



Fig. 1: distribution of small box flues

London's earliest Roman bath-houses?

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Introduction

In a recent article, I defined and examined the dating evidence for four types of small box flue from Roman London.¹ This article examines the distributions of those tiles and some other specialised types in use in 1st-century London.

The tile forms in this study have been selected because they are thought to have been in use in the mid-1st century AD in hypocausts or bath-houses. Included are the small box flue tiles, *parietales* (wall tiles), *tegulae hamatae* (half-box flues), *tegulae mammatae* and ceramic water-pipes. They were made from the red-firing clays of the Thames Valley (from fine to coarse, fabrics 2452, 2459A, 3006, 3004 and very coarse 3070), the pale yellow-firing Gault clays of north-west Kent (fabrics 2454 and 3022), orange and light brown streaked fabric 3227 (source unknown) and red and orange fabrics 3054 and 3059, thought to originate from kilns near the West Sussex coast.²

The analysis is based on records in the archive of the Museum of London

(LAARC), and the data used are mainly from the Museum of London Department of Urban Archaeology UNIX and the MoLAS ORACLE databases. Data from sites up to the end of 2004 have been used. The accuracy of the data depends upon that of the post-excavation records; thus where the record is ambiguous, material that could not be checked has been excluded. It should be noted that the phasing and dating of material from unpublished sites is provisional.

Where are the box flues?

Fig. 1 shows the distribution of three distinct types of small box flue.³ Tile Type 1 is found in the coarser sandy versions of the local red-firing clays, typically fabric 3004, but the range is from fabric 3006 to fabric 3070. Most of the occurrences are in the north island of Southwark, with a large deposit (at least 125 fragments) at Winchester Palace (WP83).⁴ A second large deposit (c. 250 fragments), comes from Fenchurch Street (FER97) in the City of London.⁵

Dating for this type is consistent both north and south of the river. At FER97 it occurs in contexts which pre-date the Boudican fire (c. AD 60–1) and in Boudican destruction debris dated to c. AD 60/63. In Southwark it is abundant in dumps on Open Area 4 at Winchester Palace, dated AD 60–70, and occurs in deposits of similar date at 107 Borough High Street (107BHS81) and 2 Southwark Street (2SSBS85).⁶ Its presence in pre-Boudican levels indicates that it was used in buildings dating to AD 50–60; there is no evidence that it was made or used after the Boudican fire.

Box flue Type 2 (fabric 3227) is found in smaller quantities than Type 1. It has a similar distribution centred on north-west Southwark, but is rare north of the Thames where the only identified examples come from Fenchurch Street (FEN83).⁷ Dating evidence suggests it may be slightly later than Type 1; the earliest recorded occurrences are in demolition deposits of c. AD 70–80 at Winchester Palace and AD 71–100 at nearby 28 Park Street.⁸ A similar date

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range in the City suggests disuse by *c.* AD 70/80.

Box flue type 3 occurs on three sites east of the Walbrook, and is particularly well-represented in Threadneedle Street (TEA98) and 12 Arthur Street (AUT01).⁹ All the securely identified examples are in the same gritty variant of fabric 2454. It is not a common type, and has yet to be identified west of the Walbrook or in Southwark. The earliest deposits are at FER97 in deposits of the later 1st century. At AUT01, it comes from the backfill of Waterfront 3, constructed *c.* AD 120/5, and at TEA98 from late-1st- or early-2nd-century dumps.

It is emphasised that these are not the only small box flue tiles from 1st-century deposits; fragmentary examples of several less well-defined types in both red and cream fabrics occur on both sides of the River Thames, notably in the earliest hypocaust of the Cheapside baths.¹⁰

Wall-jacketing tiles

Black has suggested, on the basis of parallels from Pompeii, that these small box flues were used in single stacks in conjunction with other types of wall-jacketing tile such as *tegulae mammatae*, *parietales* or half-boxes.¹¹ All *tegulae mammatae* from London

have shallow bosses, Brodrigg's type A, rendering them less suitable than the Pompeian type for such usage;¹² the tiles most likely to have been used for wall-jacketing here are thus *parietales* and half-boxes.

