

MEDIEVAL AND POST-MEDIEVAL WATERFRONTS AT ARUNDEL HOUSE/FITZALAN HOUSE, 13–15 ARUNDEL STREET, CITY OF WESTMINSTER

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With contributions by John Brown (building material), Wendy Carruthers (plant remains), Nina Crummy (small finds), Tony Dyson (historical research), Damien Goodburn (woodwork), Chris Jarrett (clay tobacco pipe), Beverley Meddens (animal bone), Frank Meddens (pottery), and Peter Moore (glass)

SUMMARY

An archaeological evaluation, excavation, and watching brief were undertaken by Pre-Construct Archaeology (PCA) at Arundel House/Fitzalan House, hereafter Arundel House, 13–15 Arundel Street, City of Westminster intermittently between November 1997 and October 1998 (Fig 1). The work was in advance of the redevelopment of the site and involved the excavation of trenches for lift pits, underpinning, and pad footings. The archaeological investigation was limited to those areas directly threatened by the redevelopment. The existing frontage was retained in the south and west.

The solid geology, London Clay, was recorded in two trenches and the level on the top of this sloped down from north to south, reflecting the slope of the palaeo-channel of the River Thames. In the far north of the site the London Clay was overlain by river terrace gravels, which had been eroded by the river across the majority of the site. Elsewhere the clay was overlain by alluvial deposits. In one area the alluvium was overlain by peat, which is thought to date to the Neolithic period. A sequence of foreshore deposits, foreshore structures, and river walls (constructed in timber, chalk and stone, and brick and stone) which date from the medieval and early post-medieval periods was recorded. All of the river walls were oriented NE–SW across the site. Post-medieval occupation, ground raising dumps, and 17th- and 18th-century walls and floors were also

identified on the eastern side of the site. The most significant post-medieval feature, due to the interesting assemblage of material recovered from it, was a large rubbish pit excavated in the north-east corner of the site. The focus of this paper is on the development of the foreshore structures and river walls recorded on the site and the assemblage of material recovered from the post-medieval rubbish pit.

INTRODUCTION

The site is located at 13–15 Arundel Street, City of Westminster (ADL 97), and is occupied by a standing building, Arundel House. The redevelopment area is roughly rectangular in plan and measures 26.5m N–S (maximum) by 22m E–W. It is bounded by a small alley to the north, Globe House to the east, Temple Place to the south, and Arundel Street to the west. The central National Grid Reference is TQ 3101 8081 (Fig 1).

The archaeological investigations were undertaken by Pre-Construct Archaeology Ltd (PCA) intermittently between November 1997 and October 1998. The work was commissioned by the Institute for Strategic Studies (IISS) and the Brian Clancy Partnership were the agents for the client; Ian Morrison of the Greater London

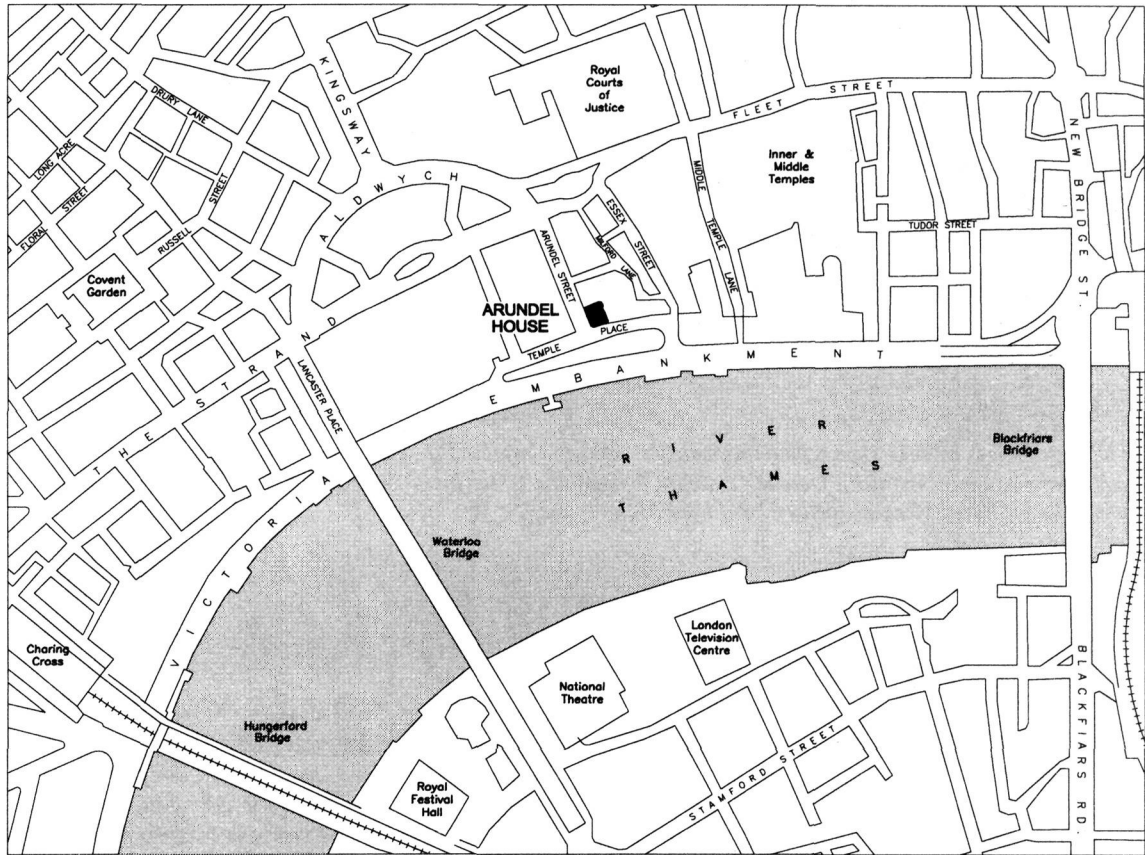


Fig 1. Site location

Archaeological Advisory Service (GLAAS) was the archaeological advisor to Westminster Council. Specifications for each stage of the archaeological work were prepared by the project manager, Gary Brown, and approved by Ian Morrison.

The redevelopment scheme involved the retention of the existing external walls, façades, and basement slab levels and the excavation of small trenches for lift pits, pad footings, and underpinning. This sub-surface impact threatened the potential archaeological remains present on the site and accordingly an evaluation was undertaken. The evaluation revealed significant archaeological survival across the entire site and an excavation ensued. It was not possible to fully excavate the archaeological sequence down to the level of the natural geology in all locations. On the recommendation of GLAAS it was decided that the full sequence of waterfront

structures would be excavated in the north-west of the site and further work would take place under the remit of a watching brief. Seventeen trenches were investigated (Fig 2). The sizes of the trenches and the depths to which they were excavated were determined by the redevelopment proposals and in some instances by the presence of archaeological structural remains which were preserved *in situ*. The dimensions of the trenches and the level to which they were excavated are listed in Table 1, below. The depth of some of the trenches necessitated the use of shoring, pumps, and winches to remove spoil.

Despite the fact that the trenches were distributed widely across the site and that only a relatively small proportion of the entire site was threatened and therefore investigated, it has been possible to establish a phased sequence of archaeological occupation with some certainty. The presence of river walls oriented NE-SW



Fig 2. Trench locations

across the site allowed structural remains encountered in separate trenches to be phased according to their north-south location. Ground reclamation

and foreshore deposits were also phased according to their north-south position in relation to these river walls and foreshore structures.

Table 1. *Dimensions of trenches*

| Trench | E-W (m) | N-S (m) | Top of archaeology | Lowest excavated level |
|--------|---------|---------|--------------------|------------------------|
| 1 | 1.70 | 1.85 | +1.68m OD | -1.22m OD |
| 2 | 1.10 | 1.30 | +1.76m OD | -2.25m OD |
| 3 | 3.40 | 3.30 | +1.92m OD | +1.18m OD |
| 4 | 1.00 | 4.10 | +2.58m OD | +0.38m OD |
| 5 | 1.30 | 1.20 | +1.84m OD | +1.14m OD |
| 6 | 1.00 | 1.40 | +1.73m OD | -1.80m OD |
| 7 | 1.50 | 1.00 | +1.67m OD | -2.44m OD |
| 8 | 5.20 | 4.40 | +1.62m OD | +0.63m OD |
| 9 | 1.10 | 0.70 | +1.88m OD | +0.81m OD |
| 10 | 1.80 | 7.20 | +2.55m OD | -0.02m OD |
| 11 | 2.10 | 1.50 | +1.76m OD | -2.12m OD |
| 12 | 0.90 | 1.10 | +1.86m OD | +1.29m OD |
| 13 | 2.60 | 4.40 | +2.54m OD | +1.61m OD |
| 14 | 2.70 | 2.40 | +2.55m OD | +1.44m OD |
| 15 | 2.30 | 2.00 | +1.68m OD | -0.32m OD |
| 16 | 2.00 | 2.00 | +1.80m OD | -0.50m OD |
| 17 | 1.50 | 0.40 | +1.76m OD | +1.76m OD |

GEOLOGY AND TOPOGRAPHY

The development site is located approximately 80m to the north of the present course of the River Thames which was last embanked by 1874. The modern ground surface slopes down from north to south towards the Thames, and lies between +6.1m OD and +5.8m OD in the vicinity of the site; this reflects the slope of the palaeo-channel of the river. The standing building is basemented throughout with finished floor levels at between +2.65m OD to +3.05m OD. The depth of truncation of archaeological deposits by the modern building foundations varied throughout the building and the highest level at which the archaeology survived in each trench is listed in Table 1, above.

The British Geological Survey North London map indicates that in the vicinity of the site London Clay is overlain by River Terrace Gravels which are overlain by alluvium (British Geological Survey 1994). Recent archaeological excavations by the Museum of London Archaeology Service (MoLAS) at Globe House (TMP 96), located immediately east of Arundel House, have provided detailed information about the geological deposits in the area. The height on the top of the London Clay at this site dropped from -1.00m OD in the north to -6.04m OD in the south, reflecting erosion by the Thames (Bowsher 1996). Deposits of

Kempton Park Terrace Gravels were only identified in two small areas, elsewhere they had presumably been scoured out by the river. The clay and the gravels were overlain by thick deposits of alluvium. Peat was recorded across the site overlying the alluvium at a fairly uniform level; between -1.90m OD and -2.29m OD (*ibid*). C¹⁴ analysis of the peat has produced a date of between 4500 and 4000 BC (*ibid*).

HISTORICAL BACKGROUND

The line of the Strand, known to have been in existence by 1002 (SMR 081175), is assumed to have been preceded by a Roman road exiting the city of *Londinium* at Ludgate and extending west upon the approximate lines of Fleet Street and the Strand. Residual Roman artefacts have frequently been recovered in the Strand area, but there is as yet no evidence for an occupation site or road.

Significant Middle Saxon (7th to 9th centuries) remains exist in a broad swathe to the north and south of the Strand, although both the eastern and western limits are poorly defined. It has been suggested that the Saxon settlement occupied approximately 60 hectares, with the majority of the site lying to the north of the Strand (Cowie 1988). By 1002 the Strand was referred to in a charter as *Akemannestracte* (SMR 081175). The Saxon foreshore has been identified to the immediate west of Arundel House at Globe House (TMP 96). Sherds of Middle Saxon Ipswich Ware (8th to 9th centuries), along with a copper-alloy strap end with an animal mask terminal typical of the 9th century, and a Saxon loomweight, were recovered from foreshore deposits (Bowsher 1996). Animal bone from these deposits displayed signs of butchery; the species present in the assemblage were cattle, sheep/goat, pig, red deer, whale, unidentified fish, chicken, and goose. The assemblage appeared to derive from primary processing and post-consumption waste. These deposits are interpreted as natural foreshore rather than land reclamation; the faunal and artefactual material within them is seen as being more indicative of rubbish from the Saxon settlement accumulating on the foreshore than reclamation dumps (*ibid*).

The Strand was the principal medieval thoroughfare between London (the City) and Westminster and became lined with mansions of the wealthy and the clergy, one of which was the

bishop of Bath's Inn. The Bath Inn site was granted to the bishop of Bath and Wells at some time before 1221 (Kingsford 1922, 243). Most of the English and Welsh bishops and leading abbots maintained 'inns' or episcopal residences in the City, more specifically in the district to the west of the Fleet (*cf* Honeybourne 1947, 67–87), perhaps the most notable of all being the house of the bishops of Ely on the north side of Holborn a little beyond the bridge. Their purpose was varied: primarily to accommodate the bishop himself when in London to attend parliament or church councils, but also as a permanent base close to the commercial and political heart of the country.

At the time of the Reformation the Inn was appropriated by the Earl of Southampton who owned the property for three years and renamed it Hampton Place (Honeybourne 1947, 248). In 1545 the house was granted to Sir Thomas Seymour and at this time it was largely rebuilt and renamed Seymour Place. It is this property which is shown on the Agas map dated to c.1550 (Fig 3). Documentary and cartographic evidence suggests that the excavated area was occupied by gardens throughout these periods. In 1549 the site was acquired by Henry Fitzalan, Earl of Arundel, and the family more-or-less retained ownership of the land into the 20th century.

In 1607 Thomas Howard became the new Earl of Arundel and the house entered what is considered to be its greatest period, when it housed a collection of classical sculptures and other marble works of art. Some of the marbles were housed in the gardens, although not necessarily in the area of the site. In 1671 Henry Howard, now Earl of Norwich, obtained an Act of Parliament for building on and improving the grounds of Arundel House, with the intention of building a house there for his family. The exact chronology of the rebuilding is far from clear. As already noted, demolition and clearance of the site as a whole cannot be dated more closely than the six-year period between 1677 and 1683. Kingsford implies that the new Norfolk House (like its predecessor, situated well to the north of the excavation site) was completed by 1689 or soon after (1922, 256). Surrey Street, along with Norfolk and Arundel Streets, had come into existence by 1683. Strype's map of 1655 (Fig 4) indicates that Arundel Street was fully built upon as far as the waterfront by this date.

The 1874 Ordnance Survey map shows, most significantly, the Victoria Embankment built over

the former Thames foreshore. A number of small buildings were built on the site on three sides surrounding a central courtyard, with the south side remaining open. The present Arundel House, currently being redeveloped, was constructed by 1894.

THE ARCHAEOLOGICAL REMAINS

Phases I, IIA, IIB and III: natural deposits

London Clay (Phase I) was only recorded in two trenches; the level at which it was encountered dropped from -1.17m OD in Trench 11 in the north to -2.25m OD in Trench 2 to the south. This north to south slope reflects the profile of an earlier channel of the Thames, still discernible at modern street level.

In Trench 11 the clay was overlain by a 0.79m thick deposit of orange sand and gravel and the highest level at which this occurred was -0.34m OD . This deposit (Phase IIA) is interpreted as River Terrace Gravels dating to the Pleistocene period. This was the only area of the site where the gravels were recorded and it is presumed that elsewhere they had been scoured away by the river. This trench was located in the far north of the site which would have been towards the edge of the river bank.

The clay and the gravel were overlain by alluvial deposits (Phase IIB) which were encountered in Trenches 1, 2, 6, 7, and 11; the full thickness was only excavated in Trenches 2 and 11, where it was 1.10m and 1.02m thick, respectively. The alluvium comprised silt clay with lenses of sandy clay and gravel and occasional shell and would have been deposited during periods of riverine transgression. Sand and gravel were deposited during flood events.

In Trench 7 the alluvium was overlain by a 0.95m thick deposit of peat (Phase III). The highest level at which this occurred was -1.49m OD . Peat deposits encountered at Globe House have been dated to between 4500 and 4000 BC by C^{14} analysis (Bowsher 1996). It is presumed that the peat from Arundel House also dates from the Neolithic period. The formation of peat would have occurred during a period of marine regression.

