

The Roman Riverside Wall and Monumental Arch in London



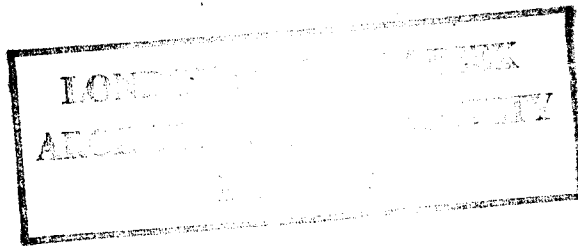
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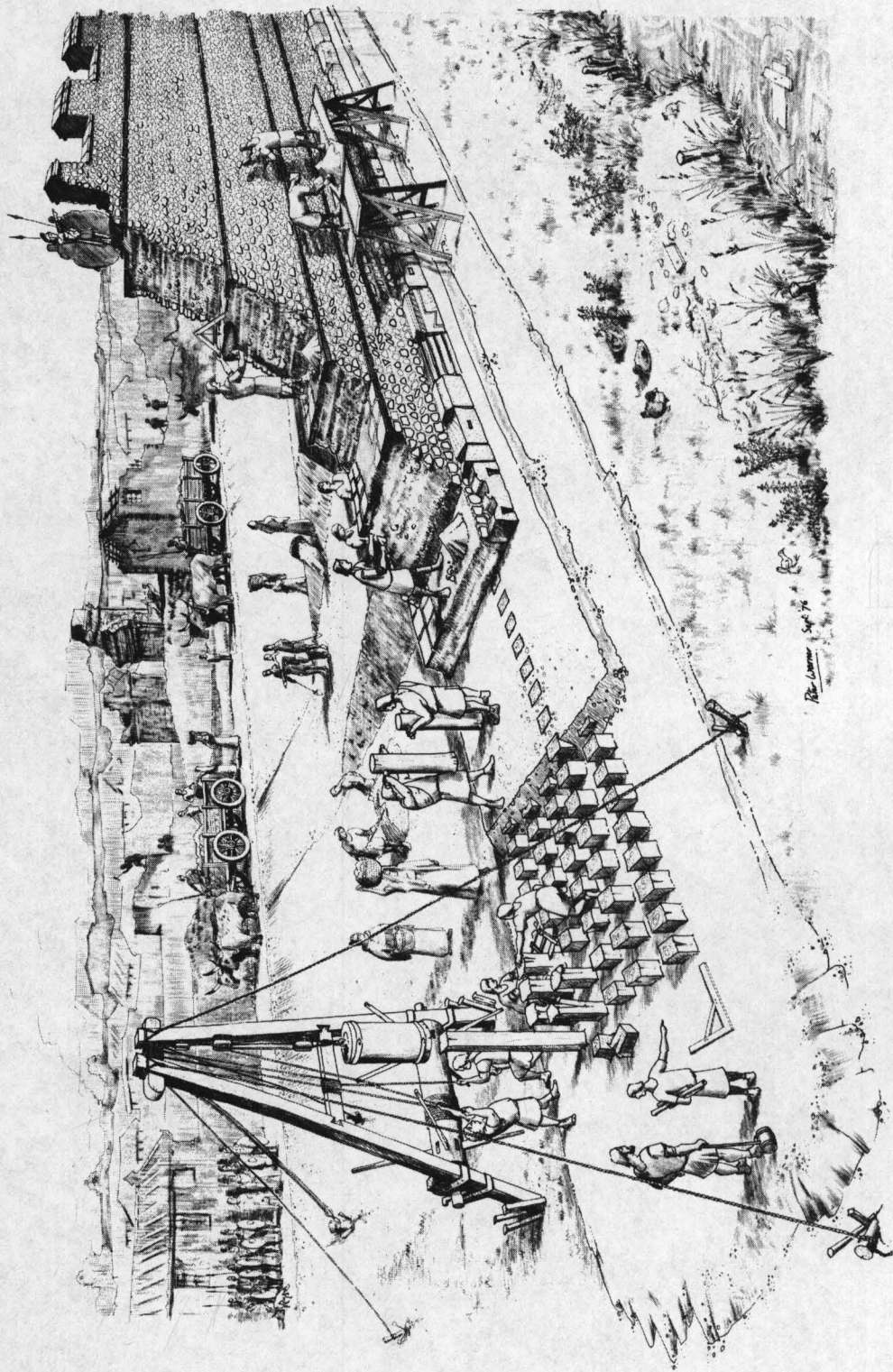
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Frontispiece Roman Riverside Wall: A reconstruction of work in progress on the piled section of the Wall in the later fourth century, as envisaged by Peter Warner.

