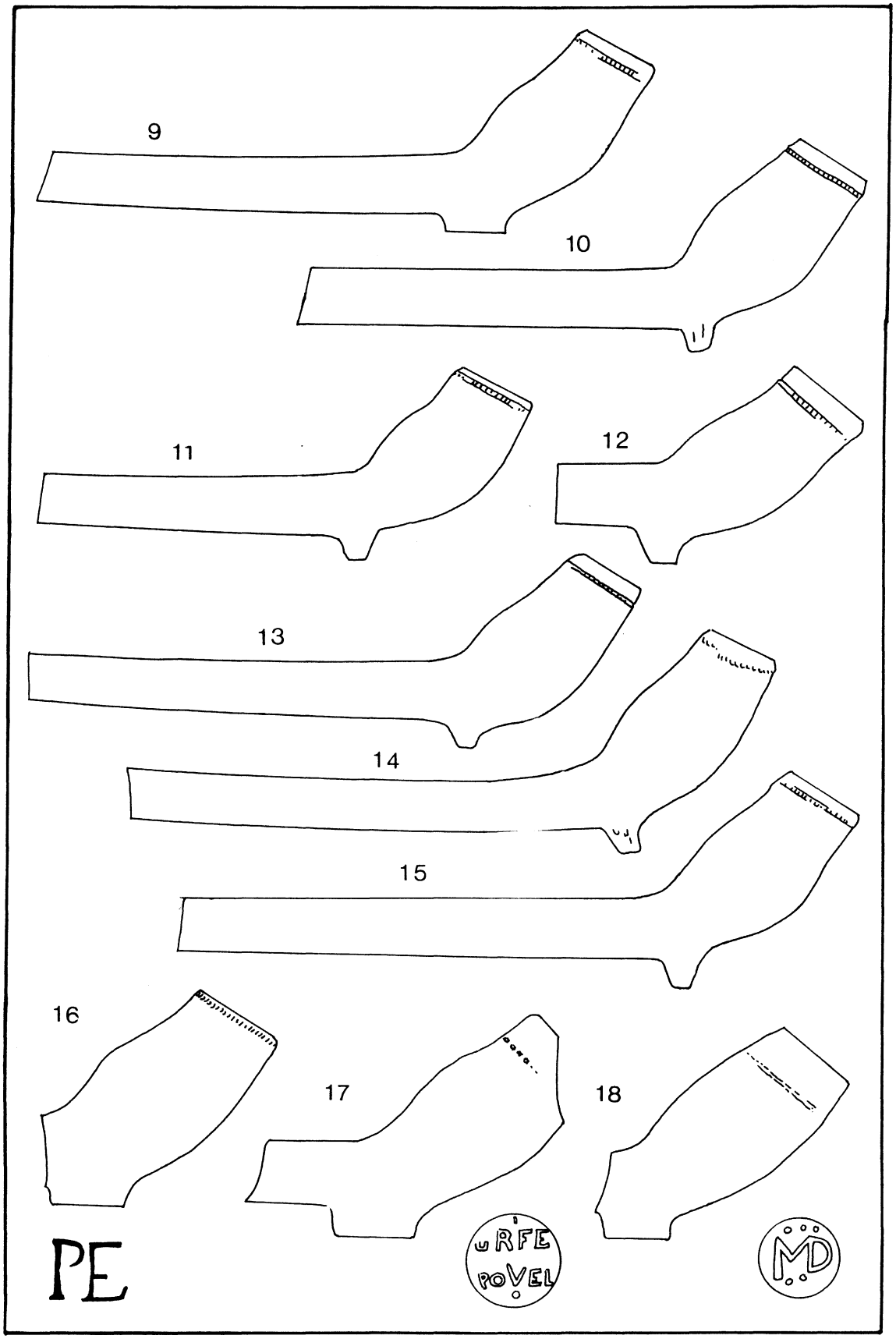


Figure 4 Gloucester Quay Street, tobacco pipes, 9 with heel, 10-15 with spur, 16-18 from other production centres, actual size.

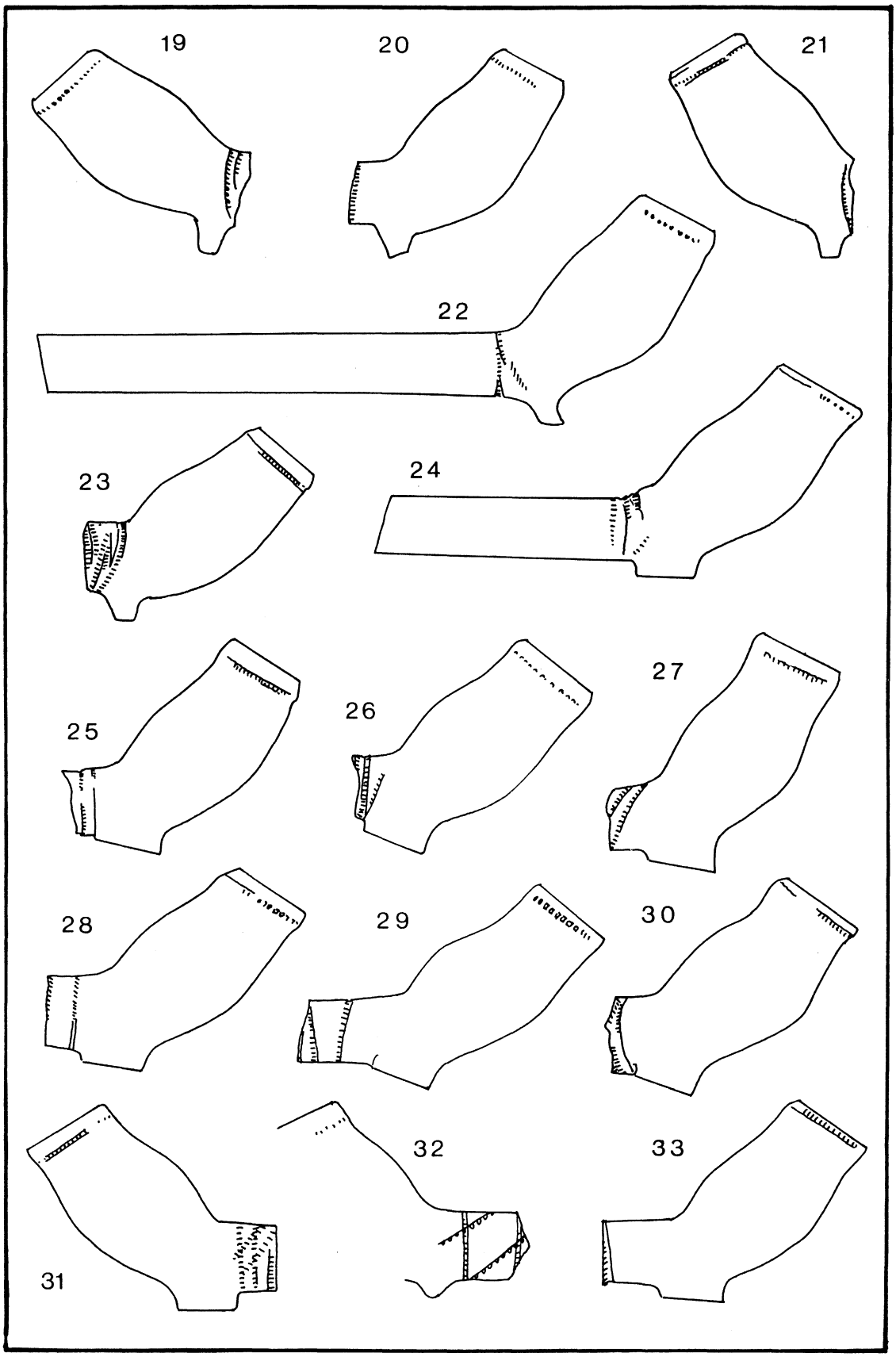


Figure 5 Gloucester Quay Street, tobacco pipes with milled decoration on the stem, actual size.

