London Transport Museum, Covent Garden

An Archaeological Archive Report

Volume I - Publications

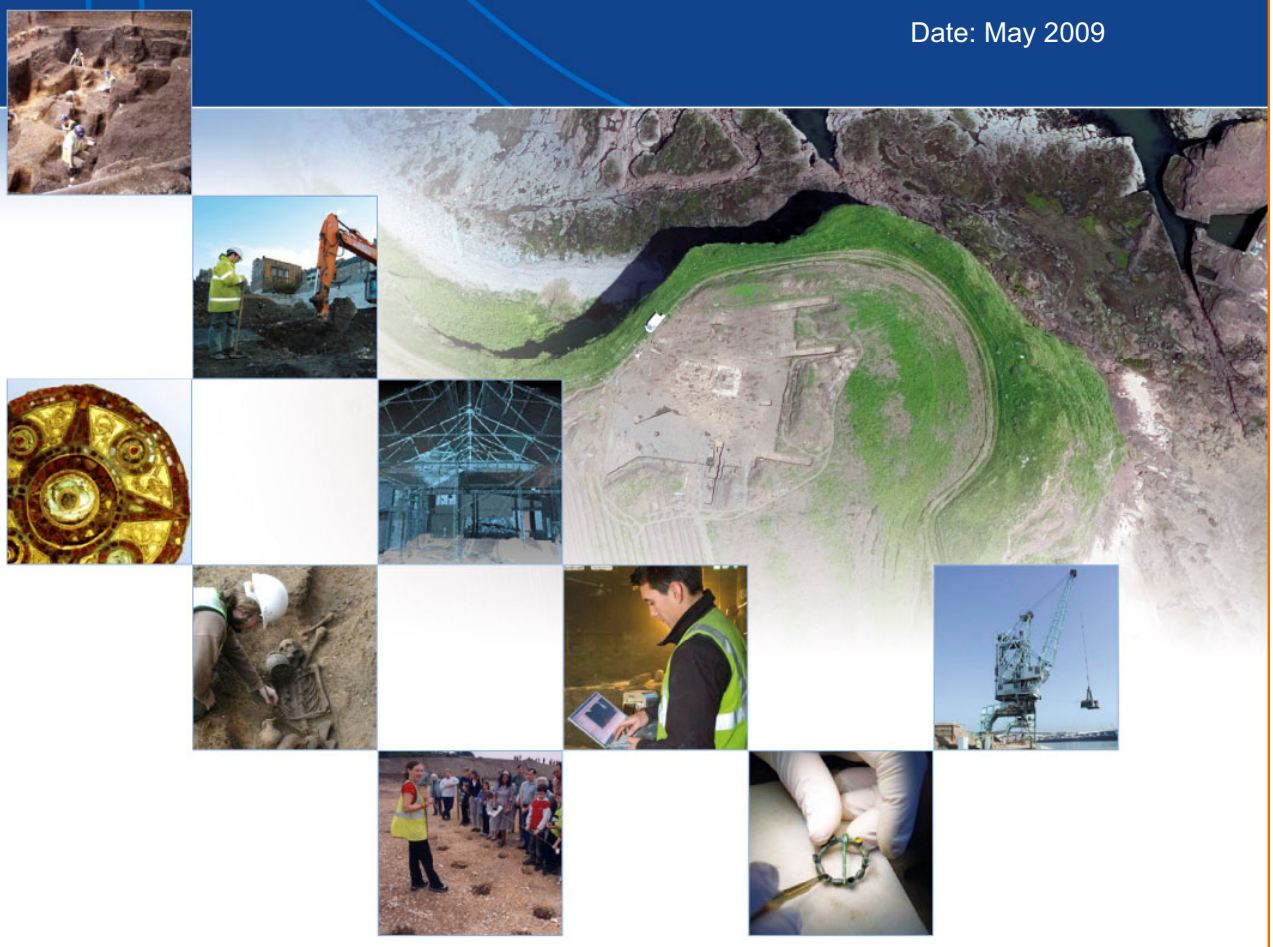
Planning Application Number: TP/4144; RN: 03/08388/FULL

National Grid Reference Number: TQ 3042 8085

AOC Project no: 7308

Site Code: LTM03

Date: May 2009



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London Transport Museum, Covent Garden

An Archaeological Archive Report

On Behalf of:	**Wates Group Ltd**
National Grid Reference (NGR):	**TQ 3042 8085**
AOC Project No:	**7308**
Prepared by:	**Tim Carew**
Illustration by:	**Jonathan Moller**
Date of Excavation:	**June – October 2005**
Date of Report:	**May 2009**

This document has been prepared in accordance with AOC standard operating procedures.

Author: Tim Carew	**Date: May 2009**
Approved by:	**Date:**
Draft/Final Report Stage:	**Date:**

Enquiries to: AOC Archaeology Group
Unit 7
St Margarets Business Centre
Moor Mead Road
Twickenham
TW1 1JS

Tel. 020 8843 7380
Fax. 020 8892 0549
e-mail. london@aocarchaeology.com

AOC Archaeology Group

www.aocarchaeology.com

Contents

List of illustrations

Saxon Burials and Settlement at the London Transport Museum, Covent Garden

A Covent Garden 'Hummum' and Brothel: the Post-medieval Remains at the London Transport Museum

Non-Technical Summary

Archaeological investigations were undertaken in advance of groundwork on an extension to the London Transport Museum, adding a basement to the western gallery of the museum. These investigations culminated in an excavation of the area within the basement between June and October 2005. Both the Saxon and post-medieval remains are independently of regional or national importance.

Initial work on the documentary archive and the finds was undertaken, and an assessment report on the results of this excavation was produced in June 2006, with assessments of the stratigraphy, the significance of the results, the archive, and the assessment reports for the different classes of finds recovered. Following the recommendations of that report, further analysis of the documentary and physical archive has been completed. The specialist reports for that work are presented in Volume II of this report.

Two papers have been written for publication on the remains from the site, and are presented in Volume I of this report. One is on the Saxon remains, and will be submitted to the 'Transactions of the London and Middlesex Archaeological Society', or to 'Medieval Archaeology'. The other is on the post-medieval remains, and will be submitted to 'Post-Medieval Archaeology'.

The archive is being prepared for deposition at the London Archaeological Archive Resource Centre. All the reports for the project will be available through the Archaeological Data Service (ADS) website.

Saxon Burials and Settlement at the London Transport Museum, Covent Garden

Tim Carew, Lyn Blackmore and Andy Leonard

With contributions by Phil Austin (charcoal), Ian Betts (building materials), John Giorgi (plant remains), Rachel Ives (human bone), Lynne Keys (slag), Marcos Martinón-Torres (crucibles and mould), Alan Pipe and Kevin Rielly (animal bone), Alan Vince (pottery thin section and chemical analysis).

(c. 16,000 words)

SUMMARY

Excavations at the London Transport Museum have added to the evidence for the Saxon use of Covent Garden. The earliest remains are ten cremations, all but one of which were within urns. Other grave goods included glass beads and a pair of tweezers. The vessels have a broad 6th to early 7th century date, but a radiocarbon date and the tweezers narrow this down to before the mid 6th century.

Two inhumations, both adult women, followed in the last quarter of the 6th century. One was richly furnished with grave goods: an amber and glass bead necklace; a copper alloy shield on tongue buckle; a copper alloy Roman terret (a ring on a horse harness); an iron chain object, possibly a chatelaine; and an iron knife. The most valuable item buried with her is a silver and garnet keystone disc brooch, probably one of a pair on her dress, which was retrieved from a well that cut through the head of this grave. She was buried on her back with the head to the west, possibly reflecting Christian practice. The other inhumation was only accompanied by a small quantity of copper alloy sheet, now unidentifiable but probably dress fittings. Her age at death was 26-35, and a series of pathological skeletal changes suggests a hard, physical life: she was very probably significantly lower in terms of economic position and status than the inhumation with the rich artefacts. Her position, on her side, shows less Christian influence.

These are the earliest cremations so far in *Lundenwic*, and the second earliest inhumations (following recent excavations at St Martins-in-the-Fields). The town at that time is likely to have been restricted to the area bordering the river, with the cemetery area therefore being on the ridge of higher ground above it.

During the early to mid 7th century there was a change in land-use, possibly to rubbish disposal and animal pens rather than human occupation. A thick levelled midden deposit sealed the site. Occupation started in the early to mid 8th century leaving large waste pits, wells, stakeholes, postholes, gravel yard or alley surfaces and deposits of burnt debris. From the late 8th to the mid 9th century dumped deposits and waste pits were the latest evidence for Saxon activity.

The archaeological sequence therefore represents the site changing as *Lundenwic* developed and expanded. From being a burial area outside the early town it became on its periphery, and then within the occupation area. The final phase of the site indicates a reduction in the intensity of occupation, although truncation during the post-medieval period had removed the

deposits dating to the very end of *Lundenwic*. The post-medieval remains are being published separately.

INTRODUCTION

In 2005 the London Transport Museum began works for the addition of a basement to the western gallery of the museum, between Covent Garden and Tavistock Street (Figure 1). This rectangular area covers an area of approximately 430m² (TQ 3042 8085). Evaluation in 2001 (site code CVG 01) had demonstrated survival of post-medieval and Saxon remains so full excavation of the affected area was required (site code LTM 03). The archaeological investigations were undertaken by AOC Archaeology on behalf of Wates Group. The post-medieval remains are being published separately, and consist of buildings and high status objects associated with a 'Hummum' and probable brothel on the site (Carew & Leonard forthcoming). In this paper features are denoted by square brackets [], deposits by round brackets (), registered finds (small finds) by <SF>, and burials by <B>. Context groups are classified as Structures and Gravel Surfaces. Full osteological analysis was undertaken on the human remains. Full stratigraphic and specialist reports (assessment and analysis) will be available online with other archive documents at http://ads.ahds.ac.uk, or from AOC Archaeology until they are uploaded.

Figure 1 – Site Location

ARCHAEOLOGICAL BACKGROUND

The identification the Strand and Covent Garden area as the location of *Lundenwic* was made in the 1980s. The earliest documentary reference to it is by the Venerable Bede in the 730s, who describes it as an *emporium*, a market for many peoples trading by land and sea. The Strand, with its sloping river edge at the time, would have been better for landing boats than the Roman city with its decaying riverside defences (Blackmore 2002, 278). Over time, the earliest recorded dates for *Lundenwic* have been getting earlier, with potentially 6th century activity over a wide area being envisaged recently (Blackmore *et al* 2004; Capon 2006, 172; Telfer 2008).

The archaeological evidence confirms *Lundenwic's* economy relied heavily on manufacture and commerce. Because it originated as a place for trade, the first part to have been settled is thought to have been next to the Thames foreshore, in the Charing Cross or St Martin's in the Fields area, but possibly with scattered *foci* (Blackmore 2002, 281). The foreshore then was about 100m to the landward, north-west, of the present riverfront (*ibid*, 281). Possible waterfront structures have been identified at Charing Cross (Cowie 2000, 199; 2001a, 198) and Arundel House, Aldwych (Proctor 2000, 51). From the third quarter of the 7th century it spread inland, so that at its height around the middle of the 8th century *Lundenwic* probably covered 55-60 hectares (Blackmore 2002, 284; Cowie 2000, 199; 2001b, 88). The core of the town was more or less within the area now demarcated by Northumberland Avenue, the National Portrait Gallery, Charing Cross Road, Long Acre, Drury Lane (formerly Wych Street) and Aldwych, but with some settlement extending to the north and east of this (Blackmore 2002, 284). A reduction in international trade from the later 8th century is one factor in its probable decline from this time, but this was accelerated during the 9th century by Viking attacks, recorded in the Anglo-Saxon Chronicle entries for AD 842, 851, and 871-872, when they wintered in London (Whitelock 1979, 187-94). Eventually *Lundenwic* became unviable,

and in AD 886 King Alfred ordered the reoccupation and strengthening of the old walled city, which became known as *Lundenburg*. By AD 959, in a Charter of King Edgar, the Strand area was described as a wasteland (Maplestone, unpublished, refs).

No other cremation burials have been found in *Lundenwic* to date. Saxon cremation burials tend to be rare in the south of England and previous investigations have identified few cremation burials relative to inhumation burials, particularly in the east of England. In eastern Britain, Lucy (2000, 140) refers to 692 known sites with inhumation burials compared to 70 sites with cremation burials.

THE EXCAVATIONS

Geology

The site is at the edge of an outcrop of Langley Silt over Hackney Terrace Gravels (BGS 2006). On site the geological deposits were light brown to orange clayey silt 'brickearth' overlying light brown sandy gravels, and were encountered at around 16.90mOD at the north end sloping down to around 16.55mOD at the southern end. Where not truncated, the surface of the brickearth was discoloured.

Burials outside Lundenwic – 6th century

Nine definite cremations, <B1> to <B9> (with MNI 10 bodies), and two inhumations were present (Figure 2, Tables 2 & 3). A probable tenth cremation, <B10>, is represented by pottery from pit [850] which suggests that it was another cremation that had suffered disturbance. The number of burials within the site area would have been rather higher than this, as about half of the contemporaneous land surface within the site had been truncated. Several items in later contexts are likely to have originated in disturbed burials from this time.

Figure 2 – Burials

Even allowing for the broad date range for many of the burials, the inhumations are likely to be later than the cremations. There was a general change in the preferred burial rite during this period from cremation, during the 5th to 6th centuries, to inhumation during the 7th (Lucy 2000, 119; Taylor 2001, 92; Hadley 2001; Williams 2002, 60–1), and cremations <B1> was cut by inhumation <B11>. However, in southern England and especially north Surrey there are cemeteries where both rites were used, apparently contemporaneously, in the 6th century and in some cases perhaps into the 7th century (ibid, 61, 64, 66; figs 3, 4, 6; Poulton 1987, 197–207; McKinley 2003, 104–11; Stoodley 2005, 76).

Cremation Burials

The three cremations in pit [828], <B6>, <B7>, and <B8>, are radiocarbon dated to AD430-640 (Figure 3, Tables 1 & 2) from a sample of human cremated bone taken from <B8>, assuming they are contemporary. Cremation <B1> has a narrower radiocarbon date of AD410-550 (Tables 1 & 2).

Sample & Context	Material	Lab no	$\delta^{13}C$	Result	Cal BC (OxCal3.10, 95%)
Cremation <B1> Pit [569] Fill (570) vessel <10>	Cremated human bone	SUERC-15174 (GU-15662)	-24.5 ‰	1580 ± 30	AD410–550
Cremation <B8> Pit [828] Fill (829)	Cremated human bone	SUERC-15176 (GU-15664)	-23.1 ‰	1510 ± 35	AD430–640
Lower Greensand-tempered lamp Layer (298) Figure 19:44	Carbonised residue in ceramic lamp	SUERC-15173 (GU-15661)	-30.1 ‰	1295 ± 35	AD650–780
Chaff-tempered cooking pot Fill (801) Pit [803]	Carbonised residue in ceramic jar	SUERC-15175 (GU-15663)	-28.4 ‰	1320 ± 25	AD650–780

Table 1 – Radiocarbon Dates

Figure 3 – Radiocarbon Dates

Nine of the cremations were buried in urns, the earliest ceramic finds to date from *Lundenwic* (Figure 4). <B2> and <B10> had been disturbed in antiquity, with remains of both the vessel and bone being present for <B2>, but only the vessel for <B10>. Only <B8> did not have its own vessel although it may have been in a bag or another organic container.

