

THE DEVELOPMENT OF THE CLAY TOBACCO PIPE KILN IN THE BRITISH ISLES

Volume II

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy by Allan Arthur Peacey.

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CONTENTS

Volume II

List of figures.

Conclusion

I-VI

Appendix 1	Catalogue	411
2	The Watkinson "Journal"	493
3	New evidence for the dating of the Robinson Account	508
4	Gloucester, Quay Street Pipe Kiln Dump	512
5	Clay tobacco pipe kilns from Waterford	537
6	Clay tobacco pipes and kiln material from Moulsham Street, Chelmsford	549
7	Trial excavations on the site of a tobacco pipe workshop at Pipe Aston, Herefordshire.	559
8	Duhamel du Monceau: description of the small kiln from Rouen.	574
9	Model making to solve problems	579
10	A muffle kiln from Breda, Holland	590
Glossary		596
Bibliography		604

List of figures.

Volume II

- Figure 100 The Watkinson 'Journal'; facsimile of the original manuscript with sketches. 504
- Figure 101 Sketches by Watkinson: 'Clay soaking trough and block'; 'Rolling stems, wiring, moulding'. 505
- Figure 102 Sketches by Watkinson: 'Trimming, drying'; 'Kiln, tipping'. 506
- Figure 103 Sketch by Watkinson: 'Toll bar and Old Pipe Cart' 507
- Figure 104 Facsimile of C P Robinson's account c. 1884-9. 510
- Figure 105 Facsimile of C P Robinson's account c. 1884-9. 511
- Figure 106A 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. 514
- Figure 107 Plan and sections of kiln waste deposit. 516
- Figure 108 Gloucester Quay Street, tobacco pipes, heeled forms, actual size. 520

- Figure 109 Gloucester Quay Street, tobacco pipes, 9 with heel, 10-15 with spur, 16-18 from other production centres, actual size. 521
- Figure 110 Gloucester Quay Street, tobacco pipes with milled decoration on the stem, actual size. 522
- Figure 111 Gloucester Quay Street, tobacco pipes with milled decoration on the stem, actual size 523
- Figure 112 Gloucester Quay Street, tobacco pipes and stem fragments with milled decoration, actual size. 524
- Figure 113 Gloucester Quay Street, tobacco pipes and stems, actual size. 526
- Figure 114 Gloucester Quay Street, tobacco pipes, actual size. 528
- Figure 115 Gloucester Quay Street, tobacco pipes, actual size. 530
- Figure 116 Gloucester Quay Street, structural fragments, $\frac{1}{2}$ size. 534
- Figure 117 Gloucester Quay Street, h-j structural fragments, scale $\frac{1}{2}$; k diagram illustrating the tube muffle principle, not to scale. 535
- Figure 118 Olaf Street, Waterford, E434 Area III plan No 2 Pre-excavation plan of clay pipe kiln. 21.1.88 539

Figure 119	Suggested use of saggar rings within the muffle. Not to scale.	544
Figure 120	Chelmsford, Moulsham Street, tobacco pipes, actual size.	551
Figure 121	Chelmsford, Moulsham Street, muffle details: h muffle prop buttress, i muffle rim, k muffle base edge, scale $\frac{1}{2}$.	555
Figure 122	Chelmsford, Moulsham Street, Type 1 prop, Scale $\frac{1}{2}$.	557
Figure 123	A location of Pipe Aston; B position of excavation; C trench layout.	561
Figure 124	Pipe Aston, tobacco pipes, actual size.	567
Figure 125	Pipe Aston, tobacco pipes, actual size.	569
Figure 126	Pipe Aston, tobacco pipes, actual size.	571
Figure 127	Model based on the evidence from Arcadia Buildings, Southwark [see Appendix 2].	580

Figure 128 a Life size model of the Bristol tipping muffle; b muffle base model using the Gloucester, Quay Street evidence; c model showing how the Gloucester muffle might have looked with walls and sparsely spaced buttressing; d & e reconstruction of the Chelmsford, Moulsham Street prop; d & f prop and bun based on Stamford examples. 582

Figure 129 Ground plan of the Breda kiln after Carmiggelt et al. 594

Figure 130 Photograph of the Breda kiln taken from above the stoking pit with the brick trough at the farther end of the flue ash pit. 595

CONCLUSION

Archaeological material, derived from pipe kiln sites and associated dumps, has been recorded from collections throughout the British Isles. Contemporary descriptions of pipe kilns and processes surrounding their use have also been consulted. Using these and the author's own experience as a practising ceramicist the archaeological material has been divided and catalogued according to function and location within the kiln structure. A terminology has been established to facilitate identification and recording of similar material as it becomes available. A recognisable pattern of evolution runs through the collected data with a small number of aberrant forms also recorded. A far greater body of evidence is required before the geographical or chronological significance of these atypical assemblages can be assessed with any certainty. Set out in the following pages, under the main category headings, are abstracts of the findings followed by indexes to the main text.

Muffles

Muffles appear to have been adopted from as early as 1612 [Pages 294-5]. The common form to the end of the seventeenth century was that of a circular vessel with external prop type buttresses [Pages 63-69]. Atypical forms have been encountered at Gloucester, North Herefordshire, Shropshire, Cheshire and Merseyside suggesting little direct

contact with the London based Company [Pages 303-5]. Although eighteenth century material is scarce it is clear that radical developments took place culminating in a developed type of greater height displaying both external buttresses and internal peripheral shelves [Pages 306-7]. Muffles from the nineteenth century are remarkably consistent; tall, cylindrical, tapering wall from base to rim, combined step and cornice type peripheral shelving, open top with additional side access and bar type buttresses [Pages 77-82].

Muffle:-

Definition - 39-40. Features of - 40-42. Catalogue categories - 43-46. Table of sites; alphabetical - 47-51, chronological - 297-301. Significant assemblages - 52-83. Contemporary descriptions of; 19th C. English - 274-89; 18th C. French - 290-4. Data analysis and discussion - 297-310. Italian antecedent - 390-3.

Furniture

The earliest recorded furniture associated with tobacco pipe making [Type 1 saggars from Barnstaple dated by pipe typology 1610-30] was used in a kiln not specifically designed for pipe production [Pages 125-7]. True pipe kiln furniture makes its first appearance in the last quarter of the seventeenth century [Pages 95, 97 & 314]. The furniture typologies were created to aid cataloguing and manipulation of accumulated data. Although paucity of data prevents firm conclusions some patterns have emerged which appear to have

chronological significance. Non stacking type 1 props clearly relate to muffles without peripheral shelves. They have been recorded from the period 1670-1710 and are unlikely to occur after 1725 [Page 367]. Dishes occur in later nineteenth and twentieth century assemblages dated between 1870 and 1950 [Pages 313-4]. These appear to be associated with exaggerated stem length. A similar case exists for saggars types 2 and 3. Type 1 saggars reappear in the second half of the nineteenth century with the adoption of open flame kilns. Although stray fragments occur earlier they are invariably from unsafe contexts contaminated with waste from pottery production.

Furniture:-

General definition - 84. Table of sites; alphabetical - 87-90; chronological - 311-4.

Prop:- Definition - 85. Typology - 92. Significant assemblages - 95-106, 121-2. Contemporary descriptions - 278, 279, 281, 286-7, 292. Discussion - 314-17.

Bun:- Definition - 85. Typology - 93. Significant assemblages - 106-14, 121-2. Contemporary descriptions - 278, 279, 286-7. Discussion - 317-9.

Dish:- Definition - 85. Typology - 93. Significant assemblages - 115-22. Contemporary descriptions - 286-7. Discussion - 319.

Saggars:- Definition - 39, 86. Typology - 94. Significant assemblages - 123-33, 136-8. Contemporary descriptions - 285-7, 292. Discussion - 320-25.

Bat:- Definition - 86. Typology - 94. Significant assemblages - 132-5. Discussion - 325-8.

Furniture supplement

The evolution of furniture supplements is linked closely with that of furniture. With the increased quantity and diversity of furniture in the nineteenth century there is a corresponding increase in the quantity and diversity of supplements. As wads type 3 and 5 were used with stacking props their occurrence at Rainford prior to 1760 and 1770 respectively provide useful earlier dates for these objects than is apparent from the tabulated furniture data [329 & 312].

Furniture supplement:-

General definition - 139-40. Table of sites; alphabetical - 145-9, chronological - 328-33. Fabrics - 333-4.

Roll:- Definition and typology - 140-1. Significant assemblages - 151-4, 179-80. Discussion - 335-6.

Strap:- Definition and typology - 141. Significant assemblages - 153-4, 179-80. Discussion - 336.

Wad:- Definition and typology - 141-2. Significant assemblages - 155-6, 179-80. Discussion - 336-7.

Applied strip:- Definition and typology - 142. Significant assemblages - 157-60, 179-80. Discussion - 337.

Thin sheet:- Definition and typology - 143. Significant assemblages - 161-4, 167-8, 179-80. Contemporary descriptions - 278, 286. Discussion - 338-44.

Rack:- Definition and typology - 143-4. Significant assemblages - 165-72. Discussion - 352.

Miscellany and waste:-

A number of unexpected objects and categories of waste product emerged as recording progressed. These include waste clay from the manufacturing process in the form of trimming rings and seam trimmings preserved by firing. The former may have served a secondary function as test pieces whilst preservation of the latter almost certainly results from accidental entry to the firing chamber. Waste arising from the firing process includes pipes with transverse squatting and various slag laminates. The former indicate orientation of product within the chamber whilst the latter derive from temporary covers over muffles. Miscellany includes candle holders and a lamp used inside the chamber to facilitate packing; a pipemakers stamp from Chard; various small objects possibly parts of figurines or ornaments; plugs, a damper plate and door slabs all relating to kiln superstructures; fragments from several tipping muffles used for glazing stem tips after removal from the pipekiln.

Trimming rings:- Significant assemblages - 175-8, 181-2. Discussion - 374-5.

Seam trimmings:- Significant assemblages - 181-4. Discussion - 374-5.

Waste pipes:- Significant assemblages - 183. Discussion - 367.

Slag laminates:- Definition and typology - 191-2. Significant assemblages - Table of sites; alphabetical - 192-3, chronological - 349-50. Significant assemblages - 195-6. Discussion - 344-52.

Candle holders and lamp:- Significant assemblages - 173-4, 184-5.

Pipemakers stamp:- Description 181-2

Miscellaneous objects - Description 181-2.

Plugs, damper plate and door slabs:- Significant assemblages - 187-8.

Tipping muffle:- Description - 189-91. Discussion - 375-88.

Ground plans

Of the nineteen plans recorded, thirteen, covering the period 1680 to 1919, show remarkable consistency. All have a stoking pit and flue ash pit cut into existing ground levels. Eleven of these had circular muffles set in rectangular brick structures. All were of updraught design with a single firemouth. Of the remaining six plans one is single fire, updraught, open flame with massive circular foundations suggestive of tall bottle design, four are multi-fire, open flame, circular, updraught, the remaining kiln was constructed as a multi-fire, updraught, open flame and later converted to downdraught with the addition of a freestanding chimney. Although it is impossible to be precise about the construction dates of these open flame kilns none are likely to be earlier than 1850.

Ground plans - 197-234. Discussion - 352-3.

Superstructures

Parts of the superstructures of two nineteenth century kilns survive intact at the time of writing. Both are constructed from conventional building materials, predominantly brick. That from Lewes probably dating from the eighteen thirties was a single fire, updraught, muffle kiln built into an end wall of the workshop. The second surviving kiln, at Broseley, probably built in the eighteen eighties, is a freestanding kiln. Construction plans and photographs from the nineteenth century show superstructures of pipekilns which are unlikely to differ greatly from those of earlier periods.

Superstructures - 235-267. Discussion - 353-366.

APPENDIX 1

CATALOGUE

The catalogue serves two major functions; as a gazetteer of all sites from which either structure or artefactual material relating to tobacco pipe kilns has been reported; secondly as a record of such artefactual material. A full discussion of the recording system and the way that the catalogue entry is condensed from the record sheets is included in Chapter 3. The entry opens with a code number specific to this survey by which all records, drawings and photographs are identified. There follows the site address, below which is the name of the museum, unit or other place where the material is held. Where possible an accession number is included. On the extreme right is the National Grid Reference for the site to as high a degree of accuracy as available information allows. There follows a brief qualification of the assemblage which records whether the material is an excavated group; a recovered group; a casual find or other. Any information concerning the maker or makers of marked pipes included in the assemblage or documented occupation of the site by pipemakers is also included.

The tabulated entry is split according to fabric type and listed in order of the catalogue hierarchy. The first column of figures is the total weight [in grams] of material in each category. The second

column of figures is the number of fragments or objects that yield this weight. In the final column is the category description. Where this is followed by a ? this means that the identification is in doubt. Furniture items are given a number from the respective typology. Where the letter prefix, identifying a group of objects, is not followed by a number identifying the type, this simply means that the fragment or fragments recorded have no specific diagnostic features to distinguish types within the group. Where the abbreviation NA appears in the first column of figures the object or objects has not been weighed. Where the word bag follows a number in the second column of figures this denotes the number of bags of material rather than the number of individual fragments.

Other abbreviations used in the catalogue are:-

ext external

frag fragment

imps impressions

inc incomplete

int internal

NI Northern Ireland

no number

obj object

Catalogue Hierarchy

Muffle

Muffle: wall/base/prop/bar

Peripheral shelf

Core fragment

Stems/bowls/mouthpieces from matrix

Wig curler in matrix

Layered/flaked lute

Lining patch

Furniture

Prop

Bun

Dish

Saggar/wall/base

Bat

Roll

Strap

Wad

Thin Sheet: flat/rolled/folded edge/strip

Variable sheet

Rack end

Clay with bowl mouth impressions

Access

Wicket: Shelf/wad/brick/tile

Door with spy hole

Plug Concentric plug

Muffle cover &	Stem slag laminate
flue lining	Thin sheet, stem, slag laminate
	Stem & slag
	Bowl & slag
	Corner infill
	Ridge
	Brick & slag
	Clay formed against bricks
	Composite support
Miscellaneous	Shaped section Wedge section
	Stem/bowl/wasters
	Glazed mouthpiece
	Stamp
	Knob
	Clay as mortar
	Rounded clay pellets
	Tipping muffle
	Clay slate sandwich
	Daub squeezes
	Brick or bar
	Fire brick Red brick
	Cylinder/pipe
	Trimming ring?
	Raw pipe clay
	Coal Coke Charcoal Slag
	Dish setter

Pottery Shell Glass Stone Chalk

Lime mortar Ash & clay mortar

Iron Bone Wood

Amorphous fragment

Slagged detritus Mixed detritus

C A T A L O G U E

AL1 ALDERHOLT, DORSET

SU 130 125

Verwood & District Potteries Trust

Field walking in February 1992 recovered material from a pipe kiln muffle. The majority of the pipes recovered are reported to be from the late seventeenth century though there are also some early eighteenth century examples. A trial excavation on the site is planned for the Autumn of 1992. This author has not yet had the opportunity to view the material.

AS1 ASHWICK, OAKHILL, SOMERSET.

ST 140 485

Location of finds not known.

The following note was published in 1972. The present whereabouts of the finds is not known. 'Clay-pipe wasters dated 1780-1800 bearing the name WATTS of OAKHILL were recovered near a possible kiln structure'. [Dawson & Jackson 1972]

AT1 ATHELNEY/BOROUGHBRIDGE, SOMERSET.

ST 350 290

Somerset County Museum and A Peacey collection.

Combined here are two unstratified groups of material collected separately in 1967 and 1983. Some of the pipes in both groups are marked G T, attributable to George Tottle who was active between 1851 and 1873. Pipes are known to have been made in the village since 1831 so the kiln material might encompass the broader date range of 1831 to 1873. [Minnitt & Peacey forthcoming]

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1	185	14	WA5 Ring wad
W	207	11	TS1 Flat thin sheet
	310	23	TS2 Rolled thin sheet
	5	1	TS4 Folded edge thin sheet
	10	3	Pipe wasters
	105	3	Clay as mortar
	20	1	Clay & slate sandwich
	415	16	Daub
	65	1	Amorphous fragment
Fabric 2	12	1	TS1 Flat thin sheet
W.O			
Fabric 3	55	1	Amorphous fragment
W.GP			
Fabric 4	160	1	SAG Saggar
W.G			
Miscellaneous	100	1	Coal shale

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

AY1 AYLESBURY, CASTLE STREET, BUCKINGHAMSHIRE			SP 820 140
Buckinghamshire County Museum 526.79			

Excavated in 1979. The date of 1670-90 ascribed to it by the excavator may be a little early and a terminal date of 1710 may be more reasonable. The group is significant in that it contains early examples of thin sheets, a rack end and a large assemblage of muffle material including many prop type muffle buttresses. [Moore 1979]

Fabric 1	16555	99	Muffle wall
W.QO	1119	14	Muffle base
	45	1	RK4 Rack end
Fabric 2	822	5	Muffle wall
W.QO	260	2	Lining patch
Fabric 3	162	7	Bowls from matrix
W.	42	23	TS1 Flat thin sheet
	5	1	Amorphous fragment
Fabric 4	5597	35	Muffle wall
W.MO			
Miscellaneous	inc	inc	Red tile muffle support fused to muffle base fragment

BA1 BARNSTAPLE POTTERS LANE, DEVON			SS 556 334
North Devon District Council Rescue Archaeology Unit 53; 58; 237; 570; 574; 1023			

Unstratified material from an area dominated by potters throughout the seventeenth century. Three round saggars with pipe bowls and stems trapped in glaze pools show that the pipes were fired together with glazed pots. The pipe bowls suggest a date in the region of 1610-1630.

Fabric 1	NA	3	SAG1 Saggars, glaze & pipes
W.M			
Fabric 2	NA	3	Pipe & glaze
W.Q			

BA2 BARNSTAPLE ALEXANDRA ROAD, DEVON			SS 5615 3330
North Devon District Council Rescue Archaeology Unit BAJ.86			

Material from the 1986 excavation on the site of Seldons' short lived tobacco pipe factory which was operating from 1857 to 1865. The group includes saggars, wads, rolls and thin sheets. Unusual objects are folded edge thin sheets and a fragment from a tipping muffle. [Terry 1989]

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1	3604	1101	WA1 Wad
W.	132	28	WA1 Wad pinched
	2	1	WA1 Wad bend
	157	20	WA4 Wad
	30	3	WA5 Wad
	20	1	Wad irregular
	95	7	RL1 Roll
	5	1	RL1 Roll pinched
	71	47	TS1 Flat thin sheet
	126	24	TS4 Folded edge thin sheet
	35	1	Clay as mortar
	261	27	Amorphous fragment
Fabric 2	87	2	WA1 Wad rectangular
W.QM	11	1	RL1 Roll
	25	1	Amorphous fragment
Fabric 3	1399	22	SAG Saggar
W.QG	275	3	SAG4 Saggar rectangular
	72	2	Glaze crucible
Fabric R1	565	100	WA1 Wad
R	144	22	WA1 Wad pinched
	22	4	RL1 Roll
Fabric R2	20	1	WA1 Wad
R/W.M			
Miscellaneous	365	4	Coal
	4880	3bag	Slag
	3945	5	Fire brick

BEL1 BELFAST, WINETAVERN STREET

J 336747

Chance discovery of clay pipe fragments lead to the excavation of the site by the Historic Monuments and Buildings Branch of the Department of the Environment [NI]. The material recovered appears to be debris and wasters from production in the second half of the nineteenth century. Various members of the Hamilton family made pipes in Belfast from 1812 into the present century [Deane 1914, 8]. Although the works was established in Winetavern Street later production moved to Durham Street whilst the original site continued in a retail capacity. Material recovered includes mid to late nineteenth century pipes of many designs, pipe stems embedded in slag, saggar fragments and a four stem rack end.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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BE1 BENTHALL, 11BENTHALL LANE, SALOP
Ironbridge Gorge Museum BE.84

SJ 6639 0196

This group dating from 1660-90, excavated in 1984, contains enough material to permit a plausible reconstruction of a muffle with prop buttresses. There is also a quantity of low fired material which may derive from a lid or cover. [Jones, Higgins & Trueman 1987]

Fabric 1	59	2	Muffle wall
W.O	3311	15 bag	Layered lute
	470	2	Lining patch
	65	1	Amorphous fragment
Fabric 1&2	855	4	Muffle wall
W.O, & W.O			
Fabric 2	652	19	Muffle wall
W.O	1119	9 bag	Layered lute
	390	3	Lining patch
	16	1	WA2 Wad
	45	10	TS1 Flat thin sheet
	141	6	Daub
	2786	62	Cover? chimney?
	792	18	Amorphous fragment
Fabric 3	1192	3	Muffle wall
W.			
Fabric 3,1&2	3370	12	Muffle wall
W., W.O & W.O			
Fabric 4	2912	9	Muffle wall
W. & R.	897	13	Core fragment
	3054	21	Brick
Fabric 5	305	1	Muffle wall
W.MO	1682	3	Muffle base
	115	1	BAT Bat
Fabric 2 or 5	445	2	Muffle wall
W.O or W.MO			
Fabric R1	11223	127	Muffle wall
R.			
Fabric R1&4	485	1	Muffle Prop
R. & W. & R.			
Fabric R2	452	2	Brick
R.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Miscellaneous	9350	53	Assorted core fragments
	1145	4 bag	Stems from matrix
	2200	1 bag	Stone
	3191	10 bag	Mixed detritus

BI1 BIRMINGHAM, MOAT, WEST MIDLANDS SP 070 865
City Museum and Art Gallery

Material of uncertain date from the tip fill of the ditch. [Watts 1979]

Fabric 1	1200	1	Muffle wall
W.O			

Fabric 2	140	2	Muffle wall
W.MO			

BIR1 BIRSTALL, WEST YORKSHIRE SE 225 260
Bagshaw Museum, Batley

A group of finds recovered in the 1960s but deposited in the museum in 1992. Reported to have been dumped material recovered from Musgrave Street, Birstall where it had apparently been used as road hardcore. The assemblage includes pipe stems in slag and a small pipe clay roll. Pipes date the assemblage to the late nineteenth century. This author has not yet had the opportunity to view this group.

BIR2 BIRSTALL, WEST YORKSHIRE SE 225 260
H Brooks, 91a Wellhouse Lane, Mirfiels, W Yorks.

A group recovered in July 1991 from the foundations of a house in Musgrave Street, Birstall, where it had apparently been used as hardcore. Pipes date the assemblage to the late nineteenth century. The assemblage includes slag and pipe stems trapped in slag. This author has not yet had the opportunity to view this group.

BIRT1 BIRTLEY FARM, HEREFORD SO 365 692
J. Griffiths, Birtley

A waste heap of pipe fragments discovered by the late Mr. J. Griffiths Sen. is reported in the transactions of the Woolhope Club for 1931 [Watkins 1931, 133]. A meeting with Mr. Griffiths in 1972 established that he had dug on the site for some weeks but had not found the kiln. Pipes from the site conform to the Herefordshire typology types F and J placing production in the second half of the seventeenth century [Peacey 1985, M8.A8-10]. Marks include wheel stamps and Rose & Crown initialled RO attributable to Richard Overton who is recorded in the parish registers between 1664 and 1667. The collection is currently housed in three wall mounted cases with the pipes wired to a backing sheet. There are many marks

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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additional to those published by Watkins as well as two pieces of kiln furniture. These are irregular trapeziform bats c. 20mm thick, made from a light coloured clay reinforced with pipe stems.

Fabric 1 W.	N/A	2	Trapeziform bat
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BO1 BOSTON, ROSEGARTH STREET, LINCOLNSHIRE P. Wells Collection	TF 326 441
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This material comes from the excavation of a pipemakers workshop carried out in 1967. The material which dates from the middle of the nineteenth century was recovered from the workshop floor, the kiln ash pit and stoke pit. The published report includes a plan of the workshop showing the kiln and a possible stoving or tipping area. [Wells 1970]

Fabric 1 W.	5	1	RL1 Roll with pinched join
	74	16	RL4 serpentine roll
	5	1	WA1 pinched wad
	5	1	WA5 with confronting vessel rim impressions.
	55	10	WA5 ring wad
	5	1	TS1 flat thin sheet
	22	1	RK3 three stem rack end
	27	1	Stem slag laminate
	32	11	Daub squeezes
	N/A	11	Yellow glazed mouthpieces
	N/A	6	Un glazed mouthpieces
Fabric 2 W.O	10	8	TS1 flat thin sheet
	3	1	TS2 Rolled thin sheet
	27	2	TS3 Folded thin sheet
Fabric 3 W.QM	35	1	Muffle wall
Fabric 4 W.	60	1bag	Unfired pipe fragments & rolls
Fabric 5 W.PT	1300	1	P3a prop
	1000	1	DI2 Dish
	362	1	SAG1 saggar
	415	3	BAT1 Bat
	3820	2	Door with spy-hole
Fabric 6 W.MG	1100	1	P3b prop
Fabric 7 W.QM	287	1	Muffle wall
	510	1	Slagged detritus

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
-------------------------	-----------------	-------------------	-------------

Fabric 8 W.MG	1415	2	SAG1 saggarr
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Fabric 9 R.PT	50	1bag	Brick
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BRE1 BRENTFORD, GODDARDS FURNITURE STORE, GREATER LONDON TQ 178 775
Unknown

This group is noted by Alison Laws in the introduction to her report of the excavation of the kiln of William Heath [Laws ^{Oswald} 1981. 15 & 63]. R. G. Lancaster, who collected this material from a pit discovered during building works, recalls flattened rolls or straps and possible muffle fragments. The material has not been traced.

BRE2 BRENTFORD, HIGH STREET, GREATER LONDON TQ 1780 7750
Museum of London

Excavations, by Alison Laws of the Brentford Unit, in 1977 uncovered the unexpected remains of an eighteenth century clay tobacco pipe kiln. Pipes found in the kiln fill link the structure to William Heath who is recorded as a pipemaker from 1730 until his death in January 1764. The pipe evidence supports the scenario that the kiln went out of use between 1760 and 80. Pipes marked MH, from a nearby pit, B55, may be the work of William's widow Mary. The internal diameter of the muffle is calculated at 620mm. [Laws & Oswald 1981, 15-65] The bricks from the kiln structure are stored at the Gunnersbury Park Museum. Although correspondence held at Gunnersbury Park indicate that the remaining material is in the keeping of the Museum of London efforts to trace it have been unsuccessful.

Fabric 1	3800	33	Muffle wall
W.M	4600	22	Muffle base?
	3500	38	Core fragment
	NA	27	Muffle bar buttress
Fabric 2	2790	138	TS1 Thin sheet BM imp
W.?	3240	144	TS1 Thin sheet ST imp
Fabric 3	NA	1	P1 Prop
W.	NA	10	Trimming or test ring?

BRI1 BRISTOL GRAVEL STREET, AVON ST 5876 7340
Bristol Museum and Art Gallery BWF.73A

This group of material was recovered from a building site under difficult conditions and may not be contemporaneous. A single pipe bowl trapped in a piece of muffle wall suggests a late eighteenth century date. The muffle material features peripheral shelf and bar buttresses.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1 W.	25098	21	Muffle wall
Fabric 2 W.O	35	1	Amorphous fragment
Fabric 3 W.	50 20	1 1	Layered lute Bowl & slag
Fabric 4 W.O	55	1	BAT2 Bat
Fabric 5 W.M	270 600	1 1	BU3d Bun BAT2 Bat
Fabric 6 W.M	900	1	SAG1 Saggar

BRI2 BRISTOL LOWER CASTLE STREET, AVON
Bristol Museum and Art Gallery 085.1971

ST 5938 7322

This group is of uncertain date. The muffle material displays evidence of peripheral shelf and bar type buttresses. Jackson & Price 1974, 115-20]

Fabric 1 W.QO	11868 277 295	50 1 1	Muffle wall BU2 Bun BAT Bat
Fabric 2 W.	10 25	1 6	WA3 Wad TS1 Flat thin sheet
Fabric 3 W.O	55 35	1 2	Wig curler in matrix WA1 Wad pinched
Miscellaneous	272	1	Plaster

BRI3 BRISTOL UNPROVENANCED, AVON
Bristol Museum and Art Gallery Q2354.A-D

ST 58 73

Date uncertain.

Fabric 1 W.	190	3	Muffle wall
Fabric 2 W.?	95	1	P1 or RK4 Prop or rack

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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BRI4 BRISTOL LEWINS MEAD, AVON	ST 5872 7333
Bristol Museum and Art Gallery Box 132	

Pipes from this group, recovered from contractors trenches, are attributable to James Jenkins who was active between 1707 and 1739. [Jackson & Price 1974, 121-5]

Fabric 1	595	2	BU3d Bun
W.	800	1	BU1 Bun
	102	1	BAT1 Bat
	47	1	BAT Bat or bun
	2210	2	Brick
Fabric R1	200	2	Brick
R.			

BRI5 BRISTOL, WAVERLY STREET, AVON	ST 600 748
Allan Peacey collection WSB.77	

A substantial early nineteenth century assemblage of muffle material used to fill a soak away. Discovered in 1977 when the site was perimeter trenched to prevent unauthorised access. The muffle material features peripheral shelves, bar type buttresses and an opening in the side [Peacey 1982, 12].

Fabric 1	45050	80	Muffle wall
W.TO	8965	14	Muffle bar buttress
	152	1	Peripheral shelf
	252	1	Muffle rim
	465	1	Muffle patch
Fabric 1 & 2	1220	2	Muffle wall
W.TO & W.	1752	3	Wicket edge
Fabric 2	180	3	Layered lute
W.	75	1	Shaped section
	15	1	Daub
Fabric 3	6919	40	Lining?
W.T	3114	9	Lining? base angle
	122	2	Lining? rim
Fabric 4	1885	6	Fire brick
FB.G			
Fabric 5	792	2	BU2 Bun
W.QPO			
Fabric 6	225	1	SAG1 Saggar
W.G			
Fabric 7	480	9	Layered lute
W.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric uncertain	325	1	Tile
Miscellaneous	1730	5	Slagged detritus

BRI6 BRISTOL, 14 BATH STREET, AVON

ST 592 729

Photographs of a 'kiln' at the above address are published by Walker with a caption suggesting that it is a pipe kiln. It has been examined and though its purpose is uncertain it could not function as a pipe kiln. Access to its interior is limited; it contains an iron lining; there is no sign of any access to a possible ware chamber; three of the openings visible in the photographs appear to have been made to investigate its function. [Walker 1977, 1834-5]

BRI7 BRISTOL, TEMPLE BACK, AVON

ST 5955 7270

R Jackson, 13 Sommerville Road, Bishopston, BS7 9AD

A rescue excavation by R & P Jackson, for the Bristol City Museum and Art Gallery, recovered a substantial amount of material from an early nineteenth century tobacco pipe kiln [Egan 1984, 318]. The muffle had been broken up and thrown into two arched brick coal bunkers. At some later date a service trench had been cut through the deposit and a quantity of the material then used to build a wall. The muffle, described in Chapter 4, features bar type buttresses and peripheral shelves.

Fabric 1	700901	537	Muffle wall & base
W.MGP	190	1	BUI bun
Fabric 2	1150	1	P4a prop
W.MG	2000	1	BU?
	1365	5	BU1 bun
	2575	2	BU3 bun
	4900	2	BU3b bun
	165	1	Bat
Fabric 3	4455	12	SAG1 saggar
W.G	5185	14	SAG base
	170	1	SAG
	550	1	Brick or bar
Fabric 4	420	1	P3 or 3b prop
W.MGP	1000	1	Prop
	2890	4	BAT1 glaze & slag
	650	1	BAT1 slag
Fabric 5	285	1	Thick sheet
W.O	80	4	Clay as mortar
	50	1	Daub infill

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 6	115	4	WA1 wad
W.	30	9	TS1 thin sheet
	135	30	TS folded, rolled & twisted
	10	4	Bowl fragment
	110	18	Slagged bowl & wad frags
	25	1	Quatre-foil extrusion
Fabric 1&6	240	10	Bowls from matrix
W.MPG&W.			
Fabric 7	8300	15	Fire brick
FB.	660	4	BAT1 interlocking
	1150	1	BAT1 interlocking, glaze
	1180	1	BAT1 glaze
Fabric 8	3000	3	Red Brick
R.			
Fabric 9	800	1	Shaped section
W.?	145	1	Clay as mortar
	60	1	Strap
Miscellaneous	100	1bag	Pottery & glass
	1300	2	Mortar & roof tile

BR18 BRISTOL, MEAD STREET, AVON

ST 5968 7216

R Jackson, 13 Sommerville Road, Bishopston, BS7 9AD

This assemblage, recovered from contractors trenches during re-development work, had apparently been used as landfill prior to the construction of terraced houses in the nineteenth century. Makers marks, typology and topographical documentation date this assemblage c. 1850-65 [Price et al 1984, 279-80].

Fabric 1	780	3	SAG1 cylindrical saggar
W.G	2550	4	SAG3 rectangular saggar
	1445	15	SAG flat frags
	4285	18	Crucible or glaze muffle
Fabric 2	23	10	WA1
R.	345	50	RL1 extruded
Fabric 3	280	6bag	Pipes
W.	25	30	Glazed mouthpieces
	5	3	Stems
Fabric 4	205	1	Brick
W.M			
Fabric 5	90	2	Fire brick
FB.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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Miscellaneous	5	1	Coal
	325	4	Slag

BRI9 BRISTOL, PENNYWELL ROAD, AVON ST 6002 7360
 R Jackson, 13 Sommerville Road, Bishopston, BS7 9AD

Building works in 1986 exposed a spread of pipe-makers waste. A small excavation established that it was a secondary landfill deposit. Documentary sources fix the date of the deposit between 1828 and 1844 [Jackson et al 1991, 118-125].

Fabric 1 W.G	1050	1	Muffle wall
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Fabric 2	100	16	WA1
W.	60	6	WA5
	940	217	TS1

Miscellaneous	470	1	Detritus & soil
	335	1bag	Pottery & glass

BRI10 BRISTOL, TEMPLE WAY, AVON ST 5947 7267
 R Jackson, 13 Sommerville Road, Bishopston, BS7 9AD

A small rescue excavation, in 1988, by members of the Bristol and Avon Archaeological Society, recovered this mixed assemblage from a pipe-makers dump [Jackson et al 1991, 97]. Documentary and map evidence suggests that the dump was sealed beneath buildings by 1820 [Ibid 118].

Fabric 1	10	1	RL twisted roll
W.	385	28	SP1,3&4 strap, stem & bowl imps
	235	18	WA5 ring wad
	20	1	WA5 ring wad word stamp imp
	35	1	WA5 hollow based prop imp
	32	1 bag	WA fragments
	97	14	TS1 thin sheet some stem imps
	10	1	TS2/3 Folded and rolled
	95	8	TS4a thickened edge embedded stems
	30	3	TS4a thickened edge
	20	2	Rack? possible rack frag
	1450	264	Stem frags
	140	30	Stem spur frags
	45	29	Bowl frags
	55	33	Green glazed mouthpieces
	5	4	Yellow glazed mouthpieces
	100	23	Unglazed mouthpieces
	40	1	Daub

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	1950	1	Muffle wall with int shelf & ext bar
W.GPO	755	3	Muffle wall frags
Fabric 3	25	1	SAG fragment
W.GPO	180	1	SAG1 cylindrical saggar
	155	1	SAG fragment
Fabric 4	595	2	Tipping muffle frags
W.GP	3000	1	Tipping muffle
Fabric 5	615	12	Daub over stems
W.O	15	1	Plug or cast of hole
Fabric 6	95	9	WA1 Wad pinched
W&R.M			
Miscellaneous	195	3	Pipe bowls in slag
	15	1	Thin sheet slag laminate
	90	1	Raw pipe clay
	15	1	Coal
	615	2 bag	Pottery
	425	2 bag	Iron objects
	20	6	Slagged detritus

BRI11 BRISTOL, PENNYWELL ROAD, AVON
A Peacey, 110 Cainscross Road, Stroud, GL5 4HN

ST 6015 7410

Recovered from a surface exposure following site clearance in 1976.

Fabric 1	5	2	WA1
W.	45	14	Bowl fragments
	165	1bag	Stem fragments
	10	15	Mouthpiece fragments
	5	3	Stems from matrix
Fabric 2	15	3	Daub
W.O			
Fabric 1&2	5	1	Core fragment
W.&W.O			
Miscellaneous	95	4	Slag

BRI12 BRISTOL, BATH ROAD AVON
R Jackson, 13 Sommerville Road, Bishopston, BS7 9AD

ST 6015 7175

Recovered, in 1982, from four pits exposed during roadworks. Associated commemorative pottery places this deposit in the early 1850s. [Price et al 1984, 291].

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1 W.MO	500	1	Prop base
Fabric 2 W.QMP	4550	5	SAG1 Saggar, cylindrical or possibly oval
	1600	2	SAG3 Saggar, rectangular possibly hump backed
	800	1	SAG4 Saggar, rectangular possibly hump backed
	1450	2	Saggar base, rectangular possibly hump backed
	2900	2	Saggar base, possibly hump backed
	205	1	Tipping muffle
Fabric 3 W.QM	95	1	Object, socket stand

BU1 BURFORD, WITNEY STREET, OXFORDSHIRE
Tolsey Museum, Burford & A Peacey collection

SP 260 115

This group of surface finds includes pipes attributable to Bernard Smith who was working between 1850 and 1861. The muffle material includes a bar type buttress.

Fabric 1 W.	1	1	RL1 Roll
	0.5	1	TS1 Flat thin sheet
	17	9	Stem
	5	5	Bowl fragment
	10	4	Bowl T17 marked BS
	2	1	Bowl T17 marked JOS
Fabric 2 W.O	1300	1	Muffle wall
Fabric 3 W.O	5	4	TS1 Flat thin sheet
	25	9	Daub
Fabric 4 R.P	195	1	Muffle wall

BUR1 BURNLEY, MANCHESTER ROAD, LANCASHIRE.
Townley Hall Art Gallery and Museum

OS 830 305

Recovered from a builders trench behind the 'Bull and Butcher', a public house on the site of a late nineteenth century pipe works. In 1881 the works was run by James Lyon, it ceased production around 1895 [Higgins 1990]

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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CAM1 CAMBRIDGE, MASONIC HALL, CAMBRIDGESHIRE TL 46 58

In 1914, during the construction of the Masonic Hall, a single fragment from the wall of a pipe kiln muffle was recovered from the fill of the King's Ditch. A published photograph shows a rim fragment reinforced with stems laid parallel to one another obliquely to the rim [McKenn y Hughes 1915, 24]. The whereabouts of this fragment has not been discovered.

CA1 CANTERBURY NORTHGATE 'B', KENT TR 152 585
Canterbury Archaeological Trust Ltd NGB.89

A quantity of demolished muffle material deposited in a brick lined pit recovered during the course of excavation in 1989. Pipes used in the construction of the muffle suggest a date of 1790-1820. The muffle includes bar buttresses and peripheral shelves.

Fabric 1	14867	47	Muffle wall
W.QO	40	2	BAT Bat
	92	2	BAT1 Bat
	5	1	WA5 Ring wad
	19	4	RL1 Roll
Fabric 2	370	1	Clay as mortar
W.	10974	21	Brick
Fabric 3	907	4	Brick
W.GO			
Fabric 4	150	1	Lining patch
W.P	257	2	Amorphous fragment
Fabric 5	92	2	Muffle wall
W.QMGO			
Fabric 6	5	1	WA5 Ring wad
W	52	3	RL1 Roll
	65	1	Stem slag laminate
Fabric FB1	255	1	SAG1 Saggar
FB.QMGPO	1977	9	Fire brick
	2806	9	Dish setter built in
Fabric R1	937	4	Brick
R.	354	1bag	Tile
Miscellaneous	2773	27	Slag
	340	2	Chalk
	57	1	Lime mortar
	75	1	Iron
	1485	18	Mixed detritus

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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CA2 CANTERBURY NORTHGATE 'B2', KENT	TR 152 585
Canterbury Archaeological Trust Ltd. NGB.89	

Material from the 1989 excavations. This group of material comes from construction and repair phases of the surviving kiln base of William Brisley. The pipes date from 1840-70.

Fabric 1	172	1	Shaped section
W.MP	3289	8	Brick
Fabric 2	155	1	Door with spy hole
W.QMPO	2748	14	Brick
Fabric 3	120	10	Pipes in matrix
W.O	65	30	TS1 Flat thin sheet
	62	4	Clay as mortar
	445	28	Daub
	142	8	Amorphous fragment
Fabric 4	20	2	WA5 Ring wad
W.	10	1	WA1 Wad
	1	1	TS1 Flat thin sheet
	40	18	Stem & slag
	17	2	Bowl & slag
Fabric FB1	310	1	Fire brick
FB.QG			
Fabric FB2	417	2	Fire brick
FB.MG			
Miscellaneous	30	1	Coal & slag
	5	1	Coal & shale
	510	37	Coke
	1370	28	Slag
	908	6	Sandstone
	57	1	Iron concretion
	30	2	Mixed detritus

CA3 CANTERBURY, CAKE BREAD, KENT	TR 15 57
Canterbury Archaeological Trust Ltd	

This group of pipes which date from 1680-1710 were found in association with a kiln or oven in the course of a controlled excavation. There is no indication that the pipes are wasters nor any evidence to indicate that the structure was for the manufacture of pipes.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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CAR1 CARLISLE, HAMILTONS' KILN, CUMBRIA
Carlisle Archaeological Unit CAR.82

NY 39 55

Material from the 1982 excavation of Hamiltons' pipe works. Pipes associated with a kiln base date from the late nineteenth or early twentieth century.

