EXCAVATIONS AT CRISPIN STREET, SPITALFIELDS: FROM ROMAN CEMETERY TO POST-MEDIEVAL ARTILLERY GROUND. SUPPLEMENT: SPECIALIST CONTRIBUTIONS

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INTRODUCTION

The following specialist reports have been published online as a supplement to an article in *LAMAS Transactions* Volume 65 (2015). These reports use the Museum of London codes for ceramics and building materials. Complete lists of these codes, their expansions and date ranges are available at www.mola.org.uk/resource-library.

THE ROMAN POTTERY

James Gerrard and Malcolm Lyne

The excavations produced a small assemblage of Romano-British pottery (106 sherds, 1829g), which included a number of complete or partially intact vessels from graves. The bulk comprises small abraded sherds, and its presence is probably the result of activities such as field marling. The discussion is primarily concerned with the grave goods and other vessels associated with funerary ritual.

There were 11 complete or nearly complete vessels from graves and other features (listed below). Virtually all of these can be dated to within the period *c.*AD 100/150–250. This, at first sight, is quite surprising as inhumation is usually considered to have become the dominant burial rite during the course of the 3rd century AD. However, unless we are to suppose that all of these vessels were heirlooms or salvaged and reused from earlier graves (Barber & Bowsher 2000, 122–3), for which there is no evidence (none of the pots exhibited abraded surfaces similar to those identified as reused in the eastern cemetery), then it must be assumed that the cemetery is of this approximate date. No other ceramic finds contradict this dating. There was, for instance, very little late Roman material in the assemblage. Furthermore, a recent review of early Roman burial practices concluded that inhumation was an established rite in the early Roman city (Butler 2006, 38–44).

Two noteworthy vessels were found in non-burial contexts. The first of these was represented by large fragments of a spouted vessel (Fig 12.5), sometimes termed a 'wine strainer', in a local micaceous fabric (LOMI) from Pit 3 (Davies *et al* 1994, 139, fig 116, 745). It has a well-formed spout decorated with two finger impressions that appear to indicate 'eyes'. The intention may have been to make this into a zoomorphic spout influenced by metalwork prototypes. These spouted strainers are uncommon finds dated to AD 70–120 and must have been used for preparing and pouring liquids, perhaps infused with herbs or something similar. It seems reasonable to suppose that it was used in a funerary ritual of some sort, and the close proximity of Pit 3 to Grave 28 is noticeable. Its early date compared to other vessels from the site suggests that it was carefully curated in use until deposition later in the 2nd century AD. Further large fragments of a LOMI bowl base with 'basal kick', possibly derived from the same vessel, were recovered from a medieval ditch. The cutting or excavation of this later ditch may have disturbed sherds from Pit 3.

The second pot was a complete but crushed Hoo (HOO/NKWS) flagon from the cemetery soil (Fig 12.6). This may be a disturbed grave good or even some sort of votive deposit. No trace of any associated finds or features was identified so its presence defies easy explanation.

The placing of pots alongside inhumations is a well-known Roman practice and is well attested in Roman London. Unfortunately, the number of accompanied graves at Crispin Street is too few to allow statistical cross-comparison with other cemetery sites. That said there is little to mark these burials out of the ordinary (Barber & Bowsher 2000; Swift 2003). The presence of vessels associated with liquids can be seen as indicating the importance of drinking or graveside ablutions/purification rituals. Similarly, the tazza fragments are an appropriate find in a 'ritual' context and the unguent pot (Fig 12.2) can be seen as a ceramic version of the glass accessory vessels known from other sites (Barber & Bowsher 2000, 126–7). The only noticeable 'oddity' is the lid (Fig 12.3) from Grave 15. As these are usually found sealing jars in burial contexts, its presence as the only grave good is worthy of note. However, as it was found upside down and can stand inverted quite easily it seems certain that this vessel was intended to serve as a platter. It may be that mourners pressed a lid into service as a dish/platter as they did not have the means to discard a 'true' dish.

Table 3. Types of pots accompanying the burials and occurring in other associated contexts

Vessel form	Grave goods	Pit 3 and cemetery soil
Jars	3	0
Dishes	1	0
Flagons/beakers	2	1
Other	3	1

Catalogue of burial vessels

Grave 6

Grave 6 contained two vessels placed at the head and feet of the skeleton. The first was a miniature everted rim jar in a sand tempered fabric (SAND) dated to AD 120–200 (<SF16>, Fig 12.1). Miniature vessels are often considered to have fulfilled symbolic or ritual functions (Young 1977, 127) and are common on temple sites (Leech 1986, fig 22). The second 'vessel' was a large fragment of another everted rim jar in SAND fabric, <SF17>, which can be broadly dated to the 2nd to 3rd centuries AD. Other sherds include a large fragment of a black-burnished ware 1 (BB1) handled beaker (AD 140–300+) and a tiny chip of Nene Valley Colour Coat ware (NVCC). Assuming the latter is intrusive (it weighs only 2g), the pottery would date this burial to the period AD 140–200).

Grave 9

Two pottery vessels accompanied the burial in Grave 9. The first is a BB2 pie-dish, <SF23>, dated to AD 150–270, found inverted and covering the second pot. This vessel, an unguent pot of form CAM309 (Fig 12.2), was in an oxidised Colchester fabric dated to AD 100–250. Both pots suggest an interment date of between AD 150 and AD 250.

Grave 15

Grave 15 contained a single lid in London oxidised ware (LOXI) (Fig 12.3), dated AD 90–160 (Davies *et al* 1994, 34–6). The piece can be inverted and sits comfortably on its handle. As it was recovered upside down in the grave it may have served as an impromptu platter.

Grave 20

Grave 20 contained an intact ovoid flagon in SAND fabric dated to AD 150–250, with recent damage. There were also two joining fragments of a Verulamium region white ware (VRW) tazza. It is uncertain whether these sherds were a deliberate inclusion to the grave or not. However, the unusual nature of tazze and their suggested use as incense burners would make this object appropriate in funerary ritual and a tazza was recovered from a burial in the eastern cemetery (Barber & Bowsher 2000, 158). These vessels can be dated from the foundation of *Londinium* up to about AD 160–200 in this fabric, although they are more common in the 2nd century AD (Davies *et al* 1994, 50–1).

Grave 21

The burial in Grave 21 was accompanied by a decorated necked-jar (Fig 12.4) in Highgate Wood ware C fabric with added sand (HWC+), dated to AD 120–160.

THE POST-ROMAN POTTERY

Chris Jarrett

Introduction

The post-Roman pottery consists of 2415 sherds representing 1199 minimum number of vessels (MNV) and includes both medieval (174 sherds, 143 MNVs) and post-medieval pottery (2241 sherds, 1056 MNVs).

The distribution of the pottery by phase is presented in Tables 4 and 5. The assemblage of post-Roman pottery conforms to the ceramic profile for London. Surrey whitewares, particularly Coarse Border wares dominate the late medieval phase. Smaller quantities of London-type ware (LOND) are present, dated from 1080 to 1350. Current evidence from three 14th-century kilns shows that this pottery type was being made at Woolwich Arsenal (Cotter 2008) and later post-medieval period kilns hint at a continued pottery production tradition. A notable South Hertfordshire greyware (SHER) foot ring base from a large storage jar decorated with incised lines (Fig 12.11) was recovered from a mid-18th-century layer.