Phase IV: pre-12th- to 13th-century foreshore and possible Saxon structure

The deposit of peat in Trench 7 was overlain by a sequence of foreshore deposits. The earliest

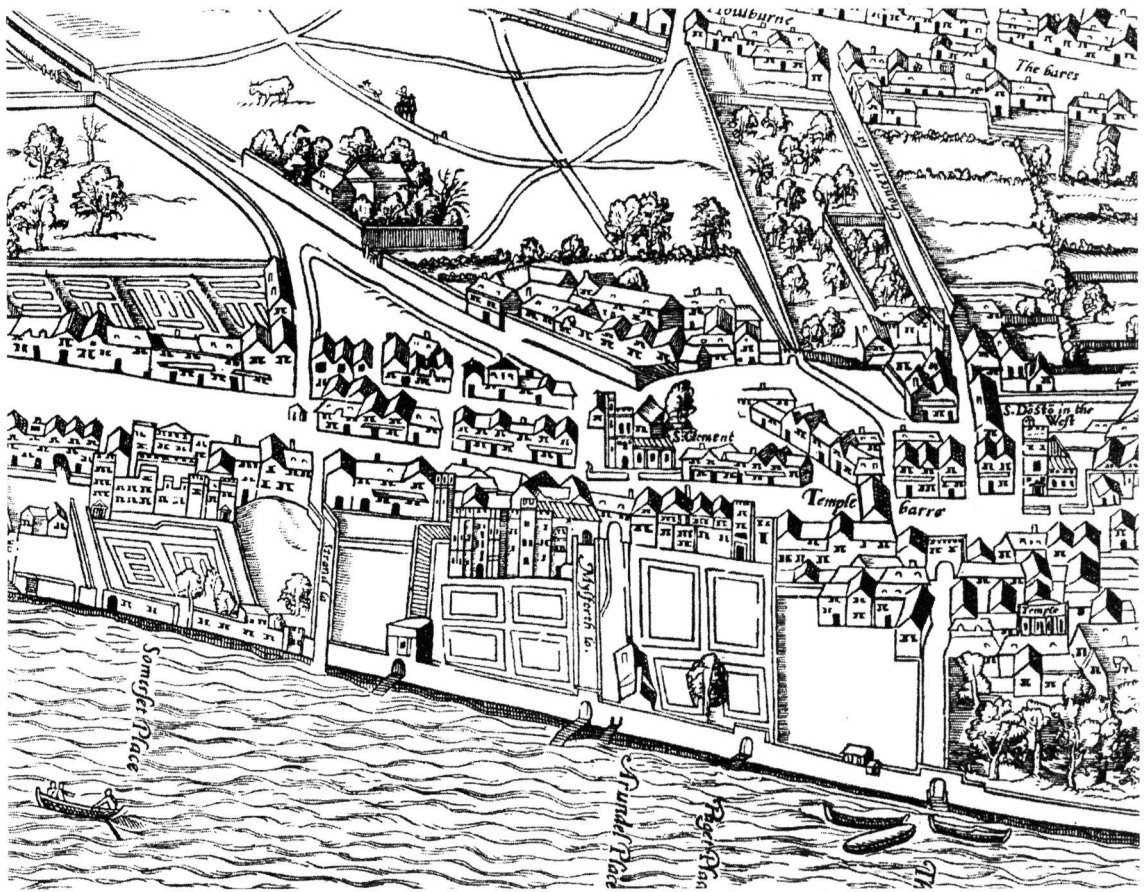


Fig 3. Agas map dated to c.1550

[239] comprised firmly compacted, mid grey, clayey sand with frequent inclusions of flint pebbles and occasional bone. This deposit was 0.10m thick and the highest level was -1.39m OD .

The alluvium in Trench 6 was overlain by a sequence of foreshore deposits ([218], [216], [215], and [143] from earliest to latest) the combined thickness of which was 1.25m. The foreshore in Trench 1, [189] and [183], was 0.96m thick. The level on top of the foreshore sloped from north to south from $+0.16\text{m OD}$ in Trench 6 to -0.22m OD in Trench 1. A similar sequence of early foreshore deposits ([323]–[320]) was recorded during the watching brief in Trench 16. Although this trench was located to the east of Trenches 1 and 6, the foreshore has been interpreted as being contemporary with those in the latter trenches due to its

location to the north of the earliest river wall recorded on the site. The maximum thickness of the foreshore in Trench 16 was 0.75m and the highest level at which it occurred was $+0.40\text{m OD}$.

The foreshore comprised deposits of silty sand and pea grit and clayey sand and pea grit with frequent inclusions of oyster and mussel shell and aquatic snails. A small amount of bone was recovered from the foreshore; the majority of the assemblage was either cattle or cattle sized with pig, sheep/goat, dog, and red/fallow deer also present. There was evidence for butchery in a deer radius which had been axially split for marrow extraction. Tile dating from 1150/1180–c.1500+ and residual Roman brick were recovered from [143] and [183], respectively. Environmental analysis was carried out on a sample from foreshore deposit [143]; the

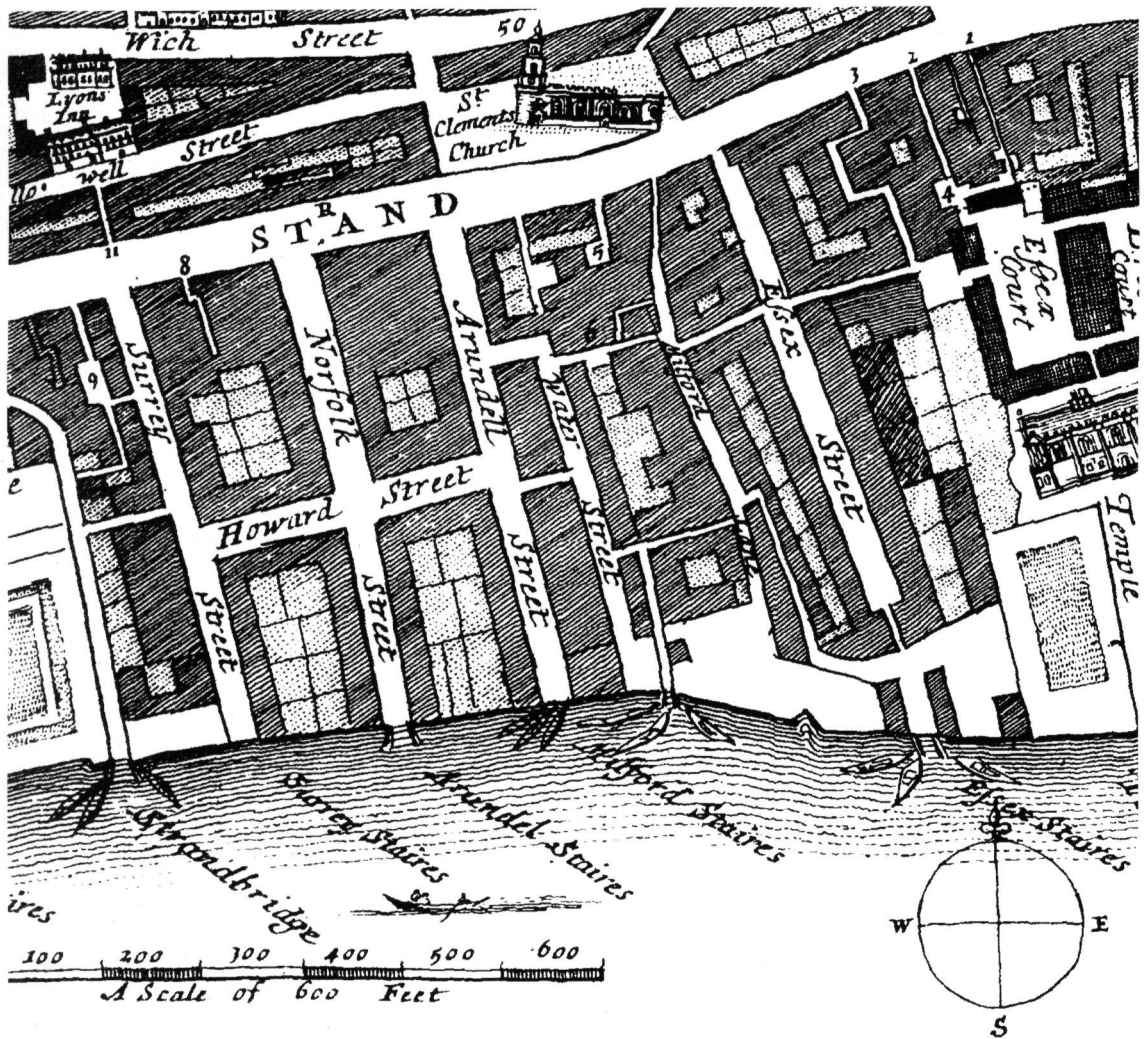


Fig 4. Strye's map of 1655

flotation residue contained seeds from elder, nettle, and buttercup, the latter suggesting a grassy habitat. The presence of cereal contaminants in the form of corncockle within the sample is indicative of faecal waste. It tends to be ground up with cereals for consumption and its fragmentation is typical of it having passed through the gut.

Three oak stake tips recovered from Trench 7 [326]–[328] and one from Trench 6 [329] may represent the remains of a truncated mid Saxon structure [330]. The oak stake tips were all

around 80–90mm in diameter and had multifaceted points with flat axe stop marks. These four stakes were all recovered during the watching brief and as a result their exact locations were not obtained. However, it was possible to determine an ordnance datum level range and a general location can be plotted due to the small size of the trenches. The three stakes in Trench 7 were recovered from foreshore deposit [239] at a level of between -1.39m OD and -1.49m OD . In Trench 6 the stake was recovered from foreshore deposit [218] at a level

of between -0.89m OD and -1.09m OD . These two trenches are on the same N S alignment and this, along with the level at which they were located and the similarities in tool marks, suggests that they originate from the same waterfront structure. This structure may have been an unloading jetty on the tidal foreshore and if this is the case then it would be the first known example from *Lundenwic*. An alternative interpretation suggested by the small size of the stakes is that they may have formed part of a fish trap.

There was no indication of the line of the contemporary waterfront associated with these foreshore deposits and structure. It is presumed that this lay beyond the northern limit of the area of excavation.

Phase V: late 12th- to 13th-century foreshore and foreshore structure

Structure [134] comprised four oak piles, [129]–[132], which had been driven through the foreshore in Trench 6 from a level of around $+0.16\text{m OD}$, with an average of three-quarters of their length below the foreshore. The top of the posts survived to a height of $+0.60\text{m OD}$ and they were between 960mm and 1400mm in length by $60\text{--}100\text{mm}$ by $110\text{--}170\text{mm}$. They were arranged in a roughly square formation and a fifth post [184], located to the immediate south in Trench 1, may have been a part of this structure. This post was severely truncated, it was 170mm in length, and the highest level at which it survived was -0.22m OD . Two horizontal planks were located to the south of the posts in Trench 6. The lower plank [144] was tangentially faced and measured 470mm by 150mm by 35mm thick. Overlying it was [133], also tangentially faced, which measured 600mm by 160mm by 40mm thick. The piles from this structure are interpreted as forming part of a simple wooden jetty. The function of the planks is unknown, although they were possibly associated with the structure; they may have fallen from the superstructure of the jetty and were not *in situ*.

The piles appear to have been made by splitting a somewhat crooked pole in half and hewing each half to a rectangular cross-section with an axe, although no very clear tool marks survived. Timbers [130] and [132] had similar grain patterns and were very fast grown; 25

annual rings with wane or 'bark edge'. Timber [131] was slower grown, but had less than 45 rings and was therefore not sampled for tree-ring dating. Technologically they appear to be medieval rather than Saxo-Norman and a date in the late 12th to 13th century seems likely.

A 0.14m -thick foreshore deposit [135] had built up around the posts in Trench 6. The post in Trench 1 was overlain by a 0.20m -thick foreshore deposit [182]. Tile dating from $1270/1360\text{--}c.1500+$ was recovered from both of these deposits.

The line of the waterfront with which this jetty was associated was not identified within the areas investigated and it is presumed that this was located beyond the northern limit of excavation.

Phase VI: mid 13th-century scissor-braced framed jetty or stair and foreshore

Two substantial timber posts were recorded during the watching brief in Trench 16; due to the limited time available for investigation their stratigraphic relationship with the foreshore deposits in this trench cannot be definite. However, a probable interpretation of the sequence was determined by comparing the levels of the foreshore in this area with those from other trenches and by an examination of the deposits in section.

A large timber post [310] was set into the foreshore; presumably a posthole had been cut but this was not identified during excavation. Timber [311] was aligned from the north of this post to the south and, although this timber had slumped from its original position, it was evidently a brace for the upright post. The post measured 1530mm by 200mm by 190mm and the brace was 1170mm by 170mm by 160mm . The highest levels on top of the post and brace were $+1.61\text{m OD}$ and $+1.11\text{m OD}$, respectively. This structure may have been part of a framed jetty or stair, in which the posts were 'earth fast'. As with the jetty excavated to the west in Trench 6, the line of the waterfront associated with this structure was not identified within the areas excavated and must have been located further to the north.

A notched lap joint had been used to join the two timbers and the upper end of the brace had a halving joint demonstrating that this structure had originally been scissor-braced. Both oak timbers were hewn to virtually square sections

with some axe stop marks surviving, the largest being 75mm on the brace. Each parent log was rather small and crooked and they were cut from a small, fairly fast growing oak(s). Both the shoulders of the joints and the base of the post were axe cross-cut; no trace of sawing was evident. Cut marks from a broad axe over 130mm long were left parallel with the side of the notched lap joint showing where the made part of the joint (the lower end of the brace) had been trimmed during prefabrication. The 32mm-diameter peg hole in the joint is rather large and this clearly weakened the brace which broke at this point.

A precise year of felling of winter 1239/40 was obtained for timber [310] by dendrochronological dating (Tyers 1999). Fragments of a similar scissor-braced structure were found during salvage recording at the City of London Vintners Place site (VHA 89). A broadly 13th-century bridge over the Fleet Prison moat (VAL 88) was also similar in terms of its use of diagonal notched-lap-jointed braces, although a baseplate was used in this structure.

Documentary evidence

The earliest record of the Bath Inn site dates from the reign of John (1199–1216) and is in the form of a grant by Henry fitz Reiner to Eustace de Falconberg of land held of the see of Robert de Harcourt in the parish of St Clement Danes and dating from the two decades before 1221 (*CAD* 1, A 1665). Eustace became Bishop of London in 1221, and before his death in 1228 granted the property to Joscelin Bishop of Bath and Wells, creator of the cathedral at Wells and the first builder of the house of his see in London (Kingsford 1922, 243). Perhaps the most remarkable aspect of the Falconberg grant, and one not adequately taken into account by Kingsford, is the set of dimensions it supplies. According to these, the early 13th-century plot measured $21\frac{3}{4}$ ells at its head (*in capite*) along the street (*vicum*), $25\frac{1}{4}$ ells at its foot towards the Thames, and $40\frac{1}{2}$ ells in length from street to river. As the standard ell was 3 feet, dimensions of 75ft 9in along the Thames, 65ft 3in along the street, and a depth of 121ft 6in from street to river are indicated. Kingsford, apparently speaking of this period, suggested that the river frontage exceeded 500ft, the street frontage being 'rather more', and the depth, from street to river, exceeding

400ft (Kingsford 1922, 243). It is not at all clear where Kingsford derived his measurements from, unless they are based on the Survey of 1590 in which the river frontage is given as 522ft, the street frontage as 612ft, and the eastern boundary (which extended all the way from street to river) as 335ft (see below).