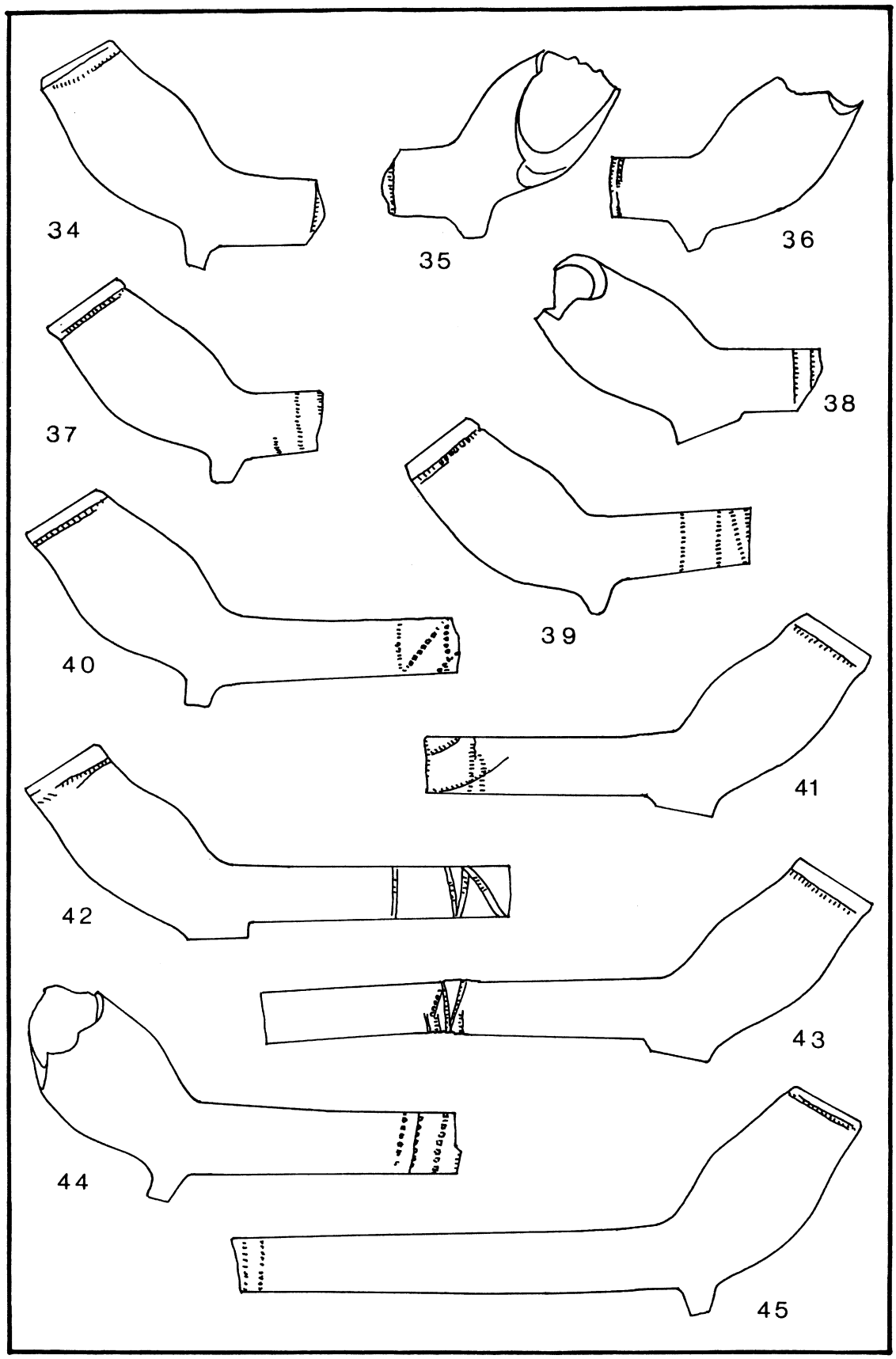


Figure 6 Gloucester Quay Street, tobacco pipes with milled decoration on the stem, actual size

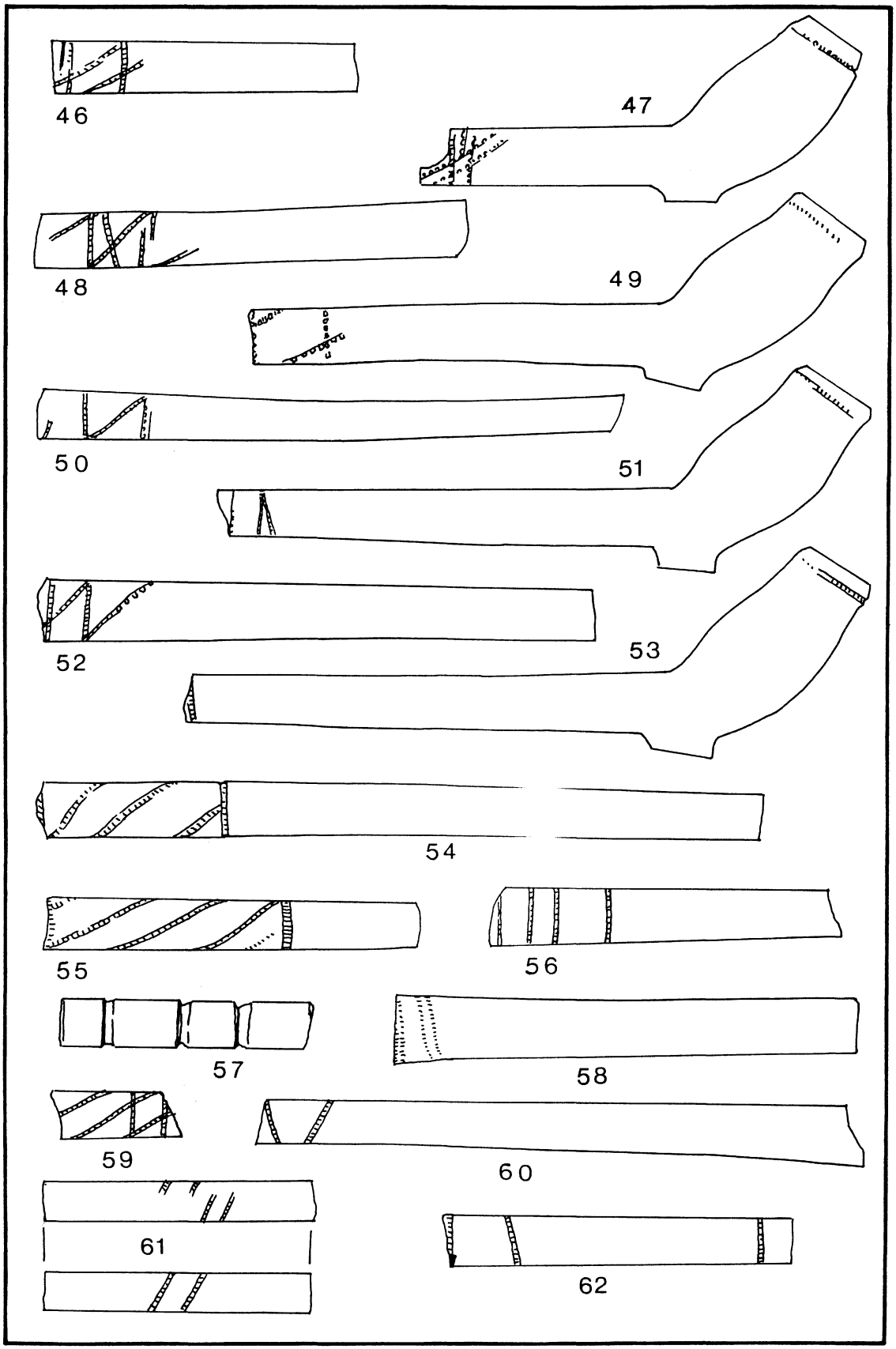


Figure 7 Gloucester Quay Street, tobacco pipes and stem fragments with milled decoration, actual size.