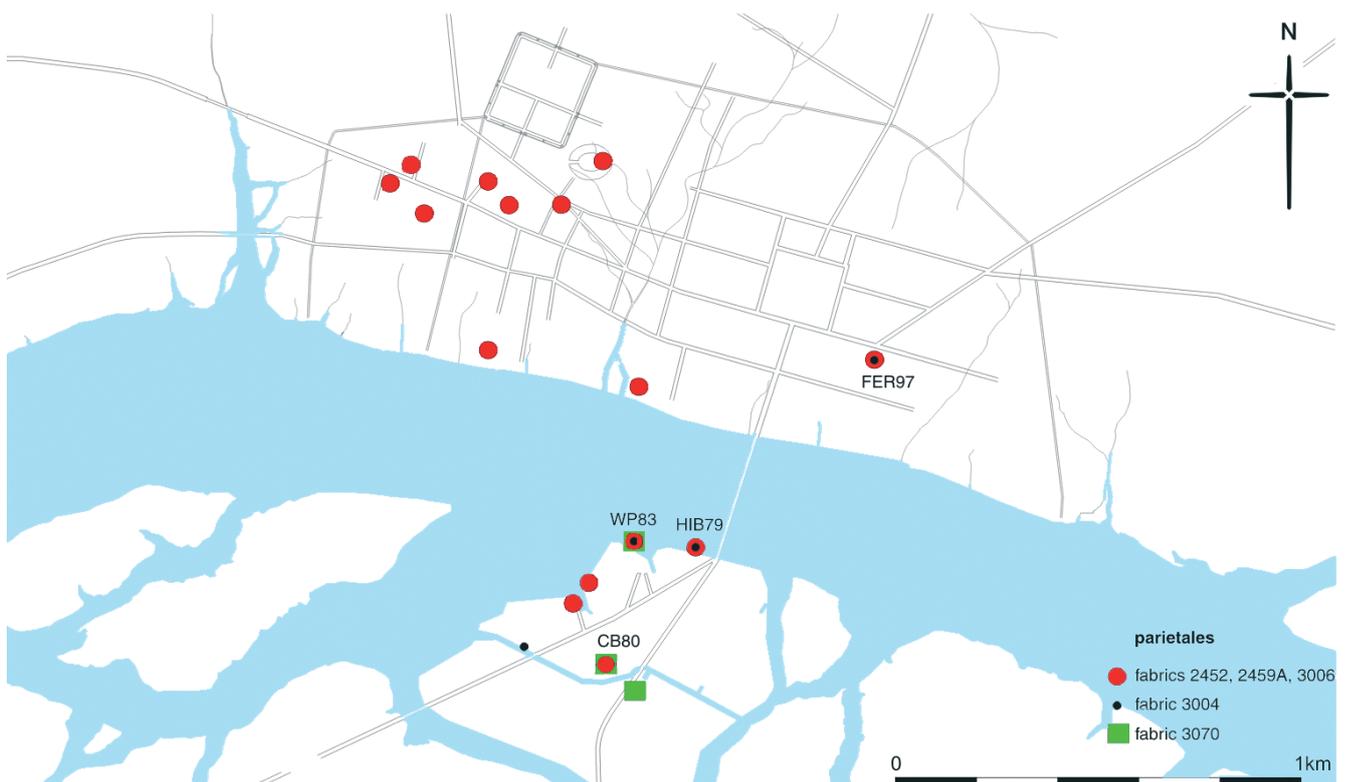
Parietales are thin bricks with notches in the long sides to take iron nails or cramps which were used in conjunction with spacer bobbins (those which survive are in the form of perforated clay cylinders) to form a cavity on the inner surface of a wall through which hot air from a hypocaust system could pass.¹³ They are generally keyed with a diagonally-scored lattice, either on the sanded base of the tile or, less often, on the smooth upper surface. When fragmentary they cannot usually be differentiated from half-box flues, which has led to both types being under-reported from assemblages, particularly in comparison with lattice-scored fragments in fabric 2454 which can be attributed with reasonable certainty to half-box flues, as *parietales* in this fabric have not been found in London.