Wherever he got them from, they bear little relation to those in the deed. These show that the early 13th-century plot, with a width of *c.*70ft, was much narrower than the late 16th-century plot with its width of 522ft. That in itself is unremarkable, for it is more than likely that during the intervening three centuries the inn was extended, on one side or the other, with the acquisition of adjoining properties by transactions of which no record survives. Of much greater potential interest is the relative *length* of the property at the two dates: 121ft shortly before 1221 and 335ft in 1590; clear and unequivocal evidence, on the face of it, of the southward progression of the waterfront between those dates. Yet the excavation record shows that this cannot be so. The earliest structures located on site, dating from the 12th to 13th centuries, lay as much as 470ft (143.5m) south of the Strand – three times the distance given in the contemporary deed – while the 16th- to 17th-century structures lay at 549ft (167.5m), more than 200ft further south than indicated by the 1590 Survey. Nor was there anything at all exceptional about the archaeological data. Downstream near Whitefriars Street the distance from Fleet Street to the Thames across the Carmelites' property to the west of the bishop of Salisbury's tenement was 660ft as early as 1349 (*Cal Patent Rolls* 1348 50, 298; *cf* Gadd & Dyson 1981, 13): compared with that, the waterfront at Arundel House was a late developer.

One obvious explanation, apart from scribal incompetence, for this enormous discrepancy between the archaeological evidence and two quite distinct documentary sources is that the street (*vicus*) referred to in the deed (and indeed in the 1590 Survey) was not the Strand, but some parallel thoroughfare much closer to the river. Although this is not a line of enquiry that can be resolved within the terms of the present investigation, it is perhaps worth noting that distances of 335ft north from the Phase IX Tudor river wall and 121ft north from the Phase V 12th- to 13th-century jetty would roughly coincide with a point a little south of the line of Maltravers Street. It should be noted that some

of the discrepancy may be accounted for by expansion of the area both to the north and to the south where land was reclaimed on the foreshore and into the Thames.

Phase VIIA: demolished timber river wall

Two fragments of oak beams, [318] and [319], were located in the south of Trench 16 set into foreshore deposit [323], both continued to the south beyond the limit of excavation. Timber [318] measured 340mm in length by 280mm by 140mm thick and the highest level on top of this was +0.15m OD. The dimensions of [319] were 720mm by 240mm by 120mm thick, the level on top of this was +0.12m OD.

The timbers were both apparently knotty beam-end offcuts and [319] had a very clear and straight, but incomplete, broad axe stop mark which was 130mm long. The oak timbers were very fast grown and each had less than 45 rings and were therefore unsuitable for dendrochronological dating.

A group of horizontal timber beams and posts were located to the east in Trench 10. These were recorded during the watching brief and it was not possible to remove all of the timbers. Posts [287] and [289] were positioned on either side of a horizontal beam [282], aligned N-S, at its southern end. This beam appeared to continue to the north beyond an unexcavated area where it was recorded as [286]; if these were the same timber then the beam was 2m long. The level on top of this timber was 0.00m OD. Another beam [287] was partially exposed adjacent to the eastern limit of excavation. Two further posts were associated with this structure; [285] was located to the south-west of beam [282] and [288] was to the north-east of [286].

It is presumed that these timbers from Trenches 10 and 16 originated from the same waterfront structure as they were located on the same N-S alignment and occurred at a similar ordnance datum level. Both the beams in Trench 16 and beam [286] had halvings cut into their upper faces and the alignment of these suggests that they were *in situ*. They are interpreted as chocks for the E-W baseplate of a timber framed river wall which had been removed in antiquity. It is possible that this was the same structure as the timber framed river wall (Phase VIIC) encountered to the west in Trench 1 as this is also on the same alignment (Figs 5-6).

Phase VIIB: late 13th- to 14th-century dismantled timber framed river wall

The foreshore in Trench 1 was overlain by a 0.25m thick deposit of rubble [181] which comprised large flint nodules, roughly hewn limestone blocks and chalk blocks with flint pebbles, tile fragments, and oyster shell. This was only located in the eastern half of the trench in an area where the underlying foreshore slumped down. It is interpreted as a ground consolidation dump deposited to level the area prior to the construction of a timber framed river wall. A second consolidation dump [157] up to 0.35m thick was located throughout the trench.

Structure [177] comprised an abraded and split box-halved oak beam [174] laid heart up and set into the consolidation dumps. This was located in the centre of the trench oriented NE SW and the highest level on top of the timber was +0.27m OD. The timber was 250mm wide by 125mm thick by 1510mm long, continuing to the east beyond the limit of excavation and truncated to the west by the standing building foundations (Fig 7). This is interpreted as a baseplate for a timber framed river wall which had been dismantled in antiquity. It had a complex pattern of joints; three through-mortices, and three shallow housings. Two of the mortices, which had 30mm peg holes, were broken in a manner which demonstrates that the posts were wrenched out while the baseplate was *in situ*. A smaller central mortice with a 24mm-diameter peg hole was not broken and this joint appears to date from a previous use of the timber. The larger mortices and the housings appear to reflect the existence of two posts with three planks set on end filling the spaces between the posts, the same construction as the overlying river wall. Four retaining piles were located to the south (riverside) of the baseplate, driven through the make-up dumps and the foreshore. Although interpretation of the construction sequence cannot be definite, it appears that these were contemporary with this baseplate. The posts were flush against this baseplate whereas there was a small gap between them and the overlying later baseplate. The posts were on average 1100mm long by 150mm by 130mm and were all hewn roughly square from small oak logs which had too few annual rings for dating.

Dendrochronological dating of the baseplate [174] has produced a felling date of soon after

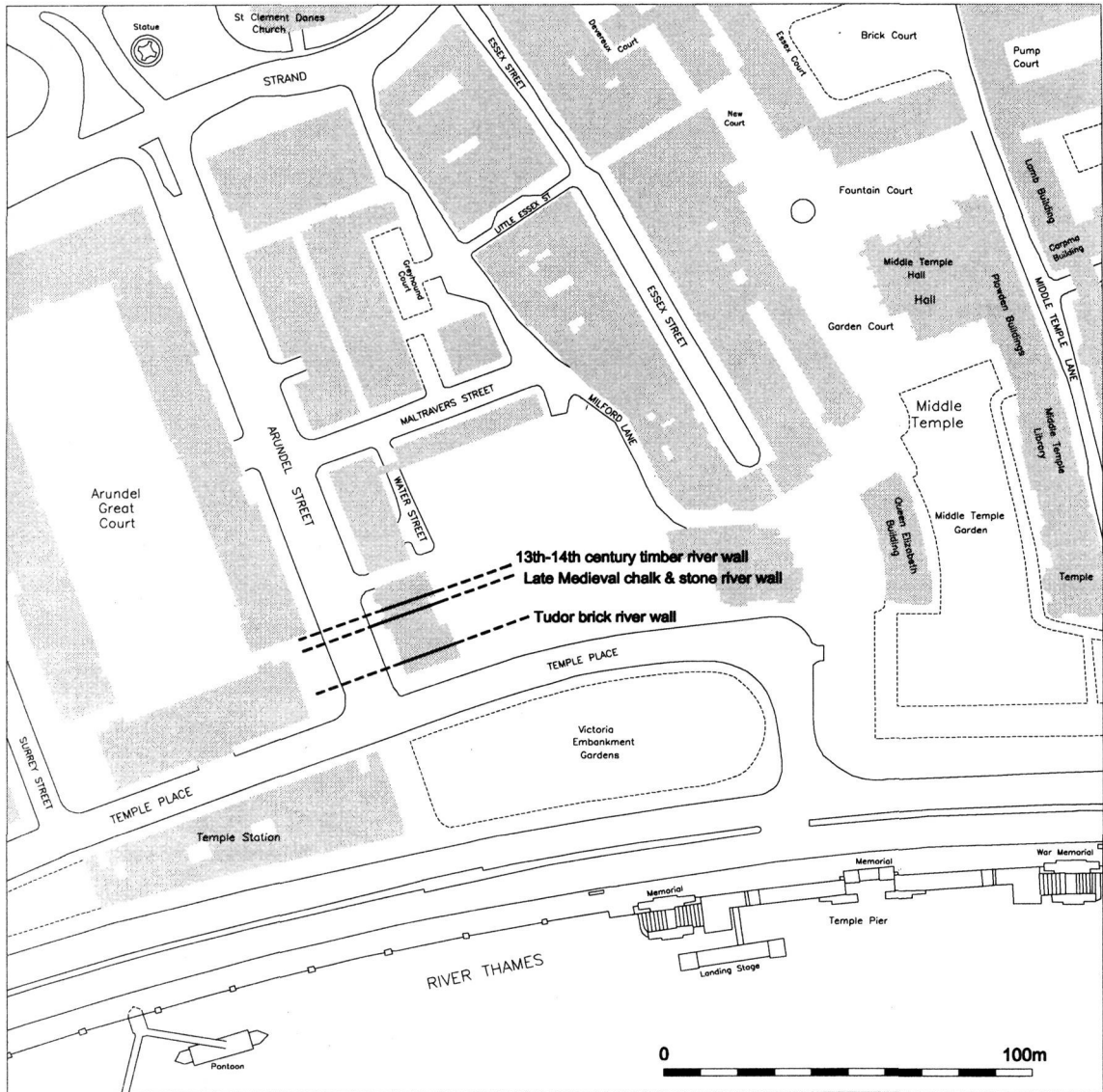


Fig 5. Line of waterfronts shown on OS tile

1237 (Tyers 1999). However as noted above this is a timber reused from a previous structure. The proportions and working details of the timber, such as the through-mortices, suggest that it was probably reused in the late 13th to 14th century. Recovered from consolidation dump [157], along with residual early medieval pottery (AD 650–850), was a fragment of a Kingston Ware skillet dating from 1250–1350. Fragments of tile from this context date from 1270/1360–c.1500+.

Phase VIIC: 13th- to 14th-century timber framed river wall

The remains of a substantial timber framed river wall, structure [160], were located in the centre of Trench 1, overlying the earlier baseplate of structure [177] (Fig 8). This revetment was exposed for a distance of 1.65m NE–SW, the structure continued to the east beyond the limit of excavation and was truncated to the west by

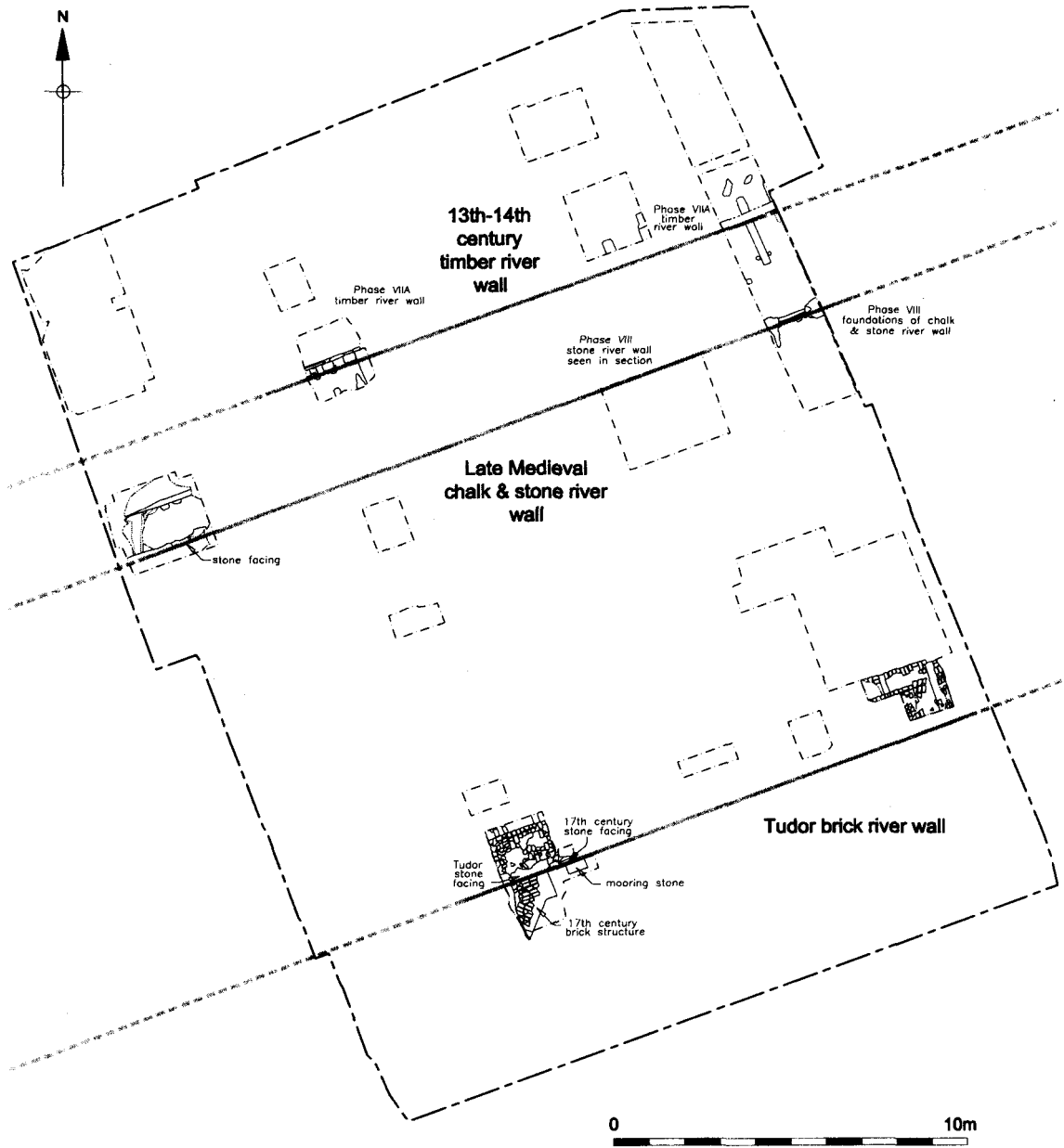


Fig 6. Excavated and conjectured waterfronts in detail

the modern building foundations. Ground reclamation dumps to the north (land side) were excavated for a maximum distance of 0.90m N-S. To the south of the wall ground reclamation deposits, associated with a later river wall, which overlay the structure were excavated for a distance of 0.75m N-S; these were also truncated by recent building foundations.

Two baseplates were placed directly on top of the baseplate of the earlier structure. Timber [173] was 1015mm in length, continuing to the east beyond the limit of excavation, by 360mm by 110mm. A large oak peg had been used to pin this baseplate to that from the earlier structure [177]. Only a small area of baseplate [172] survived truncation by the modern building



Fig 7. Phase VIIB timber river wall sill

foundations; this was 380mm in length by 350mm by 50mm. The highest level on top of the baseplates was +0.37m OD. The timbers were box-halved oak beams laid heart up and jointed to each other with a simple edge-halved scarf and two face pegs. The ends of the joint had clearly been sawn, but the long faces were axe trimmed. Three posts were set into the baseplates with three planks filling the space in between and slightly overlapping the posts. Post [166] was truncated to the west and it was not possible to remove this timber as it was stuck to the concrete foundations. This was set into baseplate [172] with a bare-faced tenon joint. It survived to a height of 860mm and measured 130mm by 240mm. Posts [162] and [164] were neatly hewn and tenoned into through-mortices; the latter was locked with an oak peg. The dimensions of these were 680mm high by 310mm by 220mm and 940mm high by 310mm by 220mm, respectively. Abraded edge tool 'in-cut' marks up to 70mm wide on the tenon of post [162] suggest that a method of 'double-cutting' may have been used to ensure a close fit of the posts to baseplate in the off-site framing process. The upright planking ([161], [163], and [165]) survived to a

height of around 730mm being on average 90mm thick by 500mm wide; this is relatively wide by late medieval standards, although much wider sawn planks are also known from sites in the City. The planks had clearly been sawn from a hewn baulk and traces of saw marks survived on the heart face of [163]. This plank was waney and sappy on the north face where it would not be seen. The two front braces [167] and [168] were truncated to the south and decomposed to the north. They were lying at a 45° angle in line with posts [162] and [164] to which they clearly would have articulated. Post [167] measured 230mm in length by 160mm by 180mm and [168] was 840mm long by 250mm by 250mm. As they were of relatively large and solid section they may have been set on a subsidiary plate rather than being earth fast.