Fabric 1 W.	74	3	Layered lute
Fabric 2 W.MPO	2300	1	Brick
Fabric 3 W.	500	1 bag	Pipes
Fabric 4 W.	318	1	Raw pipe clay
Fabric SA1 W.GM	22257 420	93 2	SAG1 Saggar SAG Saggar flat
Fabric SA2 R.GM	65641 4642	280 24	SAG1 Saggar SAG Saggar flat
Fabric FB1 W.GM	4900	7	Fire brick
Fabric FB2 W.G	1770	2	Fire brick
Fabric FB3 W.GO	2820	2	Fire brick
Fabric FB4 W.GM	470	2	Fire brick
Fabric FB5 R.M	720	1	Fire brick
Fabric FB6 R.M	1000	1	Fire brick
Fabric FB7 ?.?	11850	4	Fire brick
Fabric R1 R.G	155	1	Brick
Fabric R2 R.QM	3702	4	Brick

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric R3 R.QM	190	1	Brick
Fabric R4 R.M	465	1	Brick
Fabric R5 R.QM	3110	4	Brick
Fabric R6 R.QM	6769	12	Brick
Fabric R7 R.?	3450	1	Brick
Miscellaneous	60	1	Slag
	324	3	Stone
	120	1	Slate
	105	1	Mortar lime
	75	1	Mortar ash & clay
	1307	2 bag	Iron

CH1 CHARD, SILVER STREET, SOMERSET
Somerset County Museum TTNCM.173.1989

ST 325 085

This excavated group represents a dump of material from a demolished kiln which produced pipes in the last quarter of the seventeenth century. Predominant among the marked pipes are those of George Webb though the assemblage includes the marks, SW CHAR, WILL PITCH ER and WEBB IN CHARD. The muffle material features bar type buttresses.

Fabric 1	3515	19	Muffle wall
W.QM	220	1	Muffle base
Fabric 2	21311	178	Muffle wall
W.O	115	1	BU3 Bun with stems
	137	3	WA2 Rim wad
	3844	38	Brick or bar
Fabric ?	3337	10	Muffle wall
	410	1	BAT Bat
	170	2	WA2 Rim wad
Fabric 3	105	2	Muffle wall
W.QM	242	2	Layered lute
	25	1	BAT2 Bat pierced
	45	1	WA1 Wad
	265	1	Brick pierced
	35	2	Amorphous fragment
Fabric 4	210	2	Muffle wall
W.QMO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 5 W.O	150	1	DI1 Dish pierced
Fabric 6 W.	95	1	Stem/slag
	NA	2	Stems
	NA	1	Stamp
Fabric R1 R.M	205	2	Tile pierced
	152	2	Tile
Miscellaneous	170	1	Raw pipe clay
	200	1	Slag
CHA1 CHATHAM, GIBRALTAR COTTAGE, KENT			TQ 75 67
Rochester Guildhall Museum 948.Box 2			
<p>This dump of pipemakers waste was found in the garden of Gibraltar Cottage in 1979. Pipes from the site are Oswald G24 which he dates 1810-40. Nine makers are represented, that most commonly being Charles Birchall c. 1822-55. [Williams 1980, 382-3]</p>			
Fabric uncertain	90	1	BU2 Bun with wad
Fabric 1 W.	3	1	Stem from matrix
	5	1	RL1 Roll pinched
	105	5	WA5 Wad
	80	2	WA5 or 6 Wad convex
	15	1	WA1 Wad
	50	7	AS1 Strip with stem imp
	70	19	TS5 Thin sheet
	937	20	Stem slag laminate
	20	3	Bowls in slag
	10	1	Stems in slag
	20	1	Daub
	5	2	Trimming rings?
	665	4 bag	Pipe bowls & stems
	2	1	Red Mouthpiece
Fabric 2 W.O	70	1	BAT Bat
	45	4	TS1 Flat thin sheet
	10	1	Thin sheet slag laminate
	155	6	Daub
Fabric 3 W.MO	210	3	Amorphous fragment
Fabric 4 W.QGO	690	5	Muffle wall?
Miscellaneous	50	1	Raw pipe clay
	80	3	Coal
	282	1	Coke

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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	709	4	Slag
	100	1	Shale in slag
	7	1	Pottery
	20	1	Iron object
	25	1	Detritus

CHA2 CHATHAM, JAMES STREET/RICHARD STREET, KENT
Rochester Guildhall Museum 948.Box 1

TQ 75 67

This assemblage of pipemakers waste, dated 1790-1810, was discovered during road widening in 1980. [Williams 1980, 383] The muffle material features bar type buttresses.

Fabric 1	15	1	RL1 Roll with stem imp.
W.	45	13	SP1 Strap with stem imp.
	25	1	WA3 Wad
	20	1	TS1 Flat thin sheet
	975	7 bag	Pipe bowls & stems
	5	1	Daub

Fabric 2	110	1	BU2 Bun
W.O	27	1	TS1 Flat thin sheet slag
	375	1	Shaped section

Fabric 3	1735	8	Muffle wall
W.GO			

Fabric 4	275	1	Brick
W.M			

Miscellaneous	240	2	Shale & slag
	100	1 bag	Raw pipe clay & detritus

CHEL1 CHELMSFORD, MOULSHAM STREET, ESSEX
Chelmsford and Essex Museum CHAG.75

TL 70 06

This small excavated group dates from the early eighteenth century. [Cunningham & Drury 1985]

Fabric 1	60	6	Muffle wall
W.O			

Fabric 2	37	NA	Stems
W.	45	4	Stems and bowls

CHEL2 CHELMSFORD, MOULSHAM STREET, ESSEX
Chelmsford and Essex Museum

TL 70 06

This group has been separated from its excavation record. The homogeneity of the group suggests a single context; the fact that the material is bagged and numbered according to typology supports this interpretation. The character of the flash glazing on the muffle

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

fragments is similar to the previous group. Both may derive from the same kiln. The predominant pipe types are Oswald G7 and G8 dated 1660-80 and 1680-1710 respectively.			
Fabric 1	440	16	Muffle wall
W.QMO	355	5	Muffle base
	80	1	Muffle prop
	10	1	Core fragment
Fabric 2	350	56	Stems from matrix
W.	535	43	Bowls from matrix G7
	110	9	Wastered bowls from matrix G7
	35	2	Bowls from matrix G8
	2	2	Mouthpiece from matrix
	1857	110	Product bowls G7
	60	3	Product bowls G8
	184	12	Wastered product bowls G7
	5	1	Bowl G24
	20	4	Rack?
Fabric 3	7	3	TS1 Thin sheet 0-2mm
W.Q			
Fabric 4	15	3	TS1 Thin sheet 6-10mm
W.O			
Fabric 5	575	1	Prop P1
W.QMPO			
Miscellaneous	35	1	Pumiceous material
	20	1 bag	Mixed detritus

CHES1 CHESTER, NORTHGATE BREWERY, CHESHIRE SJ 40 66
Grosvenor Museum, Chester

This single fragment from an early rectilinear muffle comes from Phase 1 of the excavations carried out in 1972-3. The date calculated from the bores of included stems is 1671, whilst that of other stems from the same context is 1672 [Rutter & Davey 1980, 260].

Fabric 1	215	1	Muffle wall
W.M			

CHES2 CHESTER, HUNTER STREET SCHOOL, CHESHIRE SJ 405 670
Grosvenor Museum, Chester

From Context I [3] of the 1979 excavations. The date calculated from the stem bores of pipes in the context is 1698 [ibid, 260].

Fabric 1	NA	1	Muffle wall
W.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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CHIS1 CHISWICK, HOGARTH HOUSE, GREATER LONDON TQ 2125 7795

This group is noted in personal correspondence from A Oswald dated 18.12.78. All attempts to trace the material have been fruitless.

CHU1 CHUDLEIGH KNIGHTON BY-PASS, DEVON SX 850 775
Royal Albert Memorial Museum and Art Gallery, Exeter

This excavated group dates from the first quarter of the eighteenth century. [Miles 1977]

Fabric 1 W.O	449	34	Amorphous fragment
Fabric 2 W.O	52 35	3 1	Muffle wall Cylinder 50mm diameter

COL1 COLCHESTER, JOSLINS SITE, ESSEX TL 99782525
Colchester & Essex Museum

In the winter of 1959-60 site clearance prior to development provided the opportunity to examine a corner site bounded by High Street and Maidenburgh street. Remains of a pipe kiln, consisting of 'a number of pieces of the saggar, or inner chamber in which the clay pipes were fired', were recovered [Gant 1960, 43-4]. Although this material is believed to be in the store of the Colchester & Essex Museum attempts to trace it have not been successful.

CR1 CROYDON, 9 DICKENSON PLACE, GREATER LONDON TQ 343 672
Croydon Natural History & Scientific Society

Two trenches were excavated for the Croydon Natural History and Scientific Society in the garden of a house once occupied by Earnshaw, a nineteenth century clay tobacco pipe manufacturer. Although the kiln was not found many specimens of his work were recovered. [Savage 1974, 13; Pearman 1975, 2; Cherry 1975, 258].

Fabric 1 W.	25	NA	Roll
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CR2 CROYDON, MINT WALK, GREATER LONDON TQ 323 653
Croydon Natural History & Scientific Society MW.89-91

This assemblage was recovered from a service trench in the road outside the library in 1989/90. The pipes include types current from as early as c. 1720 to as late as c. 1840 though the earlier types could be much later than the former date. The kiln material includes muffle fragments dated by included spur marked pipes to the early nineteenth century. The waste is consistent with a nineteenth century date.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1	27	20	Stem from matrix
W.	43	40	RL1 Roll
	4	3	RL3 Roll
	3	4	RL4 Roll
	1	1	AS4 Applied strip
	638	113	Pipe bowls
	201	2bag	Pipe bowl fragments
	4136	2bag	Pipe stem
	10	3	Milled pipe stem
	150	1bag	Mouth pieces
Fabric 2	165	5	Muffle wall
W.O	40	1	Core fragment
Fabric 3	515	3	Muffle wall
W.QO	40	2	Core fragment
	325	1	Brick
Fabric 2or3	1092	12	Muffle wall
W. Unwashed			
Miscellaneous	1400	1	Red brick
	42	1	Shell
	50	4	Mortar
	65	1bag	Detritus

DA1 DARTFORD, OVERY STREET, KENT
Dartford Borough Museum 1983.39

TQ 54 74

This small excavated group is of particular interest for the inclusion of wasters bearing stem marks for London and Rochester suggesting manufacture for other makers or distributors. Pipes in the group date typologically to c.1820-30. [Baker 1979, 11-17]

Fabric 1	50	1	Stem & slag
W.O			
Fabric 2	2	1	Roll
W.	100	1	Bowl & slag

DA2 DARTFORD, SPITAL STREET, KENT
Dartford Borough Museum D48.1

TQ 54 74

This small excavated group of pipes and kiln waste dates from the late eighteenth century.

Fabric 1	10	1	TS1 Flat thin sheet
W.O			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	45	10	SP1 Strap
W.	50	1	Stem & slag
	45	1	Bowl & slag
	45	13	Stem
Fabric R3	80	1	Tile & slag
R.			
Miscellaneous	150	3	Slag
DO1 DONCASTER, CHURCH STREET, SOUTH YORKSHIRE			SE 575 028
Doncaster Museum and Art Gallery DC.AAG			
This small excavated group is from the late eighteenth century workshop of Samuel Lumley. [Buckland, Magilton & Hayfield 1989, 200-1]			
Fabric 1	30	1	Muffle wall
W.QMO			
Fabric 2	40	2	Bowl & slag
W.			
DOR1 DORCHESTER, COLLITON PARK, DORSET			SY 69 90
Dorset County Museum 1938; 1938; 1950.41.2; 1956.39			
Three separate groups from the same location. Group 1 is from excavations in 1938, Groups 2 and 3 are casual finds from building works in 1950 and 1956 respectively. There is not necessarily any period cohesion between the groups. [Watkins 1967]			
Group 1.			
Fabric 1	70	13	Stems from matrix
W.	50	2	RL2 Roll curved
	15	2	Stems
	204	17	Pipe bowls
Fabric 2	790	3	Muffle wall
W.O			
Miscellaneous	25	1	Roman pot sherd
	15	1	Iron
Group 2			
Fabric 3	232	1	Muffle wall
W.QMO			
Fabric 4	10	1	TS1 Flat thin sheet
W.O			
Miscellaneous	85	1 bag	Mixed detritus

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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Group 3			
Fabric 2	32	1	Muffle wall
W.O			

DU1 DURHAM, BACK SILVER STREET, DURHAM NZ 278 425
 Old Fulling Mill Archaeological Museum 1984.7

An excavated group dating from the first half of the nineteenth century. [Clipson 1980]

Fabric 1	22	8	Stem from matrix
W.	1867	8 bag	Stem slag laminate
	972	5 bag	Stem & slag
	534	71	Bowl & slag
	547	5 bag	Stem
	353	51	Wastered bowls
	14	3	Glazed mouth pieces

Fabric 1&2	152	3	Bat
W.&W.O			

Miscellaneous	25	1 bag	Slag
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EC1 ECCLESTON, ORITH FARM, MERSEYSIDE SJ 472 965
 North West Archaeological Trust, Harold Cohen Library, University of Liverpool.

Unstratified surface finds collected as part of the survey, of known pipemaking sites carried out in 1979-80 [Liverpool University extra-Mural class]. [Lewis et al 1982, 122].

Fabric 1	1	2	TS1 thin sheet
W.			

EC2 ECCLESTON, CATCHDALE MOSS LANE, MERSEYSIDE SJ 472 959
 North West Archaeological Trust, Harold Cohen Library, University of Liverpool.

Unstratified surface finds collected as part of the survey, of known pipemaking sites carried out in 1979-80 [Liverpool University extra-Mural class]. [*ibid*, 123].

Fabric 1	2	1	RL1 roll
W.			

EC3 ECCLESTON, BLEAK HILL ROAD, MERSEYSIDE SJ 489 963
 North West Archaeological Trust, Harold Cohen Library, University of Liverpool.

Unstratified surface finds collected as part of the survey, of known pipemaking sites carried out in 1979-80 [Liverpool University extra-Mural class]. [*ibid*, 124].

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1 W.O	50	1	Thick sheet slag laminate

EC4 ECCLESTON, 14-20 AKERS LANE, MERSEYSIDE SJ 490 955
North West Archaeological Trust, Harold Cohen Library, University of
Liverpool.

Unstratified surface finds collected as part of the survey, of known
pipemaking sites carried out in 1979-80 [Liverpool University extra-
Mural class]. [*ibid*, 126].

Fabric 1 W.	1	1	TS1 thin sheet
Fabric 2 W.GO	19	1	Abraided core fragment

EX1 EXETER, BARTHOLOMEW STREET DEVON SX 9162 9242
Royal Albert Memorial Museum and Art Gallery, Exeter BS.74

An excavated group from the early eighteenth century. [Oswald, Allan
& Hunt 1984]

Fabric 1 W.O	2702 120	47 1	Muffle wall Brick or bar
Fabric 2 W.O	45 274 80 615 817	1 16 2 2 30	BAT Bat TS1 Thin sheet Daub with bowl mouth imps Brick or bar Amorphous fragment
Miscellaneous	70 27 75	2 1 1	Slag Stone Lime mortar

EX2 EXETER, SHILHAY, DEVON SX 9181 9212
Royal Albert Memorial Museum and Art Gallery, Exeter

Collected from builders trenches in 1975. Typological date c.1690-
1730 [Oswald, Allan & Hunt 1984, 282]. Attempts to trace the pipe
reinforced material described by Allan have been un successful.

Fabric 1 W.O	20	4	TS1 thin sheet 2-4mm
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EX3 EXETER, ST. MARY MAJOR, DEVON SX 9200 9257
Royal Albert Memorial Museum and Art Gallery, Exeter

Unstratified material with a typological date of c.1700-30 [*Ibid*,
282]. Attempts to trace the 'few fragments of muffle' reported by
Allan have been unsuccessful.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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EX4 EXETER, SOUTHERNHAY GARDENS, DEVON SX 9240 9256
 Royal Albert Memorial Museum and Art Gallery, Exeter

Material recovered from a back-filled gravel quarry in association with other find dating to c.1720-60 [*Ibid*, 282]. Attempts to trace this material have been unsuccessful.

EX5 EXETER, MERMAID YARD, DEVON SX 9193 9234
 Royal Albert Memorial Museum and Art Gallery, Exeter

'A handful of fired pipeclay was excavated in 1977 from an undated context in Mermaid Yard' [*Ibid*, 282]. Attempts to trace this material have been unsuccessful.

EX6 EXETER, QUAY, DEVON SX 9201 9212
 Royal Albert Memorial Museum and Art Gallery, Exeter QUAY.85-6

An excavated group from the early eighteenth century.

Fabric 1 W.O	644	12	Muffle wall
Fabric 2 W.O	10	1	Muffle wall
	37	8	TS1 Flat thin sheet
Fabric 3 W.QMO	277	3	Muffle wall
Miscellaneous	65	1bag	Mixed detritus

EX7 EXETER, CRICKLE PIT, DEVON SX 9288 9217
 Royal Albert Memorial Museum and Art Gallery, Exeter CP.86-7

An excavated group of indeterminate date probably 1650-1720. The muffle material features prop type buttresses.

Fabric 1 W.MO	1275	15	Muffle wall
	22	1	BAT1 Bat
	125	1	Brick or bar
Fabric 2 W.MO	170	1	Muffle wall
Fabric 3 W.MO	1619	6	Muffle wall
Fabric 4 W.MO	185	2	BAT Bat
	60	1	Large pipe - chimney rim?
	57	2	Pottery
	20	1	Amorphous fragment

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 5 W.M	1900	1	Brick
Fabric 6 W.O	7 15	4 2	TS1 thin sheet 2-4mm Daubed irregular sheet
Fabric 7 W.GMO	150	9	Muffle base?

EX8 EXETER, IDA COTTAGE, DEVON

SX 91 92

Royal Albert Memorial Museum and Art Gallery, Exeter

Recovered from building works. This fine group of early seventeenth century bowls, apparently unsmoked, includes 12 examples with yellow glaze splashes or drips. This is indicative of firing in kilns containing glazed wares as was the case at Barnstaple [see Page 124-6 above]. None of the pipes can be considered as wasters so may reflect wholesalers stock rather than a nearby kiln.

Fabric 1	NA	69	Pipe bowls G4 1600-40
W.	NA	9	Pipe bowls G16 1610-40
	NA	12	Pipe bowls G4 1600-40 with yellow glaze splashes or drips.

GL1 GLOUCESTER, 99 WESTGATE STREET, GLOS.

SO 828 189

A Peacey collection JJ.99.WS

Material from an excavated kiln dump dated by documentary sources to 1870-5. Includes material from peripheral shelves pegged into tile or brick built muffle or door. [Peacey 1979, 72-5]

Fabric 1	201	32	WA1 Wad
W.	254	4	RL1 Roll
	47	6	RL1 Roll, pinched
	45	1	Daub
Fabric 2 W.	275	14	Daub
Fabric 3 W.MPO	180	8	Daub
Fabric 4 W.M	282	1	P2 Prop
	660	1	P4 Prop
	290	2	DI1 Dish
	7845	33	SAG1 Saggar
	4363	9	SAG3 Saggar
	1844	5	SAG4 Saggar
	150	1	SAG5 Saggar
	6061	19	SAG Saggar flat

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
	6936	18	SAG Saggar rectangular
	30	1	BAT Bat
	6587	3	BAT3 Circular bat
	870	3	BAT Bat or brick
	1877	6	Brick
	25	1	Amorphous fragment
Fabric 5 W.M	1170	3	BAT Bat or brick
Fabric 6 W.Vitrified	320	9	Clay as mortar
Fabric 7 W.PO	358	3	Wicket shelf
Fabric 8 W.MG	324	2	Wicket shelf
	1200	1	DI1 Dish
Fabric 9 FB.G	265	2	BAT1 Bat
	65	2	BAT1 Bat or brick
	12164	4	Fire brick
Fabric 10 W.O	7	1	TS1 Flat thin sheet
	200	19	Daub
	50	1	Daub, patch?
Miscellaneous	35	4	Coal
	617	7	Slag & shale

GL2 GLOUCESTER, QUAY STREET, GLOS.
Gloucester City Excavation Unit 28/79

SO 827 187

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 [see Appendix 4].

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

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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	1520	111	Base angle lining
W.QMP & W.			
Fabric 1 & 2	400	1	Muffle fragment fused to brick support
W.QMP & R.QM			
Miscellaneous	70	1bag	Raw pipe clay
	157	1bag	Coal
	130	4	Slag
	125	6	Pottery
	10	1	Iron

GL3 GLOUCESTER, BLACK DOG YARD, GLOS. SO 835 188
 Gloucester City Excavation Unit and A Peacey Collection 3/83; G.BD.82

Material rescued from builders trenches on the site of Robert Williams pipe manufactory. Dated by documentary sources 1849-70. The muffle material features peripheral shelves.

Fabric 1	577	2	BU1 Bun
W.G	92	1	BAT? Bat or bun
	110	1	Amorphous fragment
Fabric 2	92	1	P2 Prop
W.	30	1	P & WA5 Prop & wad
	130	7	RL1 Roll
	85	5	RL1 Roll, pinched

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
	50	1	SP1 Strap end
	20	1	AS1 Applied strip
	170	9	WA1 Wad
	859	50	WA5 Wad
	20	1	WA1 Wad
	192	22	TS1 Thin sheet
	10	1	TS4 Folded edge thin sheet
	37	2	RK3 Rack
	130	6	Amorphous fragment
Fabric 1&2 W.G&W.	150	1	Brick or bar
Fabric 3 W.P	25	1	Amorphous fragment
Fabric 4 W.GO	40	1	Clay as mortar
	42	1	Amorphous fragment
Fabric 2&4 W.&W.GO	40	1	Muffle wall
Fabric 5 W.MG	175	2	Muffle wall
	90	1	Peripheral shelf
	175	1	Wicket shelf
Miscellaneous	50	2	Raw pipe clay
	57	1	Coal
	99	4	Slag
	25	1	Slagged detritus

GR.Y 1 GREAT YARMOUTH, NORFOLK
Great Yarmouth Museums

TG 52 07

This single large piece of pipe reinforced kiln material has no provenance. The stem bores are consistent with a late eighteenth or early nineteenth century date.

Fabric 1 W.O	N/A	1	Muffle support or buttress
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GR1 GRIMSBY, CHURCHYARD, HUMBERSIDE

TA 266 092

First noted in 1972, a pipe kiln discovered by building workers in the corner of the churchyard and immediately destroyed. Some pipes were recovered but are untraced. [For this information I am indebted to Peter Wells.]

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
D			
GU1 GUILFORD, MILLBROOK STREET, SURREY			SU 998 489
Guilford [^] Museum RB.3124			

Material from the excavation of a river bed dumping site. Dated by pipe typology and makers marks to the late eighteenth century. [Kingsford-Curram 1968, 87-90]

Fabric 1 W.QO	65	1	Amorphous fragment
Fabric 2 W.	5 15	4 6	RL4 Serpentine roll RL1 Roll
Miscellaneous	207	1	Slag

D			
GU2 GUILFORD, ST. MARY'S/ROSEMARY ALLEY, SURREY			SU 993 495
Guilford [^] Museum RB.1005			

Material from the excavation of a pipe kiln dated by pipe typology to c.1680-1710. Most of this material was recovered from the stoke pit and ash pit of the structure. The muffle material features prop type buttresses.

Fabric 1 W.QMO	7564 844	86 5	Muffle wall Brick or bar
Fabric 2 W.O	10236	89	Muffle wall
Fabric 1&2 W.QMO&W.O	769	6	Muffle wall
Fabric 3 W.	190	NA	Stems from matrix
Fabric 4 W.QMO	1088	3	Brick or bar
Fabric 5 W.PO	485	1	Muffle wall
Fabric 6 W.?	20	5	RL1 Roll
Fabric 7 R.	5800	2 bag	Tile
Miscellaneous	87	10	Mixed detritus

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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D

GU3 GUILFORD, 7 CHAPEL STREET, SURREY Guilford Museum LG.2813			TQ 002 495
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A small group of material dating from the last quarter of the seventeenth century. The muffle material features prop type buttresses.

Fabric 1	710	2	Muffle wall
W.MO	865	2	Muffle base

D

GU4 GUILFORD, QUARRY STREET, SURREY Guilford Museum RB.1139			SU 999 495
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This group is dated by bowl typology to c.1690-1720.

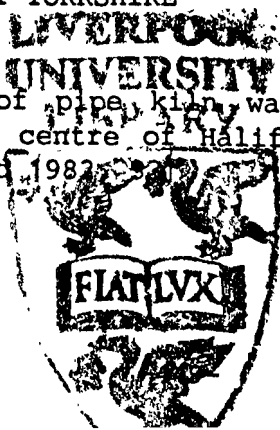
Fabric 1	350	3	Bar
W.MO			
Fabric 2	2013	8	Muffle wall
W.QMO	1250	1	Muffle base
Fabric 3	249	2	Layered slipwash
W.			
Fabric 4&3	165	1	Tile with slipwash
R.&W.			

HAL1 HALESWORTH, 49 CHEDISTON STREET, SUFFOLK Present whereabouts of material not known.	TM 38 77
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Building works in 1975 cut through a brick built structure infilled with domestic refuse and debris from a nineteenth century tobacco pipe kiln. There is no conclusive evidence to suggest that the structure was part of a kiln though the possibility can not be ruled out. The assemblage included, 'slabs of kiln lining (fired pipe-clay reinforced with a lattice-work of broken pipe stems)' [Oak-Rhind & Wade 1977], material typically used in the construction of pipe kiln muffles. The material was examined and returned to the owner of the site, Mr. R J Nicholls. In 1990 this author contacted Mr Nicholls who no longer has the material and cannot help to locate it.

HA1 HALIFAX, CENTRE, WEST YORKSHIRE Peter Hammond collection	SE 08 25
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This small assemblage of pipe kiln waste was discovered under a demolished house in the centre of Halifax in 1974. The typological date is 1830-60. [Hammond 1982]



C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1	20	3	RL1 Roll
W.	75	8	WA5 Wad
	5	2	TS2 Rolled thin sheet
	45	4	Slagged stems & bowls
	390	1 bag	Pipe bowls

HAS1 HASTINGS, TOWN WALL, EAST SUSSEX
Museum of Local History, Hastings

TQ 80 09

In 1980 an excavation on the site of the town wall was undertaken jointly by the Hastings Museum and the Hastings Area Archaeological Research Group. This recovered waste and destruction material from the kiln of John or Joseph Watkins both active c. 1840. The present whereabouts of the material is not known to the museum.

HE1 HELSTON, MENEAGE STREET, CORNWALL
County Museum, Truro 1970

SW 65 27

In 1970 it was reported that two kilns were discovered, by building workers, beneath the floor of a garage. The material now in the County Museum appears to be all that has survived. It consists of two pieces of muffle wall [one with a prop type buttress], two pipe bowls and a few stem fragments. The form of the pipe bowls suggests a date of around 1680-1710. [Douch 1970, 148]

Fabric 1	35	4	Stems from matrix
W.	15	3	Stems
	17	2	Pipe bowls
Fabric 2	322	2	Muffle wall
W.QMO			
Miscellaneous	55	1	Raw clay

HU1 HULL, ALFRED GELDER STREET, HUMBERSIDE
Town Docks Museum, Hull 530.1980

TA 1010 2884

This small assemblage of pipe kiln waste, recovered from a pit after building demolition, has a typological date in the first quarter of the nineteenth century. [Stothard 1985, 13-16]

Fabric 1	35	7	WA5 Ring wad
W.	20	3	RL1 Roll
	2gms	1	TS1 Thin sheet 1-3 mm
Fabric 2	100	1	Lining patch
W.O	110	7	TS1 Thin sheet 5-7 mm
Miscellaneous	105		Coal
	700		Slag

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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HU2 HULL, LOWGATE, HUMBERSIDE Town Docks Museum, Hull 48.1986	TA 105 295
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Discovered during building works this group dates from the second quarter of the nineteenth century. [Watkins 1979, 102-3]

Fabric 1	2	1	RL1 Roll 5-7 mm diameter
W.	10	2	RL1 Roll 8-12 mm diameter
	92	6	Stem slag laminate
	150		Wastered stems
	480		Unwashed stems
	55	31	Glazed mouthpieces
Fabric 2	37	3	Amorphous fragments
W.vitrified	25	2	Slagged detritus
Miscellaneous	30	2	Coal
	95		Slag
	150	2	Red brick & slag
	20		Mixed detritus

IP1 IPSWICH, PORTMAN ROAD, SUFFOLK Ipswich Museum 1966.21	TM 155 450
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Found during the construction of the telephone exchange in 1957, the date of this piece is uncertain. [Owles & Smedley 1966, 280]

Fabric 1	225	1	Muffle wall
W.O			

IP2 IPSWICH, CURRIERS LANE, SUFFOLK Ipswich Museum 1934.102	TM 179 440
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Nature of discovery obscure; a small group from the early nineteenth century which includes a muffle wall fragment with a bar type buttress.

Fabric 1	1107	2	Muffle wall
W.GP	877	2	BU3b Bun
	600	1	BAT or Bun
Fabric 2	410	1	Muffle base
W.GP			
Fabric 2&3	760	1	Clay mortar, brick & slag
W.GP&W.QG			
Fabric 4	45	bag	Bowl, stem & slag
W.	107	bag	Pipe wasters
Fabric 1,2&3	2100	1	Clay mortar, brick & slag
W.GP&W.QG			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
IP3 IPSWICH, NEPTUNE QUAY, SUFFOLK			TM 172 450
Suffolk County Council Excavation Unit IAS.6601			
Material from the 1989 excavations on the site of Goodwins Pipe factory which was in operating in the hands of the Goodwin family from 1834-83 and continued by others up to 1892. The muffle material features a bar type buttress.			
Fabric 1	20	1 bag	WA1 Wad
W.	429	87	WA1 Wad
	3743	13 bag	WA5 Wad
	35	1 bag	Wad & slag
	270	7 bag	Roll
	54	4 bag	TS1 Flat thin sheet
	132	1 bag	Wad, roll & thin sheet
	27	4	RK3 Rack end
	17541	36 bag	Stem & slag
	18751	14 bag	Stem
	36	4 bag	Stem & bowl
	303	6 bag	Bowl
	15	1	Bowl & slag
	12	1	Clay as mortar
	10	1	Rounded clay pellets
	14	4	Trimming ring
Fabric 1&2	4452	12 bag	Thin sheet, stem & slag
W.&W.O			laminate
Fabric 2	140	1bag	Irregular slab
W.O	119	12	TS1 Flat thin sheet
	3145	7 bag	Daub
	357	1	Slag
	105	15	Amorphous fragment
Fabric 3&5	575	1	Brick & slag
FB.G&W.T			
Fabric 4	5924	9 bag	Amorphous fragment
W.TO			
Fabric 5	1002	3	Amorphous fragment
W.T			
Fabric 6	4756	20	Muffle wall
W.GO	85	1	BU2 Bun
	40	1	BU3 Bun
	32	1	Clay as mortar
Fabric 7	15712	8 bag	Dense brick & slag
W.PT	482	4	Amorphous fragment/slag

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

Miscellaneous	150	1	Raw pipe clay
	26	3	Coke
	47336	19 bag	Slag
	4450	2 bag	Slag & fire brick
	4265	7 bag	Slag & red brick
	7675	2 bag	Slag & brick
	16944	12 bag	Slag, pebbles & iron
	125	1	Stone
	15	1	Shale & mortar
	920	1 bag	Slagged detritus
	5057	11 bag	Mixed detritus

KI.L1 KINGS LYNN, ST. ANNE'S FORT, NORFOLK TF 62 20
 P Davey, Dept of Archaeology, University of Liverpool

This small assemblage of pipe fragments and kiln waste was gathered from freshly dug flower beds. The pipe typology is consistent with a late eighteenth to early nineteenth century production period [Davey 1991, 29-30].

LA1 LAMBETH, GREATER LONDON TQ 30 78
 Birmingham City Museum and Art Gallery CP.563

Type 25 pipes in the matrix have a very long typological date span of 1700-70. The nature of the discovery is uncertain.

Fabric 1	1625	6	Muffle base
W.			

LEE1 LEEDS, COTTAGE STREET, WEST YORKSHIRE SE 30 34
 Abbey House Museum, Kirkstall

Samson Strong, the last pipemaker working in Leeds, retired in 1950. The works in Cottage Street had been established by his father, Frederick, in 1882. The family had been engaged in pipemaking prior to this date; Frederick's father working in Derby and his wife's sister, Jane Wilson, in Leeds. In the nineteen fifties the contents of the workshop were removed for permanent display at the Abbey House Museum. This display includes a reconstructed kiln together with five items of kiln furniture. The muffle of this kiln is built from fire bricks with peripheral shelves pegged into joints and bricks used to form bar type buttresses. [Brears 1991] [Hartley & Ingilby 1976, 139-41].

Fabric 1	52157	3	DI1 Dish
W.?	5600	2	P2 Prop

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

LE1 LEICESTER, SYLVAN STREET, LEICS.			SK 572 050
A small group of pipe waste, consisting of 5 bowls, 8 stem fragments, 14 mouth pieces and 3 rolls was recovered from beneath a quarry-tiled floor in 1989. The pipes are attributed to William Flannagan who worked at 36 Frog Island from c.1884-1905.			
Fabric 1 W.	5	3	RL1 straight roll
LE2 LEICESTER, CAUSWAY LANE, LEICS.			SK 585 047
Three groups of material have been recovered from this site. The first from an excavation in 1980 is numbered 8052 F11. The second an unstratified assemblage resulting from cleaning prior to the 1991 excavation is numbered A1 1991 (3501). The third, numbered A1 1991 (2358), excavated in 1991, was sealed beneath a brick cellar floor. Pipes from this context have a typological date of c. 1810.			
8052 F11 Fabric 6	25	1	Stem slag laminate
A1 1991 (3501) Fabric 5 W.T	15	1	Amorphous lump
Fabric 6 W.	10 10 40 2	1 1 5 1	RL1 straight roll RL2 curved roll WA5 ring wad Unfired pipe clay
Fabric 6&9 W. & W.O	175	1	Thin sheet, stem slag laminate
Fabric 9 W.O	2	1	TS1 thin sheet
Fabric 10	25	1	Core fragment
Miscellaneous	5	1	Coke
A1 1991 (2358) Fabric 1 R.	0.5	1	Brick fragment
Fabric 3 W.QMO	3492 170	15 6	Muffle wall Core fragments
Fabric 4 W.QMO	135 50 2555 350	1 5 146 13	Muffle wall RL1 roll RL2 irregular curved roll RL5 Roll as strut

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

	55	2	SP1 strap
	50	2	WA1 wad
	15	1	WA4 joint wad
	45	1	WA5 ring wad
	30	1	AS1 rounded applied strip
	10	1	AS2 triangular applied strip
	5	2	Lute spalls
	55	2	Daub squeezes
	52	5	Amorphous lump
Fabric 5 W.PT	815	5	Amorphous mass
Fabric 6 W.	25	7	Stems from matrix
	1	1	Lute layers
	2	1	Pipe bowl fragment
	2.5	2	RL1 roll
	0.5	1	AS1 applied strip
	11	26	TS1 thin sheet
	5	1	Stem in clay blob
	30	15	Mixed material
	1	bag	Tiny fragments of thin sheet, pipe, trimmings and dottle.
Fabric 7 W.QMP	375	2	P4a prop
Fabric 8 W.QMO	185	1	Lining patch
	330	2	P4a prop
	30	1	Variable sheet
Fabric 9 W.O	5	2	TS1 thin sheet
Fabric 11 R.	0.5	1	Red brick fragment
Miscellaneous	5	1	Stem in slag
	30	1	Coal
	2	1	Charcoal
	592	16	Slag
	10	1	Oyster shell
	320	3	Detritus concretion
	95	3 bag	Mixed detritus
	30	15	Mixed detritus

A large mass of material remained unwashed at the time of this examination. Because of this fabric types have not been established for this material [listed below]. The assemblage has been divided into broad groups which will require adjustment at a later date. It

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

is, however clear that it derives from a developed muffle of the type commonly used at the beginning of the nineteenth century.			
Fabric ?	19350	71	Muffle wall
	19750	21	Massive structural frags
	7000	7	Massive composites
	1230	8	Lining patch
	1000	1	Fire brick
	3000	8	Red brick
	5000	6	Yellow brick
	70	1	Daub
	1000	1	Concretion of carbonised matter
	1305	11	Slag
	600	1	Stone
	320	1	Lime mortar
	10500	4bag	Dirt & detritus

LEW1 LEWES, PIPE PASSAGE, EAST SUSSEX
Barbican House Museum, Lewes 1981.52

TQ 415 105

This group of material is from the excavation of of a nineteenth century pipe kiln. Much of the material comes from the filling of the original stoke pit and raising of the floor level associated with a reduction in the capacity of the kiln. Overlaying this was material from the final destruction of the kiln superstructure. The date range for the group as a whole is c.1830-1870. The muffle material features peripheral shelf and bar type buttresses. [Norris 1970; Atkinson 1962]

Fabric 1	4636	7	Muffle wall
W.MPO	650	1	SAG5 Sagger
	1217	5	Wicket shelf
	672	6	Wicket wad
	8240	9	BAT1 Wicket tile
Fabric 2	1720	1	BAT3 Bat
W.MP	1200	1	Wicket brick
	1700	1	Wicket tile
	1030	1	Brick or bar
Fabric 3	3900	1	P5a Prop
W.QM			
Fabric 4	C10900	1	P3a Prop
W.QO	C7800	1	DI1 Dish
	C7400	1	DI2 Dish
Fabric 5	2428	7	P2 Prop
W.?	1256	3	P3 Prop
	2009	3	P4 Prop
	620	1	P3b Prop

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
	2066	7	BU2 Bun
	60	2	WA3 Wad
	5	1	WA5 Wad
	710	1	Prop?, Baffle vent?
	662	2	Plug

LI1 LICHFIELD, CATHEDRAL CLOSE, STAFFORDSHIRE SK 117 100
Lichfield District Council

In January 1869 building workers discovered the base of a seventeenth century pipe kiln. Wastered pipes from this kiln are in the possession of Lichfield District Council. [Anon 1869; Hewett 1869; Oswald 1974/5]

LIM1 LIMERICK, BROAD STREET 5815 5724
Limerick Corporation
National Catalogue number E366

The excavation of a multi-flue kiln was carried out under the direction of K Wiggins for the Limerick Corporation between February and April 1989. A plan of this kiln is included in Chapter 7, Figure 63. Pipes marked R AHERN LIMERICK, who is documented as a pipemaker at 18 Broad Street between 1881 and 1892, clearly date this structure to the last two decades of the nineteenth century. Two small finds of considerable interest are copper alloy pipe markers. These are of oval imprint with a tang protruding from the obverse for fixing into a handle of some kind. One reads J WALSH GROCER &^C TEMPLEORUM and the other T FLYNN GORT.

Fabric 1	N/A	90	Saggar
Fabric 2	N/A	2	SP1 Strap with stem imps
W.	N/A	1	Strap twisted spirally
	N/A	2	RK1 rack end
Fabric 3	N/A	1	Amorphous fragment
W.O			

LIN1 LINCOLN, BROADGATE, LINCOLNSHIRE SK 979 713
Lincoln Archaeological Trust BE.74

This material, excavated in 1973, constitutes waste from an early nineteenth century kiln. The date range ascribed to it by the excavator is c.1816 to c.1850. [Mann 1977, 44-5]

Fabric 1	3	3	TS1 Flat thin sheet
W.	15	1	Stem & slag
	5	1	Pipe bowl fragment
Fabric 1&2	10	3	Stems from matrix
W. & W.QO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	5	1	AS2 Applied strip
W.QO	5	2	TS1 Flat thin sheet
	7	2	Amorphous fragment

LIN2 LINCOLN, CORNHILL, LINCOLNSHIRE
City & County Museum 103.82

SK 9761 7104

This material was rescued, by museum staff, from a gas board trench.
The typological date for the pipes is c.1840-60

Fabric 1	2	1	Stem slag laminate
W.	35	17	Stem & slag
	345	1 bag	Stem
	15	6	Stem with spur
	7	3	Stem & iron
	243	2 bag	Bowl
	95	1 bag	Bowl fragments
	25	19	Glazed mouth pieces
Fabric 2	15	1	RK3 or P1 Rack or Prop
W.O			
Fabric 2&3	47	1	Muffle patch?
W.O&W.Q			
Fabric 3	2	5	TS1 Flat thin sheet
W.Q	3	1	Daub squeeze
Fabric 3&4	300	1	Muffle wall
W.Q&W.QMTO			

LIV1 LIVERPOOL, CUSTOMS HOUSE, MERSEYSIDE
Liverpool Museum, Decorative Arts 1978.64.27

SJ 340 910

This assemblage, recovered from building works, includes pipe forms
dating to the early nineteenth century.

Fabric 1	980	8	WA3 flattened ball wad
W.	35	5	TS1 Thin sheet
	120	1	Thin sheet & slag
Fabric 2	860	17	Daub
W.OMG			
Fabric 3	665	3	Muffle wall
W.MO			
Fabric 4	625	2	Fire brick
FB.G			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Miscellaneous	865	8	Slag
	352	5	Slag & pipe detritus
	602	11	Unfired pipeclay
	3920	3	Sandy clay & detritus

LIV2 LIVERPOOL, VICTORIA STREET, MERSEYSIDE SJ 350 910
 Liverpool Museum, Decorative Arts 1967.206

This assemblage, recovered from building works, includes pipe forms dating to the early nineteenth century.

Fabric 1	10	1	RL1 Straight roll
W.	15	1	WA1 Flattened roll wad
	20	1	AS2 Triangular strip
	22	2	TS1 Flat thin sheet
	27	2	Stem slag laminate
	38	1	TS slag laminate

Fabric 2	10	1	TS1 Flat thin sheet
W.O			

LO1 LONDON, THAMES FORESHORE, GREATER LONDON TQ 30 79
 R.A.C.Le Cheminant Collection

This single fragment of muffle material features a prop type buttress. It is dated by a pipe included in the matrix to 1650-1700.

Fabric 1	130	1	Muffle wall
W.O			

LO2 LONDON, 21-9 MANSELL STREET, GREATER LONDON TQ 340 825
 Museum of London, Dept of Urban Archaeology MAN.82.58.194; 207

Material recovered from urban excavation.