Fig. 2 compares the distribution of *parietales* in fabrics of the 2815 group and 3070. There are two notable features of the distribution. The first is the concentration of tiles in the coarser

fabrics 3004 and 3070 on the north Southwark island; no definite wall tiles in fabric 3070 have been recorded from north of the river and FER97 is the only City site on which they appear in fabric 3004. This contrasts with the distribution of tiles in the finer 2815 group fabrics which are spread more widely across the City and north Southwark. The second is that the distribution of local red *parietales* tends to avoid the south island; the southernmost site with securely identified wall tile in any of the 2815 fabrics is 107BHS81.

The evidence from London suggests that *parietales* were in use very early in the Roman occupation, although their production, at least in the finer fabrics, almost certainly continued into the 2nd century. Examples in fabrics 2452, 2459A and 3006 have been found with procuratorial stamps, which dates them to after *c.* AD 80.¹⁴ However, all the *parietales* in fabric 3070 are from early deposits in Southwark, where they occur on Open Area 3 at 2SSBS85 and 107BHS89, with box flue Type 1, and associated with Building 1 at Winchester Palace, probably from within the make-up beneath Building 1 where box flue Type 1 was found. At 15–23 Southwark Street, too, *parietales*

Fig. 2: distribution of *parietales*



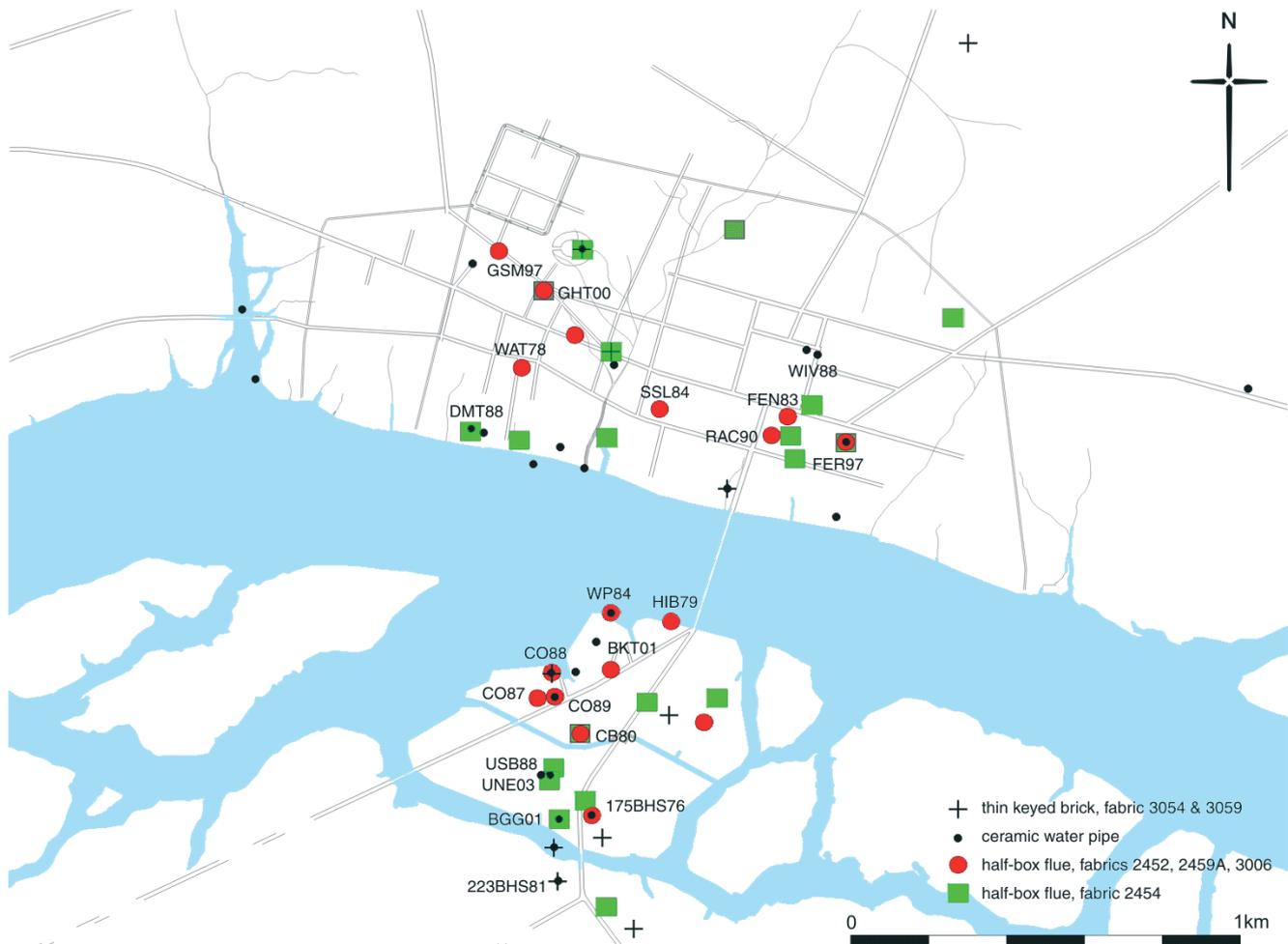


Fig. 3: distribution of thin keyed bricks, ceramic water pipes and half-box flues

in 3070 occurred in the foundations for Flavian (AD 68–98) Building 4.¹⁵ It may be relevant that, although spacer bobbins are very rare in London, the few that have survived come from north-western Southwark, particularly the area of Winchester Palace. In the City, *parietales* in fabric 3004 appear early in the sequence on FER97 in Boudican fire debris on Open Area 5.