Although the structure was truncated by foundations and only a small area was exposed, its basic structural form can be reconstructed with a moderate degree of certainty. Parts of all the key elements, with the exception of the top plates, survived. The structure comprised two wide, thin baseplates with three heavy posts tenoned in. The sheathing planking was set on

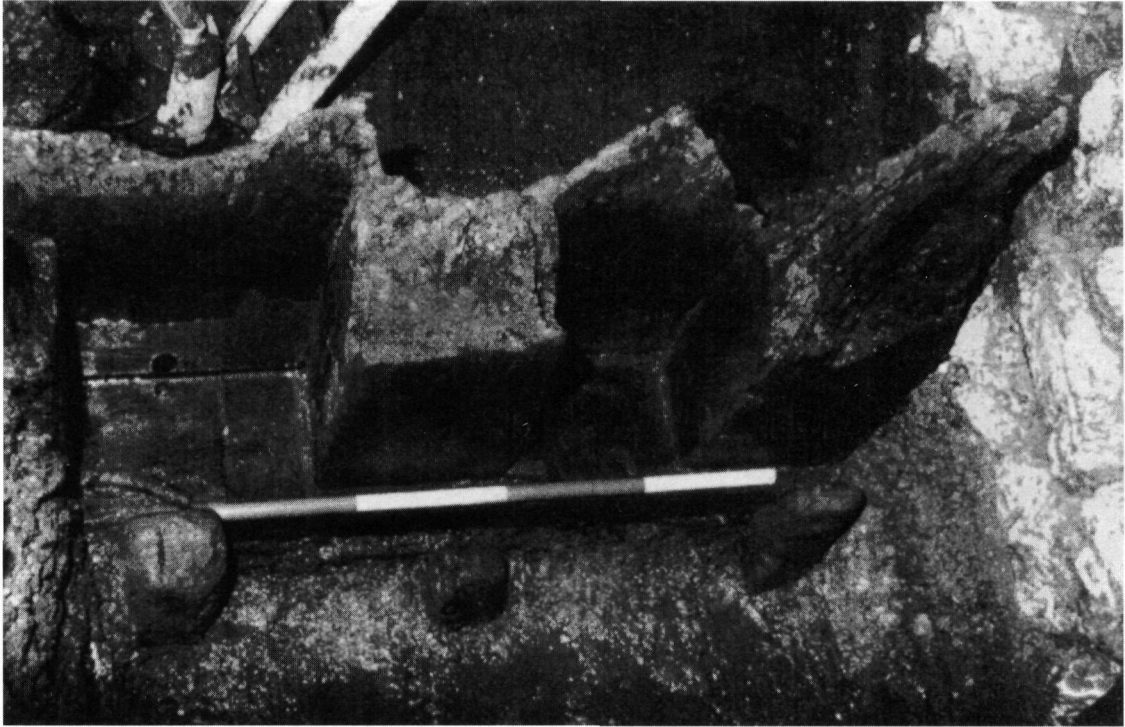


Fig 8. Phase VIIC timber river wall

end resting on the baseplates, filling the gaps between the posts and slightly overlapping them. The planking was not set into a groove or rebate in the post edges, the more common 'plank and muntin' arrangement, but appeared just to have been pressed against the posts by the weight of the landfill behind. It may have been tacked in place with nails or clamped against the posts in some other way higher up, but the full height of the wall did not survive. It is possible that this unusual arrangement was a cheaper version of the 'plank and muntin' construction seen in some later medieval buildings and a late 14th-century timber framed dock wall found at Hays Wharf in Southwark (Goodburn & Minkin 1996). The riverward appearance of structure [160] would have been exactly the same as a 'plank and muntin' construction but would have been achieved with a considerable saving in labour cost. The weight of the landfill was resisted by heavy front braces; these would clearly have articulated with each post top. There were no land-tie assemblies (back braces) present, but it is possible that these would have been widely spaced and therefore not encountered within the 1.65m stretch of wall exposed in this trench. A

reconstructed side elevation of the timber framed river wall (Fig 9) suggests that it would have originally been 1.80–2.00m high with the top of the structure at between +2.00m OD and +2.20m OD. Post-and-plank revetments with angled front braces were widespread in London by the late 13th century and most were around 2m in height (Egan 1991, 11–12). A notable exception is the late 13th-century revetment from Swan Lane which was 4m in height (*ibid*).

Apart from the vertical orientation of the sheath planking, the timber framed river wall from Arundel House is similar to the late 13th- to early 14th-century Group 3 timber river wall at Trig Lane (Milne & Milne 1982, 18). This structure was also set on the sill of an earlier revetment on the same alignment. It comprised a baseplate made with several timbers and retained by piles. Posts which survived to a height of 2m were tenoned into the plate at intervals of around 0.50m with five or six levels of horizontal planking secured behind the posts (*ibid*). Each post was shored to the south with a sloping timber which was set into a baseplate. This baseplate ran parallel to the principal baseplate and was located 1.60m to the south of

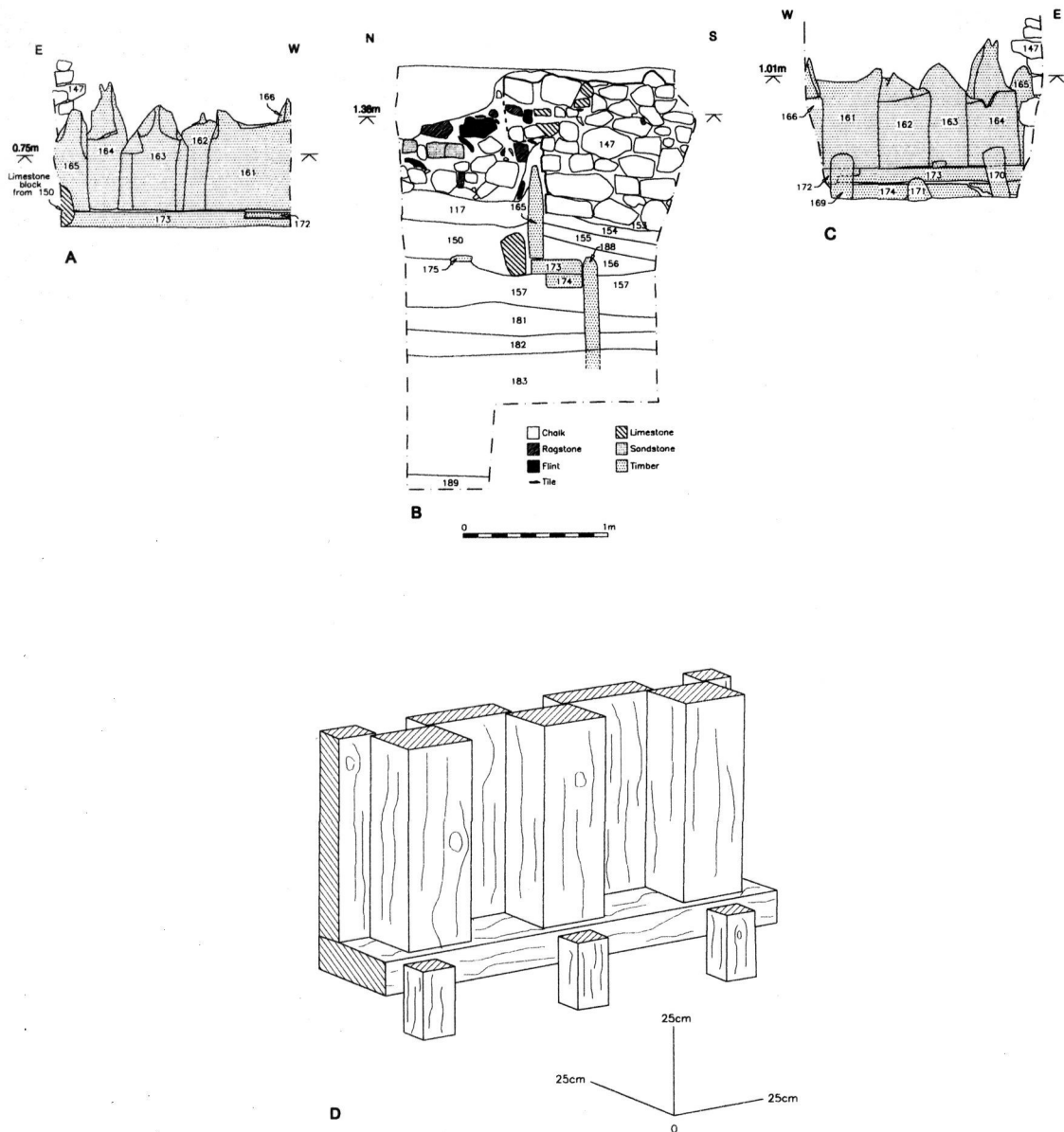


Fig 9. Reconstruction of Phase VIIC east facing side elevation

it (*ibid*). Three back braces were located 3.40m apart; these were horizontal tie-backs 3m long tenoned into vertical posts, 1.60m above the baseplate (*ibid*). The overall form of the timber framed structure from Arundel House and some of the details of its working suggest a date towards the end of the 13th to late 14th century. It was only possible to obtain a dendrochronological date from one timber [162]. Unfortunately

the absence of sapwood means that this is a *terminus post quem* date of 1300 (Tyers 1999).

Medieval ground reclamation deposits were excavated in several trenches to the north (landside) of the timber framed river wall. Although these dumps occurred in separate trenches and therefore had no demonstrable stratigraphic relationship with the revetment, their location to the north of this feature, their

similar composition, and the dating evidence recovered from them all suggest that they were land reclamation deposits associated with it. It was not possible to ascertain whether these dumps were associated with the construction of the Phase VIIB dismantled timber wall (structure [177]) or the subsequent replacement Phase VIIC structure [160]. Accordingly they have been assigned to the latest possible sub-phase with which they may have been associated. The reclamation deposits were all horizontally truncated by the modern basement, and therefore the contemporary medieval ground level did not survive. At Trig Lane the reclamation deposits behind the late 13th- to early 14th-century Group 2 timber wall were overlain by a 0.15m thick layer of oyster shells and a thicker deposit of earth and gravel (Milne & Milne 1982, 18). This probably served the dual purpose of sealing the smell of rotting vegetation and providing a well-drained bedding layer for the overlying gravel surface (*ibid*). A more substantial surface, composed of marble chippings, was later laid down over the gravel surface (*ibid*).

The total surviving thickness of the ground reclamation deposits to the immediate north of the wooden revetment in Trench 1 was 1m and the highest level at which they survived was +1.59m OD. These deposits sloped down from north to south demonstrating that they had been tipped down from the north. The earliest [150] was up to 0.60m thick and comprised silty sand and gravel with moderate inclusions of tile, bone, and occasional oyster shell. It was overlain by [117], a sandy silt with moderate inclusions of pebbles and tile and occasional chalk, ragstone, flint, bone, and oyster shell. This deposit also contained inclusions of organic material such as straw, reeds, and wood. It was up to 0.60m thick and, along with the underlying deposit, was located throughout the trench. The overlying reclamation deposits ([116], [83]–[81]) only survived in the north-west corner of the trench; they had been truncated in the east by later archaeological remains.

To the north in Trench 6 the earlier medieval Phase V jetty structure was overlain by land reclamation deposits ([128], [119], [57], [56], [54], [63], [53], [62], [51], and [52]) associated with the construction of the Phase VII timber river wall. The maximum combined thickness of these was 1.45m. They were similar in composition to those excavated to the south in Trench 1 and also contained quantities of domestic refuse

such as tile, chalk, pottery, animal bone, oyster shell, and decayed straw and reeds. These deposits also sloped down from the north to the south and the highest level at which they survived was +1.77m OD.

To the east in Trench 16 the foreshore and scissor-braced structure were overlain by reclamation deposits, [316]–[312], which had a combined thickness of 1.80m. These were similar in composition to those located to the west in Trenches 1 and 6 and also contained quantities of domestic rubbish. The highest level of the reclamation deposits in this trench was +1.84m OD.

Environmental analysis was undertaken on deposit [117] from Trench 1. The flotation residue contained frequent buttercups, sedge, self-heal, hemlock, spikerush, meadowsweet, and corncockle fragments. These taxa suggest a damp meadow environment and the corncockle is an indication of faecal material. The flotation residue from deposit [128] in Trench 6 included Chenopodiaceae, spike-rush, water-pepper, corn marigold, and buttercup which represent ruderal (wasteland) and arable weeds and aquatics and semi-aquatics.

The bone assemblage recovered from the Phase VII reclamation deposits is more varied than that of the preceding phases. The cattle and cattle sized element still constitutes a dominant component of this group making up 61.4% of the fragment count (NISP) and 81.8% in weight. Sheep and goat sized mammals constitute 30.7% in NISP and 13% in weight. The presence of red or fallow deer in the assemblage indicates that wild mammals constituted part of the diet. Birds and fish are also represented, although they form a small part of the assemblage; the fact that little or no animal bone was recovered from the flotation residues suggests that the quantity recovered in the hand collected samples can be taken as an accurate reflection of their frequency in the assemblage. Chicken is the most important bird meat species. An unusual species in the assemblage is crane. This species is a relatively rare visitor to the United Kingdom and prefers river banks (Peterson *et al* 1983, 91, 115) such as this part of the site would have been at this period. Its use as a species for food at this time has been commented on by Maltby (1979, 72), and is confirmed by the description of a method of keeping this type of wading bird and raising it for the table in a 17th-century book on animal husbandry (G.M. 1683, 125).

Tile recovered from deposits [150], [116], and [83] in Trench 1 dates from 1270/1350–c.1500+. The majority of the tile assemblage recovered from the reclamation deposits in Trenches 6 and 16 also dates from 1270/1350–c.1500+, with a fragment dating to 1150/1180–c.1500+ recovered from [53]. A sherd from a Kingston Ware bowl (1230–1350) and a Mill Green Ware sherd (1270–1350) were recovered from [150] in Trench 1. A Kingston Ware sherd (1230–1350) and an Early Medieval Sandy and Shelly Ware fragment (1000–1150) were recovered from deposit [116] in Trench 1. The pottery assemblage from Trench 6 comprised two Mill Green Ware sherds (1200–1400) from [128]; two Kingston Ware sherds (1230–1400), three London Ware sherds (1080–1350), and a fragment of a London Ware jug from [119]; three fragments of handles from Kingston Ware jugs (1270–1350) and a sherd from a South Hertfordshire Ware chamber pot (1150–1400) from [57]; and one sherd from a Kingston Ware jug (1340–1400) from deposit [52]. Pottery sherds recovered from deposit [313] in Trench 16 date from 1240–1350.

The pottery assemblage recovered from the reclamation deposits comprises 32 sherds including residual mid Saxon Ipswich Wares. The assemblage also comprises Kingston Wares, London Wares, and some Mill Green material. The most likely deposition date is between 1270 and 1350. The sherd size and some joins suggest that the material, although clearly redeposited, was either not moved any great distance or was moved in large enough quantities in order for it to retain some of its original associations – a scenario which would be consistent with domestic rubbish being used as land reclamation.

Phase VIII: late 14th-century medieval chalk and stone river wall

The heavily truncated foundations of a medieval river wall were recorded on the eastern side of the site in Trench 10. These comprised a horizontal timber baseplate [280] with four timber posts located to the south [276]–[279]. The highest level of the baseplate and each of the posts was +0.15m OD. The baseplate was 230mm wide by 100mm thick and was exposed for a length of 880mm E–W. The piles varied between 120mm and 160mm in diameter with [278] measuring 60mm by 200mm; it was not possible to excavate the piles so their lengths

were not ascertained. Two areas of roughly hewn chalk blocks [281] survived at the east and west ends of the baseplate; these measured 0.34m E–W by 0.54m N–S and 0.30m E–W by 0.90m N–S, respectively. The highest level at which these chalk foundations occurred was +0.20m OD (Figs 5–6).

