



Fig. 1: the late-15th-century brickwork parapet at Saint Alphege Garden, City of London

The late medieval bricks and brickwork of London Wall in Saint Alphege Garden, EC2

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In his *Survey of London*, the Tudor antiquary John Stow relates how, in 1477, Sir Ralph Jocelyn, Mayor of London, ‘caused part of the wall about the City of London to be repaired; to wit, betwixt Aldgate and Aldersgate. He also caused Moorfield to be searched for clay, and brick thereof to be made and burnt; he likewise caused chalk to be brought out of Kent, and to be burnt into lime in the same Moorfield, for more furtherance of the work.’ He also ‘caused the whole [City] ditch to be cast and cleansed ...’. A late medieval chronicle¹ likewise records that in 1477 ‘the Mayr [‘Rauf Joslyn’] and the Comons began to Repayre the walles of the Cite, and to clense the Diches of the same; ... and or [ere] his yere came to ende he had made a goode parte of that which is newe made, beside provysion of lyme and Bryk, which he also provyded for in the more [that is, in Moorfields] the same yere.’ In order to pay for the work, Jocelyn ‘caused to be graunted by Comon Counseill, that euery Citizein shuld pay euery sonday durying his [Jocelyn’s

mayoral] yere v d [5d].’ He also ‘by his poletik meanys caused dyvers fflyshippes of Worship’ (that is, City companies) each to be responsible for ‘a certayn length of the walle; and to Encorage theym he began w^l [= with] his owne fflyship’ – the Drapers’ Company.²

All that survives of this activity is the brickwork at the top of the city wall in St Alphege (or Alphege) Garden, now within the Barbican complex (Fig. 1). Other portions of similar brickwork still existed in the late 18th century, when a section in the churchyard of St Giles Cripplegate was drawn by J. T. Smith; sadly, it was demolished in 1803. In 1812 he drew a then remaining length in front of the Royal Bethlehem Hospital (‘Bedlam’) in Moorfields, some way east of the St Alphege section of wall.³ The late-15th-century work comprised a crenellated parapet of brick above the Roman and the earlier medieval stone wall, parts of the brickwork being decorated with a regular diaper pattern in darker bricks (Fig. 2). The embrasures were finished

with flat stone copings, bull-nosed to the north, the merlons with pitched stone copings with roll mouldings at their apexes – a standard design of the period. The embrasure copings remain; those of the merlons do not, but are shown well preserved in Smith’s engravings of the St Giles Cripplegate section of the wall. The brick parapet is some 0.5 m thick. Below it, the much thicker wall is patched and repaired with similar bricks. The wall was incorporated into the church of St Alphege, demolished in the 16th century.⁴ Brick arches built against the back of the wall, discovered in a number of places, *may* be part of the same 15th-century defensive campaign.⁵

The surviving brickwork, considered together with Stow’s information, is of interest, not only as an aspect of concern for London’s defences at the end of the Middle Ages, but also in providing evidence both for brick making practices and for brick building techniques in late medieval London.

Defending London

There was a fad in certain archaeological quarters some years ago for dismissing town walls as no more than expressions of civic pride,⁶ and at first blush the decorative treatment of the brickwork in

St Alphege Garden might be taken to support that view. But apart from more general objections,⁷ it is worth noting that Jocelyn had been one of those who distinguished themselves in defending London against the attack of Thomas Neville, the Bastard of Fauconberg, in May 1471, during an episode in the Wars of the Roses.⁸ The attackers were repulsed and many killed whilst making their retreat. Fauconberg himself surrendered on promise of a pardon, but was nevertheless hanged, drawn and quartered, and ‘hys hedd ... sett upon London Brydge, loking into Kent warde ...’.⁹ That, of course, was intended as a warning to others; and it may serve as a warning to us too: as Desmond Seward has stressed, this ‘was no peasant revolt’.¹⁰ It was, rather, a serious and determined military attack, and one which came close to success. There was not, in England, anything to match Henry V’s campaign of town sieges in France, from Harfleur in 1415 to Meaux in 1421–2; but this was always a possibility. In other respects too these were turbulent times, and Jocelyn was not ordering a toy fort! Rather, his work reflects a general situation aptly described by John Schofield and Alan Vince: ‘Towns were acquiring or refurbishing their walls late into the Middle Ages; the impetus rose from the insecurity of invasion or baronial warfare.’¹¹ In