Figure 4 – Cremation Urns

Cremation	**Context**	**C14 date on bone** (95%)	**Skeletal Evidence** (bone weight)	**Grave Goods**	**Urn** dimensions of vessel in mm: (height: base diameter: rim diameter: maximum girth)	**Comments**
<B1>	Fill (570) Pit [569]	AD410-550	Indeterminate Adult (462g)	Three larger and several smaller unidentified fragments of bent or curved sheet copper alloy <SF113>	<SF10> (Figure 4:5) Chaff tempered, rounded (–: 90: –: –)	Cremated bone adhering to the metal
<B2>	Sample <39> Layer (543)		Indeterminate Adult (189g)		<SF243> (Figure 4:6) Chaff tempered, sub-biconical (136: 65-70: 130: 160)	Disturbed cremation, with bone and pottery recovered from a layer
<B3>	Fill (855) Pit [856]		Indeterminate Adult (218g)		<SF46> (Figure 4:7) Quartz sand tempered, shouldered, wide-mouthed bowl, nearly whole (174: 70-80: 200: 240)	
<B4>	Fill (858) Pit [859]		Body (1): Indeterminate Adult Body (2): Indeterminate Juvenile (> 1 year, < 15 years) (162g)		<SF47> (Figure 4:3) Chaff tempered, rounded, lopsided, whole (187–196.5: 90: 130-135: 206)	
<B5>	Fill (853) Pit [854]		Male Adult (19g)		<SF45> (Figure 4:8) Flint tempered, rounded? (–: 80: –: 250)	

<B6>	Fill (867) Pit [828]		Indeterminate Adult (>30 years) (660g)		<SF38> (Figure 4:1) Chaff tempered, convex-shouldered, whole (164–165: 90: 107: 192)	Green copper alloy stain on a rib fragment
<B7>	Fill (868) Pit [828]		Indeterminate Adult (425g)		<SF39> (Figure 4:2) Chaff tempered, rounded, necked (176: 80: 100: 170)	Green copper alloy stain on a cranium fragment (both internal and external surfaces)
<B8>	Sample <114> Fill (829) Pit [828]	AD430-640	Indeterminate Adult (649g)	(1) Copper alloy tweezers <SF43> (Figure 5:1) (2) Up to 19 burnt glass beads <SF146>, <SF147>, <SF148> & <SF236> (3) Small irregular unidentified fragment of ?sheet copper alloy <SF149> (4) Burnt iron wire <SF118> (Figure 5:2) (5) Iron strips <SF127>, <SF129> (Figure 5:3 & 4)	No vessel	Cremated bone fused to a glass bead and the copper alloy fragment Tweezers associated with males Beads associated with females
<B9>	Fill (840) Pit [841]		Indeterminate Adult (687g)	Cremated animal bone included with the human burial	<SF42> (Figure 4:4) Chaff tempered, rounded (213: 90: 120: 214)	
<B10>	Fill (851) Pit [850]		N/A		(Figure 4:9) Chaff tempered wide-mouthed jar or bowl (–:–: 180:180)	Cremation represented by vessel only. Disturbed, pottery sherds present in residual context but no bone

Table 2 – Cremations.

The urn with <B4> (Figure 4:3) is noticeably lopsided, as if had slumped during the drying stage, while uneven firing temperatures have resulted in patchy colouring on the urns with <B9> (Figure 4:4) and <B3> (Figure 4:7). The vessel with <B2> (Figure 4:6) is small and has a row of stamps around the neck and further stamps extending over the shoulder in vertical rows of two or three. The stamp (Briscoe type A 5di, Briscoe 2007), is very common with a wide distribution. The urn representing <B10> is more intricate, reconstruction is difficult due to fragmentation, but there seems to be a band of rosette stamps with eight petals (Briscoe type A 5aviii) between triple horizontal lines, below which are a rather crude chevron or pendent triangle design and quatrefoil stamps (Briscoe type B 1di). The former stamp is common, but the latter is rare.

<B8> was from a larger pit also containing <B6> and <B7> in their own vessels (Figures 4:1 & 2). It cannot be proven from the skeletal elements recovered that there were three, not two, bodies in this pit, but this is likely given the weights of bone recovered: each of the vessels and the pit fill had enough bone to represent, approximately, a largely complete adult (Table 2). The surviving bone shows that all three were adults, and <B6> was over 30 years old. Accompanying these burials, but not in either of the vessels, were a pair of copper alloy tweezers (Figure 5, Plate C), 23 burnt glass fragments from up to 19 beads (Plate A), a fragment of copper alloy, probably in sheet form, some burnt iron wire (Figure 5:2), and two iron strips (Figure 5:3 & 4). These seem to be associated with more than one of the burials and collected together for deposition. The tweezers are in good condition and did not go through the pyre or pyres, but the beads, copper alloy fragment and wire did. Both practices, burning the grave goods with the body and adding them unburnt to the ashes, were normal (Lucy 2000, 108). One of the beads and the copper alloy fragment fused to pieces of bone. The beads lacked the high level of soda that might be expected for beads of this date, possibly due to the effects of heat and weathering. Also tweezers are almost without exception with males in Britain (Evison 1987, 118, Steuer 2003, 181), and beads with females (ref). The cremation urn forms might imply <B7> is male and <B6> is female (see below). This group seems to include a man, a woman, and one other adult, so it conceivably is a family group.

Figure 5 – Grave Contents: Cremation pit with <B6>, <B7> and <B8>

Plate C – Tweezers (DSCN0108)

Plate A – Beads (DSCN9377 OR preferably photo as larger / complete group)

Plate B – Bead fused to bone (DSCN9348)

Many of the glass beads are difficult to identify with certainty due to burning or their small size, but one, possibly a continental import, is important for dating. It may be of Brugmann's 'Constricted Segmented' type, a form placed in her phase A2, which is broadly dated to *c* AD 480–580 (Brugmann 2004, 70; fig 173).

The pair of continental tweezers were a Frankish import of the late 5th or 6th century. Assuming the dating proposed for the Haillot cemetery to be too early, and working on the more recent dating suggested by Koch (1977, 132, 144) and Siegmund (1998, 113–4), it seems most likely that the tweezers date to before *c* AD550. They could have been an heirloom when buried, as at Broechem in Belgium where burial was in the third quarter of the 6th century (ref), so dating this cremation is not clear cut.

The tweezers are quite robust and of elaborate form, with functional jaws; the arms, however, are so tightly folded or fused that the object may never have been intended for use. The linear 'Roman' style incised decoration is more elaborate than usual. The arms are segmented, with simple or crossing diagonals in some of the segments. The bow has raised nicked sides and three longitudinal grooves down the back. The blades have frilly rounded tops and trapezoidal blades with right-angle returns to form the jaws, decorated with opposed single indentations on each side and incised diagonal crosses between paired horizontal lines on the upper half. Few English parallels for the decoration exist, but there are more from Germany (Koch

1977, 132; Siegmund 1998, Steuer 2003, 178–82), and northern France and Belgium (Breuer and Roosens 1957, 278; Annaert and van Heesch 2004, 238, and note 23). This pair therefore seems to be a Frankish import of high status.

The objects with <B8> of sheet copper alloy, iron wire, and iron strip are too damaged to identify. Another unidentifiable sheet copper alloy object accompanied <B1>. These are likely to have been clothing fixtures. The animal bone buried with <B9> could represent possessions such as dogs or horses or food (Lucy 2000, 112).

Charcoal with cremations <B2>, <B3>, <B4> and <B8> indicate that oak dominated the funeral pyres, to the extent (over 85% of fragments), that deliberate selection is implied. While it is one of the best fuel woods, this is very likely to be due to prevailing esoteric beliefs rather than purely practical considerations. The bone is mostly white, with high fragmentation, and the charcoal is often nearly vitrified, showing that the pyre was efficient in terms of its temperature, probably over 600^{o}C, and duration (McKinley 1994, 11). False oat grass was also present with <B8> in reasonable quantity, probably as fuel or tinder. If local sources of oak were not adequate to meet demand the Thames would have facilitated its import from upstream or elsewhere. Timber was an important resource, and the most economically valuable woods, like oak, were managed (ref). Documentary evidence indicates that ownership of woods, and rights over timber and fuel-wood, were increasingly moderated within the wider economy (Rackham 2006).

The cremation urns have shouldered or globular forms with simple upright rims, which are typical of the London area throughout the 6th century and into the 7th century, and therefore not particularly helpful in pinning down the date of the burials. Even the stamp on the jar with <B2> (Figure 4:6) can only be broadly dated, being common, although the rarity of one of the two stamps on the vessel with <B10> (Figure 4:9) is more useful. Most of the other examples are from early Saxon cemeteries, notably Loveden Hill, Lincs, Spong Hill, Norfolk; Long Wittenham, Berks and Little Paxton, Cambs. The disturbance to the burial, with the pottery in a later pit rather than the cemetery horizon, and lack of associated bone or ash, diminishes its value for dating the cemetery.

In four cases the date can be refined further. The radiocarbon date for <B1> only extends to AD550, at 95% confidence, so this was early to mid 6th century. The artefactual evidence for the three in one pit, <B6>, <B7>, and <B8>, in particular the tweezers, also give a date in the early to mid 6th century. This cemetery is the earliest yet recorded from *Lundenwic*.

Despite recent shifts in thinking, cremation is still generally accepted as a Germanic, or Anglian tradition and as a pagan rite (Williams 2002). Inhumation, on the other hand, has traditionally been seen as more of a Saxon tradition inherited from the Romans (*ibid*, 49–57, 70), although not necessarily any less pagan (*ibid*, 66).

The presence of stamped cremation vessels is notable, and the disturbed vessel (Figure 4:9) is very similar in form and decoration to a 6th-century urn from Park Lane, Croydon (McKinley 2003, fig 7, no.46; Mepham 2003, 89). The general uniformity of the other vessel forms, however, suggests a strong family or community tradition and possibly burial over a short period of time, particularly as there are two occurrences of multiple burials (Williams 2002, 68). No other information is available on how long the cemetery was in use for cremations. Cremation may, therefore, have reflected '*aspirations, idealizations and (in some cases at least) conscious ideological programs, as much as the stable realities of past ethnic communities*' (*ibid*, 64). Various theories have been put forward regarding the symbolism of the shape and size of cremation vessels, recently summarised by Blinkhorn (1997, 122; Williams 2002, 69–70). It has been suggested (Richards 1987) that the pot makes a statement about the sex, age and status of the deceased, which is reinforced by the presence or absence of grave goods. Status might be indicated by whether the pot was purpose made (higher status) or reused (lower status). While it is possible that the present pots were made purely for the burial rite, post-depositional wear and their generally fragmented condition makes this hard to determine.

The more complete examples are not of particularly high quality, being lop-sided and roughly finished; the same is true of most urns from the Stadium site, *Hamwic*, although no link was found between age and the quality of a pot (Mepham 2005, 24–5).

Richards (1987) also proposed that cremations without grave goods are usually in shorter, wide-mouthed vessels, while those with grave goods are usually in taller, narrow-necked vessels, and that males are typically buried in narrow pots, while females are associated with wider pots with wider mouths. If so, urn 2 <B7> (Figure 4:2) would have been used for a man, while urn 1 <B6> (Figure 4:1) would have been used for a woman. Of the other urns, vessels 3 <B4>, 4 <B9>, 5 <B1>, 6 <B2> and 7 <B3> (Figure 4:3, 4, 5, 6 & 7) should, from their form, all have held female burials, while vessels 8 <B5> should have held a male. Robust features at the back of the skull of <B5> confirms that this was a man, but no indicators of sex are present for the others.

The second multiple cremation burial, <B4>, has no grave goods other than vessel 3 (Figure 4:3), but contains bone from both an adult and a juvenile of between 1 and 15 years at death. If the adult is a woman, as inferred from the pot form, this is conceivably a mother and child. Double burials predominately include an infant or juvenile, but the tendency for the adult to be a woman rather than a man is less pronounced (McKinley 1989, 245; Lucy 2000, 107).

Another hypothesis is that the dimensions (height, width and height of maximum diameter) of a pot are related to age and status, infants being buried in small pots, adults in tall ones (Richards 1987); at the Stadium site, *Hamwic*, correlation was noted between age and vessel size (Mepham 2005, 25). On this basis, urn 4 <B9> may have been used for a senior female, and urn 6 <B2> for a young woman.

Pathological changes are present in three of the cremations (see 'Human Bone Pathologies' below). A probable humerus of <B8> and a tibia of the adult in <B4> exhibited non-specific periosteal new bone formation. These could have arisen from infection, trauma, or inflammation. The effect on these individuals may have been limited to localised pain for a limited period. <B9> had fractured a forearm a while before death, and the bone had set overlapping and misaligned.

Inhumation Burials

Bone preservation of inhumation <B11>, about 80% complete, was better than <B12>, about 10% compete, as the cut for <B11> was shallower and did not penetrate through the brickearth to the more acidic sandy gravels. The small effective sample size of cremated and uncremated bone means inferences from the osteological data are tentative.

Inhumation	Context	Sex and Age (skeletal evidence)	Grave Goods	Comments
<B11>	Skeleton (558) Fill (553) Grave (552)	Female Early middle adult	Eight small unidentified fragments of curved sheet copper alloy <SF9>	
<B12>	Skeleton (700) Fills (701) & (702) Grave (699)	Indeterminate Adult	(1) Brooch <SF14> (Figure 6:1) (2) Amber beads <SF16>, <SF>, <SF> (Figure 6:4) (3) Glass bead <SF233> (Figure 6:3) (4) Copper alloy Buckle <SF19> (Figure 6:2)	Grave goods associated with females

			(5) Copper alloy Roman terret <SF17> (Figure 6:6) (6) Iron knife blade <SF69> (Figure 6:8) (7) Iron chain like object <SF20> (Figure 6:9) (8) Iron strips <SF121>, <SF125> (Figure 6:7) (9) Rim fragment of Roman glass bowl <SF144> (Figure 6:5)	

Table 3 – Inhumations

<B11> was a woman of early middle adult age (c. 26 to 35 at death) that was flexed on her left side, with her head to the north. Chaff-tempered pottery sherds were in the grave fill, but these do not appear to have been grave goods *per se*. An object of sheet copper alloy <SF9>, now unidentifiable fragments, was buried in the knee area. Also intentionally deposited were a number of animal bone fragments, exclusively cattle and sheep-sized, which had all been burnt white. These are probably the remains of a burnt food offering accompanying the body.

Five pathological changes are present in the skeleton: osteoarthritis in her right hand; two areas of damage to the spine; a well-healed rib fracture; and the loss of teeth. Multiple causes are possible for all of these, except for the rib fracture, but taken together this catalogue of pathology, acquired in under 35 years, tells of a hard, physical life. Osteoarthritis may be caused by wear and tear resulting from repetitive actions. Intervertebral disc disease in the lower neck, visible as pitting of the bone surface, also signifies degeneration of the joints; again wear and tear can be responsible. The damage to the lower spine represents Schmorl's nodes, lesions caused by herniation of material in the intervertebral disc into the adjacent bone surfaces following compression of the spine (Rogers & Waldron 1995, 27; Aufderheide & Rodríguez-Martín 1998, 97). Schmorl's nodes are associated with falls from a height, heavy lifting, or other strenuous activity (Mann & Hunt 2005, 95), although other factors may be involved. Roberts & Cox (2003, 195) found that in Britain the prevalence of Schmorl's nodes declined slightly from the Roman period (4.8%) to the early medieval period (2.9%). Neither the damage to the neck nor the lower spine were probably severe enough to have caused a disabling level of pain by the time she died, and may even have been asymptomatic. Trauma of some kind is clearly implicated in the rib fracture. Three teeth were lost ante-mortem but as they are from two areas of the mouth poor dental health is more likely to be the cause than trauma. While honey was available (Robinson 2004, 38-9; Roberts & Cox 2003, 190) it may have been a prestige food with restricted availability, and the high consumption of cereals and other carbohydrates will have had a worse effect on dental health than sugary food (*ibid*). For the Saxon period, the bulk of the existing data on pathology, and hence the prevalence of injuries from strenuous activity, is from rural populations. <B11> adds to our limited knowledge of presumed urban activities causing impacts on health.

<B12> was a supine adult aligned with the head to the west, with the wrists over the pelvis. Both head and feet ends of the grave were lost to truncation, and the bone was in poor condition: no age, sex, or pathology data could be gathered. A necklace of 19 amber beads, <SF16> <SF>, <SF>, and <SF> (Figure 6:4), and one drum-shaped reticella glass bead with finely twisted threads of contrasting colours, <SF233> (Figure 6:3), was found across the lower chest. A shield-on-tongue buckle with an oval loop and cello-shaped shield, <SF19>, (Figure 6:2) was by the pelvis. A Roman terret ring, <SF17>, (Figure 6:6) was found between the thighs. Part of the rim of a Roman (1st-3rd centuries AD) pale green glass bowl <SF144> (Figure 6:5) was also in the primary grave fill. At hip level was an iron knife, <SF64> (Figure 6:8), an iron chain with attachments, <SF20> (Figure 6:9), and some other iron strips, <SF121> and <SF125> (Figure 6:7).

Figure M – Grave Contents: Inhumation <B12>

The most impressive find from the site, a silver Kentish keystone disc brooch with four cut garnets <SF14> (Figure 6:1), was recovered from the primary fill of a well that truncated the head end of the grave. It is likely this had been around the shoulders area of the body, and fell into the well soon after it was dug. Given the rest of the funerary costume, one or more brooches, probably of saucer or keystone form would have been expected with <B12> (cf Blackmore 2003, 265–6; Malcolm and Bowsher 2003, 27, fig 13). If worn as a pair or group in the Kentish style, such brooches would have been one above the other, rather than at the shoulders, and possibly linked by beads or a chain (Evison 1987, 69, text fig 13; Owen Crocker 2004, 91–2).