Trench 15 was located to the west of Trench 10 and the northern limit of this trench was formed by the south facing elevation of the medieval river wall which was exposed for a height of 1m. In this trench the wall [309] was visible for a distance of 2.30m NE–SW. It was constructed with ragstone ashlar blocks up to 460mm by 210mm; the depth of the blocks could not be seen as the wall was only visible in elevation, bonded with sandy mortar. Individual stones could only be discerned in the top two courses as a render was present below this level. Two tiles were visible beneath one stone and these appear to have been used as a levelling course. The highest level at which the wall survived in this trench was +1.56m OD and the lowest exposed level was +0.54m OD; the base of the wall was not exposed in this trench.

To the west in Trench 14 the wall was encountered directly beneath the concrete floor of the standing building and deposits on either side of the wall were excavated to reveal the north and south elevations to a height of 1.11m (Fig 10). The south face (river side) of this wall was located 3.2m to the south of the earlier timber revetment whilst the north face was 1.8m to the south, this being the extent of the land reclaimed by the construction of the chalk and stone wall. The north facing elevation was constructed with chalk fragments and blocks which varied in size, the largest measuring up to 350mm by 180mm, bonded with yellow sandy mortar. This side of the wall was battered and the upper courses, above +1.82m OD, were random coursed, below this level the wall was uncoursed. The south face (riverside) was very irregular in comparison to the north and three ragstone ashlar blocks exposed at the base of the trench demonstrated that the stone facing, recorded to the east in Trench 15, had been robbed out. The core was constructed in chalk with occasional flint nodules; the large quantity of mortar in this area meant that individual blocks could not be discerned. The river wall was 1.39m wide and was exposed for a length of 2.72m. The highest level at which it occurred was +2.55m OD and the lowest exposed level



Fig 10. Phase VIII chalk and stone wall

was +1.44m OD. The construction techniques used in the chalk and stone river wall are very similar to those of the Group 8 and Group 15 river walls recorded at Trig Lane. The former dates from the early 14th century and the latter was constructed *c.*1440 (Milne & Milne 1982, 25).

The full height of the Phase VIII wall at Arundel House was not exposed in any trench, but the foundations were exposed in the east of the site. If the contemporary level of the land is presumed to have been the same across the site, then the wall would have been at least 2.50m high. The exclusive use of chalk in the north facing elevation would suggest that this area of the wall would have been below medieval ground level as chalk was not a suitable material for exposed areas of wall. It is presumed that the top would have been faced in stone as with the Group 15 wall from Trig Lane and that this had been truncated by the foundations of the present standing building. The full height of the wall would therefore have exceeded 2.50m.

Ground reclamation deposits associated with the medieval chalk and stone wall were excavated

to the immediate north of the wall in Trench 14. The maximum excavated thickness of these was 0.87m and the lowest exposed level was +1.41m OD. The earliest exposed deposit [262] comprised sand and flint gravel with inclusions of oyster shell and tile. This was overlain by a 0.17m thick deposit of clayey silt with inclusions of flint pebbles, oyster shell, mortar, chalk, and tile [256]. The latest reclamation deposit in this trench [255] comprised clayey silt with inclusions of pebbles, oyster shell, chalk, tile, and bone. This was up to 0.70m thick and the highest level at which it occurred was +2.28m OD. Tile recovered from deposit [256] dates from 1150/1180–1500+.

A series of ground reclamation deposits ([156]–[151], [149], and [148] from earliest to latest) was excavated to the north-east of the river wall in Trench 1. These were located to the south of the earlier Phase VII timber wall, overlying this structure, and are interpreted as being deposited as part of the ground reclamation process associated with the Phase VIII river wall. The maximum combined thickness of these

deposits in Trench 1 was 1.42m. The reclamation deposits all sloped down from the north to the south demonstrating that they had been tipped from the north. The level at the base of the earliest deposit was +0.26m OD and the highest level at which the reclamation deposits occurred was +1.56m OD.

Environmental analysis was undertaken on two reclamation deposits from Trench 1. The flotation residue from [152] included buttercup, sedge, marsh marigold, and stinking mayweed. The residue from [155] comprised buttercup, sedge, spikerush, Chenopodiaceae, dock, and nipplewort. Both of these assemblages indicated a damp grassland environment with aquatics, semi-aquatics, and arable weeds also present. The environmental samples of reclamation deposits from Trench 14 produced very few seeds with only buttercup and Chenopodiaceae present.

The majority of the tile recovered from the reclamation deposits dates from 1270/1360 *c.*1500+. The assemblage from [149] included tiles dating from 1380/1400 *c.*1500+. The pottery assemblage recovered from these deposits included a small number of sherds which indicate a date of deposition in the late 14th century, probably between 1350 and 1400. The assemblage also included a significant amount of residual earlier medieval material, the earliest of which dates to 900–1050. The largest pottery assemblage was recovered from deposit [149] and this included fragments of Earlswood Ware jars, jugs, skillets, and louters (1200–1400), Kingston Ware chamber pots (1270–1350) and skillets (1250–1350), and London Ware jugs (1270–1350) and louters (1080–1350).

A series of foreshore deposits was excavated in several trenches located to the south of the Phase VIII river wall. It is possible that some of the lower foreshore material in these trenches may have been deposited while the earlier Phase VII river wall was in use; however the absence of closely dateable material from these lower foreshore deposits means that this cannot be verified. Accordingly the foreshore deposits have been phased with the latest possible date of deposition and are therefore interpreted as being deposited while the Phase VIII river wall was in use. Foreshore deposits ([308]–[302] from earliest to latest) were excavated to the immediate south of the river wall in Trench 15. The maximum excavated thickness of these was 1.20m and the highest level at which they were encountered was +0.94m OD. The lowest exposed level of the

foreshore in this trench was –0.32m OD. To the south in Trench 2 the foreshore deposits [208]–[205] were 1.30m thick; the level at the base of the foreshore was –1.15m OD and the highest level was +0.15m OD. Two sherds of Kingston Ware pottery (1230–1350) were recovered from deposit [205] and a fragment of a Kingston Ware jar (1230–1350) was recovered from [207]. The tile assemblage from these two deposits dates from *c.*1380/1400–1666/*c.*1700 and 1480/1520–1900+, respectively.

The maximum thickness of the foreshore deposits ([238]–[232]) excavated in Trench 7 to the south of Trench 2 was 1.65m. The level at the base of the foreshore was –1.39m OD and at the top was +0.26m OD. Tile dating from 1270/1360 *c.*1500+ and 1150/1180–*c.*1500+ was recovered from [232] and [233], respectively. The most southerly area where the foreshore was recorded was in Trench 9. An auger survey was undertaken in this area to ascertain the thickness of the foreshore, however it was not possible to remove cores beneath a depth of 1.40m. The level on the top of the foreshore in this trench was –0.02m OD.

The bone assemblage recovered from the Phase VIII reclamation deposits and foreshore is dominated by cattle and cattle sized species (53.3% NISP, 64.8% total weight). But sheep/goat and sheep sized species (31% NISP, 7.9% total weight) and pig (10.4% NISP, 12.1% total weight) are also of significance. There is a noticeable juvenile element among the pig remains. Horse is present (*c.*11 years of age). Both roe deer and red/fallow deer were identified, with the latter demonstrating clear butchery evidence (signs of chopping right through the ball socket of the pelvis). As with the earlier phases this material derives from foreshore deposits. The dominance of the cattle and cattle sized element in this group appears to be a common feature, matched for instance in an assemblage of late 15th-century date excavated at Greyfriars (Armitage & West 1985, 111).

Medieval chalk walls

Two stretches of chalk wall were located to the north of the Phase VIII medieval chalk and stone river wall. The ground reclamation deposit [148] in Trench 1 was truncated by the construction cut for a chalk wall. This was located next to the eastern edge of excavation and to the south of

the wooden revetment. Cut [146] measured 1m N-S, continuing beyond the southern limit of the trench, and was 0.58m wide as excavated; the wall was not excavated, so the full width of the cut was not seen. The visible section of the construction cut had a vertical side and the highest and lowest levels were +1.56m OD and +0.46m OD. The west face of the wall [147] was visible within the limits of the trench and this was constructed with chalk blocks which varied in size between 250mm by 200mm by 200mm and 100mm by 100mm by 100mm. Very occasional limestone and ragstone were also present; these were the same size as the chalk blocks, and flint was used to fill the gaps in between. The bonding material was yellow-brown sandy mortar. Seven courses of the wall survived; it was random coursed and measured 1.10m high by 2.10m N-S by 0.28m E-W, continuing beyond the eastern and southern limits of excavation. The highest level at which the wall survived was +1.68m OD. The backfill of the construction cut was a moderately compacted, dark grey, clayey silt which contained occasional inclusions of chalk, flint, and ceramic building material [145]. As only a small area of this wall was exposed within the limits of the trench it is not possible to define the function of the wall. The construction techniques would suggest that the wall is medieval in origin and the stratigraphic relationships within the trench demonstrate that the wall post-dates the Phase VII wooden revetment. The ceramic building material recovered from the construction cut backfill includes some residual medieval tile but the latest material dates to *c.*1480/1520–1800, which is not inconsistent with a late medieval date for the building of the wall.

A chalk wall [250] was located directly beneath the concrete floor slab in Trench 13 and 7.50m to the west of wall [147]. This wall was oriented NNW-SSE and continued beyond the limits of excavation to the north and south. The full width of the wall was only visible in the southern half of the trench as it ran under the wall of the present standing building to the north. It was exposed for a distance of 4.40m and was 0.75m wide. A sondage was excavated through the deposits to the east in order to examine the east face of the wall and the maximum exposed height was 0.70m. The chalk blocks varied in size from 290mm by 280mm by 200mm to 70mm by 50mm by 50mm. Occasional green sandstone, ragstone, and flint were used in the

wall and the bonding material was a yellow sandy mortar. Tile and a fragment of re-used Roman brick were also visible. It was possible to excavate deposits to the west, in the south-west corner of the trench, and this demonstrated that the wall was random coursed on both the east and west faces. The highest and lowest levels on the top were +2.54m OD and +2.23m OD, respectively. The construction techniques used would suggest that it dates from the medieval period.

Deposit [260] was located to the west of the chalk wall and was visible only in the south-west corner of the trench. It was excavated to a depth of 0.46m; it was not possible to excavate beyond this due to the confines of the trench. The deposit comprised grey-brown sandy, clayey silt with frequent patches of clay, frequent inclusions of tile and small stones, and very occasional bone and oyster shell. The tile within [260] was vertically 'set' which suggests that this may have been the backfill of a construction cut for the wall; if tile fragments had been deposited in a narrow space between the chalk wall and a construction cut then it is likely that they would lie vertically rather than horizontally. The tile dates from *c.*1380/1400 *c.*1666/1700 and one piece of medieval pottery (1200–1400) was also recovered.

The deposit to the east of the wall, which occupied the remaining area of the trench, comprised brown sandy, clayey silt [254]. It contained frequent inclusions of pebbles, occasional ceramic building material, oyster shell, chalk fragments, and charcoal. Deposit [254] was not fully excavated and a 1m-wide sondage with a maximum depth of 0.60m was dug through it in order to expose the east face of the wall. The highest level at which it occurred was +2.14m OD. Tile from it dates from 1270/1360 *c.*1500.

It is not possible to be certain about the interpretation of these medieval chalk walls as only a small area was exposed and no documentary evidence survives from this period. As a result it is not possible to determine whether the walls were from a building (either internal or external), from a property boundary, garden wall, or some other structure.

Documentary evidence

No documentary evidence survives from the central medieval period. The 3m extension of

the Phase VIII waterfront at Arundel House is paralleled by two similar progressions of the frontage at Trig Lane in the City between the late 13th and mid 15th centuries (Milne & Milne 1982, 17–24, 29–42, fig 4). The comparison is not of course binding, but indicative of the general scale of waterfront revetting in the central medieval period. The use of masonry for river walls, which finally put an end to the perennial problem of rotting timber revetments and the frequent need to replace them, became increasingly common in the 15th and 16th centuries.

It should also be noted that in view of the relatively modest size of the initial, early 13th-century grant of land to Eustace de Falconberg, there can be no certainty that the present site, located towards the eastern end of the frontage of Bath Inn at its final stage of development, necessarily formed part of it in the earlier medieval period.

Phase IX: Tudor river wall

A Tudor brick and stone river wall oriented NE–SW was located to the south of the medieval stone and chalk wall, close to the southern limit of the site. The north side (land side) of this wall was 10.40m south of the river face of the medieval wall. The internal E–W walls of the standing 19th-century building were built directly on top of the Tudor wall, whilst the load bearing N–S walls truncated it. The top of the wall was also truncated horizontally by the basement of the standing building. It was recorded in four trenches (3, 5, 12, and 17) (Figs 5–6) along the same alignment, suggesting that it survived across the width of the site (Fig 6). In the east of the site the internal wall of the standing building which divided Trenches 5 and 8 was demolished during the watching brief and post-medieval deposits to the north of the Tudor wall were excavated to reveal the north facing elevation.

This elevation was exposed over a length of 3.20m and height of 0.75m in Trench 5/8. The wall had a stepped profile, and this step had a true width of c.1.00m in this trench. The highest level at which the wall survived was +1.84m OD. In Trench 3 there was a 0.18m-high void in the brickwork underneath the step. A deposit of decayed organic material was located on top of the brickwork in this void which may have been the remains of a decayed timber beam. Alternatively it may have been connected with

some form of drainage system and the organic material may have been silting up the void. In Trench 3 the lowest course of bricks in the step was rounded and the mortar had worn away suggesting that it may have been eroded by water. A series of drains or gutters constructed in the brickwork was located on the lower NW–SE stretch of wall running out of the core of the wall under the step and presumably draining into the river. Two drains were visible in Trench 3; these were 0.90m apart, 0.18m wide, and 0.12m and 0.09m deep respectively. Three drains were visible in Trench 5. The eastern drain was 0.15m deep and was exposed for a distance of 1.40m NW–SE. The level on the base of the drain at the north end was +1.21m OD and at the southernmost point +1.11m OD. This slope down towards the south was also observed in the central drain to the west. This central drain, which was also 0.15m deep, was positioned 1.20m apart from the drains to the east and west. Deposits overlying the lower step of the wall and the drains survived in this area. A sticky red-brown material overlay this central drain suggesting that it may have originally had a timber covering. Its base was silted up and above this layer was a void further suggesting that the drain had been covered. A void was also present at the top of the drain in the west of the trench similarly suggesting a cover.

The north facing elevation of the wall was constructed with random coursed red brick; this face would not have been visible as it was below ground level, so its visual appearance would not have been a concern. This elevation had a higher proportion of headers than stretchers, a construction technique which would add strength to the wall. The south facing elevation of the wall was only exposed in Trench 3. The original face here existed for a length of 0.90m NE–SW; to the west it was truncated by the standing building and to the east it had been replaced by later repairs. The section that did survive demonstrated that the side facing the river was constructed with large blocks of stone. The core of the wall, visible in Trench 5 in an area truncated by a modern pipe, was constructed of random courses of brick, brick bats, chalk, and fragments of brick with mortar to form a rubble fill.