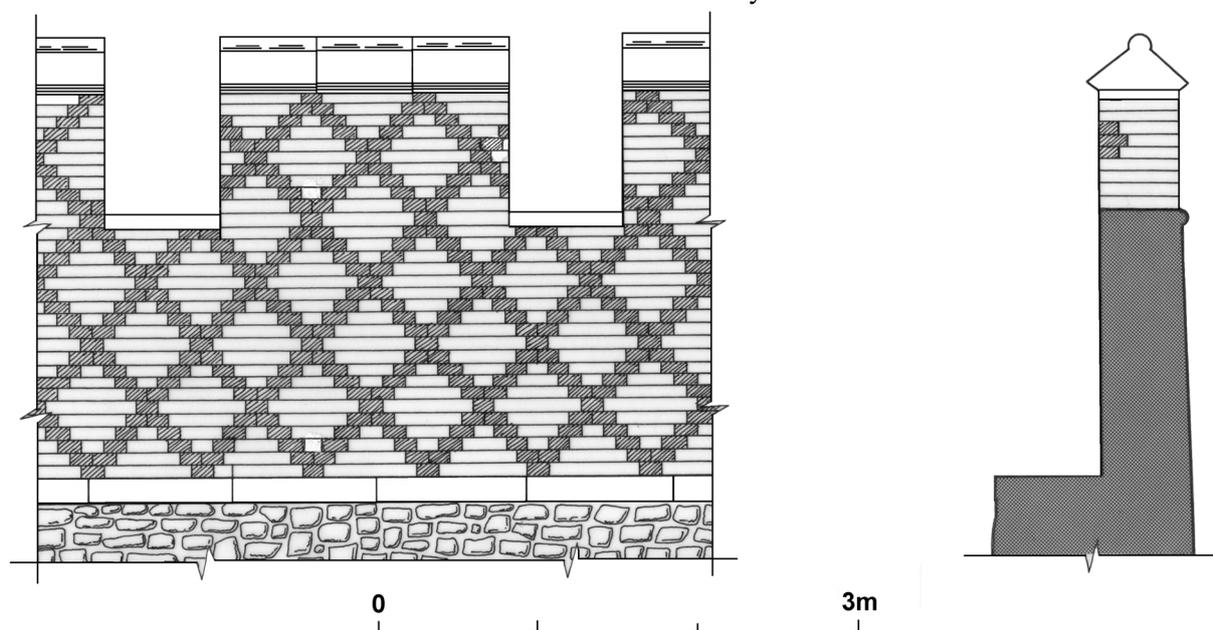


Fig. 2: reconstructed elevation and section of the late-15th-century parapet and wall-walk of London Wall at St Alphege Garden, based in part on RCHM (England) *An Inventory of ... the City of London*, vol. III, Roman London (1928) 70, fig. 9.

1516 Thomas More quite naturally describes Amaurot, principal city of Utopia, as walled 'with many towers and battlements' (*turribus et propugnaculis frequens*); whilst in the real world as late as 1549 'Exeter withstood a fierce siege ... , and York's elaborate defences deterred the northern earls twenty years later'; at London itself, Wyatt's Revolt of 1554 was met by closing London Bridge and the City gates against him, and the fact that this was only a small-scale rebellion does not make the action any less defensive.¹² It was only in later and more secure ages that walls became otiose and many of them – or large sections of them – were demolished: 'Thus have I, Wall, my part discharged so; / And, being done, thus Wall away doth go'.¹³

Throughout the Middle Ages, indeed, defence of the City was a serious concern, a fact reflected in the numerous murage grants which were received,¹⁴ whilst an early-16th-century poem on London, ascribed to William Dunbar, includes the line: 'Strong by [=be] thy wallis that about the[e] standis'. Of course, granted that walls were going to be built or repaired anyway, there was no reason why they should not be made attractive, even striking or impressive – hence the diaper pattern in the brickwork. Town walls too were often a mark of urban rank and therefore of *status*, as recognised, in a later age, by Shakespeare's *Touchstone*: '... a walled town is more worthier than a village'.¹⁵ This, however, did not make them merely, or even primarily, expressions of civic pride: in part, at least, the status which walls conferred arose from the very defensibility – and, equally valuable, *deterrence* against attack – that they provided. Walls and their gates would also have aided 'control of people and goods entering the town';¹⁶ and this would have included collection of murage. Once more, however, it is important to distinguish between the primary defensive purpose *for which walls were built* and any secondary functions which, once erected, they were able to fulfil in addition.¹⁷ In this respect, town walls are something like urban railway viaducts: their arches provide convenient locations for workshops and even retail shops, but that is not why they were built. To borrow a term from evolutionary biology, the several secondary functions of town walls may be viewed as *exaptations*.