Plate E – Amber bead necklace (DSCN9226)

Plate F – Drum-shaped reticella glass bead (DSCN9308 & DSCN9294)

Plate D – Kentish keystone disc brooch (DSCN0086)

The most useful artefacts for dating <B12> are the glass and amber beads, the copper alloy buckle, and the brooch. The use of amber beads in inhumation burials, unknown in the London area until now, is primarily a 5th to 6th century tradition, and most typical of the mid to late 6th century, when they often occur in long strings interpreted as status symbols (Huggett 1988, 64; Geake 1997, 47; Brugmann 1997, 56; Owen Crocker 2004, 87). After this it is rare to find more than two or three beads together, and although they continue to occur well into the 7th century, these late finds are mainly from children's graves (Geake 1997, 47) or heirlooms kept for amuletic purposes (Dickinson 1974, 252; Meaney 1981, 67-71; Geake 1997, 12, 47). As <B12> had multiple beads a date in the second half of the 6th century is implied.

The shield on tongue buckle form is a type typical of Böhner's *Stufe* (period) III (probably AD 510–600; Böhner 1958; Martin 1989, 132, note 41). By the early 7th century it was being copied in Kent, where it was common. The date of this example depends on whether it is an import or a native copy. Given its small size and overall neatness it is likely to be an import, so the AD 510–600 date range is applicable.

The silver keystone brooch is probably of late 6th-century date, although production of the type could have continued into the first quarter of the 7th century (ref). The group of artefacts buried with <B12> therefore is most probably dated to after about AD 575, due to the broach, and before about AD 600, due to the string of beads and the buckle.

The reticella glass bead is the earliest type yet found in a burial context in *Lundenwic* and is consistent with the artefact group dating to the last quarter of the 6th century, without helping to constrain either the start or end date. It belongs to a form (Koch type 48) that first came into fashion in the 6th century. In northern Europe the type was most popular between AD550 and *c* 580–600 (Brugmann 1997a, 60; 2004, Table 3). In England, this form belongs to Brugmann's phase A2b, which is dated to AD530–580 (ibid, 42, 78, table 3; fig 173), although they might fall within the later part of this bracket. Most of the English examples listed by Guido (1999, 313–6) are dated to the 6th-century, but some, perhaps heirlooms, are from 7th-century contexts.

Following recent excavations at St Martin-in-the-Fields (Telfer 2008), this is the second earliest post-Roman inhumation in the area that became *Lundenwic*. The earliest individual, at St Martin-in-the-Fields, is likely to have been living in the hinterland of a *Londinium* in terminal decline, rather than in a formative *Lundenwic*. The cemetery at the nearby Royal Opera House is interpreted as 7th century, even if one of the two radiocarbon dates extends back to the 6th century at the 95% confidence level (AD559-676 and AD604-756) (Malcolm and Bowsher 2003, 19, 338).

As a group the grave goods for <B12> are diagnostic of a woman, the necklace being the strongest individual indication (refs). Continental finds of shield-on-tongue buckles are mainly from male graves, but in England they are most common in female graves (Marzinzik 2003, 21, 63, 81). The knife is small, more typical of a woman than a man. The reticella glass bead is a type that was worn by men as well as women, and could be sewn into clothes or used as sword beads, attached to the scabbard as either a talisman or part of a peace bonding cord (Evison 1987, 65, 70; Brugmann 1997a, 60).

The silver keystone brooch has an empty circular central setting with no trace of gold foil so the original filling is uncertain. Radiating from this are three equally spaced triangular slab-cut garnets with bevelled edges, backed by gridded foil (4 squares per mm). Following Avent's system of classification (Avent 1975a, figs 4–7 and 12), the intervening panels contain animal ornament (Style 1 type 7.3) below a discontinuous border to the central setting, probably beaded (type 3). The rim comprises three bands: a narrow inner rim (type 1 or 3), a broader band (type 1 or 4) and a separately applied beaded outer rim (type 3) that is flush with the back, but lower than the front. The original diameter was *c* 31mm and there is a pin holder and catch on the back, but the pin is missing.

The amber beads were strung together, and the single glass bead was found at or near the centre of the necklace, so was apparently strung with the amber. The alignment of the necklace across the body is lower than usual, even for a string attached to shoulder clasps as a festoon. It may therefore have been placed over the abdomen rather than worn. Most of the amber beads can be paired, and if the glass bead was strung with the amber, the central amber bead may have had a missing pair. The glass to amber ratio of 1:19 (5%) is low, but comparable with grave 38 at Dover where the ratio was 7:77, or 9% (Evison 1987, 65). The beads are consistently dark golden-red in colour and so may well be from a single source. All appear to have been polished, but while some have a high gloss and are translucent, the more worn examples are duller and opaque. Signs of damage in antiquity include a nick at the edge of the perforation of one example, where the beads have rubbed together on the string, and the possible smoothing of damaged end faces into obliquely sloping ones on two examples. There is no evidence that they were made from recycled larger beads, as found at Mill Hill (Brugmann 1997a, 56), but this is a possibility for the smaller, more irregular examples.

The central amber bead stands out in that it is of asymmetrical disc form with wedge-shaped section, a form more typical of Anglian and Saxon regions of England than Kent (Brugmann 1997a, 56; Panter 2000, 2501–2). All the other beads are sub-polygonal in form, but are carefully made so that each has a main flat face, the back, which in some cases was chosen to hide an obvious flaw. The two largest are 12x14x11mm and 14x14x10mm, the two smallest 8x8x5.5mm and 7x7x5mm. The holes were probably pierced from both sides, and are not always central. The bore is *c* 2mm on the larger beads, 1.5mm on the medium-sized beads, and 1mm on the smallest examples.

As a large and distinctive form, the glass bead may have been selected for sentimental or amuletic reasons. It has a red and yellow core, twisted to produce a spiral, overlaid with five rows made of twisted contrasting rods. Three of these have an anti-clockwise twist, and the two between them have a clockwise twist, producing a herringbone effect. The two clockwise twisted rows are red with thinner bands of yellow, while the three anti-clockwise rows have broad bands of black, narrow bands of red and black, and narrow bands of yellow. Once the glass had been put together the bead was marvered (rolled) to produce its cylindrical form. It is almost certainly of Continental, if not Mediterranean, origin (Brugmann 2004, 37–8, 42).

The shield-on-tongue buckle was apparently worn centrally at hip level. Rivets used to fasten the two thickness of the leather strap are often present (Marzinzik 2003, 19, 62–3; Martin 1989, Abb 9, 10; Brugmann 1997a, 71), but were absent here. Some possible mineralised organic matter was noted between the tongue and the buckle. The flat cello-shaped base-plate is decorated with a single 2mm perforation at the mid-point of the base. Part of the attachment loop on the back survives around the axis but is obscured by corrosion products.

The cast dropped-bar terret ring was found within an area of dark staining that suggests burial in a bag. Terrets of this type were used throughout the Roman period for controlling driving reins, and modern harness buckles retain much the same shape. It is possibly decorated with paired transverse grooves at the outer junction of the main loop and the rectangular projection. By 1990, 21 examples from Saxon burials were known (White 1990, 144–5), and it is likely to have been one of the items selected for sentimental or amuletic reasons.

The knife, chain like object, and iron strips were under the left arm. The knife may have been tucked inside the sleeve of the left arm, a position recorded elsewhere for knives (Evison 1987, 115), but this is unusual for other objects, which may instead have been at the waist. The knife is angle-backed and has a centrally placed tang (Böhner's type C, Evison's group 5, Castledyke's type E). This form was more common in the 7th century, but present in the 6th (Drinkhall and Foreman 1998, 281).

The chain like object and iron strips may well have been part of the same object, possibly an early form of chatelaine or girdle group, a collection of personal and domestic items such as keys suspended from the girdle, usually on the left side (Cook 1985, 92–3). In addition to their practical value, chatelaines could act as an insignia of office for the mistress of a household (ref). During the 6th century non-functional girdle hangers of copper alloy were more common, then in the 7th century longer, more complex but less decorative combinations of functional iron objects became popular; the peak of the tradition was in the late 7th to early 8th centuries (Lethbridge 1931, 83; Cooke 1985, 92; Geake 1997, 57–8). A 6th century example has, however, been found at Dover Buckland in a grave dated to between AD 525–575 which also contained a shield-on-tongue buckle (Geake 1997, 57–8). Alternatively it may not be a chatelaine, and iron rings were also used in combination with other items.

The artefactual assemblage buried in this grave is typical of a later 6th-century female burial of some status, although not high ranking (Owen Crocker 2004, 93). The brooch is a significant extension of the mainly Kentish distribution of the keystone brooch form, the more so as it is one of few examples with four keystones (Avent 1975, class 2.5 or 2.6). Also, being some 50 years earlier in style than the Kentish composite disc brooch from Floral Street (Blackmore 2006), it is important for typological studies and as an addition to the limited corpus of items associated with personal ornament from *Lundenwic*.

The two inhumed women contrast in social status, to the extent that grave goods are a reliable indicator. The health impacts on <B11> are consistent with this, if they are lifestyle related. Little more than speculation can be achieved with a sample of two, but it is potentially of interest that the higher status burial is positioned more in line with Christian rites, supine with the head to the west, and there is no sign of Christian practice with <B11>. In general Christianity was introduced in a top-down manner, with royalty and elite groups being targeted by the church evangelists and spreading to the rest of society once they had been converted (ref). Unfortunately the chronology here is not sufficiently refined to test whether, instead, <B11> is simply earlier than <B12>, and the picture could be further complicated by any local burial traditions and even other extraneous factors such as architectural features at the burial site (Lucy 2000, 132; Taylor 2001, 103, 138).

The presence of continental objects in the cremation and inhumation burials does not necessarily mean that the individuals were Germanic or Frankish, although they may well have been statements of '*ideological and political affiliations with parts of Northern Europe*' (Williams 2002, 70). Whatever these may have been, the beads and shield on tongue buckle almost certainly reached London via Kent. Amber was particularly favoured in the Saxon and Anglian parts of the country, but has been found in some quantity at a few sites in East Kent (Huggett 1988, 64, 76; fig 1), notably at Mill Hill, Deal (Brugmann 1997a, 55-6) and Dover Buckland (Evison 1987, 57-60). Together with the Kentish keystone brooch, these finds suggest trade or familial links, such as the transfer of objects by marriage, with other parts of the country or with the continent. London was absorbed into the East Saxon kingdom by around the 590s, but Yorke (1990, 40) suggests that '*the expansion of [Kent's] interests to London .. by the end of the sixth century was a logical expansion of*

existing commercial interests'. The East Saxons recognised Kentish overlordship between at least the 630s and 660s, and then Mercian overlordship (Malcolm and Bowsher 2003, 17–8). The presence of a market at *Lundenwic* in the mid to late 6th century, frequented by Kentish or even foreign traders, is a possibility that must now be given serious consideration.

On the Margins of Lundenwic - mid 7th to early 8th century

At a date between the late 6th century and the mid 7th century burials were discontinued in the area of the site. It is not clear whether there was a break between the cemetery and the next phase of archaeologically detectable activity, but if there was it was not long lasting. The people who began digging pits and building fences from around the mid 7th century may or may not have known about the burials there, but if they did there is no indication that they paid any heed to them.

The remains of this activity are not highly structured (Figure 7). They are consistent with the northwards expansion of *Lundenwic*, bringing the site into a marginal zone around the town, but not directly occupied. They may represent waste or other pits dug away from the buildings, and fences for animal pens, possibly with division into properties.

Figure 7 – Plan: mid 7th to early 8th century

A possible structure, Structure 1, is indicated by a concentration of 14 stake and postholes at the southern end of the site, within an area about 3m across. Four possible closely spaced east-west stake lines have the appearance of an animal run with more than one construction phase. Three postholes on or next to these lines are interpreted as part of this structure, a fourth further away is uncertain. The silty fills of Structure 1 suggest the wood rotted *in situ*, but no artefacts were found. There is no particular reason to suppose the pits within this area are associated with Structure 1, and a few stratigraphic relationships show some features, at least, were not contemporary.

In addition to Structure 1, this phase of activity comprised 16 pits, 6 stake or postholes, and 14 layers. A few of the pits had no datable artefacts and were filled with slumped natural material, but most had varying amounts of debris in deliberate infills. The bone was mostly sheep and cattle, with a single chicken bone present. Chaff-tempered pottery and a sherd of a Surrey-type (Lower Greensand, type A) jar was recovered from three of the pits. Some of the layers were redeposited brickearth, interpreted as the upcast from pit digging. Some were gravely silt with little or no cultural material. Others contained ash and charcoal and will have originated in the settlement, as did a cat bone.

Midden Spread – mid 7th to early 8th century

An extensive and relatively heterogeneous layer of grey clayey silt covered more than half the site area, 0.10m to 0.30m thick, and doubtless had once covered it completely (Figure 8). Inclusions were frequent, notably 66kg (1,990 pieces) of animal bone. This group is similar to the bone from the rest of the site and other assemblages from *Lundenwic* sites (e.g. Malcolm and Bowsher 2003, XX), a consumption meat-bearing group heavily dominated by the major domesticates: cattle, sheep, goats and pig. Just one goose bone was present. A human bone will have been reworked from a burial, and an antler crown from a large red deer represents craft working rather than food.

Figure 8 – Midden Spread

Within the midden spread, and the preceeding mid 7th to early 8th century features, almost all of the pottery is local chaff-tempered ware (Figure 9). This accounts for 62 vessels, with another three being of regional

origin and two being imports. Dark green-brown glass fragments <SF142> were from a vessel with *reticella* decoration in yellow (Figure 10), and a Roman (late 1st to early 2nd centuries) blue-green glass fragment is from a square sectioned prismatic bottle <SF143>. Bone spindlewhorl <SF15> (Figure 11:1) and loomweights demonstrate more craft activity. Two iron objects were recovered: a possible key or another chatelaine component <SF130> (Figure 12:1) and mount <SF137> (Figure 12:2). The mount has a straight-sided strip or bar, pierced by two short iron nails set *c* 8mm apart, each with large sub-rounded heads and a sub-rectangular rove. The form is that of a clench bolt, used for joining two layers of wood. The dimensions are small but possibly appropriate for a box, where rove-like mounts might have served as decorative features.

Figure 9 – Pottery: mid 7th to early 8th century

Figure 10 – Glass vessel

Figure 11 – Worked Bone

Figure 12 – Iron

This layer represents settlement debris, but derived from elsewhere and spread across the area rather than originating from habitations on the site itself. Probably the material came from one or more middens that accumulated within the occupation area of *Lundenwic*, and was subsequently taken out for disposal. The build up of rubbish within the urban area has been documented on a number of *Lundenwic* sites (e.g. Malcolm and Bowsher 2003, XX). It could have been dumped directly, rather than coming from a midden, but had this been the case it would probably have been more heterogeneous. The layer was thicker at the southern, lower end of the site, so some degree of levelling was accomplished, although this may not have been the main reason for moving the material.

Occupation – early to mid 8th century

Following the midden spread the character of the activity changed, becoming more urban (Figure 13). More structures left traces, albeit fragmentary, in the archaeological record, and for the first time wells were dug. This implies that people were now living on the site itself, although their buildings cannot be distinguished: the identified structural remains are indistinct in form and mostly insubstantial. A number of gravely layers represent yard surfaces. The utilisation of the land was more intensive from this point until the end of the Saxon sequence, as represented by number of features and layers. As well as being more numerous, the pits became larger and contained more bone. The levelling of the midden across the area may have been preparatory work ahead of the change is use, more likely in order to remove the midden than improve the suitability of the ground for occupation.

Figure 13 – Plan: early to mid 8th century

Chaff-tempered wares still dominate the pottery, but there are now more regional wares and imports (Figure 14). The features without the Ipswich ware probably date to about AD670-730. A scattering of Ipswich ware, available in *Lundenwic* in modest amounts from about AD730 but dominating the market from around AD750 until AD850, came from what were probably the later features in this phase. Within one of the layers in this period there was the rim of a large thick-walled internally abraded jar, possibly some form of industrial vessel (Figure 14:20) (Blackmore 2003, 234, fig 47 <P43>). Other jars from the same deposit have white, brown and purple residues and were probably used for boiling water and dyes such as madder. The stamped decoration on Figure 14:34 is unusual.