Repairs to the stone facing were apparent in the east of Trench 3; three Portland stone ashlar blocks [248] had been used to repair the south face (Fig 11). The stone to the west had clearly been cut to key into the surviving original face

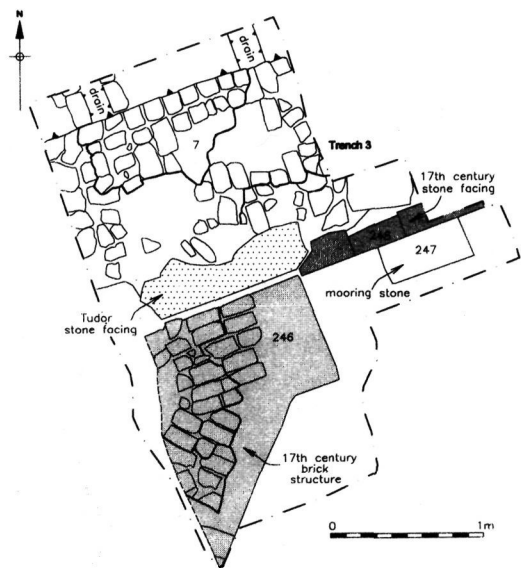


Fig 11. Phase IX and X wall plan

and the stones were bonded with a yellow limey mortar. The repair was visible for a distance of 1.30m E-W, continuing beyond the eastern limit of excavation, and the blocks overhung the original stone facing by 45mm. The blocks measured 210mm N-S by 110mm high; two of the blocks measured 350mm E-W while the eastern block measured 550mm E-W and continued beyond the limit of excavation. The highest level of the stones was +1.74m OD. A large stone [247] was located beneath the repaired stone face of the river wall. This stone had a flat upper surface with convex sides which then became vertical (Fig 12). The stone measured 0.55m E-W by 0.27m N-S by 0.41m high, continuing beyond the base of the trench. The level on the top of the stone was +1.58m OD. The upper surface appeared to be worn down in the centre, creating two rims on the outside, and this wear pattern suggests that the stone may have been a mooring-point.

The full width of the wall was not exposed in any one trench, although the north and south sides were exposed in Trenches 5 (Fig 12) and 3, respectively. If it is assumed that the wall was the same width along its length then the full width towards the top would have been 1.98m. It is probable that the width of the wall would have increased with depth.

The bricks used to construct the wall date from 1450/1480-c.1666/1700. A small area of the wall was demolished in Trench 5 in order to

accommodate a lift shaft. A fragment of Post-Medieval Red Ware pottery was recovered from its core and dates from 1480-1600.

Documentary evidence

Documentary evidence suggests that the construction of the wall is probably best attributed to Sir Thomas Seymour. On 29 November 1545 he acquired from the Crown for £700 the grant in fee of the 'chief mansion and chief messuage called Hampton Place alias Bath Place in the parish of St Clement Danes without the bars of the New Temple, London'. The grant alludes to the premises having all formerly belonged to John, Bishop of Bath and Wells, and having subsequently been acquired under Act of Parliament of 1539-40 by William, late Earl of Southampton, Great Admiral, who had subsequently died without heirs. There is minimal description of the principal house itself, though much space is given to a description of the location and the occupants of fifteen ancillary properties located between the house and the Strand (*L & P Henry VIII*, 20 (1545), ii.910(77)). Kingsford dismisses much of the supplementary detail as partly inaccurate, but concludes that the substantial rebuilding of the house attributed to Seymour probably amounted to the erection of the extensive blocks stretching from the southwest corner of the old house down to the river, preserving intact the ancient courtyard and hall (Kingsford 1922, 249). That would certainly be consistent with a southward extension of the existing, medieval frontage, and with the Phase IX brick wall encountered on site, while Tudor structures built partly in brick and including a cesspit and vault were located in 1972 in the area north of Howard Street between Norfolk and Arundel Streets (Hammerson 1975, 214-21), apparently on the site of the west wing of the courtyard.

Following Seymour's execution on 20 March 1549, his house on the Strand was purchased by Henry Fitzalan, Earl of Arundel, reputedly for £41 6s 8d (Kingsford 1922, 249-50). The purchase was effected in letters patent of 5 November 1549 which granted him as 'the king's councillor' the capital mansion and messuage called Hampton Place alias Bathe Place alias 'the Bysshop of Bathe Place', late of Thomas Seymour knight, Lord Seymour of Sudley, attainted, and previously of William Earl of



Fig 12. Phase X repairs to wall and possible mooring-point

Southampton, and formerly of John Bishop of Bath and Wells, together with the various tenures to the north (*Cal Patent Rolls Edward VI*, 1548–49, 245).

At the time of the survey of Arundel House carried out on royal instructions in 1590 after the attainder of Earl Philip (PRO King's Remembrancer Miscellaneous Book 45; Kingsford 1922, 269ff), the house covered 3½ acres and, as has been seen, extended 522ft along the river. On the west side it extended to Strand Lane, and on the east, by various premises and at one point only, to the lane leading to Milford Stairs (*ibid*, 257). That part of the survey that concerned itself with the frontage of the house contented itself with the observation that:

The common passages of the Sewers from the whole house carried in vaults to the Thames: to be repaired with cost by estimation £20. Under the privy bridge the foundation of the wall adjoining upon the Thames being waterworn will require XL foot of stone, very needful to be done presently: which will cost by estimation for stuff and workmanship £6. (*ibid*, 269)

None of the vaults carrying the sewers from the house to the river were encountered during the present excavations, and there was probably no direct relationship between them and the large, north–south aligned vault found further north in 1972 on the site of the west wing of the courtyard of the house (Hammerson 1975, 216–19). The latter was constructed mainly of chalk blocks, and with an internal width of 5m was too wide to have served merely as a sewer. It was thought to represent the foundations of a long, narrow building datable to the mid 16th century or perhaps earlier.

Phase X: 17th-century occupation

A series of deposits was excavated in Trench 9, located to the immediate north of the Tudor wall. The lowest exposed deposit [61] was excavated to a maximum thickness of 0.05m. Overlying this was dark grey-brown sandy, silty clay [60] with inclusions of ceramic building material, stone, charcoal, oyster shell, and

mortar. Occasional patches of darker material within the deposit had the appearance of decayed organic material. This deposit was 0.41m thick and the highest level at which it occurred was +1.28m OD. In the centre of the trench the deposit was truncated by a linear cut [44] oriented NW–SE. The highest and lowest levels of the cut were +1.28m OD and +1.05m OD. The feature had concave sides and base and measured 0.71m in length, 0.34m in width, and 0.20m deep. Large stones were located at the base and sides of the cut. The remainder of the fill comprised a sticky silty clay which contained lenses of decomposed wood. A semi-circular void over the top of the cut was visible in the north facing section of the trench and beyond this the brick-lined drain of the Tudor wall was visible. The level at the base of the drain was too low to allow drainage through the wall, but the presence of the void and the decomposed wood suggest that this feature may have had a wooden lining. It is interpreted as a stone-lined drain which had a wooden pipe to facilitate drainage through the masonry. It was overlain by a 0.64m thick deposit of sandy, silty clay [42] which contained frequent inclusions of ceramic building material, moderate stone and mortar and occasional oyster shell. The highest level at which this deposit occurred was +1.88m OD.

Pottery dating from the 17th century was recovered from these deposits. Sherds dating from 1625–1675 and 1550–1750 were recovered from [61], 1600–1800 from [60], and 1550–1650 from [42]. One residual sherd of particular interest came from pit [22] and consisted of a rim sherd of a Late London Ware (LLON) hexagonal dish (Fig 15.1). The archaeological remains excavated in Trench 9 are interpreted as 17th-century garden features – garden soils and a drainage system which utilised the drains previously constructed through the Tudor wall. Ogilby and Morgan's map of London (Fig 13) depicts the excavation site as being occupied by gardens in 1677.

A brick structure [246] which abutted the Tudor river wall was located in the west side of Trench 3 (Figs 11–12). The walls of the standing building truncated this structure to the west. It extended west to east for a distance of 1.24m then turned to run N–S for 0.74m, from there it turned back to the west for 0.30m before running diagonally NE–SW for 1.20m, at which point it was truncated by the standing building. Two

higher courses of brick survived in the west and the bricks measured 210mm by 100mm by 65mm. Below this level a hard mortar render obscured the brick courses. The mortar used to bond the top courses of brick and to key the structure into the Tudor wall was soft, white, and sandy. The structure was exposed to a height of 0.46m, continuing beyond the base of the trench, and the highest surviving level of the masonry was +1.84m OD. The surviving courses of brick post-date 1690. Its interpretation cannot be definite as it was not fully exposed, but its location suggests that it is likely to have been part of a river stair, which is supported by the archival evidence (see below).

A large number of post-medieval dumps were excavated across the site. Trenches 2 and 7 were located between two phases of river revetments, to the south of the medieval river wall and to the north of the Tudor wall. It was to be expected that ground reclamation dumps associated with the construction of the Tudor wall would have been encountered in this area. The presence of these sequences of 17th-century dumps directly overlying the medieval foreshore suggests that there may have been a major truncation in the area; however, as only small areas were excavated, it was not possible to identify the limits of this truncation. A deep sequence of post-medieval dumps was also excavated in the north-east corner of the site in Trenches 4 and 10. The dumps excavated in Trenches 2, 4, 7, and 10 contained a large quantity of demolition debris (tile, brick, and mortar), and many of them also contained fragments of marble. The majority of the marble comprised polished and faceted fragments which are presumed to be architectural or furniture elements, such as fireplaces or table tops. Two fragments of an unusual stone type, with grey fabric and green inclusions, were recovered. Further examination identified these as fragments of *Porphido Verdi*, from Sparta in Southern Greece. These quarries were closed at the end of the Roman occupation of Greece (David Williams 1999, pers comm), which suggests they are either from a residual Roman context, or more probably derive from the Earl of Arundel's collection of antiquities. The pieces were worked, and may be tesserae, tile fragments, or decorative elements from furniture.

The 17th-century dumps contain a large quantity of demolition debris and the presence of marble and the material from Sparta suggests

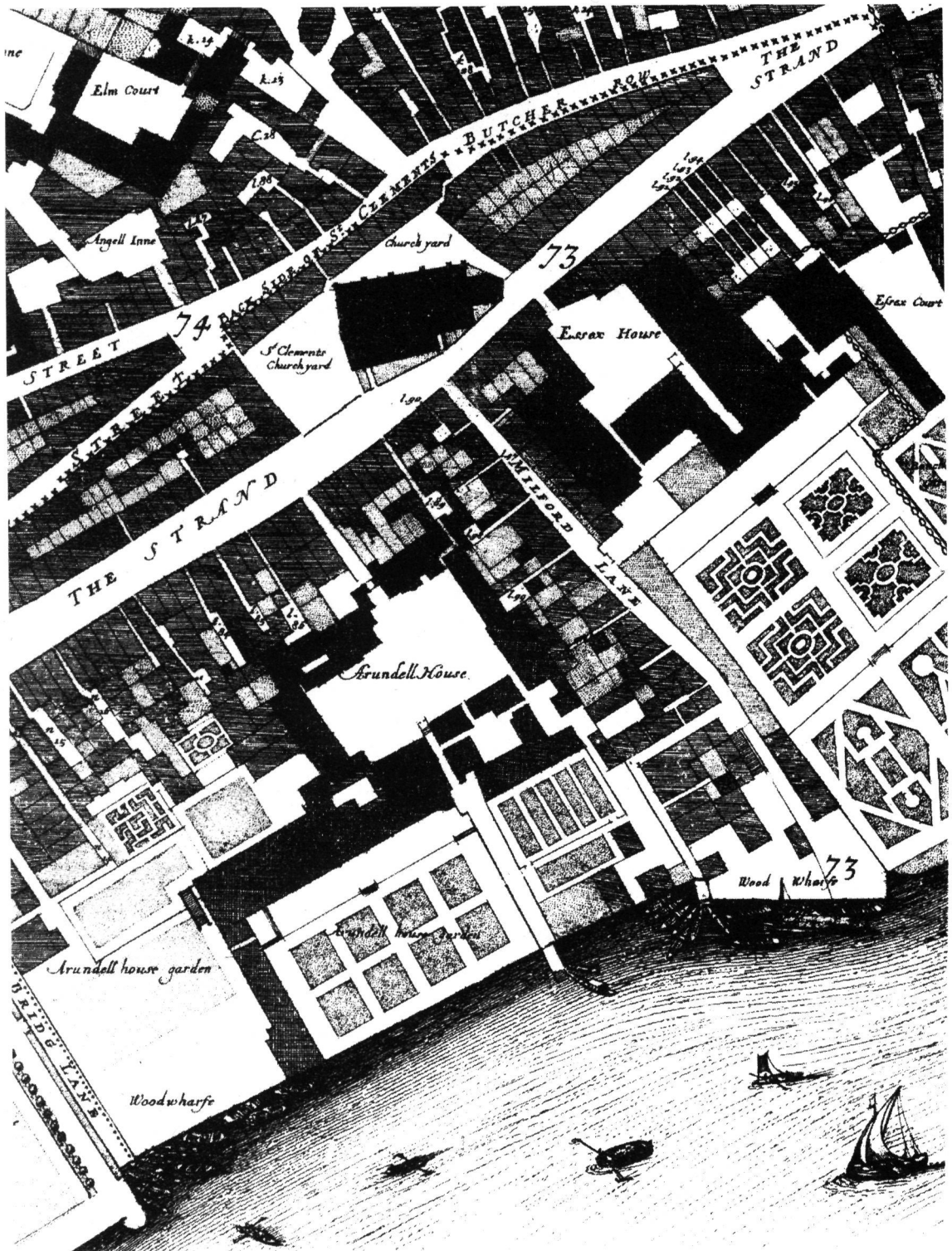


Fig 13. Ogilby and Morgan's map of 1677

that this may be connected with the demolition of the original Arundel House which occurred between 1677 and 1683. Clay tobacco pipes recovered from these deposits date to 1680–1710 which includes the period of the demolition of the house. It is also possible that these contexts represented levelling dumps brought in to prepare the land for the programme of rebuilding which Norfolk is known to have contemplated from 1676, as discussed in the documentary research, below.

A large rubbish pit [27] which truncated the 17th-century dumps was located in the centre of Trench 4. It was not possible to determine the shape of the pit as it was truncated on all sides by later buildings. The surviving area of the pit measured 1.95m N–S by 1.05m E–W by 0.80m deep and the highest and lowest levels of the cut were +2.45m OD and +1.62m OD. The primary fill of the pit [19] comprised loosely compacted grey sand and ceramic building material with frequent inclusions of stone, moderate chalk, and occasional clay tobacco pipe. This fill was 0.20m thick and the highest and lowest levels at which it occurred were +2.09m OD and +1.64m OD. The secondary fill [18] comprised loosely compacted black, sandy clay which contained frequent inclusions of ceramic building material, and occasional chalk, charcoal, and stones. A large quantity of pottery and clay tobacco pipe was also recovered from this fill. The maximum thickness was 0.20m and the highest and lowest levels at which it was present were +2.41m OD and +1.79m OD. The latest fill was a moderately compacted, grey-brown, sandy silty clay which contained frequent inclusions of ceramic building material, mortar, and stone, and occasional shell, pot, clay tobacco pipe, and charcoal [14]. The maximum thickness of this fill was 0.65m and the highest and lowest levels at which it was found were +2.45m OD and +2.41m OD.

This rubbish pit was truncated to the south by a wall foundation and cut [109] which may be the south-west corner of pit [27], which was located beyond this wall. In this area the cut measured 0.60m N–S by 0.50m E–W by 0.30m deep and the highest and lowest levels at which it was present were +1.72m OD and +1.46m OD. The primary fill was a loosely compacted dark grey-brown, clayey sandy silt which contained occasional inclusions of ceramic building material, mortar, stone, and clay tobacco pipe [108]. It was 0.21m thick and the highest level

at which it occurred was +1.67m OD. This appears to have been the same composition as the secondary fill of pit [27] (fill [18]), although there are no sherd joins between the two contexts which would constitute conclusive evidence for these contexts being the same. If they are the same feature then the maximum N–S dimension of the pit would be 3.25m, truncated to the north.