The use of brick in medieval London

The use of brick for this work is interesting. Unlike some other parts of eastern England, notably a great swathe from the East Riding down to Essex and with an offshoot along parts of the Thames Valley, London was somewhat tardy in adopting the new material, and it was not until the early Tudor period that it began to be used as a major material in its own right, although there had been more minor uses in earlier times.¹⁸ The late medieval work at St Alphage Garden, therefore, is significant in the history of brick building in London, presentiment of what was to come in the Tudor period. It is also of interest in being an instance of brick used for town walls. In contrast with some other European countries – the Netherlands or Czechoslovakia, for example – brick was not much used in English town defences. Examples of walls, or of individual defensive elements, in brick are exclusively eastern, occurring at York, Beverley, Hull, King's Lynn, Norwich, Great Yarmouth, Canterbury, and Sandwich. In this respect, at least, London is more typical of eastern England generally. There were, moreover, good reasons for the choice of material. The cheapness of brick in the late Middle Ages is sometimes exaggerated, but in London, which possessed no local building stone but where bricks could be manufactured virtually on site, this was probably a significant consideration. Further, compared with much stone (such as the intractable Kentish Rag commonly employed in London), brick was 'easier to stack and bond together due to its regular shape'.¹⁹ It is worth remembering too, in view of the insular assumption sometimes made in Britain, that a 'tower or curtain wall made of this material is not necessarily weaker than one built of stone',²⁰ as even a cursory glance at town walls and castles in various part of Europe will readily demonstrate.

The bricks and their manufacture

Of no less interest are the bricks themselves. They are of an orange-red colour, except where over-fired, and are quite soft and sandy in texture, belonging to the fabric 3033 family. This fabric number is that in use within the Museum of London Specialist Services. There are, in fact, slight variations – more sandy versions (fabrics

3046 and 3065) and one with white or yellow silty streaks (fabric 3039). Without microscopic examination, however, it is impossible to be certain which precise variety or varieties occur at St Alphage Garden, and the bricks are therefore here regarded as belonging to the fabric 3033 *family* of London brick types. Examples of such bricks dating from the period *c.* 1380–1400 have been excavated at Billingsgate Fish Market in Lower Thames Street,²¹ but more commonly they date from the later 15th century onwards, the St Alphage Garden examples thus being among the earliest. Bricks of this type persisted down to *c.* 1700, being fairly rapidly superseded by different types after the Great Fire of 1666.

London is fortunate in possessing widespread raw materials for making bricks, and it was thus possible to manufacture them close to where they were to be used. This had a great economic advantage. Even in late medieval and Tudor times (though less so than in later centuries) bricks were a high-bulk/low-value commodity, so that transport over any distance added considerably to their cost ‘at the yard’.²² On the other hand, most towns throughout medieval and early modern Europe strove to keep brickmaking outside the towns themselves, not just because of the fire risk but also because of the unpleasant fumes given off during firing.²³ Moorfields, where Stow tells us the bricks for Jocelyn’s work were produced, therefore had every advantage for brickmaking: it belonged to the City, so that there was no need to pay rent on it; it was an open area from which raw material could easily be dug; it contained ample space for drying and firing the bricks; it was close to where the bricks were going to be used in the City wall, thus minimising transport costs; and it lay outside the wall itself and beyond the built-up area. Commercial brickyards were known in medieval England, but they were not common: they were, indeed, precarious undertakings so long as demand for the product remained sporadic. Most yards were temporary, set up to serve a specific building project. The temporary nature of the Moorfields operation appears to be indicated by Stow’s remark that because of the brickmaking the area ‘was made the worse for a long time’ – *for a long time* but not permanently; certainly by the time of the earliest accurate map of London, engraved on

copper in the 1550s, there were no signs of brickmaking activities at Moorfields.²⁴ It is reasonable to suppose that the yard operated only so long as bricks were required for the wall, and was then abandoned. Such, indeed, was the conclusion of the excavator of several shallow brick pits at Moorfields which it seems safe to associate with Mayor Jocelyn’s work, especially since an incomplete brick found in one of the excavator’s test pits closely matches the unusually large size of the London Wall bricks (see below), being 134 mm (5¼ inches) broad and 63 mm (2½ inches) thick. Pottery from the brick pits is of late 15th- and early 16th-century date, representing subsequent dumping as part of a land reclamation scheme.²⁵

The whole enterprise was thus markedly different from those to be found in a few other towns, where municipal brickyards, not always operating at a profit, were established. To some extent at least, this must reflect different demands for the product. Hull, where the best documented municipal yard was situated, was very much a brick-built town in the later Middle Ages;²⁶ London, as previously noted, was far from being such a town at the time. It is not known how the work at Moorfields was organised, but the usual practice at the time (at least in the temporary yards) was for a brickmaker to contract to make the required number of bricks for an agreed sum of money; from that sum he would pay any assistants whom he needed to employ.