Fabric 1	45	1	Layered lute and slag
W.	60	16	Stem, slagged & discoloured

LO3 LONDON, 78 CUTLER STREET, GREATER LONDON TQ 335 820
 Museum of London, Dept of Urban Archaeology CUT.78.201.650

Material recovered from urban excavation.

Fabric 1	55	8	Stems from matrix
W.	7	1	Bowl T10/13 discoloured
	7	1	Bowl T14/15 discoloured
	30	2	Bowls T14/15

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

LO4 LONDON, 68-72 CORNHILL, GREATER LONDON			TQ 325 820
Museum of London, Dept of Urban Archaeology CNL.81.100.186			

Material recovered from urban excavation.

Fabric 1	30	4	RL1 Roll with square cut end
W.			

LO5 LONDON, ALDGATE, GREATER LONDON			TQ 3372 8117
Museum of London, Dept of Urban Archaeology AL.74; 264; 304; 310; 713; 941; 1354-5			

Excavation by the Department of Urban Archaeology, Museum of London, in 1974 recovered a small assemblage of eighteenth century pipe kiln material. The vestigial remains of the pipe kiln ash pit were found *in situ* [Thompson et al 1984 1-148]

Fabric 1	35	3	Bowls from matrix
W.	50	12	Stems from matrix

Fabric 2	190	5	Muffle wall
W.O			

Fabric 3	55	2	Muffle wall
W.MO			

Fabric 4	410	3	BU3d Pierced bun
W.GO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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LO.G1 LONGWELL GREEN, AVON ST 660 710
 Allan Peacey 110 Cainscross Road, Stroud, GL5 4HN LWG.78

Material collected by P Ellis in 1978 for the Committee for Rescue Archaeology in Avon Gloucestershire & Somerset from a construction site. The assemblage, containing a variety of pipe forms together with material from a muffle structure cannot be regarded as from a homogenous context. The muffle base contains pipe material which provides a typological date in the second half of the eighteenth century.

Fabric 1	3374	8	Muffle base
W.QMGO	625	49	Muffle core fragments
Fabric 1&2	2650	1	Muffle base
W.QMGO&W.MG			
Fabric 3	500	110	Stems from matrix
W.	5	2	Bowls from matrix
	15	4	Spurs from matrix
	190	14	Pipe bowls
	240	bag	Pipe fragments

MAL1 MALMESBURY, HOLLOW WAY, WILTSHIRE ST 935 873
 Athelstan Museum MAL.77

This excavated group has a typological date in the first quarter of the eighteenth century. [Peacey 1982, 12]

Fabric 1	1986	50	Muffle wall
W.O	77	6	Core fragment
	12	1	BAT2 Bat
	37	2	Daub
Fabric 2	25	1	Brick
R.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

MA1 MANCHESTER, HURST COURT, GREATER MANCHESTER Manchester Museum, Oxford Road M.2			SJ 83 97
<p>This assemblage comes from two nineteenth century pipe kilns excavated by the Greater Manchester Archaeological Unit in 1981. The muffle material features peripheral shelf and bar type buttresses. [Arnold 1983, 67-75]</p>			
Fabric 1	2	1	Stem from matrix
W.	118	8	RL1 Roll
	75	5	Roll pinched
	2	1	SP1 Strap
	35	5	WA1 Wad
	55	2	WA1 Wad doubled up
	47	2	WA5 Wad
	130	25	WA1 or 5 Wad
	20	1	AS1 Strip with stem imps
	152	74	TS1 Flat thin sheet
	402	9	Stem slag laminate
	60	13	Stem & slag
	185	1 bag	Stem & slag
	15	1	Bowl & slag
	555	4 bag	Stems
	NA	1 box	Stems
	2242	9 bag	pipe bowls
	850	1 bag	Green glazed mouthpieces
	5	4	Amorphous fragment
Fabric 1 & 2	40	2	Slipped fragment
W. & W.PO			
Fabric 2	2735	7	BAT Bat
W.PO	1040	2	BAT1 Bat
	950	1	Bat with spy hole
	425	1	Bat or brick
	57	1	Rim
	455	1	Core fragment
Fabric 3	536	6	Muffle wall
W.PO			
Fabric 4	912	2	Shelf? formed over bricks
W.QO			
Fabric 5	856	7	Muffle wall
W.T	490	5	Shelf? formed over bricks
	1152	7	P Prop
	175	1	BAT Bat
	447	1	BAT1 Bat
	207	1	Tapered brick
	65	1	Clay as mortar
	1409	8	Clay as render to bricks

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 6 W.QMPO	5282	7	DI1 Dish
Fabric 7 W.QMO	3200	4	DI1 Dish
Fabric 8 W,TGO	865	3	DI1 Dish
Fabric 9 FB.G	9512 5697	15 7	Brick Thin brick
Fabric 10 R.	15440	20	Brick
Fabric 11 W.P	750 1300	1 1	BAT Bat Door?
Fabric ?	534	2	Daub
Miscellaneous	155	1 bag	coal & coke
	365	1 bag	Slag
	80	1	Lime mortar
	1050	1	Detritus in concrete
	600	1	Mortar, slag & coke
	4624	5 bag	Mixed detritus

NA1 NANTGARW, CAERPHILLY ROAD, MID GLAMORGAN
Allan Peacey collection NGW.1972

ST 125 855

Unstratified material collected during the construction of the Taff Valley Trunk Road in 1972. A single large fragment of muffle wall, found on the ground surface, includes a peripheral shelf, a bar type buttress and a step in wall thickness coinciding with the upper surface of the shelf. This site, famous for its porcelain production between 1813 and 1822, was occupied from 1833 to the mid nineteen seventies by various members of the Pardoe family who produced earthenware, stoneware and clay tobacco pipes until 1920 when the pottery finally closed.

Fabric 1	4000	1	Muffle wall
W.O	85	9	Core fragment
	45	1	Slagged fragment
	5	2	TS1 thin sheet

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	60	11	WA1 wad
W.	5	1	WA4 joint wad
	25	8	TS1 thin sheet
	180	10	Layered lute lining
Fabric 3	5	1	WA1 wad
R.			
Miscellaneous	30	1	Slag
NE1 NEWARK ON TRENT, 37 ALBERT STREET, NOTTS.			SK 795 540
Peter Hammond collection			
<p>This group of kiln waste material came from an excavation in gardens of houses erected by the pipemaker William Edmunds in the eighteen thirties. These gardens lay between the houses and the pipe manufactory. The muffle material features peripheral shelf and a bar type buttress. [Hammond 1985, 97-9]</p>			
Fabric 1	20	1	RL1 Roll
W.	10	3	RL4 Roll
	7	2	AS1 Applied strip
	102	4	AS2 Applied strip
	15	5	TS1 Flat thin sheet
	7	1	RK1 Rack
	10	2	Stem
	445	18	Stem slag laminate
	50	7	Stem, TS, slag laminate
	40	5	Palmed bob
	25	1	Clay as mortar
Fabric 1 & 6	140	2	Lute, clay as render
W. & W.QMO			to bricks
Fabric 2	50	1	Peripheral shelf?
W.O	185	1	Thin sheet slag laminate
	40	2	Daub
	65	1	Clay as mortar
Fabric 3	160	1	P Prop
W.MO			
Fabric 4	452	2	Peripheral shelf
W.MTO	115	1	BU1 Bun
Fabric 5	617	3	Core fragment
W.GP			
Fabric 6	920	1	Muffle wall
W.QMO			
Miscellaneous	45	1	Raw pipe clay

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

NE2 NEWARK ON TRENT, HEATONS YARD, NOTTS Tudor Hall Museum 44.58; 45.58; 26/4-85			SK 794 539

This material, rescued from builders trenches, is of indeterminate date probably nineteenth century.

Fabric 1	27	3	RL1 Roll
W.	10	1	SP1 Strap
	17	3	TS1 Flat thin sheet
	260	9	Stem slag laminate
 Fabric 1 & 2	 82	 2	 Thin sheet, stem slag
W. & W.O			laminate
 Fabric 2	 5	 1	 TS1 Flat thin sheet
W.O			
 Fabric 3	 4669	 10	 Muffle wall
W.QO			

NO1 NORTHAMPTON, CHALK LANE, NORTHANTS. Central Museum and Art Gallery, Northampton N.C.64			SP 749 605
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Recovered by the museum after demolition and site clearance; interpreted as a dump of material 'from the workshop of F. Street, who worked in nearby Pike Lane, 1835-40'. The muffle material features peripheral shelf and bar type buttresses. [Moore 1981, 130]

Fabric 1	12	1	AS2 Applied strip
W.	101	8	WA5 Ring wad
	65	6	RL1 Roll
	10	3	TS1 Flat thin sheet
	27	2	Stem slag laminate
	85	6	Stem & slag
	15	1	Bowl & slag
	3450	4 bag	Unwashed stem
	500	7 bag	Pipe bowl 1830-60
 Fabric 2	 96	 35	 TS1 Flat thin sheet
W.O	90	2	Wicket shelf
	25	4	Amorphous fragment
 Fabric 3	 2817	 28	 Muffle wall
W.QMO			
 Fabric 4	 25	 1	 Muffle wall
W.QMPO	150	1	BAT1 Bat

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 5	1160	8	Brick
R.			
Miscellaneous	35	1	Raw pipe clay
	120	31	Coal
	185	NA	Slag
	87	1	Fire brick
	290	22	Pottery, shell & glass
	70	1	Stone
	470	NA	Mixed detritus

NO2 NORTHAMPTON, HORSESHOE STREET, NORTHANTS. SP 7514 6032
 Central Museum and Art Gallery, Northampton D.193.1974

Material, collected from unstratified deposits ahead of building works. The site was occupied by the clay pipe workshop of F Street from 1840-50. [Moore 1975, 173]

Fabric 1	92	14	RL1 Roll 7-12mm diameter
W.	82	7	Stem slag laminate
	15	1	Bowl & slag
Miscellaneous	10	NA	Coal

NOR1 NORWICH, POTTERGATE/ST. BENEDICT'S, NORFOLK TG 23 08
 Norwich Bridewell Museum 364.973

An anonymous gift 1973. Date uncertain post 1750 from upper bowl forms in matrix.

Fabric 1&2	660	3	Muffle base
W. & W.QM			
Fabric 2	15	1	Muffle wall
W.QM	600	1	P1 prop
Fabric 1, 2&3	85	1	Muffle base
W. W.QM W.QMOPG			
Fabric 1, 2, 3&4	1100	1	Muffle base
W. W.QM W.QMPG			
R.			

NOR2 NORWICH, 26-7 CATTLE MARKET STREET, NORFOLK TG 23 08
 Norwich Bridewell Museum 583.467

Fabric 1	150	1	Stem slag laminate
W.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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NOR3 NORWICH, CASTLE MALL, NORFOLK TG 23 08
Norwich Bridewell Museum 777N

Fabric 1 W.	NA	2	Pipe bowls in slag
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Miscellaneous	NA	1bag	Mixed detritus
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NOR4 NORWICH, POTTERGATE, NORFOLK TG 23 08
Norwich Bridewell Museum N149

Material from several separate contexts.

Fabric 1	NA	4	SP1 strap
W.	NA	1	Trimming ring?
	NA	1	Stem & iron concretion
	NA	4	Stem & slag
	NA	5	Bowl & slag
	NA	1	Pipe bowl 19th C.

NOT1 NOTTINGHAM, WHITE COW YARD, CARTERGATE SK 57 41
Peter Hammond collection

Between 1971 and 1979 a series of small tips of waste from a pipe kiln or kilns were discovered in the environs of White Cow Yard. The pipe evidence associates these with the factory of Issac Dance known to have been working from c. 1841 to 1880. The material had apparently been used to level surfaces for building and footpath construction. [Hammond 1982, 27-33]

Fabric 1	40	3	WA1 Wad
W.	35	2	WA5 Wad
	258	18	AS1 Strip with stem imp
	5	1	TS1 Flat thin sheet
	28	3	Pipe bowls
	27	3	Pipe stems

Miscellaneous	102	2	Raw pipe clay
	510	2 bag	Soil sample

NOT2 NOTTINGHAM, GENERAL CEMETERY SK 57 41
Peter Hammond collection

A casual find.

Fabric 1	3	1	SP1 Strap end
W.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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NOT3 NOTTINGHAM, LEOPOLD STREET
Not known

SK 57 41

A small assemblage of kiln waste dating from the nineteenth century was discovered below a cobbled surface. The present whereabouts of this group is not known. [Hammond 1982, 32]

PE1 PETERBOROUGH, THORPEWOOD, CAMBS.

TL 183 984

Excavated in 1965, this three chambered stone built structure was tentatively identified as a tobacco pipe kiln. Many tobacco pipes were found associated with the structure together with a mixed assemblage of pottery, plaster and brick. At least a quarter of the tobacco pipes had been used. There is no evidence from the site that tobacco pipes were made there. There is documentary evidence for lime kilns on the site in a lease dated 1786 and a lime kiln was excavated nearby immediately prior to the discovery of the structure in question. The ground plan is unlike any known tobacco pipe kiln, but is paralleled by lime kilns at Clementhorpe Nunnery, North Yorkshire [Cherry 1977, 99-100]. It is therefore thought unlikely that this structure is the base of a tobacco pipe kiln but probable that it is of a second lime kiln. [Dakin 1968, 164-6]

P.A1 PIPE ASTON, HEREFORDSHIRE

SO 4675 7200

A Peacey 110 Cainscross Road, Stroud, GL5 4HN PA.72; PA.92

The site was discovered in 1930 by a timber contractor, Mr. Davies, when the wheel of his waggon sank into a 'nest of fragments of white clay pipes' [Watkins 1931, 132]. A visit to the site in 1972 resulted in a small collection of pipes and kiln debris from the upcast of mole hills in the field. Further pipes were collected from the stream bed in May 1992. Trial excavations were carried out in July 1993 to locate the exact site of the buildings associated with pipe production [Appendix 7]. The pipe typology suggests a manufacturing period in the last quarter of the seventeenth century.

Fabric 1	5	1	Bat?
W.	2	1	Roll
	15	2	Daub
	65	10	Pipe bowl fragments
	25	10	Pipe stem fragments
	25	4	Pipe bowl fragments
	5	1	Pipe spur fragment
	35	11	Pipe stem fragments
Fabric 2	45	5	Muffle wall?
W.O	40	2	Muffle wall
	75	7	Daub
Fabric 3	135	2	Red Brick
R.			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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relate to these same structures. The groups are catalogued separately as PO1-PO4. PO1 and PO2 feature bar type buttresses. PO3 has one prop type buttress. [Moorhouse 1971, 216-8; Peacey 1982, 5-12; Fox & Barton 1986, 69-71]

PO1 [PK1 in Fox & Barton 1986, 69-71]

Fabric 1	13017	22	Muffle wall
W.QMO	15	1	Pipe bowl
	485	1	Brick or bar

Fabric 2	510	1	Cover?
W.O			

Fabric 3	1500	1	Brick
R.M			

PO2 [PK2 in Fox & Barton 1986, 69-71]

Fabric 1	4574	38	Muffle wall
W.QMO	7	1	TS1 Flat thin sheet

Fabric 2	305	3	Irregular slab
W.O	90	1	Daub

Fabric 3	155	2	TS1 Thin sheet
W.O			

Fabric 7	130	14	Stem from matrix
W.	35	1 bag	Bowls from matrix
	15	1 bag	Stem

Miscellaneous	182	3 bag	Mixed detritus
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PO3 [PK3 in Fox & Barton 1986, 69-71]

Fabric 1	455	5	Muffle wall
W.QMO			

Fabric 1 & 7	30	4	Stem in matrix
W.QMO & W.			

Fabric 8	67	2	Brick
R.			

PO4 [PK4 in Fox & Barton 1986, 69-71]

Fabric 1	928	12	Muffle wall
W.QMO			

Fabric 3	20	1	Bowl in matrix
W.O			

Fabric 5	165	2	Muffle base
W.O			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 6	200	1	Muffle wall
W.QO	32	2	Amorphous fragment
Fabric 9	275	2	Brick
R.Q			
Fabric 10	60	1	Tile
R.QM			
Miscellaneous	60	1	Raw clay, stem & TS
	25	1	Stem & iron concretion

RA1 RAINFORD, CHURCH FIELD, MERSEYSIDE SD 478 007
National Museums & Galleries on Merseyside, Blundell Street Stores.

The site was excavated in 1977/8 by an extra mural student group from the University of Liverpool under the direction of P J Davey. Pipe kiln material had been observed in the ploughsoil. This proved to belong to a mid seventeenth century dump of tobacco pipes and associated kiln debris. The date ascribed by the excavator is 1630 to 1650. The overlying soils contained some later pipe kiln material. The entire assemblage is recorded in this catalogue regardless of stratigraphy. All fabrics except Type 9 are represented in the stratified material. The unstratified objects formed from fabric Type 9 are all consistent with a late eighteenth or nineteenth century date. The site is fully reported in the BAR British Series 100 [Davey et al 1982, 189-251].

Fabric 1	3221	18bag	Layered lute
W.Q	2440	11bag	Flaked lute
Fabric 2	60	1bag	Muffle wall
W.QG	145	1bag	Flaked lute
	1020	12bag	Daubed lining
Fabric 3	1150	1	Muffle wall sub rectangular
W.?	326	1	Muffle wall
	2030	34	Muffle base
Fabrics 1, 2 & 3	2315	4	Muffle base
Fabrics 2 & 3	3080	6	Muffle base
Fabric 4	14190	20 bag	Muffle wall
W.GO	3880	11bag	Muffle base
	60	1	Plug
	222	2	Brick or bar
Fabric 5	75	1	Muffle wall
W.GO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 6	5988	9bag	Muffle wall
W.MO	2620	10	Flue lining?
	395	5	Daub
	600	13	Shaped section
Fabric 7	1540	14	Muffle wall
W.M			
Fabric 8	140	2	Pierced tile
W.G	395	3	Fire bar?
Fabric 9	26	4	Thin sheet
W.	225	39	Roll, strap, Applied strip & wad
	45	2	Edge of brick or bar
	1	1	Thimble?
	5	2	Marble
Fabric 10	10619	22bag	Brick
R. QM			
Fabric 11	1255	10bag	Flaked lute
W.M			
Fabric 12	1392	11	Muffle wall
W.M	1032	4	Muffle base
Fabric 13	700	11bag	Daubed lining
W.M			

RA2 RAINFORD, TRIAL HOLE IN FIELD, MERSEYSIDE
R Dagnall, 14 Old Lane, Rainford R42

SD 486 019

Trial excavation in field depression. Mid to late nineteenth century.

Fabric 1	50	7	Wad fragments
W.	85	10	AS2 applied strip
	55	6	AS2 ditto, stem imp
	210	56	TS1 flat thin sheet
	180	7	Amorphous fragment
	1500	25	Thin sheet slag laminate
Miscellaneous	75	6	Coal
	280	4	Fire brick
	175	8	Pottery

RA3 RAINFORD, DROWN PITCHER LANE, MERSEYSIDE
R Dagnall, 14 Old Lane, Rainford R.17

SD 485 020

This assemblage is the result of field walking. The material is of uncertain date.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1 W.	23	5	WA wad fragments
Fabric 2 W.O	25	1	Muffle wall? reinforced with stems

RA4 RAINFORD, 1 PASTURE LANE, MERSEYSIDE SJ 485 995
R Dagnall, 14 Old Lane, Rainford R.43

Unstratified surface finds. The site is known to have been used for pipe production from 1841 until 1891 [Dagnall 1990, 14].

Fabric 1 W.	95	11	WA wad fragments
	395	14	WA5 ring wad
	75	40	TS1 thin sheet fragments
	110	20	Thin sheet slag laminate
Fabric 2 W,QMO	700	1	Heavily glazed curved arris possibly from muffle base
Miscellaneous	50	3	Coal

RA5 RAINFORD, ROOKERY LANE, MERSEYSIDE SD 487 000
R Dagnall, 14 Old Lane, Rainford R.64

An unstratified group of mid nineteenth century date.

Fabric 1 W.	5	1	RL1 pinched roll
	10	1	RL2 curved with stem imp
	22	2	WA wad fragments
	10	1	AS2 D section - stem imp
	5	2	TS1 fragments
	15	2	Thin sheet slag laminate
Fabric 2 W.O	65	3	Daub
Miscellaneous	15	1	Coal

RA6 RAINFORD, RANDLE BROOK BRIDGE, MERSEYSIDE SD 473 015
R Dagnall, 14 Old Lane, Rainford R.65

Unstratified finds from building site. The site was used for pipemaking from c. 1800 until 1925 [Dagnall 1990, 4].

Fabric 1 W.	45	2	WA curved wad
	65	1	Thin sheet slag laminate
Fabric 2 W.G	375	1	Fragment from cylinder

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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Fabric 3 W.QMG	112	1	Fragment from cylinder
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Miscellaneous	10	3	Coal
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RA7 RAINFORD, ROOKERY FARM, MERSEYSIDE SD 487 000
R Dagnall, 14 Old Lane, Rainford R9

Unstratified assemblage collected from a sewer trench. The pipes are consistent with a second quarter nineteenth century date.

Fabric 1	50	13	RL1,2&3 straight & curved
W.	5	1	RL3 tapered roll
	30	31	SP4 with bowl imp
	35	6	WA wad fragments
	815	23	WA5 ring wad
	40	5	AS1 Strip with stem imp
	385	40	AS2 triangular stem imp
	600	1 bag	TS1 thin sheet fragments

Miscellaneous	1300	15	Fire brick
	650	1	Raw clay & detritus

RA8 RAINFORD, HILL TOP WORKS, MERSEYSIDE SJ 487 986
R Dagnall, 14 Old Lane, Rainford R.15

Unstratified finds from garden soil. The works is believed to have been established around 1800 and continued to produce pipes until 1956 [Dagnall 1990, 7-8].

Fabric 1	280	26	WA5 ring wad
W.	20	6	AS1 D section
	50	19	AS1 Strip with stem imp
	15	3	AS2 with stem imp
	455	272	TS1 fragments
	20	2	TS3 folded thin sheet
	1100	26	Thin sheet slag laminate

Miscellaneous	125	9	Coal
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From a rabbit hole in a nearby wood where the above works is known to have tipped waste. R.68

Fabric 1	95	8	WA5 ring wad
W.	45	5	AS1 D section
	900	1	Thin sheet slag laminate
	60	55	TS1 fragments

Fabric 2	940	3	Cylindrical saggar
W.G	495	1	SAG7 Circular with tapering walls

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

RA9 RAINFORD, ORRETS NOOK, MERSEYSIDE			SD 494 007
Group 1; R Dagnall, 14 Old Lane, Rainford R.48			
Unstratified material collected from a contractor's trench. Pipes with the assemblage are of early to mid eighteenth century form.			
Fabric 1	15	3	RL1 fragments
W.	70	3	WA5 ring wad
	45	1 bag	TS small fragments washed out from pipe bowls

Group 2; North West Archaeological Trust, Harold Cohen Library, University of Liverpool.

Unstratified surface material collected by members of a Liverpool University extra-Mural class working on a survey of documented pipe production sites. In December 1979 a systematic collection of man made material was made in an attempt to locate the production area [Davey et al 1982, 129-142]. Because of the mixed nature and chronological anonimity of the sample only that material consistent with pipe kiln origin has been included in this catalogue.

Fabric 1	5	1	Fragment with stem voids
W.	2	1	RL1 roll
	16	15	TS1 thin sheet
	15	1	Daub
	75	29	Abraded fragment
Fabric 2	120	5	Fragment with stem voids
W.O	155	23	Abraded fragment
Fabric 3	55	1	Fragment with stem voids
W,M	50	1	Abraded fragment

RA10 RAINFORD, SHELL HOUSE, MERSEYSIDE SD 485 018
R Dagnall, 14 Old Lane, Rainford R.14

Unstratified material collected from field after ploughing. Pipes are of late eighteenth to late nineteenth century forms.

Fabric 1	810	83	WA1 fragments
W.	275	43	AS1 fragments
	5	1	AS1 with bowl mouth imp
	25	18	TS1 fragments
	485	10	Thin sheet slag laminate
	5	1	TS, stem slag laminate
	225	16	Amorphous fragments
Fabric 2	270	3	Muffle wall
W.O	415	26	Daub
Fabric 3	60	1	BU3? section
W.GPO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Miscellaneous	255	9	Amorphous fragments in mixed fabrics

RA11 RAINFORD, GRAVEYARD, MERSEYSIDE
R Dagnall, 14 Old Lane, Rainford R.47

SD 478 007

Surface collection led to a small excavation which revealed a compact deposit of early eighteenth century material [Dagnall 1990, 26]. The stratified material is listed separately from the unstratified.

Stratified.

Fabric 1	5	2	RL1 roll fragments
W.	150	230	TS1 fragments
	5	1	TS3 Folded thin sheet

Miscellaneous	140	1 bag	Mixed detritus
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Unstratified.

Fabric 1	145	88	TS1 fragments
W.	17	5	RK1 Rack or strut
Fabric 2	35	2	Cylindrical vessel wall
W.O			
Fabric 3	1790	4	Cylindrical vessel wall
W.MO			
Fabric 4	170	3	Cylindrical vessel wall
R.O			
Fabric 5	800	1	Cylindrical vessel wall
Miscellaneous	25	6	Pottery
	100	1 bag	Mixed detritus

RA12 RAINFORD, PENNSYLVANIA FARM, MERSEYSIDE
R Dagnall, 14 Old Lane, Rainford R.70

SD 492 010

This assemblage comes from a small excavation, by R Dagnall, in the garden of the farm. It was found that a paved area had been bedded on a layer of pipe kiln material. Pipe forms range from mid seventeenth to mid eighteenth century [Dagnall 1990, 20].

Fabric 1	70	52	RL1 roll fragments
W.	140	11	WA1 fragments
	200	4	WA3 ball wad with imp of hollow prop base
	45	39	TS1 thin sheet fragments
	100	16	Daub fragments
	385	1 bag	Daub fragments
	10	1	Fragment reinforced with stems possible rack

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2 W.O	450	3	Muffle wall
Fabric 3 W.GO	70 55	1 1	Muffle rim Muffle wall
Fabric 4 W.MO	180 275	1 1	Muffle wall Tapering bar of rounded D section

RA13 RAINFORD, PRIMROSE HILL, MERSEYSIDE
R Dagnall, 14 Old Lane, Rainford R.86

SD 488 007

This site is known, from a document, to have been occupied by a pipe shop in 1783. Finds from field walking suggest production from the middle of the seventeenth century well into the nineteenth century. Trial excavations on the site, carried out by R Dagnall in 1986 produced stratified material dating from the late eighteenth to early nineteenth centuries [Dagnall 1990, 21]

Fabric 1 W.	45 5 50 73 115	6 5 14 48 5	RL1 roll fragments SP1 small fine fragments WA1 fragments TS1 fragments Amorphous lumps
Fabric 2 W.O	50	1	Daub
Fabric 3 W.QO	200 4890 1510 345 985	1 5 43 11 35	External prop buttress Muffle rim fragments Muffle wall fragments Daub encasing stems Daub
Fabric 3 R.&W. marbled	350	1	SAG1 Saggarr base wheel thrown
Miscellaneous	769 1200 1000	11 7 5	Assorted glazed fragments Red brick, flash glazed Red brick

RA14 RAINFORD, REEDS BROW FARM, MERSEYSIDE

SD 487 020

Unstratified surface finds collected as part of the survey, of known pipemaking sites carried out in 1979-80 [Liverpool University extra-Mural class]. Two distinct areas produced concentrations of finds characteristic of tobacco pipe manufacture. A concentration of nineteenth century waste lay on the line of the former Drownpitcher Lane whilst from a field further to the east, nearer the farmhouse, 17th-century material was recovered. [Lewis et al 1982, 100].

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

Group 1			
Fabric 1	125	25	RL1 roll
W.	10	3	RL1 roll with stem imps
	15	5	RL3 tapered roll
	10	1	SP1 strap
	125	19	WA1 wad
	40	11	AS1 applied strip
	1	1	TS1 thin sheet
	10	1	Socket stand
	190	17	Abraded fragments
Fabric 2	65	1	Edge of brick or muffle
W.O	5	4	Stem fragments
	15	1	RL1 roll
	2	2	TS1 thin sheet
	100	8	Abraded fragments
Miscellaneous	10	3	Marble, stone, insulator
Group 2			
Fabric 1	160	1	Fragment with flat glazed surface
W.O	70	2	Bat or saggar base fragment
	85	1	Base angle patch
	85	4	Abraded daub
	10	1	Core fragment
SA1 SALISBURY, CITY DITCH, WILTS.			SU 14 29
Salisbury & South Wiltshire Museum SAL.72.2			
A single unstratified fragment of uncertain date.			
Fabric 1	45	1	Muffle base, bat or brick?
W.MO			
SA2 SALISBURY, TRINITY CHEQUER, WILTS.			SU 14 29
Trust for Wessex Archaeology 88.W.227			
In the words of the excavator: 'not from a particularly secure context but at a guess late eighteenth century'.			
Fabric 1	97	1	P1 Prop
W.M			
SH1 SHEFFIELD, SCOTLAND STREET, SOUTH YORKSHIRE			SK 350 878
City Museum 1986.333			

This group was found by school boys on wasteland. The large quantity of pipes recovered date from c. 1830-60. The brick feature in which the pipes were lying may be part of the kiln or workshop structure.

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 1	3	1	TS1 Flat thin sheet
W.	5	1	TS3 Folded thin sheet
	175	1	Stem slag laminate
	12	1	Bowl & slag
Fabric 2	5	1	TS1 Flat thin sheet
W.O	30	1 bag	Daub squeezes
Miscellaneous	3	2	Coal
	75	2	Slag
	375	2	Red brick

SN1 SOUTHAMPTON, 58 FRENCH STREET, HANTS.
Eagle warehouse, French Street SOU.102

SU 419 111

Excavation in 1976, by the Department of Archaeology, University of Southampton in conjunction with the restoration of a medieval building on the site, recovered a quantity of pipe kiln waste from the fill of a light well [Hinton 1978, 46-7]. Typologically the finds appear to date to the period 1775-1825. There are a few earlier pipes which are probably residual. Many pipes marked I S are attributed to James Skeams who is recorded in a Southampton directory for 1839 [Oswald 1975, 173]. The form of the pipes is certainly earlier than this date.

Fabric 1	60	7	WA5 Ring wad
W.	225	237	SP1 Strap with bowl imp.
Fabric 2	190	4	Muffle wall
W.O	35	5	Core fragment
	250	130	TS1 Flat thin sheet
	340	44	Daub
Miscellaneous	165	8	Stem slag laminate
	15	3	Thin sheet slag laminate
	900	38	Slag
	95	18	Coal
	11500	3 bag	Mixed detritus

SN2 SOUTHAMPTON, 58 FRENCH STREET, HANTS
Eagle warehouse, French Street SOU.228

SU 419 111

Excavated in 1987 by Southampton Museums. The pipe evidence is consistent with the previous group. Several moulds are common to both assemblages. There are no later forms from the contexts which contain kiln debris. A date of 1775 to 1825 for the material is therefore appropriate.

Fabric 1	8090	22	Muffle wall
W.QO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	800	1	Slagged mass
W.P	15	2	Core fragment
Fabric 3	5	1	RL1 Roll with bowl imps
W.	10	1	RL1 Roll with stem imps
	20	5	SP1 Strap with bowl imps
	120	9	WA5 Ring wad
	380	3bag	Pipe bowls
Miscellaneous	95	1	Stem slag laminate
	1910	22	Slag
	20	1	Red brick
	5	1	Coke
	80	3	Mortar

SN3 SOUTHAMPTON, BUGLE STREET, HANTS.
Eagle warehouse, French Street

SU 418 113

Among the finds from the Bugle street excavations of 1967 is a single fragment of stem reinforced muffle wall. The finds from this excavation were not available for inspection when the writer visited the warehouse. The fragment is illustrated in the pipe report for the site [Atkinson 1975, 349].

SN4 SOUTHAMPTON, ST. MICHAELS SQUARE, HANTS.
Eagle warehouse, French Street

SU 418 115

Following the subsidence of a pavement at the west end of St Michaels Church, in 1969, excavation revealed a vault filled with domestic and workshop refuse from the seventeenth and eighteenth centuries [Thompson 1969, 37-8]. Among this assemblage were some fragments from a pipe kiln muffle. These fragments could not be located when the writer visited the warehouse.

SO1 SOUTHWARK, ARCADIA BUILDINGS, GREATER LONDON
Museum of London AB.77-9

TQ 328 791

This group was recovered during excavations, carried out by the Southwark and Lambeth Archaeological Excavation Committee, between 1977 and 1979. It constitutes the fill of two pipe kilns and the features associated with them. Sufficient muffle material was recovered to allow a plausible reconstruction which together with the surviving ash pit and fire box provides a substantial illustration of the main elements of a tobacco pipe kiln towards the end of the seventeenth century. [Dean 1980, 367-373; Peacey 1982, 3-17]

Fabric 1	7589	89	Muffle wall
W.MO	11889	53	Muffle base
	8898	34	Muffle prop
	550	5	Muffle ridge
	170	1	Lining patch

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	310	1	Muffle prop
W.	2565	368	Stems from matrix
	1160	2bag	Stems from matrix
	448	27	Bowls from matrix
	715	2bag	Stems & bowls from matrix
	117	30	Stems
	379	25	Bowls
Fabric 3	143	2	Muffle wall
W.QO	1519	105	Layered lute
	270	10	Lute over stems
	800	17	Lining patch
	5	1	Core fragment
Fabric 4	42	3	Tile
W.M			
Fabric 4	360	2	Rectangular bar
W.M			
Fabric 6	2479	26	Muffle wall
W.QO	2482	7	Muffle base
	615	2	Muffle prop
	3118	13	Muffle bar
	429	22	Core fragment
Fabric 1&3	1707	31	Muffle wall & lute
W.MO&W.QO	360	1	Lining patch
Fabric 3&6	2533	40	Muffle wall & lute
W.QO&W.QO			
Miscellaneous	140	3	Slag
	2364	24	Red Brick
	1449	11	Red tile
	115	1	Pottery
	3470	5	Stone
	340	8	Mortar
	32	2	Bone Bone
	470	5	Slagged detritus
	155	2bag	Mixed detritus

SO2 SOUTHWARK, 15-23 SOUTHWARK STREET, GREATER LONDON TQ 326 810
Museum of London CB.80

This assemblage, excavated in 1980 by the Southwark and Lambeth Excavation Unit, was in association with the vestigial remains of a tobacco pipe kiln. Associated pipes are of London type 25 which had currency from 1700-70 [Atkinson & Oswald 1969, 179].

Fabric 1	6690	17	Red brick
R.QMO			

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 2	285	93	TS1 fragments
W.O	275	46	TS edge fragments
	140	5	Core fragments
Fabric 3	30	9	Spalded lute
W.	5	1	Roll
	6	6	TS1 thin sheet
	10	3	Flakes
	20	3	Bowl fragments
	15	3	Stem fragments
	240	1	Object, Lamp
	195	4	Object, Stand or socket
Fabric 4	640	36	Muffle wall
W.O	230	14	Core fragment
	750	1	Prop base
Fabric 5	220	10	Muffle wall
W.QM			
Fabric 6	625	3	Muffle wall
W.QMO			
Fabric 7	45	1	BU1 Indented bun
R.QMO			
Fabric 1&4	500	1	Composite fragment
R.QMO&W.O			
Fabric 3&4	240	21	Muffle wall
W.&W.O			
Miscellaneous	1000	1 bag	Mixed detritus

ST1 STAINES, ELMSLEIGH HOUSE, SURREY

TQ 04 71

Surrey County Archaeological Unit, County Planning Dept. CAD.77

This assemblage was recovered by the Archaeological Unit during emergency trenching in 1978. On the evidence of pipe forms recovered it dates from the late seventeenth or early eighteenth century. The material is much abraded but includes one prop type muffle buttress. [Barker 1976]

Fabric 1	155	2	Muffle wall?
W.QO			
Fabric 2	107	1	Muffle wall?
W.O	365	1	Muffle rim
	35	1	Layered lute
	45	19	TS1 Flat thin sheet
	80	6	Daub
	20	1	Amorphous abraded fragment

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 3	60	1 bag	Stems from matrix
W.	6	2	TS1 Flat thin sheet
Fabric 4	325	2	Muffle wall?
W,QO			
Miscellaneous	132	5	Slag
	220	1	Slag & stone
	370	24	Abraded brick
	15	1	Red tile
	55	4	Pottery
	45	1	Stone
	20	1	Flint
	2	1	Mortar

ST.A1 ST. ALBANS, HOLYWELL HILL, HERTS.
Kingston House, Inkernman Road 30

TL 146 069

Excavated in 1970 by the St. Albans & Hertfordshire Architectural and Archaeological Society. The muffle material includes 41 prop type buttresses. Associated pipes have a typological date span of 1680-1730. [Christophers 1970, 33; Freeman & Lane 1980, 101-10]

Fabric 1	34034	944	Muffle wall
W.QMO	1257	14	Muffle base
	3205	41	Muffle prop
	10	1	Core fragment
	285	4	Corner infill
	205	1	Ridge
	185	5	Daub
	2092	15	Brick
Fabric 2	339	2	Muffle wall
W.O	43	1	Muffle prop end?
	102	2	BAT1 Bat
	3080	578	TS1 Flat thin sheet
	330	19	Variable sheet
	42	2	Wedge
	42	2	Clay as mortar
	1320	1	Brick
Fabric 3	10043	10 bag	Stems from matrix
W.	862	6	Bowls from matrix
	110	1 bag	Mouth-pieces from matrix
	1385	175	Flaked lute
	52	2	RK2 Rack end
	300	1 bag	Stems
	15	1	Clay as mortar

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 4	20	2	Core fragment
W.O	1565	32	Formed against bricks
	1208	22	Clay as mortar
	55	1	Amorphous fragment
Fabric 5	87	2	Clay as mortar
R.	1762	20	Brick
	317	1 bag	Brick
	3300	6 bag	Brick and tile
	3562	23	Tile
Fabric 1 & 5	57	1	Muffle matrix & tile
Fabric 1, 3 & 5	550	1	Composite support
Miscellaneous	50	1	Raw clay
	35	7	Coal
	1	1	Charcoal
	1420	2 bag	Mixed pottery
	25	1	Oyster shell
	454	3 bag	Glass
	3010	8	Stone
	34	1 bag	Flint pebbles
	1315	6 bag	Chalky mortar
	554	2 bag	Iron
	150	3 bag	Bone
	2	1	Wood

ST.N1 ST. NEOTS, MARKET SQUARE, CAMBS.

TL 18 60

Excavations in 1956 encountered the 'remains of a clay pipe kiln containing many wasters' [Tebbutt 1956, 83]. The finds from the site were deposited in the Norris Museum, St. Ives. In December 1989 when enquiries were made the Norris Museum had no wasters or other material from the pipe kiln.

STA1 STAMFORD, NORTH STREET, LINCOLNSHIRE
Stamford Museum, Broad Street ST.2657

TF 025 075

A good group of kiln furniture rescued from building works in 1972. The site was occupied by the Lonstaff family from 1847. The last record of pipemaking on the site is a trade directory entry of 1896. [Comrie 1979, 221-6]

Fabric 1	650	1	P2a Prop pierced
W.P	2536	3	P4a Prop
	E15000	1	P3b Prop
	505	1	P4c Prop
	257	1	BU2 Bun
	297	1	BU3b Bun
	250	1	BU2a Bun
	930	1	BU3 Bun

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
	3900	1	BAT1 Bat
	2600	1	WA3 Wad
	E15000	1	Door
	587	3	Bar
Fabric 2	240	1	AS2 Applied strip
W.	NA	24	Pipe bowls
SU1 SUNDERLAND, HALF MOON LANE, TYNE & WEAR Museum and Art Gallery			NZ 39 57
Pipe kiln waste found in a well during building works. The typological date for the pipe bowls is c.1830-60.			
Fabric 1	1110	2	Stem slag laminate
W.			
Fabric 1&2	750	1	Thin sheet, stem slag laminate
W.&W.O			
TR1 TROWBRIDGE, ISLINGTON ALMSHOUSES, WILTSHIRE Devises Museum DZSWS.Box 18			ST 8589 5866
Material of uncertain date.			
Fabric 1	1880	2	Muffle wall
W.GO	2770	1	Muffle base
TR2 TROWBRIDGE, 10 CHURCH STREET, WILTSHIRE The Museum, Civic Hall, Trowbridge TC.588			ST 85 58
The site was excavated in 1988 after building work uncovered kiln muffle fragments and pipe waste. The kiln was not located but a coherent group of pipes and kiln debris, dating from the second half of the seventeenth century, was recovered. At the time the following record was made a small number of the finds, being on display, were not accessible for detailed examination. These included five fragments from the muffle wall constructed from clay and prefired pipe stems together with a few objects ancillary to the production of pipes on the site.			
Fabric 1	177	2bags	Stems from the matrix
W.	115	3bags	Bowls from the matrix
	2	1	RL1 Roll pinched
	441	121	TS1 Flat thin sheet
	25	1	TS1 Thin sheet laminate
	444	55	Variable sheet
	337	58	Thin sheet, smear or daub
	60	1	Stem and slag
	435	1bag	Wastered stems
	922	12bags	Pipe stem fragments
	2328	39bags	Pipe bowl & stem fragments

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
	74	8	Daub
	12	2	Object, fragment of sphere
	15	2	Object, pared irregular star
	15	1	Object, rectangular tapered base
	1	2	Object, 3mm slice from oval prism, knife trimmed from heel of pipe
	NA	1	Object, pipe clay stamp with reverse image of a man with long hair or wig
	NA	1	Object, pipe clay box with milled decoration
	10	1	Object, white unglazed pot sherd
Fabric 1&2 W. & W.O	15	7	TS1 Thin sheet laminate
Fabric 1&3 W. & W.QM	100	10	TS1 Thin sheet laminate
Fabric 2 W.O	10	1bag	Core fragments
	27	1	Stems in matrix
	84	2	Variable sheet
	5	1	Thin sheet, smear or daub
	50	2bag	Daub
	214	14	Daub
Fabric 4 W.Vitrified	35	1	BAT Bat
	72	1	Muffle, saggar or pot?
Fabric 5&1 R.O & W	540	2	White clay slip on red clay tile
Fabric 5&2 R.O & W.O	255	2	Daub on red brick
Fabric 6 W.QM	17	1	Muffle wall?
Fabric uncertain	NA	5	Muffle wall
Fabric uncertain Vitrified	179	2	Muffle wall
	87	1	SAG? Fragment from cylind- rical vessel
	35	1bag	TS1 Thin sheet laminate
	165	2bag	Variable sheet

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Miscellaneous	10	4	Raw pipe clay
	601	38	Coal shale
	17	2	Coak or charcoal
	104	8	Slag
	180	1bag	Slag
	25	1	Slag 'worms'
	55	2	Slag, brick & shale
	1613	12	Red brick
	165	1bag	Soil sample
	415	3bags	Slagged detritus

TRU1 TRURO, PYDAR STREET, CORNWALL
County Museum, Truro

SW 82 44

In 1971 kiln material was collected from a building site. It came from two distinct areas and each produced distinctive material. Pipes from one area suggest a date in the first quarter of the eighteenth century whilst the others are from the first half of the nineteenth century. Both groups produced kiln muffle material.