Figure 8 Gloucester Quay Street, tobacco pipes and stems, actual size.

63-4 Stem tips with milled decoration, stem bores 7/64".

65 Stem fragment with alternating pinched decoration, stem bore 7/64ths.

66 Stem fragment with alternating pinched decoration and milling, stem bore 7/64ths.

67 Stem tip with alternating pinched decoration, stem bore 7/64ths.

68-9 Pipes with un-trimmed seams, stem bores 7/64".

70 Pipe with un-trimmed seams and punctured bowl, stem bore 7/64".

71-3 Residual pipes from layer (11), stem bores 1/8", 7/64" & 7/64 " respectively.

74 Layer (15), Broseley Type 2 heel fragment, stem bore 7/64".

75 Layer (15), Broseley Type 2, Mark TC, stem bore 7/64".

76-7 Layer (15), Residual pipes, stem bores 7/64".

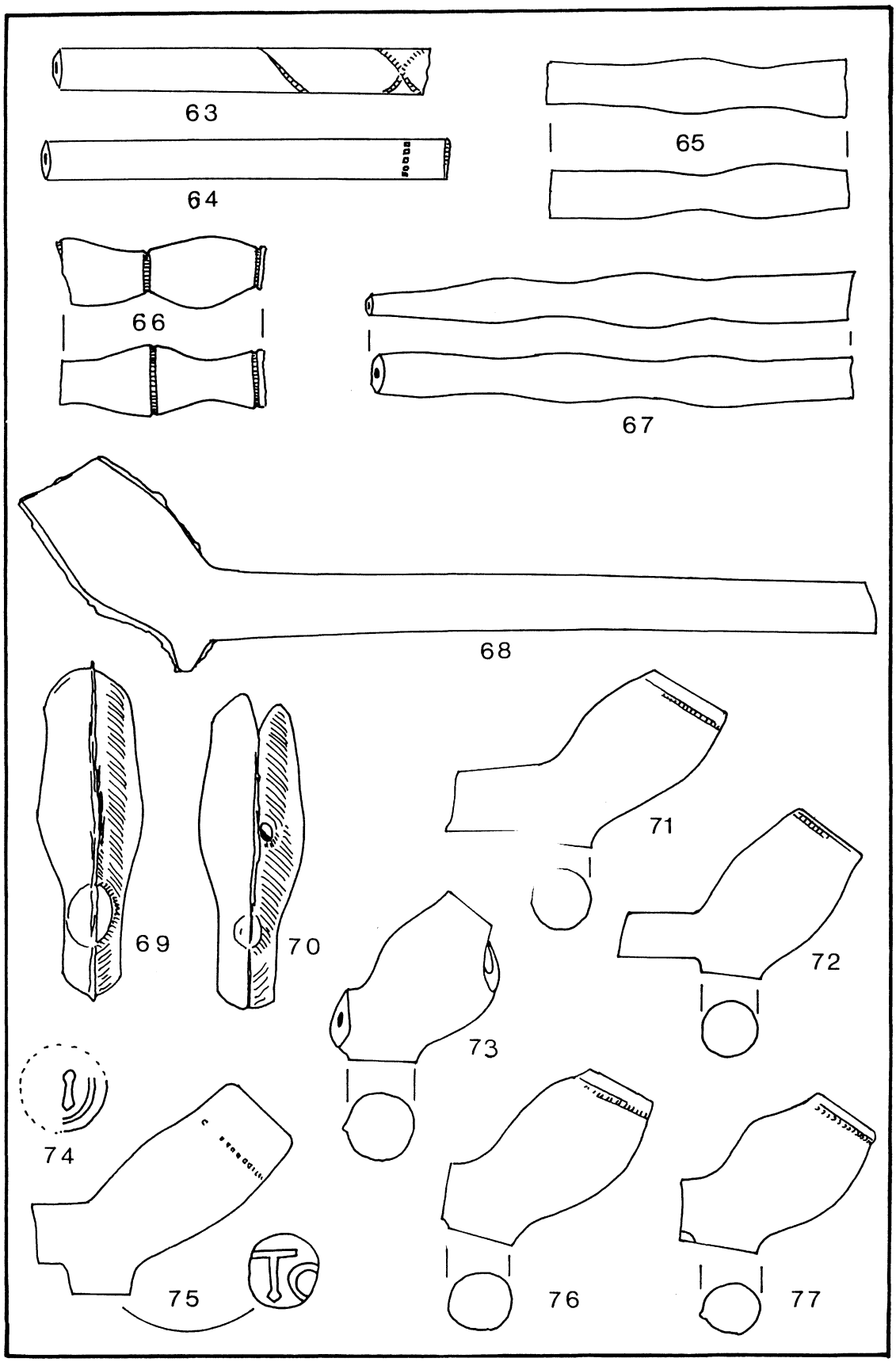


Figure 8 Gloucester Quay Street, tobacco pipes and stems, actual size.

Figure 9 Gloucester Quay Street, tobacco pipes, actual size.

78 Layer (15), Broseley Type 2, mark MD, stem bore 6/64".

79 Layer (13), Type G1, stem bore 7/64".

80 Layer (13), Type G1, stem bore 1/8".

81 Layer (17), Type G1, stem bore 9/64".

82 Layer (17), Type G1, stem bore 1/8".

83 Layer (17), Type G1, stem bore 7/64".

84 Layer (1), Type G1, stem bore 7/64".

85 Layer (1), Broseley Type 2, Mark TC, stem bore 7/64".

86 Layer (2), Bristol Type, Mark EL, stem bore 1/8".

87 Layer (5), Type G2, Mark H, stem bore 7/64".

88 Layer (5), Broseley Type 2, Mark illegible.

89 Layer (5) This pipe is similar in bowl form to certain Herefordshire types [Peacey 1985, M8.A8, F, G & J] except for the spur, which, at this period, is rarely found. The ovoid form coupled with the low band of milling are diagnostic. Stem bore 7/64"