The second type of wall-jacketing used in the early Roman period is the half-box flue.¹⁶ This tile has *tegula*-like flanges on the long sides, which act as spacers to form a cavity when the tile is placed against a wall; vents cut into the flanges allow for the lateral circulation of heat. Half-box tiles are recorded in London only in fabric 2454 and the finer fabrics of the 2815 group: 2452, 2459A and 3006. In fabric 2454 they are early in date, occurring in pre- and early post-Boudican fire destruction deposits from Fenchurch Street (FER97) and similarly-dated sites in Southwark. Tiles in the 2815 fabrics are less well-

dated, although likely to be contemporary with the 2454 tiles.

Fig. 3 shows the distributions of half-box tiles in fabrics of the 2454 and 2815 groups. Some City sites have half-box flues in both fabric groups; most of them are east of the Walbrook and centre on Gracechurch Street and Fenchurch Street (particularly RAC90 and FER97), the area to the south-east of the forum.¹⁷ The distributions in Southwark are very different, with tiles in the 2815 fabrics clustering on the western side of the north island, and those in 2454 fabrics occurring mainly on the eastern side of the north island and the south island.

Also plotted on Fig. 3 is the distribution of a group of thin bricks in fabric 3054 with broad combed wavy or zigzag keying, some of which have the bosses typical of *tegulae mammatae*. Identical thin bricks with bosses and combed keying were found with small flue tiles and ceramic spacer bobbins in First Period deposits of the pre-Flavian bath-house at Fishbourne Roman Villa

where they were perhaps used as wall-jacketing.¹⁸ Their distribution is concentrated in Southwark, where it is similar to that of the 2454 half-boxes, although they do not always appear on the same sites. The date range of this fabric in London is *c.* AD 70–100/120, and there is no clear stratigraphic association with half-boxes on the sites where both types occur. However, both are associated with finds of ceramic water-pipes, which suggests that they represent the remains of more than one bath-house, or perhaps different phases of a single, long-lived, bath-house.