Fabric 1 W.O	1742	3	Muffle wall
Fabric 2 W.	35	1	P1? Prop or stem cluster
	32	3	WA5 Wad
	25	3	SP1 Strap
	165	1 bag	Stems
	839	77	Pipe bowls 18th C
	600	78	Pipe bowls 19th C
	140	1 bag	Pipe fragments
	2	2	Glazed mouthpiece
	20	1	Knob
Fabric 3 W.O	465	10	Muffle wall
Miscellaneous	87	1	Slag
	900	1	Fire brick
	145	1 bag	Pottery

WA1 WAREHAM, NORTH STREET, DORSET
Wareham Museum

SY 922 877

Unstratified material recovered from building works in 1974. The typological date for the pipes is early to mid eighteenth century. [Brown 1974, 71]

Fabric 1 W.Q	260	1	Muffle wall
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C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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WAR1 WARWICK, MARKET STREET Warwickshire Museum, Warwick WAR.67.A	SP 279 649
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A small excavated group of mid nineteenth century material. The group has been dated by documentary evidence to the period 1870-90 [Taylor & Gault 1979, 279-80].

Fabric 1 W.Q	1865	4	Muffle wall
Fabric 2 W.MP	990	3	P2 Prop
	1200	1	P2a Prop
	610	2	P5a Prop pierced
Fabric 3 W.	19	4	WA5 Ring wad
	10	1	WA3 Disc wad
	24	3	RL1 Roll
	4	2	TS1 Flat thin sheet
	50	1	RK2 Rack
	52	1	Stem slag laminate
Fabric 4 W.GO	32	1	BAT2 Pierced bat
Miscellaneous	1250	2	Fire brick

WAT1 WATERFORD, OLAF STREET University College Cork E.434	S 607 123
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This group of material is associated with a kiln excavated in 1988 by the Archaeological staff of the Waterford Corporation [see Appendix 5]. Pipes and wig curlers marked WW date production to the second half of the eighteenth century.

Fabric WAT1:1 W.QM	575	6	Muffle rim
	12575	104	Muffle wall
	525	6	Shaped section
Fabric WAT1:2 W.O	30	2	Daub squeezes
Fabric WAT1:3 R.	1650	4	Slagged brick
Miscellaneous	775	4	Slag
	5000	bag	Mixed detritus

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

WAT2 WATERFORD, ARUNDEL SQUARE			S 607 123
University College Cork E.527:626			
<p>This group of material is associated with a kiln excavated in 1988 by the Archaeological staff of the Waterford Corporation [see Appendix 5]. Pipes and wig curlers marked WW link this kiln with the previous entry and date production to the second half of the eighteenth century.</p>			
Fabric WAT2:1	275	6	RL1 straight roll
W.	5	4	RL4 serpentine roll
	275	130	SP1 strap
	5	2	SP2 serpentine strap
	5	8	TS1 flat thin sheet
	80	2	Object rim knob
	255	1	Object prop
Fabric WAT2:2	420	1	Shaped section bowl mouth impressions
W.O	320	1	Daub folds
Fabric WAT2:3	2600	11	Bat
W.QM	3800	5	Bat with 280mm hole
Fabric WAT2:4	550	1	BAT3 circular bat with 120mm hole
W.QM	300	2	Bat with 120mm hole
	200	1	BAT3 circular bat c. 200mm
	1400	7	BAT3 circular bat c. 180mm
	860	6	Bat
	900	3	SAG6 Saggar ring 120mm high
	6800	33	SAG6 saggar ring 93mm high
	4050	50	SAG6 saggar ring
Fabric WAT2:5	20760	62	Muffle wall
W.QM	2175	3	Muffle base
	1900	8	Core fragments
Fabric WAT2:6	2400	100	TS1 flat thin sheet 5-10mm
R.O	3400	bag	TS1 flat thin sheet 5-10mm
Fabric WAT2:7	725	1	P3 Prop
W.QMO			
Fabric WAT2:8	325	1	P3a Prop
W.QM			
Fabric WAT2:9	5350	7	Brick & slag
R.	3200	3	Malt kiln tile

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Miscellaneous	150	6	Coal
	3400	35	Slag
	200	23	Red brick & slag
	2050	2	Concretion, mortar, pipes, wig curler etc.
	3000	23	Mixed detritus

WAT3 WATERFORD, HIGH STREET
University College Cork E.406:2009

S 607 123

This assemblage comes from a stone lined pit excavated by the Archaeological staff of Waterford Corporation [see Appendix 5]. Tobacco pipes and wig curlers marked WW link this with the previous two groups and date it to the second half of the eighteenth century.

Fabric WAT3:1	300	2	Muffle shelf
W.QMO	1925	9	Muffle rim
	8325	12	Muffle wall & buttress
	10800	66	Muffle wall

Fabric WAT3:2	175	1	Red brick & slag
R.			

Fabric WAT3:3	150	1	Daub joint
W.O			

Miscellaneous	650	1	Slag
	1800	bag	Mixed detritus

WIC1 WICKWAR, HIGH STREET, GLOUCESTERSHIRE
Peacey, 110 Cainscross Road, Stroud, Glos. GL5 4HN W.67

ST 725 884

Excavated in 1967 by the author. Marked pipes link the material to Thomas Sommers who is recorded as a pipemaker in the will of a kinswoman dated 1769 [Peacey 1979, 76-7]. The pipes are of a type common in the region throughout the first half of the eighteenth century.

Fabric 1	35	1	Layered lute
W.	2	3	TS1 thin sheet 1-2mm
	22	7bag	Wasted stems
	255	5bag	Pipe bowls
	260	6bag	Bowl fragments
	5	1	Rouletted stem
	15	1	Mould formed solid bowl blank
Fabric 2	15	6	TS1 thin sheet 2-4mm
W.O	5	1	Daub
Fabric 3	135	6	Muffle wall
W.QO	40	6	Daub

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
Fabric 4 W.PO	15	1	BU2? Bun or curved rim
Miscellaneous	5	1	Unfired pipe clay

WIC2 WICKWAR, 'THE GATE', GLOUCESTERSHIRE ST 724 883
 Peacey, 110 Cainscross Road, Stroud, Glos. GL5 4HN W.69

Collected from garden soil by the author in 1969. The many stem stamps of Robert Lovell link this maker to the site. From entries in the parish registers for his birth in 1750 and death in 1826 a possible working life of c. 1770 to 1826 can be inferred. The style of the stamps is consistent with those of Gloucester over a similar period. [Peacey 1979, 76-7]

Fabric 1	10	1	WA1 or 5 Wad
W.	5	1	RL1 roll pinched
	5	1	RL1 roll end rounded
	160	43	Pipe bowls
	40	8	Pipe bowls
	65	26	Wastered stems
	110	41	Marked stems
Fabric 2 W.MO	10	1	Muffle wall
Miscellaneous	30	1	Slag
	80	2	Coal shale

WI1 WINCHESTER, THE BROOKS, HAMPSHIRE SU 48 29
 Hyde Study Centre, Winchester Museums Service BR.87

This group comes from an excavation conducted in 1988. The date of the group is uncertain.

Fabric 1	315	84	WA1 Wad
W.	2	1	Amorphous object
	18	3	Pipe stems
	700	1	Iron & detritus concretion

WI2 WINCHESTER, ST. GEORGE STREET, HAMPSHIRE SU 48 29
 Hyde Study Centre, Winchester Museums Service SGS.54

Nature of discovery uncertain acceded in 1954. The fragments are small and unstable but seem to come from a rectilinear structure.

Fabric 1	2076	30	Muffle wall
W.O	100	1	Muffle base

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description

WI3 WINCHESTER, ST JOHN STREET, HAMPSHIRE			SU 487 297
Hyde Study Centre, Winchester Museums Service SJS.81			
<p>This group comes from the salvage excavation of a kiln operated by Harry Baker in the first half of the nineteenth century. Construction workers sliced through the kiln with a mechanical excavator in 1981. Winchester Museums Service carried out the rescue work. The muffle material features peripheral shelf and bar type buttresses with a step in wall thickness coinciding with the top of a shelf. [Cherry 1982, 224]</p>			
Fabric 1	2522	15	Muffle wall
W.QPO	190	1	Muffle buttress
	997	1	Bat or shaped tile
	155	1	Shaped section
Fabric 1 & 3	4937	4	Muffle wall & slag
W.QPO & W.O			
Fabric 1 & 4	95	1	Muffle wall, brick & slag
W.QPO & R.			
Fabric 2	320	1	Lining patch
W.O	27	2	TS1 Flat thin sheet
	306	56	Amorphous fragment
Fabric 3	2	1	RL1 roll
W.	1	1	WA1 wad
	3	4	TS1 thin sheet
	10	12	Pipe bowl & stem fragments
Fabric 4	531	17	Brick
R.	570	79	Brick or tile
	983	10	Tile
Miscellaneous	70	1	Stone
	495	1	Chalk
	22	1	Mortar
	135	1	Iron & detritus concretion
	85	1bag	Pipe stem, brick, raw pipe clay & coal
	366	1bag	Mixed detritus

WRE1 WRENTHORPE/ POTOVENS, WEST YORKSHIRE
Wakefield

SE 315 226

Excavations, undertaken by P Brears in 1963/4, to investigate pottery kilns revealed evidence of seventeenth century clay tobacco pipe production. The site of the pipe kiln was, unfortunately, cleared by machine in preparation for road construction. The only evidence

C A T A L O G U E

Fabric type Category	Weight grams	No. obj /frags	Description
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observed by the archaeologist was 'a circle of 8 ft. in diameter of burnt clay in the natural clay [Brears 1965, 19]. Several hundred broken pipes, some bearing the initials EG, were recovered.

YO1 YORK, SITE UNCERTAIN
York Castle Museum

SE 60 52

Until the mid nineteen eighties the York Castle Museum featured a display of implements from pipemakers workshops. This material is now in store and not easily accessible. It is probable that the assemblage derives from several sources though the provenance of individual items is not consistently recorded. Correspondence on file suggests that the collection was founded around 'a bench and machine for making clay pipes' which came from the works of S W Wilson of Leeds which closed down in November 1943. There is also correspondence with William White and Son of Glasgow and Samson Strong of Leeds both of whom probably contributed to the collection. The saggar may be from William White as a saggar features in his offer to the museum in 1951. Lantern slides include a 'Clay Pipe Works in Leeds' and a depiction of a kiln being loaded with pipes. The former is the Cottage Street works of Samson Strong. The latter, taken from Dean 1914, shows the kiln of the Hamiltom family situated in Durham Street, Belfast.

Fabric 1 NA	NA	1	SAG1 Saggar
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APPENDIX 2

THE WATKINSON "JOURNAL"

W E R Hallgarth, in his article entitled 'The Market Rasen Pipe Maker', refers to a journal kept by George Spencer Watkinson junior, son of George Spencer Watkinson who founded the business in Market Rasen, Lincolnshire, in 1843 [Hallgarth 1969, 32-34]. It is not clear how much of the text of Hallgarth's article is drawn from this primary source. Hallgarth does not record the whereabouts of the "journal" but writes simply that it 'came to light' as result of a 'train of investigation'. Enquiries addressed to the local records office and libraries failed to locate the document. It was assumed that if it survived at all the "journal" must be in private hands. An attempt was made to trace papers belonging to the late Mr. Hallgarth with the result that his photographs were found to be in the keeping of the Welholme Galleries, Great Grimsby Borough Council. Amongst these were the originals used for the 1969 article and one other of a pencil sketch showing the interior of the trimming and drying room at the pipe factory. No papers or "journal" were found.

In October 1991, an advertisement placed in the *Market Rasen Mail*, requesting information regarding the Watkinson pipe factory, initiated a reply from Mr Bernard M Watkinson, a grandson of the pipemaker. Bernard Watkinson and Hallgarth had been colleagues at Binbrook School and Bernard Watkinson had supplied Hallgarth with much of his material. Bernard has in his possession photocopies of a

transcript of the papers used by Hallgarth. These papers are later recollections, not a contemporary journal as Hallgarth implied. Also in Bernard's possession are a number of pocket books filled with naive sketches in pencil and coloured crayon, all the work of his grandfather, G S W. One of these books contains four invaluable illustrations depicting the four rooms inside the pipe works. These are annotated, 'the clay soaking trough and block, trimming and drying, rolling stems wireing [sic] and moulding, kiln and tipping'. In the same book but separated from the others is a depiction of 'the Toll Bar and Old Pipe Cart'. The first five pages of the pocket book, containing the illustrations, are used as a diary beginning on January 1st ending on January 13th 1941. Every subsequent page in the book is covered by an illustration. Some of these are drawn from local life some from literature; many of uncertain origin. The drawings of the pipe factory appear to have been made from memory in the nineteen forties. In this writers experience these illustrations have no parallel.

The original memoirs are in the keeping of another grandson, the Rev. Eric Whitworth, now residing in Wiltshire. A note on the top left hand corner of the original suggests that at least one other copy existed, in the hands of 'brother Dick'.

The pages are numbered 1 to 14. Pages 2 and 10 to 13 are missing. Pages 1 to 9 are signed and dated 1918. Page 14 is signed and dated 1928. Beginning on the obverse of page 14 and continuing uninterrupted on the obverse of page 9 is an undated postscript written sixty eight years after G S W was married. This dates the postscript to the early 1940s about the time that the illustrations were drawn. Clearly pages

10 to 13 were already missing at this time. Hallgarth appears to have had access to at least one page that is no longer available for he states that G S W noted the rates paid for various tasks, and quotes these in his article. This information is not included in the surviving papers. In a later article in the *Grimsby News* for January 23 1974 [Hallgarth 1974], Hallgarth again quotes the piece work rates stating that they are those paid at the Burgess Street pipeworks in Grimsby, established in the eighteen twenties or thirties by Spencer Watkinson the father of George Spencer senior. Unfortunately no source is given for this information.

The memoirs appear to have been edited sometime after the first draft, additions, in the same handwriting are inserted between lines. These additions may not all be contemporary. Some seem to cloud rather than clarify the text. In the following typescript these additions are shown between brackets thus [], while the G S W's parentheses are shown thus (). Notes made by this writer are italic in square brackets. Page breaks are shown thus;

4

The numbering shown on the left at indicated page breaks is the original page numbering. The following typescript is a faithful copy of the original including erratic capitals, punctuation and spelling. Pages 5 and 9 include thumb nail sketches in the text [Figure 100].

[The passing of]
The Old Clay Pipe:
Well what about it?

[this is
Revised
in your Uncles Copy
Brother Dick]

Isn't it about time, someone who really knows something first hand of our history, and the important part we often took in public or private functions, in social life of a century ago - We should have something to say about it. Certainly yes! We have many references in prose, and Poetry, where the "Old Arm Chair" - Grandfather Clock" and the foaming Bowl, with its Home brew,- [...y] But never a word, or Hyphen even, of the humble Clay Pipe - Though conspicuous in Lordly Halls and public bean feasts, with lesser jovial functions The part it has played in being the humble, but necessary vessel for containing the fragrant weed by which its aromatic virtues could be diffused like "Incense" a Silent oblation, and opiate of calm on the atmosphere, of a bibulous quarrelsome garrulous circle - [1] or the rest by the wayside and cottars [sic] Ingle Nook, seeing visions, or Dreaming of the might have beens or [the wayfarm [sic] on the lazy road with something -better at the bend of it too. thinks] of past days, with Hopes bright, scenes of the May-be yet [- to come] As the short clay is filled [with dry herbs or dark shag he puffs away] and its pungent vapour floats around [; or] the Occupant of the "Old Arm Chairs, silent [,sits] Puffs, and ponders, to the Rythm [sic] of Fathers [old] Clock - Tick Tock tick, measuring out lifes [sic] short day. "The Pipe of Peace", quite true: The tale of the Old Clay Pipe we now unfolds Its Genesis

1

[These dwindled away rapidly in the sixties through the public being introduced to the more durable Briar Wood pipe.]

Father left Gy, [Grimsby] his home, in Feb. 1841, to set up in business at Mkt R [Market Rasen] - for himself at the time of my birth [14 years later] he employed two [or] three journeymen with an indoor apprentice the workman had choice of hours, pay according to quantity and size of pipe, usually per gross, of twelve; sixteen to the dozen, to allow for breakages; boy & girl trimmers [sic] any or all hours Each bench about six feet by two & half height two ft Until the factory Acts of 1864 our working hours were indefinite; with the Act, school half day supposed to be compulsory; unfortunately few or no schools until the seventies - The crude Clay prepared [until] plastic [and uniform in texture, by beating on a raised slab.] Upon the bench mentioned was laid a smooth board; about 4ft by 1ft in width - sitting in front of centre with the raw material of plastic clay, on this the workers [right hand, the] only tool, a four inch wide smooth hand board- the worker nips off a lump [on right]

sufficient for two models, pressing and dividing into two; which is then rolled [out] into length and thickness required, each hand moving in unison: leaving the upper end with a thicker amount for the bowl, [a slight diminishing taper of shank with] a smart turn of the [hand, on left] placing the rolled shapes, side by side. the hand [board] rounding [it] is applied, the models then pressed together lightly, and placed in a double layer of eight, the workers dozen; the pipe in embryo now left to harden, until firm enough to handle separately.

3

The next phase of the crude clay in its metamorphoses, is the moulders task; sat with a pile of the rolled forms in front, a box press of iron, loose sliding [centre, side clamp] when the mould [is] inserted and tightly screwed up, with left hand lever, while [the] right brings down a [right] lever with a punch [below] exactly poised to insert in the head bowl [for] pressing the clay into the mould [having a cavity] and allowing escape of surplus [material.] the worker having separated his rolled forms, a wire as thick as an ordinary ladies knitting needle, held firmly by right hand the left hand taking the tip of the rolled form presses it on the wire [with thumb and fore fingers] which drawing pressure, is continued until whole [length] is perforated [and wire covered] to bend of the upper part as the bowl - a slight touch of lubricant, then laid in one side of mould [and] closed then [smartly] inserted in press, overhead lever brought down, mould withdrawn bowl top, trimmed smooth, shape still with wire enclosed then held in left hand right [hand with a slight twist] extracts the wire and Hey Presto "A clay pipe" in form but firing to come.

After a few hours exposure on boards the clay hardens, for the trimmer to remove the slight ridges left by moulding a small steel tool, hollowed to enfold half the stem as a scraper, with other side or end, hollowed out for smoothing: Inserting the wire, and cutting tip of stem[;] as assistant [;] was my introduction to the work shop [age] between 7 & 8 passing the D^T as fit [for work] in June of 64 [the] good old times - "What" ending in a smoking day [or blowing soap bubbles of the unknown future].

After exposure to dry air indoor, or out; the pipe is really [then] a White clay, each [one] separate [sic], lay in horizontal sequences, heads out, over the ledge, alternate right and left, thus ready for potting, [that is packing in the kiln]

4

the term used for packing in the kiln

The very brittle stems required considerable skill and light handling, from drying tray to position in kiln [a delicate task for the expert.]

The kiln internally was constructed on simple principles but peculiar details, to fulfill [sic] its purpose.

Imagine an egg shape fire clay [cone hollow cone well with a larger] standing upon arched curved fire box 5ft long - flues on either side, between kiln sides and outer walls: the thickness of kiln wall diminishing from 9in [base] to a flimsy thin dome cover about two coppers thick; thus leaving an incircular [sic] shelf [sketch] [at intervals round inside] the centre [of] mushroom shape points of stem supports mushroom. Heads or bowls resting on the ledge of the [inside of] kiln: As each ledge filled another mushroom shape stalk and all added to centre [sketch] like the sketch, the gradual widening by reduction of the thickness of kiln walls, ensured gradual and equal diffusion of heat; otherwise the lot might fly into fragments - the firing usually occupied 11 to 13 hours quality of coal the determinate factor - upon testing heat by the withdrawal of a test stem, if brittleness satisfactory, fires were immediately raked - as too much [was] disastrous as too little firing. After some hours cooling, contents of kiln withdrawn, there but remaining the glazing of tip stems, that the users lip would not be injured - this was called tipping by liquid red lead Potash [permanganate of] or verdigris [;for different colour of glaze, then by] inserting the tips, over a coke fire in a confined space at white [heat] withdrawn immediately when clearly fused. Then placed with the tip on a raised wire [to cool]. The clay pipe is complete [ready for sale and use by each devotee, Aristocrat, Tradesmen, Cobler [sic], or child floating Bubbles in Air]

5

[Now Having our stock its disposal comes next that the pipes are available for the user - there was first of importance the Licensed Houses Hotels Inns Jerry shops [country stores &] Wholesale grocers supplying small shops in out of the way places, [with a few] scattered wholesale tobacco & pipe dealers who bought in quantities these -

the Inn or Public house, and Hotel had their select Bar parlour Commercial and open smoke room with the Tap room or kitchen for the common man not a hard or fast arrangement - but in harmony with the adage Birds of a feather flock together so those of the public found their own place and were content it should be so.

In select Parlour Bar or Smoke room the table was provided with a supply of long clay pipes with open Tobacco jar for any to use if so inclined the pipe often used but once].

[The above is on the reverse of page 6 but is clearly intended to precede it]

The worker should have a place in the picture - they being literally and actually "hand crafts men" from the plastic clay to the pipe finished "no mechanical element used whatever except the mold [sic] screw press"!

They served an apprenticeship of not less than five years; I had an Indenture of one of fathers apprentices, which I gave to my brother Will a few years ago as a "Curio."

After completion of apprenticeship to qualify as a full fledged "Journeyman" - this sobriquet " a mark of distinction, before Trade Unionism evolved - being gained by at least a years wandering over the country from town to town; with the object of acquireing [sic] any additional skill; with short or long terms [of work] in various workshops; Designated on "Tramp": If no offer of work, Customs unwritten law enjoined a subsidy from the shop to enable the Trampler, to have sufficient funds to reach his next call.

One result of this wandering life - was some became regular Nomads perpetual roadsters [sic], never remaining over a few weeks to refresh and refit for another spell of freedom - On the Open Road and Fresh Air his Goal determined by the mudpushers [sic] he wore; a few days work and off again. [Overleaf]

6

[The following paragraph appears inverted on the bottom of the reverse of page 6].

[This the manner of their life, was not exceptional or peculiar to pipemakers, but customary, with a section of unstable workers in all handicrafts that required no bulky or expensive tools to encumber an handkerchief and stick their entire fit out. To page 7 Top]

[you could make sure this type] of seeing them again on the same old round or quest. They were not heavy drinkers but the Pub or Jerry being their most valuable customer, frequent calling contributed to formation of bibulous habits of conviviality their earnings sixteen to twenty four shillings [p week] according to ability a good wage for those days -

To return to our "Clay pipes" having stock of various sizes. The salesman or Hawker with [a tilted cart and horse] a stock packed [within,] in casks, and boxes; usually some casks of six or eight gross would [be] earmarked for a particular Pub or dealers shop our salesman accompanied by a boy (I started to travel at eight) starts off with his load for distribution anywhere

within the Area of mid and North Lincoln: Humberside to Spilsby with all town and intervening villages [to call.] The round or journey varied from one day, say to Kirton, Lindsey and villages: [or Lincoln] Or three, Grimsby Tetney Nth Somercotes, Spilsby, Alford [Horncastle] - home - we made no Speed Records & no need of Halt signs; the roads or [better say] direction tracks arranged for stoppages; it might be a snow drift or a six inch rut: or worse still loose stones thrown broadcast for traffic to reduce: All in the piece, with plus the Turnpike Toll Bars; Lin, Louth, Gy, Tetney, Rasen all paid [their] Toll - until the sixties: toll for one Horse and cart 4½d. Horse & Rider 3d. - These Journeys with a night in Country Inn and the big kitchen with their big fireplaces and log wood fires plus the company "nondescript" all sorts from bailiff foreman village cobbler smith and constable with peripatetic roadsters [sic] all smoking clay pipes [with mug or Pewter on table or long saddle - these]

7

[Was a wonderful education in human life of town and village life with their homeless types most everywhere.] I remember one night in a Pub kitchen at Nth Somercotes [sic] conversation turned on the jobs the members of the company engaged in; their answers I havent [sic] forgot. One man in fustian said he was not a sandhopper we [sic] wings - but a clodhopper Ploughman Another looking much worse for wear - said he was a road surveyor "professional". [One Tramp a born cadger his bed the barn of the Inn, no charge for this, only smoking barred As a recent one remarked at Reading] One with a complete set of whiskers, long seedy Frock coat and small cloth cover'd [sic] box, stated he was a professional man Extractor general move all and optician -literally Travelling Dentist and Pill vendor, Spectacles a side line at 6d. Father wound up by describing himself as a Scots Whistle maker. [one Wholesale Paper hanger & Bill sticker] a truly mixed company [of the country side at night]

Different localities varied on preferences, Lincoln had a demand for Church Warden or a go between A Pipe twenty inch stem a more aristocratic style than the common Pub smoke room type. Grimsby wanted shorter stems mostly Dandies a nine inch or cutty; for to take to sea to smoke his cheap [duty free] bacca - swopped for fish, from the Dutch Cooper of North sea fame. And so our clay pipe found its way into Civic Halls Pubs or Village Club feasts, and a solace or sedative to the road mender pondering how to get bread at 1/- a four pound loaf, for wife and four or five children [at 10/- bob a week] as he ate his frugal meal a raw onion, roasted potato or a turnip -(I have seen it) in the sixties.

This rambling over the country made one familiar with its odd ways & topography - calling on shopkeepers the simple needs, and limited purchasing

8

power made apparent. I was packed off to sell my first load when thirteen [12] years old my companion a younger brother, Snow, Hail, Rain or sunshine the Pipes must be delivered or what is habitues [sic] of the Bar Parlour or smoke room to do. then Johnny Hodge [the] village Patriarch sitting and ruminating on how to live on 4/6 week in his old arm chair (Parish relief for two) with difficulty peering at a well thumbbed letter from his lad in Canada or Australia (a time of mass emigration) the Old Grandfather clock tick, tock, marking with other unrecorded things without so much as a protest by - The meerschaum the Wood Briar pipe, Cigar and cigarette later ousting it entirely & Passing of the Old Clay Pipe [with only a sigh from the old time maker]

G S W July 1918

Sketches

[A half page of sketches appears here].

The crude clay as received in lump about 30lb

Same after drying, crushing, & water'd [sic]; until a Plastic consistency gained

After kneading Roll into this shape

Packed thus mould top cavity of ...

outer wall & chimney Trimmers [sic] tool and block

inside kiln

Fire & Flues dark inside kiln

Stoke Hole mushroom dish for pipe tips to rest

Flues basin inverted for tip rest

Grate bars Ledge for heads

9

[Pages 10-13 inclusive are missing and were missing when the postscript was written starting on the back of page 14 and continuing on the back of page 9].

superstition and odd ways, just oscillating though not perceived - between the Old and an entirely New order
The eclipse, [why the passing of the clay from the date of] of the Clay pipe is invariably charged to the innovation of the Briar cigar or Meerschaum - this is not so from my philosophic reasoning, these being an effect, rather than cause which was [were] readjustments [sic] [to change.] Casting our mental vision Backward a century or [so] Railway just introduced [electric energy and application the dream of a future age]
No unity of workers, Institutes, free libraries a muzzled press transport by execrable [sic] road, or sleepy water way, the Pub or licenced house was a centre from which radiated all the news available, which being limited to that orally by travellers; and few newspapers the gossip and report of those able to read made the Bar Parlour and smoke room, the "Hub" for [and] Broadcasting news; home or foreign, in every village pub or town Tap room the first hard knock for benefit of all the cheap Newspaper 1860 Tax off, shortening of hours and restricting of labour women & children. Free compulsory education by stages; were all factors, in lessening the social lump [in its change] the Pub lost its place as a local Club Newsperveyer [sic] and with the decline its accessories the Clay pipe one of them, in Hotel or restaurant and The modern open Bar or Jug Dept - there is no place for long clays or convivialities, [sic], these ways, and days, are as dead as Queen Ann and so with many memories, neither so pungent or soothing we write the Old clay Pipes Epitaph -[Here lies the old clay pipe sometime] Going: Gone but not forgotten".

G. S. W. 1855-1928

14

Postscript

As you probably know your mother was born at Market Rasen about three years about after we were married. I had stayed at home to see the other lads all fixed up & father believing there would be a good living for me in the pipe trade, this I doubted as the years went by as we had to constantly extend our field of operations for to keep up sales this revived for a time by buying out competitors Lincoln where I had charge of one shop for about two years Spilsby, Louth Horncastle Brigg we closed except one of them for a year or two, it was at this time when I felt sure the old clay pipe was doomed - by improved transport the Pubs lost a great part of their clients the commercial traveller and their habit of


staying days while they ranged the villages with their samples with the Packhorse hired from the innkeeper hence the familiar sign The Pack Horse. and commercial room the rendezvous [sic] of the huckster [sic] and his clients with a sprinkle of traders to hear the latest news and spend a quiet hour with glass and pipe - the introduction of railways and telegraph under post office control caused an underground revolution in all commercial or industrial affairs its working was quiet but the old stage coach ceased to from Nottingham by Retford Gainsborough, Rasen and Louth daily these caused a silent upheaval in ways habits

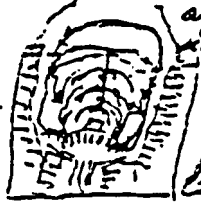
in my earliest recollection [sic] smoking was almost limited to indoor workshop or field - with the introduction of Briars and meerschaum to carry in ones vest the old clays day of supremacy was over the Cigar or cigarette putting its light out - The introduction of the Lucifer matches had the effect of widening the field to the worker

as you could not carry Flint steel and tinder box in waist coat pocket -


In Those days education of the mass was a thing undreamed of since the monastic orders were suppressed no effort was made to enlighten the common folk the first Government grant in the forties was 8 thousand pounds for England and Wales restricted to the Established Church all honour to them in their National or British schools that kept the Torch alight - the effect of any attempt to educate is evident in the ignorance of the mass the day mother and I married that is sixty eight years ago - there was a couple of young folks to be married a very ordinary country pair - from Tealby - we waited for their nuptials to be over as they had a four mile walk when asked to sign the register they admitted inability to read or write all four of them Brother T R and myself signing for them they affixing a X in confirmation a genuine illustration of the illiteracy of the age.

George Spencer Watkinson junior born 1855 began working for his father at the pipe factory in 1864. The factory seems to have succumbed around 1895 [Oswald 1975].


Imagine an egg shape fire clay ^{is an hollow cone with a large} standing upon arched curved fire box. ^{is an hollow cone with a large} long-flues on either side, between kiln sides and outer walls: the thickness of kiln wall, diminishing from girth to a flimsy thin dome cone about two coppers thick; thus leaving an ^{at interval round} in circular shelf ^{in the centre of} mushroom shape points of stem supports mushroom heads or bowls resting on the edge of the inside of kiln: as each ledge filled another mushroom shape stalk and all added to centre  like the sketch, the gradual widening by reduction of the thickness of kiln walls ensured gradual and equal diffusion of heat; otherwise the lot might fly into fragments - the firing usually occupied 11 to 13 hrs quality of coal the determinate factor -



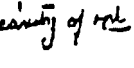

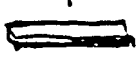
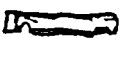
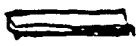


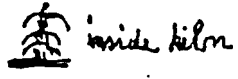
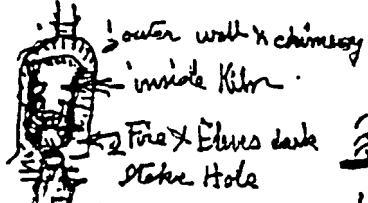
Sketches

The crude clay as received in lumps  about 3 1/2"


Some after drying, crushing, & watered: until a Plastic consistency gained

After kneading Roll into this shape 

Packed thus  mould  Cap cavity of rod  were  Pipe  Timmer's tool  wood block 



 mushroom dish for pipe tips to rest

→  Flue Gate bars

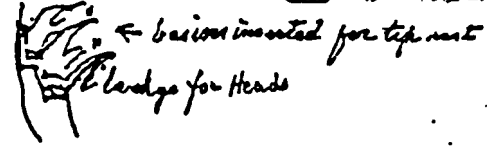


Figure 100 The Watkinson 'Journal'; facsimile of the original manuscript with sketches.

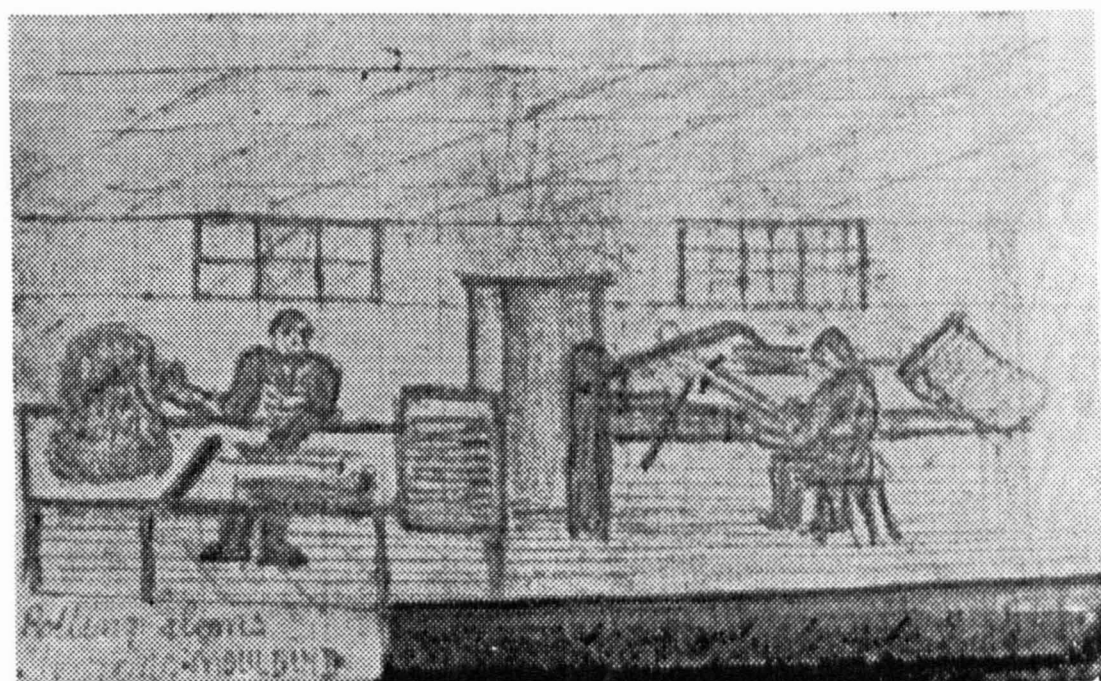
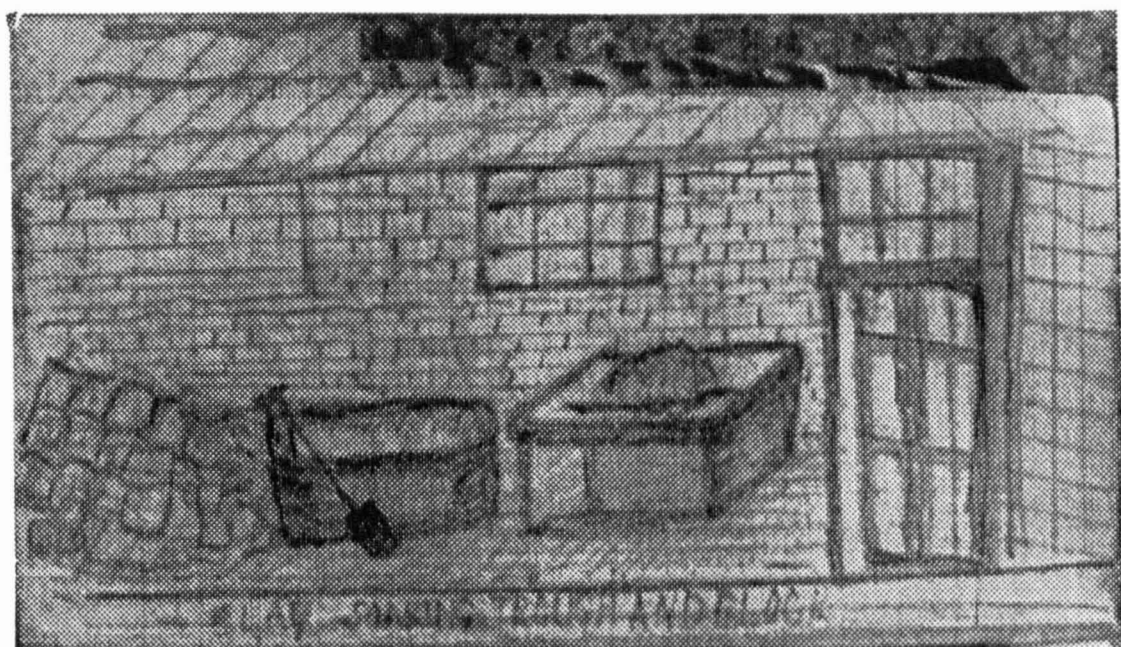


Figure 101 Sketches by Watkinson: 'Clay soaking trough and block';
'Rolling stems, wiring, moulding'.

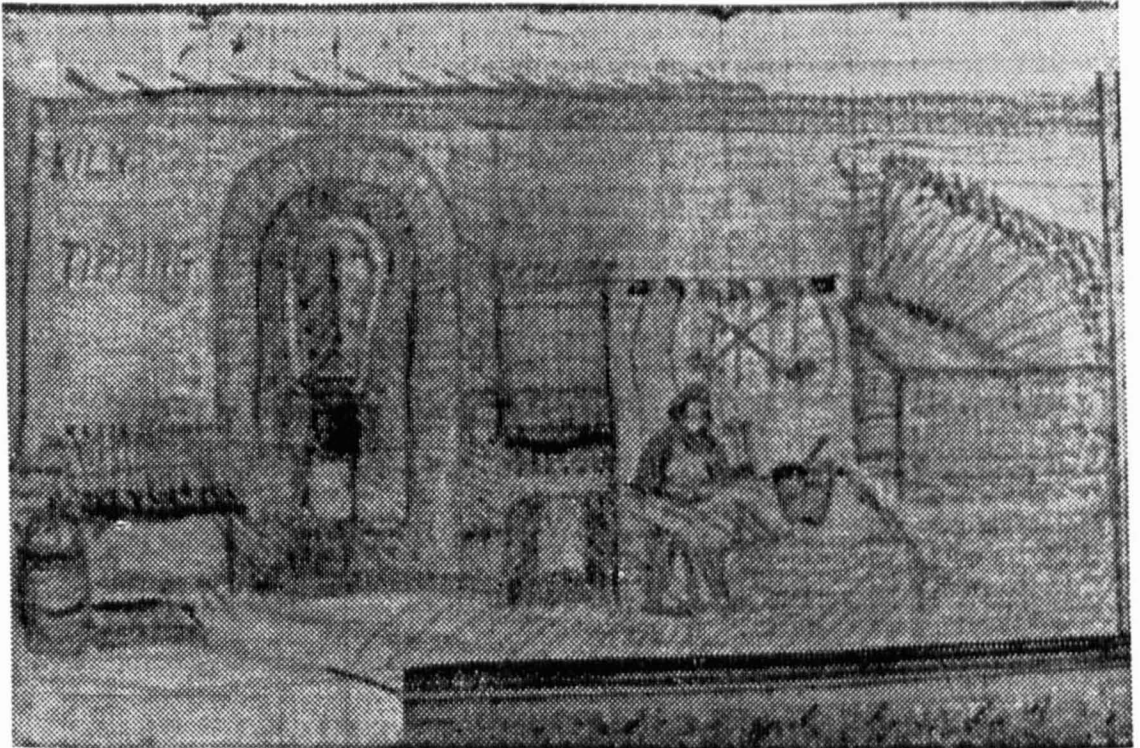
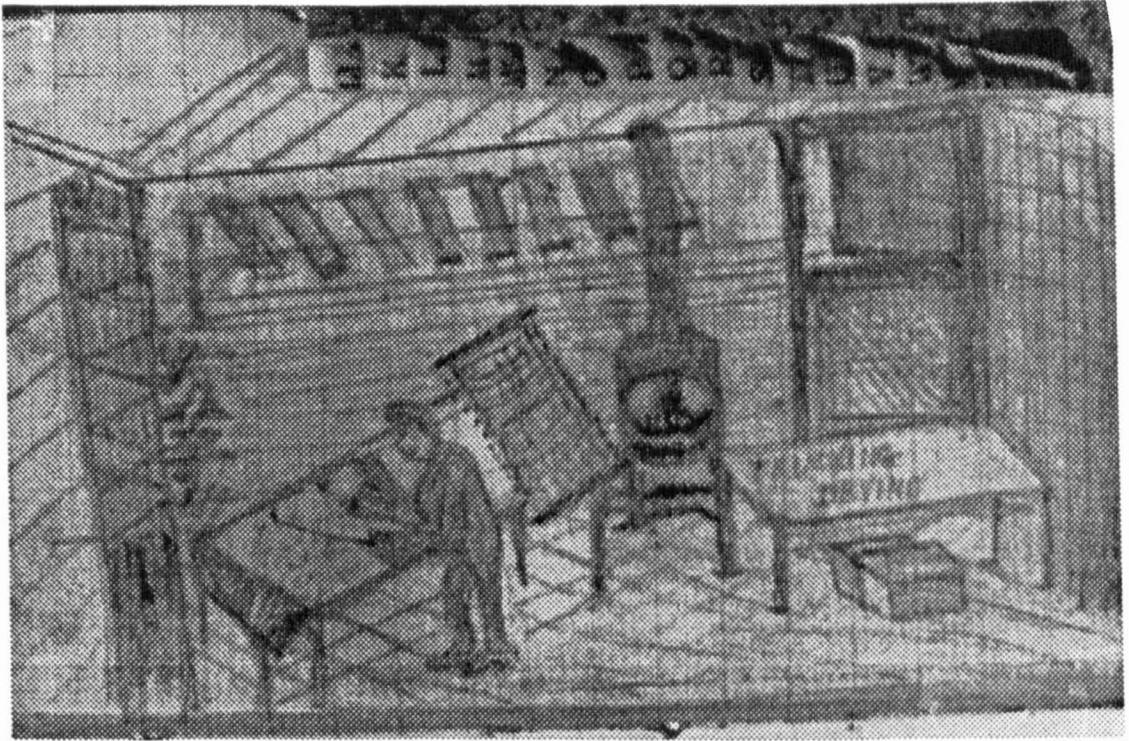


Figure 102 Sketches by Watkinson: 'Trimming, drying';

'Kiln, tripping'.