THE ROMAN RIVERSIDE WALL AND MONUMENTAL ARCH IN LONDON

EXCAVATIONS AT BAYNARD'S CASTLE, UPPER
THAMES STREET, LONDON 1974-76

by

CHARLES HILL, MARTIN MILLETT AND THOMAS BLAGG

edited by

TONY DYSON

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PART I

(a) SUMMARY

During the summer of 1974 a rare opportunity arose to excavate a section across Upper Thames Street, a major and ancient thoroughfare, at a point a little to the east of the Mermaid Theatre and close to the south-west corner of the intra-mural City. The investigation showed that the street had been in continuous existence, albeit much encroached upon in the late medieval period, from the 12/13th centuries. It also showed that its earliest deposition overlay a collapsed portion of a Roman wall. Lying on the presumed shore-line of the early City, this masonry was seen as a remnant of a riverside wall which had long been conjectured as a logical extension of the more enduring landwall but which had never been verified archaeologically. On the other hand documentary evidence was rather more positive, and the fact that below the wall were found dumps of 6th to 8th-century date seemed in particular to support William FitzStephen's statement of the 1170's that such a wall had existed but had succumbed at some earlier period to river erosion.

Accordingly, close observation was maintained in 1975-6 on redevelopment activity over a much more extensive area to the east and south of the original controlled excavation. At intervals considerably more evidence of the wall came to light, in varying states of decay and exhibiting differing methods of construction, over a total length of some 115m. To the west, where the sub-soil was firm, less elaborate foundations were required but on the less stable ground to the east a 40m stretch of wall was constructed upon a chalk raft supported by tightly packed rows of timber piles. Carbon 14 and dendrochronological dating of these piles indicated that the wall was built in the 4th century, probably after AD 330. Certain of its construction methods share similarities with the apparently late Roman eastern group of bastions added to the landwall, and a further, more recently discovered, portion of the riverside wall close to the inner curtain of the Tower of London at the opposite end of the City has been provisionally dated on numismatic evidence to the 390s.

One peculiar characteristic of the western section of the wall was the re-use of sculptured stone blocks which on close examination were found to possess a dramatic and independent interest of their own. Most of the 52 blocks recovered can be assigned to one or other of two major monuments, of which one was an arch, richly decorated with figures of classical gods, including Minerva and Hercules, in relief, and surmounted by a frieze of the busts of deities, possibly representing the days of the week. Rare in Britain — it is in fact the first time that a detailed reconstruction could be made of the original appearance of a Roman arch in this country — and unique to London, the arch was probably not erected earlier than the late 2nd or early 3rd centuries. The other monument was a screen of gods, 6.20m long, carved on both sides and at one end, which presumably formed part of some larger monument. The remaining blocks included a relief of four (at variance with the more usual three) Mother Goddesses probably of 3rd century date; and two altars commemorating the restoration of temples, one to Isis and the other probably to Jupiter, one of which records the name of an hitherto unknown Roman governor of Britain whose term of office was most likely within the years AD 251-9.

During the post-Roman period the gradually rising level of the Thames caused the southern face of the wall on the eastern part of the site to erode to about half its original width, and by the mid 12th century a gravel foreshore had formed against the surviving masonry. But while there is now every reason to respect FitzStephen's claim that the destruction of the wall in general was due to erosion, it was also clear from the present site

that this was not the only cause. One feature of the wall in the western part of the site was that it had collapsed northward or inland, a phenomenon which strongly suggests deliberate demolition. It is unlikely that this remote section of the City waterfront was developed much before the mid 12th century at the earliest, and the present conclusion is that this demolition took place in the late 12th century before the superimposition of the earliest Thames Street level and before the construction of the timber waterfront to the south in the first half of the 13th century.

(b) THE ARCHAEOLOGICAL BACKGROUND

BY CHARLES HILL

There can have been few more problematic or controversial aspects of Roman London than the vexed question of the existence of a southern or riverside defensive wall, required to complete the well-established landward circuit of the City's defences.¹ Apart from the documentary record,² various lengths of walling, discovered in the last one hundred and twenty five years along Upper and Lower Thames Streets, have all, in their turn, been claimed as evidence for this enigmatic structure (Fig. 1).