The bricks used in the wall at St Alphage Garden are uncommonly large; several have been measured and are 10 7/8 – 11 by 4½ – 5 1/8 by 2 3/8 – 2 5/8 inches (276–280 by 114–130 by 60–67 mm). The wide variations reflect the fact that before Victorian times it was impossible to regulate the sizes of the finished products with any precision, since it was not possible to control the degree of shrinkage during both drying and firing. This did not prevent – largely unsuccessful – attempts to regulate sizes during the late Tudor and Stuart periods. Little is known of any such attempts in London. The earliest known occurs in connection with building at Oxford in 1534, when bricks were to be made ‘after the largest assize of the Chamber of ... the City of London’ (‘assize’, here, = medieval Latin *sisā* = ‘(standard) size’, from *assisum* = ‘standard, regulation’);²⁷ this

implies a smaller 'assize' too, and it is possible that the latter is to be identified with the 'lawful scantling' of 9 by 4 by 2 inches (229 by 112 by 51 mm) referred to at Eton College in 1543–4.²⁸ Whether such regulations existed over half a century earlier is not known, but if so then the London Wall bricks presumably belong to the 'largest assize' later mentioned at Oxford. In 1538 the Common Council of London complained that 'brykks' (and other building materials) were not 'kepyng measure as of old tyme hath bene used'; it added that 'It ys nowe enacted ... that ... brykkes ... [shall] kepe the measure as hath bene accustomed at any tyme withyn theys fowerty yeres nowe last past [therefore, since c. 1498], upon payne of forfeiture for every such defaut iijs iiijd [3s. 4d.] ...'.²⁹ The Council may have been thinking of something like the size of the London Wall bricks, or possibly the smaller but still quite large bricks of Old Hall at Lincoln's Inn (1489–92): 9¼–9½ by 4½–4 7/8 by 2½ inches (235–241 by 114–124 by 64 mm).

The bricks were made by throwing the raw material with some force and then pressing it into a wooden mould. This process resulted in *crease-marks* in the faces of the bricks (Fig. 3:1). Surplus material was scraped off using a flat piece of wood (the *strike*), leaving fine striations (*strike-marks*) along the upper face (Fig. 3:2). Sometimes the material oozed slightly beneath the walls of the mould at the bottom, leaving small protrusions (*squodge-marks*) along one or more bottom edges of the brick (Fig. 3:3).

In a few places within the wall it is possible to observe sunken margins on some of the bricks. These (Fig. 3:4) are a common feature in bricks of the 3033 family (and some others) and comprise depressed borders, up to about 12 mm wide, along one, two, three, or even all four edges of one – usually but not quite invariably the upper – bedface (that is, the face which was uppermost in the mould). Width and depth often vary along a brick, the margins sometimes petering out altogether; sometimes too, where they appear on three or four edges, the margins overlap at the angles, forming a small 'step'. There have been several suggestions as to how these sunken margins were formed, but only one of them, that offered by Ian Betts, accounts for all their

characteristics, and there can be no doubt that his is the correct explanation.³⁰ Because of the fairly soft nature of the raw material used in the bricks, the wooden brick mould would not have been removed at the moulder's bench; instead, the bricks would have been carried by an assistant, probably a woman or child, *and still in the mould*, to the drying ground, where they would have been demoulded to lie flat for initial drying: the soft nature of the material made setting on edge impracticable. The bricks were what Richard Neve in the early 18th century termed 'place bricks, because they were demoulded at the *place* or drying ground.³¹ As the mould was pulled off, it sometimes dragged up small 'lips' along one or more edges; these were then pressed down by using the bottom of the mould itself; because, very often, rather too much pressure was applied, the sunken margins were formed as an incidental effect. The drying ground was strewn with sand, straw or grass (hay) to prevent the soft bricks from sticking to it. Straw or grass often leaves impressions in the lower faces, but it is impossible to observe these on bricks *in situ* like those of London Wall.

After a period of initial drying, the bricks would have been reset ('skintled') – stacked on edge in a honeycomb arrangement, thus freeing space on the drying ground, and also hastening further drying, since a greater surface area of each brick was now exposed to the air. Once sufficiently dry, the bricks would be fired. Although kilns

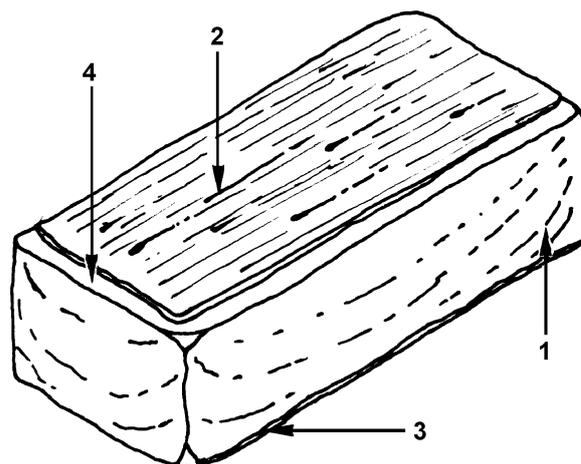


Fig. 3: a brick of the kind used in London Wall in the late 15th century, showing its various characteristics: 1: crease-marks; 2: strike-marks; 3:squodge-marks; 4: sunken margin