Table 4. The medieval and transitional pottery types and distribution by phase. SC = sherd count

		Phase									
		3: Medieval		4: 16th century		5: Late 17th century		6: Early 18th century		7: Mid-Late 18th century	
Fabric	Common name	SC	%	SC	%	SC	%	SC	%	SC	%
CBW	Coarse Border Ware	30	68.2	9	25.7	36	56.3	1	14.3	4	19.0
CHEA	Cheam whiteware	1	2.3	1	2.9		0.0		0.0	1	4.8

		Phase									
		3: Medieval		4: 16th century		5: Late 17th century		6: Early 18th century		7: Mid-Late 18th century	
Fabric	Common name	SC	%	SC	%	SC	%	SC	%	SC	%
DUTR	Dutch red earthenware	2	4.5		0.0	1	1.6		0.0	2	9.5
EMSH	Early medieval shell-tempered ware		0.0		0.0	2	3.1		0.0		0.0
KING	Kingston-type ware	2	4.5		0.0	5	7.8	1	14.3	4	19.0
LLON	Late London-type ware	3	6.8	3	8.6	4	6.3		0.0		0.0
LLSL	Late London-type slipware	1	2.3		0.0	2	3.1		0.0		0.0
LMHG	Late medieval Hertfordshire glazed ware		0.0	3	8.6	5	7.8		0.0		0.0
LOGR	London-area greyware		0.0		0.0	1	1.6		0.0		0.0
LOND	London-type ware	3	6.8	3	8.6	1	1.6		0.0	1	4.8
LSS	Late Saxon shelly ware		0.0	1	2.9		0.0		0.0		0.0
MG	Mill Green ware		0.0	3	8.6		0.0		0.0		0.0
MPUR	Midlands purple ware		0.0		0.0	4	6.3	5	71.4	7	33.3
SAIN	Saintonge ware		0.0	1	2.9		0.0		0.0		0.0
SHER	South Hertfordshire-type greyware		0.0	1	2.9		0.0		0.0	1	4.8
SIEG	Siegburg stoneware		0.0		0.0	1	1.6		0.0	1	4.8
SPAM	Merida-type micaceous ware		0.0		0.0	1	1.6		0.0		0.0
SPOW	Miscellaneous unsourced Spanish wares		0.0	1	2.9		0.0		0.0		0.0
SSW	Shelly-sandy ware	1	2.3		0.0		0.0		0.0		0.0
TUDG	'Tudor green' ware	1	2.3	9	25.7		0.0		0.0		0.0
XX	Unknown/ unsourced		0.0		0.0	1	1.6		0.0		0.0
Total		**44**	**100.0**	**35**	**100.0**	**64**	**100.0**	**7**	**100.0**	**21**	**100.0**

The 16th to 18th centuries

By the start of the 16th century the emphasis shifted from Surrey whitewares as the main pottery type marketed to London to locally produced redwares. At this time the principal pottery type became London-area early post-medieval redware (PMRE), dated 1480–1600. There is a single sherd of contemporary London-area post-medieval bichrome redware (PMBR) in the assemblage. These pottery types are known from the evidence of wasters, kilns and documentary sources to have been made at a number of very long-lived production centres, predominantly in south-east London close to the Thames at Greenwich and Woolwich (Nenk 1999). It includes the later 16th-century technological development of PMR or London-area post-medieval redware, dated to 1580–1900, with transitional production areas known at Lambeth and Moorgate (Nenk 1999; Sudds 2006) and from *c.*1660 at Deptford (Jarrett 2004).

During the late 17th and 18th centuries local redwares and delftware are the foremost pottery types. Surrey-Hampshire border whiteware is important during the 17th century, later followed by the redware from this source. Although there is documentary and some artefactual evidence of native stoneware production in the early and mid-17th century, it was not until 1672 that John Dwight could effectively produce stoneware commercially at Fulham and that the technology for making this ware spread to the rest of the country (Pryor & Blockley 1978; Hildyard 1997; Green 1999). All of these suppliers were largely outcompeted by the industrial finewares from the Midlands during the 19th century.

Table 5. The post-medieval pottery types and distribution by phase. SC = sherd count

		Phase									
		4: 16th century		5: Late 17th century		6: Early 18th century		7: Mid-late 18th century		8: 19th century	
Fabric	Common name	SC	%	SC	%	SC	%	SC	%	SC	%
AGAT	Agate ware							2	0.3		
BBASG	Black basalt stoneware with glaze									1	0.1
BLACK	Blackware									3	0.3
BORD	Surrey-Hampshire border whiteware	1	2.6	33	15.6	39	10.4	49	8.6	3	0.3
CHPO	Chinese porcelain			1	0.5	3	0.8	21	3.7	5	0.5
CREA	Creamware					1	0.3	4	0.7	103	10.3
DERBS	Derbyshire stoneware									1	0.1
DTGW	Dutch tin-glazed ware							6	1.0		
EBORD	Early Surrey-Hampshire border whiteware	1	2.6								
ENGS	English stoneware									6	0.6
ENPO	English porcelain									33	3.3
FREC	Frechen stoneware			18	8.5	2	0.5	18	3.1	3	0.3
GERW	German whiteware							1	0.2		
KOLFREC	Cologne or Frechen stoneware			1	0.5						
KOLS	Cologne stoneware							1	0.2		
LONS	London stoneware			1	0.5	16	4.3	8	1.4	18	1.8
LUST	Lustreware									3	0.3
MAJO	Majolica									1	0.1
MART3	Martincamp-type ware type III flask (red earthenware)			1	0.5						
METS	Metropolitan slipware			6	2.8			14	2.4	1	0.1
NOTS	Nottingham stoneware							3	0.5		
PARIAN	Parian ware									1	0.1
PEAR	Pearlware									108	10.8
PEAR TR	Pearlware with underglaze transfer-printed decoration							2	0.3	206	20.6
PMBL	Post-medieval Essex black-glazed redware			3	1.4	2	0.5	3	0.5		
PMBR	London-area post-medieval bichrome redware	1	2.6								
PMCR	Post-medieval crucible	1	2.6								
PMFR	Post-medieval fine redware			9	4.2			9	1.6		
PMR	London-area post-medieval redware	6	15.4	53	25.0	203	54.1	126	22.0	17	1.7
PMR SLIP	Slipped redware									4	0.4
PMRE	London-area early post-medieval redware	29	74.4					1	0.2		
PMSR	London-area post-medieval slipped redware			1	0.5			2	0.3		
POTG	Portuguese tin-glazed ware					1	0.3				
RAER	Raeren stoneware			1	0.5			1	0.2		
RBOR	Surrey-Hampshire border redware			12	5.7	6	1.6	51	8.9	2	0.2
REFW	Refined white earthenware									107	10.7
RESTG	Glazed red stoneware									1	0.1
SIEG	Siegburg stoneware							2	0.3		
STMO	Staffordshire-type mottled brown-glazed ware					2	0.5				
STRE	Staffordshire-type redware									5	0.5
STSL	Combed slipware			3	1.4	2	0.5	7	1.2		

		Phase									
		4: 16th century		5: Late 17th century		6: Early 18th century		7: Mid-late 18th century		8: 19th century	
Fabric	Common name	SC	%	SC	%	SC	%	SC	%	SC	%
SUND	Sunderland-type coarseware									10	1.0
SWSG	White salt-glazed stoneware							27	4.7	1	0.1
SWSL	Dipped white salt-glazed stoneware							2	0.3		
TGW	English tin-glazed ware			65	30.7	92	24.5	199	34.7	7	0.7
TPW	Transfer-printed refined whiteware							3	0.5	310	31.0
WEST	Westerwald stoneware			3	1.4	6	1.6	11	1.9		
YELL	Plain yellow ware									41	4.1
XX	Unknown/ unsourced			1	0.5						
Total		**39**	**100.0**	**212**	**100.0**	**375**	**100.0**	**573**	**100.0**	**1001**	**100.0**

Imported ceramics

Imported pottery forms a minimal component of the medieval assemblage and 16th-century material, but increases in importance during the late 17th century at a time when the Spitalfields area became home to an influx of Huguenot refugees from France. French imported pottery continues as a minor component and is probably residual during the late 17th century with only a Martincamp redware flask (MART3) recorded. The only other French import is a sherd of Saintonge ware (SAIN) found in 16th-century deposits. French post-medieval imported pottery is relatively rare in London (Jeffries 2001, 59–60). The large-scale excavations at Spitalfield's Market produced more French pottery than the Crispin Street site, but even so it constituted a small amount (0.3% of the total sherd count (SC)) of the material here (ibid).