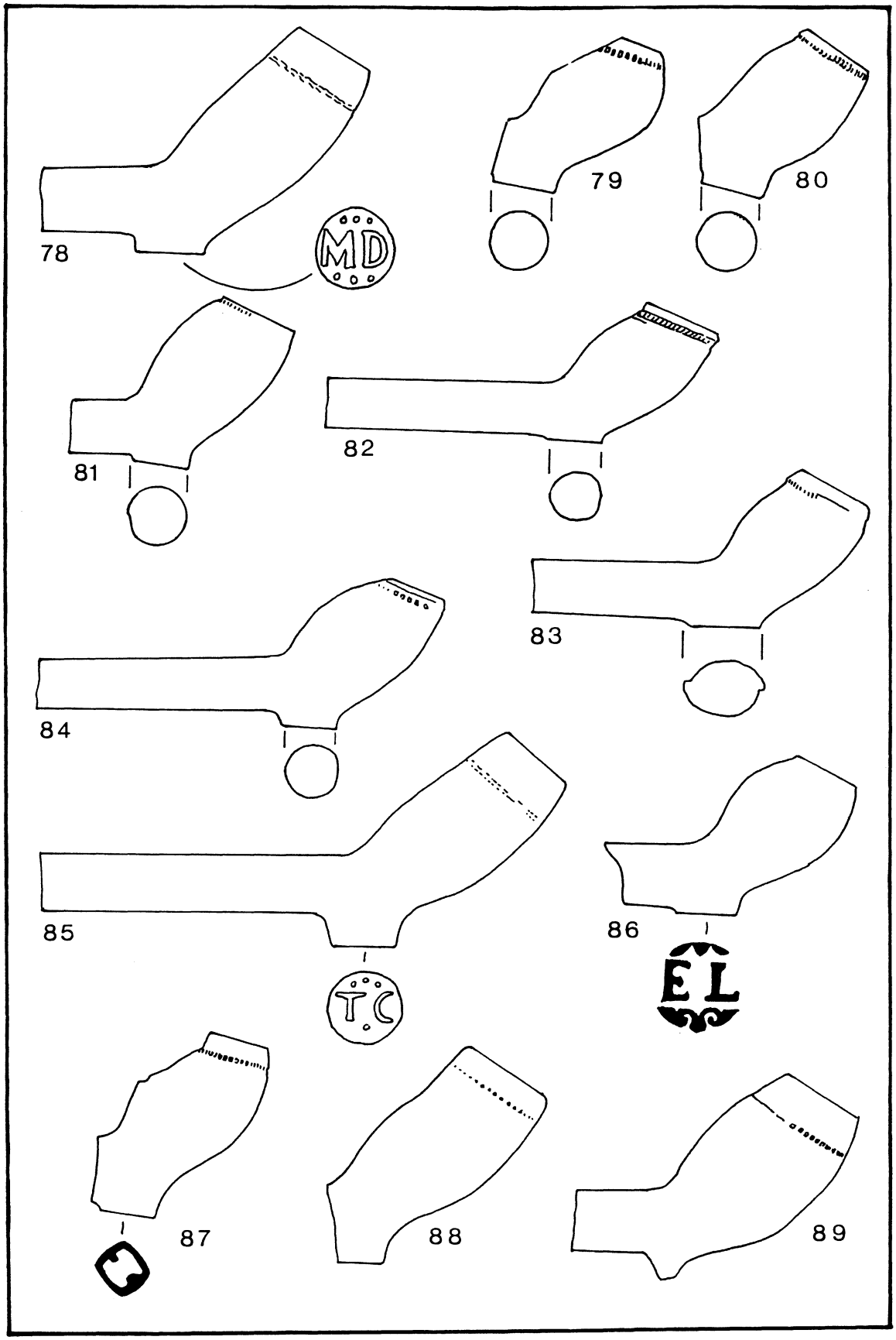


Figure 9 Gloucester Quay Street, tobacco pipes, actual size.

Figure 10 Gloucester Quay Street, tobacco pipes, actual size.

90 Layer (5), Type G1, stem bore 7/64".

91 Layer (5), Type G1.

92 Layer (5), Type G1, stem bore 7/64".

93 Layer (5), Type G1, stem bore 7/64".

94 Layer (5), Type G1, stem bore 7/64".

95 Layer (5), Type G1.

96 Layer (5), Type G2, stem bore 7/64".

97 Layer (5), Type G14, stem bore 4/64".

98 Layer (9), Broseley type 2, Mark CP, stem bore 7/64".

99 Layer (3), Type G17, stem bore 5/64".

100 Layer (6), stem bore 6/64."

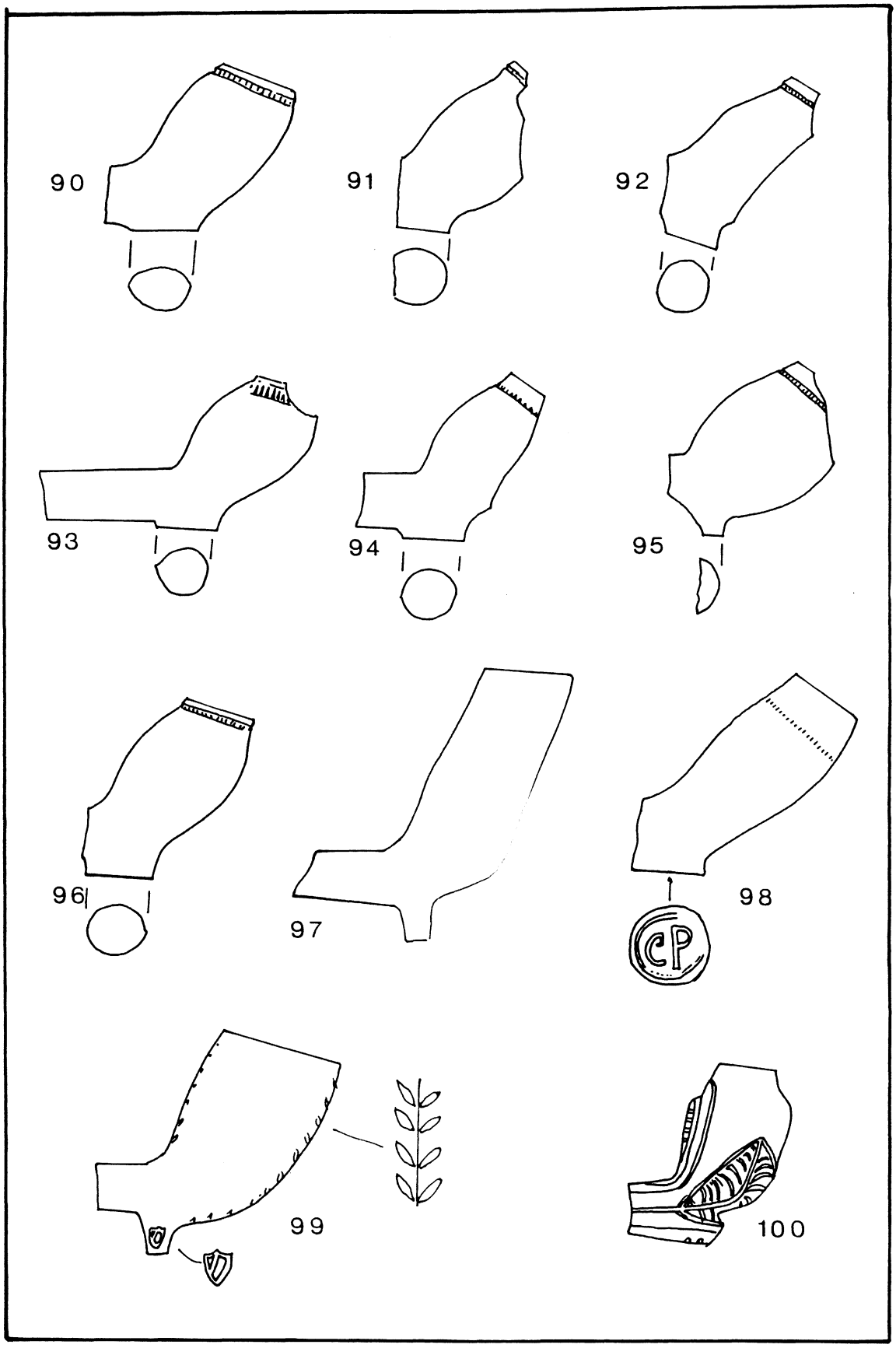


Figure 10 Gloucester Quay Street, tobacco pipes, actual size.

Kiln Fabric and Furniture.

The excavation produced a little over 40kg of muffle fragments together with 2kg of furnishings. The Gloucester muffle has straight sides with right angle corners. In Figure 11 disconnected base fragments are illustrated, arranged in the most simple possible regular form, that of a square. The base is 100mm in thickness and there is evidence of one hole through this which is shown in the centre. It is of course possible that the base was rectangular and that there was more than one hole passing through it. It is formed from an ill-prepared, predominantly white firing clay, with a rufous speckling of iron rich particles. Only the upper 25mm of the base has any pipe stem content and this is randomly aligned, often breaking through the upper surface. The upturned outer lip is integrally formed. Into this lip pipe stems have been inserted vertically at c. 25mm centres and left projecting to key into the later formed wall. The outside of the base is punctuated by voids of sub-circular section c. 35mm diameter reducing in size towards the interior. As none are complete, it is not possible to discover whether they terminate or form continuous airways. Slagging on the outside of the base is in patches, other areas being merely discoloured. The underside survives in minimal quantity, none of which is slagged.