In 1839 workmen, deepening a sewer in the middle of Upper Thames Street, opposite Vintners' Hall (Fig. 1, RW1),³ came across at a depth of 10ft.,

'The perfect remains of an old Roman wall, running parallel with the line of the river. The wall was formed of alternate layers of flint, chalk and flat tiles and offered considerable obstructions to the workmen from the firmness with which the materials were fixed together'.⁴

Just east of this site another length of wall was observed in the same year (Fig. 1, RW2) and was reported by Charles Roach Smith in 1841 as being similar to his own major discovery,

'In Thames Street, opposite Queen Street, about two years since, a wall, precisely similar in general character, was met with; and there is but little doubt of its having originally formed part of the same.'⁵

Roach Smith's own discovery (1841) came as a result of major sewerage works in Upper Thames Street, between Lambeth Hill and Queenhithe (Fig. 1, RW3)

'The excavations for sewerage . . . commenced at Blackfriars. The workmen having advanced without impediment to the foot of Lambeth Hill, were there checked by a wall of extraordinary strength, which formed an angle with the Hill and Thames Street . . . It extends (as far as I had means of observing) from Lambeth Hill to Queenhithe, with occasional breaks. In thickness it measured from eight to ten feet. The height from the bottom of the sewer was about eight feet, in some places more or less; it reached within nine feet from the present street, and three from that which indicates the period of the fire of London; in this district easily recognised. In some places, the groundwork of the houses destroyed by the fire abut on the wall.

'The foundations were made in the following manner. Oaken piles were first used; upon these was laid a stratum of chalk and stones and then a course of hewn sandstones from three to four feet, by two, and two and a half feet, firmly cemented with the well-known compound of quick lime, sand and pounded tile. Upon this solid sub-structure was built the wall, composed of rag and flint with layers of red and yellow, plain and curved-edge tiles. The mortar throughout was quite equal in strength to the tiles from which it could not be separated by force.'⁶

Excavations in 1859 in Lower Thames Street on the site of the Coal Exchange (Fig. 1 RW4) opposite the Custom House revealed further evidence of a bath house, with a 'solid outer wall of Kentish ragstone', approximately 7ft. thick.⁶ Its position in Lower Thames Street, size, construction and lack of association with the bath building, immediately to the north, all suggest that it may have been the Roman Riverside Wall.