During the early 18th century imported pottery drops to 3.1% and then climbs to 10.8% in the later part of that century, but the pottery types are mostly Chinese porcelains, German stonewares, including two Westerwald stoneware small cylindrical mugs (Fig 12.7) with blue and purple decoration (WEST PURP), and a small number of 17th-century continental tin-glazed wares. A relative rarity is a sherd of a 17th-century Portuguese faience (POTG) plate, and of note in a mid-18th-century layer, [58], are four Dutch tin-glazed ware (DTGW) dishes all decorated in blue and white. Two of these vessels survive as base sherds with internal decoration either as an octagonal panel or a floral motif. The third dish is a charger with a Wan li border dating to *c.*1670, whilst the final vessel is a cracknel (a fluted shape) with a dark blue pendant design which dates to the late 17th century. By the 19th century imported pottery only accounts for 0.8%, mostly comprising Chinese or occasionally continental porcelains. This is fairly representative for the period when Britain became self-sufficient in ceramics.

Vessel function

Functionally the pottery changes with drink serving forms dominant in the medieval period, changing to storage wares in the 16th century and food preparation or serving vessels in the late 17th century. The range of functions notably increases during the 17th century when pharmaceutical and tea ware vessels make their first appearance.

During the early 18th century a wide range of functional categories are evident with food serving and preparation forms, display items and drinking forms, and there is a significant number of industrial vessels accounting for 38.7% by sherd count. These are composed of PMR sugar cone moulds (111 sherds, 15 MNVs) (Fig 12.8–12.10) and syrup-collecting jars (37 sherds, 17 MNVs).

The dominance of industrial forms in the early 18th century is probably a reflection of sugar refining wares being brought on to the site as hardcore in floor make-up layers for a building. If important in the early 18th century, by the mid to late 18th century industrial forms were negligible. A wide range of household activities are evident amongst the pottery of this date, with most forms associated with food preparation, serving or both. Hygiene wares (chamber pots) are a notable component, as are tea wares, reflecting the rise in the fashion and affordability of this social nicety. By the 19th century food consumption and tea wares are dominant.

The 19th century

As would be expected for 19th-century London, the pottery shows a completely different ceramic profile from previous phases. From *c.*1800 local sources dramatically decrease as other production centres gain popularity in the market with their new durable finewares. The ceramics from this period are best demonstrated by a large assemblage from the rectangular masonry Cesspit 4, [99], comprising 957 sherds, representing some 255 vessels (72.02 EVEs (estimated vessel equivalents), 39,531g).

The majority of the pottery from Cesspit 4, [99], is of British origin, indicating that many pottery production centres across the country were making very similar wares on an industrial scale. All the marked industrial finewares from Cesspit 4, [99], have makers' marks from Staffordshire. Very occasionally there are wares with marks from other production centres, such as Leeds and Swansea. These rarities may represent the possessions of migrants to London rather than marketed wares to the capital.

Pottery with a London origin represents the third major group, after Britain and the Midlands, but it is relatively minimal and largely consists of stoneware containers, post-medieval redware and two delftware pharmaceutical vessels. The improvement in national infrastructure, during the mid-18th century, coincided with the development of superior ceramics elsewhere in the country. Together with a change in the methods of cooking, specifically the adoption of the range and metal rather than ceramic cooking vessels, this meant London's pottery industry declined and adapted to cater for a more restricted market. The most notably affected were the London delftware pot houses, which supplied finewares up until the mid-18th century until they were supplanted by Creamwares and successive developments. In the mid-19th century the last surviving tin-glaze pot houses were largely restricted to making pharmaceutical wares, and the demise of the industry came with the closure of the Glass House Street factory, Lambeth, in 1846. The range of vessels also declines in the 19th century for the post-medieval redware industry, at this time located mostly in south-east London at Greenwich, Deptford and Woolwich, with bowls, dishes and flowerpots being the main domestic output. The London stoneware industry always made containers for consumables and capitalised on this with the expansion of consumerism in the later 19th century.

The Surrey-Hampshire Border pottery industry is poorly represented in the cesspit. Although documentary evidence indicates these wares were still arriving in London at this time via canal and then horse and cart transport (Hollins 1971, 213). The impact the industry once had on the London market had waned significantly. Imported pottery in the cesspit is restricted to Chinese porcelains, which is largely what would be expected. Earlier taxation laws on imported pottery and Britain's self-sufficiency in production resulted in very few other types of pottery from outside the British Isles being found in 19th-century archaeological contexts. If they do occur, they are usually in the form of packaging containers, such as Westerwald stoneware spa water bottles. However, it has to be conceded that some of the porcelains in the cesspit may be continental in origin as these, particularly from Germany, were imported in large quantities to cater for lower socio-economic groups.

Table 6. Function of the pottery and glass from Cesspit 4, [99]

Function	Material	SC	% SC	MNVs	% MNVs
Storage	glass	13	1.2	10	3.2
	pottery	25	2.3	11	3.5
Sub-total		*38*	*3.5*	*21*	*6.6*
Cover	pottery	6	0.6	3	0.9
Alco storage	glass	41	3.8	15	4.7
Alco cons	glass	16	1.5	8	2.5
Drink storage/serving	pottery	10	0.9	7	2.2
Food prep	pottery	9	0.8	1	0.3
Food prep/serving	pottery	135	12.6	39	12.3
Food serving	glass	1	0.1	1	0.3
	pottery	54	5.0	5	1.6
Sub-total		*55*	*5.1*	*6*	*1.9*
Drink serving	pottery	29	2.7	11	3.5
Drink	pottery	8	0.7	3	0.9
Drink coffee	pottery	1	0.1	1	0.3
Drink teawares	pottery	187	17.5	68	21.5
Food cons	pottery	312	29.1	61	19.3
Hygiene	pottery	141	13.2	13	4.1
Display	glass	5	0.5	3	0.9
	pottery	7	0.7	5	1.6
Sub-total		*12*	*1.1*	*8*	*2.5*
Leisure	pottery	3	0.3	1	0.3
Pharmaceutical	glass	35	3.3	21	6.6
	pottery	2	0.2	2	0.6
Sub-total		*37*	*3.5*	*23*	*7.3*
-	glass	3	0.3	3	0.9
-	pottery	28	2.6	24	7.6
Sub-total		31	2.9	27	8.5
Total		**1071**	**100**	**316**	**100**

The main function category in the group by MNVs is tea wares, accounting for 21.5% (Table 6). By sherd count food consumption wares, at 29.1%, are the most common but these are the second most common form by MNVs (19.3%), showing that these vessels are in a more fragmentary state than the tea wares. Food preparation/serving, in the form of ceramic bowls and dishes, are the third most important functional group (12.3% by MNVs). Glass phials, bottles for medicine (including a Daffy's Elixir example) and poison represent the fourth most important group, with pharmaceutical wares at 7.2% MNVs. This demonstrates how important the 21 glass vessels are in this functional category and contrasts with the low frequency of the two delftware vessels. Storage wares with bottles for blacking and sauces are in similar proportions to glass and pottery and account for 6.6% MNVs, while alcohol storage vessels (glass wine and case bottles) represent the sixth most important category at 4.7%.