were sometimes used in medieval England, the usual method in northern Europe, as opposed to, say, Italy, was to fire in *clamps*.³² Possible clamp sites were discovered in Moorfields in the early 20th century.³³ Unlike a kiln, a clamp was not a permanent built structure but consisted of a flat platform of tamped clay or of fired bricks, not mortared, on which the raw ('green') bricks were stacked, intermingled with fuel. The whole structure was set alight and left to burn itself out over a period of (usually) four to six weeks. Although clamp-firing was much slower than kiln-firing, was more susceptible to the vagaries of the weather, and, even in a successful firing, produced more waste bricks than did a kiln,³⁴ it had certain advantages: no permanent plant (and therefore little capital) was required, clamps could be set up virtually anywhere, and they could be built to any size (within limits) depending on how many bricks were required on a particular occasion; nor did clamps need the frequent maintenance and repair required by permanent kilns. Clamp-firing remained the norm in the London area, even in the early 20th century, for making the familiar yellow-brown London Stocks. In medieval and Tudor times, wood was the normal fuel, with turf (peat) or furze sometimes used, but coal only occasionally.³⁵

The products of firing resulted not only in bricks of varying sizes but also – and especially with clamp-firing – in bricks of varying quality. At one end of the scale were under-fired bricks, known in the Middle Ages as 'samel', 'sammel', or some other variant of the word; it has been explained in terms of their pale and therefore 'salmony' colour;³⁶ but it is much more likely that the word derived from Middle English *sam*, meaning 'half', and *elden*, meaning 'burn': *samel* (from *sam-eld*) thus meant 'half-burned'.³⁷ These under-fired bricks were not necessarily wasted, since they could be built into subsequent clamps and re-fired. At the other end of the scale were bricks which melted and fused together: they were of no use except as rubble. Between these extremes were bricks showing various degrees of firing, the best of them red, others black or near-black and sometimes with vitrified or semi-vitrified surfaces. These darker bricks could be used in the wall-face with scant regard for consistency of

colour, could be hidden within the thickness of a wall, or could be used to create diaper patterns, as at St Alphage Garden, an issue to which we shall return. With bricks as large as those made for London Wall, there was also a danger that they would not fire thoroughly throughout their volume; or, due to insufficient oxygen reaching their centres, they could develop grey ('reduced') cores; the latter, however, did not constitute a serious weakness, and such bricks could be used along with perfectly fired examples. Indeed, unless they were broken or deliberately cut it would have been impossible to know that they were such bricks.

The brickwork of London Wall

The bricks at St Alphage Garden are laid with thick mortar joints, as usual in medieval and Tudor brickwork, in order to accommodate the varying sizes of individual bricks. The mortar presumably includes the lime burnt at Moorfields and which, Stow tells us, was made from 'chalk ... brought out of Kent'. This was available from quarries in the dip slope of the North Downs in the Greenwich, Erith and Northfleet area and was easily transported to London *via* the River Thames. John Schofield has drawn attention to 'patches of burnt chalk containing finds of late-fifteenth century date found at 4–6 Finsbury Circus [on the site of Moorfields] in 1920' and which 'were perhaps traces of this [lime burning] activity'.³⁸

On the north (outer) face at St Alphage Garden the bricks are laid in English Bond, again as usual in brick buildings of the time – the brickwork, that is, consists of courses of *stretchers* (bricks laid with their long faces exposed) alternating with courses of *headers* (bricks with their ends exposed). On the inner face, however, this bonding pattern has had to be modified to create the diaper pattern in black bricks. In order to make some of the stretchers fit this adjusted bonding pattern they have been chopped to a shorter length; brick-axes were certainly available at the time, although for such a simple operation the edge of a trowel was probably used as the bricklayers went along.

The diaper at St Alphage Garden, as noted, is limited to the inner face of the wall. At St Giles Cripplegate, according to Smith's engraving, the

outer face was decorated with similar diaper patterning; it is not known whether this also appeared on the inner face of this stretch of the wall. In the Tudor period, diaper was – perhaps surprisingly – sometimes painted onto the brickwork. Examples survive at Hampton Court Palace and at Long Melford Hall, Suffolk, and there is some evidence too for the practice at Second Court, St John’s College, Cambridge (1598–1602).³⁹ It is *possible*, though one may put the point no more strongly than that, that diaper was painted onto the outer wallface, ignoring the English bond, at St Alphage Garden, indeed it is even *possible* that the diaper pattern shown in Smith’s engraving of the wall formerly at St Giles Cripplegate was painted.