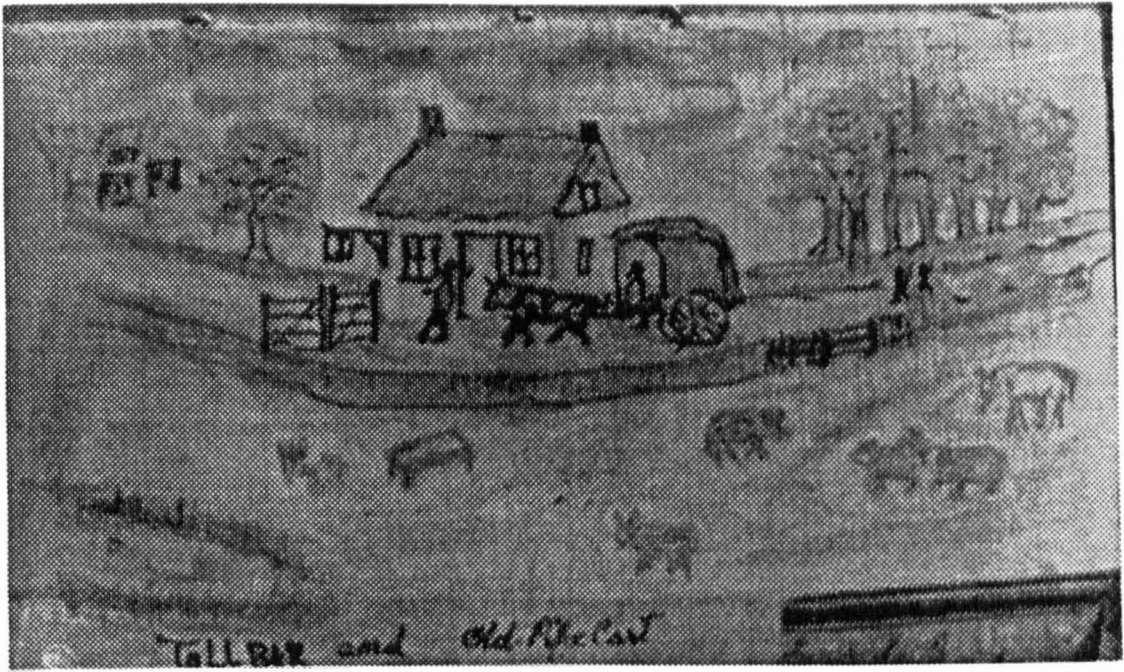


Figure 103 Sketch by Watkinson: 'Toll Bar and Old Pipe Cart'.

APPENDIX 3

NEW EVIDENCE FOR THE DATING OF THE ROBINSON ACCOUNT

The family history of the Robinsons of Bolsolver and Chesterfield, published in 1937, includes a description of the processes involved in the production of clay tobacco pipes [Robinson & Spence 1937]. Although no source is given, the account, clearly well observed, is not derived from any previously published material known to this writer. The account begins in the following manner:

'Local clay must have been getting scarce by this time for we find that the clay he used was brought in hard solid blocks, about 10 inches cube, from Cornwall by ship to Hull, thence by canal to Chesterfield' [ibid 194].

Although the preceding text is vague it seems to imply that the period referred to is the late eighteenth century and that 'he' is William Robinson; born 1733, died 1812. If it could be established that the account is from this early period the description of stem tipping with lead glaze would assume greater significance. Neither Good or Rees, writing in the early nineteenth century, mention this process. The firing process also requires some clarification. The described practice of firing pipes in large iron pots, 'about 4 feet deep and 2 feet 6 inches in diameter at the bottom', is not known from any other source either documentary or artefactual. It is

therefore important, in terms of the general state of knowledge, that the source of the account be identified and that these two points be clarified.

The Robinson company archives hold working papers used for the preparation of the family history together with other papers relating to the family and their business interests. Enquiries addressed to the company have unearthed a probable source for the published account amongst notes written by Charles P Robinson [1844-1916]. The typed account, included below in facsimile, appears to have been written between 1884 and 1889. The first page of the notes lists genealogical data including the death of Martha Bradbury [his mother] on Dec 9, 1884, whereas, for his Aunt, Maria Bradbury Robinson, only her date of birth is listed, implying that she was alive at the time that the notes were made. She died in 1889. It is known that Charles P Robinson collated information from his Father's diaries as well as from family letters dating from the 1790's. It is therefore possible that the account of the manufacture of 'church warden' clay pipes is drawn from an earlier source. It has, however, been established that the published account is drawn from a local source and that it dates from the nineteenth rather than the twentieth century. The recently discovered version includes one new detail omitted from the published account. The iron pots in which the pipes were fired are described as 'about 4 feet deep and 2 feet 6 inches diameter at the bottom, and 4 feet at the top'. This form is closely paralleled by the developed muffles made from clay and pipe stems [see pages 79-82]. It is possible that this description is a conflation of two processes and that the pots or muffles used for the manufacture of pipes were not made of iron. The Robinsons, who were also involved in the

manufacture of brown glazed pottery and bricks, with a wealth of ceramic tradition behind them, would seem unlikely candidates to break with accepted proven practice. Further work on the Robinson archives is clearly required. Examination of the diaries and early correspondence may well establish whether the following account from Charles P Robinson's notes, compiled in the 1880s, is taken from an earlier source.

The MANUFACTURE OF CHURCH WARDEN CLAY PIPES.

The clay for this purpose was brought from Cornwallin solid hard blocks of about 10" cube by ship to Hull then by canal to Chesterfield.

Preparation of the Clay.

These hard clay lumps were broken up, and then "Blunged" until they were reduced to a soft pulp, but with an excess of water.

The clay is then in a very soft almost creamy state, was then taken out and poured into large evapourators, some 6 or 7" in depth, fires were lighted underneath, the clay kept boiling until the water was evapourated off, leaving the clay a proper consistency.

It was then taken out into a shed where the benches were covered with iron plates, and it was beaten with an iron tool until it was in a thoroughly pliable state.

The clay after being properly prepared was taken into a rolling room, where it was placed in small heaps on the benches in front of women, whom we will call the Rollers, they grasp a handful of clay in each hand, and comence to roll it on the bench, both right and left hand, each manipulating its own lump of clay, at the same time, the object being to roll out a long thin round stem from $\frac{1}{4}$ " to $\frac{3}{8}$ " in diameter, and about 15" long, at the same time leaving a lump of clay at one end which was to form the bowl of the pipe.

After they had been formed thus by the hand, they were roled more perfectly with a narrow board, and thus made fairly straight, they were then placed in rows on boards.

These boards of pipes were carried into the Moulding Room, a woman Moulder would then take one of these pipes in her left hand, and insert a wire up the stem, this was a work of skill, for the wire must go straight up the soft clay stem 15" long

into the lump of clay at the head, and must not make holes Through, or if such were made, great care must be taken that they were made up.

At the end of the wire there was a very small wooden handle.

Figure 104 Facsimile of C P Robinson's account c. 1884-9.

This being done the clay stem, the wire still being in it, was laid into an iron mould which was in two halves, one $\frac{1}{2}$ of the mould was placed on the bench, and the clay form laid into it, the other half of the mould was laid on top, and the two halves being held together in position by pins in the one half entering into the holes in the other half.

The mould was then placed in a kind of iron vice which was attached to the top of the bench, the mouth of the bowl standing upwards, and then screwed up tight.

Attached to a lever just where the bowl of the pipe had to be formed was a conical piece of iron coming to a point just the shape of the bowl had to be inside.

The vice having been screwed tight with the left hand, the lever was dropped down with the right hand, the conical pointed iron entering into the lump of clay in the head of the mould, forcing all superfluous clay through an aperture left on the top of the mould for this purpose.

You had then a perfect pipe made except for the lump of clay standing on the top of the bowl, and also small thin pieces of clay along the stem of the pipe at the joining of the mould.

It was then taken out of the vice, the lump of clay at the top of the bowl was cut off with a knife, the wire was withdrawn and the pipe laid flat on the boards in rows.

The boards of pipes was then taken into the dressing room, the dressers had to remove all further bits of clay adhering to the pipe, and were finished off smooth and neatly, they were then placed on a hollow or concave board which just gave the stems the proper bend.

They were then taken into a stove room and thoroughly dried.

The dried pipes were placed in iron pots, about 4 feet deep and 2'6" diameter at the bottom, and 4 feet at the top.

The building up of these pipes in these pots had to be done with considerable care, the pots being filled and the top covered, the fire was lit underneath, and the pipes thoroughly burnt.

When the pots had cooled down, they were taken out, being quite white, but not fit to smoke.

The smooth mouthpiece was made by pouring over the stem end, a solution of red lead, and then placing the ends of the stems into a clear red fire, and so burnt until a bright green glaze had been formed, to which the lips would not stick on being used.

The pipes were then placed in boxes ready for sale.

APPENDIX 4

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 appendix.

The location of the site is shown in Figure 106B & 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 106A 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 115, 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 107].

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.

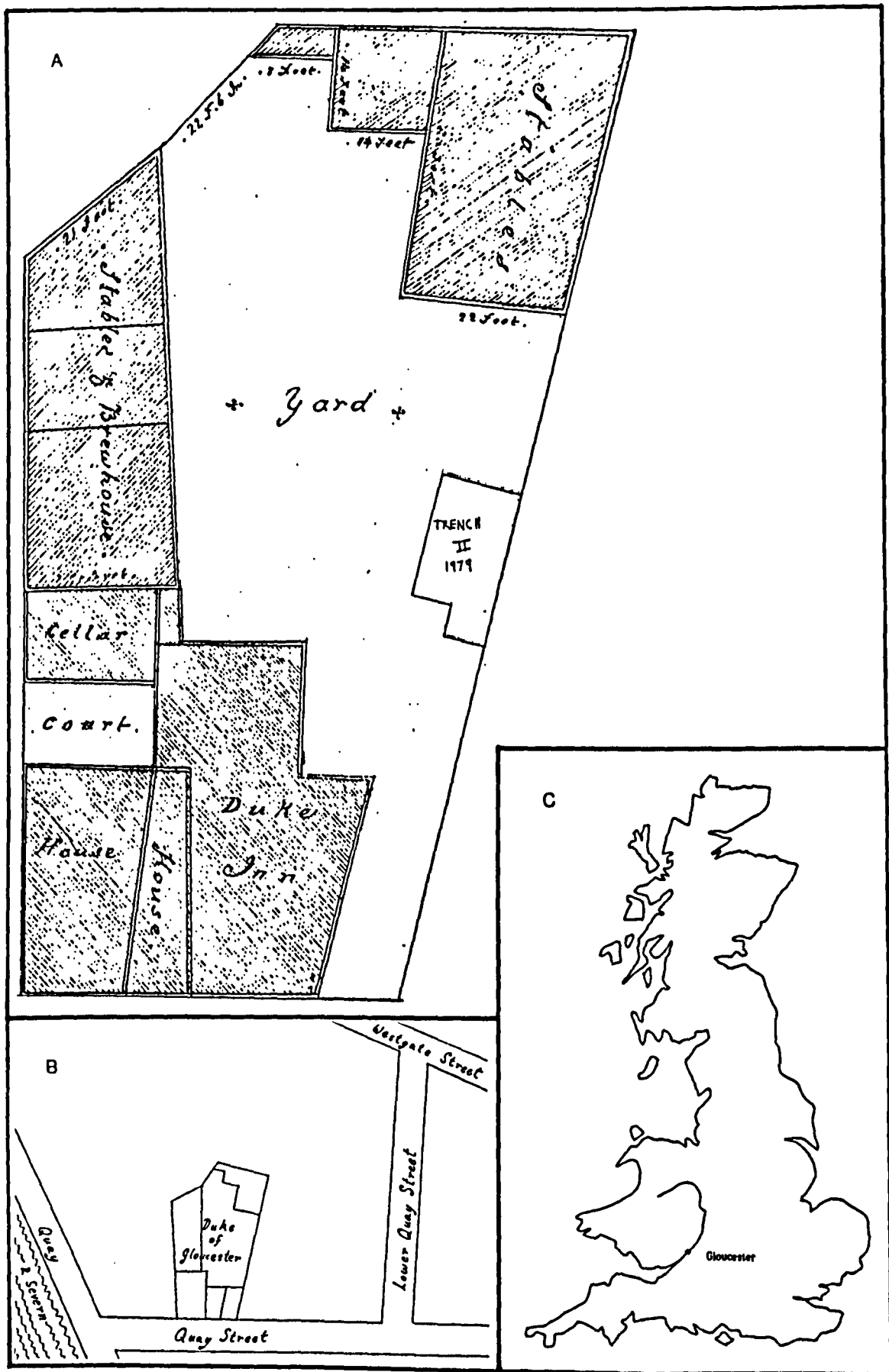
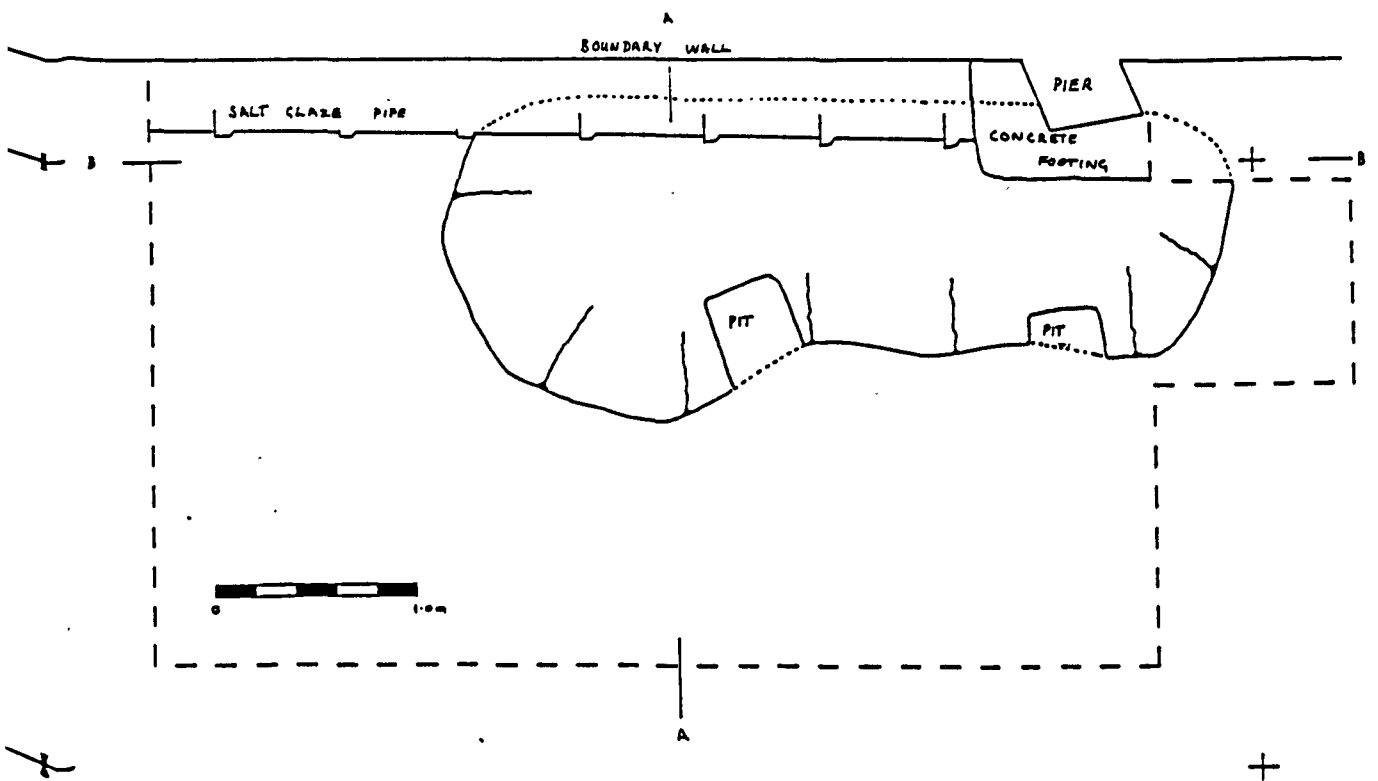


Figure 106A City lease plan dated 1826 showing the trench location within the bounds of the Duke Inn; B location within the street grid; C location in the country.

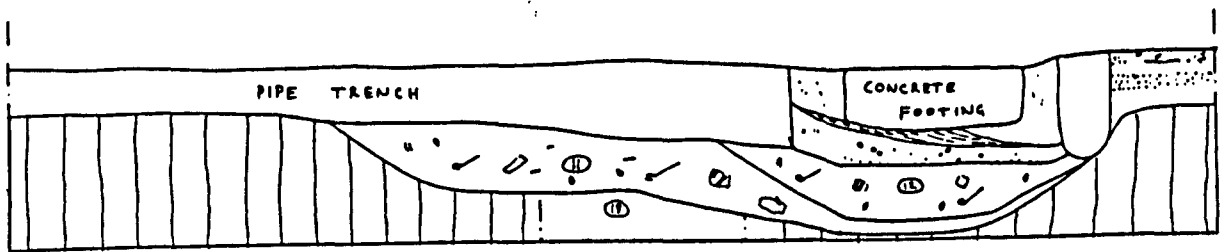
The Finds.

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.

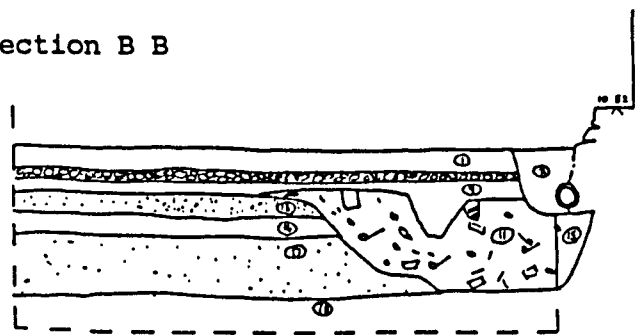
The pipe types are fairly evenly represented, there being 590 Type G4 and 671 Type G8. The majority are probably breakages rather than true wasters of which there are only a handful. These are either underfired, un-trimmed or punctured through the bowl front by the wire [Figure 113, 68-70]. Both types 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 107 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 108, 1-8, and 109, 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 110-112]. There are even two examples of mouth pieces with this type of decoration [Figure 113, 63 and 64]. Two stem fragments are decorated by alternate pinching at 90° axes [Figure 113, 65 & 67]. One of these is a mouth piece. A further stem fragment is both pinched and milled [Figure 113, 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 109, 16-18, Figure 113, 74-5 and Figure 114, 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, who's 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 108 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 109 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".

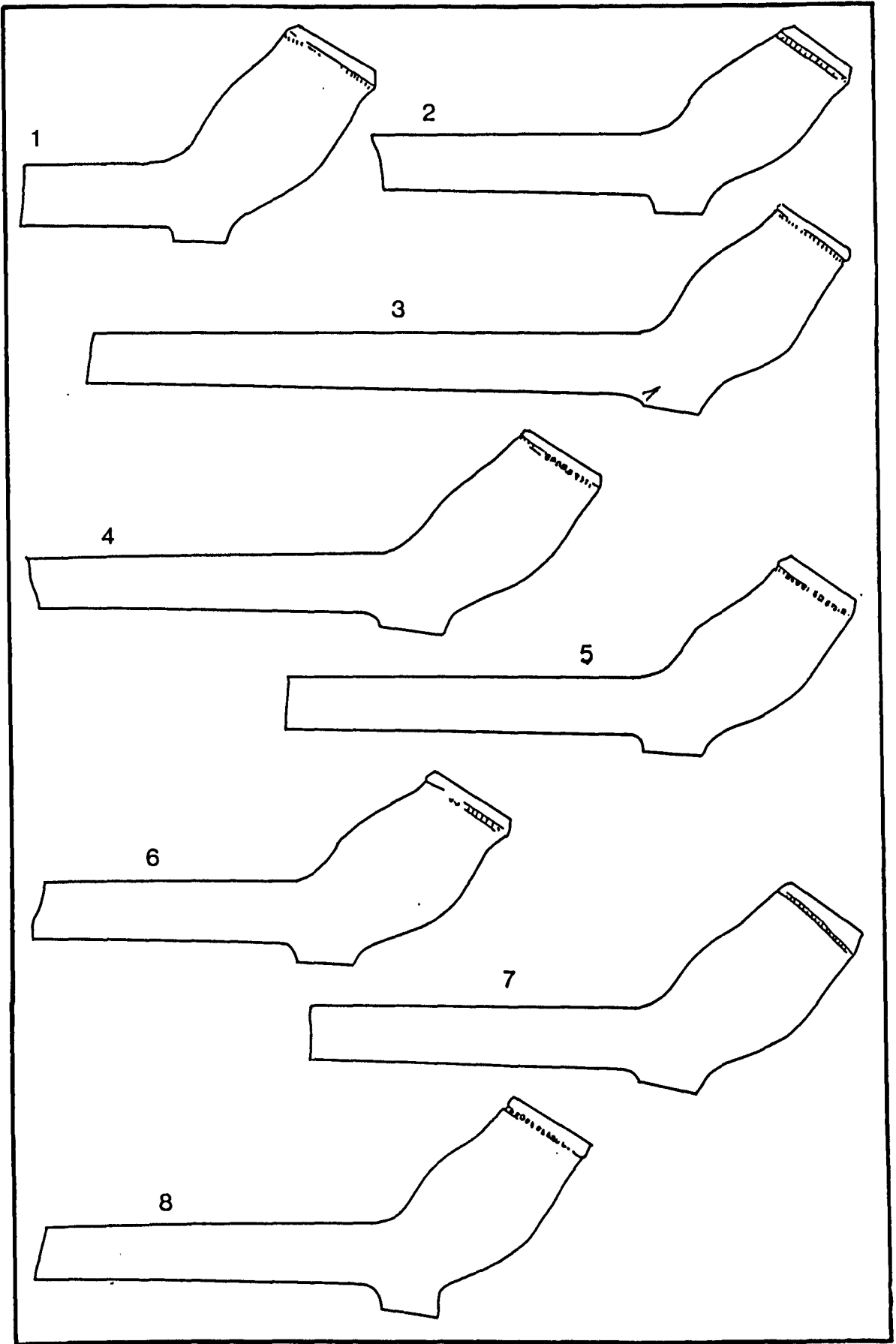


Figure 108 Gloucester Quay Street, tobacco pipes, heeled forms,
actual size.

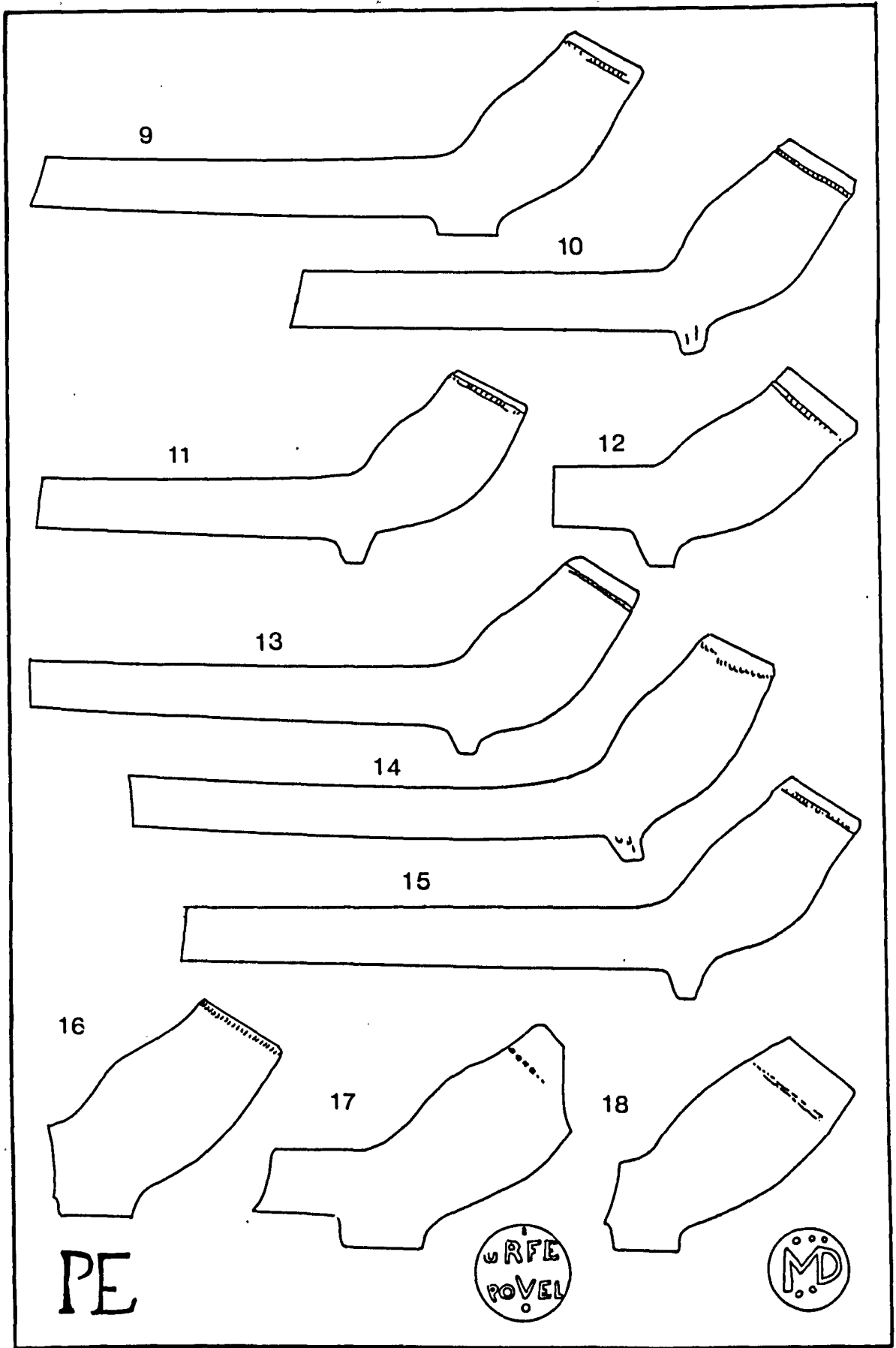


Figure 109 Gloucester Quay Street, tobacco pipes, 9 with heel, 10-15 with spur, 16-18 from other production centres, actual size.

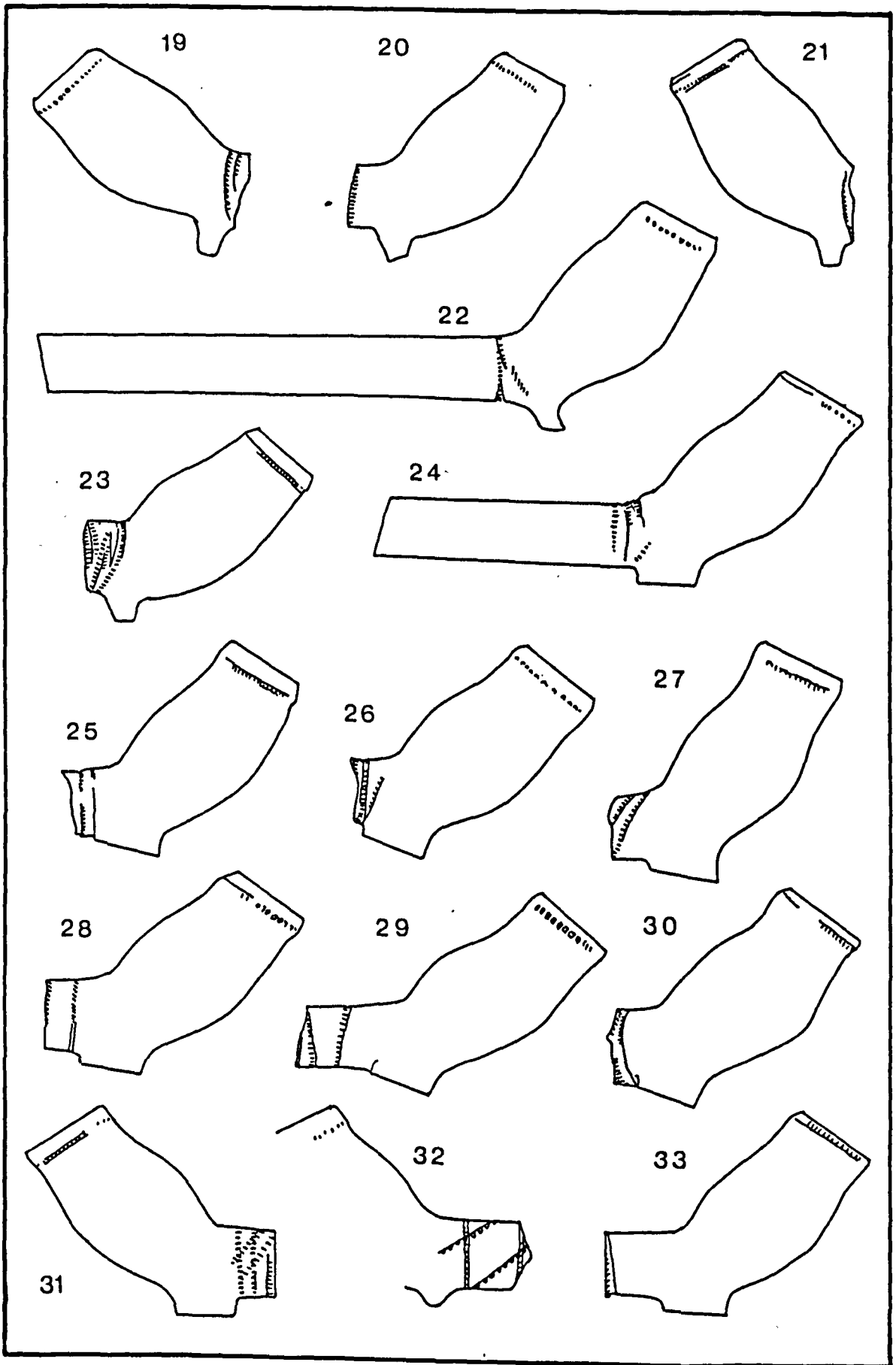


Figure 110 Gloucester Quay Street, tobacco pipes with milled decoration on the stem, actual size.

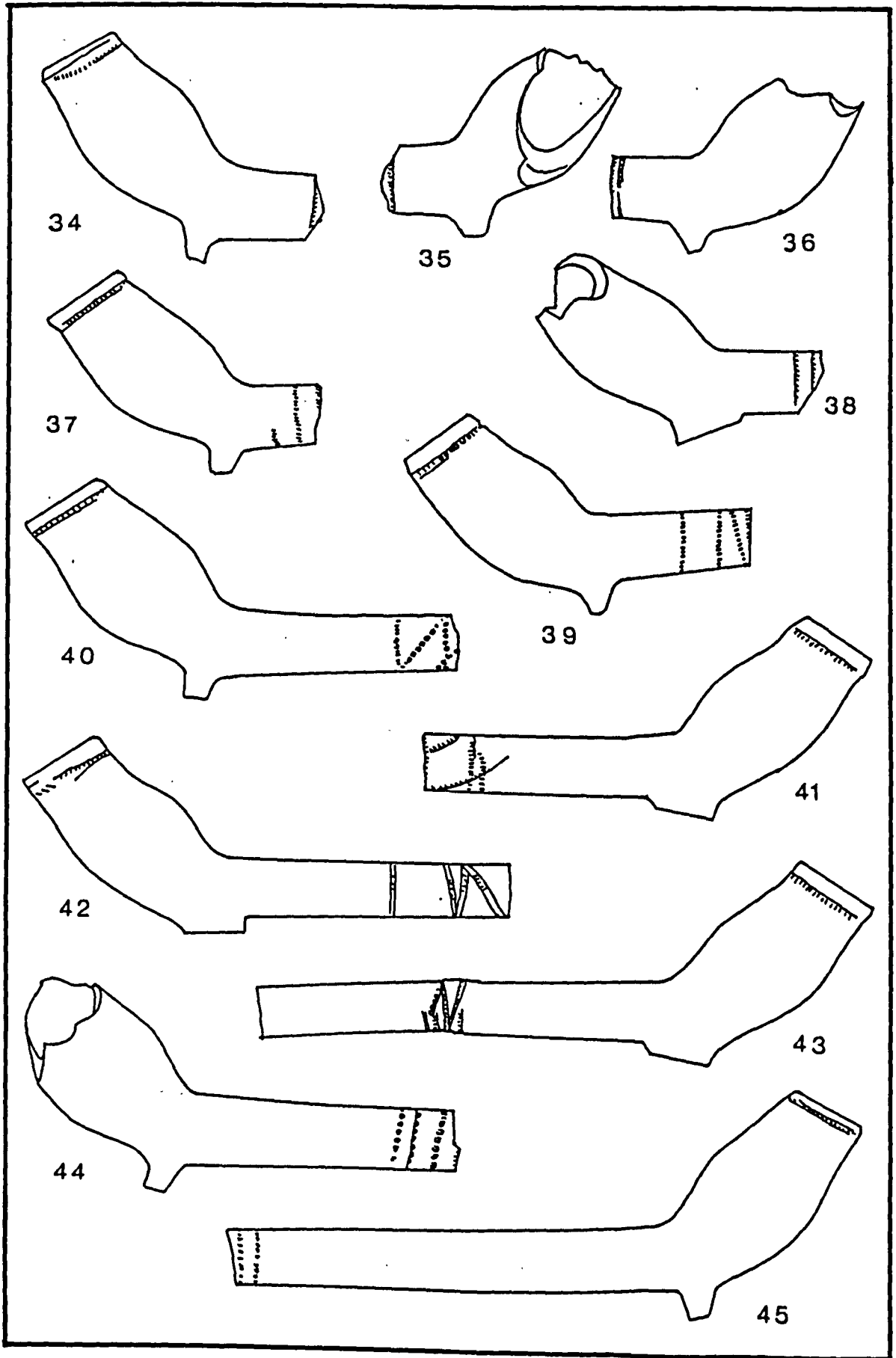


Figure 111 Gloucester Quay Street, tobacco pipes with milled decoration on the stem, actual size

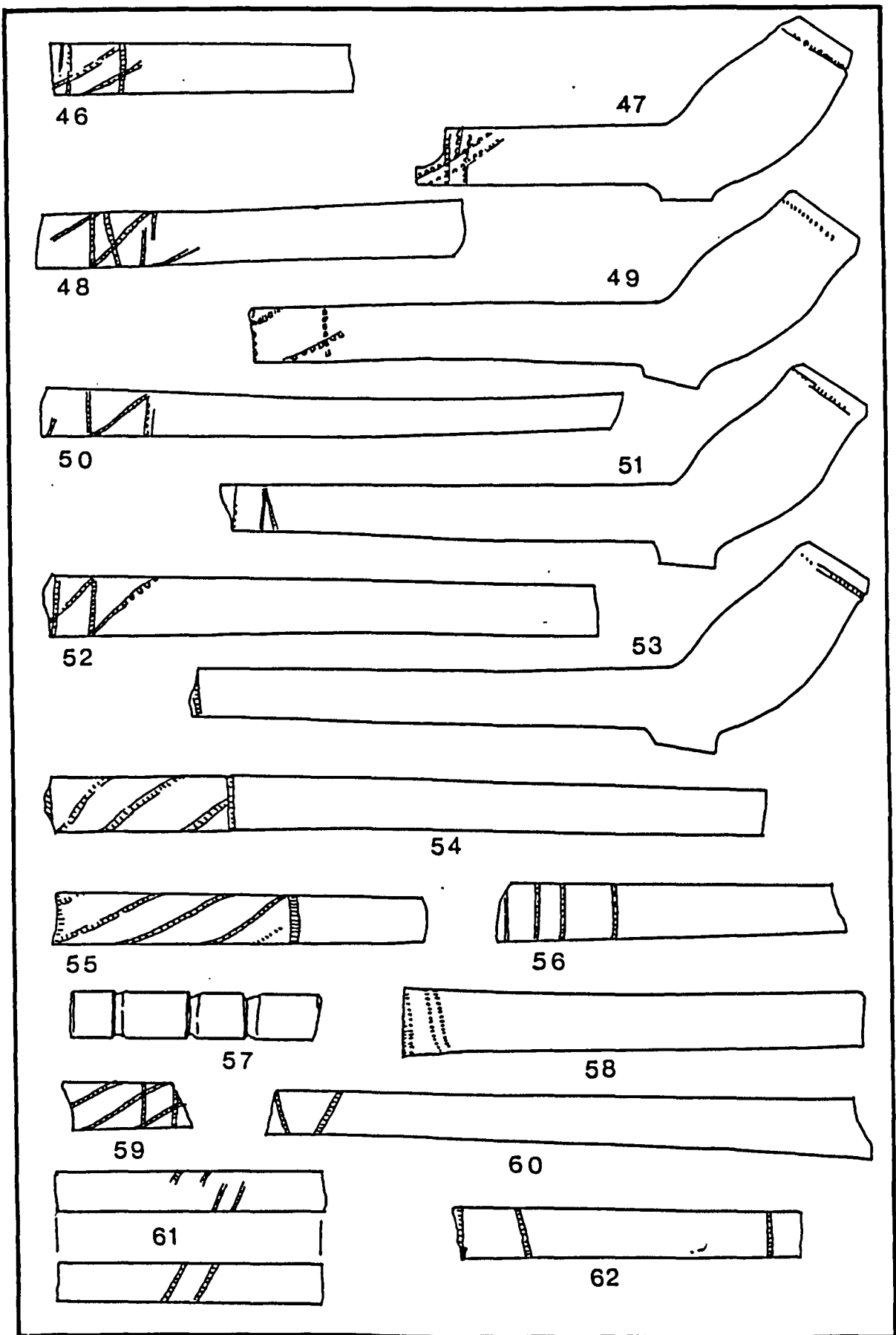


Figure 112 Gloucester Quay Street, tobacco pipes and stem fragments with milled decoration, actual size.

Figure 113 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".

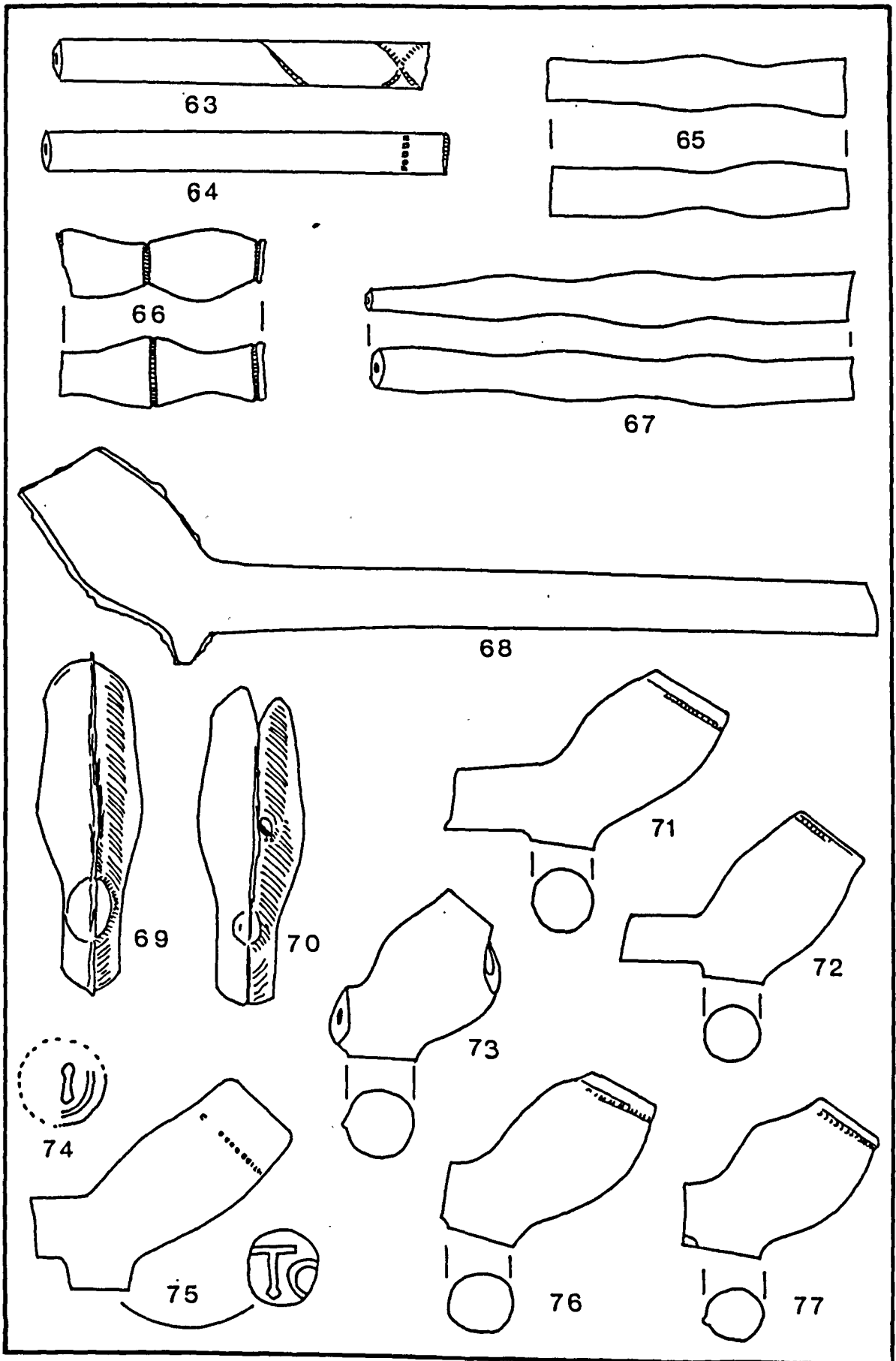


Figure 113 Gloucester Quay Street, tobacco pipes and stems, actual size.