The pottery types and designs present range in date across the 19th century. The latest types are English Majolica, which was introduced around 1850, and a Tyneside area baking dish (PMR SLIP) which is more common after *c.*1870. Refined whiteware plates are found with blue-glazed, plain, moulded shell edge rims, dating between *c.*1840 and *c.*1860. The latest marked plate is by J Vernon, 1860–1880, and fits within the date range of *c.*1851–1885, dated by the 'COPELAND' mark on a porcelain plate. The ceramics indicate deposition between *c.*1860 and *c.*1880.

The ceramics betray something of the social status of the household. The quality of the transfer-printed wares is variable, usually not of the best standard, while services made by one or two manufacturers are readily evident. Some items, particularly the kitchen wares, show evidence of being seconds, so economy may have been borne in mind when purchasing decisions were made. Continental porcelains, factory-made slipwares, lustre ware and sponge-decorated wares are often seen as indicators of a low socio-economic 19th-century community, but apart from three lustre decorated vessels the other wares are generally absent.

THE CLAY TOBACCO PIPES

Chris Jarrett

The excavation produced a total of 1206 fragments of clay tobacco pipes from stratified deposits. There are unusually more bowls present (631) than stem fragments (551) with an additional 22 nibs. Of note is the presence of clay tobacco pipe production on the site represented by two fragments of muffle (the inner wall of a clay tobacco pipe kiln) which, together with two pipes with glaze drips, indicate that clay pipe manufacture was taking place on or more likely close to the site. The clay pipes have been classified according to Atkinson and Oswald's (1969) classification (AO) and 18th-century examples by Oswald's (1975) typology (prefixed OS).

17th-century pipes

A number of bowls date to the period *c.*1640–1660/70, including a spurred AO9 type, heeled AO10 examples and heart-shaped heeled AO11 and AO12 types. These are largely residual finds. Bowls dating to 1660–1680 are the most numerous. The heeled AO13 bowl is represented by nine examples, of which nearly all are residual. The spurred AO15 bowl is the most numerous type with 187 examples, 151 of which are residual in layer [58]. Typically none are marked. There are 73 examples of the heeled, tubular AO18 bowls, with both short and tall variants present. From layer [58] one has an incuse stamp on the heel with tobacco leaves over the initials 'I C', possibly for James Cornish, 1658, Finsbury Place or Joseph Crumpton, 1659, Ratcliffe and James Court, 1668.

Of interest are four bowls which are probably local and contemporary with the 1660–1680 types, but which are not included in Atkinson and Oswald's typology. They have a bulbous profile and unusually a diamond-shaped heel. This type of bowl must have been a local innovation to provide a stable base, like the oval and heart-shaped heel examples, but they were never adopted by other pipe-makers. The popularity of spurred pipes seems to have caused no concern as a fire hazard, and 17th-century paintings show pipes placed on the flat rims of earthenware and metal dishes, for example Pieter van Anraadt's (*c.*1635–1678) 'Still life with a stoneware jug'. The diamond-shaped heeled bowls were residual in layer [58].

The 1680–1710 dated pipes include a spurred AO19 bowl, which is usually more common in Southwark than north of the river. Similarly dated are heeled AO20 and straight-sided AO22 bowls. Type AO22 bowls are most numerous with 122 examples. Other clay pipe assemblages in London indicate that this was the most popular type of bowl across London at the time (Jarrett forthcoming). Fourteen of the AO22 bowls and seven AO20 bowls have makers' marks on the heel. One AO20 example has 'W W', with an additional star or wreath over the initials. This bowl may have been made by William Whitaker, St Martin's in the Field, recorded in 1682 or William Whitaker, known to have been working between 1691 and 1696. There is a high incidence of marked bowls suggesting a local maker, whose details remain as yet unknown. There are also four heeled AO21 bowls, which developed into the later OS10/AO25 bowls. One of these has a crown on each side of the heel.

The muffle and other evidence for late 17th-century clay tobacco pipe production

Two fragments of muffle were recovered from fill [322] of pit [327]. The muffle was an inner kiln wall segment made of pipe clay and used to prevent the clay tobacco pipes from discolouration resulting from the combusting fuel. The muffle is white with impressions of clay pipe stems and one fragment also contains a slightly vitrified AO15 bowl. The other clay tobacco pipes associated comprise a further six AO15 bowls and four of the AO18 type. These and some 21 stems and one nib do not represent wasters. Other pipes from the excavation that may be wasters or seconds include an unstratified AO15 bowl with a clear or self-glaze drip and an AO28? 1 I? marked bowl with yellow olive glaze splashed on the family initial.

London was a major clay tobacco pipe production centre, so it is surprising that actual evidence for clay tobacco pipe production is rare. Only a small number of kilns have been found in the capital, with 17th-century kilns found at Arcadia Buildings (site code: AB.77-9) and Tabard Square (LLS02), Southwark, and Aldgate (AL74). An 18th-century kiln was excavated at 15–23 Southwark Street (CB80). Muffle and other production waste has been recovered at 21–29 Mansell Street, E1 (MAN82), 78 Cutler Street, EC1 (CUT78), 68–72 Cornhill, EC1 (CNL81) and early 18th-century wasters at 169 Tower Bridge Road (TWG00) (Peacey 1996; Jarrett 2008). Although it was not possible to trace the pipe-maker associated with the muffle, it is important new evidence for this industry in Spitalfields between 1660 and 1680.

18th-century pipe bowls

Heeled OS10 bowls, dated 1700–1740 comprise 73 examples, a number of which have makers' marks. Eight are marked 'I D', two 'N H' and 'T.W', and single examples were found with 'R R' and 'T C'. Multiple makers for these individual sets of initials can be found in London (see Oswald 1975), but how local they are is not always certain. Up to eight bowls are marked 'W W', possibly representing the same maker as the AO20 and AO22 bowls or a descendent. A William Wilder was working nearby at Whitecross Street between 1717 and 1763 (ibid, 149). The later OS12 bowl type, distinguished by its narrow stem, dated 1730–1780, is represented by nine bowls, two marked with 'AR' and one example with 'M R', although these makers are not known in London during this time. A damaged bowl with crowns over the initials may read 'W R', possibly for William Rushton, Moorfields, 1763. An armorial on this type of bowl has the Prince of Wales feathers, but it lacks the motto 'ICH DIEN'. It is initialled 'R B' and was possibly made by Robert Baldwin, Chyminster Alley, St Martins. There is a single unmarked spurred 18th-century OS23 bowl.

19th-century pipe bowls

The spurred AO28 bowls can be mostly dated to between 1820 and 1860, from the evidence of working dates of clay tobacco pipe-makers. There are 22 examples of this bowl and a number are marked, but some are only partially legible. One bowl is marked 'F L', probably for Felix Lebrun, 1856–1857, Tooley Street, and another is marked 'I H'. This is a popular set of initials for 19th-century London pipe-makers (see Oswald 1975, 138). Fourteen of the bowls are marked 'W W' and the majority of these have oak leaf border decoration. These bowls can be related to a local master pipe-maker, William Walker, who was working in Spitalfields between 1837 and 1860 at Wheeler Street, to the north of the site. The only AO29 bowl, dated 1840–1880 with a characteristic sloping rim, is also marked 'W W' and this has an acorn and oak leaf border on the front of the bowl, but only oak leaves on the back. The only AO30 bowl, dated *c*.1830–1910, was unstratified and shaped in the form of a Turk's head. This type of bowl is usually associated with public houses, and the closest establishment using the name 'Turk's Head' was at Aldgate High Street.