The pit contained a large quantity of pottery, glass (Fig 14), clay tobacco pipe, animal bone, and several artefacts of note. The latest tobacco pipe recovered from it dates from 1690–1710. The assemblage of glass includes several wine glasses of interest which date from 1650–1700, and fragments of wine bottles, the latest of which dates from 1680–1700. The wine glass assemblage consists of both soda and lead glasses, plain knoped stems, and a higher status pruned-decorated bowl.

The pottery assemblage indicates a late 17th- to early 18th-century deposition date, probably between 1690 and 1710. It includes vessels related to food and drink preparation and serving vessels, as well as sanitary ware. A significant proportion of the material has sherd joins with other pottery from the same pit. Staffordshire Butterpot or Midlands Purple Ware (STBU, MPUR), Tin Glazed Wares (TGW) (Fig 15.2), Post-Medieval Red Wares (PMFR) (Fig 15.3), and Border Wares (BORDY, BORDG) dominate this group, with an occasional example of Metropolitan Slipware (METS) and Frechen and Westerwald Stonewares (Fig 15.4) (FREC, WEST). This material has clearly seen some use as is evidenced by external sooting of some of the pipkins and cooking vessels. Of particular interest are a Chinese porcelain bowl in Batavian Ware (1690–1750), a large PMFR colander with everted and folded over rim and tripod base (Fig 15.5), and a Tin Glaze Ware ‘Persian Blue’ sherd (1680–1710) chipped into a disk shape. It is likely that this particular group represents a roughly contemporary assemblage disposed of at the same time, for example after a house clearance, clean out, or demolition.

Several small finds were recovered from the same pit and these include a pair of decorated bone apple-corers or cheese-testers. The first of these (SF1, see Fig 16) is a 129mm-long, well-polished bone apple-corer, made from a sheep or goat metatarsus. The proximal end and over half of one face of the shaft have been removed and the remaining part worked to a long scoop; the distal end, the handle, is decorated with a

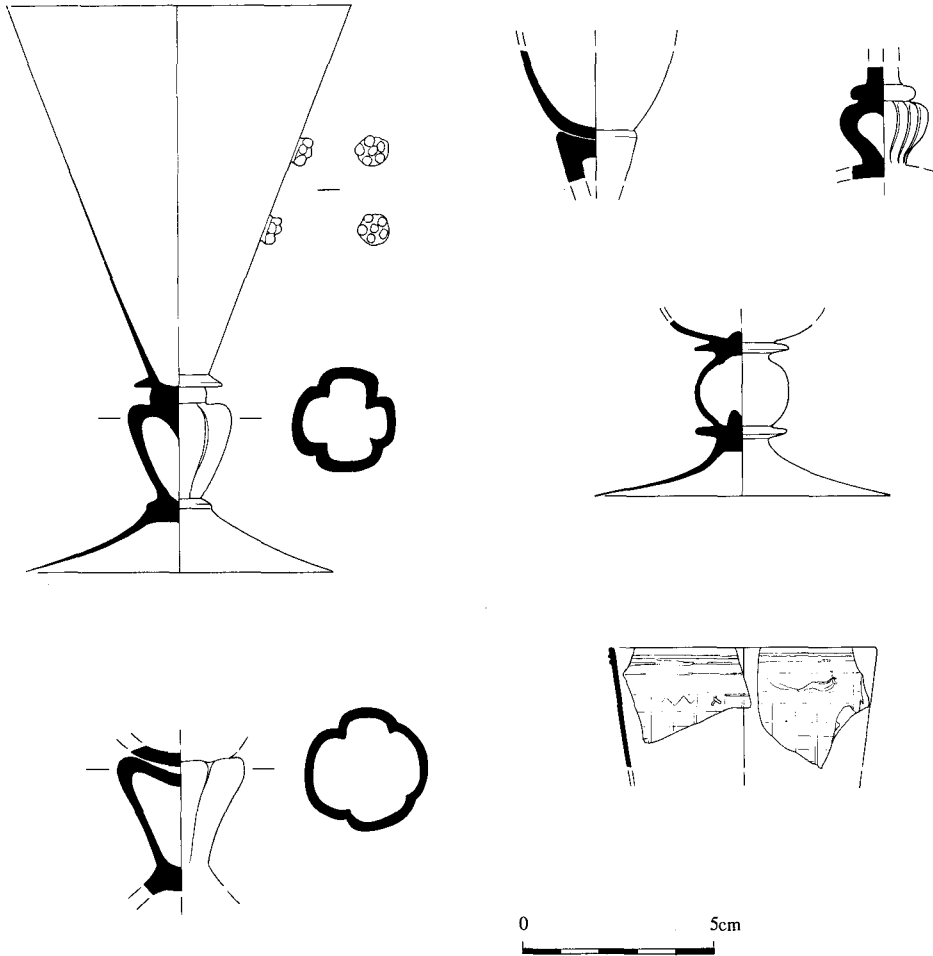


Fig 14. Glass

triangle of ring-and-dots above two pairs of transverse lines sandwiching a line of three ring-and-dots. The second (SF2) is 152mm long and is similarly decorated; this is stained in places by contact with copper alloy. The earliest excavated example of such an artefact is probably one from Portsmouth, Hampshire, which came from a context dated from the late 16th to 17th century (Fox & Barton 1986, fig 153, 12). An early 17th-century corer from Norwich, Norfolk, was found in a context dated *c.*1620–50. They continued in use into the 19th century (Margeson 1993, 120; MacGregor 1985, 180). The decoration on the front of the handle is usually idiosyncratic, restricted to lines and crosses, and quite casually applied (Brown 1990, fig 244, 2556; Margeson 1993, fig 85, 758–9; Crummy *et al* forthcoming);

therefore this well-produced matching pair is unusual. A fragment of a small bone brush 37mm long was also recovered from this pit. Part of the rectangular-section handle and the beginning of the main body survive. The body was broken across the first two holes that held the tufts, and on the back was scored with two fine grooves in which the copper-alloy wire would have been set that fixed the bristle tufts in place. Both sides of the body are stained by contact with copper alloy. This is a particularly small and delicate brush, though the tuft holes are larger than on some toothbrushes (Crummy 1988, fig 27, 1861, 1863). It may have been a child's toothbrush, or perhaps even a gentleman's moustache brush. Other small finds from the pit include a round bone handle with iron whittle

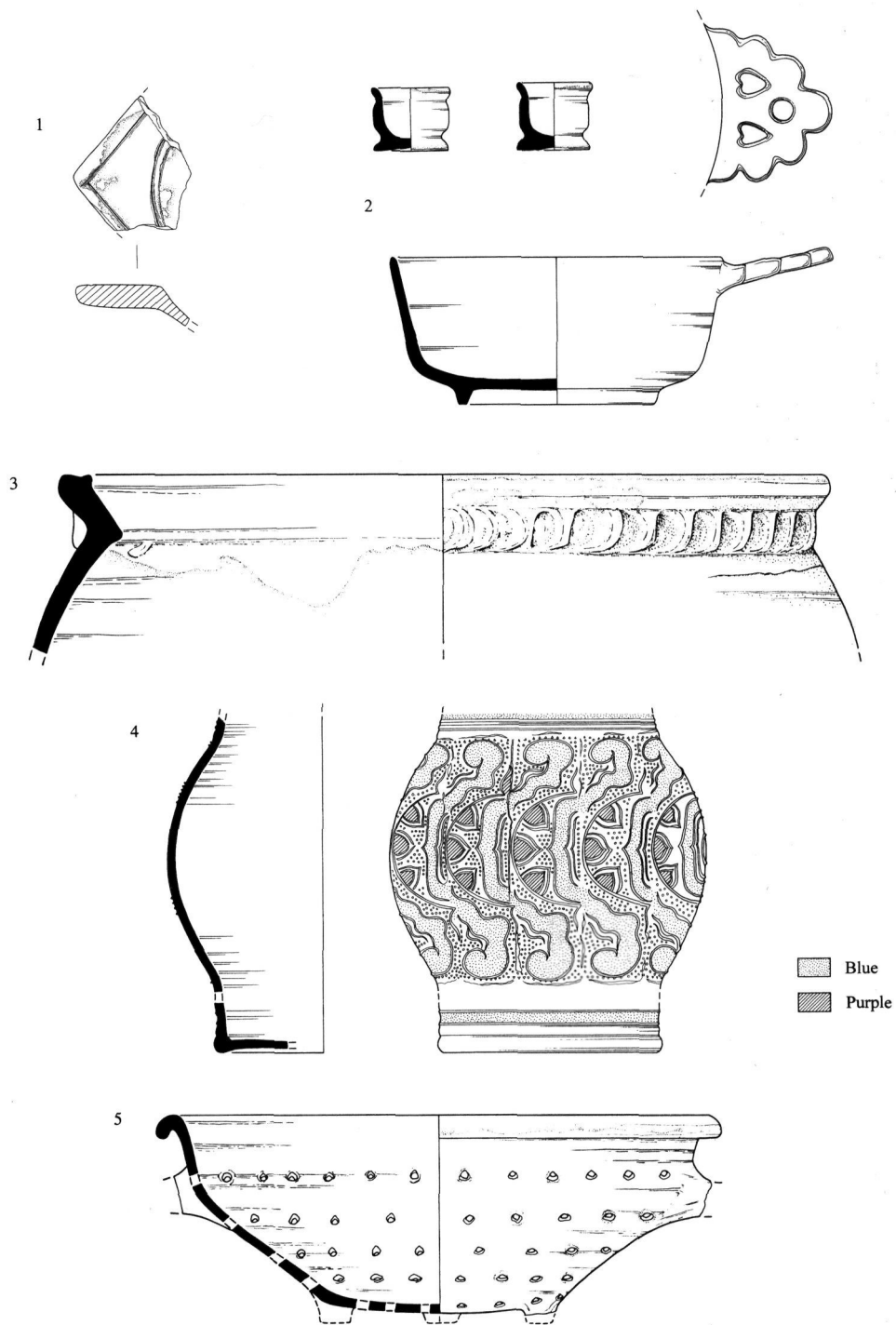


Fig 15. Pottery (Scale Nos 1, 3, 5 = 1:4; Nos 2, 4 = 1:3)

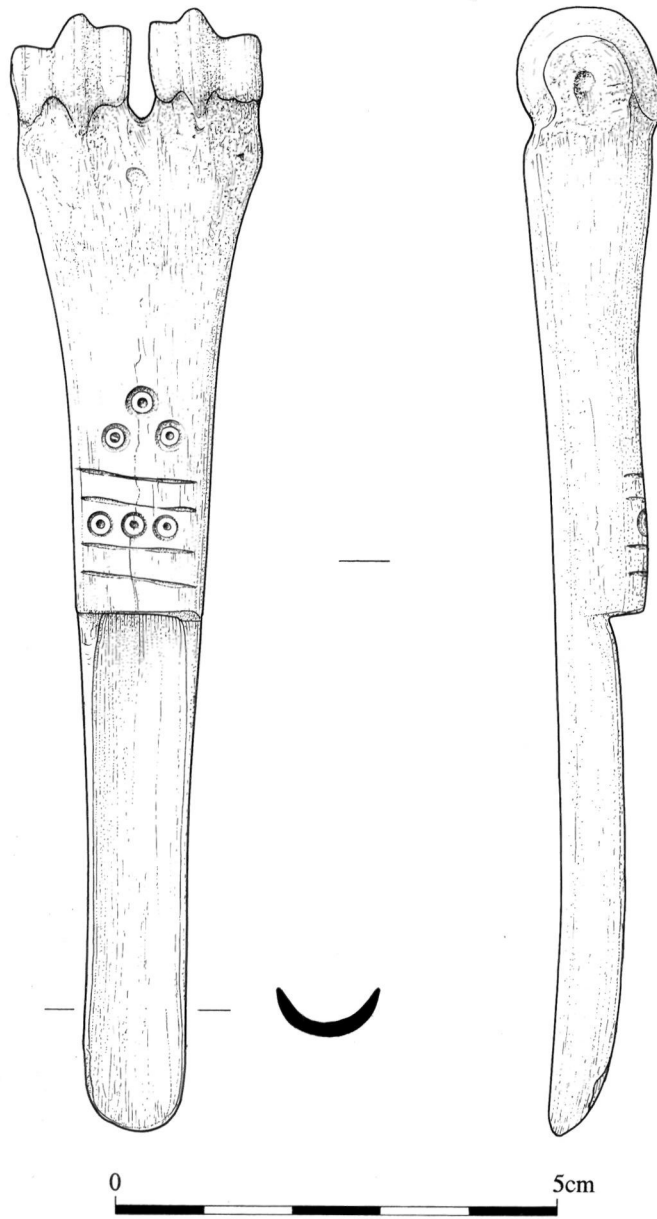


Fig 16. Apple-corer (Scale 1:1)

tang and a one-piece double-sided bone comb. Two roughly cut slate discs were also found, one 4mm thick and 37.5mm maximum diameter, the other 4.5mm thick and 34mm maximum diameter. A much larger pierced slate roundel from a medieval context at Exeter was interpreted as a pot lid (Allen 1984, 302), though no

identification was offered for smaller pierced examples. A small slate disc from medieval Colchester, with incised cross and pellet decoration on one face, has been identified as a game counter (Crummy 1988, fig 51, 2018), and it may be that this interpretation is also appropriate for these two pieces.

Documentary evidence

Though not mentioned in the 1590 survey, river stairs appear to have existed at Arundel House by the middle of the 17th century, possibly the ones tentatively identified in Trench 3 (context [246]). Some evidence of this is seen in contemporary views and maps. The earliest of these is Agas's woodcut of c.1550 (Fig 3) which shows a series of flights of stairs leading from access ways in a wall that appears to have run along the whole of this sector of the river bank, though it would be unwise to place much weight on the finer detail of a map which locates 'Arundel Place' to the east of Milford Lane. Norden's map of Westminster at the end of the same century places Arundel House and Milford Stairs in correct relation to each other, but seems to rule out the existence of stairs belonging to the house itself. Hollar's view (probably drawn between 1656 and 1666) shows for the first time 'Arundell Staires' in a position apparently half-way between the later Arundel and Norfolk Streets. In reality, however, it probably lay at the end of 'Arundel Street' whose line was determined by the position of the House's main entrance onto the Strand: Ogilby and Morgan's plan of 1677 (Fig 13) shows a jetty in that position, though Morden and Lea's plan of 1683 (Fig 17), made after the demolition of the House, places the stairs further upstream, opposite the end of Norfolk Street. An affidavit of Thomas Bellenger, a waterman of St Saviour Surrey, taken on 26 September 1659 refers to the 'City and Arundel wharves' belonging to Thomas, late Earl of Arundel and Surrcey (*Arundel Archives* 2, 70-3, no. 1005); while a printed notice, undated but probably of the 1670s, refers to lightermen, bargemen, and others having laid down 'chunks and road stones' between Arundel and Surrey Stairs for the purpose of [illicitly] mooring their vessels (*Arundel Archives* 4, 89, no. 2382).

In 1671 Howard obtained an Act of Parliament for building on and improving the grounds of Arundel House, with the intention of building a house there for his family. On 14 July 1676 Howard, now Earl of Norwich, petitioned the king for a grant of the soil for 40ft in depth from Strand Bridge to Milford Stairs, *ie* his entire frontage and, at the east end, a little more. The petition was granted on condition that no wharves, brewhouses, or other dwellings were erected on the soil (*Cal State Papers Charles II*, 1676-7, 226; Kingsford 1922, 256). The 40-ft

strip of soil petitioned for must have been additional to the existing extent of the house, and both it and the building restrictions placed upon it clearly reflect the contemporary preoccupation with schemes for the comprehensive refashioning of the City waterfront, which terminated only a short distance downstream of Arundel House. In particular the second Rebuilding Act of April 1670 gave official sanction to a Thames Quay that was to be continuous all the way from London Bridge to the Temple and of the width of forty foot of assize from the north side of the river. Converted into a 'quay or public and open wharf', only cranes, docks, and stairs were to be permitted, and ownership was to be shown only by 'dented stones placed in the pavement thereof' (Reddaway 1940, 221-43, esp 226-9).