Figure 114 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 $7/64''$

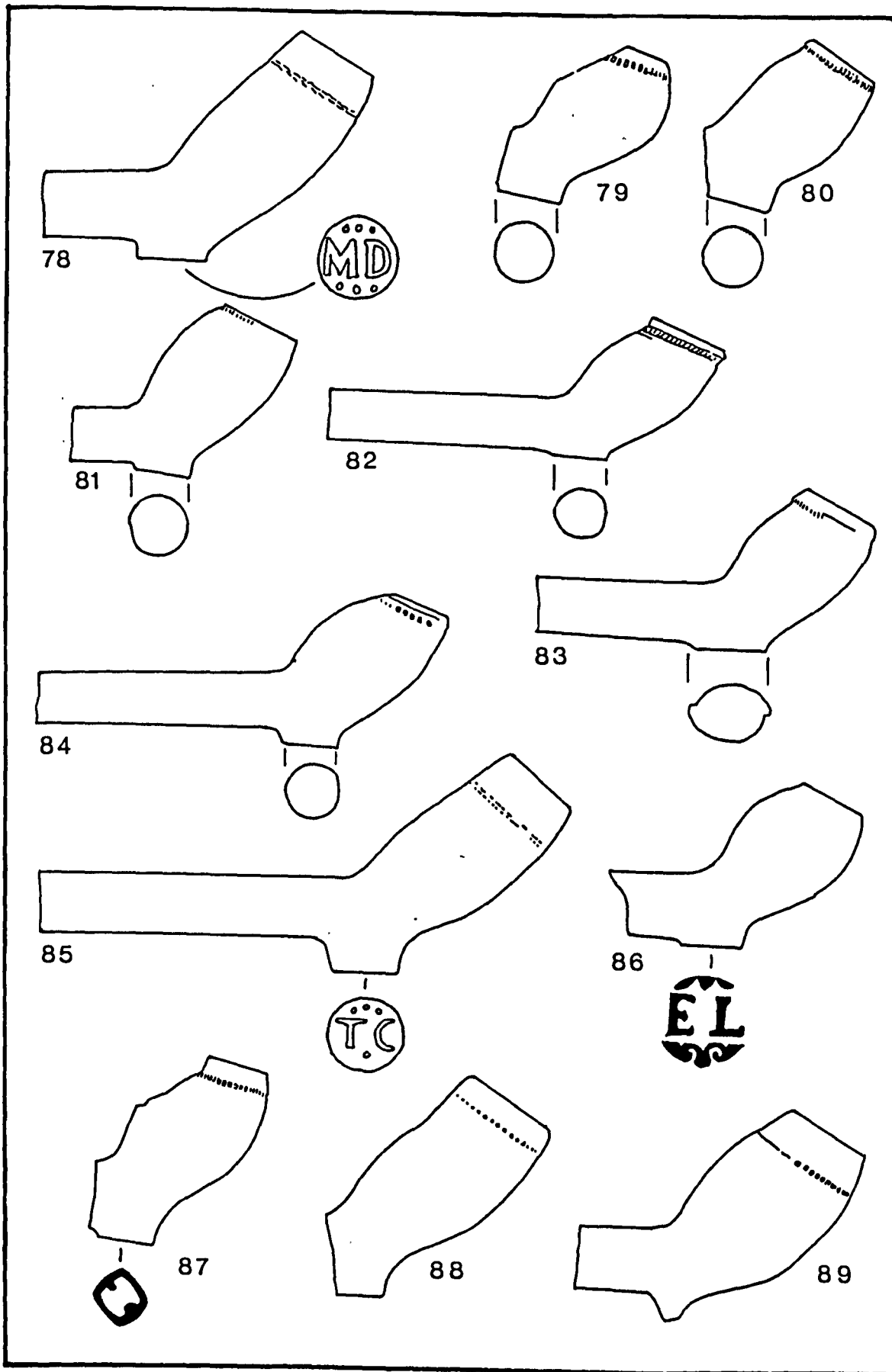


Figure 114 Gloucester Quay Street, tobacco pipes, actual size.

Figure 115 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 $6/64$ ".

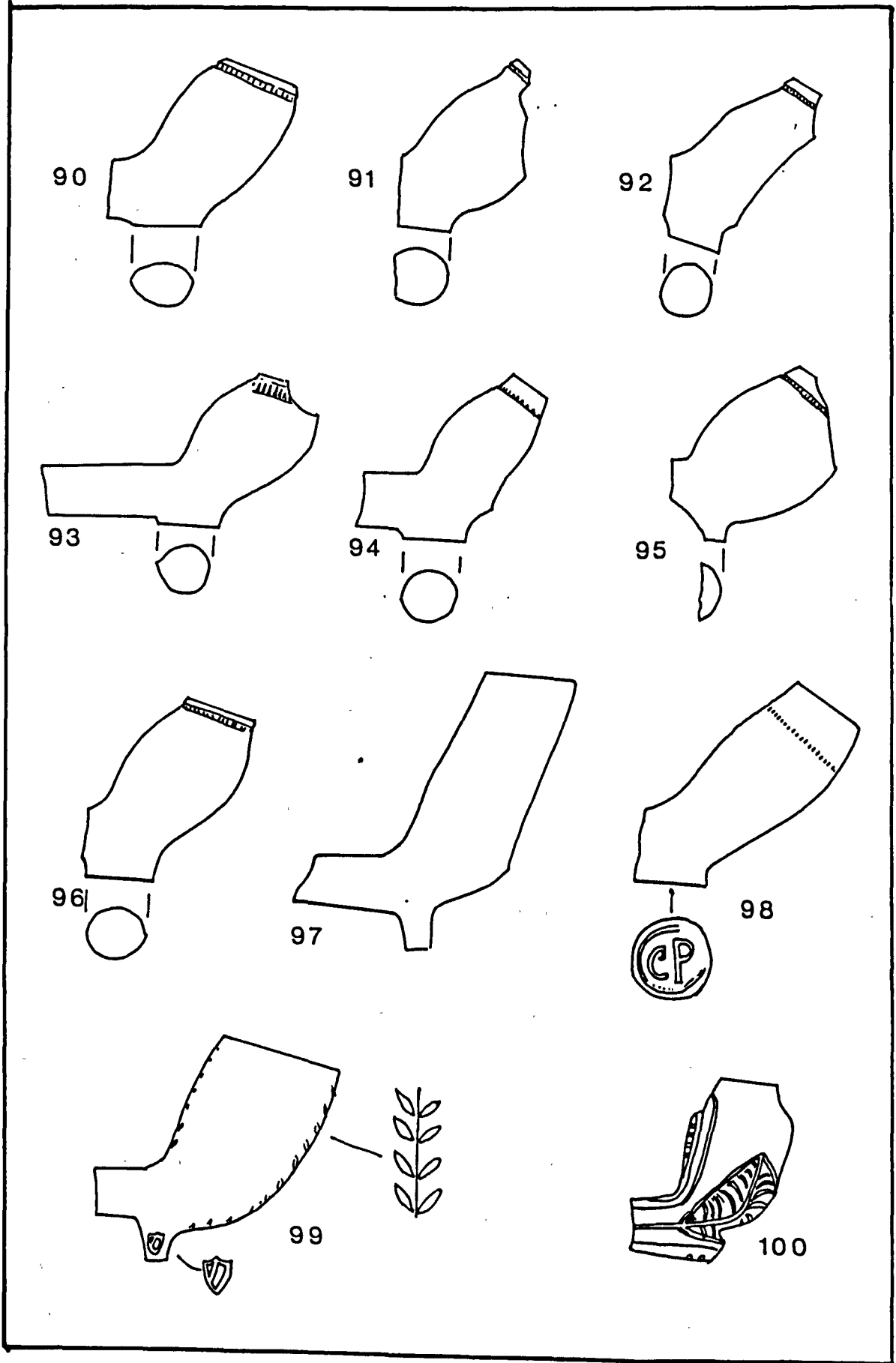


Figure 115 Gloucester Quay Street, tobacco pipes, actual size.

Kiln Fabric and Furniture.

The excavation produced a little over 40kg of muffle fragments together with 2kg of furnishings. The muffle fragments are from a rectangular structure with at least one circular opening through the base. The base is c. 100mm thick with tapering voids impressed around the outer edges. There is a peripheral upstand which forms the first stage of the walls. Stems are included, randomly, in the upper surface of the base and in regular vertical alignment in the wall upstand. One large section of the wall, reconstructed from several fragments, has a vertical dimension of 310mm and a horizontal dimension of between 220mm and 350mm, without any sign of an external support. There is, however, in the assemblage one external prop of sub-circular section 90mm in diameter and 100mm long [Figure 116a & b]. This implies infrequent buttressing across a flue space 100mm wide at the point of support. A plan and section of this muffle are shown in Figure 8 with a sketched reconstruction in Figure 9.

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 18a], the base from a tapered prop with fire damaged interior [Figure 20v], four rims or bases and one body fragment also from tubular forms [Figure 116c-g]. None of these prop

type forms has a complete profile. The assemblage also includes two lobed buns [Figure 21a & c] and a ring bun [Figure 22n]. 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 for runners. 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 117k].

A number of angled lining fragments, three of which are illustrated [Figure 117h-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.

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. For the full catalogue of finds see pages 445-6.

Figure 116 Gloucester Quay Street, structural fragments, scale $\frac{1}{2}$.

- 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, possibly props with indications of fire passage through their interiors.

Figure 117 Gloucester Quay Street, structural fragments, scale $\frac{1}{2}$.
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 insufficient 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.

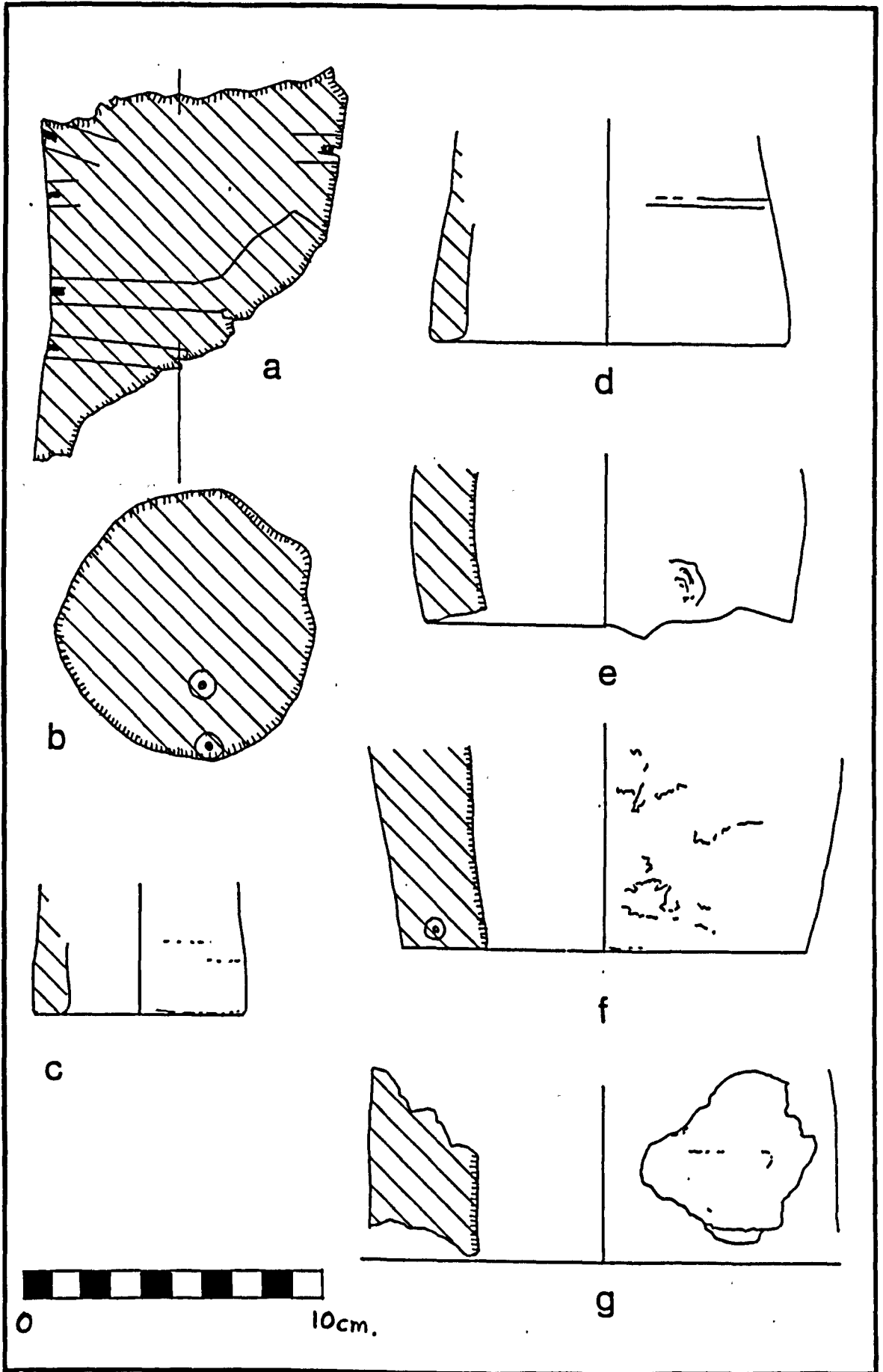


Figure 116 Gloucester Quay Street, structural fragments, scale $\frac{1}{2}$.

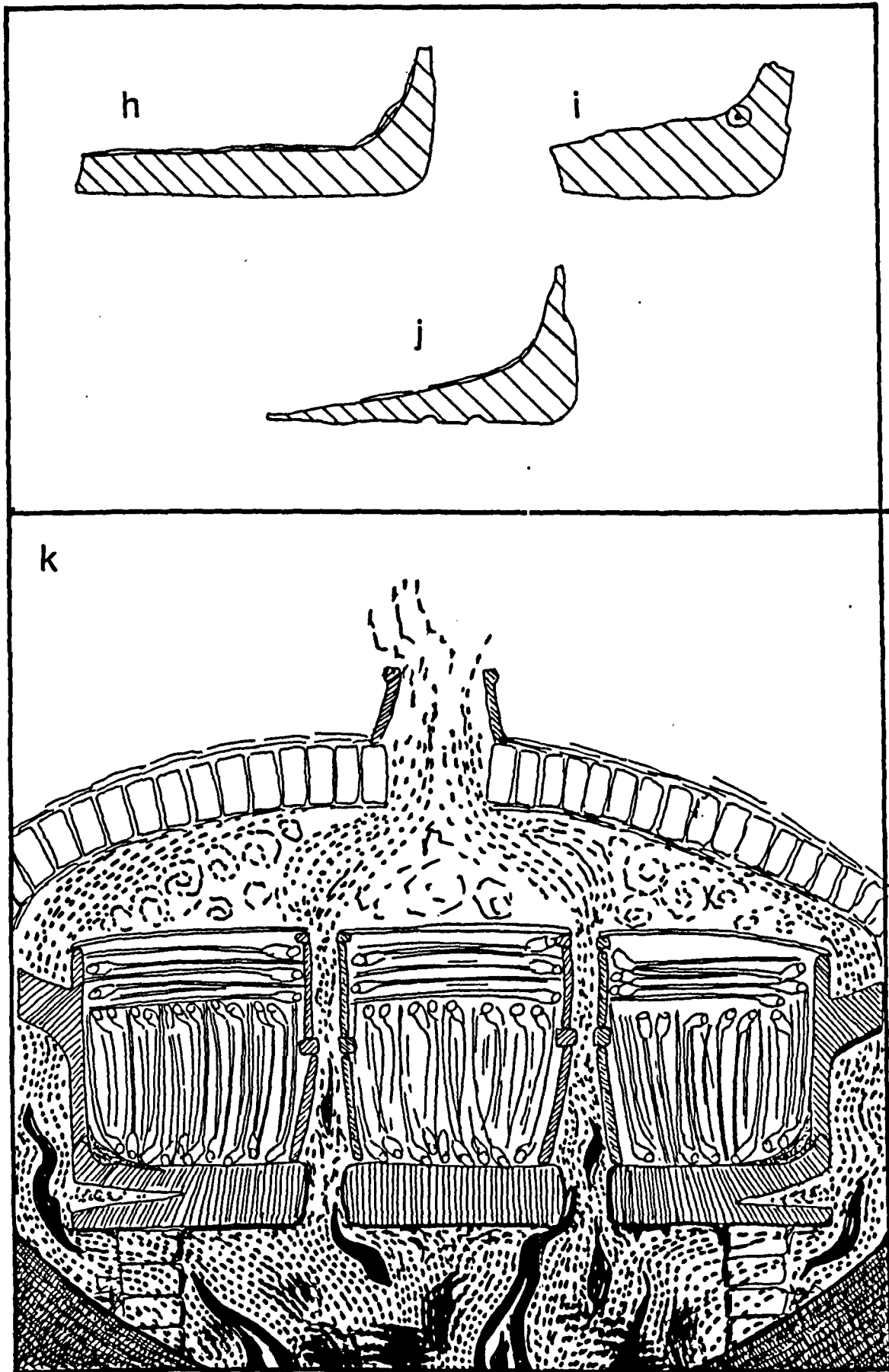


Figure 117 Gloucester Quay Street, h-j structural fragments, scale $\frac{1}{2}$;
k diagram illustrating the tube muffle principle, not to scale.

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. Table 7 highlights the 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 evidence from Chard, Portsmouth and Southwark is more cohesive; 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.

APPENDIX 5

CLAY TOBACCO PIPE KILNS FROM WATERFORD

Excavations carried out by the Waterford Corporation archaeologists between 1988 and 1990 in the area bounded by High Street, Olaf Street, Peter Street and Arundel Square, produced evidence for the manufacture of clay tobacco pipes and wig curlers during the second half of the eighteenth century.

Three groups of structural material were recovered, from the surviving bases of two kilns and from a stone lined pit. Pipes associated with this material, having various WW marks, link the three deposits to the same maker. Some pipe forms are common to all groups whilst others are exclusive. The muffle material from the three groups is distinguishable by fabric composition and in one case by the alignment of the pipe stems included in the matrix. Clearly three muffles are represented. The three deposits are named after the street from which entry to the respective site was made.

Kiln 1, Olaf Street, E.434.

A plan of this kiln is included in Chapter 7, Figure 54, Page 208. The surviving structure, composed of roughly dressed sandstone with some brick facing, survived to a maximum of three courses. The layout is conventional with kiln base bisected by a flue ash pit connecting to a stoke pit area in front of the kiln. Figure 118 is a pre-

excavation plan of the kiln in which the black deposits reflect the shape of the flue ash pit [compare with Figure 54, Page 208]. An unusual feature is a pit, of V-section, straddling the western edge of the stoke pit. This pit may have served as a sump for drainage.

Debris recovered from the interior of the kiln provides evidence for some features of the superstructure. It represents a kiln of updraft design with a muffle within the firing chamber to protect and support the pipes. The muffle remains are formed from a fabric comprising large amounts of sandy material bound in a light firing clay matrix [WAT1.W1]. The clay content is only just sufficient to bind the inclusions together resulting in a very friable fabric. Fragments of muffle wall are distinguished by the differing aspects of their inner [concave] and outer [convex] surfaces. The inner surfaces are clean and show signs of repeated coverings of white slip between firings. The outer surfaces are variously slagged, glazed or discoloured through contact with high temperature flue gasses bearing ash, earthy impurities and flux material.

The muffle wall fragments range in thickness from 70mm in the lower parts to 15mm at the rim. Fire damage to the outside is most intense on the fragments from the lower wall. Pipe stems are included within the thickness of the wall, aligned vertically in the lower wall fragments and horizontally in those from the rim. These stems have been fired prior to their insertion into the wall matrix. One section of the lower wall displays a false rim which has knife slash marks and implanted pipe stems to facilitate a good bond with the later added wall section. This is a common feature of pipe kiln muffle construction representing a temporary halt in the progress of

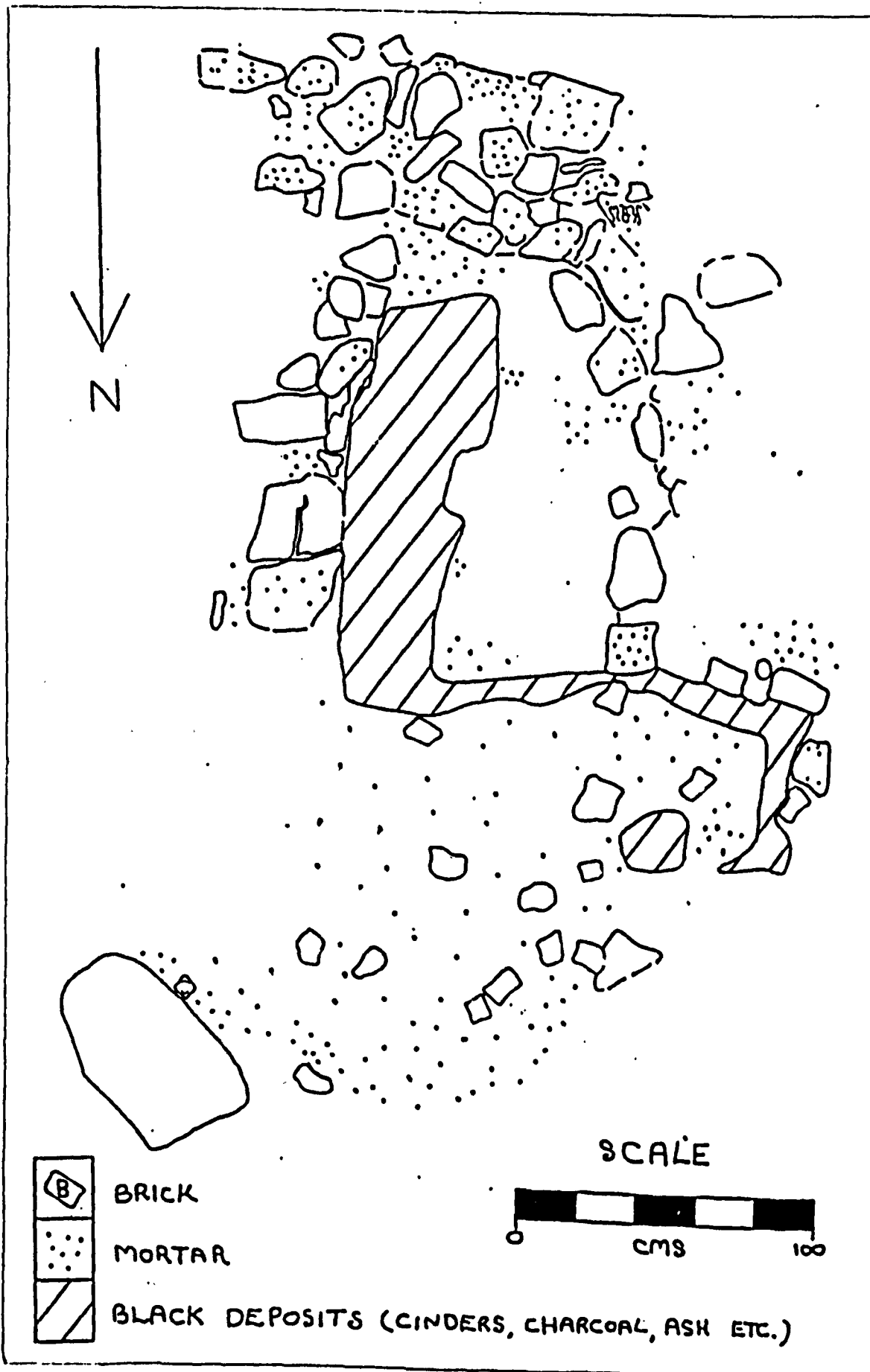


Figure 118 Olaf Street, Waterford, E434 Area III plan No 2
 Pre-excavation plan of clay pipe kiln. 21.1.88

building. It is probable that this was to allow the material to stiffen sufficiently to support continued work.

Four fragments have external scars consistent with a junction with a buttress bar. None of the fragments display any signs of internal projections. The curved inner surface of five joining fragments, if continued at the same radius, would form a cylinder of c. 400mm internal diameter.

In addition to the muffle remains are two small fragments of low density daubed material in a white clay fabric liberally voided where included organic material has been consumed by the fire [WAT1.W2].

There are also fragments of red brick with heavily slagged surfaces consistent with use in the fire box or lower parts of the outer walls of the kiln.

Kiln 2, Arundel Square, E. 527: 626.

A plan of this kiln is included in Chapter 7, Figure 55, Page 210. The surviving structure was built predominantly from brick with some sandstone. The layout is in the form of a rectangle, five metres long by two metres wide, divided into three zones. The eastern zone is the kiln base penetrated by the flue ash pit. The central zone is the stoke pit with a step down into it from the north. The western zone probably served as a storage area, possibly for fuel. A brick drain follows the western and southern edges of the two latter zones discharging into a circular pit adjacent to the kiln base. The sunken parts of all three zones were filled with pipes and kiln debris.

Material recovered from the interior provides evidence of furnishings and details of the superstructure. The kiln was of updraft type with a muffle to protect the ware. The fabric used to form the muffle is a light coloured clay with a high degree of quartz sand and other mixed mineral inclusions [WA2.W5]. There is some voiding consistent with the burning out of organic filler but this is masked by the progress of vitrification. The presence of iron bearing minerals gives the matrix a speckled appearance. The muffle displays similar features to E. 434. The walls vary in thickness from 20mm to 75mm with the heaviest slagging on the thicker pieces. The pipe stems enclosed within the thickness of the wall are vertically aligned at c. 25mm centres in the lower [thicker] wall and horizontal in the upper [thinner] wall fragments.

Three fragments of muffle wall have vertical external bar type buttresses. The flue space spanned by these buttresses varies from 30mm to 70mm. One of these buttresses has stems vertically aligned within the fabric whilst in the adjoining wall they are horizontal. None of the fragments has any internal projections.

Four fragments have pipe bowls ranged side by side with stems pointing towards the interior. In a lower wall fragment these bowls are placed upright and if, as seems likely, the stem alignment represents that of the muffle floor then the lower wall is angled outwards at c. 60 degrees. One fragment, with a rounded outer vertical profile, has two layers of bowls seemingly inverted and the impression of a third layer above these set bowl upwards. A third fragment has a single layer of apparently inverted bowls. None of these fragments join together but, if section drawings of the three

are overlaid using the ranges of bowls as registers, a convincing lower wall to base profile is achieved [Figure 15, Page 74].

A substantial amount of a flat slab 55mm thick with a circular aperture 280mm in diameter was recovered. This slab is formed from a white firing clay with similar inclusions to those in the muffle fabric but in lesser proportions and of smaller size [WAT2.W3]. A single layer of pipe stems radiate outwards from the circular aperture. It is not possible to determine the shape of the slab as none of the outer edge is present. There is no slagging or discoloration evident. The purpose of this object is not known.

A large number of fragments are apparently from shallow cylinders and separate circular bats. These are formed from a clay, firing a pink to buff colour, with quartz sand and other mixed mineral inclusions [WAT2,W4]. The cylinder wall fragments are of two heights. Three fragments measure 120mm whilst the remaining thirty-two measure 93mm. All measure 15mm in thickness. The top and bottom edges are all square cut with no evidence of a join or seal to a base or lid. There is no indication of contact with the flue gasses. Two of the fragments have a vertical cut edge. Several fragments display distortion away from regular cylindrical form rendering diameter calculation approximate. Two of the largest fragments have an internal diameter of c. 360mm. Greater lengths of circumference achieved by joining fragments indicate diameters of c. 320mm, c. 320mm and c. 480mm. Seven circular bat fragments with a thickness of 18-20mm have an outside diameter of 360mm. One fragment of similar thickness has a diameter of 400mm. One fragment 18-20mm thick with an outside diameter of 440mm has a circular centre hole of 120mm

diameter. Two fragments 20-22mm thick also have a similar circular aperture but do not survive to their circumference. Although this group of objects have the appearance of sagger rings and lids the complete lack of fire damage suggests use within the muffle. Similar objects are not known from other pipe kiln assemblages. None of the previously studied assemblages include wig curlers as a product. A credible explanation is that these objects were used to form a stack in the lower part of the muffle and that wig curlers were contained within the shallow cylinders, arranged vertically, between the circular bats. The centre hole is large enough to permit a typical prop to pass from the muffle base through the wig curlers to support pipes in the upper part of the chamber [Figure 119].

A quantity of wig curlers were recovered from the site. Several sizes are represented, measuring from 62mm to 78mm in length. One of the WW stamps used on the clay pipes appears also on the ends of some of the wig curlers. It is clear that both pipes and wig curlers are the work of the same maker.

A single prop Type P3 in the form of a truncated cone is represented by the surviving upper part. The top diameter is 60mm widening to 82mm at a point 155mm below. It is not possible to determine the height as the base is broken off [Figure 20w, Page 103]. It is formed from a generally pink firing clay enclosing patches of buff firing clay suggesting a casual approach to preparation. The fabric has moderate quantities of mixed mineral and voiding from organic inclusions [WAT2.W7]. There is relatively less distinguishable quartz than in the preceding fabrics and this occurs in larger particles, average size 3-5mm, rather than the fine quartz sand seen previously.

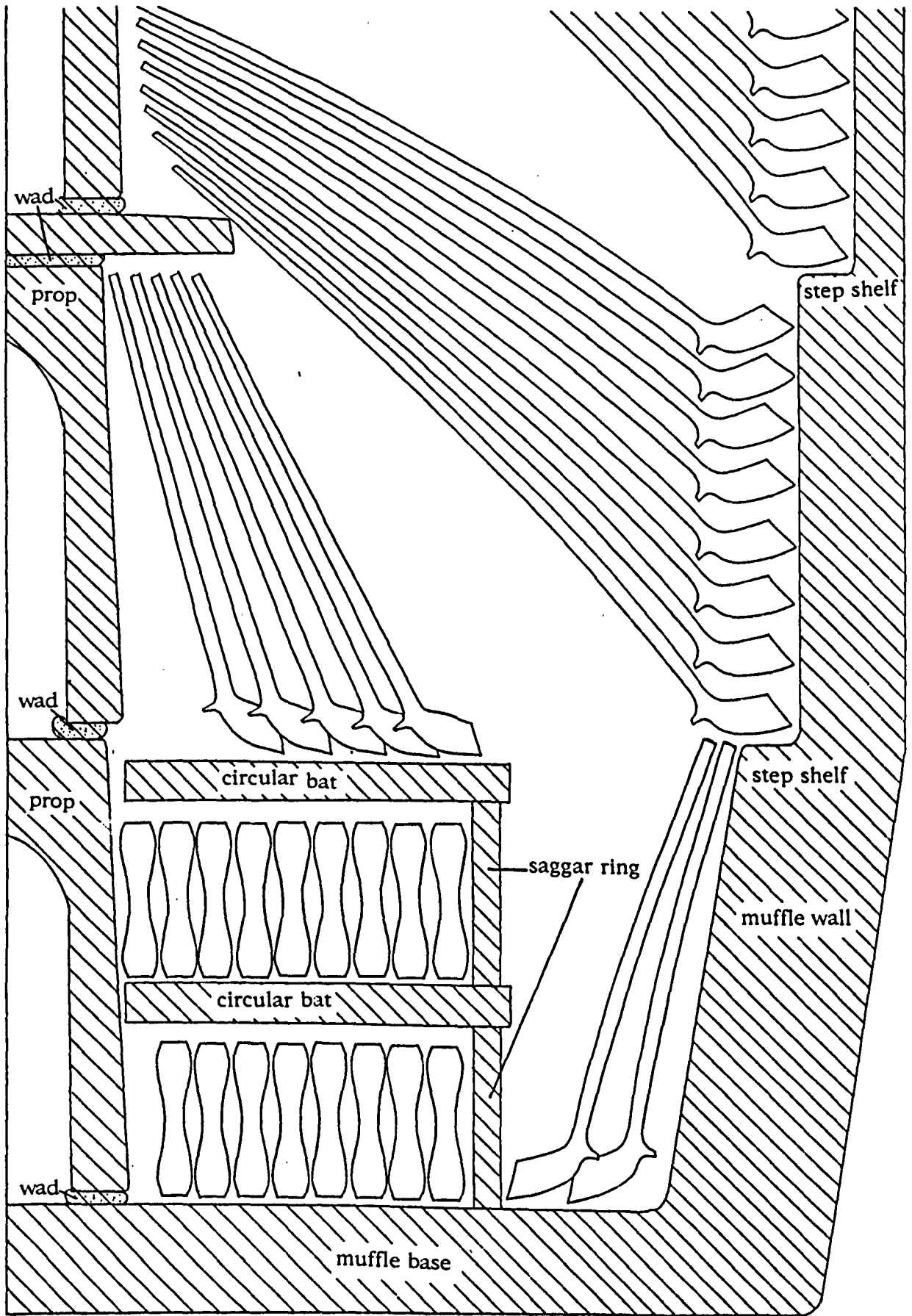


Figure 119 Suggested use of saggar rings within the muffle.

Not to scale.

The prop has been formed round a cluster of pipe stems. The outer surfaces are liberally coated with multiple layers of white slip. The white slip is indicative of use within the muffle where it probably served as a central prop to support pipes.

The function of a second object in the form of a truncated cone is not so clear. It has the same form as a prop Type 3A and which indeed it might be. The base diameter is 95mm, the top 63mm and the height 45mm. There is an eccentric conical aperture passing from the base through the upper surface with a diameter at the base of 42mm and at the top of 25mm [Figure 19a, Page 100]. The fabric from which it is formed is a very hard sandy buff coloured clay with fine [0.5-1mm] well rounded quartz sand inclusions [WAT2.W8]. There is no trace of any white slip coating but the inner surface, the base and the first few millimetres of the lower outer surface have an adhering coating of red slip. It is possible that this is a concentric plug acting both as a spy hole, through which to observe the colour within the kiln, as a means by which to judge the temperature, and as a larger aperture through which a test piece might be withdrawn.

A number of temporary furnishings are present, formed from a clean white inclusion free clay [WAT2.W1]. There are 130 fragments from strap shaped clay forms. These are hand made by pressing small rolls of clay, from opposing sides, into flattened strips with rounded edges. They have clear finger and palm prints on all surfaces. They range in section from 10-15mm x 3-5mm. Two fragments are of serpentine form with clear impressions of pipe bowls on the incurving opposed surfaces. These have clearly been used between layers of pipes, perhaps to separate and or to stabilise.

Four fragments from serpentine rolls 6-8mm in diameter again with bowl impressions as above are also present.

In the same fabric are six fragments from larger rolls, more accurately formed, 20-22mm diameter, some of which exhibit flattened portions. These show no signs of contact with other objects.

There are six fragments from thin sheets 1-2mm thick. These have a soft textured contact surface on one side and a wiped or scraped surface on the other. It is known from nineteenth century references that the soft texture results from their formation by spreading slip on sheets of paper.

Finally from this fabric group are two enigmatic hand formed clay knobs. These have finger and thumb prints on all surfaces except for a concave contact surface mirroring a rounded rim or edge. The purpose of these is not known.

Clean white clay with voiding from organic inclusions [WAT2.W2] is used to form an irregular slab of material. This fragment varies from c. 5mm to c. 30mm in thickness. On one surface it is dimpled with repeated bowl mouth impressions whilst the other has a lightly fire discoloured wiped appearance. There are a further three fragments of daubed material in this fabric.

A similar fabric but with a red clay base voided from organic inclusions [WAT2.R6] is used to form wavy sheets of material. There are several hundred fragments of this material which has been formed over a woven cloth leaving its impression clearly visible. Pipe stem

impressions on a few fragments show that these at least were supported whilst still plastic upon pipe stems. This material together with the previous group is of very low density making it ideally suited for use as a covering either for stacks of pipes or for the muffle chamber itself.

Among the recovered assemblage is a large quantity of red brick most of which probably derives from the outer shell of the kiln. Notable are seven large fragments with a very heavy layer of dark coloured slag, formed over and eating into one of the greater surfaces. This slag has 'bagged' into full folds as it has run over the edges of the bricks. These almost certainly represent fire bars on which the fuel was burned and through which ash might fall and air, required, to sustain combustion, pass.

Thirty-five pieces of contorted slag were also recovered. All of the slag has the appearance of that resulting from burning coal. Six small pieces of coal were also recovered.

Three fragments in a red clay fabric come from a tile divided into square pockets each of which are pierced by a number of holes. There is no sign of either mortar bonding or fire damage. This type of tile is commonly used to form malt drying floors. It cannot be established whether the fragments were used in the kiln structure or for some ancillary purpose.

The bulk of the structural material recovered from the stone lined pit is from the muffle of a tobacco pipe kiln. The fabric from which it is formed comprises a clay which fires to a pink or buff colour with quartz and other mineral inclusions together with voiding from burnt out organic stuffing [WAT3.W1]. The muffle is generally cylindrical with a pipe clay washed inner surface and varying degrees of slagging and discoloration on the outside. The wall thickness varies from 20mm to 60mm with the thicker [lower] sections most heavily slagged. There are twenty one fragments. Of those for which the alignment can be ascertained, all have horizontal stem reinforcement. Nine of these are from the rim. Thirteen fragments have external bar type buttresses. On one of these the wall terminates in a vertical edge coincidental with the edge of the buttress. This is consistent with a door type aperture in the side of the muffle. There are two pieces which appear to be from internal peripheral shelves.

There is a single fragment of red brick with one slagged face and a single fragment of a daubed joint formed from a low density fabric of white clay with organic voiding.

APPENDIX 6

CLAY TOBACCO PIPES AND KILN MATERIAL FROM MOULSHAM STREET, CHELMSFORD

The subject of this report is a quantity of kiln material and clay tobacco pipes recovered from Moulsham Street. No excavation notes are available for this assemblage. The material is stored in twenty three numbered bags each containing similar material or pipes of a particular type. None of the material is marked but its homogeneity suggests a single context. The pipes are separated into fifteen mould groups and a mixed bag of nine bowls not allocated to either group. Close examination shows this breakdown to be illfounded. Bags 10-13 designated G7ai-G7aiv are indistinguishable; a mould flaw [on the left hand side just below the rim] can be seen on 10 out of the 12 bowls in the first bag, 4 out of the 6 in the second, 7 out of the 12 in the third, and 6 out of the 8 in the fourth. The probability is that these 38 bowls are from one mould. Clearly the criteria used, to separate these pipes into their bagged groups, are invalid.

The pipes in the assemblage consists of 171 bowls. Of these 164 conform to Oswald's general Type G7 dated 1660-80; 6 to G8 dated 1680-1710 and 1 to G9 1680-1710 [Oswald 1975, 37-41]. The remaining bowl is intrusive of London Type 27 dating 1780-1820 [Atkinson & Oswald 1969, 179-80]. These bowls can be divided into two groups; those that have been used as reinforcement in the muffle matrix and those that have not; the product. Pipes in the first group are distinguished by their appearance being, discoloured, overfired and

covered with adhering clay from the muffle matrix. Types G7 and G8 occur in both groups. 52 G7 and 2 G8 from the muffle; 113 G7 and 3 G8 product.

Figure 120 Chelmsford, Moulsham Street, tobacco pipes, actual size.

- a Type G7 1660-80 with chamfered bowl edge and milled stem. Stem bore $7/64$ ".
- b Type G7 1660-80 with chamfered bowl edge. Stem bore $7/64$ ".
- c Type G7 1660-80 with milled stem/bowl join. Stem bore $7/64$ ".
- d Type G7 1660-80 Stem bore $7/64$ ".
- e Type G8 1680-1710 with chamfered bowl edge. Stem bore $7/64$ ".
- f Type G9 1680-1710. Stem bore $7/64$ ".
- g Type L27 1780-1820 marked E C. Stem bore $5/64$ ".