Figure 14 – Pottery: early to mid 8th century

Structure 2 consisted of a line of six stakeholes, around 0.10m across and 0.15m deep. These cut a layer of firmly compacted redeposited brickearth, that may have been a floor. If so the stakeholes were an internal division, which is consistent with their size. Structure 3 was a rough square of four postholes 1.2m apart, each around 0.35m across and 0.15m deep, showing that it had a considerable load-bearing capacity in relation to its area. The posts appeared from the fills to have been removed before they decayed. Structure 4 was a concentration of 38 stakeholes and postholes in a 6m by 3.5m area. The postholes were again about 0.35m across and 0.15m deep. A clear pattern to the structure cannot be made out despite the number of features; later pits removing the centre of this structure have not helped. The relative positions of Structures 3 and 4, and the similarity in their posthole size, implies they may have been associated or even a single structure.

The structures belonging to this period of occupation were towards the centre of the site, and the four wells were towards the south-east. The wells were from 1.15m to 1.65m across and from 1.85m to 2.55m deep, and contained slumped natural gravel and clayey silts, usually the primary fill, and dumped material largely consisting of domestic waste. A layer of clean sand in one of them may have been an attempt to seal off the smell from the debris below. The domestic waste included large quantities of animal bone, ash and charcoal, oyster shell, daub flecks, and some broken loomweights. Pottery was also present, but not in large quantities.

Most of the site was subject to fairly intensive pitting, with 14 pits being ascribed to the period between the midden spread and AD750. Four of these were over 2m across, and six were 1m or more deep. Three contained little cultural material other than charcoal and occasional animal bone, but the rest had been used for dumping domestic waste. Bone was abundant in around half of the pits, and two had such high quantities (10kg and 5.5kg) that meat processing is implied. These were 15m apart, so this activity cannot be linked to any particular part of the site. Oyster, charcoal and daub were also often present. There were 16 fragments from 13 loomweights in the primary and upper fill of one of the pits, possibly from the same loom in use in the immediate vicinity. One of these, <SF37> (Figure 15:1), has two finger impressions on the side and a large oval impression on the upper surface: these are generally taken to be ‘brand’ marks or maker’s marks (Pritchard 1984, 65; Goffin 2003, 221; Leahy 2003, 71). An oval impression is also present on another loomweight from this phase <SF53>/<SF88> (Figure 15:2). Loomweight <SF103>, (Figure 15:7), residual in the post-medieval horizon, has a row of 12 impressions made up by using a three-toothed implement four times.

Figure 15 – Loomweights

Other features belonging to this period comprise three lengths of ditch, each 0.6m to 0.7m wide and truncated at the ends, and some postholes or small pits and stakeholes. Twenty five layers were recorded, mostly only about 2m to 3m across. Most of these appeared to be dumped material containing domestic waste, similar to that found in most of the pits. As they were limited in size it is unlikely that the material had been in middens before their final deposition. The amount of food waste and other refuse seemingly lying around means that it would have been an unhygienic and smelly place to live. This is consistent with the excavated evidence from elsewhere in *Lundenwic* and other contemporary urban areas (refs). Fire debris is again well represented, with abundant charcoal and ash, and this is interpreted as mostly or all domestic hearth rake out, rather than houses burning down. Robust but damaged iron object <SF135> (Figure 12:3) was within one of these layers, and could have been a punch, spoon auger, or broken key.

Of the other layers, without significant domestic waste, some are redeposited natural material, probably from pit digging. Only four were even moderately compact, but these are not interpreted as floors: their composition was too mixed and there were no associated features.

Occupation – mid to late 8th century

Horizontal truncation in the post-medieval period removed all remains later than the mid 8th century in the south-eastern half of the site that were not within deep cuts. The activity in the north-east of the site continued in a similar character, with structures of unclear form, and the deposition of layers (Figure 16). However, less well and pit digging is evident than before the mid 8th century, possibly implying pressure on space.

Figure 16 – Plan: mid to late 8th century

Structure 5 was formed by a group of 16 stakeholes and postholes within an area of 3m by 2m. These are not in an obvious pattern and their concentration, and some pairing, implies that some of them are replacements. The stakes and posts may well have decayed *in situ* as the fills were silty and contained no finds, except one posthole which, in addition to chaff-tempered ware, had Ipswich ware and Middle-Saxon shell-tempered ware. These date Structure 5 to AD770–850, assuming the features are roughly contemporary. Some of the features were cut through a layer of firmly compacted brown silty clay, which could have been a surface associated with Structure 5. Two iron nails were in this layer.

Following disuse of Structure 5, cess-rich domestic waste was spread over the this part of the site, up to 0.2m thick. A variety of pottery types came from this, including three forms of Sandy-ware, Surrey ware type C, and North French grey ware. This was sealed by a series of four greyish brown sandy gravel layers, Gravel Surface 1, interpreted as a yard surface. Although the number of layers demonstrates maintenance of the surface, frequent animal bone shows it was not kept clean. Discussing external surfaces at the Opera House site, Malcolm and Bowsher (2003) noted that public thoroughfares were kept most clean and private yards least clean, with semi-public spaces such as alleys in-between. This implies that this surface was within a private area, probably a yard attached to a building.

This area was then occupied by Structure 6: similarities between Structures 5 and 6 suggest this may represent it reverting to its previous use. Structure 6 consisted of a scatter of eight postholes and a possible beam slot, within an area that forms a right angled triangle 5m across, but without other internal organisation. On the south side of Structure 6, over the gravel surface, there were two further layers of clay and sand containing little cultural material, which may be associated with the structure. Gravel Surface 2 was then laid down over the same area, taking it back into use as a open yard. Part of the area was covered by layers of silt and compacted clay, then further postholes and another possible beam-slot, Structure 7, were cut into this surface. Just to the west of three of the postholes was a shallow linear feature, that may have been formed by wear. The changes in this part of the site between light structures and an open yard were evidently rapid. A conceivable scenario is that it was an area outside a building, at times used as a yard but at others used for a stall. The stall could have been used for selling goods or making them, although if the latter there is no evidence for any specific craft activities at this spot.

The sequence now changed slightly: several layers of clays and silts, mostly containing burnt material, were deposited. These were individually of limited extent and thickness but together covered a wider area. They possibly represent demolition material following a fire. Gravel Surface 3 was laid over this, to return the area to a yard once more.

The north-eastern side of part of Gravel Surface 3 had been cut by a length of probable beam slot, Structure 8. An area of closely packed stone, denoted Gravel Surface 4 for convenience although technically the stone size was larger than gravel, had been laid against the north-eastern side of the beam slot. Only a small area of this had survived. Overlying Structure 8 and Gravel Surface 4 were a series of dumped thin bands of dark yellow clay, discoloured by burning and separated by lenses of charcoal. These may represent demolition debris.

Although individually fragmentary, the sequence of structures and gravel surfaces had survived along the north-west edge of the site, whereas further to the south-east horizontal truncation had removed this horizon.

One exception was a small area where there was a line of four postholes, Structure 9, cut into a limited area of yellow gravel, Gravel Surface 5.

Relatively little pottery was present in this phase, with just 10 vessels represented, other than an intrusive shell-tempered jar.

Figure 17 – Pottery: mid to late 8th century

Occupation – late 8th to mid 9th century

The nature of the archaeological record changed in the late 8th century (Figure 18). This was the final phase of Saxon occupation that had survived the effects of post-medieval building. It was characterised by larger scale dumping in pits and in layers, with wells being the only definite evidence that the area was still being used for habitation, rather than abandoned and used for dumping waste. Again, in the south-eastern end of the site generally only cut features from this date had survived.

Figure 18 – Plan: late 8th to mid 9th century

The pottery in this period became more diverse, and more abundant once again (Figure 19). Ipswich ware now accounts for almost half of the 124 vessels, with chaff-tempered ware reduced to under one fifth, while a number of those are likely to be residual. Regional wares and imports are well represented, and a small amount of shell-tempered ware is now present, which dates those features to after AD770. Stamp decoration is seen on some of the Ipswich ware, typical of the late 8th and 9th centuries.

Figure 19 – Pottery: late 8th century to mid 9th century

Of the three wells, two were next to each other and so are likely to have been used sequentially, and served the same property or group of inhabitants. Both were steep sided and had been filled in with domestic waste, demonstrated by the amount of bone present. The other well had a compacted dark yellow sandy gravel fill, so not every hole that became redundant was used for rubbish. This may have been used to provide a solid surface for the next use of the ground.

Twenty nine other cut features are ascribed to this phase, of which one is a length of ditch, a few of the smaller ones were possibly postholes, and the rest were pits. Many of these were substantial, up to about 3.3m across, and the finds density was variable. The largest had a primary fill that appeared to have been naturally silted. The secondary fill of another large one had 7kg of bone, more than would be expected from day to day household consumption. Awl <SF134> (Figure 12:4) was within one of these pits, and may have been used for leatherworking. Other iron objects from this phase consist of a rove, a nail head, a rod-like object, and miscellaneous fragments.

There were also 17 layers identified, which seem to represent dumping or trample of otherwise unwanted material, rather than intentionally deposited surfaces. All of them were sand or silt except for two that were redeposited natural gravel, presumably from digging the wells or deeper pits, which was discoloured by other material mixed in. As with the cut features, some of the layers had little cultural material and others had large quantities, such as one with over 7kg of bone that may have been a spread out midden. Shell and fishbone provide evidence for the use of some wild resources.

An area of about 2m across had a sequence of three charcoal-rich layers, which may have come from levelling following a house fire. Several other layers had significant quantities of burnt material in them, but as they also contained food and other domestic waste this is likely to have come from hearth rake-out. The presence of cereal grains in samples from these deposits reinforce this interpretation.

There is little evidence from the layers to indicate whether their matrix originated in ongoing daily activities of the town, or whether it was from buildings that were allowed to disintegrate. The organic parts of the buildings would ultimately decay, but the non-organic constituents of daub, unless burnt, would revert to formless sand, silt and clay.

The presence of wells and domestic artefacts shows that the area had not been abandoned, but negative evidence, the lack of even insubstantial structures from this phase, strongly suggests that urban life was in decline. A lowering in the intensity of land use is indicated by the availability of large areas for digging pits. This is consistent with the evidence from other sites such as X (ref), X (ref), X (ref), and X (ref). It confirms that *Lundenwic* was past its peak by the 9th century (Blackmore 2002).

Occupation – all periods

Table 4 shows that at the start of the occupation of the site chaff tempered wares account for the bulk of the pottery (94% of sherds). By the early to mid 8th century this had gone down (82% of sherds), and by the late 8th to mid 9th century it was a minority (22% of sherds), much of which will be residual.

Ware:	Cemetery	Mid 7th to early 8th century (Margins of *Lundenwic* & Midden Spread)	Early to mid 8th century (Occupation)	Mid to late 8th century (Occupation)	Late 8th to mid 9th century (Occupation)	Residual (Post-medieval levels)	Total
Chaff	13	62	86	8	23	19	211
Ipswich			5		61	9	75
Shell			1	1	6	2	10
Regional	3	3	14	2	11	3	36
Imports		2	7		23	2	34
Total	16	67	113	11	124	35	366

Table 4 – Pottery wares by phase (ENV – equivalent number of vessels)

The pottery assemblage from this site is typical for *Lundenwic*. In the first main ceramic phase the pottery is heavily dominated by chaff-tempered ware, which gives way to the second main ceramic phase, when the groups are more mixed, containing Ipswich ware and other regional wares and imports as well as the chaff-tempered ware. The third main ceramic phase is characterised by shell–tempered ware, which comes in slightly later. Jars are the most common form of the main wares, with bowls and spouted pitchers making up most of the rest. A significant proportion of the vessels are burnished, and many are sooted from use as cooking pots.

Chaff-tempered wares were long-lived, appearing in the 5th century and continuing into the mid-8th century (Blackmore 1988, 106; 1989, 104-7; 2001, 25; 2003c, 229-34). There is a trend from predominantly sand-tempered wares with sparse organic matter towards greater amounts of organic temper in the later 6th and 7th centuries (Blackmore in prep; Blackmore and Vince in prep). Globular and round shouldered forms with upright rims are typical of the 5th to early 6th centuries on the Continent (Myres 1977, 6–7, figs 48–51) and the most common in 6th century deposits across the London region (Blackmore in prep). Inverted rims are found in later contexts (Blackmore 1988, fig 20, no.1; Jarrett 2004, fig 19, no.5; 2005, fig 65, no.2). In this assemblage the rims from the occupation levels are generally more developed than those from before, for example, vessels 20, 24 and 31 (Figure 14) are deep everted forms. Five of the Ipswich vessels have stamped decoration: numbers 46, 50, 51, 54, and 55 (Figure 19) (Briscoe types F3aiii, A 3aiv, A 1bi$, A 3aiii, and A 3iv respectively, Briscoe 2007).

Figure 20 – Pottery: residual Saxon wares in later contexts

POTTERY SOURCE

Figure 21 – Pottery factor analysis

Little change was evident in the animal bone assemblage throughout the period of occupation of the site, cattle representing 60-70% by fragment count, sheep and goats 10-20%, and pig 15-20%. A minor contribution came from chicken, goose, and mallard or domestic duck. Domestic mammals such as horse, dog and cat were very sparse, as were game species. The bones from the major food species were biased towards meat consumption, with largely sub-adults and adults and relatively very few foetal/neonate, infant or aged animals. This is an urbanised pattern, demonstrating specialisation in patterns of food production and consumption between the rural and town populations. Animal husbandry, dairying, traction and wool production were happening elsewhere.

Hulled barley, free-threshing wheat, rye and oats were the main grains cultivated during the Saxon period in southern England (Grieg 1991, 315), with hulled barley and free-threshing wheat being the best represented on *Lundenwic* excavations, followed by rye and then oats (Davis, forthcoming). Wheat was the most expensive and preferred bread-making grain (Hagen 1995, 18) while barley and rye may have also been used to make heavier breads. The samples from the occupation deposits on this site are remarkably consistent, and fit the wider pattern, with 60% barley, then wheat, and smaller amounts of rye and oats. Modest quantities of cereals within the samples suggest that they mostly represent background debris blowing around the site. There is occasional evidence for horse beans, flax, hazelnuts and sedges and spike-rushes for building or flooring. Wild plants make up just 17% of the quantified material, and crop-processing by-products are virtually absent. Most of the earlier stages of processing had therefore been carried out before the grain arrived on the site. Again, division of labour in the economy is implied.

Daub was also present throughout the occupation, and reused Roman material, especially *tegula* and *imbrex* roofing and brick, presumably freely available from *Londinium* or closer buildings, was common. Elsewhere in *Lundenwic* the tile and brick is often burnt and cracked, probably from use in Saxon hearths: curiously that is nearly absent here. A sandstone paving slab with a door socket hole (Figure 22:5) is very likely to have been Roman. Withy rod impressions show that much of the daub comes from wattle and daub structures. Generally these provide little information about wattle construction methods, but one, (Figure 22:4), supports the idea proposed by Hughes (2004, 132, fig 73) that pre-formed wattle panels were used and pegged in place by large vertical posts, in some cases at least. Another example (Figure 22:3) may show that the wattle was held in place by horizontal round withies, but not whether the wattle was pre-formed or made *in situ*. Many of the daub fragments have white deposit, probably limewash, on one surface, which is likely to have been used to improve the light level within the buildings. The outer surface is often crude (Figure 22:1). The function of a small number of wedge-shaped fragments of daub (Figure 22:2) is uncertain.

Figure 22 – Daub and Paving Slab

The charcoal from samples of the occupation deposits was not as heavily dominated by oak as the cremation samples, with better representation of other hardwoods native to southern England. The assemblages are typical of an occupation site and do not change significantly over time. Pits and wells have an intermediate level of diversity, with about 50% fragments being oak, and this charcoal may originate in domestic fires. The samples from layers were the most diverse, and may come from both domestic fires and other sources, such as burning houses.

Textile production

This is the earliest industry represented on the site, evidenced by six loomweights and one spindlewhorl, <SF15> discarded in the midden spread. The processes of textile production are detailed elsewhere, see Walton Rogers (1997), Leahy (2003, 61–82) and Owen-Crocker (2004, 272–315). The evidence from *Lundenwic* has been summarised elsewhere (Blackmore 1988, 111–4; 2003, 254–5, 304–6; Williams 1989, 107–10; Goffin 2003, 216–222; Malcolm and Bowsher 2003, 168–70; Leary 2004a, 11; Jarrett 2004, 95–7; 2005, 61–3; Riddler 2004a, 19–22; 2004b, 54–6). Due to the current lack of waterlogged deposits in *Lundenwic*, textiles survive only where mineralised, usually in burial contexts, and spindlewhorls are the only evidence for spinning. Although never as common as weaving equipment, these occur across *Lundenwic*, occasionally in stone, but mostly of bone. The size of the central hole, usually 8–10mm, reflects the size of the spindle and the quality of the yarn to be spun (MacGregor 1985, 185–7; Hamerow 1993, 65; Walton Rogers 1997, 1731). The example from this site is quite typical in size, form, and weight (Blackmore 2003, 304–5; Goffin 2003, 203–4; Malcolm and Bowsher 2003, 168). It is made from the ball of the femur of a cattle-sized animal, and has horizontal ridges and grooves around the shoulder.