Reddaway also remarks that west of the Fleet, where the demand for new wharves already threatened the gardens of former great houses, the actual width was to be much more than 40ft (1940, 232), and, though Arundel House was technically just outside the City and had not been affected by the Great Fire, growing commercial pressures of this kind may have become apparent to Howard, and led, by 1676, to a scheme that may have been intended to cater for these growing needs as well as for his domestic requirements. On 26 October 1676 articles of agreement were drawn up between Henry Earl of Norwich and the Hon Charles Howard concerning the latter's intention to carry out building works in a new street 'designed to be built by the said earl and to be called Surrey Streete' (*Arundel Archives* 4, 89 no. 2572). These articles were never executed, but Surrey Street, along with Norfolk and Arundel Streets, had come into existence by 1683. It was aligned near the western boundary of the House (though short of Strand Lane), while Norfolk Street must have crossed the House just to the west of the buildings forming the western side of the main courtyard, and the north end of Arundel Street occupied the position of the House's gatehouse and entry (Kingsford 1922, 264).

It is notable that an analysis of income and expenditure for the Strand Estate and other London properties survives at Arundel Castle for the years 1652 to 1675, and no later (*Arundel Archives* 2, no. 435), which might suggest the date at which the houses along the Strand were demolished in preparation for the introduction of the new streets and subsequent rebuilding



Fig 17. Morden and Lea's plan of 1683

along the Strand frontage. At some date after 1677, when it appears for the last time on Ogilby and Morgan's map, Arundel House itself was demolished, and in 1676-8 'agreements' for leases were made by the 'commissioners for the building of Arundel Ground' (*ibid*, no. 665). Morden and Lea's map of 1682 shows the position of the three new streets and a vacant space on the river labelled 'The Ground for

Arundel house'. A design for the new house was prepared by Wren, but the scheme was abandoned, and in 1689 the then duke of Norfolk, empowered by a fresh Act to grant leases of the garden ground, completed the layout of the site as it exists today (Kingsford 1922, 256). Contracts for building leases at Arundel Grounds were issued on 18 June 1689 (*Arundel Archives* 4, 89 no. 2580).

The origin of the material from the large rubbish pit was probably not from the demolition of the old Arundel House and its ancillary buildings by 1683. It should be noted that not all or even any of the contents of the buildings were necessarily discarded at the same time as the demolition. The tobacco pipe of 1690-1710 which dates the material is too late to have been contemporary with their levelling. It is therefore more likely that, like so much other waste material dumped along the London waterfront, the assemblage was collected from unknown locations further afield in the City and its suburbs and brought to the waterfront for disposal, although clearly the limited date range, contemporaneity of the different classes of material, and the completeness of some of the vessels indicate that this assemblage is unlikely to have either been moved any great distance or have been mixed with other sources of material before disposal. The 17th-century dumps excavated across the site were probably brought in to level up the ground in preparation for the ambitious programme of rebuilding which Norfolk is known to have been contemplating since midsummer 1676.

The exact chronology of rebuilding is far from clear. As already noted, demolition and clearance of the site as a whole cannot be dated more closely than the six-year period between 1677 and 1683. Kingsford implies that the new Norfolk House (like its predecessor, situated well to the north of the excavation site) was completed by 1689 or soon after (1922, 256). There is some support for this from the fact that contracts for building leases of 'Arundel Grounds' were not issued before 18 June 1689 (*Arundel Archives* 1980, no. 2580). These clearly related to the southern part of the Norfolk estate, where building works in a new street 'designed to be built by the said earl and to be called Surrey Streete' had been under active consideration at least as early as October 1676 (*ibid.*, no. 2572). This speculative building was a secondary aspect of the scheme, not likely to have been undertaken until after the completion of Norfolk House itself, and in the event seems to have been postponed to much later than 1689. In fact it would seem not to have been completed for another three or four decades as the Arundel archives contain nothing on the subject until 1623, when Thomas, the eighth duke, was granted an Act of Parliament to make 60-year building-leases for houses and ground in Arundel, Howard, and Surrey Streets (*Arundel Archives* 1968, 150).

The period of delay between the completion of Norfolk House in c.1689 and the presumed completion of the speculative building to the south in the mid 1720s coincides closely with the date of the large rubbish pit. The pit may therefore have been dug at any time during this period, perhaps in connection with some intermediate and temporary activity on the cleared and levelled site.

CONCLUSIONS

The earliest foreshore structure at Arundel House comprised four oak stake tips which may have been the remains of a truncated mid-Saxon structure such as a fish trap.

The remains of a timber jetty (Phase V) were excavated in the north-west of the site. The absence of closely dateable material in the foreshore deposits through which the timber piles were driven means that a *terminus post quem* for the construction of this structure cannot be established. The timbers did not have enough rings to obtain a dendrochronological date, but the woodworking evidence suggests a date in the late 12th to 13th century. Structural remains from another jetty, or perhaps a river stair, were recorded to the south-west (Phase VI). The use of a notched lap joint in this scissor-braced structure suggested a date most likely in the early to mid 13th century. Dendrochronological dating on one of the timbers produced a precise year of felling of winter 1239/40. The line of the contemporary waterfront(s) associated with these jetty structures was not identified within the excavated areas and would have been located beyond the limits of the site to the north.

The earliest river wall excavated at the site was located 2m to the south of the Phase V jetty. If the line of this wall is projected on the same NE-SW alignment, then it was located just to the south of the Phase VI jetty. This timber river wall had been dismantled and only the baseplate, and possibly the retaining piles, remained *in situ*. Dendrochronological dating of the baseplate produced a felling date of soon after 1237 (Tyers 1999). However this was a reused timber from a previous structure. The proportions and working details of the timber, such as the through-mortices, suggest that it was probably reused in the late 13th to 14th century.

A timber river wall was constructed directly on top of the baseplate of the dismantled wall on

the same alignment. The timber framed structure comprised baseplates with posts tenoned in, with sheathing planking filling the spaces between the posts. Front braces resisted the weight of the land-fill behind the wall. It resembled the late 13th- to early 14th-century Group 3 wall excavated at Trig Lane (Milne & Milne 1982, 18). There is no documentary evidence as to when it was constructed. The form of this structure and some of the woodworking details suggest that it dates from the late 13th to late 14th century. It was only possible to obtain a dendrochronological date from one timber [162]. Unfortunately the absence of sapwood means that this is a *terminus post quem* date of 1300 (Tyers 1999). The pottery recovered from the reclamation deposits associated with the timber wall suggests the most likely deposition date for these dumps to be between 1270 and 1350.

The south face (river side) of a stone river wall was located 3.2m to the south of the earlier timber revetment whilst the north face was 1.8m to the south; this is the extent of the land reclaimed by the construction of the chalk and stone wall. The construction of stone river walls began as early as the 12th century in York and occurred at Westminster by at least 1220 (Milne & Milne 1982, 40). Generally, the construction of stone walls in London tended to occur in the 15th century and the rate of further encroachments into the river decreased following their construction (Egan 1991, 12). This was probably due to a combination of the high cost of building stone walls coupled with the fact that they were more resistant to decay than timber walls; this meant that they were less likely to be abandoned (*ibid*). It has not been possible to establish the exact date of the construction of the stone wall at Arundel House through documentary sources. Pottery recovered from the reclamation deposits placed behind the wall suggests a date of deposition for these in the late 14th century, probably between 1350 and 1400.

The construction of revetments further onto the foreshore than preceding ones provided a good opportunity for the disposal of rubbish at a time when the population of London was increasing (Rhodes in Milne & Milne 1982, 87). The material recovered from reclamation deposits on many London waterfront sites originated from industrial as well as domestic sources. For example at Trig Lane the material included refuse from the fishing industry, metalworking, and cobblers waste (*ibid*, 89-90). The reclamation

deposits from Arundel House in contrast appear to have originated from exclusively domestic sources.

Although the dating evidence for the construction of the river walls cannot be precise, the next reclamation of land at the site did not occur for at least 150 years. However, the expansion into the river was extensive; the brick and stone wall is located 10.4m to the south of the medieval stone wall. This wall was constructed in brick with a stone facing on the river side. The bricks used in the construction of the wall cannot be closely dated; the time span is 1450/1480 - c.1666/1700. The date range is narrowed slightly by a fragment of pottery found in the core of the wall which dates from 1480-1600. Documentary evidence suggests that the wall can be attributed to Sir Thomas Seymour who acquired the site in 1545. Repairs to the stone facing of the river wall were identified in the east of the site. A survey of Arundel House carried out in 1590 refers to the foundation of the wall being waterworn and stone repairs being necessary. Although the repaired area recorded on the site was located towards the top of the wall, it is possible that these repairs were carried out at the same time.

17th-century garden features were located to the north of the Tudor wall and drains which were built through the river wall continued to be utilised. A large brick structure to the south of the wall is interpreted as a possible 17th- to 18th-century river stair. Large quantities of 17th-century refuse appear to have been brought onto the site, possibly in preparation for the building scheme proposed by the Earl of Norfolk. Towards the end of the 17th/early 18th century a large rubbish pit was dug in the north-west corner of the site. The nature and form of the material recovered from this pit suggest that it originated from a contemporary assemblage disposed of at the same time. Of particular interest were a matching pair of decorated bone apple-corers or cheese-testers.

The development of the site therefore related to waterfront management and use from at least the late 12th century, with the possibility of an earlier mid-Saxon foreshore structure, until the late 17th century, with the construction of the river stair. The encroachment into the river, involving reclamation of the foreshore and construction of river walls, began on the site in the late 13th to 14th century and continued into the Tudor period, probably 1545. During this

period the waterfront advanced over 16m to the south. This period of land reclamation was followed by a sequence of garden and building developments from the 17th century onwards associated with the properties facing the Strand.

The archaeological investigations undertaken at Arundel House, although confined to small trenches, have provided a wealth of information about the development of the waterfront in this area. Despite the presence of a basemented building, archaeological waterfront structures spanning several centuries have survived to greater and lesser degrees across the site. The later medieval chalk and stone wall and the Tudor brick and stone wall appear to have survived across the width of the site. These structures have been preserved *in situ* as part of the redevelopment plan and the potential for further information concerning their construction is therefore available for future generations.

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BIBLIOGRAPHY

- ALLEN (1984), J P Allen *Medieval and Post-medieval Finds from Exeter, 1971-1980* Exeter Archaeol Rep 3
- ARMITAGE & WEST (1985), P L Armitage & B West with contributions by B T Clarke, T Dyson, M F W Festing & A Locker 'Faunal evidence from a late medieval garden well of the Greyfriars, London' *Trans. London Middlesex Archaeol Soc* 36, 107-36
- Arundel Castle Archives 1-4 (1968-80) ed F W Steer
- BETTS 1995a, I Betts *Medieval and Post Medieval Brick and Tile Dating* MoLAS unpubl
- BETTS 1995b, I Betts *Roman Brick and Tile Dating* MoLAS unpubl
- BOWSHER 1996, J M C Bowsher *Globe House (formerly Electra House), Temple Place, London WC2, an Archaeological Watching Brief* MoLAS report unpubl
- BOWSHER 1998, J M C Bowsher *Globe House Temple Place, London WC2, an Archaeological Watching Brief* MoLAS report unpubl
- BRITISH GEOLOGICAL SURVEY 1994, *North London Map* sheet 257 1:50000
- BROWN 1990, D Brown 'Bone apple-corer' in M Biddle *Object and Economy in Medieval Winchester* Winchester Studies 7ii
- BRUNNING c.1996, *Waterlogged Wood* English Heritage Guidelines
- Calendar of Patent Rolls* (State Papers)
- Catalogue of Ancient Deeds* 1 (State Papers)
- CLIFTON TAYLOR 1987, A Clifton Taylor *The Pattern of English Building*
- COWIE 1988, R Cowie 'A gazetteer of Middle Saxon sites and finds in the Strand/Westminster area' *Trans London Middlesex Archaeol Soc* 39, 37-46
- COWIE & WHYTEHEAD 1989, R Cowie & R Whytehead *DGLA Excavation Report for York Buildings (YKB88)* unpubl
- CRUMMY 1988, N Crummy *The Post-Roman Small Finds from Excavations in Colchester 1971-85* Colchester Archaeological Report 5
- CRUMMY *et al* forthcoming, N Crummy, P Ottaway & H Rees *Small Finds from the Suburbs and City Defences*, Winchester Museums Publication 6
- EGAN 1991, G Egan 'Industry and economics on the medieval and later London waterfront' in G L Good *et al* (eds) *Waterfront Archaeology*, CBA Research Report 74, 9-14
- FOX & BARTON 1986, R Fox & K J Barton 'Excavations at Oyster Street, Portsmouth, Hampshire, 1968-71' *Post-Medieval Archaeology* 20, 31-255
- GADD & DYSON 1981, D Gadd & T Dyson 'Bridewell Palace. Excavations at 9-11 Bridewell Place and 1-3 Tudor Street, City of London, 1978' *Post-Medieval Archaeology* 15, 1-79
- G.M. 1683, *Cheap and Good Husbandry, for the Well Ordering of all Beasts and Fowls and for the General Cure of their Diseases* (Printed by T.B. for Hannah Sawbridge, at the Bible on Ludgate Hill)

- GOOD *et al* 1991, G L Good, R H Jones & M W Ponsford (eds) *Waterfront Archaeology* CBA Research Report 74
- GOODBURN 1992a, D Goodburn *Report on the Woodwork Excavated during the DUA Fleet Valley Project (VAL88)* unpubl
- GOODBURN 1992b, D Goodburn 'Woods and woodland: carpenters and carpentry' in Milne *et al* 1992, 106-30
- GOODBURN & MINKIN 1996, D Goodburn & J Minkin *Woodwork from the Fastolfs and Rosary Project, Hays Wharf, Southwark* unpubl MoLAS report
- HAMMERSON 1975, M J Hammerson 'Excavations on the site of Arundel House in the Strand, WC2, in 1972' *Trans London Middlesex Archaeol Soc* 26, 209-51
- HILLAM c.1998, J Hillam *Dendrochronology* English Heritage Guidelines
- HONEYBOURNE 1947, M B Honeybourne 'The Fleet and its neighbourhood in early and medieval times' *London Topographical Record* 19, 13-87
- KINGSFORD 1922, C L Kingsford 'Bath Inn or Arundel House' *Archaeologia* 72, 243-77
- L&P Henry VIII, *Letters & Papers of Henry VIII* (State Papers)
- MACGREGOR 1985, A MacGregor *Bone, Antler, Ivory and Horn. The Technology of Skeletal Material since the Roman Period*
- MALTBY 1979, M Maltby *Faunal Studies on Urban Sites, The Animal Bones from Exeter 1971-1975*, Exeter Archaeological Reports 2
- MARGESON 1993, S Margeson *Norwich Households: the Medieval and Post-Medieval Finds from Norwich Survey Excavations* East Anglian Archaeology report 58
- MILNE & MILNE 1982, C Milne & G Milne *Medieval Waterfront Development at Trig Lane, London* *Trans London Middlesex Archaeol Soc* special paper No. 5
- MILNE *et al* 1992, G Milne *et al* *Timber Building Techniques in London, c.900-1400* *Trans London Middlesex Archaeol Soc* special paper No. 15
- PETERSON *et al* 1983, R Peterson, G Mountford & P A D Hollom *A Field Guide to the Birds of Britain and Europe*
- REDDAWAY 1940, T F Reddaway *The Rebuilding of London after the Great Fire*
- SPENCE 1990, C Spence (ed) *Museum of London Archaeological Site Manual*
- TYERS 1999, I Tyers *Dendrochronological Spot-dates of Timbers from Arundel House (ADL 97)* *London ARCUS* report 511 (unpubl)