A number of the bowls are wasters, unsaleable. There are in this assemblage three faults which render the pipes useless. The first of these is transverse squatting of the upper part of the bowl drastically narrowing or closing it altogether. In the muffle matrix group are 9 such deformed bowls and in the product group 2. This

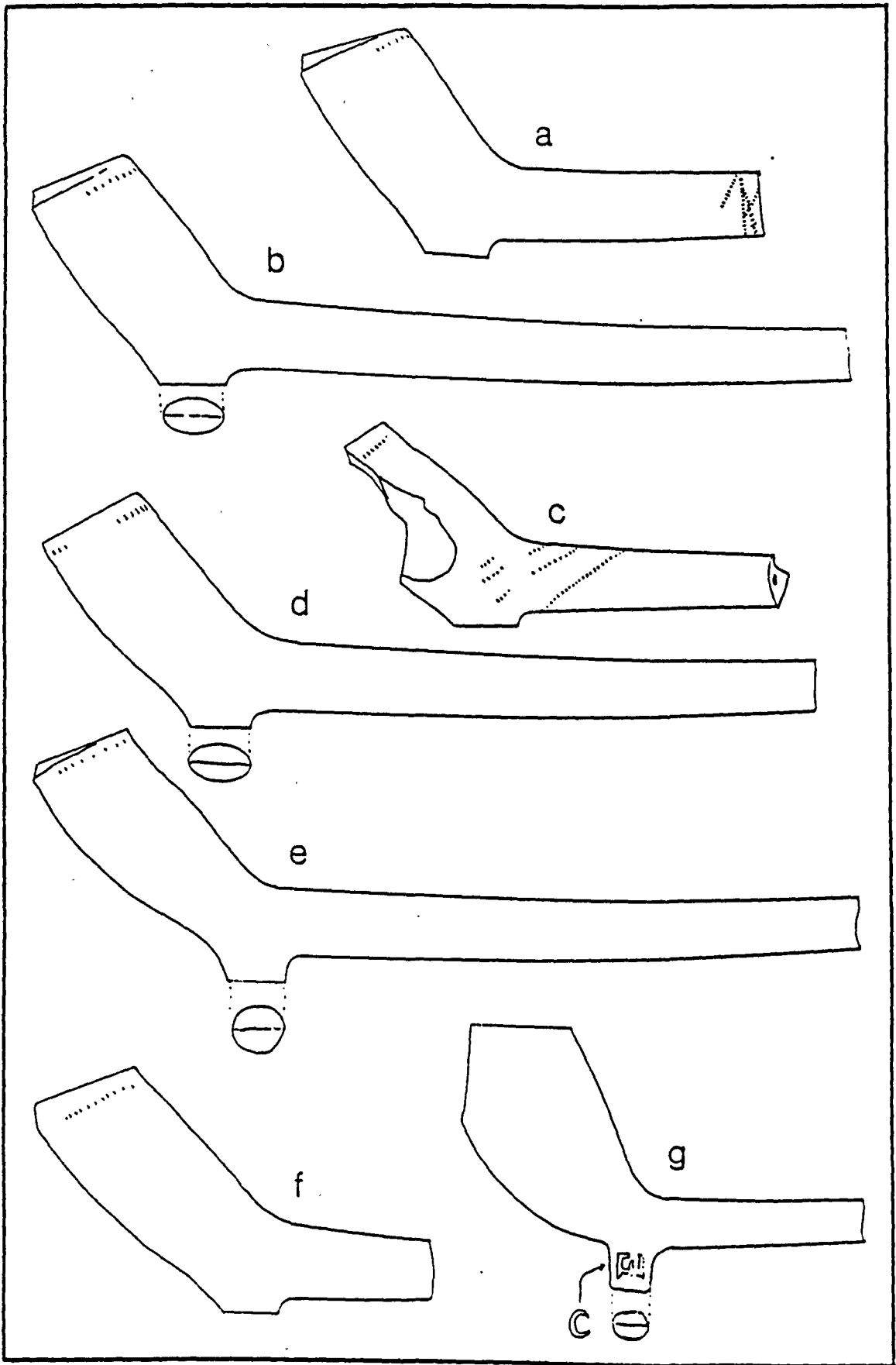


Figure 120 Chelmsford, Moulsham Street, tobacco pipes, actual size.

fault, noted from several other sites, is not the result of accidental contact while the pipes remained malleable but is caused by a combination of pressure and temperature in the kiln. The direction of the pressure is indicative of the manner in which the pipes were arranged within the muffle, clearly similar to the documented methods of the early nineteenth century [Good, Gregory & Bosworth 1813, Pipes, no pagination]. Clay bodies will soften and become elastic at high temperature [the critical temperature depending upon the composition of the body] and in this state are subject to deformation under load. Squatting such as is apparent in this case may be the result of either too high a temperature in the kiln, too great a load exerted on the lower layers of pipes or a combination of the two.

The second defect represented in this assemblage is longitudinal splitting of the bowl. In some cases the split appears where the clay enfolds a partially dry surface in others the clay appears to contain pockets of dry crumbly material. The first of these is caused by poor moulding and the second by poor clay preparation. In the product group are 9 split bowls.

The third defect represented in this assemblage is underfiring. A single example having the soapy feel of French chalk used by dressmakers occurs in the product group.

None of the pipes are marked. All but the intrusive G24 have milling just below the rim. Two, both Type G7, have decorative milling on the stem. One of these, from the muffle matrix, has milling at the junction of the bowl with the stem and the other, from the product

group, has a plain stem extending 40mm from the bowl to the point where the milling begins. The bowl mouths are button finished.

Among the stem fragments saved from the muffle matrix are 3 mouth piece ends. These are all simply treated, whether as moulded or knife trimmed is impossible to distinguish. All have a slight burr where the wire was withdrawn from the stem.

It is difficult to be exact about how many moulds were used to produce these pipes but it is certainly not less than 5 for the G7s and 1 for the G8s.

Kiln material.

Material from the kiln structure and furnishings is divided into categories according to the composition of the fabric. Five divisions are represented all based on a light coloured clay. The differences are due to the addition or possibly subtraction of inclusions from the parent clay. The finest fabric, used predominantly for the manufacture of the pipes themselves, is to the naked eye, inclusion free. This is designated Fabric 1. Fabric 2 has visible quartz, fused iron rich material and voids left by burnt out organic material. Fabric 3 quartz only. Fabric 4 organic material only. Fabric 5 quartz, fused iron rich material, crushed clay pipe grog and organic material. Either or both of the mineral inclusions may occur in the parent clay. The crushed pipe and organic material are clearly additions. These fabrics conform to national patterns of design for specific use in pipe kilns and their furnishings.

Four fragments of kiln material are formed from Fabric 1. The fragments clearly come from the same or similar objects. They are hand formed around a stem shaped object. They are tentatively described in the catalogue as racks because they closely resemble a known series of complete terminals encompassing groups of pipe stems. These terminals, which have been recorded from St Albans, Aylesbury, Gloucester, Ipswich and Boston, present an enigma respecting their completed form and their purpose [see above pp 165-172].

All of the fragments formed from Fabric 2 derive from the pipe kiln muffle. The evidence conclusively shows that from the middle of the seventeenth century until the middle of the nineteenth century pipe kilns were built on the true muffle kiln principle. There is evidence to support the view that this practice was known from as early as 1612 [see above pp 294-5] The material from this site is similar to that from Arcadia Buildings Southwark [Peacey 1982, 3-12].

Figure 121 Chelmsford, Moulsham Street, muffle details, scale 1/2.

- h Prop type muffle buttress with pipe bowl Type G7 included.
- i Fragment from the muffle rim with pipe stems included.
- j Reconstruction based on a substantially complete muffle of similar period from Arcadia Buildings, Southwark. Not to scale.
- k Fragment from the muffle base with pipes of Type G7 included.

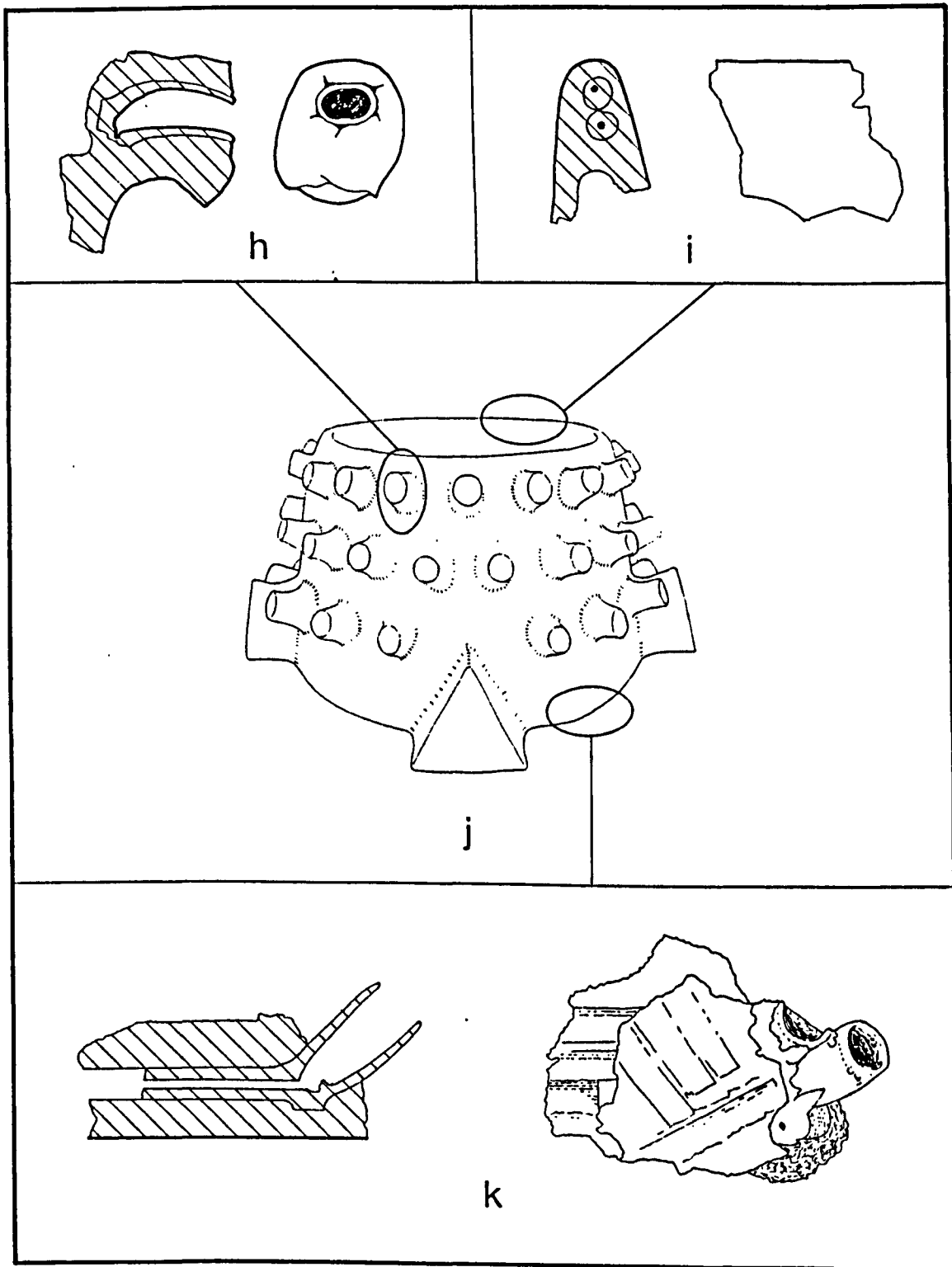


Figure 121 Chelmsford, Moulsham Street, muffle details: h muffle prop buttress, i muffle rim, k muffle base edge, scale 1/2.

Fabric 3 is represented by three fragments of thin sheet material 0-2mm thick. This common material type from pipe kiln sites was used to stabilise, separate or cover groups of pipes within the kiln. It results from the use of paper or cloth covered with a thin skim of liquid clay. The backing sheet gives the clay film handling strength then in the kiln burns away leaving only its texture on the waste product. The practice survived into this century, is recorded on film and attested by Gordon Pollock of Manchester who is still producing pipes today.

Fabric 4 is used for similar material represented by three fragments. These are 6mm thick and have the impression of a coarse woven cloth.

Fabric 5 is the material used for the most important object in this assemblage. Kiln furniture from this period is scarce and though conforming to a general theme, tends to be individual. Complete profiles are even more scarce. The prop recovered from this site has a solid hand formed trunk with a pipe stem throughout its vertical axis. The base is spread for stability, the top rounded and twice pierced horizontally to take a cruciform arrangement of pipe stems. This would have been used in the centre of a radiating stack of pipes within the kiln.

Figure 122 Chelmsford, Moulsham Street, Type 1 prop, Scale 1/2.

1. Prop Type P1 with a single pipe stem included and traces of white clay slip coatings on external surface.

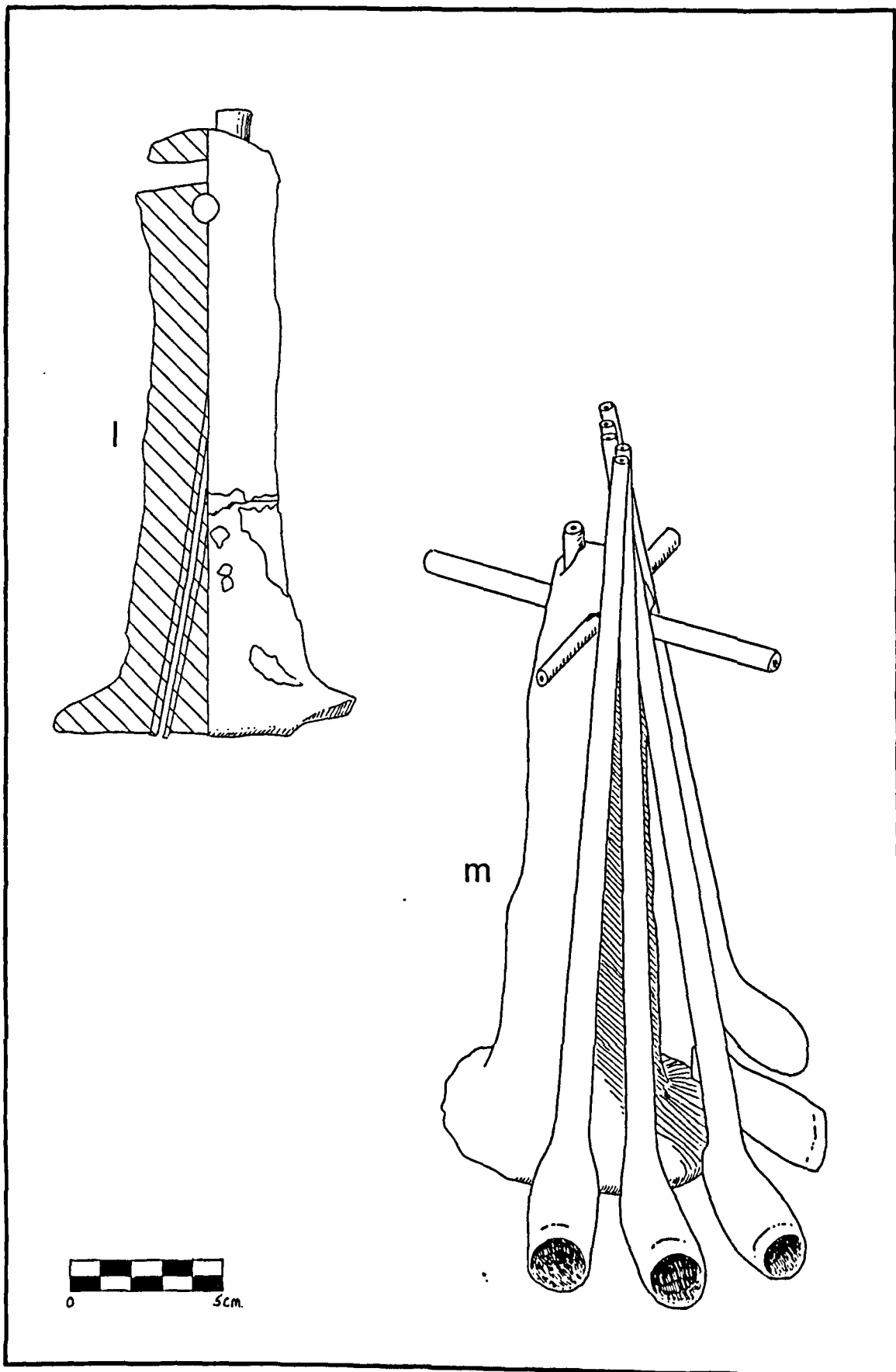


Figure 122 Chelmsford, Moulsham Street, Type 1 prop, Scale 1/2.

m Illustration of the prop as it probably appeared in use with cruciform arrangement of stems at the top to support a radial stack of product pipes.

APPENDIX 7

TRIAL EXCAVATIONS ON THE SITE OF A TOBACCO PIPE WORKSHOP AT PIPE ASTON, HEREFORDSHIRE

On sheet 32/47 of the 1:25,000 Ordnance Survey the village of Aston is shown lying between Ludlow and Wigmore at grid reference SO 460 720. Caldicot, writing in 1895, gives the full name as Pipe Aston by which it is known locally to this day [Caldicot 1895, 85].

In 1930, a local contractor, Mr Davies of Bucknell, Shropshire, was hauling timber from the wood above Juniper Dingle when a wheel of his waggon sank into a soft patch of ground. On digging out the wheel a 'nest' of tobacco pipes was discovered. This incident was reported, by G H Jack, in the *Transactions of the Woolhope Naturalists' Field Club* [Watkins 1931, 32]. An un-named boy, living in the nearby 'Juniper Cottage', had a collection of pipes said to have been found in the adjacent stream and assumed by Mr Jack to derive from the same source. Ten bowls and five stamps are illustrated, including examples initialled IB, TW and HW together with two wheel designs. All appear to date from the later part of the seventeenth century. Three of the bowls are derivatives of the Broseley Type 5, with tailed or 'racket' heels [Atkinson 1975, 25-8]. The pipes are described as wasters, some 'very white', others 'yellow mottled with brown'.

The site lies, under pasture, in a small isolated valley, surrounded by woods. Although some levelling was carried out in the 1940's the

present uneven contours suggest that this was not too drastic. The nearby cottage, now uninhabited, appears to have been built early in the nineteenth century.

Pipes collected in 1972 from the stream and from mole upcasts in the field together with the published group suggest a single phase production in the last third of the seventeenth century. The isolation and rural nature of the site are conducive to limited disturbance. The site, therefore, offers the potential to investigate a complete complex of domestic and workshop buildings together with yards and other utilities.

In June 1992 an approach was made to the land owner, Mr Hepworth, and the tenant, Mr Saunders, for permission to make trial excavations. The short term objectives being to locate the exact site of buildings associated with the production of tobacco pipes and to establish which of the published forms were indisputably made on the site. The longer term objective is to carry out full excavation of the site; to establish a complete plan of the complex and a typology of forms and stamps produced. In doing this it is hoped to shed further light on certain problems, relating to kiln design, posed by archaeological material from other sites in the region. These sites are, 11 Benthall Lane [Jones et al 1987] and Birtley Farm [Watkins, A 1931]. From Benthall Lane there is a simple muffle, divorced from its kiln base, which, because of the unusual distribution of slag damage, poses problems relating to the relative positions of muffle, fire and chimney [see above p 304]. From Birtley Farm there are two axe shaped tiles, most probably kiln furniture, which are unparalleled elsewhere, the function of which is not understood [see pp 132-3].

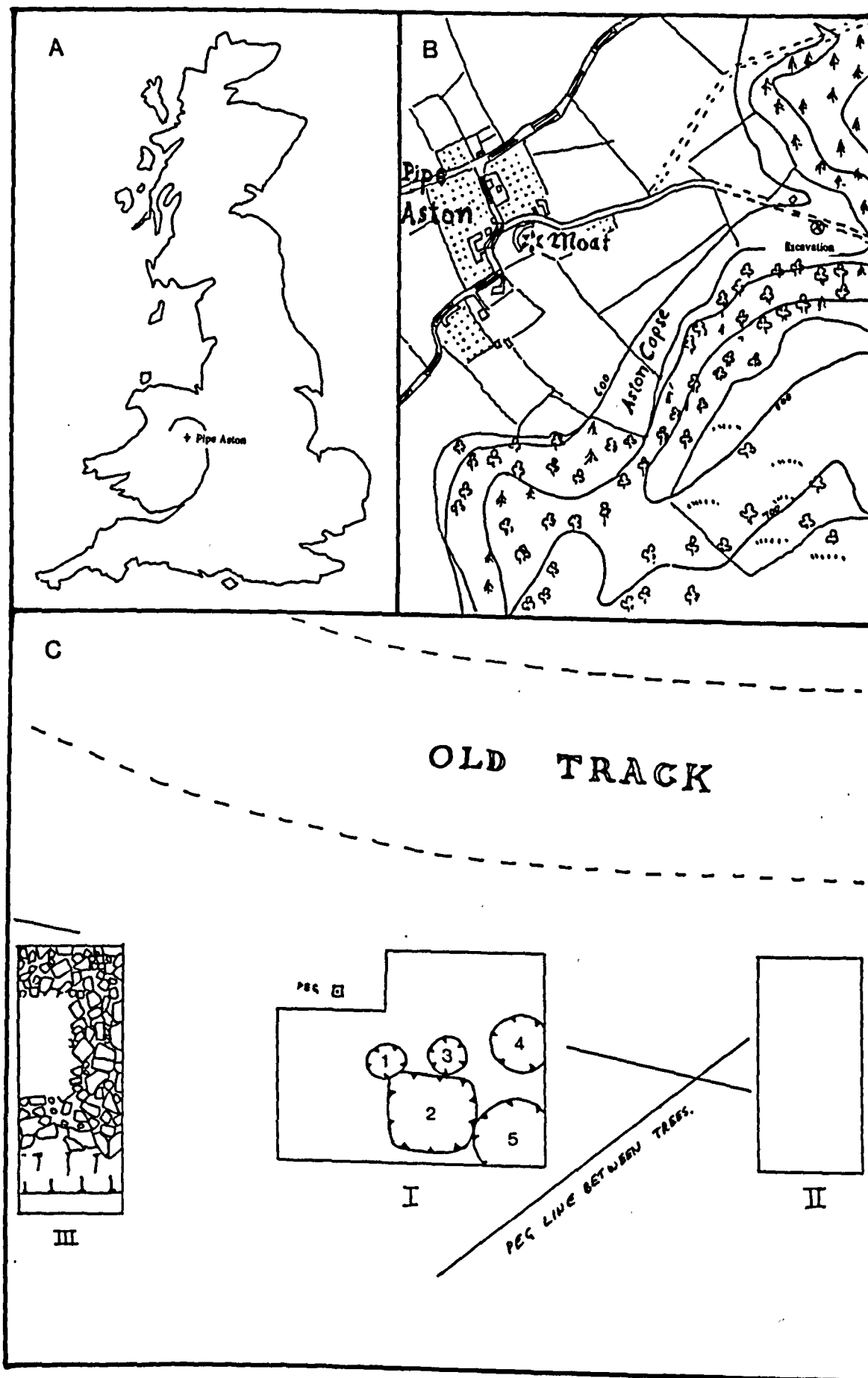


Figure 123 A location of Pipe Aston; B position of excavation; C trench layout scale 1:59.

The position of the waggon wheel incident was tentatively established from the published photograph and trial excavations were undertaken by the author between 27 July and 1 August 1992. The contours suggested the possibility of buildings cut into the slope alongside the old track with the further possibility of another building or buildings on a platform above. Three trenches were marked out on the trackside location. These each measured two metres by one metre with a space of two and a half metres between each. The three trenches were set out around an East-South-East to West North West axis. The central trench was numbered I; the more eastern II and the more western III, this being the order in which they were excavated [Figure 123C].

It became clear that the levelling, referred to above, had deposited material, from further up the slope, over the workshop site. This overburden (8) together with the earlier top soil (9) yielded much pottery dating from the eighteenth century. The early top soil (9) varying from 5 to 15mm thick lay directly over a worn stone surface (4) with pipe kiln material trodden well into it. This surface was largely formed from the upper brashy layer of the bed rock. Vigorous trowelling of this layer in Trench II exposed layered natural bed rock with no man made features.

In Trench I, four circular pits had been cut into the bedrock, two partially in the sections. The trench was extended by half a metre towards Trench II and one metre towards Trench III to expose the remainder of the pits and ascertain their alignment. This measure exposed a further pit in the south east corner of the now extended trench. Pit 2 cuts, and is therefore later than, Pits 1, 3 and 5.

Because of the similarity of their fill (2) Pits 1 and 3 were not separated until the bottom contours testified duality. The fill consisted of loam with charcoal, pipes and kiln debris. Pit 1 contained a uniform deposit of ash, cinder, pipes and kiln debris (3). The purpose of Pits 1, 2 and 3 is uncertain. Pits 4 and 5 were filled with disturbed natural material including clay, stones and sharp angular stone chips. A small quantity of pipe material was also present. In the centre of Pit 4 a soft column of material (14) suggested that a post had been removed. In Pit 5, large stones packed concentrically on edge also suggested a post setting (16).

Below the old soil horizon in Trench III lay an unbroken stone surface. Approximately 70% of the stone in this surface was burnt to an orange colour. The burnt and unburnt stone was randomly intermixed suggesting re-use rather than burning *in situ*. The burnt stone could be from the superstructure of a kiln. The trench was extended half a metre South-South-East into the bank to investigate an ash layer apparent against the section. This layer proved to be the fill of a linear feature, bordering the burnt floor, tentatively interpreted as a beam slot.

The Pipes.

Pipes from the excavation showed the period of production to have been c. 1660-1690. The pipes conform to typical seventeenth century forms. All have a heel at the junction of bowl and stem. There are no pipes in the deposit with a spur at this point. Bowl mouths are generally finished with a tool having a rotational movement, ['button'] accompanied by a line of milling below the rim. This

finishing is generally applied in a careless fashion resulting in blurring of the impression. It is, however, clear that several different devices were used for this process. Some show a line of tiny rectangular denticulations, some triangular and others corded.

The excavation yielded heels from 153 bowls of the production period; two bowls from c. 1620-50 and two spur fragments not earlier than c. 1780. Of the pipe bowls from the production phase, 43 are not marked; 107 are marked with 'wheel' stamps; 2 are marked with the initials IB and one with the initials PS.

A number of different moulds appear to have been used to produce pipes falling within two types. Type 1 has simple convex profiles to both front and rear, opening gradually from the stem to the bowl mouth. The rear profile is generally less curved than the front. In some cases the bowl closes slightly at the mouth, often accentuated by the action of the finishing tool. The range of this type is illustrated in Figure 124, 2-5, 10-12; Figure 125, 13-19 and Figure 126, 26-7. Type 2 has serpentine curves front and rear, opening out from the stem to the belly and closing again to the mouth. The range is illustrated in Figure 124, 1, 6-9; Figure 125, 20-24 and Figure 126, 25 and 28-9. As variations in shrinkage and finishing make mould identification impractical a policy of illustrating the range of forms has been adopted. Figure 124 shows forms of pipes which have heels without stamps. Figures 125 and 126, 25-8, illustrate those which bear stamps. The stamps are indicated with a stylised graphic.

The stamps are numerous and present problems of identification. Some at least are produced by a series of radial grooves cut across the

end of a cylindrical billet. Depending on the depth of the impression these stamps may produce a full circular depression with deeper detail or simply a series of shapes fitting a circular space without any continuous edge. The illustrated examples bear witness to the variety and complexity of the stamps used. These are from a single production unit of cottage proportion not a vast factory with dozens of moulders. It is difficult to conceive any significance between one design and another. As no stamping device was recovered from the trial excavation, the material from which they were fashioned is not known. It is possible that the variety of design derives from repeated replacement. Stamps to produce this type of design are easily made from a small stick by notching with a knife across a square cut end. Such stamps might have a limited life and would naturally differ one from another. Pipe clay is also likely to have been used for this purpose. It is the material that would always be readily available to the pipemaker and is simple to use. Figure 126, b and f, might be made from a broken pipe stem, the bore reflected in the centre of the design. Two pipemakers stamps fashioned from pipe clay are known to the writer. One from Chard bearing the mark GEO WEBB CHARD and one from Trowbridge which produces a face, probably for small figures [see above Page 182].

Figure 124 Pipe Aston, tobacco pipes, actual size.

- 1 Type 2, layer (2), stem bore $7/64$ "
- 2 Type 1, layer (2), stem bore $7/64$ "
- 3 Type 1, layer (9), stem bore $6/64$ "
- 4 Type 1, layer (7), stem bore $6/64$ "s
- 5 Type 1, layer (9), stem bore $7/64$ "
- 6 Type 2, layer (10), stem bore $6/64$ "
- 7 Type 2, layer (10), stem bore $7/64$ "
- 8 Type 2, layer (10), stem bore $7/64$ "
- 9 Type 2, layer (10), stem bore $7/64$ "
- 10 Type 1, layer (17), stem bore $6/64$ "
- 11 Type 1, layer (17), stem bore $6/64$ "
- 12 Type 1, layer (17), stem bore $7/64$ "

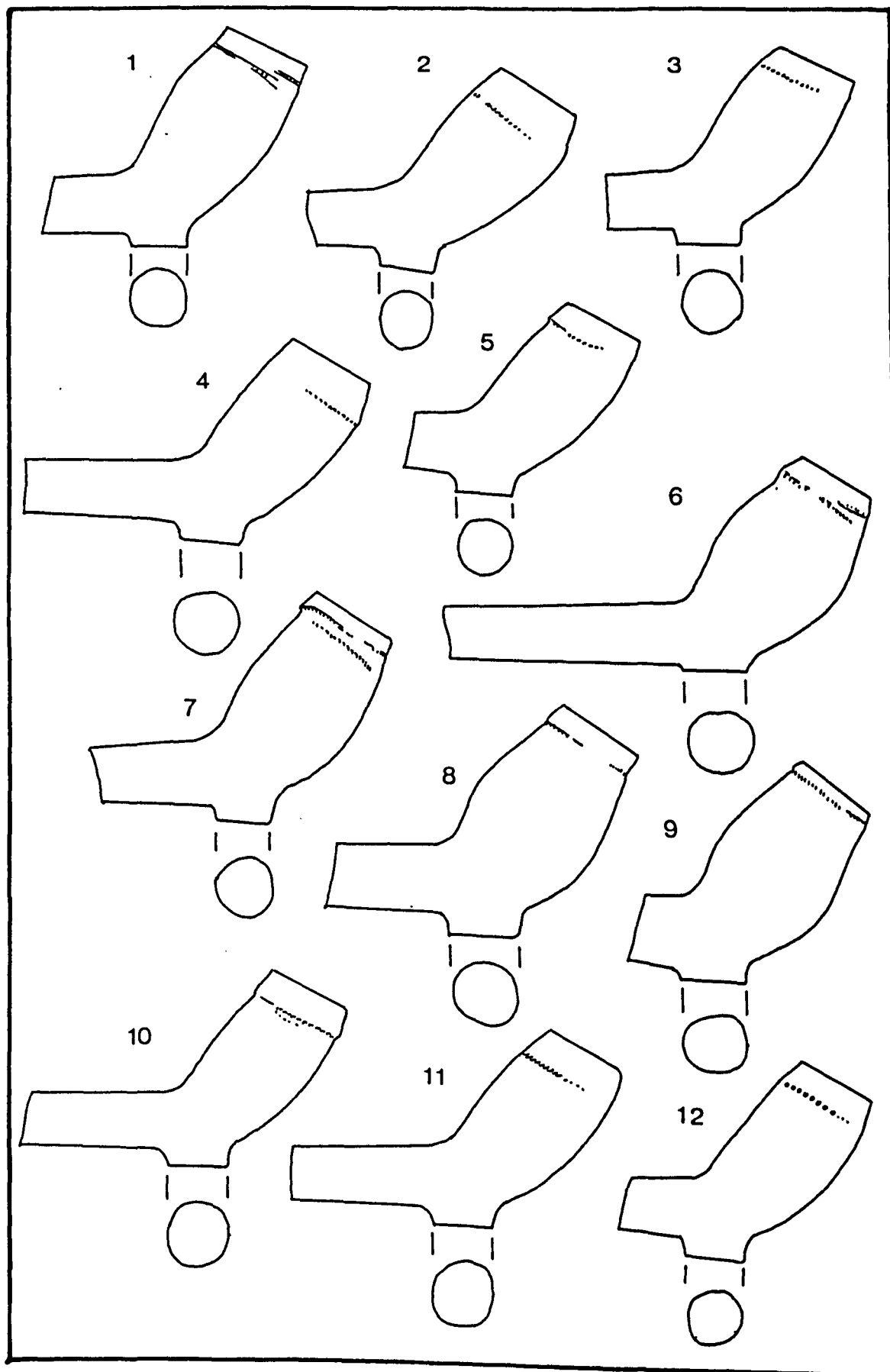


Figure 124 Pipe Aston, tobacco pipes, actual size.

Figure 125 Pipe Aston, tobacco pipes, actual size.

- 13 Type 1, layer (2), stem bore $7/64$ "
- 14 Type 1, layer (2), stem bore $7/64$ "
- 15 Type 1, layer (2), stem bore $6/64$ "
- 16 Type 1, layer (7), stem bore $7/64$ "
- 17 Type 1, layer (9), stem bore $7/64$ "
- 18 Type 1, layer (9), stem bore $7/64$ "
- 19 Type 1, layer (9)
- 20 Type 2, layer (11), stem bore $7/64$ "
- 21 Type 2, layer (9), stem bore $7/64$ "
- 22 Type 2, layer (9), stem bore $6/64$ "
- 23 Type 2, layer (17), stem bore $6/64$ "
- 24 Type 2, layer (17), stem bore $7/64$ "

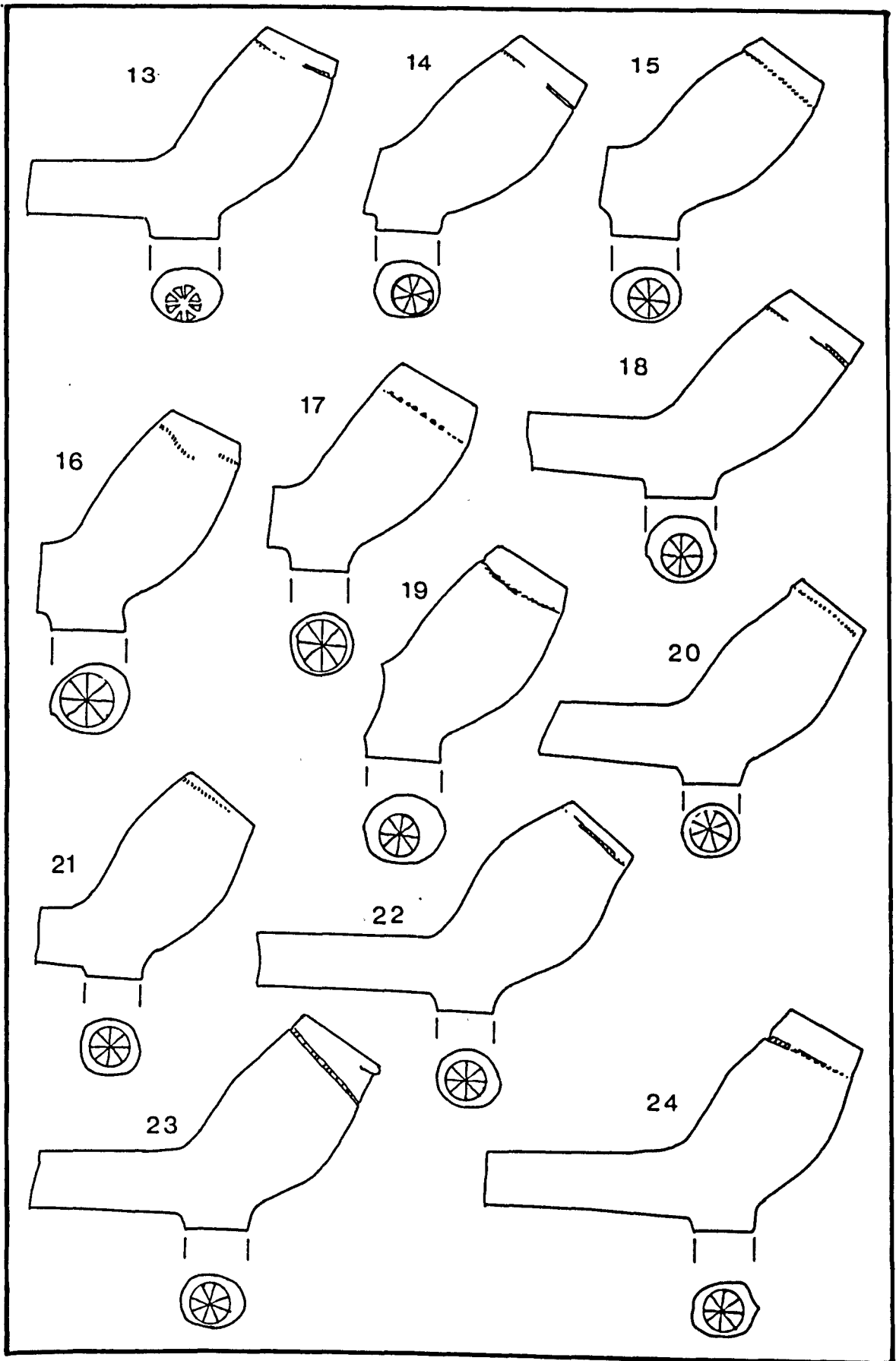


Figure 125 Pipe Aston, tobacco pipes, actual size.

Figure 126 Pipe Aston, tobacco pipes, actual size.

- 25 Type 2, layer (17), stem bore $7/64$ "
- 26 Type 1, layer (17), stem bore $6/64$ "
- 27 Type 1, layer (17), stem bore $6/64$ "
- 28 Type 2, layer (17), stem bore $7/64$ "
- 29 Type 2, layer (9), mark PS, stem bore $7/64$ "
- 30 Type Hereford C, 1620-60 [Peacey 1985, M8. A9], layer (7),
mark IL, stem bore $8/64$ "
- 31 Type Hereford C, 1620-60 [Peacey 1985, M8. A9], layer (9),
stem bore $6/64$ "
- 32 Layer (17), mark IB, stem bore $6/64$ "
- a-1 Wheel stamps. Twice actual size.

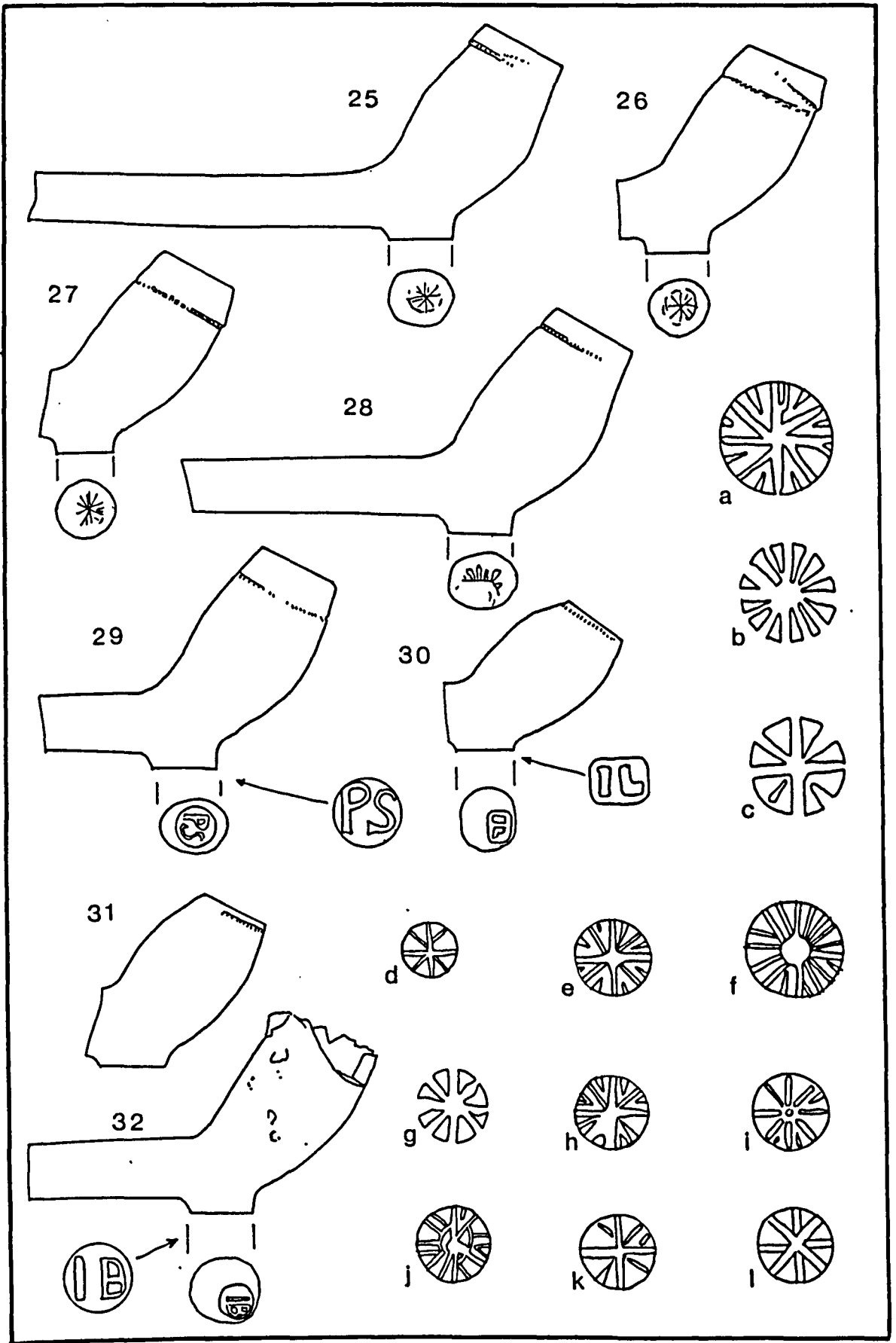


Figure 126 Pipe Aston, tobacco pipes, actual size.

Kiln fabric and fuel.