The prepared yarn was woven into cloth on an upright loom, consisting of a frame and heddle placed at an angle against the wall. Loomweights gave the necessary tension to the warp threads, which were tied in groups, probably at intervals of 75–80mm (Walton Rogers 1997, 1749–53; Plunkett 1999, 283; Leahy 2003, 66–74). The *Lundenwic* loomweights were almost certainly produced locally and the fabrics remain consistent over time. One of the fabrics (Fabric 3) a distinctive oxidised calcareous ware, is not common, but has been found at the Royal Opera House (Goffin 2003, 216), Floral Street (Blackmore 2006), Bruce House, Kemble Street, Long Acre, Shorts Gardens and Southampton Row (Keily in prep a).

Weaving seems to have increased in *Lundenwic* during the late 7th to early 8th century, and especially after the introduction of Ipswich ware (Blackmore 1999, 47; Goffin 2003, table 36; Leary 2004b, 143; Malcolm & Bowsher 2003, 169-70; Riddler 2005, 63). The present finds follow this pattern, with a noticeable increase in the early to mid 8th century occupation phase. Only two fragments are from a context in the mid to late 8th century occupation phase, but the number of fragments discarded in the late 8th century to mid 9th century occupation phase is much the same as in, the early to mid 8th century occupation phase, and seven of these weights are from contexts dated to after *c* 770 by shell-tempered pottery.

Loomweight forms are governed by three main factors, profile, diameter and weight. The first has generally received most attention in the literature, and does seem to evolve over time. Here the profiles are quite consistent (Table 4), and although annular weights are more common up to the early to mid 8th century occupation phase, the one bun-shaped weight from the midden spread adds support to the suggestion that this type was probably in use by the late 7th century (Goffin 2003, 218). Intermediate types, the most common form, are also present in the midden spread, but more common in the early to mid 8th century occupation phase. The disc-shaped weights (Figures 15:6 & 8) are a new type for *Lundenwic*, the closest parallels being of late Saxon date: a group of smaller weights from Winchester (Hedges 1978) and three larger weights from Beckenham (Keily 2003, 174–6, fig 4). It would appear that all the main forms occur together in the late 8th century to mid 9th century occupation phase, and the same has been noted for later contexts elsewhere in the settlement (Goffin 2003, 218–220; Jarrett 2005, 62–3).

Form:	Mid 7th to early 8th century (Margins of *Lundenwic* & Midden Spread)	Early to mid 8th century (Occupation)	Mid to late 8th century (Occupation)	Late 8th to mid 9th century (Occupation)	Residual (Post-medieval levels)	Total
Annular	1	5	1	2	0	9
Intermediate: C-shaped profile	1	6	0	4	0	11
Intermediate: D-shaped profile	0	3	0	5	1	9
Intermediate: U-	0	3	0	2	1	6

shaped profile						
Bun-shaped	1	3	1	5	1	11
Disc?	0	2	0	3	3	8
Unknown	3	4	0	3	0	10
Total	6	26	2	24	6	64

Table 5 – Loomweight form by phase (number of loomweights)

Differences in loomweight diameter, height and weight may reflect the production of different types of cloth, or the location of a weight in the row. Of the 64 examples found, 50 could be measured with some degree of confidence. Of these 33 have a diameter of *c* 130–140mm, including Figures 15:1, 2, 4, 6 & 7, while a further 12 are *c* 120–125mm, including Figures 15:3 and 9, and three others probably fall between 120mm and 140mm. Only six weights are smaller than this, while seven are larger. The smallest is 95mm in diameter (<SF48> Figure 15:5), while the four largest, including Figure 15:8, are 160mm. Excluding the disc-shaped weights, heights of the annular and intermediate weights mainly fall between 40–49mm, while most bun-shaped weights have heights between 53–66mm. Despite variation in profile, the collection thus conforms to the national pattern, which is that 100–140mm was the standard range for loomweights until the 9th century (Hamerow 1993, figs 44, 45; Plunkett 1999, 279; Blackmore 1988, 112; Goffin 2003, Table 35; Riddler 2004b, 56). Weights of the Middle Saxon period generally exceed 500g (Holden 1976, 315; Walton Rogers 1997, 1753; Riddler 2002, 203; Goffin 2003, 220). The same seems to apply here: the small weight <SF48> (Figure 15:5), *c* 95% complete, probably weighed *c* 400g; weight <SF61>, diameter 110mm and *c* 60% complete probably weighed *c* 560g; weight <SF72>/<SF73> (Figure 15:4), diameter 130mm and 85% present probably weighed *c* 615g.

Two bone pins and one possible needle (Figure 11:2) are likely to have been for sewing (Blackmore 2003, 306, 309–10; Riddler 2004b, 55). Hones and burnishers were both probably used principally in textile production, while also having more general uses. Hones would have been used for sharpening shears, pins, and needles, and burnishers for smoothing finished cloth (Every *et al* 2005, 138).

Metalworking and glassworking

Evidence for metal-working and related crafts in *Lundenwic* has been summarised by Blackmore (2003, 251–4, 271–8), Dennis (2003, 275-7), Keys (2003), Malcolm and Bowsher (2003, 175–80), and Riddler and Rackham (2004, 60–1). None of the slag, crucibles or the mould fragment were associated with buildings or hearths, and given the small quantity of slag it is likely to represent random debris from metalworking elsewhere in the settlement. The possible ingot <SF8> from the late 8th century to mid 9th century occupation phase, however, suggests non-ferrous metalworking nearby.

Three crucible fragments came from the early to mid 8th century horizon, and a fourth, <SF245> (Figure 23:2), one of the largest fragments found in *Lundenwic* (Blackmore 2003, 271–3), is from the mid to late 8th century. Deep vitrification is present from fluxing of the clay with the ash in the fire, and metal and slag are present on the inside. The gently curved surface of mould <SF232> (Figure 23:1), made of fine reduced clay, would make it suitable for a flattish or large object, such as a frying pan or a bell.

Figures 23 – Crucible and mould

Analysis of the crucibles fragments produced the typical trace of leaded brass: low concentrations of copper, moderate amounts of lead, and relatively high concentrations of zinc. Tin does not always leave a trace, so leaded gunmetal is also possible. Copper, lead, zinc, and tin were all detected on the mould, which was therefore used to cast leaded gunmetal. Throughout the Middle Ages leaded brass and leaded gunmetal were typically made of alloys of haphazard composition obtained by remelting scrap (ref).

Four complete smithing hearth bottoms came from contexts dating to between the mid 8th and the mid 9th century, and there was also small amounts of slag and fragmented smithing hearth bottom within the occupation deposits. Again, these are not associated with specific structures.

No evidence of noble metal processing was identified, despite this being present nearby on the Royal Opera House site (Dennis 2003, 275-8). A possible touchstone (Figure 24:1) made from indurated black siltstone or mudstone from the midden deposit is of interest both in view of its suggested function, and as a possible import. Although identical stones have been found in *Hamwic* (D Williams pers comm), only one other possible example has been found in *Lundenwic* (Goffin 2003, 202-3, <S90>). Gold has been detected on similar stones from later contexts in Winchester (*ibid*, 202; Biddle and Barclay 1990, 76), but none of the examples from *Hamwic* or *Lundenwic*, including this example analysed by XRF, have tested positive for it.

Figure 24 – Stone

Possible glass working can only be surmised by negative evidence. Roman glass occurs in small amounts across the settlement; this may be chance, or it may have been assiduously collected, either for symbolic or amuletic purposes or for recycling. The near absence of Saxon glass supports the view that most broken glass in *Lundenwic* was carefully collected for reuse, possibly for bead making (Stiff 2001, 43–5; 2003, 246–7) and perhaps for use in other jewellery manufacture (Andrews 1997, 216). While no evidence for this has been found in the main settlement area, three glass working crucibles hint at specialised activity in the Temple area during the 9th century (Butler 2005, 19; Goodburn Brown 2005) and similar evidence has been found in *Hamwic* (Andrews 1997, 216–8).

Hones and burnishers

Stone objects signify both craft activities and trade, as all the pieces are made of non-local stone. For the late Saxon to early medieval period it has been suggested that English hones were used for the initial sharpening of tools, and for maintaining everyday tools, but that fine points and blades were sharpened with hones of imported stone such as Norwegian schist (MacGregor 1982, 79; Goffin 2003, 202). In the Middle Saxon period, however, no hones were imported. The hones of English stone were used for all types of blade, and deep grooves on some indicate use for sharpening needles, awls and the like (cf Riddler 2004b, 54, fig 38.3; Goffin 2003, 197–201; fig 148 <S85>).

<SF49> (Figure 24:2), made of grey siltstone or mudstone, is of interest as it has been used as both a hone and a burnisher. Numerous fine lines on the surface have been made by sharpening needles or other points, but some of these have been more or less removed by its subsequent use as a burnisher: all the undamaged surfaces are highly polished, and some bevelling is evident. The other two Saxon hones from this site, <SF65> (Figure 24:3) and <SF220> are sandstone, which, along with Kentish ragstone, was the most common material used in *Lundenwic* (Blackmore and Williams 1988, 132-4; Williams 1989, 129-31; Goffin 2003, 202; Riddler 2004a, 25). This is also the case at *Hamwic*, where hones of other stone types are from 9th century contexts (Andrews with Phillips 1997, 240). Hone <SF6> was in a Saxon context but its striking regularity suggests it was intrusive, originating in the post-medieval deposits immediately above its found context.

Querns

Use of querns made from English stone is evidenced by a find from the late 8th to mid 9th century occupation phase, but, as in the Roman period, Rhenish lava querns were clearly preferred due to the superior qualities of the stone for the purpose, and they were a major import to *Lundenwic*. This Niedermendig lava (nepheline-tephrite) originates in the Eifel hills, Germany. Most examples from the Royal Opera House site were from contexts dating to after *c* AD730 (Goffin 2003, table 28), but here greater proportion are from earlier levels (Table 6). In terms of fragment abundance (42 fragments from an estimated 18 or 19 querns)

the collection is consistent with assemblages from several other sites in the settlement. It differs in that it includes some extremely large pieces, the like of which have only been found at the Royal Opera House (*ibid*, fig 149) and James Street (Riddler 2004a, 24-5, fig 23).

Form:	Early to mid 8th century (Occupation)	Mid to late 8th century (Occupation)	Late 8th to mid 9th century (Occupation)	Total
Upper stone	2	-	-	2
Lower stone	4	-	2	6
Upper/Lower stone	2	1	-	3
Unknown	1	-	6	7
Total	9	1	8	18

Table 6 – Quern form by phase (estimated number of querns)

Some querns may have been exported from the Rhineland in a finished state, but evidence from sites such as Dorestad (Parkhouse 1976; Kars 1980) and Hebeby (Schön 1995) points to local quern finishing on a large scale. It is therefore likely that at least some lava querns reached England as blanks, to avoid damage in transit, and were finished at workshops closer to the point of distribution (Parkhouse 1976, 185–6; Goffin 2003, 205). This was certainly the case in the 10th to 11th centuries, when such a workshop was operating in the City of London (Freshwater 1996) and unfinished stones were carried on the Graveney boat (Fenwick 1978; Smith 1978). Possible waste from quern dressing has been recovered from Six Dials, *Hamwic* (Andrews with Phillips 1997, 240), and perhaps at Fishergate (Rogers 1993, 1322, fig 640, no.4528), but evidence for such workshops in *Lundenwic* has so far been lacking. Even in the large assemblage from the Royal Opera House site there were no pieces that could definitely be identified as waste (Goffin 2003, 208).

This assemblage contains substantial fragments from some eight unfinished querns from the occupation deposits ranging from the early 8th century to the mid 9th century. Lower stones <SF218> and <SF219> (Figure 25:1 & 2), both from the same pit fill in the early to mid 8th century occupation, show tooling that is not that of a finished quern. They have rough tooling on one side and none on the other, and no evidence for wear. Quern <SF231> (Figure 25:3), from the mid to late 8th century, also has unfinished surfaces. Both it and <SF219> have unfinished central holes with a waisted shape rather than parallel sides. Fragments <SF224> and <SF225>, from different fills of the same late 8th to mid 9th century pit, appear to be from the edge of a large unworked block. These, and other pieces, have roughly tooled surfaces with no signs of wear. The only other direct evidence for the finishing of imported blanks into querns is six small chips, but these could equally be derived from repairs or resurfacing damaged querns, or simply general breakage.

Figure 25 – Querns

Unfinished tooling and unfinished central holes have not been noted elsewhere in England. The collection is therefore of importance as the first real evidence that some querns arrived in *Lundenwic* in an unfinished state throughout the 8th century and possibly earlier. An upper stone from Dorestad has the collar for the central hole but the hole itself is undrilled (van Es and Verwers 1980, 167, fig 120.3). On another Dorestad quern variations in the size of the central hole were attributed to wear (*ibid*, fig 120.2), although, like <SF219> and <SF231> (Figure 25:2 & 3) they may have been drilled from both sides.

Given their absence elsewhere, the broken unfinished querns point towards there having been a workshop for finishing querns on or near the site. Stones that broke during finishing would have had little value, and been discarded. If a workshop was present it was either there for a long time or the examples of unfinished querns in later deposits are residual. Finishing seems to have involved drilling the central hole and tooling the grinding surfaces.

Few of the finished or worn querns have an outer edge, but the measurable diameters are broadly comparable with those from other *Lundenwic* sites (Blackmore and Williams 1988, 133-4; Goffin 2003, 205, tables 26, 27; Riddler 2004b, 54; 2004c, 24). Taken together, the various studies show that that the average quern used in *Lundenwic* was rather smaller than in the later Saxon period, although comparable with the earlier stones from Dorestad (Kars 1980, 410–20; Goffin 2003, 205, tables 26, 27). The identification of upper and lower stones is problematic and although it has been inferred that upper were thinner than the lower, this depends on various factors, and in some cases the reverse may apply. Late Saxon upper stones were often larger in diameter than the bedstones (ibid, 205, 207) but it is currently unclear whether this applies to the Middle Saxon period.

Hemispherical fragment <SF226> (Figure 25:4) is intriguing. It could be an integral handle for rotating the upper stone, but no other examples are known. Similarly, no lower stones are known with a projection that the upper stone fits over. Possibly a projection was left on the surface of the quern to mark the point at which a hole should be bored through, and to give something to grip onto while the preliminary chiselling was carried out. Similar, although flatter, projections have been noted on unfinished querns at Dorestad (Parkhouse 1976, 185, fig 6; Kars 1980, 412).

Bone and antler working

The best evidence of bone working techniques in *Lundenwic* is from the Royal Opera House, where the amount of waste rises from *c* 1.4kg to *c* 4kg and *c* 10kg discarded in the periods *c* AD 600–675, AD 675–730 and AD 730–770 respectively (Blackmore 2003, 302–3, tables 67, 68, Malcolm & Bowsher 2003, 170–5). Even there, however, there were no large dumps of waste of the type found at *Hamwic* (Riddler 2001), where, for example, a late 9th century pit at Six Dials contained 1790 fragments of antler waste including shavings and over 1000 other offcuts (Riddler with Andrews 1997, 228–9). Most finds from the London Transport Museum are from the late 8th to mid 9th century occupation phase (Table 7); while it is unclear how much this is affected by residuality, it fits in with the general increase in the craft noted elsewhere (Leary 2004b, 143–4; Riddler 2005, 63–4). The small quantity, and limited range of offcuts, suggest random redeposition rather than bone working actually on the site. Different bone working techniques are evident, and saw blades with a thickness between 1mm (<SF181> Figure 11:9) and 2mm (<SF189>, <SF194> Figures 11:11, 13) were used.

Form:	Mid 7th to early 8th century (Margins of *Lundenwic* & Midden Spread)	Early to mid 8th century (Occupation)	Mid to late 8th century (Occupation)	Late 8th to mid 9th century (Occupation)	Residual (Post-medieval levels)	Total
Comb		1		3		4
Pin			1	2		3
Spindlewhorl	1					1
Other		2				2
Waste	1	4	1	23	7	36
Total	2	7	1	28	7	46

Table 7 – Worked bone form by phase

This is consistent with the Royal Opera House, where most cuts were made by blades 2mm thick, but a range of 1mm to 2.6mm was noted (Malcolm and Bowsher 2003, 172). The absence of pedicles, burrs and

cranial bone suggests that most of the antler was shed, although fragments with skull attached have been found elsewhere, notably at the Lyceum Theatre site (Riddler 2004b, 55, tables 20, 21).