THE CERAMIC BUILDING MATERIALS

John Brown

Of particular interest on site was the Tudor period brick boundary wall [247] (Fig 21). This feature survived particularly well to the south end of the site, having been incorporated into the cellars of Building 1. An English Garden Wall bond was used in this wall; its bricks were produced in a local red sandy fabric (MoL fabric 3033). Some features such as indented borders and sunken margins were visible when the bricks were recorded *in situ*. The wall survived to a level equivalent to the contemporary road, with later additions in fabrics 3032, 3034 and reused bricks in 3033.

THE MEDIEVAL AND POST-MEDIEVAL GLASS

John Shepherd

The glass assemblage from Crispin Street included some late medieval fragments as well as a large number of bottle and drinking glass fragments, dating from the 17th century to the modern period.

The standard 'English' wine bottle was commonplace here among contexts dated to the late 17th to 19th centuries, but of particular interest is the neck and body from a Belgian Spa water bottle (CP2, [323]). This bottle, in a natural pale green glass, was finished with an applied string rim roughly tooled with vertical ribs – typical of northern European bottles of the late 17th century. Just below the string rim is an applied seal with a crest bearing three lozenges at the base, a rampant animal, possibly a lion to the upper left and at least three horizontal bars to the upper right. There is a crown above the crest and some lettering around it, which reads 'POUHON IN SPA'. This indicates that this particular water bottle is from the Belgium town of Spa, which was known for hundreds of years for its drinking and bathing waters. Pouhon was the first source discovered in this town and the water was known as 'Eau Rouge' because of the iron content which gives the water its colour. Other examples of 'Pouhon in Spa' bottles have been excavated by Pre-Construct Archaeology at Fulham Island (VAC01) and Kew Palace (KEW4).

There are two small groups of drinking vessels, which deserve comment. A medieval pit (P5) contained, in its primary fill [607], pottery dated to the 14th and 15th centuries. The bases of two glass beakers were found here, both mould-blown with relief decoration consisting of ribs and bosses. These beakers are well known among continental assemblages and it is likely that they too are northern European imports.

The assemblage also included two stems from drinking vessels with inverted baluster stems, both from 18th-century contexts. One, from Cesspit 2, [346], has a base decorated with radiating ribs and the other, from Cesspit 3, [359], is quite crude in its finish. Both of these vessels appear to be lead glasses and are probably among the earliest examples to be made during the late 17th century.

THE POST-ROMAN METAL AND SMALL FINDS

Märit Gaimster

Altogether, around 100 post-Roman metal and small finds were retrieved from Crispin Street. Only the identifiable and relevant finds are discussed here.

Medieval

A handful of medieval metal finds were retrieved across the site, which are likely to represent casual losses. They include three French copper-alloy jettons, two of which were recovered from the Roman cemetery soil and the third was an intrusive find in a 17th-century deposit.

One of these jettons, <SF20>, was associated with a small piece of embossed copper-alloy sheet, <SF24>. This jetton is a Tournai issue signed '+IOA DE CUEMTS TODV ODV D' (Jean de Cuemts, M.620). Example <SF2> is another Tournai issue with a crown and the legend 'AVE MARIA GRACIA PLENA' with a triple-strand cross fleury in quadrilobe on the reverse. The remaining jetton is a Languedoc bear-type marked 'CEST LA MALLE BEST' (M.493). The jettons date to the late 14th and 15th century and may be compared with the six examples recovered from the inner precinct of St Mary Spital (Egan 1997, 207). To the south of the site, the fill of a recut of the medieval boundary ditch yielded a complete D-shaped iron harness buckle, <SF48>.

16th century

Final fills of the recut boundary ditch produced three metal finds, including a copper-alloy sewing needle, <SF8>, and an incomplete iron horseshoe, <SF10> (Type 4) as well as a copper-alloy Nuremberg jetton, <SF5>, probably dating to the mid to late 16th century. Two further finds from this period were recorded residually in and around Building 2. These comprise an incomplete silver penny of Elizabeth I, <SF38>, which was retrieved from a late 17th-century pit, and a late 16th-century lead token, <SF3>, recovered from a mid to late 18th-century dump layer. The lead token has a crowned rose on the obverse and a double-headed displayed eagle on the reverse.

Late 17th century

From the remains of Building 1, 12 pieces of horn plate, <SF124>, were retrieved from a floor joist slot. The presence of several straight-cut sides suggests horn pane which, during the medieval and early modern periods, would have been used both for lanterns and windows (Egan 1998, 151, fig 119; cf Schaverien 2006, 228–38). The panes may be associated with the horn-working industry reflected in the contemporary horn core waste on site. A smithing hearth bottom also indicates iron working in the vicinity (Keys 2005, 132).

The majority of small finds from this phase were retrieved from the north-east side of the site, including a cylindrical glass bead, <SF7> (Fig 24), a Charles I copper-alloy rose farthing of the late 1630s, <SF37>, and a distorted iron harness buckle, <SF112>. A further Charles I rose farthing, <SF4>, was found redeposited near Building 2, while a probable 17th-century private halfpenny token, <SF1>, came from just to the south – unfortunately it is too corroded for further identification.

A significant find was retrieved from Cesspit 1. It consists of one of a two-part lead cloth seal, <SF14>, of the Dutch community at Colchester. The seal is stamped with three crowns inside an ornate shield, flanked by (15)71. The original legend is all but gone, but parallels to the seal show this would have read 'DVUTS COLCHESTER' followed by a reference to the type and quality of fabric: this particular design refers to the kind of cloth known as bay (cf Egan 1985, fig 11). The year '1571' most likely refers to the year of the establishment of this textile-producing community in Colchester; the date appears on all known finds of these seals, mostly from 17th- or early 18th-century contexts (Egan 1984; 1988). This find may indicate the presence of a tailor in Gun Street at this time.

It is interesting how the image of the Dutch Colchester seals was designed to refer not only to the place of manufacture, but also to the respective 'brand name' of cloth on offer (Egan 1984, 124). The design is adapted from the arms of Colchester: a cross raguly with three ducal coronets. Cloth seals are known which are closer to the original motif; these are marked 'DVYTS COLCESTER 100 CROS', referring to *cross bay*, the highest quality of Colchester fabric. On seals referring to the more common *crown bay*, the cross is omitted from the design, and this is the case for the Crispin Street seal. The quality of the stamp suggests that this is an authentic cloth seal; however, by the mid-17th century the high standard and good

reputation of the Dutch cloth manufacturers in Colchester had also led to numerous forgeries of their seals (Egan 1978, 178; 1984).

18th century

Building 2 produced an assemblage of household finds of late 17th- and early 18th-century date. Finds from the floor make-up include an S-shaped iron hook, <SF80>, presumably used in the kitchen to hang pots, cauldrons or meat, and a wall hook, <SF42>, adapted from an antler tine (Fig 27). A cesspit, just to the north of the building, yielded a complete pewter spoon, <SF43>. The simple slip-top handle and oval bowl have parallels in spoons from the late 16th to 17th centuries (Egan 2005, 110–17). The Crispin Street spoon has a maker's stamp on the upper part of the bowl, in the shape of a ?shield or a hide. A further D-shaped stamp, featuring the initials 'I I', is placed at the lower back of the stem; this could be an owner's mark. A smoothly finished and slightly facetted bone ring, <SF110>, from the same context, fashioned from the long bone shaft of a sheep-sized animal may be a curtain ring.