Ceramic water-pipes

The final element on Fig. 3 is the distribution of moulded ceramic water pipes in fabric 3006. Pipes have been found *in situ* on only two sites, Huggin Hill bath-house and in Room 59 of the Roman Palace site south of Cannon Street (probably GM187).¹⁹ The map shows a line of find spots along the riverbank which may represent material from both the Huggin Hill bath-house,

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west of the Walbrook, and a bath-house to the east of Cannon Street Station.²⁰ There is however a markedly linear distribution of ceramic water pipes in Southwark, running from 223 Borough High Street (223BHS81) on the northern extent of the Southwark mainland, across the south island to the Courage's Brewery sites. The most northerly find spot is at 15 Winchester Walk (BY103),²¹ just south of the bath-house at Winchester Palace on the north island, a total distance of *c.* 650 m. Wheel-thrown pipes, unique in London, were found in dumps of *c.* AD 60–70 at WP84 but their interpretation as water-pipes is dubious as their rims and bases are of similar diameter with no obvious method of linkage; they may instead have been used as cylindrical *pilae* within a hypocaust.²² The linear appearance of the distribution cannot be explained by density of excavation in the area, as the line runs to the west of Borough High Street, where most of the Southwark excavation work has been done.

Discussion

In discussing these distributions it is important to remember the limitations of the data. These are not the only bath-house-related tiles from early deposits in London, but those that are particularly distinctive and for which we have good typological evidence. The analysis relies both on the presence of information on the building materials database and the quality of the recording. With both these reservations in mind, it is possible to see some patterning in the distribution of tile types.

The distributions plotted on Figs 1 and 2 and the dating evidence seem to confirm Black's theory that box flues *c.* 80mm in depth were used with *parietales* as wall-jacketing in hypocausted buildings. The relationship between small flues and *parietales* is perhaps clearest in north-west Southwark where Type 1 box flues and *parietales* were found in a number of early deposits, sometimes in the same context. The picture is slightly different at FER97, where the dating and land-use information suggests that box flue Type 1 may have been more closely association with half-box flues in fabric 2454 than with the *parietales*. If Type 1

box flues were used here with half-boxes rather than *parietales*, this could explain the apparent absence of spacer bobbins from this part of City.

Pre-Boudican military tile production?

Fabric 3070 was used in the pre-Boudican period for a limited range of tile types; Type 1 box flues and *parietales* (both also in fabric 3004), bricks, including thick bricks, and roofing tile. Fabric 3004 is also particularly frequent in north-west Southwark, and some early tile types in this fabric, such as the wheel-thrown pipes and the half-box flues, seem to be confined to this area. No tile in either fabric 3070 or 3004 has yet been found with a procuratorial stamp which suggests that both fabrics may have gone out of production before *c.* AD 75/80, when tile-stamping is believed to have been introduced.²³ It may be relevant that WP84, the site on which brick and tile in fabric 3070 is most plentiful, has unequivocal military connections in the later Roman period and that the other major find-spot for flue tiles and thick bricks in fabric 3004/3070 is in Fenchurch Street, on the site of a pre-Flavian fort.²⁴ The likelihood of military involvement in northern Southwark has been the subject of much discussion.²⁵ Pre-Flavian deposits are ephemeral in this area, but the alignments of Road 3 and certain ditches suggest that the area may have been laid out at an early date. There is however no structural evidence for either a fort or an early bath-house at Winchester Palace before the construction of Building 14 in the early 2nd century AD. Despite this, it is possible that these types represent limited tile production by the Roman army in the period AD 50–60. The absence of military stamps in London is not significant in this early period, as they were not used in Britain until the later 1st century AD.²⁶