Parts of four combs were recovered, two just connecting plates, <SF186> and <SF182> (Figure 11:5 & 6) and two with both connecting plates sandwiching double sided toothplates, <SF200> and <SF168> (Figure 11:7 & 8). These are typical of the period (cf Blackmore 1988, 137, fig 38, nos.4, 5; 1989b, 131; fig 45, nos.286-288; 2003b, 310–12; Riddler 2004a, 22–3; 2004b, 53; 2004, 101–2). Incised decoration is present on three of the combs. Needle <SF7> (Figure 11:2), has a roughly rounded head and a round eye, and is one of three made of pig fibulae.

The waste material is all antler (34 fragments) other than a goat horncore and a sawn sheep bone. Some have scooped facet cuts or fine knife marks suggesting that they were tested to gauge whether it had been adequately soaked prior to working (Malcolm & Bowsher 2003, 171). Fragment <SF195> is bleached and slightly flaking, suggesting that it had been boiled (*ibid*, 171). <SF13> (Figure 11:3) has knife cuts and notches from testing, and then was adapted as a functional object. The use of <SF244> (Figure 11:4) is unclear, unless it was used to form linear decoration in pottery. The largest piece, <SF194> (Figure 11:13) is a crown from a mature deer with marks produced by efforts made to detach tines. One complete tine appears to be quite usable, but six more may have been discarded because they are too small, curved or crooked to be useful, or damaged by fighting or subsequent gnawing.

HUMAN BONE PATHOLOGIES – Rachel Ives

Inhumation <B11>
(1) The distal articular surface of the right second metacarpal (hand) displayed a small patch of eburnation, which covered less than 50% of the joint surface (1/4 metacarpal heads present). This change occurs following degenerative breakdown of the protective cartilage in the joint, which allows bone surfaces to come into direct contact during joint movement. With continued joint movement the bone surfaces become eburnated or polished, one of the features of osteoarthritis (Rogers & Waldron 1995, 35-36).
(2) The lower spine displayed Schmorl's nodes. These bony lesions are caused by herniation and expulsion of intervertebral disc material into the surrounding vertebrae following compression of the spine (Rogers & Waldron 1995, 27; Aufderheide & Rodríguez-Martín 1998, 97). Schmorl's nodes often occur in the lower thoracic and lumbar spine (Roberts & Manchester 1997, 107) most likely at the points of greatest load-bearing. Degeneration of the intervertebral discs can occur as a result of increasing age, but may be exacerbated by a range of conditions during life (Roberts & Manchester 2005, 140). Trauma can predispose to such herniations, including falls from a height, heavy lifting, or other strenuous activity (Mann & Hunt 2005, 95). The lesions themselves may be asymptomatic. The superior and inferior aspects of the twelfth thoracic vertebral body (T12) displayed Schmorl's nodes, as did the superior and inferior aspect of the first lumbar vertebra (L1) (2 vertebrae affected/23 observable). The superior surfaces of both vertebrae manifested medium sized-lesions (between 15-25mm in length and/or depth) affecting the anterior margins of the vertebral bodies, with T12 also affected by a second lesion towards the central-posterior aspect. The inferior surfaces displayed slightly smaller Schmorl's nodes (less than 15mm in length and/or depth) at the central-posterior aspect of T12 and anterior aspect of L1.
(3) Intervertebral disc disease (IVD) was evident between the inferior surface of the fifth cervical vertebra and superior surface of the sixth cervical vertebra. Marked pitting and porosity of the bone surface was apparent on the centrum rather than around the peripheral annulus fibrosus of the vertebrae. This condition represents bone reaction to the degeneration of the intervertebral discs, which results in porosity of the articular vertebrae surfaces, often together with osteophyte formation. These changes tend to occur in the mid- to lower cervical vertebrae as well as in the lower lumbar region (Rogers & Waldron 1995, 27).
(4) There is a well-healed fracture in a small (c 6 cm) fragment of rib shaft. Which rib it is cannot be determined, other than it is not an upper rib (1-3). The overall preservation of the ribs is quite poor with high fragmentation. There is slight lateral displacement of the fractured end with minor residual mal-alignment.

The fracture comprises well-remodelled lamellar bone, with slightly rounded edges on the superior and inferior margins of the shaft indicating the residual fracture callus.
(5) The right and left second mandibular premolar and first molar were lost ante-mortem, which in a young adult indicates dental disease.

Cremation <B8>
The surface of a fragment of probable humerus (based on dimensions, shape and thickness of the cortex) is covered by vertical striations. The fragment measures 33mm (superior-inferior) by 11mm (medial-lateral). The striations are evident in the existing layer of lamellar cortical bone rather than as a discrete layer on top of the bone surface. The lines are not indicative of fissure fractures, and contrast with the concentric fissures or cracks on burnt bone. In addition, there is no evidence of warping or abnormal bending in the shape of the bone. The striations do not separate or split the cortical shaft at the broken edges of the shaft fragment, which would be expected had these been caused by the cremation or taphonomic processes. These features are interpreted as evidence of well-healed non-specific periosteal lamellar new bone formation, actively remodelling at the time of death, and well-integrated into the shaft.

Cremation <B9>
A fragment of radius or ulna (indeterminable on the size of the bone fragment) shows a fracture of the shaft, with mal-alignment of the fractured ends, which overlap. The fragment of bone measures 40mm (superior-inferior) by 11mm (medial-lateral). The over-lapping segment comprises lateral, external, displacement of the fractured piece with appositional overlap of 9mm between the two periosteal surfaces. The margins of the bone fragment which overlie the residual outline of the shaft are largely sharp-edged and have been abraded post-mortem. The margins of bone surrounding the overlapped fragment clearly show continuation of the bone shafts, indicating that the bone has not simply snapped or been warped post-mortem, but that a reactionary bone response to the overlapping of bone segments had occurred prior to death. The lamellar nature of the surrounding bone, which bears no evidence of woven bone formation, indicates that the fracture was not immediately before death. The medullary cavity is exposed and there has been post-mortem damage of the endosteal bone surface. However, the longitudinal section through the cortical bone of the fractured shaft also indicates a directional change in outline with external inclination of the bone leading to the appositional fractured portion in contrast to the expected horizontal alignment in a normal shaft.

Cremation <B4> - Adult
A layer of periosteal new bone formation comprising striated and porous woven bone on top of the existing bone shaft is present on a fragment of tibia. The new bone formation is clearly defined although the margins of the layer were still remodelling into the underlying normal periosteal shaft surface at death. The layer of new bone formation measures 7mm (superior-inferior) by 9mm (medial-lateral), although this is not the full extent of the new bone formation.

ACKNOWLEDGEMENTS

AOC Archaeology thanks Wates Group Ltd for funding this work. The authors also thank the fieldwork team: Helen McQuarrie, Christiane Meckseper, Tom Collie, Andy Shapland, Ken Bazely, Helen Robertson, Anna Nunes, Richard Humphrey, Andrew Sergeant, Aidan Taylor, Elizabeth Papworth, Dave Harris, Laura Davies; the illustrator Jonathan Moller; and the finds illustrators Les Capon and Will Spring.

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LIST OF HEADINGS

A Covent Garden 'Hummum' and Brothel: the Post-medieval Remains at the London Transport Museum

Tim Carew and Andy Leonard

With contributions by Ian Betts (building materials), Lyn Blackmore (glass, metal, hone, worked bone), Tony Grey (clay tobacco pipes), Jacqui Pearce (pottery), and Alan Pipe and Kevin Rielly (animal bone)

(c 7000 words)

Introduction

In 2005 the London Transport Museum began works for the addition of a basement to the western gallery of the museum, between Covent Garden and Tavistock Street (Fig 1). This rectangular area covers an area of approximately 430m² (TQ 3042 8085). Evaluation in 2001 (site code CVG 01) had demonstrated survival of post-medieval and Saxon remains so full excavation of the affected area was required (site code LTM 03). The archaeological investigations were undertaken by AOC Archaeology on behalf of Wates Group. The Saxon remains are significant (the earliest cremation burials and pottery found so far in *Lundenwic*, two very early inhumations, and an occupation sequence continuing up to the mid 9th century) and are being published separately (Carew *et al* in prep). The Saxon sequence was truncated by post-medieval buildings, and it is these later remains that are reported here.

Fig 1 – Site Location Plan

The complete set of stratigraphic and specialist artefact reports will be available through the ADS (Archaeology Data Service) website. The physical and documentary archive will be available at LAARC (London Archaeological Archive and Resource Centre).

'the great square of Venus'

The Covent Garden area was largely open throughout the medieval period, being beyond London's city walls, and owned by Westminster Abbey. Braun and Hogenberg's map shows that in 1572 there was a line of houses on either side of the Strand, with gardens running to the north, but the site itself was undeveloped. By the early 17th century pressure on space within the City had become intense, while legal restrictions on development beyond the boundary of the City became less stringent, so the residential area spread to create suburbs on its west, north, and east sides. Even so, only developments reaching certain standards were officially permitted, promoting the creation of elegant houses for the gentry (Clout 1997, 65). However, demand was not just for elite houses, and the attempt to keep the middling and poorer people from building outside the City was ultimately futile (Ackroyd 2001, 104).

Inigo Jones's 1630s Italianate portico buildings of the Covent Garden Piazza were designed to attract the elite, but already by the second half of the 17th century the number of occupants of the highest rank, with titles or holding high public office, fell, to be replaced by less elevated individuals such as artists, tradesmen, and even, probably, lodging house keepers (Sheppard 1970, 82). The social tone of the area took a turn for the worse following the opening of the Theatre Royal in 1663, which bought in numerous pleasure seekers (Rubenhold 2006, 14). The market, established in 1670 and located in the centre of the square from 1705, contributed to the Piazza's inability to maintain its grand pretensions (Sheppard 1970, 82-4). By the 1670s at the latest prostitution was well established in the Piazza and the surrounding area (Rubenhold 2006, 14), and the local economy was centred on entertainment and gratification of all types: drinking, dining, the theatre, and, by no means least, whoring.

Shops and stalls began to appear in the Piazza almost from the start, and cluttered the portico walk (Sheppard 1970, 82-4). The tolerance of this by the Bedford Office, the estate managers, varied over time,

and shops were removed from there in the 1770s (*ibid*). A picture stall displaying obscene prints 'attracting the idle' operated within the portico walk, but may have been the one removed as an 'abominable nuisance' by the surveyor to the fifth Duke of Bedford in 1793 (*ibid*). William Maitland (1756) noted that the buildings had formerly been inhabited by 'Persons of the greatest Distinction' but were 'now obliged to take up with Vintners, Coffeemen, and such other Inhabitants'. Other businesses were also being run from the houses, and coffee houses were present from the 1720s. These flourished in the second half of the 18th century, and were patronised by famous artists, actors, and writers (Sheppard 1970, 83). The most famous establishments were the Bedford Coffee House and the Piazza Coffee House, with their association with David Garrick, Dr Samuel Johnson, Samuel Foote, and the rest of the hard-living artistic and intellectual set (Rubenhold 2006, 42). Most notorious was the Shakespear's Head Tavern near the north corner of the Piazza, one of the best known brothels in London. There, as at many other inns, the waiters operated a more profitable side-line as pimps (*ibid*, 27-8).

In 1776 the Society for the Reformation of Manners (ie morals) claimed that Covent Garden:

> 'is the great square of VENUS, and its purlieus are crowded with the votaries of this Goddess. One would imagine that all the prostitutes in the Kingdom had decided on this neighbourhood … . The jelly-houses are now become the resort of abandoned rakes and shameless prostitutes. These and the taverns afford an ample supply of provisions for the flesh; while others abound for the consummation of the desires which are thus excited. For this vile end the bagnios and lodging-houses are near at hand.' (Burford 1986, 192; Hampden 1940, 334).

The first 'bagnio' (from the Italian 'bagno', bath) in London, called the Hummums, was established in 1683 near to the site on the north-east side of the Piazza (Sheppard 1970, 82-4), within the area now occupied by the London Transport Museum (Burford 1986, 22-3) (Fig 1). The name was derived from the Arabic word 'hammam', meaning bath, and the term 'hummum' became generic. They were Turkish baths, but also normally licensed for the sale of tea, coffee, and alcohol, and provided lodgings. Unsurprisingly, given the prevalence of prostitution in the area, they soon illicitly functioned as brothels as well. Over time the word 'bagnio' came to mean brothel, and while the term is now obsolete modern dictionaries give its meaning as both Turkish bath and brothel. A caricature from 1787 (Fig 2) shows three prostitutes, the "Retail traders not affected by the shop tax", in the doorway of a bagnio. The note in the window reads "For the benefit of the Dowager Eve, this & every evening by permission of their Worships, such things are."

Fig 2 – 1787 Caricature of Prostitutes at a Bagnio

Another service provided by bagnios was rooms to rent for the night, or less, with no questions asked. In Hogarth's 'The Bagnio', the fifth painting of the 'Marriage à-la-mode' series, the story has moved to a bagnio where the wife, the Countess, has been with the lawyer Silvertongue. The unmade state of the bed leaves no doubt about the circumstances. The husband, the Earl, has burst in on them, but then has been mortally wounded by the lover who has dropped his bloody sword on the floor and is seen escaping by the window. The proprietor and the watch have been bought to the door by the noise. Drops of mercury on the floor refer to syphilis, and broken furniture emphasises discord. The establishment chosen by the lovers for their tryst is clearly very comfortable even if it is not reputable; the room is richly furnished, with paintings and a tapestry. A bill on the floor identifies it as an actual bagnio, the Turk's Head Bagnio in Bow Street, Covent Garden.

In the 1770s there were at least three hummums on the Piazza alone (Sheppard 1970, 82-4), with an unknown number in the surrounding streets. In 1769 a fire started in Mr Bradley's distillery spread and destroyed 'Lovejoy's bagnio', 'Mr. Rigg's hummum', a 'great part of the Bedford Arms Tavern' and other properties, causing part of the Piazza frontage to collapse (Annual Register 1800, 83). The colonnade was lost between Russell Street and the eastern corner of the Piazza due to this fire. In some 19th century maps the eastern corner of the Piazza was even labelled 'hummums' rather than the more usual 'Little Piazza' (MacLauchlin n.d.).

The hummums continued to trade in this way for most of the 18th century, and, while prostitution was theoretically illegal, in practical terms the attempts to curtail the libertine lifestyle of the area were at best sporadic. The several Societies for the Reformation of Manners, who drew much of their support from the emerging middle classes, were the most prominent opponents of the laissez-faire attitude of the state towards morality (Burke and Selfe, 222). The first of these was started in 1692, and they actively tried to suppress activities they opposed by gathering information on malefactors and passing it to the magistrates, or even bringing prosecutions themselves (Barker-Benfield 1996, 57). John Gonson, Justice of the Peace and Chairman of the Quarter Sessions for the City of Westminster for 50 years in the early 18th century, was a supporter of the Societies and an enthusiastic raider of brothels, passing harsh sentences: he is depicted twice in Hogarth's 'A Harlot's Progress'. The Societies were also responsible for organising a series of raids against homosexual brothels, "molly houses", in 1725.

Nonetheless it was only towards the turn of the 19th century that attempts to prohibit, or at least control, the sex industry achieved greater support and became more systematic, in line with the increasingly moral tone of the times (Barker-Benfield 1996, 58). In 1787 George III issued a 'Proclamation for the Encouragement of Piety and Virtue, and for the Preventing and Punishing of Vice, Profaneness, and Immorality' following a campaign by William Wilberforce (Barker-Benfield 1996, 58). The Bishop of London responded and led a 'great number of Gentlemen of the Highest Rank and Estimation' to put this into effect (Rubenhold 2006, 312). Even the publishers of 'Harris's List of Covent Garden Ladies' were put on trial, and the last edition was withdrawn from sale in 1795 (Rubenhold 2005; 2006, 312). This annual guide book to the area's prostitutes was an instant success on its inception in 1757 (Rubenhold 2006) by salaciously detailing the women's looks, addresses, prices, sometimes the services offered or specialities, and their history of sexual disease if this was poor. The rakish tone and colourful style of Harris's List contributed to its popularity, in addition to its evident usefulness to prospective clients, and it became virtually an institution (Rubenhold 2006).