Diaper patterning, though not always done, was a common feature of medieval and Tudor brick buildings, reaching its apogee in the decades either side of 1500, when elaborate patterns, pictures, or initials might be created: there were, for example, pictures in the wall which once ran round Bermondsey Priory,⁴⁰ whilst simpler designs and the initials IH (for John Houghton, the last prior, 1531–5) survive in Wash House Court at the Charterhouse. More often the patterning was restricted to an all-over diagonal mesh, as, for example, on Old Hall, Lincoln’s Inn (1489–92, reconstructed 1924–8 using original materials),⁴¹ on the gatehouse of Lambeth Palace (c. 1495), and at St Alphage Garden. It has been suggested that normally the bricks for these patterns were deliberately formed for the purpose, since the black vitrification is frequently only a thin surface layer, the result, it is claimed, of dipping a header face into sand before firing.⁴² Sand, however, was normally present anyway,

since it was used to prevent the bricks from sticking to the mould (although water was sometimes used for this purpose instead), and if exposed to the fiercest heat these sanded faces would become vitrified or semi-vitrified unintentionally during firing. On the other hand, bricks sometimes show a thicker surface vitrification, more fully integrated with the brick fabric itself, and these, it seems, *were* deliberately produced, expressly for use in patterning, by dipping *fired* bricks into a specially chosen material, such as mineral-rich estuarine mud, and then firing them for a second time.⁴³ The bricks forming the diaper pattern at St Alphage Garden, however, are dark throughout their length, and most of them are not vitrified at all on their surfaces. Vitrified or not, it is clear that the bricks are over-fired products which were made use of to create the decorative patterning, as also, for example, on the mid-16th-century Roper Gateway at Canterbury.⁴⁴ It was, no doubt, a way of making a virtue of necessity, of using up what were unavoidable products of early brickmaking.

Conclusion

It is fortunate that the St Alphage Garden stretch of London Wall remains. It is the earliest surviving example in London of brick used as a display material. Considered in conjunction with documentary sources, it underlines the continued importance of defensive architecture in south-east England at the very end of the Middle Ages, whilst examination of its fabric, supplemented by other archaeological and documentary evidence, provide a picture of brickmaking and bricklaying techniques within the City on the eve of the Tudor period.

1. Cotton, *Vitellius* A XVI, and doubtless one of Stow’s sources.
 2. J. Stow *A Survey of London*, ed. H. Morley (1912, reissued 1994), 41–2, 51, 388; C.L. Kingsford (ed.) *Chronicles of London* (1905) 187.
 3. J. T. Smith *Ancient Topography of London ...* (1815, reprinted in reduced facsimile and with re-arranged plates, 1985), pl. opp. 44 and pl. between 28 and 29; the Cripplegate illustration is reproduced in H. Chapman, J. Hall and G. Marsh *The London Wall Walk* (1985), section 14; in J. Schofield *Medieval London Houses* (1995) 9; and in J. Schofield *The Building of London from the Conquest to the Great Fire*, 3rd edn (1999) 128.

4. A. Westman ‘The Church of St Alphege’ *Archaeol Today* 8, 11 (December 1987) 17–22.
 5. Schofield, *op cit* fn 3 (1999) 9; for the City ditch in the St Alphage Garden area see W. F. Grimes *The Excavation of Roman and Mediaeval London* (1968) 88–9.
 6. Notably in C. Taylor and R. Muir *Visions of the Past* (1983) 167–8; more recently in J. Steane *The Archaeology of Power: England and Northern Europe AD 800–1600* (2001) 202–6; P. Ottaway *Archaeology in British Towns: from the Emperor Claudius to the Black Death* (1992) is beguiled by the view (168) despite presenting convincing evidence to the contrary (171).