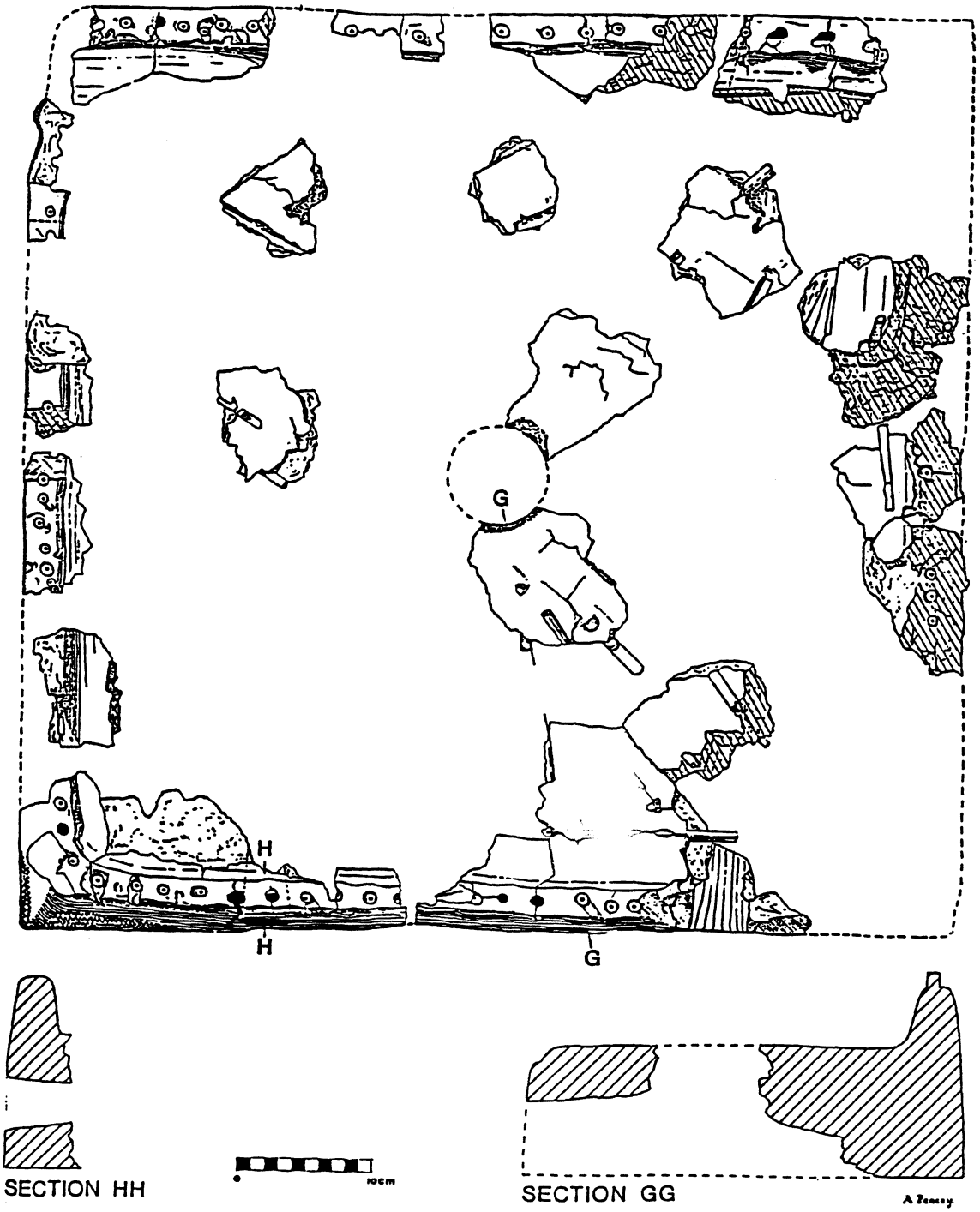


Figure 11 Plan and Section of Muffle from Quay Street, Gloucester.

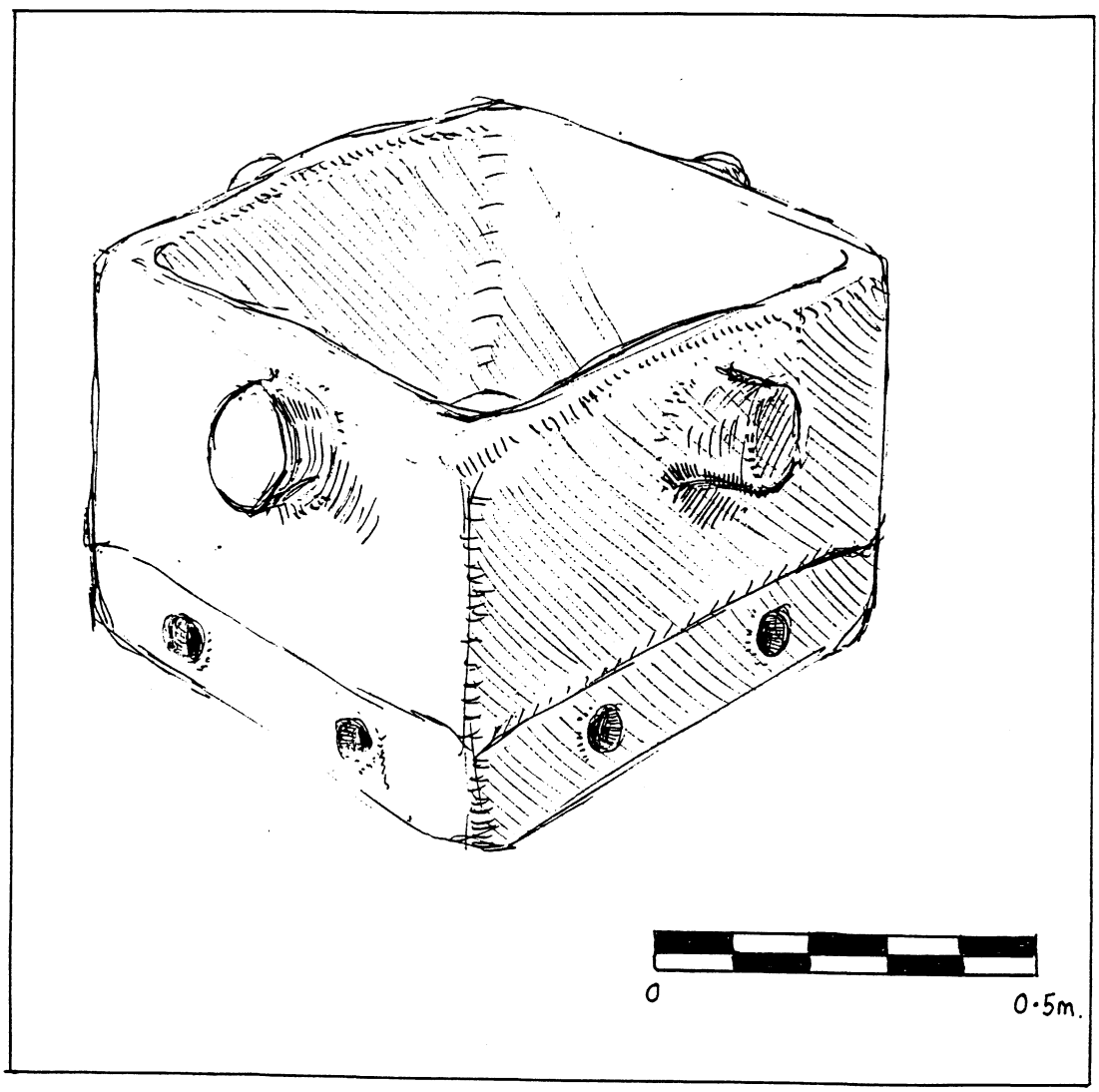


Figure 12 Sketch representation based on the Gloucester evidence.