In the vicinity of Building 2, a late 18th-century dump layer produced further household objects, including a Dutch Type II or English copper-alloy thimble <SF35> and an ivory cutlery handle with bulbous end, <SF55>. Both these objects are of a type characteristic of the late 17th and early 18th centuries (Thompson *et al* 1984, 100–3; Holmes 1988, fig 7b). Another delicately carved ivory handle, <SF61>, has a drilled cavity apparently for the insertion of a weight; such balance handles, aimed to counterbalance the blade and prevent it from touching the table, are known from the late 18th and 19th centuries (Dunning 2000, 37). This handle, too, has a bulbous end, but is finished with a carved finial. A substantial copper-alloy lace chape, <SF82>, measuring 57mm in length, was also retrieved. It has an overlapping seam and is neatly finished with a folded tab at the end. A small dressmaker's pin, <SF83>, is of a type that became common after *c*.1700 (Caple 1991, 246).

A 1772 halfpenny of George III, <SF100>, came from the fill of a soakaway in Building 1, although this may have been deposited during the early 19th century.

19th century

The only significant 19th-century metal and small finds came from the northern part of the site. In Building 3, pit [213] yielded a complete iron meat cleaver, <SF69>, along with parts of a fabric-lined leather shoe with a square toe, <SF57>. To the north of this property numerous finds were recovered from the fill of Cesspit 4, [99]. A date around 1870 is suggested by the pottery, which is supported by the presence of an 1856 farthing of Victoria, <SF12>. An earlier date may be ascribed to a heavily worn gold and enamel finger ring, <SF6>, characteristic of the late 18th and early 19th centuries (cf Dalton 1912, 406, no. 1424; Chadour 1994, 408, no. 1305). The ring is hoop-finished with an embossed gold and enamel bezel depicting a flag motif. Other finds include a hexagonal ivory scale-tang cutlery handle, <SF62>, and an incomplete ivory toothbrush, <SF126>. A pair of probable copper-alloy gas fittings, <SF85>, are interesting as indicative of gas lighting. In spite of being introduced already in the late 18th century, this type of fitting was not common in houses before the 1860s.

Of particular interest is the large number of composite sheet-metal buttons deposited in Cesspit 4. At least 38 buttons were retrieved, ranging in size from 20mm to 38mm. Many of the buttons still carry traces of textile covering, <SF67>; two consist of wooden discs with metal backing, <SF95>. One button has a domed upper of copper alloy embossed with a simple basket weave pattern, <SF96>. All buttons seemingly lack loops for fastening, which may suggest they were unfinished; however, this may also be because the backs of composite buttons, along with the loop, were usually of iron and more susceptible to decay. In either case, the assemblage of buttons is likely to relate to a trade, either of a tailor or a button-maker, in 19th-century Gun Street.

Even further to the north-east, another ivory cutlery handle, <SF502>, was retrieved. The handle is straight and tapering with a rounded end and the rat-tail tang still in place. A French bronze centime, <SF13>, dating from 1848 to 1851, was also recovered, residual in the fill of a modern pipe trench.

THE LEATHER

Quita Mould

Part of the upper from a side-lacing shoe of adult size was found in the fill of a recut of the medieval outer precinct ditch ([389] <SF59>). It had been cut from the shoe sole below the lace holes suggesting it to be cobbling waste. The remaining one-piece quarters with lace hole lining, both of cow hide, come from a shoe that laced up the side through four pairs of lace holes, a style popular from the 13th through to the later 15th century.

Catalogue

<SF59>. One-piece quarters for a side-lacing shoe. Much of the lasting margin, stitch length 5mm, worn away, deliberately cut off below the left front seam. Straight top edge with edge/flesh whip stitching. Short, butted edge/flesh left front seam with four lace holes above. Right side seam torn off. Stitching to attach a triangular heel stiffener present at centre back on flesh side. Part of lining for lace holes present, lasting margin also cut off, whip stitching around edge to attach to flesh side of quarters. Surviving height centre back 43+mm. Adult size.
Leather quarters cow hide, lining calf/cow hide.

THE ANIMAL BONES

Lisa Yeomans

Medieval

The fill of Ditch 2 contained a number of elements of an articulated horse skeleton. Preservation of the bones from this phase was average and the majority of the faunal waste could be classified as typical domestic waste (Table 7). One piece of worked bone was also recovered from the ditch. Manufactured from the distal shaft portion of a cattle metatarsal, the bone had been sawn to produce six flat sides of uneven width almost parallel to the bone's long axis. Two thin grooves were partially cut at an angle into the flattened surfaces; although broken the form is typical for a pin-maker's bone.

Table 7. Summary of the faunal remains from Crispin Street based on bone fragment counts. Med = medieval

Species/animal size class	Roman	Med	16th C	Late 17th C	Early 18th C	Mid/Late 18th C	19th C	Modern
Cattle (*Bos taurus*)	9	8	12	223	75	83		1
Horse (*Equus caballus*)	2	6	18	2		2		
Pig (*Sus scrofa*)	1	3	2	17	8	27	2	
Red Deer (*Cervus elaphus*)				2		1		
Large cervid			1		2			
Sheep/Goat (*Ovis aries*/*Capra hircus*)		6	5	28	18	43	1	
Sheep (*Ovis aries*)	1	2	6	39	29	40		3
Goat (*Capra hircus*)						1		
Dog (*Canis familiaris*)		2	3	89	2	53		
Cat (*Felis catus*)				57	13	12		
Rabbit (*Oryctolagus cuniculus*)				2		2		

Species/animal size class	Roman	Med	16th C	Late 17th C	Early 18th C	Mid/Late 18th C	19th C	Modern
Human	1	1		1		2		
Indeterminate (horse/cattle size)	21	11	41	64	19	110	4	3
Indeterminate (pig size)	6	3	3	43	11	15		5
Indeterminate (sheep/goat/dog size)	34	16	28	117	27	89	3	2
Indeterminate (cat/hare size)				3				
Indeterminate					1			1
Domestic Fowl (*Gallus gallus*)		1	1	1		1		
Goose (*Anser anser*)			1	2	1	2		
Duck (*Anas platyrhynchos*)						1		
Indeterminate bird				2	2	1		
Total identified to species	**14**	**29**	**49**	**463**	**148**	**270**	**3**	**4**
Total	**75**	**59**	**121**	**692**	**208**	**485**	**10**	**15**
Percentage identified to species	**18.7**	**49.2**	**40.5**	**66.9**	**71.2**	**55.7**	**30.0**	**26.7**

16th century

A slightly larger sample of bones was recovered from the 16th-century deposits. The material was derived from just three contexts (Table 7). More articulated horse bones were found in the fill of Ditch 4 [376]. The rest of the bones identified to species level comprised of the occasional piece of domestic debris along with a few dog bones in the fills of Ditch 2, [96], Ditch 4, [376], and Pit 6, [299].