7. T. P. Smith 'Why did medieval towns have walls?' *Current Archaeol* 95 (January 1985) 376–9; for a 15th-century Italian view see Leon Battista Alberti *The Ten Books of Architecture: the 1755 Leoni Edition* (1986) 72: 'Now as it is certain that Walls are a very powerful Defence both of our Persons and our Liberties, ... I cannot join in with those who are for having their city quite naked without any Wall ...'.
8. G. Home *Medieval London* (1927, reissued 1994) 229–33; A. Weir *Lancaster and York: the Wars of the Roses* (1995) 411–13; B. Watson 'Medieval London Bridge and its Role in the Defence of London' *Trans London Middlesex Archaeol Soc* 50 (1999) 21; B. Watson, T. Brigham and T. Dyson *London Bridge: 2000 Years of a River Crossing*, MoLAS monograph 8 (2001) 108.
9. Letter of Sir John Paston, 28 September 1471: J. Gairdner (ed.) *The Paston Letters* (1904), vol. 5, 113.
10. D. Seward *The Wars of the Roses* (1995) 188.
11. J. Schofield and A. Vince *Medieval Towns* (1994) 42; there seems to be a wide consensus on the point: e.g. H. L. Turner *Town Defences in England and Wales* (1970) 74–84; W. G. Hoskins *The Age of Plunder: King Henry's England 1500–1547* (1976) 1, 90; M. W. Beresford and J.K. St Joseph *Medieval England: an Aerial Survey*, 2nd edn (1979) 189–91; J. R. Kenyon *Medieval Fortifications* (1990) 183–99; as well as Smith *op cit* fn 7, 202–6. For dissenting views: J. R. Lander *The Wars of the Roses*, new edn (2000) 7–8, and M. Keen *English Society in the Later Middle Ages 1348–1500* (1990) 95.
12. G. M. Logan, R. M. Adams and C. H. Miller (eds) *Thomas More: Utopia: Latin Text and English Translation* (1995) 118, 119; D. Palliser *The Age of Elizabeth: England under the Later Tudors 1547–1603*, 2nd edn (1992) 240; S. Brigden *London and the Reformation* (1988) 544–5.
13. *A Midsummer Night's Dream*, V.i: line number varies with edition. I owe the application of this quotation to Beresford and St Joseph, *op cit* fn 11, 189.
14. Turner, *op cit* fn 11, 238–41; B. Hobley 'The Archaeology of London Wall' *London Journal* 77, no. 1 (1981) 10.
15. *As You Like It*, III.iii: line number varies with edition.
16. C. J. Bond 'Anglo-Saxon and Medieval Defences' in M. J. Jones and C. J. Bond 'Urban Defences' in J. Schofield and R. Leech, eds, *Urban Archaeology in Britain* CBA Res Rep 61 (1987) 62.
17. See the brief but useful discussion in R. L. Kagan 'A World without Walls: City and Town in Colonial Spanish America' in J. D. Tracy, ed. *City Walls: the Urban Enceinte in Global Perspective* (2000) 117–8.
18. Cf. Schofield, *op cit* fn 3 (1995) 150–2, and (1999) 126–8.
19. Kenyon, *op cit* fn 11, 194.
20. W. D. Simpson *Castles of England and Wales* (1969) 9; Keen, *op cit* fn 11, 133 comments that late medieval fortifications were 'often of brittle brick': in fact, contemporary bricks were far less brittle than much stone – the Kentish Ragstone commonly used in London, for example.
21. J. Keily 'The Fabric of the Medieval House' in G. Egan *The Medieval Household: Daily Living c. 1150 – c. 1450*, *Medieval Finds from Excavations in London*, 6 (1998) 37.
22. T. P. Smith *The Medieval Brickmaking Industry in England 1400–1450* BAR British Series 138 (1985) 58–9.
23. R. A. Goldthwaite *The Building of Renaissance Florence: an Economic and Social History* (1980) 181–2; J. Hollestelle *De steenbakkerij in de Nederlanden tot omstreeks 1560*, 2nd edn (1976) 144–7; Smith *op cit* fn 22, 61.
24. Stow, *op cit* fn 2, 388; A. Saunders and J. Schofield, eds, *Tudor London: a Map and a View* London Topographical Soc Publication 159 (2001) 2, pl. 1.
25. G. Malcolm 'Excavations at Island Site, Finsbury Pavement, London EC2' *Trans London Middlesex Archaeol Soc* 48 (1997) 39–41.
26. J. A. Wight *Brick Building in England from the Middle Ages to 1550* (1972) 56–60; F. W. Brooks 'A Medieval Brick-Yard at Hull' *JBAA* 3rd series, 4 (1939) 151–74; for analysis of its production and economy see Smith, *op cit* fn 22, 71–9.
27. J. H. Harvey *Mediaeval Craftsmen* (1975) 198; for 'assize' see R. E. Latham *Revised Medieval Latin Word-List from British Sources* (1965) 34, sub 'assess/io'.
28. R. Willis and J. W. Clark *The Architectural History of the University of Cambridge and of the Colleges of Cambridge and Eton* (1886) vol 1, 419, n. 4; N. J. Moore 'Brick' in J. Blair and N. Ramsay, eds, *English Medieval Industries: Craftsmen, Techniques, Products* (1991) 231; strictly, of course, the superlative 'largest' implies two smaller sizes, but it would be unwise to draw such a conclusion from 16th-century usage.
29. R. H. Tawney and E. Power, eds, *Tudor Economic Documents* (1924), vol 1, 116.
30. I. M. Betts 'New Thoughts on Bricks with Sunken Margins' *British Brick Soc Information* 68 (July 1996) 6–10.
31. R. Neve *The City and Country Purchaser, and Builder's Dictionary ...*, 2nd edn (1726, reissued in facsimile 1969) 42–3; 'place bricks' were later superseded by 'stock bricks' in London during the last decades of the 17th century; the meanings of both terms subsequently changed, so that caution is required when using them.
32. Goldthwaite, *op cit* fn 23, 177–9; Hollestelle, *op cit* fn 23, 28–40; Smith, *op cit* fn 22, 50–7; in earlier