A quantity of material was recovered which clearly derives from the kiln fabric. From this it is clear that brick, stone and pipe clay were used for various parts of the structure. Both brick and stone appear to have been used in the fire box area where heavy slag and glaze deposits are formed. Some of the stone from this part of the kiln may have been undisturbed bed rock into which the kiln was cut. Pipe clay reinforced with pipe stems was used for parts of the kiln or its furnishings. The fragments of this material recovered are not of sufficient magnitude for any meaningful interpretation of their shape or function to be made. One small piece from a rim and two which are probably from a muffle wall are the most informative. Part of a pipe clay sheet, 25mm thick, punctured with holes. was also recovered [Figure 291, Page 133].

There are indications that more than one type of fuel was used on the site. A quantity of unburnt coal was recovered, 200 grams of which is associated with pipe kiln waste in the fill of the beam slot. A number of pieces of stone are coated with slag or glaze of a celadon green colour which almost certainly derives from wood or vegetative ash, which lacks the earthy impurities of coal.

Discussion

Both of the objectives of the trial excavation were achieved; the site of buildings associated with pipe production were located and a range of products and stamps were recovered. The stamps compare with examples from excavations in Hereford [Peacey 1985, M8. A14, 1-9]. Material from the structure of a kiln shows that in a material sense at least it follows practices known from other sites throughout Great Britain. It now remains to mount a large scale excavation of the site to realise a complete plan of domestic and industrial buildings with kiln and other facilities.

DUHAMEL DU MONCEAU: DESCRIPTION OF THE SMALL KILN FROM ROUEN.

Transcribed by A A Peacey.

L'Art de faire les Pipes à fumer le tabac.

H L Duhamel du Monceau. Paris 1771.

p 25.

De la Cuisson des pipes, &c la description des fours propres à cet usage.

Le petit four ou fourneau propre à cuire les pipes, forme à son extérieur fig. 18, Pl. X, une espee de tourelle élevée sur une base de 32 pouces de diametre fig. 19, cette tour a 5 a 6 pieds de hauteur, (je parle présentement du plus petit four,) Les murs qui ont environ 7 pouces d'épaisseur, forment intérieurement un octogone tracé sur un cercle d'environ 17 pouces de diametre intérieur. Le dans-oeuvre de fourneau, ou le diametre de ce qu'on nomme la chambre, est de 14 pouces & demi.

Pour prendre une juste idée de ce four, il fait faire attention que comme on exige que les pipes soient très-blanches, il ne faut pas qu'en cuisant elles soient exposées a la moindre fumée. C'est pourquoi le système général de ces fours est qu'il y ait en bas une fournaise B, fig. 20, Pl, X1. où l'on brûle le bois, &c au dessus son les pipes qui sont soigneusement renfermées ou dans des gassettes ou

boisseries exactement fermés, ou dans une capacité bien close. Dans l'un & l'autre cas, les pipes ne sont point chauffées immédiatement par le feu; mais la chaleur échauffant ou les parois de la chambre ou les boissiers, elle cuit l'ouvrage qui y est renfermé, comme dans un creuset qui n'a aucune communication avec la fumée.

Ceci bien entendu, on distingue dans le four fig. 18, P1, X, dont on voit la coupe verticale fig. 20, P1, XI, & la coupe horizontale au-dessous du fourneau fig. 21, même Planche: I'. Les pevois extérieurs A du four, B, ou la fournaise dans laquelle est le feu 3. La chambre C, ou le pot dans lequel les pipes sont renfermées. 40, Le chapiteau D, de pot. 50. Le chapiteau E du sur-tout. 60. Le chandelier ou fuseau F, que sert à soutenir les pipes dans une position verticale. 70. Le boisseau G, qui sert au même usage. La chemise ou le sur-tout A, qui forme l'extérieur du four, est bâtie sur les proportions que nous venons de donner, & conformément aux plans, profiles, avec des tuileaux & un mortier de terre à four. Le fourneau ou la fournaise B, est formé par une voûte de 17 pouces de diamètre & 2 pouces d'épaisseur, construit avec de tuileau & de la terre à four; le dessus de cette voûte est élevé de 14 à 15 pouces au-dessus du sol. Elle est fermée en plate-bande, bombée environ de deux pouces, & portée par huit petits piliers, qui ont trois pouces de saillie, deux pouces d'épaisseur, & qui sont construits, comme le reste, avec du mortier de terre, & des tuileaux. Tout cela s'aperçoit en B, fig. 20. & on met le bois par une porte H, fig. 18, P1. X.

Pour que la chaleur du fourneau puisse se communiquer tout au pourtour de la chambre C, ou de pot, on fait à la voûte du fourneau, & entre les piliers qui la soutiennent, des ouvertures I, fig. 21, P1. XI, de

18 lignes de largeur, sur 5 à 6 pouces de longueur, qui servent à laisser échapper la fumée, & à porter la chaleur entre le pot, & le sur-tout; car les pipes doivent cuire comme dans une espee de tourtier. Les piliers qui soutiennent la voûte, sont continués jusqu'à la base du chapiteau, mais échancrés pour recevoir les tuileaux qui ajoinloyés & crépis avec de la terre, pour que la fumée qui passe entre tous les piliers, ne pénétre pas dans la partie du pot où sont les pipes. Il faut donc imaginer que le pot C, est entouré par sept tuyaux de cheminée I, qui le chaussent tout au pourtour.

La chambre ou le pot C est, comme on le voit à la fig. 20, placée au-dessus du fourneau B, & cest l'endroit où l'on arrange les pipes pour les faire cuire, ce qu'on nomme emporter. On y arrange les pipes circulairement autour d'un petit pilier de terre qu'on nomme chandelier F, fig. 20. On le place au milieu de la chambre, & il est soutenu par une broche de fer le traverse dans sa hauteur ou suivant son axe; au moyen de cette broche, on pouroit mettre plusieurs chandeliers les uns au-dessus des autres pour soutenir une colonne de pipes plus élevée, comme on le pratique dans les grands fours.

As chandeliers ont un pouce de diametre, sur 8 à 9 pouces de hauteur, & leur tête est cannelée pour recevoir le tuyau des pipes.

Quand on place plusieurs rangs de pipes autour du chandelier, on met un boisseau pour soutenir le poids des pipes, qui étant posées les uns sur les autres, tendroient à couler en s'ecartent du chandelier, & on met encore des pipes en dehors du boisseau pour remplir entièrement la chambre. Ce que nous appellons ici boisseau, est un pot de terre qui n'a point de fond. Il a dix à douze pouces de diametre, sur huit à neuf pouces de hauteur, l'épaisseur de la terre est de six à sept

lignes. On verra dans la suite que dans les grands fours on en met plusieurs les uns sur les autres. On arrange les pipes dans le pot circulairement autour du fuseau, comme on l'a déjà dit, la tête en en-bas, ainsi qu'on le voit dans la fig. 20; mais quand il y en a cinq à six rangs de placés les uns sur les autres, on met par-dessus trois ou quatre autres rangs de pipes la tête en haut, & on observe cette alternative de position pour qu'il en tienne davantage dans le pot. La chambre ou le pot étant ainsi rempli de pipes, on forme son chapiteau sur douze à quinze pouces de hauteur, avec des feuilles de gros papier qui sont recouvertes d'une couche de terre de quatre à six lignes d'épaisseur, ce qu'on appelle dorure.

Ces dorures se font avec de la terre à pipe en poudre, qu'on imbibe d'une suffisante quantité d'eau, pour que l'ouvrier puisse l'appliquer & l'étendre avec la main sur les feuilles de papier qu'il pose sur un rang de pipes déjà cuites, mais de rebut, qui portent d'un bout sur la colonne de pipes à cuire, & de l'autre sur les pans de l'otogone qui forme la chambre. Ainsi ces pipes cuites sont comme une espèce de charpente qui soutient les papiers dorés.

On forme ensuite le chapiteau du sur-tout, à dix-huit lignes de distance de celui du pot, on le fait avec des tuiles gironnées qu'on joint de la terre, & on termine cette espèce de dôme par un pot K, fig. 18, Pl. X, & 20, Pl. XI, qui est percé au milieu pour laisser échapper la fumée.

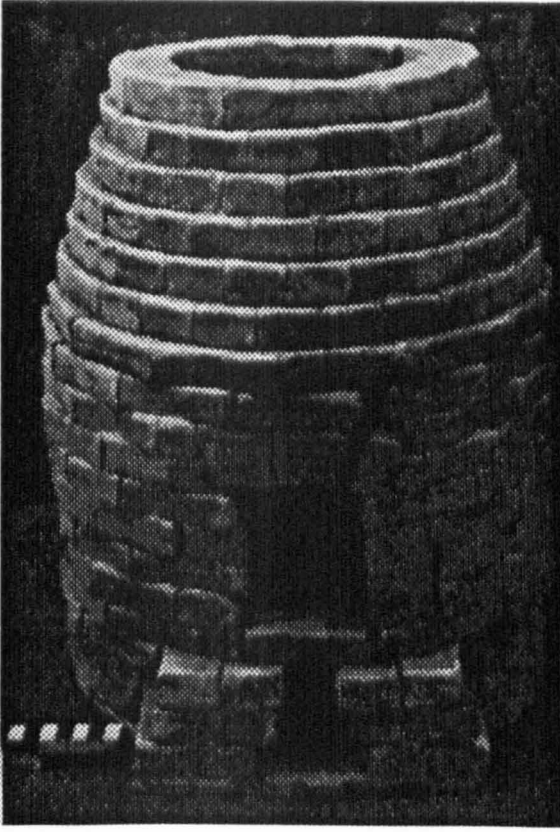
Le four est chassé avec du bois blanc, qui fait une chaleur très-vive & peu de fumée lorsqu'il est bien sec. Dans as petit fours, six où sept heures suffisent pour cuire les pipes. Il en faut quatorzeau quinze pour les cuire dans les grands fours. Quand les pipes sont quites, & qu'on veut vuider le four, ou, comme l'on dépoter, on démolit les deux chapiteaux qu'il faut refaire toutes les fois qu'on cuit de nouvelles pipes, alors le four paroît comme une tour ronde de quatre pieds de hauteur, & qui n'a point de couverture; à la place des chapiteaux, on met sur le four one planche ou une large tuile pour entretenir la chaleur, & que les pipes se refroidissent peu-à-peu. On vera dans un instant qu'on ne démolit point le chapiteau des grands fours. Les petits fours dont nous venons de parler, peuvent contenir dix-neuf à vignt grosse de pipes. Ce sont ceux dont on se sert à Rouen & dont M. Dubois a bien voulu me donner les plans.

APPENDIX 9

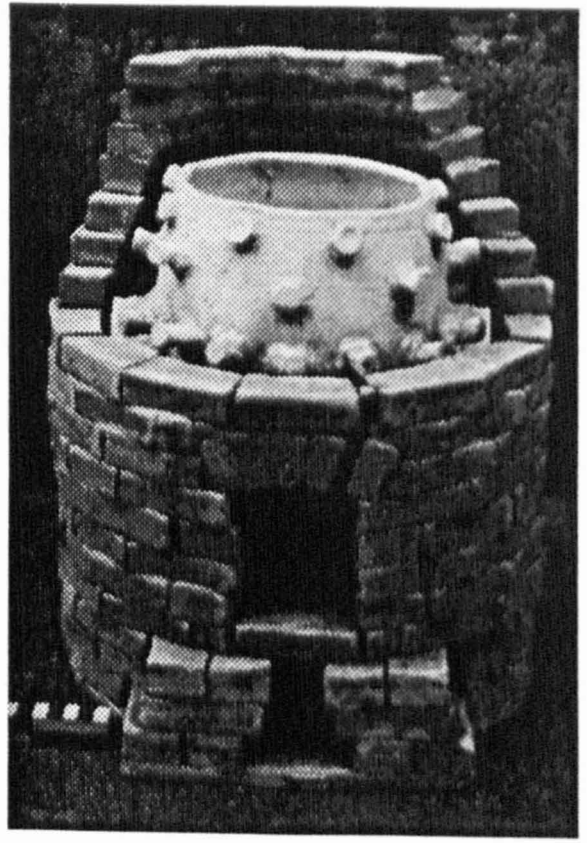
MODEL MAKING TO SOLVE PROBLEMS.

During the course of this study, on a number of occasions, models have been constructed to solve problems. In some instances this has been done to enable better understanding of spatial questions, whilst in others performance of forms and materials have been focus of attention. All models were constructed by the author.

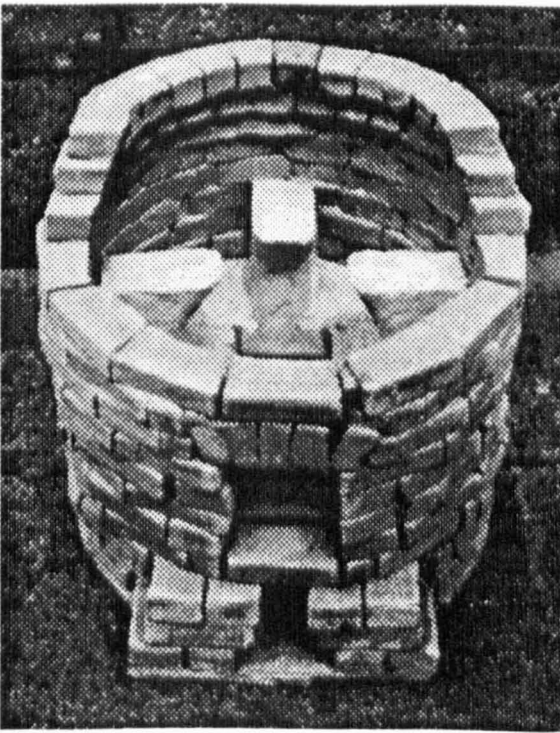
The model illustrated in Figure 127 is based upon evidence from Arcadia Buildings, Southwark. Two objectives prompted its construction. The first of these being to create a tangible realisation of the whole structure for lecture and demonstration purposes. The second to project a complete muffle form from the total number of prop buttresses recovered and the spacing of these as recorded from the reconstructed base. Whilst not conclusive this reconstruction adds support to the suggestion that muffles of this period were of over square proportions. The model is constructed from clay fired to 1000^o centigrade. A red earthenware clay is used for the outer brick shell, the flue ash pit and fire bars. A white earthenware clay is used for the muffle, muffle supports and fire box floor. These clays mimic the materials used in the actual kiln with the sole exception of the muffle support pillars which were sandstone. The scale chosen for the model is 1:3.



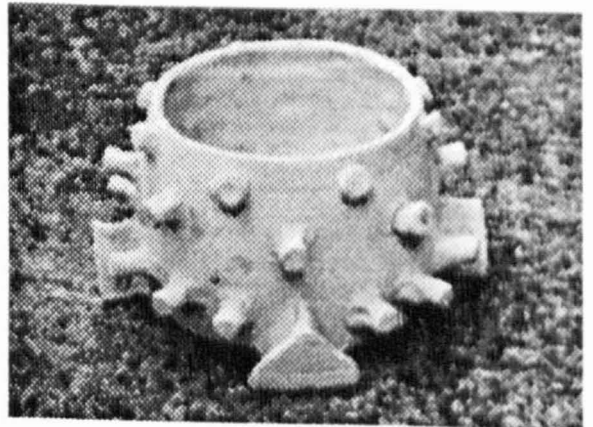
a



b



c



d

Figure 127 Model based on the evidence from Arcadia Buildings,
Southwark

The model is made in several pieces so that it can be dismantled to show the internal structure. Figure 127a shows the exterior with the fire mouth directly above the flue ash pit. In Figure 127b the upper front section is removed to show the muffle within the shell. Figure 127c shows the model with the muffle removed to reveal details of the supporting pillars. Figure 127d shows the muffle in isolation. The muffle buttresses and ridge deflectors can be clearly seen.

The model in Figure 128b and c is based on the muffle evidence from Gloucester. The objectives in this case were similar to the previous example. The model has obvious lecture usefulness illustrating in three dimensions the probable form of the complete muffle. The visual impact of the base voids can be more easily assimilated than by reference to the fragmentary evidence. Similarly the sparse prop evidence presented in this manner becomes more intelligible. The material used is again a white earthenware clay. The scale of the model is 1:3.

Figure 128a is a working model of the Bristol tipping muffles. The supporting structure has been constructed in such a way that it can be used in a modern electric kiln. Its *raison d'être* is to reproduce by repeated use the pattern of glaze spillage recorded by the archaeological evidence. Initial tests have proved its viability. The material used for the construction of the muffle is a white earthenware clay heavily groged with crushed saggar body. This mixture was found to be extremely short, requiring the addition of a greater quantity of water before it could be worked. In fabricating objects from such a heavily groged fabric compression by rolling and beating was found to give the best results. The supporting structure

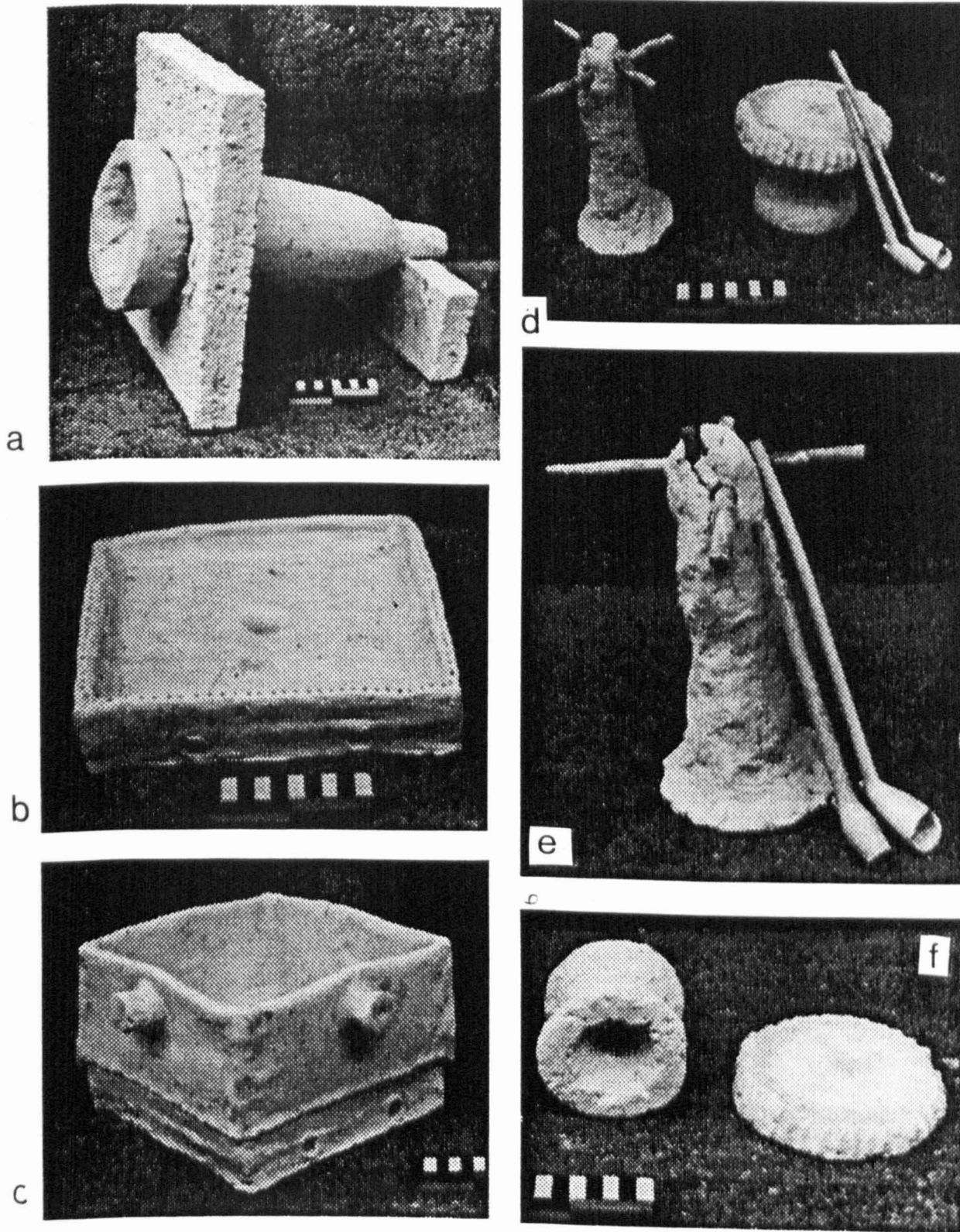


Figure 128: a Life size model of the Bristol tipping muffle; b muffle base model using the Gloucester, Quay Street evidence; c model showing how the Gloucester muffle might have looked with walls and sparsely spaced buttressing; d & e reconstruction of the Chelmsford, Moulsham Street prop; d & f prop and bun based on Stamford examples.

is made from the same clay opened out by the addition of sawdust. The addition of organic matter is best done with the clay in the form of a thick slip. The organic material takes up water from the slip forming a thick workable paste which, after a short period of air drying, can be formed into the shapes required.

Figure 128d-f illustrate models of props and a bun. The example with cruciform stems is a life size replica of the Moulsham Street, Chelmsford, example. All are made from white earthenware clay with the addition of grog made from crushed clay pipes. It was found that grog made in this way bears little resemblance to any of the archaeological material. Pipe stems, when crushed, tend to form elongated sharp spiky fragments which have not been observed in the study material. Although pipe clay grog has been recorded its blocklike form is more likely to derive from crushed pipe bowls or thin sheet material. The fabric, with its extremely high grog content, mimicking archaeological material, could only be worked whilst in a flaccid state. In this condition the Chelmsford replica remained unviable until the insertion of the vertical stem armature. This demonstration partially explains the use of stems within the structure of pipe kiln muffles. Muffle fabrics generally display evidence of varying quantities of mineral and organic additions. As has been demonstrated fabrics of this type require a greater moisture content to remain workable. With this added water the fabric is more prone to slump under its own weight requiring lay off periods for the work to stiffen before further progress can be made. The insertion of

a skeletal structure or armature within the fabric combats its propensity to slump allowing the work to progress further and faster. Pipemakers found eminently suitable material, for such skeletal structure, close to hand in the form of stems from their own pipes.

It is clear from the catalogue that clays with a variety of inclusions were used for distinct purposes by pipemakers of all periods. There are a few contemporary records of the types of mixtures used. These are generally vague, listing materials without indicating their relative ratios [see above pages 344-6]. In the case of one eighteenth century French account the exact purpose of the mix is given [Duhamel du Monceau 1771], leading to speculation of a similar function for certain archaeological material from the British Isles. Models have been constructed to replicate the documented mixtures to ascertain the performance and appearance of these after firing. Two objectives prompted this work. The first being to establish the appearance and performance of the documented mixtures; the second to replicate the stem slag laminates common in the archaeological record, both leading to a better understanding of the technology employed. The second objective dictated the form of the models.

Each test is formed over a green clay tile 4 inches square. The test number followed by materials and their ratios is engraved on the obverse. The test is then constructed upon the upper surface of the tile. A square of damp newspaper is first laid over the tile to create an adhesion free interface. Upon this a bed of prefired pipe

stems laid parallel are pressed lightly into the surface. On this bed the materials to be tested, mixed to a thick paste, are spread to a thickness of approximately $\frac{1}{2}$ an inch.

Mixtures from contemporary sources .

Paper covered with clay [Duhamel du Monceau 1771].

Paper, clay and horse-manure [Daniell 1964, 61].

Paper, clay, sand and horse-manure [Rees 1819, 32].

Sciabione, ashes, asses dung and iron scales [Piccolpasso 1570].

One part sand, one clay and two horse-manure [Walker 1977, 977 quoting Smith 1750, 7]

For the purposes of these tests the materials were mixed by volume, in their common state, samples of each being dried and weighed for accurate comparison. The horse manure was used fresh; the sand and ash damp; the clay in the form of a very thick slip for ease of mixture. When dried these equal parts by volume weighed:-

Horse manure.....	25gms.
Ash.....	75gms.
Sand.....	130gms.
Ball clay.....	160gms.
Red clay.....	110gms.
Iron oxide.....	75gms.

Although Tests 0-2 show signs of vitrification they retain their sharp combed surfaces. There appears no difference between the tests using fresh horse manure and those with weathered horse manure. The organic material in the manure fires away to leave voids in the fabric with no other apparent effect.

The sand in Test 3 remains unchanged, being apparent as mineral inclusions in the fabric.

Although Test 5 achieved a dark colour similar to the archaeological slags it did not show any significant melt.

All subsequent tests have been oxidised to a temperature of 1250°C.

Tests 6 and 7 achieved a rufous brown colour and a very slight surface melt. The fabric when broken reveals a wafer-like voided interior.

Test 8 melted to a thick shiny glass ranging in colour from blue black to grey green with colour separation reflecting melted blisters.

Test 9 achieved a thick vitreous slaggy melt of a grey green colour.

All subsequent tests utilised coal ash in place of wood.

Tests 10-12, all combinations of coal ash and manure, produced a green to brown glaze, there being little difference between them.

Test 13 retained the condition of a clay fabric with vitrified slaggy inclusions.

Tests 14 and 15 formed a chocolate brown coloured frothy slag.

Discussion.

These tests were carried out in an attempt to gain some knowledge of the formation of slags deliberately created as part of the pipe kiln firing process. Working within the confines of documented materials, the tests progressed towards replication of the archaeological slags. Clearly there is a need for a more exhaustive and systematic series of tests including chemical analysis of both archaeological and test material. Accepting the limitations of the work to date, the results are thought worthy of inclusion.

The results of these tests suggest that much of the organic matter found in the clay fabrics associated with pipe kilns could have been added in the form of horse manure. Three immediate advantages appear from utilisation of this source of organic matter. As the organic material is reduced to a convenient size by the action of the horses teeth, no labour is wasted on this process; manure was a plentiful free resource; manure utilised in the process would not have to be removed from the site.

The results further show that within the limitations of the materials tested, slag or glass formation is dependant upon the presence of ash. The ashes derived from wood produced a material of light colour; cream to grey green. The ashes of coal produced material of a more

slaggy nature and of darker colour; chocolate brown to charcoal. The tests were carried out in an oxidising atmosphere. Colour and fusion point are both subject to atmospheric changes. Fusion temperature is likely to be lower in a mixture of oxidising and reducing gasses [Spiers 1962, 304; Fieldner & Selvig 1926, 26]. These factors may in part account for the fact that none of the tests matched the remarkably consistent archaeological slags encountered on pipe kiln sites. A slag concretion from the Bristol [Waverly Street] assemblage, refired at 1250°C in an oxidising atmosphere, gave a close colour match to tests 14 and 15.

APPENDIX 10

A MUFFLE KILN FROM BREDA, HOLLAND.

Apart from du Monceau's description of the small kiln at Rouen no other evidence for muffle pipekilns was known from the European mainland until the discovery in 1991 of the Breda kiln.

Breda city archaeologists have carried out a series of excavations on the Molenstraat since 1982. In 1981-2 J Hesemans collected wastered clay pipes from 22 Molenstraat. In 1982 members of the Breda Archaeological Society [AVB] also carried out a surface examination followed in 1988 by an excavation on the rear part of the plot. In 1991 under the direction of Guido van den Eynde further excavation of the site uncovered the remains of a tobacco pipe kiln. The property is a typical urban strip c. 4.5m wide extending back c. 15m from the street frontage. The kiln occupied a position 6 to 7 metres back from the street. It was found to be of rectangular plan, built from brick, divided into three sections. The centre section of circular construction divided by a flue ash pit which connected with a rectangular brick trough at one end and a larger open ended pit at the other. The chamber wall survived above the entry to the rectangular trough, supported on a central brick pier which divided the flue into two apertures. The trough measured c. 560mm by c. 810mm. The internal diameter of the chamber measured 700mm. The sunken features were filled with loam, burnt brick, pipe fragments [many wastered] and large muffle fragments encapsulating pipe stems.

Along the upper edges of the flue ash pit walls were half brick billets, suggesting seatings for flue bars. Brick fragments recovered from the fill, with flash glazing on some surfaces, may have fulfilled this purpose.

From the combined excavations and collections of surface material, more than 900 pipes have been recovered from 22 Molenstraat. Of these pipes 63% are marked. Various versions of the SB mark account for 44.5% of the total. An Englishman, Samuel Broen [Brown] has been suggested as the maker of these pipes. Although nowhere in the documents examined has this man been described as a pipemaker, a document in which he is described as a soldier, records him renting, in 1642, a house named "The White Lion", identified as 22 Molenstraat. This document together with the marked pipes forms the substance of the case. A further document has been linked with this man; in the burial book of the Great Church on 18 October 1659 the burial of an un-named pipemaker from the Molenstraat is recorded. None of the pipes marked SB, many of which are wasters, were found in the fill of the demolished kiln. From the flue ash pit and the rectangular brick trough pipes marked CD and DP were recovered. These have been attributed to Christiaen Damman 1638-58 and Daniel Peyl 1639-1676. It has been suggested that Samuel Broen worked the kiln up to 1659 [possibly in partnership as his name is not recorded in the citizens book] and that it was then taken over by Damman and Peyl. It would appear then that the kiln ceased to be use by 1676 at the latest.

One other English connection has been made. Mary Damman, believed to have been a sister of Christiaan, married Louis Fieliep [Philips] in 1651. Louis was also a soldier turned pipemaker. In 1661 he obtained his citizenship after which he would have been free to set up in his trade. Louis died in 1698.

The kiln displays many similarities with British kilns; it is of circular form divided by a central flue; it had a large stoke pit on the same level; on the shoulders, level with the top of the firebars, settings for four muffle supports were evident; muffle fragments were formed with a skeletal structure of pre-fired pipe stems. In one very definite feature it differs markedly from any of the known British kilns. The rectangular brick built trough at the farther end of the flue has not previously been encountered. Its dimensions seem too small for a workspace. It is offset to the right which would only suit a left handed man. As access for clearing the flue, its size, its orientation and the central brick pier would all hinder this function. The central brick pier implies a need for support which would not be required if surmounted by a second fire mouth. Any support would have to derive from an arch or lintel above the fire mouth. The most likely explanation of this feature is as a secondary air supply which could aid combustion at the rear of the firebox with possible improvement to the distribution of heat around the muffle. Opinions differ over the exact function of the flue. It is thought by Hesemans, who worked on the excavation, that the fire occupied this slot [Hesemans 1994, 2-14]. Fire damage and flash glazing of some bricks led him to this opinion. Carmiggelt and Eynde on the other hand offer a reconstruction with the muffle raised up above the fire bars on brick supports [Carmiggelt & Eynde 1993, 29]. Whilst the

muffle could have been sited directly upon the bars this would obviate the need for additional brick supports. The presence of both bars and supports suggests a configuration similar to known British examples with the muffle set above the fire box which in turn occupied a position above the flue ash pit. The fire damage and flash glazing to the flue brickwork could relate to an initial preheating period with a fire lit in the lower flue. The dual apertures to the brick trough might also relate to such a practice acting as either air supply or exit. A possible scenario is that once the kiln had been loaded a fire was lit in the flue. A tile placed over the chimney would allow the fire to draw through the double aperture exiting into the brick trough. By this means rising heat would gradually affect the muffle above without and direct flame impingement. Removal of the tile from the chimney would alter the fire path gradually increasing the temperature gradient. Next the fire might be lit above the fire bars, in the fire box proper, possibly with a change in the type of fuel employed to take advantage from the increased air supply to the fire bed. The fire could then be increased in ferocity until the required temperature was reached.

This is the only example yet discovered on the European mainland of a muffle tobacco pipe kiln. The method of its construction closely parallels that of British kilns. Its association with pipemakers of British origin may in part explain this common technology. Although the Breda kiln is perhaps a little earlier than any of the pipe reinforced muffles discovered in Britain the technology is believed to have existed in these islands at an earlier date [1612 see above pp 294-5].

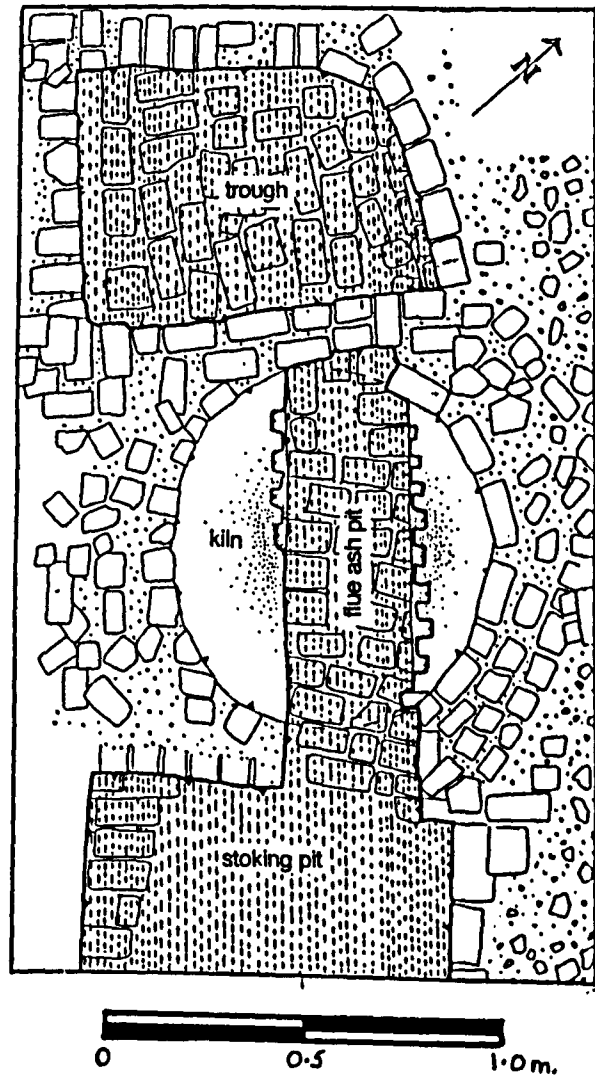


Figure 129 Ground plan of the Breda kiln after Carmiggelt et al.

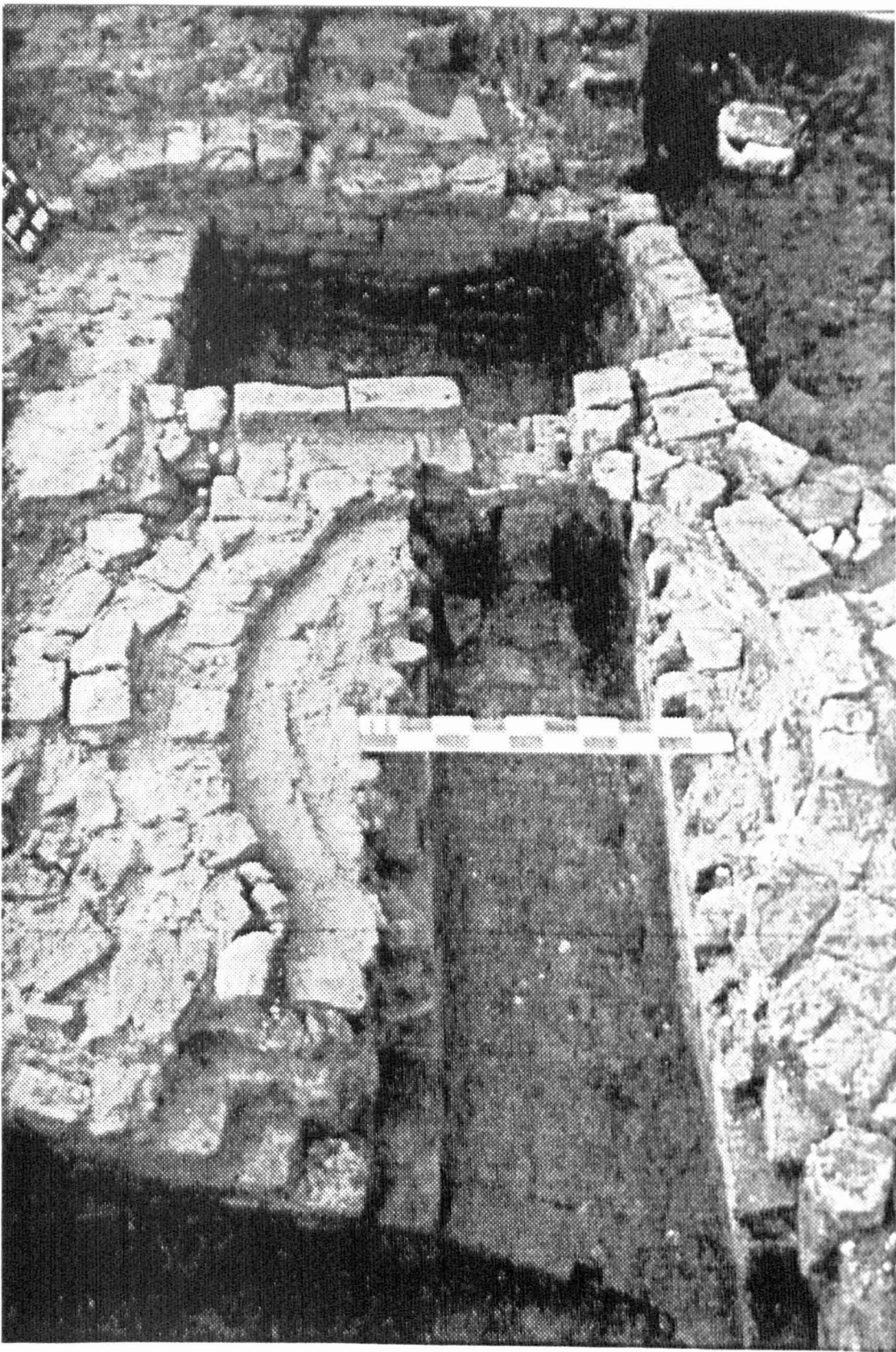


Figure 130 Photograph of the Breda kiln taken from above the stoking pit with the brick trough at the farther end of the flue ash pit.

GLOSSARY

Ash Pit: A pit or channel beneath the fire box and separated from it by fire bars, into which ash from the fire could fall and from which air could pass upwards to the fire.

Chequer: An openwork arrangement of bricks forming the floor of the firing chamber. Constructed to give support for saggars etc. whilst at the same time allowing clear and even passage for gas flow.

Chimney: Flue constructed above or at some distance from the firing chamber to draw the hot gasses through the kiln and carry smoke and noxious fumes away from the workshop area.

Crossdraft: A term applied to kilns in which the direction of travel for hot gasses, from the fire, is horizontal, across the ware chamber to the chimney.

Damper plate: A sheet of material used over an opening in a flue or chimney to control the passage of air or flue gasses.

Dish Setter: A curved piece of pottery kiln furniture with a step in its radial section. Used to separate dishes in stacks within the kiln [Brears 1971, 131I].

Dottle: The small accumulation of clay formed on the end of the wire as it passed through the stem blank forming the bore. The dottle is often to be seen remaining attached inside the pipe bowl. Detached examples have been recovered by careful washing and sorting of detritus.

Downdraft: A term applied to kilns in which the direction of travel for hot gasses, from the fire, after circulation through the ware chamber, is downward through a flue or flues in its base, to a chimney of sufficient height to draw the whole through the kiln.

Fire Bars: Bars, usually of brick or iron, set at intervals across the floor of the fire box forming a bed for the fire. Constructed in such a manner as to allow clear passage for air to pass upwards to the fire and ash to fall down into the ash pit.

Fire Box: That part of the kiln between the ash pit and the firing chamber in which the fire was set and maintained throughout the firing process.

Firing Chamber: The chamber between the fire box and the chimney to hold the ware, contained either in a muffle or saggars, for firing. Also termed the ware chamber.

Flash Glaze: The phenomena caused by fly ash alighting upon clay surfaces within the kiln and combining with silica therein to form a glaze. This can effect structure, furniture or product and is most commonly seen in the fire box and its immediate proximity.

Fly Ash: Ash drawn from the burning fuel and carried by the gas flow through the kiln chamber or flues.

Furniture: Prefabricated re-usable objects made from clay for use within the muffle or firing chamber to support or separate the pipes or other product of the kiln.

Furniture Supplement: Any piece of material used in conjunction with true furniture to assist in its function. Commonly these are distinguished by the fact that they were introduced into the kiln as plastic clay and once fired are not suitable for re-use.

Muffle Supports: Pillars or corbelled projections usually of brick or sandstone, set in the fire box to support the muffle above.

Muffle: Large refractory pot set inside the firing chamber forming an inner chamber to contain the pipes firing free from direct contact with the flame.

Muffle Buttress: Any projection from the outer surface of the muffle wall spanning the flue space between the muffle and the inner surface of the firing chamber. Commonly these take the form of props or bars. A prop having a vertical section either sub rounded or sub rectangular with more or less equal intersecting diameters or sides. A bar being extended in the vertical dimension.

Open Flame: A term applied to a kiln with a simple ware chamber through which the fire gasses have total access. Such a kiln commonly employs saggars to contain and protect the ware.

Peripheral Shelf: A circular shelf formed either by a step in the wall thickness or as a projection inwards from the inner surface of the muffle wall.

Slag: In this thesis the term slag is used to describe any metamorphic vitrified mass derived from fuel ash under the influence of extreme heat. Support for the use of the term in this context can be found in its definition in the *Oxford English Dictionary* and in Searle's *Encyclopaedia of the Ceramic Industries*.

Spew: Trimmings, breakages, unfinished work etc consisting of raw clay which could be wetted for re-use.

Stamp: Object with raised or incuse lettering, wording or design, in reverse, used to impress or print the said device.

Stoke Pit: The area in front of the fire box usually below ground level from which the fire could be fuelled and managed.

Tipping Muffle: Small refractory vessel in which stems were heated to melt glaze applied to their tips. Distinguished by external fire damage, slagging etc. and glaze runs on inside surfaces.

Trimming Ring: Surplus clay extruded from a pipe mould through the knife slot at the top of the bowl.

Updraft: A term applied to a kiln in which the direction of travel of hot gasses from the fire is continuously upward through the ware chamber to the chimney and eventual freedom.

Ware Chamber: The chamber between the fire box and the chimney to hold the ware, contained either in a muffle or saggars, for firing. Also termed the firing chamber.

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