17th century

The majority of the faunal remains from this phase originated from a number of pits (Table 7). Although a few fragments of bone represent domestic refuse, the bulk of the identified assemblage was made up from cattle horn cores (39.7%), which appear to be debris from horn working. Aside from the horn-working waste and some domestic waste, these pits were also used for the disposal of dog and cat skeletons that, whilst not found in articulation, clearly originated from a limited number of individuals. Minimum number of individuals (MNI) estimate for dogs are two from Pit 13, [293], two from Pit 11, [297], and one from Pit 12, [301]. At least two cats were represented in the material from Pit 11, [297], and another one from Pit 12, [301]. The skeletal elements present suggest these animals were deposited in the pits complete. None of the bones displayed cut marks to provide any evidence for skinning, and it seems that the rubbish pits in the yards of the buildings were used as a convenient place to dispose of the carcasses of pet dogs and cats. A partially articulated pig skeleton, [369], mainly consisting of ribs, vertebra and other elements of the torso was recovered from the garden soil.

Evidence of horn working in the 17th century at Artillery Lane

Although faunal assemblages dominated by cattle horn cores are typical of butchery, tanning and horn working, additional evidence suggests that horn working was probably taking place on site. Firstly, the quantity of horn cores and frontal bones relative to all other skeletal elements, including metapodials, shows a highly skewed body-part representation. The lack of metapodials, which are often still attached to the hides as they are transported to the tanneries, implies that waste is unlikely to be the remains from trimmed skins. Secondly, a

number of the horn cores had been sawn through at the base detaching the core from the frontal bone of the skull.

The most convincing evidence for the origin of the industrial waste at the Crispin Street site is the fact that historical data backs up the zooarchaeological interpretation. The tanneries of post-medieval London were mainly situated south of the river in Bermondsey and, although butchers were present in the area, horn-workers were found to the north of Aldgate High Street, formerly Whitechapel Street, and concentrated around Middlesex Street, previously Petticoat Lane (Fisher 1936).

The cattle horn cores recovered from the late 17th-century features were generally complete producing a total of 184 fragments. Almost all (182 of them) were found within rubbish pits dug within the backyards of the Crispin Street properties. The actual number of cattle represented by the fragmented horn cores was considerably lower than the fragment count suggests; Table 8 displays the MNI estimate for each of the late 17th-century contexts that contained cattle horn cores.

Table 8. Minimum number of individuals (MNI) represented by the cattle horn cores from late 17th-century contexts

Context	MNI	Context	MNI
[293]	1	[318]	1
[294]	8	[320]	1
[297]	1	[322]	10
[301]	15	[329]	1

Two horn cores were recovered from context [318], the fill of a beam slot from a separate building (Building 1). Additionally a number of flattened horn plates, <SF124>, were recovered from another beam slot of the same building suggesting that this structure was also involved in the horn-working industry to a certain extent during the 17th century.

Reconstruction of the industrial process

Whilst there is clear evidence for the disposal of waste generated during the preparation of horn, none of the features excavated at the site could be attributed to an actual processing area. The rubbish pits may have originally been part of the production sequence, but there was certainly nothing on the scale of the 14th-century horner's workshop uncovered during excavations at Hornpot Lane in York (Wenham 1964). At Hornpot Lane a number of shallow clay- and timber-lined pits arranged around a floor surface were discovered. Similar clay-lined pits dating to the 16th and 17th century were found in Stamford and these were interpreted as soaking vats associated with horn preparation (Cram 1982). However, the absence of horn-soaking pits from the site could be explained by either off site soaking or the use of barrels, which would leave no archaeological trace. Alternatively, the horn sheaths might have been removed from the horn cores by simply piling up the horns and waiting for the bond between the core and the sheath to breakdown unaccelerated.

The faunal remains can help reconstruct other aspects of the industry such as the selection of raw material in terms of the ages and sexes of cattle. Aging of cattle into broad categories is possible from the texture of horn cores (Armitage 1982); the age classes represented by the horn core fragments from the late 17th-century features are shown in Table 9 in the suggested age groups given by Armitage (1984). A number of the fragmentary horn cores could not be assigned to a specific age group because not enough of the original horn core survived to be definitely attributed to one of the different age classes.

Table 9. Frequency of horn cores from different age classes of cattle in late 17th-century features; indeterminate fragments were too small for the method of aging the horn core to be accurate

Age class	Suggested age range (years)	Number of specimens
Juvenile	1–2	0
Sub-adult	2–3	2
Young adult	3–7	6
Adult	7–10	24
Old adult	10+	34
Indeterminate	-	71

Although the horn cores from older animals were the most frequently represented, this may not be a reflection of the availability of cattle from the butchers, but of the horner's preference for the horns from different animals. Ox horn was valued at a significantly higher price than cow horn because the size of pieces of horn that could be manufactured from them would have been larger (Armitage & Clutton-Brock 1976) and similarly older cattle would have provided a better horn. Based on the definitions given by Armitage (1982) on the lengths of horn cores, short- and medium-horned cattle were present in the late 17th-century material. In terms of the preparation techniques utilised at the site, only saws were used during this phase. The placement of this modification on ten cores exhibiting traces of this process imply that it was performed to cut the element into suitable portions ready for use once the sheath was separated from the core.

18th century

Articulated bones of dog and cat were frequent with low MNI and probably the result of similar disposal practices as in the late 17th century.

The animal bones from the mid to late 18th-century deposits originated from two contexts. The material from [276], a floor make-up layer, was typical of domestic refuse (Table 7). Dump layer [58] contained a number of cattle horn cores including three which had been dissected into portions by sawing; the material may well be redeposited material from the horn-working industry that was present in the previous phases.

Evidence of horn working in the 18th century at Artillery Lane

Of particular interest was a rectangular horn core lined cesspit (CP2; Fig 29). Its lining was intended to facilitate the reuse or scouring out of this feature and allow the liquid fraction of the faecal waste deposited here to drain away. The lining was constructed from the base of the pit upward by successive layers of carefully stacked horn cores all facing in the same direction. Each core had its tip pointing outwards and was orientated so that it neatly fitted into the curvature of adjacent cores. A segment of the frontal bone remained attached to the horn core and formed the internal side of the lining. Occasionally specifically selected small horn cores were placed into the gaps created as the tips of the cores radiated apart at the corners. The construction technique used is similar to the English method of building walls from cattle horn cores described by Kalm in 1748.

> The quick is so cut off that part of the skull commonly goes with it. The quicks are then set quite close beside one another over the earth that has been upcast for the wall, and this so that the larger and thicker ends of the quick, or that to which a portion of the skull is attached, is turned outwards or lies just in the face of the side of the wall. In this way two rows of quicks are laid, viz.: one row on one side of the wall, and the other on the other, so that the small ends of the horns quicks meet in the middle. Over this is afterwards

> cast earth about six inches thick, when again in the aforementioned manner is laid a *stratum* of double-ranged ox-horn quicks. (Kalm 1748, 69–70)

Only a fraction of the horn cores recovered from the site were analysed, but taking into account that the western side of the cesspit had been removed by a modern wall, nearly 700 horn cores would have been present in the surviving portion of the lining (based upon the number of horn cores counted during the excavation of the lining). The level from which the pit was excavated was truncated below the contemporary ground surface, so the lining originally may have contained as many as 1000 horn cores. Additional horn cores were also retrieved from the backfill of the cesspit.

Whilst the majority of the horn cores present in the lining were complete, the cesspit fill contained some sawn into sections. Particularly interesting is the evidence that tips of the cores were sawn off and a number of these were found within the fill. Since the tips are solid horn they were often sawn off early in the production process and used immediately to make small solid items. This practice also reduces the length of time taken for the bonds holding the horn core and sheath together to decay since the decomposition process is initiated from both the base and the tip (MacGregor 1991). One horn core had a sawing initiation point discontinued from which it was possible to measure the width of the saw used as 2.0mm. A single core displayed a number of incisions around the base, which would have been made by tracing around the base with a knife to assist in the removal of the sheath. Since this is the only example of this modification it seems that generally the added effort was not required to separate the two elements.