The hummums adapted to the changed spirit of the age, as well as the increasingly hostile legal environment for brothels, by turning into more respectable hostelries. By 1887 it was possible for George Augustus Sala to publish a pamphlet titled "The Old Hummums Made New Again: A Retrospect and Description of the Most Historical Hostelry in Covent Garden" (Sala 1887). The 'Hummums' had become the 'Old Hummums' by this time. This pamphlet eulogised hummums and particularly this one, on the occasion of its rebuilding after another fire. The content now seems absurd – "the most sacred place on earth" – but the institution clearly was considered special to many people at that time. Even so, by this time the hummums were in decline, and disappeared completely in the early 20th century. The Hummums features in a number of literary works: MacLauchlin (n.d.) argues that the bathing aspect of the hummums makes them symbolise renewal and transformation in a literary context. In the 'Life of Samuel Johnson' Boswell (1791) has Johnson tell the story of Parson Ford, who haunted the Hummums after dying in a bedchamber there. At this time the moral connotations were clear to the reader. Boswell's story also connects the Hummums to Hogarth's 1733 scene of drunkenness and debauchery 'A Midnight Modern Conversation', although other locations are now also suggested. Thackeray (1847-8) has Osborne visit the Hummums baths the night before his wedding in Vanity Fair. When it was published only the more knowing of his readers would probably have registered the place's lewd connotations, although Osborne's faithlessness to Amelia is made explicit elsewhere in the novel. Dickens (1860-1) has Pip stay there in Great Expectations: by this time it is respectable enough for the young middle class hero, even if, in fact, the novel is set some decades before.

Prostitution in the Neighbourhood of the Site

A number of hummums and brothels are recorded in the vicinity of the site, and had prostitution not been illicit there would arguably have been many more references.

Harris's List includes 'Miss Phyllis: a Fine Crummy plump-made Dame, a veteran in the Mysteries of Venus, whose chief Trade is with elderly Gentlemen...the Waiter at Maltby's Bagnio sends a note to her in Tavistock Court' (Burford 1986, 225). An establishment run by Mr Carroll on Tavistock Street employed Miss Smith, said to be 'Cold as Ice itself' (*ibid*, 210). Also on Tavistock Street was a discrete 'House of Intrigue' run by

sisters Anne and Eleanor Redshawe between 1743 and 1750, which had a clientele of wealthy married women who arrived in disguise (*ibid*, 228). The Westminster Sessions Register for May 1737 shows that Mrs Elizabeth Cooper, a widow of Tavistock Street, was sent for correction for keeping a disorderly house, amongst other matters (*ibid*, 117). Her daughter, Lucy Cooper, was a highly successful and famous high class prostitute, whose charms merited the greatest acclaim, but who nevertheless died in deepest poverty in 1772 (*ibid*, 121).

In 1773 George Carpenter lived in Tavistock Court, a short distance from his business, Carpenter's Coffee-House in some of the sheds that occupied the east corner of the Piazza at the time (Burford 1986, 85-6). This was a highly disreputable establishment frequented by thieves and women available for a wide range of prices. It was one of a handful of rough drinking places open all night that men went to, drunk, once other taverns and coffee-houses had closed, and consequently also known as 'The Finish' (*ibid*).

Immediately to the north-west of the site, in a house on Tavistock Row facing onto the Piazza, Betty Careless opened a little bagnio around 1729 under the name of Mrs Elizabeth Biddulph (Burford 1986, 78). At that time she was one of London's most successful courtesans, but was less capable as a businesswoman, being financially ruined by 1735 and dying in the poorhouse of St Paul's Covent Garden in 1739 (*ibid*, 78-9). Burford (1986, 18) asserts that 'at one time every house in Tavistock Row was a brothel'.

The eastern corner of the Piazza, adjacent to the excavation site and now part of the London Transport Museum, housed the Bedford Arms tavern which operated a brothel in the upper rooms (Burford 1986, 112). The earliest indication that it was disreputable is that the lessee between 1710-27, William Luffingham, was 'assisted' by Mary Furness, who had spent time in prison for disorderly conduct. The sexual activities of the Bedford Arms feature in two mid 18th century poems, the *Covent Garden Satyre* (Legg 1756) and *The Meretriciad* (Thompson 1761), and the brothel continued to trade there until the end of the century (Burford 1986, 116).

Next door to the Bedford Arms, to the north-west, was the Old Hummums, and next to that was Mr Rigg's hummum. Beyond, to the north-west, was Lovejoy's Bagnio, one of the area's best known brothels. It was not at the top end of the market although Harris's List for 1764 stated that the dancer Nancy Dawson and courtesan Polly Kennedy, both famous demimondaines, were available there (Burford 1986,124-6).

Further north-west, above Mr Bradley's distillery on the corner of the Piazza and Russell Street, Mrs Elizabeth Gould operated a sophisticated French style seraglio from 1759 (Burford 1986, 22-3; 185-94). Before this the rooms had been part of Lovejoy's. Mrs Gould catered to rich merchants and gentry in a luxurious, discreet, and low-key style, without the raucous behaviour found elsewhere (*ibid*, 187). Such elegance came at a cost; the 1763 edition of the *Memoires of the Bedford Coffee House* (Anon 1763) says that the overnight price for one of the ladies would be more than twice that at the Bedford (itself over £5), and the bill would then be inflated by the addition of a string of extra charges. Mrs Gould moved her business elsewhere after the 1769 fire: by this time all of the other luxurious pleasure haunts patronised by the nobility and gentry had followed their clientele to the more fashionable St James's, where they were known as the 'nunneries' (Rubenhold 2006, 219-20; 229-48; Burford 1986, 223-37).

The sex industry therefore dominated economic and social life in the streets around the site in the 18th century and more widely in Covent Garden. The physical evidence gathered during the London Transport Museum excavation, detailed below, indicates that the houses on the site were not ordinary domestic dwellings for much of this period, but instead were a business or businesses providing up-market entertainment of some sort. In the context of what is documented about the area, the proposition that the business was prostitution, or largely prostitution, seems the most reasonable interpretation of the evidence.

The Buildings

The Piazza was built behind Bedford House, one of the mansions on the north side of the Strand which was built for the third Earl of Bedford in c. 1586 (Sheppard 1970, 205-207). In the original design, the south-east side of the Piazza was left open, and this area initially remained as the gardens of Bedford House. A map of the Parish of St Paul, dated 1686, shows that the site is on the north corner of the area that was still open at that date (Fig 3). The 5th Earl and 1st Duke died in 1700, and in 1705–6 Bedford House was demolished and its site and gardens were laid out for building (Sheppard 1970, 205-207). Tavistock Street was laid out in this development, and runs parallel to the Strand, with what was originally Nos. 32-34 occupying the south-east half of the site. Tavistock Court, which now no longer exists, was also laid out, with No. 4 occupying the north-west half. This was a narrower side street that ran between Tavistock Street and a point near the east corner of the Piazza (Sheppard 1970, Fig. 32, 208). Rocque's map of 1746 shows Tavistock Street and Tavistock Court, with Southampton Street passing through what had been Bedford House (Fig 4).

Fig 3 – 1686 map of the Parish of St Paul

Fig 4 – Rocque's map of 1746

The 1705-6 development was the only major phase of post-medieval building work present on the site, although limited internal alterations were evident. These buildings were demolished in 1856-61 by the Bedford Estate, when the east corner of the Piazza was renovated to ease congestion and to extend the flower market. The rubble infilling the basements was produced during this demolition.

A major structural wall, (3) (Fig 5), crossed the centre of the site from south-west to north-east. This seems to match the division of properties on a 1795 lease plan of Bedford Ground, and is interpreted as the division between the basements of properties fronting onto Tavistock Street and those fronting onto Tavistock Court. To the north-west a parallel wall, (2), may also be a party wall. Perpendicular to this, running off to the north-west, is a substantial wall, (1), with three buttresses on its north-east side. Area E was probably outside the building, although the site had been truncated to well below the contemporaneous surface. An arched brick structure, (9), of unclear function, ran between Wall (2) and the north-western of the buttresses, underneath the other two. The drainage layout, (Fig 6), is consistent with Walls (1), (2), and (3) defining the limits of properties.

Fig 5 – The Buildings

Fig 6 – The Drainage

In the property to the north-west of Wall (2) the basement consisted of rooms A to D. The floors in Rooms A to C had been robbed; in these and other rooms on the site this was probably done for reclamation during the mid 19th century demolition of the buildings. Between Rooms A and B, at the south-east end of the partition, was an arched brick structure leading to a stone grate, (6), worn smooth by drainage water. A brickwork alcove in the east corner of Room B, (8) (Fig 9), resembled several other alcoves on the site (below): all were inserted into the original building, and none showed signs of burning. Room D had a tiled floor, and a vertical flue, (7), had also been inserted into its north corner (Fig 7). This contained ash and burnt material, and several stoneware inkpots, 'penny inks', had been left in it when the buildings were abandoned (Fig 8.4). Its depth relative to its limited width shows that it was not a fireplace, which would be unlikely anyway in such a small probably windowless basement room. Flue (7) also resembled other flues found on the site, all of which were alterations to the building.

Fig 9 – Brick alcove (8) (photo)

Fig 7 – Flue (7) (photo)

Fig 8 – Pottery (Group photo)

To the south-west of Room A were two brick structures, (4) and (5) (Fig 10), which extended beyond the south-west limit of excavation. They were not physically connected to the rest of the basement of this property, due to truncation of the remains, but they were on the same alignment. The mortar used in them, which was harder than that used elsewhere in the basements, indicates that they were later in date, although the brick samples from them were early, 1500-1666; this is presumed to be due to the reuse of bricks from elsewhere. Structure (5) had one of the alcoves, with no burning apparent.

Fig 10 – Brick alcove (5) (photo)

In the property between Walls (2) and (3), one vaulted ceiling spanned Rooms F and H and another spanned Room I, with thick walls supporting both vaults, suggesting that these areas were originally for storage, and that the floor above here had considerable weight. The bricks sampled from the vaults again date to 1500-1666, before the 1706 construction date. Room F had a low, flimsy wall, (10), separating off its south corner, possibly for temporary storage of waste material; the reddish sandy silt within it differed from the demolition backfill above. The entrance at the north end of Room H had been blocked by a wall, but possibly not to its full height. At its south-east end another vertical brick flue (11) had been inserted. In Room I the tiled floor had been replaced with brick near the entrance, probably due to higher wear there. Part of the tiled floor of Room G had been left, and at the north-east end the tiles had been replaced by brick to make a ramp into Room J. Room J had a brick floor and there was a curved structure in its east corner, (12), sunk 0.3m below floor level with brick sides and tile base. A drain fed this structure from its north side, and to the south-east a hole had been punched through the wall to Room K to drain it. Whether or not the waste water then flowed into nearby brick soakaway (20) (Fig 6) was not demonstrated. Plaster with a white coating in several of these rooms may have been used to help keep the cellar dry, or to help improve light levels.

The rooms were larger in the property or properties to the south-east of Wall (3), suggesting that the houses fronting onto Tavistock Street were more prestigious than those fronting onto the more minor Tavistock Court. Room L had two vertical brick flues in its northern corner, (13) (Fig 11) and (14), next to another alcove structure, (15). All of these had been added after the original build, and the two flues were different builds, making the second a replacement, or possibly an addition. These flues were also very close to Flue (11) in Room H, but it is not clear whether this was coincidental or not. A structural wall, (3), separated them, but holes could have been knocked through this to join different part of one system. The south-west wall of Room L was not solid, but rather the weight was carried by three pillars, with gaps between them. It is not clear whether this arrangement was part of the original structure or was a modification, but it may be that fuel, presumably coal, was dropped down from street level into the area outside the south-west limit of excavation, and brought into Room L via these gaps.

Fig 11 – Flue (13) (photo)

Another brick structure with an alcove, (16), had been added to the northern corner of Room M. In this instance, like Structure (5), no evidence of a flue beside it remained. In the east corner the original tile flooring had been replaced by brick. At the south-east end of Room N a curved brick structure (17) overlay Soakaway (22), and fed it.

The three room structure in the eastern corner of the site appeared to be separated from the rest of the buildings, but that may have been because truncation was more severe in the south-east half of the site and these remains were more fragmentary. The pattern of the drainage system (Fig 6) makes it more likely that the structures to the south-east of Wall (3) were a single property, rather than two. No sewerage deposits were found, and the drains within the site seem to have been for waste water. The north-west wall of this separate structure had evidence of repair or modification, while its south-west wall was on a different orientation to the others on the site. Next to each other in the northern corner of Room P were another flue, (19), and inserted brick structure with an alcove, (18).

The distinctive feature of the structural remains is the insertion of the vertical flues and the brick alcoves into all three of the properties. These are interpreted as part of the heating system of a hummum, although there is nothing diagnostic about them that would rule out the possibility that they are standard kitchen fittings. The flues are not unusual for houses of this period, and they are similar to flues for kitchen ranges. Neither are the alcoves unique.

The interpretation as a hummum heating system is preferred for several reasons, in addition to the prevalence of hummums in the area. Firstly, the artefact assemblages across the site, especially those that date before the demolition, contain few items from kitchens (see below). Therefore these rooms do not appear to have acted as the domestic service areas for residential houses or businesses. Secondly, the pattern of inserted flues and alcoves is very similar across the excavation area, as are the features themselves. This gives the impression of being part of a single scheme, rather than representing independent modifications to the kitchens of three different houses. Thirdly, the number surviving, five flues and five alcoves, seems high within the restricted excavation area, and the total heating capacity represented by the remains seems to be greatly in excess of the likely demands, had the buildings been in residential use. On the other hand it is possible this is a function of the property divisions.

As there was no burning in any of the alcoves they were not fireplaces, despite their shape in plan. All the flues were near alcoves, which implies that the alcoves were related to the heating system. Iron stoves could have been housed in them. No flues were found next to Structures (5) and (16) but this might be a question of survival.

Presumably water, or conceivably steam, carried the heat generated in the basement up to a floor above, where the Turkish baths themselves would have been. The details of the heating system within the hummums remains conjectural on the evidence, but the scale of it is apparent. Excluding the Roman period, domestic central heating systems were not used until many decades after the first hummums. By 1784-5 James Watt used piped steam to heat the room he worked in, while his associate Matthew Boulton installed a system using hot air in the late 1790s to heat his home, Soho House in Birmingham (Morriss 1990, 103). This is the earliest known for a whole house, and used a stove with a totally enclosed fire, called a cockle (ibid, 105). This system used hot air, so involved the complications of using a heat exchanger and having a sufficient column of air for it to draw.

The Artefacts

Only three post-medieval deposits on the site can be ascribed a date before the 1856-61 demolition of the buildings with any confidence, two of which were within brick-lined soakaways.

Soakaways (21) and (22) (Fig 6) were part of the drainage system of the property at the south-east end of the site. The assemblages within them had similarities. Both had a wide date range: the earlier objects are fine Chinese porcelain (Fig 8.7, 10-13) and a few more common domestically produced items; the later ones are standard British ceramics. The *terminus post quem* is during the 1780s for Soakaway (22) and in the 1820s or 1830s for Soakaway (21), but in both cases the earlier objects date to around the 1730s. Clay tobacco pipe in Soakaway (21) dating to 1700-1740 would almost certainly not have been in circulation for long before deposition. Sporadic deposition in these soakaways over many years from about 1740 is likely, but either the different events could not be distinguished during the excavation, or the layers had became mixed in the past. The Chinese porcelain was bought well before the market for it peaked, and it would have been very expensive and exotic. It demonstrated a refined taste and would not typically have been present in a middle-class townhouse. Another similarity in these assemblages is an emphasis on alcoholic drinks, dining, and hot beverages.

Soakaway (21) contained one of the larger assemblages of pottery (50 sherds) and of glass that was recovered from the post-medieval horizon, in addition to building material and other dumped rubbish. The

earliest pottery consists of a quantity of Chinese export porcelain decorated in underglaze blue. Two pieces, a dish decorated with lotus, millet and other flowers and a fine, small teabowl with flower sprigs, were made during the first quarter of the 18th century (Kangxi period 1662–1722) (Jean Martin and Cyril Beecher pers comm). Another two, a large plate with floral patterns and a dish decorated with lotus and chrysanthemums were probably made during the second quarter or mid 18th century (Jean Martin and Cyril Beecher pers comm). The latest piece of Chinese porcelain is a saucer dish in 'willow pattern' style, dated to the late 18th century.