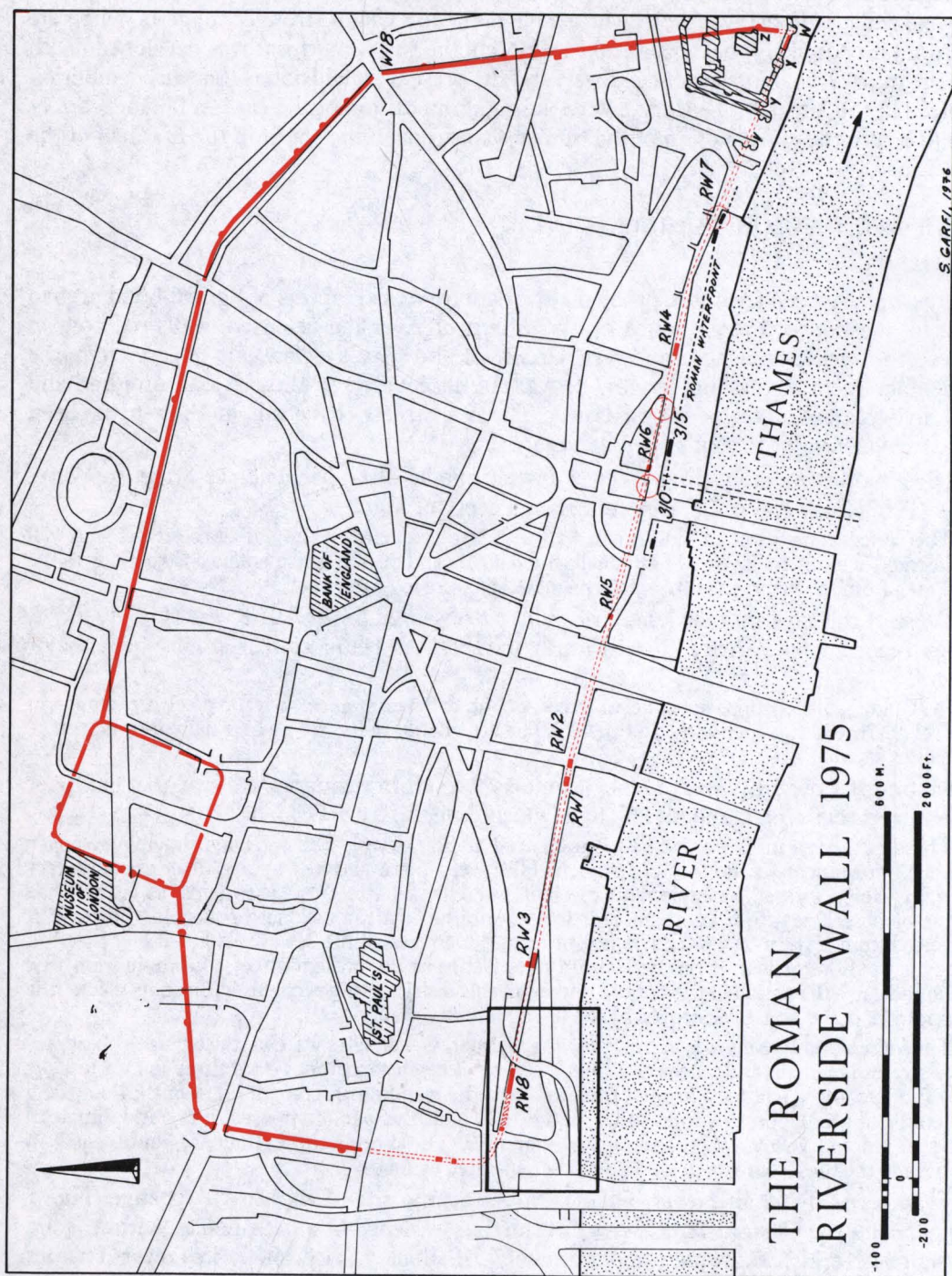


Fig. 1. Roman Riverside Wall: The Roman and medieval defences, with the individual sectors (RW1-RW8) and suggested alignment of the Wall; Site location.

In 1863 a wall was discovered in Upper Thames Street, in the south-east corner of Suffolk Lane (Fig. 1 RW5), which was considered to be part of the Roman Riverside Wall since it was aligned with Roach Smith's find some twenty-two years earlier:

'A further part of it, at or near the south-eastern angle of Suffolk Lane, has been disclosed in the past summer from which I have preserved large and interesting specimens of Roman bricks and workmanship. It stood in an exact line toward the place pointed out by our honourable fellow member [i.e. Roach Smith] above mentioned.'⁷

The chance discovery of a small length of wall, while sinking a pier hole for a new building at 125 Lower Thames Street in 1911 (Fig. 1 RW6), re-opened, after a lengthy interval of almost fifty years, the controversy surrounding the Roman Riverside Wall. The description is noteworthy:

'Large, roughly squared timbers, 12 feet long and about 8 inches square, were first laid on the top of the ballast across the thickness on the Wall; these being held in position by pointed piles driven in at intervals. One of them is preserved . . . and . . . is 30 inches long and in the upper part is triangular in section measuring 5 inches by 4 inches by 4½ inches. On one of the angles a channel has been cut as if to secure a plank. On these timbers were laid large irregular sandstones and ragstones bedded in clay and flints. Three layers of these stones showed on the face, above which was a bond of two rows of yellow tiles. Some chalk, together with other stone formed the core, the whole being cemented with red mortar. The total height of the masonry remaining was 3 feet and its width was 10 feet. Some of these stones were apparently re-used, though no moulded stone appeared in the small piece uncovered.'⁸

More recently, the excavations at Baynard's Castle by Peter Marsden in 1972 revealed, in the northern part of a trench immediately south of Upper Thames Street, a large section of the core of a Roman wall, overlying a number of circular piles (Fig. 3).⁹ The present writer's excavations later uncovered this length of wall (below, p. 44), confirming that it was, in fact, a collapsed section of the Riverside Wall.

In addition to these seven lengths of walling, various other, even less substantial, pieces of evidence could be considered as possible traces of the Riverside Wall. In 1834 (Fig. 1, 310) at the bottom of Fish Street Hill in Lower Thames Street, substantial masonry, presumed to be Roman, was discovered.¹⁰ It is possible that this represents the westward continuation of the wall (RW6) discovered in 1911. Also in 1834 (Fig. 1, 315) during excavations for a sewer in Lower Thames Street opposite Botolph's Wharf, the whole trench was found to be full of oak and chestnut piles, described as being closer and larger at the end of Botolph's Wharf gateway and warehouse.¹¹ These timbers could represent the piled foundations for the Riverside Wall, although the possibility of quayside structures cannot be ruled out.