Bearing in mind the comments given on the sample of horn cores taken from the lining and the possible selectivity in the incorporation of horn cores, the material from the early 18th century shows the presence of small-, medium- and long-horned cattle. The age of cattle represented appears to be less restricted during this period although the majority are from adults.

Evidence for bone working from the late 17th to 19th century

Descriptions of the worked bones recovered from the post-medieval contexts are given in Table 10. In addition to finished items, reported in the small finds report, there were a number of off-cuts from the bone-working process implying that the actual process of manufacture was also practiced in the area. This interpretation is based not only on the location of modifications to the bone, which are not consistent with butchering, but the use of the saw throughout the different phases. The saw was absent from the butchers' list of instruments until at least the late 18th century (Albarella 2003, 74). Bone working in the post-medieval period was not a specialised trade; whilst there was the potential for specialist bone-workers, the tradition seems to have been craftsmen producing certain functional groups of artefacts in a variety of raw materials.

Table 10. Descriptions of worked bone from the late 17th to 19th century

Date (century)	Context	Element	Species	Description
Late 17th	[297]	Long bone shaft	Cow-sized	A bone-working off-cut that was a portion of shaft sawn into a segment 49mm long.
Late 17th	[301]	Rib	Cow-sized	A least five chops were made to the anterior border of the rib producing a saw tooth pattern partially down this edge.
Early 18th	[345]	Metatarsal	Cattle	Sawn through leaving only the proximal 48mm of the bone. Traces of sawing were only just visible suggesting that this surface was then smoothed over. A hole had been drilled down through the centre of the proximal articulation (width=12.0mm).
Mid/Late 18th	[58]	Metacarpal	Cattle	Sawn through the mid-shaft, probably an off-cut.
Mid/Late 18th	[276]	Metatarsal	Cattle	Sawn section of mid-shaft measuring 91mm in length, longitudinal break on one side and sawing on the other halved the bone. Sawn section appears to have been smoothed afterwards.
Mid/Late 18th	[276]	Metatarsal	Sheep	Sawn through just below the midpoint from the medial to the lateral side.

Date (century)	Context	Element	Species	Description
Mid/Late 18th	[308]	Femur	Sheep	A series of deep cuts circumscribe the shaft of the bone at the midpoint. This could have been preparation for working into a ring that was never completed.
Mid/Late 18th	[308]	Metatarsal	Sheep	Sawn through the middle from a medial to lateral direction with last 1.8mm snapped off; probable bone-working waste.
19th	[98]	Humerus	Cow-sized	A disc of bone 18mm in width was sawn from part of a humerus proximal shaft (based on the cross section) of a cow-sized animal. The bone came from a young animal since the surface was still porous. The start of another saw cut reveals the width of the implement was 1.1mm; probable bone-working waste.
19th	[98]	Rib	Cow-sized	Off-cut of rib sawn through leaving a portion 66mm in width. Small find number 63
19th	[98]	Humerus	Sheep-sized	Bone off-cut, although measuring 9.5mm in width its cross-section is typical of a humerus, probably sheep/goat but no anatomical features left to allow species identification. Small find number 64.
19th	[212]	Long bone shaft	Cow-sized	Sawn out section of long bone with the sawn edges smoothed; length is between 72mm and 74mm. The shaft is broken longitudinally so the width is only 21mm. Appears to be evidence of pressure flaking on the external side of the sawn edges that may relate to use rather than post-depositional damage.

Discussion

From a zooarchaeological perspective the most interesting aspect of the Crispin Street site relates to the horn-working industry of post-medieval London. The potential number of horn cores originally present in the lining of Cesspit 2 gives some idea of the scale of this industry.

The location of the site means that horn-workers based here would have been ideally placed to collect cattle horns from the butchers of Aldgate and it confirms the historical evidence for the importance of the horn-working industry in the streets around Petticoat Lane. In addition, the presence of horn sheets in Building 1 could be interpreted as evidence of the later stages of the production process whereby the flattened horn sheets were split ready for use as lantern or window panes. The horn core assemblage also provides an important source of metrical data for the analysis of the cattle breeds in post-medieval London and the potentially selective utilisation of cattle horns by horn-workers.

ENVIRONMENTAL ARCHAEOLOGY SUMMARY

Nick Branch

This report summarises the results of the analysis of the bulk and column samples recovered during the excavations. The bulk samples were processed by flotation, and the 'flot' and residue were scanned using an Olympus zoom-stereo microscope to ascertain the presence/absence of sub-fossil macroscopic biological remains, in particular charcoal, charred plant macrofossils (*eg* seeds) and mollusca.

A column (monolith) sample, <13>, was obtained from the medieval sediments of the Ditch 2 recut (located on Fig 18). It was described in the laboratory noting the colour and composition of the sediments (*eg* gravel, sand, silt, clay, organic matter; see Troels-Smith 1955). The organic matter content was measured using the Loss-on-Ignition method (LOI) (Bengtsson & Enell 1986). Sub-fossil pollen grains and spores were extracted using modified standard procedures involving dispersal in 1% sodium pyrophosphate, sieving using 150µm and 10µm mesh sizes, flotation using sodium polytungstate (specific gravity of 2.0g/ml) and acetolysis (Branch *et al* 2005). The procedure involved scanning the slides at 2mm intervals and noting the main taxa. Pollen grains and spores were identified using pollen type collections and the following sources of keys and photographs: Moore *et al* (1991); Reille (1992). Plant nomenclature follows the Flora Europaea as summarised in Stace (1997).

Unfortunately, the preservation and concentration of mollusca, charcoal and charred plant remains were poor. Mollusca were only present in low numbers in contexts [248] and [216].

These were taxa commonly found in terrestrial or semi-terrestrial habitats. Charcoal was present in many of the contexts, but was highly fragmented (<2mm in size), which makes routine identification very difficult. Nevertheless, its presence attests to the exploitation and use of fuel wood for domestic or industrial purposes. Charred seeds and chaff were not present, with only context [353]/[165] having charred remains of a hazelnut shell. The latter undoubtedly indicates the use of hazelnuts for human consumption.

The sedimentary sequence in column sample <13> (contexts [388] and [389]), from a Roman ditch recut during the medieval period [390], comprises 8cm of yellowish red (Munsell 5YR 4/6) gravel with traces of silt and clay (Gg4 Ag+ As+; context [389]). This is overlain by 42cm of dark grey (7.5YR 4/1) silty clay with traces of sand and gravel, with mollusca (As3 Ag1 Ga+ Gg+; context [389]). Overlying context [389], context [388] comprises 43cm of mottled reddish brown/yellow (7.5YR 4/2 and 7.5YR 6/8) silty clay with gravel and mollusca (As3 Ag1 Gg+).

The column sample <13> (medieval contexts [388] and [389]) revealed the presence of a well-preserved and diverse pollen assemblage. This is despite the organic matter values being low (between 3–5% throughout the sequence) and the predominately mineral-rich composition of the sediments. Assessment of the pollen assemblage indicates that the environment surrounding and probably within the drainage ditch was dominated by *Salix* (willow) and Poaceae (grass), with open mixed deciduous woodland (*eg Quercus, Ulmus, Alnus*), herb-rich grassland (*Heliantheum*, *Galium*, *Thalictrum*) and areas of open, shallow water (*Typha latifolia*, *Myriophyllum*). This suggests that the drainage ditch was bordered by open grassland (*eg* pasture) and contained taxa commonly found in shallow water or on damp ground (*eg* willow and reedmace).

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