The largest reassembled section of muffle wall measures 310mm in height and between 220mm and 350mm in width. The thickness measures 60mm at the junction with the base and 30mm at the rim. The external surface is variably discoloured and slagged with the heaviest slagging towards the top. There are no external projections. The inner surface is covered with a number of layers of white slip wash. The wall has vertically aligned pipe stems included within it and has been formed in a number of stages of differing heights. Each stage has a rounded rim with pipe stems passing through connecting the stages. It is not possible to determine the original height of the wall only that it was not less than 450mm from the lower surface of the base. Only one prop type buttress survives, of sub-circular section 90mm in diameter, formed to bridge a flue space of 100mm width between two flat surfaces [Figure 15a-b]. Included within the matrix of this buttress are pipe stems and bowls of Gloucester Type 4 dated to the period 1670-1700 [Peacey 1979, 46]. A sketch reconstruction of the Gloucester muffle is included above [Figure 12].

All of the furnishings recovered are of hollow or pierced form some of which display signs of fire passage on inner surfaces. This, together with the slagged aperture through the muffle base suggests a type of tube muffle concept where, in addition to the fire passing around the muffle, a certain part of it is directed to tubes passing through the muffle interior. In the specific case of the Quay Street muffle these tubes appear to have also acted as props to support the charge of pipes within the chamber. The assemblage includes one prop with a lobed top [Figure 13a-b], the base from a tapered prop with fire damaged interior [Figure 13c], four rims or bases and one body

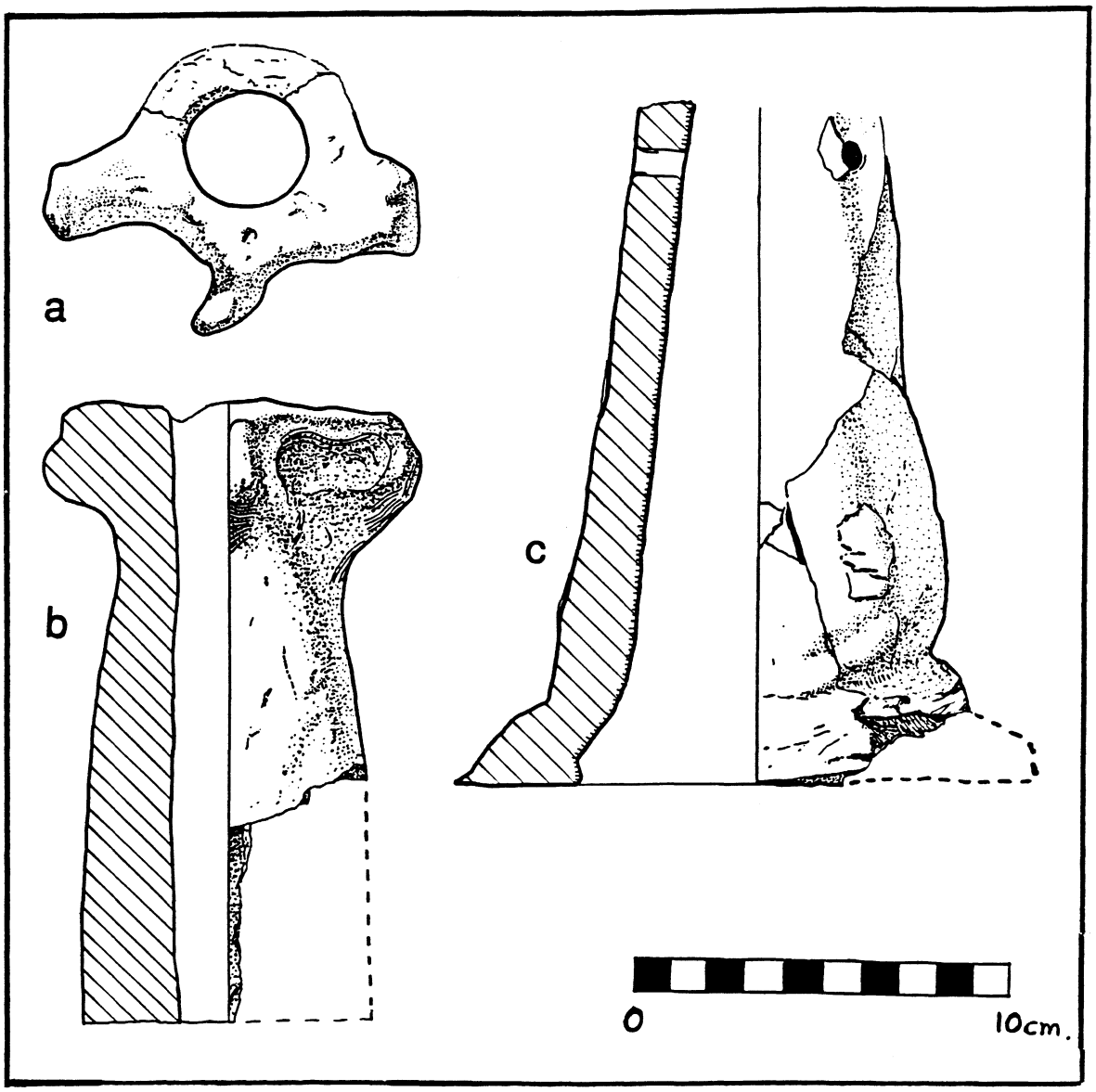


Figure 13 Hollow props, a/b with indented top, c with clear indications of fire passage on inner surface.

fragment also from tubular forms [Figure 15c-g]. None of these prop type forms has a complete profile. The assemblage also includes two lobed buns [Figure 14a-b] and a ring bun [Figure 14c]. There is no contemporary description of any such items or the practices surrounding their use. The objects must speak for themselves. There is, however, comparable artefactual data from later periods, supported by contemporary documentation, for which these Quay Street objects might reasonably be seen as forerunners. In the light of this data the objects under consideration fit easily into the role of prop and bun combinations around which the pipes could have been stacked for the firing process. In view of the number of items recovered it seems likely that either tiered stacking or more than one focus in a horizontal plane are represented. This later concept might involve a muffle of rectangular rather than square plan with two or more apertures through the base over which the tube props surrounded by their stacks of pipes might be placed [Figure 16k].

A number of angled lining fragments, three of which are illustrated [Figure 16h-j], may reflect repairs to the muffle. The outer surfaces of these fragments are clearly formed against existing surfaces whilst the inner, which display the marks of smoothing fingers, have patches of layered lute. These infill fragments may reflect repairs, strengthening, re-profiling or even accidental accumulation of material as result of work on the walls above. The 5.68kg of daubed lining and the 6.24kg of daub fragments recovered probably derive from temporary closure of the muffle top or any side opening if present.