Some of the objects of domestic manufacture are not closely datable, such as the chamber pots, a stool pan (for a close stool or commode) and a redware flowerpot. The major late 18th to early 19th century earthenwares are represented: creamware, pearlware, refined white earthenware, and bone china, and most of these items are tea and table-wares, as is typical. Two tin-glazed plain ointment pots have pedestal bases, a common form, and another small ointment pot is made in creamware. The assemblage contains a shallow moulded polygonal glass salt with a star pattern cut into the base (Fig 12.8), short-stemmed goblets or rummers (Fig 12.5-6) from the late 18th to early 19th century, a beaker (Fig 12.7) dating to c. 1720-40, and a cordial glass (Fig 12.4) of the 1760s. A large bottle was probably for some form of medical preparation, and a small glass stopper with a hollow spherical head probably came from a perfume bottle. The base of an onion bottle with high domed kick is one of the earlier domestically made items. Dating to the 1820s to 1830s, a transfer printed ware plate is decorated with a farmhouse and barn in mountainous countryside in underglaze black, with the Prince of Wales' feathers and motto 'Ich Dien' on the border (Fig 8.6), and a slops bowl shows sheep-shearing (Fig 8.8). A drain connected to Soakaway (21) contained a clay tobacco pipe also decorated with the Prince of Wales' feathers (Fig 13.1).

Fig 12 – Glass vessels and small bottles (drawing)

Fig 13 – Clay tobacco pipes (drawing)

Soakaway (22) had a similar sized assemblage, with 41 pottery sherds, with a high proportion of good quality decorative wares. The valuable early items include three rare and fine Chinese porcelain teabowls from a set that dates to 1700-25 (Jean Martin and Cyril Beecher pers comm) (Fig 8.10, 8.12, & 8.13). They have a celadon greenish glaze, '*anhua*' or hidden decoration lightly incised on the outer surface under the glaze (Fig 14.1 & 14.2), dark brown rims, and simple floral motifs inside and *lingzhi* fungus and chrysanthemum marks on their bases in underglaze blue (Fig 15.1 & 15.2). Another Chinese porcelain teabowl (Fig 8.7) of the same date (Jean Martin and Cyril Beecher pers comm) in the *Dehua* style has fish and other motifs (Fig 14.3) and a devolved conch shell mark on its base in underglaze blue (Fig 15.3). The latest Chinese piece is the neck of a porcelain 'guglet' (Fig 8.11), a bottle for water for washing hands that made a glugging sound when poured. This is probably from 1760-1780, but possibly as early as the 1730s (Jean Martin and Cyril Beecher pers comm). Several other Chinese vessels also date to the early to mid 18th century. Four nearly complete inverted, slightly marvered wine bottles (Fig 16.1-4) and parts of three others date to the 1730s. A complete small, plain white drug jar or ointment pot is a long-lived type current from the mid 17th well into the 18th century. A capuchine or small handled cup would have been used for coffee. More prosaic earlier items include a chamber pot and some plain bowls made up to c 1725.

Fig 14 – Chinese porcelain teabowls (drawing)

Fig 15 – Chinese porcelain teabowl marks on base (drawing)

Fig 16 – Glass bottles (drawing)

Mid 18th century objects indicating high living include a stemmed glass probably for the liqueur Ratafia (Fig 12.3) dating to the 1740s in clear leaded glass with simple flutes, a complete jelly glass (Fig 12.1), and a floral decorated tin-glazed punch bowl. Ratafia is a liqueur made from peach or cherry kernels or bitter

almonds, and in the 18th century was said to be particularly favoured by prostitutes in bagnios (Hallie Rubenhold, pers comm). A large eggcup in creamware may have been for duck eggs, and is mid to late 18th century. A very rare small greenish tin-glazed spittoon or 'spitting pott' (Fig 8.2) is in the form of an undersized chamber pot with a strap handle, but with a tubular spout for emptying and a non-spill rim with a small hole. The more common larger forms were in stoneware or another of the stronger fabrics and used communally in places such as taverns. Spitting was very common at this time, and while this is partly due to tobacco consumption it should be noted that one of the side-effects of mercury used to treat syphilis is profuse salivation, as it is toxic to the saliva glands. The treatment was known as 'salivation' or the 'salivary cure', some doctors believing that this washed out the syphilitic poison (O'Dowd & Philipp 2000, 228). One of the few coarseware items was a large deep oval redware pan used for salting meat in brine. These are surprisingly uncommon in excavated samples in London, given how important this process was before refrigeration.

Deposit (23), in a depression or cut in the ground surface between the two drainage systems in the south-east end of the site stratigraphically pre-dates the demolition. It was over one of the Saxon wells (Carew *et al* in prep), the fills of which may have compressed down following the post-medieval re-occupation. Masonic (Fig 13.2) and abolitionist (Fig 13.3) clay tobacco pipes dating to 1780-1820 indicate the most likely period of deposition. There is a history of Masonic activity in Covent Garden from the 18th century, with a number of taverns used for lodge meetings. The abolitionist pipe is unusual and has motifs of Britannia and a grateful freed slave, after the emblem of the Society for the Abolition of Slavery. This deposit had the largest group of glass, including a number of dressing table or medicinal items: a near complete small purple oval bodied perfume bottle with raised decoration (Fig 12.11), probably 19th century; two bottles that possibly contained some form of pharmaceutical liquid, oil, or perfumed water, one rectangular with bevelled corners and the other a small long-necked bottle or flask (Fig 16.8), and a number of other fragments of bottles or phials. Also present were a large bone assemblage, metal, and pottery, including a creamware miniature saucer (Fig 8.15) and several coffee cups.

The outstanding item from the 1856-61 demolition material and other deposits is a small hexagonal Chinese *blanc de chine* porcelain beaker that would have been bought in the early 18th century (Jean Martin pers comm). The pure white was highly desirable and of very high quality, and few examples have been excavated in London. Also present are a transfer printed ware dish with the ubiquitous willow pattern (Fig 8.9), a stoneware porter bottle with a stamp and a marked imperfection (Fig 17), a stamped stoneware spirit bottle (Fig 18), smaller bottles in London stoneware (Fig 8.1), and a mustard pot with an inscription in French (Fig 8.3). The glass includes a sherry glass (Fig 12.2), another possible Ratafia glass, an octagonal sauce bottle (Fig 16.6), a glass condiment jar (Fig 12.9), a residual large wine bottle (Fig 16.5), and the neck of a mould blown bottle (Fig 16.7).

Fig 17 – Porter bottle

Fig 18 – Spirit bottle

A number of items in the demolition material came from the dressing table. A transfer printed ware toilet box has three compartments, marked 'Greek' on its base (Fig 8.5). One of the two bone china cylindrical jars has gilded bands top and bottom, and a bone china cosmetic pot has overglaze painted rosebuds. Three residual cylindrical tin-glaze jars probably were for pharmaceutical or cosmetic preparations, while two ceramic pot lids are marked 'Cold Cream' (Fig 8.14). There is also a medium-sized narrow colourless glass phial (Fig 12.10), and a hair oil bottle, inscribed 'The original and genuine [R]owland's [M]acassar Oil No20 Hatton Garden London' (Fig 12.12). Relatively little pottery came from the kitchens, which may have been elsewhere.

Conclusions

In the original build in 1706 the basement rooms were intended for storage and similar functions, but had no apparent heating facilities. At some date they were probably converted to house a heating system for the floors above. Although the excavation area covered what had originally been three properties, on balance it is more likely that by that time it was all under one management, rather than being three separate small hummums.

The material culture of the post-medieval remains has clear connotations: luxury and high living. The function of many of the items is for drinking and dining, while the style and quality is frequently tasteful, exotic, and expensive. It paints a picture of opulence befitting an up-market business catering for pleasure-seeking men with funds at their disposal. Toiletries and medicines are also well represented in the assemblage, and while these are common in domestic contexts, the number of them at this site is consistent with the property being an up-market brothel.

The date that the hummum was operating unfortunately remains uncertain. The structural remains tell us only that the heating system was inserted into the building after it was built around 1705-6. The dates of the Chinese ceramics imply it was active between the 1720s and 1750s, but it may have been in business after this, or even before, and not catering to quite such a well-heeled and discriminating clientele. This implies that the conversion of the basement rooms is likely to have been done by the 1720s.

The libertine and sex industry sub-culture of 18th century London is well-known to historians and in literature, but this is believed to be the first instance of archaeological evidence relating to it. It enhances our picture of diversity within the city and society at this date, and illustrates a particular sub-culture within 18th century society.

The material remains of crafts, manufacturing or commerce can often be detected archaeologically, and can associate a specific trade with an area. For example bone or metal working leave plentiful waste products that can identify a workshop. Trades that do not involve manufacture are inherently harder to demonstrate. In these cases the physical evidence will normally need to be combined with documentary evidence to produce a substantive case.

For example, the early modern Inns of Court in London had a distinctive material culture (Haslam *et al* 2009; Butler 2005; Matthews & Green 1969) with candlesticks and inkpots strongly represented, due to the work being undertaken, and featuring particular ceramics. The dining and drinking ceramics, believed to be from the Hall, are often antiquated in form for the time, which, it is suggested (Haslam *et al* 2009, 73-4) consciously reflects the sense of identity and tradition at the Inns.

Also it is known that privateers (sailors acting privately but licensed to attack enemy vessels) were resident in Narrow Street, Shadwell, east London in the 17th century (Killock *et al* 2005). Excavation there has produced exotic artefacts from an extraordinary range of places, which were almost certainly bought there as booty that had been captured from foreign shipping (*ibid*).

As at the London Transport Museum site, the physical evidence from these excavations would have been hard to interpret properly in the absence of background information about the area. However, with that information the physical evidence adds substantially to the picture of daily activities.

Acknowledgements

AOC thanks the London Transport Museum for generously funding and supporting the project. The authors thank those who worked on the site: Helen McQuarrie, Christiane Meckseper, Tom Collie, Andy Shapland, Ken Bazely, Helen Robertson, Anna Nunes, Richard Humphrey, Andrew Sergeant, Aidan Taylor, Elizabeth Papworth, Dave Harris, Laura Davies, and Jon Moller for the illustrations. The authors are grateful to Hallie Rubenhold and Dan Cruikshank for their help and advice.

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LIST OF HEADINGS

Fig 1. Site Location Plan

Fig 2. 1787 Caricature of Prostitutes at a Bagnio

Fig 3. 1686 map of the Parish of St Paul

Fig 4. Rocque's Map of 1746

Fig 5. The Buildings

Fig 6. The Drainage

Fig 7. Flue (7) (north-east facing)

Fig 8. Pottery. 1: London stoneware small bottles; 2: Spittoon in greenish glaze; 3: Mustard bottle, inscribed 'Moutarde de MAILLE; Vinaigrier du Roi de LL.; MM le Roi d'Angleterre; et les Empereurs; d'Autriche et de Russie; a Paris'; 4: London stoneware inkpots; 5: Transfer printed ware toilet box with three compartments, marked 'Greek' on base; 6: Transfer printed ware plate with landscape scene; 7: Chinese porcelain teabowl, 1700-25, *Dehua* style (devolved conch shell mark on base); 8: Transfer printed ware bowl, with a man shearing a sheep; 9: Transfer printed ware dish with willow pattern; 10, 12-13: Chinese porcelain teabowls, 1700-25, celadon greenish glaze (with external *anhua* decoation and *lingzhi* fungus and chrysanthemum marks on base); 11: Neck of a Chinese porcelain 'guglet' bottle, c 1750; 14: Transfer printed ware pot lid for 'Cold Cream'; 15: Creamware miniature saucer

Fig 9. Alcove (8) (north-east facing)

Fig 10. Alcove (5) (south facing)

Fig 11. Flue (13) north-west facing)

Fig 12. Glass Vessels and Small Bottles. 1: Jelly glass; 2: Sherry glass; 3: Ratafia glass; 4: Cordial glass; 5-6: Rummers; 7: Beaker; 8: Salt dish; 9: Condiment jar; 10: Phial; 11: Perfume bottle; 12: Hair oil bottle, with 'The original and genuine [R]owland's [M]acassar Oil No20 Hatton Garden London'

Fig 13. Clay Tobacco Pipes. 1: Prince of Wales; 2: Masonic; 3: Abolitionist

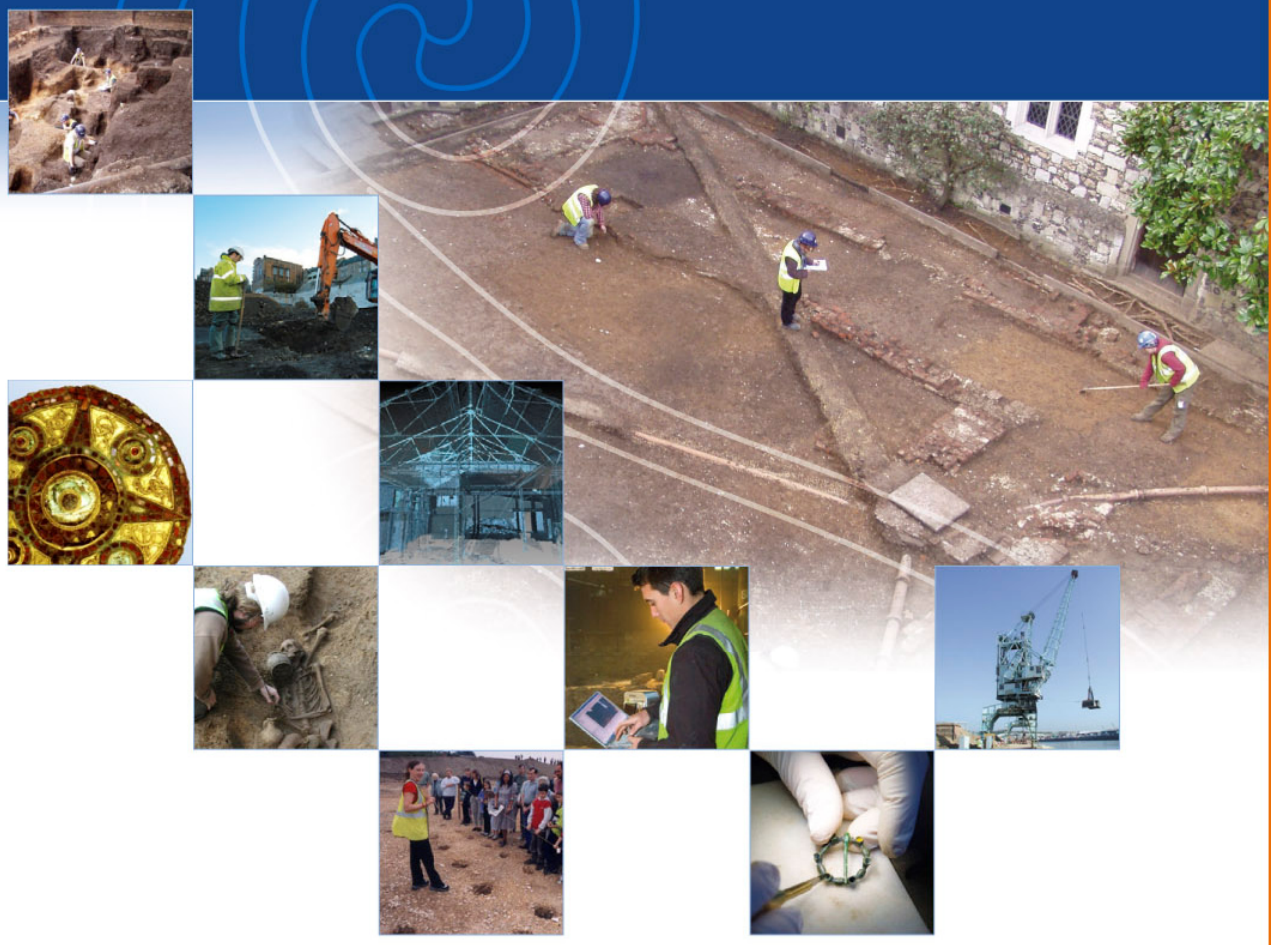
Fig 14. Chinese Porcelain Teaowls. 1-2: Teabowls, 1700-25, with external *anhua* decoation; 3: Teabowl, 1700-25, *Dehua* style (devolved conch shell mark on base)

Fig 15. Marks on the Bases of Chinese Porcelain Teaowls. 1: *Lingzhi* fungus; 2: Chrysanthemum; 3: Devolved conch shell

Fig 16. Glass Bottles. 1-5: Wine bottles; 6: Sauce bottle; 7: Mould blown bottle neck; 8: Flask neck

Fig 17. London stoneware porter bottle, with stamp ‘Mumford 17 Coppice Row’

Fig 18. London stoneware spirit bottle, with stamp ‘W Walter Spirit Warehouse 75 Drury Lane’



AOC Archaeology Group

AOC Archaeology Group, Unit 7, St Margarets Business Centre, Moor Mead Road, Twickenham TW1 1JS
tel: 020 8843 7380 | **fax:** 020 8892 0549 | **e-mail:** london@aocarchaeology.com

www.aocarchaeology.com