Evidence for early Flavian structures

Rowsome has recently summarised the evidence for London's Roman bath-houses.²⁷ There are structural remains of two early bath-houses west of the Walbrook, at Huggin Hill and

Cheapside.²⁸ The earliest phase of Huggin Hill bath-house is dated to the early Flavian period, and the Cheapside bath-house is thought to date from later in the 1st century. Neither is an obvious source for pre-Flavian tile. However, small box flue tiles of 1st-century type (type 4) but uncertain date were found with larger box flues in the hypocaust of the Phase 1 *tepidarium* of the Cheapside baths and in the fill (ER356A) of the nearby well, which is thought to date from the early 2nd century.²⁹ If this dating is correct, the small box flues are likely to have been salvaged from an earlier structure and re-used at Cheapside.

Moving east of the Walbrook, there is some evidence for two early bath-houses near the waterfront between Cannon Street Station and London Bridge. One is the eastern section of a group of buildings known as 'The Governor's Palace'.³⁰ Recent excavations on the shoreline at Cannon Street Station show that Marsden's original reconstruction of the complex is not feasible, and it is more likely that several separate buildings occupied the site, the pool in Area 3 being part of a bath-house.³¹ Marsden dated this part of the complex to *c.* AD 80, again too late for pre-Flavian tile types. A second probable site is at AUT01 where recent excavations have revealed a sequence of high-status buildings dating from *c.* AD 54 on. At this site, large fragments of box flue Type 3 were recovered from the fill of Waterfront 3. They probably represent demolition debris from an earlier bath-house on or close to the site, possibly contemporary with the large well built in *c.* AD 70–80.³²

None of the above sites has produced evidence of small box flues of Types 1 and 2. The distribution maps suggest that an early bath-house may have been sited somewhere near the forum; Rowsome mentions as a possible site a sunken masonry feature at 15–18 Lime Street.³³ Flues Type 1 and 2, however, seem to occur south of Fenchurch Street. Recent excavations at FER97 have revealed that extensive landscaping took place in this area in the decades after the Boudican fire, and it is possible that all traces of any bath-house structure were obliterated, although a possible hypocaust was noted but not fully excavated on the

eastern side of Gracechurch Street at RAC90.

In the absence of early bath-houses in Southwark (for a recent discussion of possible early bath-house locations in this area see Betts),³⁴ it has been suggested that the Southwark material is demolition debris from north of the Thames, deposited in Southwark as landfill. It is possible that the dumping of debris from an early, perhaps pre-Boudican, structure at FER97 was the source of the Type 1 box flues at Winchester Palace. However, although the assemblages are similar they are not identical; the wheel-thrown pipes/*pilae* which occurred in substantial quantities at Winchester Palace were not found at FER97. Cross-river dumping should be used with caution as an explanation for the occurrence of bath-house assemblages unless there has been detailed analysis of the material.

Conclusions

It is clear from this study, despite its limited scope, that there was a wide variety of hypocaust-related tile in use

in London in the mid-1st century AD. This may be because the construction of hypocausts in public buildings was still a fairly new technology to the Romans. Evidence from Pompeii suggests that early experiments with *tegulae hamatae* or *tegulae mammatae* for wall-jacketing were quite quickly replaced by jacketing formed by box flues stacked side by side.³⁵ The replacement of small box flues and half-boxes with larger box flue tiles, which remained in use until the end of the Roman period, suggests that a similar process was taking place in London in the later 1st century. This seems to have been achieved by the end of the 1st century.

Alternatively, the degree of variability in the source and form of bath-house tiles could reflect a lack of centralised political or administrative control before c. AD 70–80. The spatial clustering in the distributions may reflect the existence of areas under separate control for which building materials were obtained from the kiln sources available to them, some of

which may have been located outside London. Further research may help to clarify the relationship between the fabric of Roman public buildings and political and economic changes.

I have attempted in this short article to draw attention to the opportunities in London for inter-site comparison of the specialised building materials and hope that more detailed studies of this under-researched resource can be carried out in the future.

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