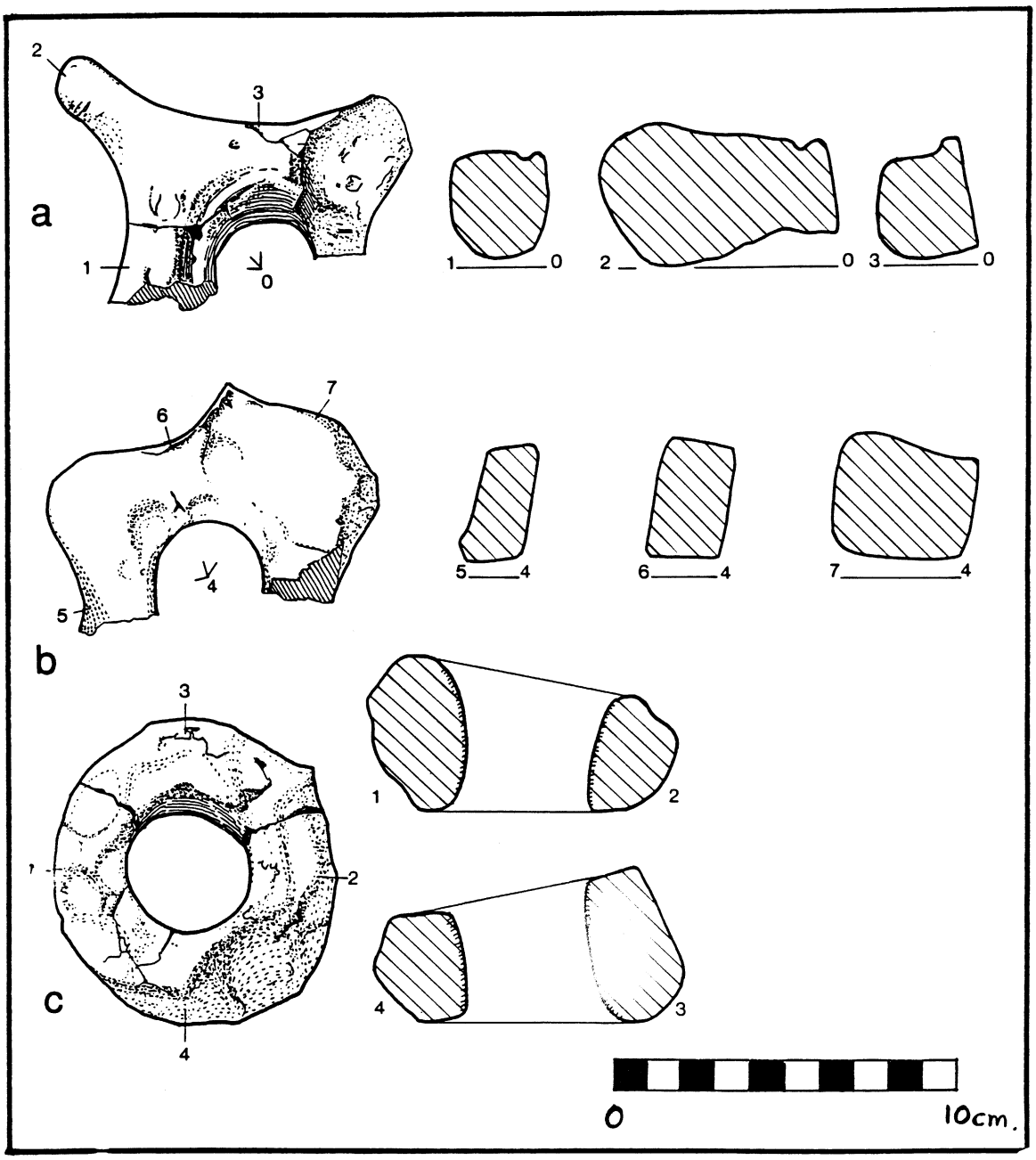


Figure 14 Buns, a-b hollow indented, c "doughnut" with fire damaged inner surface.

Over 19kg of red brick and nearly 9kg of roofing tile were recovered from the kiln dump contexts. Many pieces of the brick are encrusted with slag and in some cases overfired to a black pumiceous state. These are clearly from the fire box area. One brick fragment, fused to a muffle base fragment, indicates brick muffle supports as at Portsmouth [Fox & Barton 1986, 69-71].

Figure 15 Gloucester Quay Street, structural fragments and furniture, scale ½.

a & b Vertical sections through muffle prop showing included pipe and stems.

c & d Fragments from tubular vessels, possibly props.

e-g Fragments from tubular vessels, posssibly props with indications of fire passage through their interiors.

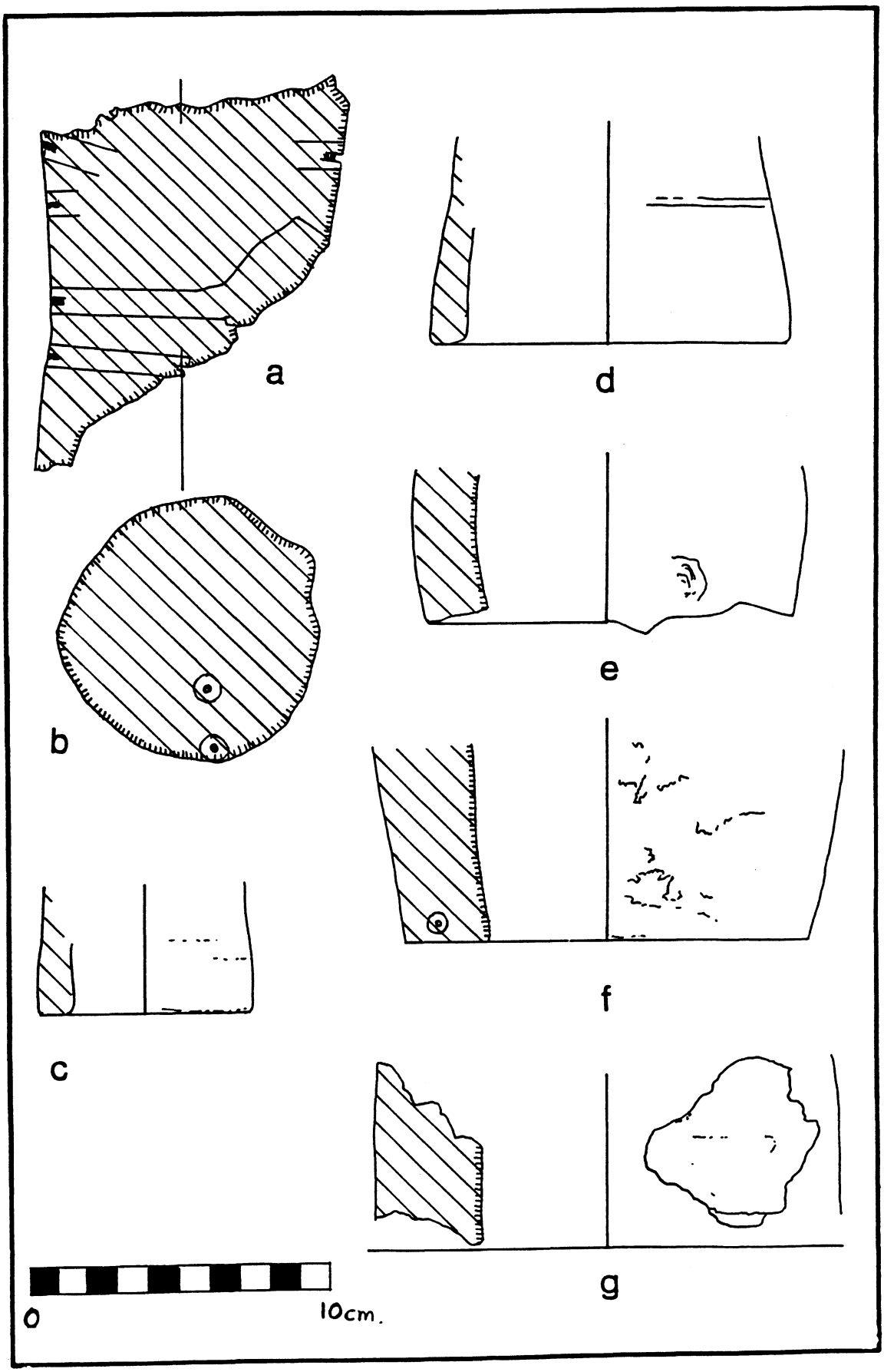


Figure 15 Gloucester Quay Street, structural fragments and furniture, scale ½.

Figure 16 Gloucester Quay Street, structural fragments, scale ½.
sketch reconstruction not to scale.

h-j Angled lining fragments. All have luted inner surfaces. Outer surfaces reflect the parent body.

k Illustration of the tube muffle principle which appears to have been applied to the firing of tobacco pipes at Quay Street. This is not a reconstruction of the kiln. The evidence is isufficient for this. A reconstruction, based on the evidence, interpreted in its most simple form is shown in Chapter 4; Figure 9. Because the number of prop fragments recovered invite the suggestion of more than one tube, this illustration includes two.