- times, it may be noted, the terms 'kiln' and 'clamp' were used interchangeably.
33. Malcolm, *op cit* fn 25, 39.
 34. L. Lefevre *Architectural Pottery*, trans. K. H. Bird and W. M. Binns (1900) 191–7; M. Airs *The Tudor and Jacobean Country House: a Building History* (1995) 116.
 35. P. J. Drury 'The Production of Brick and Tile in Medieval England' in D. W. Crossley, ed, *Medieval Industry*, CBA Res Rep 40 (1981) 136; Smith, *op cit* fn 22, 52–4; Moore, *op cit* fn 28, 223; P. Ryan *Brick in Essex from the Roman Conquest to the Reformation* (1996) 4–8. At Hatfield House, Herts., the changeover from wood to coal as fuel for brickmaking occurred during the period of building from 1607 to 1612: L. Stone 'The Building of Hatfield House' *Archaeol J* 112 (1955) 107.
 36. N. Lloyd *A History of English Brickwork ...* (1925, reissued 1983) 33; Wight, *op cit* fn 26, 36; L. S. Harley 'A Typology of Brick: with Numerical Coding of Brick Characteristics' *JBAA*, 3rd series, 38 (1974) 79.
 37. T. P. Smith 'A Note on "Samel Bricks"' *British Brick Soc Information* 31 (November 1983) 5–7; also *OED*, sub 'samel'.
 38. Schofield, *op cit* fn 3 (1995) 9.
 39. T. Easton 'The internal decorative treatment of 16th- and 17th-century brick in Suffolk' *Post-medieval Archaeol* 20 (1986) 15–17 (Hampton Court and Long Melford); E. Mercer *English Art 1553–1625*, Oxford History of Art, vol. VII (1962) 92–4 (St John's).
 40. Illustrated in Schofield, *op cit* fn 3 (1999) 139, fig. 115.
 41. Sir J. W. Simpson *Some Account of the Old Hall of Lincoln's Inn* (1928) 62–3, 75.
 42. R. J. and P. E. Firman 'A geological approach to the study of medieval bricks' *Mercian Geologist* 2 no. 3 (1967) 309.
 43. I am grateful to Peter Minter of the Bulmer Brick and Tile Works, Suffolk, for comments on this matter.
 44. T. P. Smith 'The Roper Gateway, St Dunstan's Street, Canterbury' *Archaeol Cantiana* 108 (1990) 166–7, 176. Very occasionally diaper patterns used differently coloured bricks from separate brickyards, as in the gatehouse of Jesus College, Cambridge (c. 1500): RCHM (England) *An Inventory of ... the City of Cambridge* (1959) 84.

Excavations and post-excavation work

London Archaeological Archive and Research Centre, Mortimer Wheeler House, 46 Eagle Wharf Road, London N1 7EE. Contact Archive Manager, John Shepherd (020 7566 9317).

Croydon & District, processing and cataloguing of excavated and museum collections every Tuesday throughout the year. Archaeological reference collections of pottery fabrics, domestic animal bones, clay tobacco pipes and glass ware also available for comparative work. Enquiries to Jim Davison, 8 Brentwood Road, South Croydon, CR2 0ND.

Borough of Greenwich. Cataloguing of excavated and other archaeological material, the majority from sites within the Borough. Contact Greenwich Heritage Centre, Building 41, Royal Arsenal, Woolwich, SE18 6SP (020 8854 2452).

Hammersmith & Fulham, by Fulham Archaeological Rescue Group. Processing of material from the Borough. Tuesdays, 8 p.m. to 10 p.m. At Fulham Palace, Bishops's Avenue, Fulham Palace Road, SW6. Contact Keith Whitehouse, 85 Rannoch Road, W6 9SX (020 7385 3723).

Kingston, by Kingston upon Thames Archaeological Society (KUTAS). Processing and

cataloguing of excavated and museum collections every Thursday (10 a.m.) at the North Kingston Centre, Richmond Road, Kingston upon Thames KT2 5PE. Enquiries 020 8547 6738.

Pre-Construct Archaeology Ltd., Unit 54, Brockley Cross Business Centre, 96 Endwell Road, Brockley Cross, London SE4 2PD. Environmental- and finds processing, cataloguing and archiving of excavated material. Contact Finds Manager, Märit Gaimster (020 7639 9091).

Surrey, by Surrey County Archaeological Unit. Enquiries to Rob Poulton, Archaeological Unit Manager, Surrey History Centre, 130 Goldsworth Road, Woking GU21 1ND (01483 594 634).

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