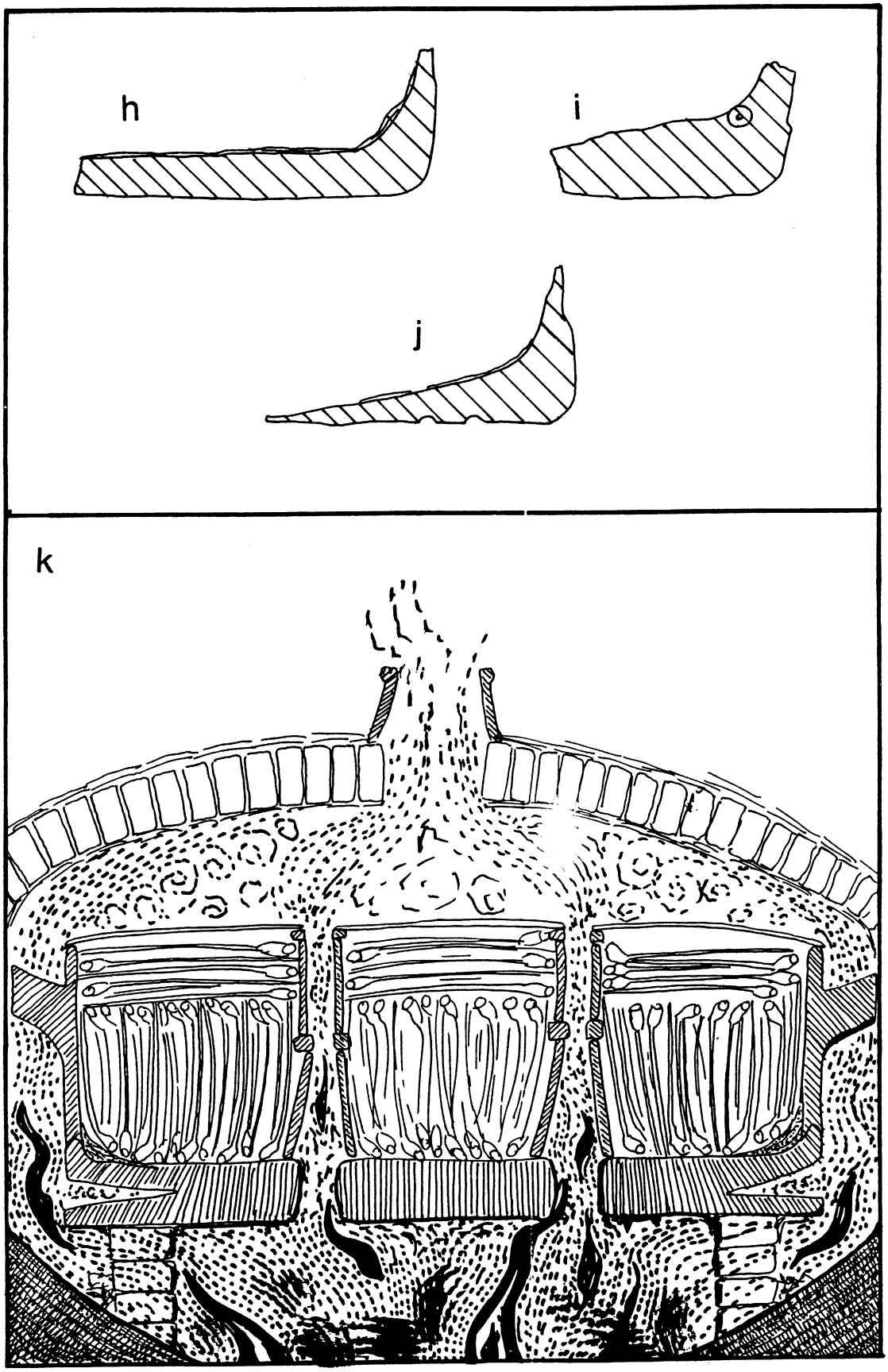


Figure 16 Gloucester Quay Street, h-j structural fragments, scale ½;
k diagram illustrating the tube muffle principle, not to scale.

Discussion.

The importance of this assemblage lies in two main aspects. Firstly, it provides sufficient detail of a rectilinear muffle to allow a plausible reconstruction. Odd angled fragments of muffle material from Winchester, Chester and Rainford had previously pointed to the existence of non circular muffles. Secondly, it includes an unparalleled range of furniture from a secure seventeenth century context. There is a paucity of evidence for furniture design and development prior to the nineteenth century. This group proves the existence of established forms prior to 1690. The indications of fire passage through the centre of props points towards the tube muffle concept; an idea which appears to have been abandoned by later pipemakers. Possibly the industry was still in a formative state at this time displaying greater diversity than the conservative state indicated by the nineteenth century evidence. Broadly contemporary kilns from Chard, Portsmouth and Southwark all have circular open topped muffles with regular rib or prop buttressing. These sites however, broadly linked by the coastal trade in pipe clay, from the beginnings of the trade, may reflect influence or spread of men and knowledge from the seat of control; the London based Company. None of the three sites mentioned furnish evidence of furniture whilst two have no significant muffle base material. Given the random survival of material it is unwise to overstate the significance of negative evidence. Clearly much more research is needed before kiln developments of the seventeenth and eighteenth centuries are fully appreciated. This research is dependant on the excavation of suitable sites which in the absence of a funded program must rely on chance discovery in the van of urban development.

C A T A L O G U E

GL2 GLOUCESTER, QUAY STREET, GLOS. SO 827 187

Gloucester City Excavation Unit 28/79

Excavated by the author in the winter of 1979/80. This material represents a contemporary dump of pipes and kiln material from the last quarter of the seventeenth century. The pipes produced are of Gloucester types G4 and G8 dated 1670-1700 [Peacey 1979, 46-9]. The muffle material is from a rectilinear design and furniture with flash glaze deposits on inner surfaces suggests a tube muffle concept.

Fabric1	27312	143	Muffle wall
W.QMP	11696	32	Muffle base
	830	2	Muffle prop
	4227	74	Core fragment
	105	3	Daubed lining
	650	1	P1a Prop
	747	4	P Hollow prop fragment
Fabric 2	19245	75	Brick
R.QM	8735	73	Tile
Fabric 3	165	7	Layered lute
W.	19671	1748	Pipe bowls
	435	2bag	Bowl fragments
	1500	1bag	Bowl & clay fragments
	2400	1bag	Mouth pieces
	406	118	Rouletted stems
	10	5	Pinched stems
	24220	11bag	Stem fragments
Fabric 4	240	1	Muffle wall
W.QO	152	3	WA2 Rim wad
	75	1	Base angle lining
	5680	226	Daubed lining
	6238	600	Daub fragments
	70	2	Daub with bowl mouth impressions
	132	1	BU1a Indented bun
Fabric 5	195	1	BU1a Indented bun
W.Q	265	1	BU4a Bun
Fabric 6	190	1	Base angle lining
W.? vitrified	85	2	Daub

Fabric 1 & 3 W.QMP & W.	1520	111	Base angle lining
Fabric 1 & 2 W.QMP & R.QM	400	1	Muffle fragment fused to brick support
Miscellaneous	70	1bag	Raw pipe clay
	157	1bag	Coal
	130	4	Slag
	125	6	Pottery
	10	1	Iron

This catalogue entry is taken from the National Survey of pipe kiln assemblages [Peacey forthcoming].The letter codes shown beneath the fabric types in the first column identify basic clay colour and inclusions. The codes used are:- W. White or light coloured clay
R. Red clay Q Quartz M Other mineral grits
P Crushed pipe grog O Voiding indicative of organic stuffing

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