The re-alignment of a sewer beneath Upper Thames Street, immediately north of the Mermaid Theatre, in 1973 exposed a massive wall, apparently similar in character to that discussed below (p. 15).¹²

The recent excavations at the Custom House by Tim Tatton-Brown in 1973 (Fig. 1, RW7) revealed in a trench in the north-east corner of the site, 'three rectangular Roman posts which have sharpened ends and were clearly driven in later [i.e. than the earlier Roman waterfront]. They are possibly piles for a wall, though only a few loose chalk blocks survived. The tops of all these timbers were eroded and covered by river gravel which contained worn later Roman pottery.'¹³ The position of these finds immediately south of Lower Thames Street, the character of the piles, the occurrence of some chalk and the fact that they were sealed by river gravels, all features similarly observed at Baynard's Castle (below, p. 29),

indicate, as Tim Tatton-Brown pointed out, the possibility that he had uncovered the remnants of the foundations of the Riverside Wall.

Finally, it has long been conjectured, but never proved, that the south curtain wall of the Tower of London (constructed under Henry III, 1216-1272) either represents the line of or is actually constructed upon the Roman Riverside Wall, which had itself been earlier refurbished and incorporated, together with the land wall, in the early Norman defences in the south-east corner of the city.¹⁴ It has been further argued that the spacing (*c.* 180ft apart) of the Lanthorn, Wakefield and Bell Towers (Fig. 1, W X Y) and perhaps also the Middle Tower (Fig. 1, V) *c.* 170ft. west of the Bell Tower, corresponding with the spacing of the Wardrobe (Fig. 1, Z) and Lanthorn Towers (the former probably having a Roman bastion at its base and the latter, it has been suggested, probably representing the south-east corner of the Roman defended circuit) may indicate that they, too, were originally Roman bastions along the Riverside Wall. Until recently no clear-cut evidence supporting these claims had ever come to light. A massive wall, 13ft 6in wide, was discovered on this alignment in 1955 but was regarded by the excavator as medieval.¹⁵ More recent excavations, however, have re-examined this wall, which has proved to be the late Roman Riverside Wall.¹⁶

Of the general works which have attempted to summarise this limited evidence, no real measure of accord prevails between the earlier works and more recent writers. The Victoria County History of London (1909) came to the conclusion that all the available evidence, such as it was, indicated a riverside defensive structure, which, being dissimilar to the land wall, was probably a late Roman defensive measure against marauding Saxons.¹⁷

The Royal Commission on Historical Monuments (1928) concluded that the noticeable variations in the construction of the riverside wall could be accounted for simply by the 'unstable character of the river bank or foreshore on which this part of the town wall is built,' and that the re-use of architectural material, pink mortar and brick bonding indicated a date of construction later than the land wall, and contemporary with the eastern bastions, whose construction it so closely followed.¹⁸ Wheeler,¹⁹ Home²⁰ and Cottrill²¹ followed, in turn, the same general conclusions as the Royal Commission volume.

In contrast, however, more recent writers (Merrifield,²² Grimes²³ and Marsden²⁴) have reconsidered the evidence and argued the case that a riverside wall, if indeed it existed at all as a continuous riverside structure, should best be seen as an embankment or quayside wall, rather than as a defensive structure comparable with the land wall.

This major variance of opinion can best be illustrated by the two most recent works to have commented on the subject. On the one hand, Christopher Brooke considered the wall to be 'a fiction',²⁵ whereas John Wachter considered it unlikely that the riverfront would have been left undefended, and that either the wall lay further south than hitherto suspected or that riverside buildings themselves formed a continuous defensible frontage.²⁶

In summary, this meagre evidence, consisting solely of half a dozen lengths of walling, no two exactly alike, and the majority inadequately observed at the bottom of contractors' trenches, plus a flimsy variety of even less substantial data, comprised all the available information regarding the Roman Riverside Wall prior to the present excavations. Altogether it was too slight, too contradictory and too controversial to permit any safe conclusion on the existence of this elusive structure. Excavation alone could decide this contended issue.

(c) DOCUMENTARY SURVEY OF THE LONDON RIVERSIDE WALL IN THE MEDIEVAL PERIOD

BY TONY DYSON

For the medieval history of the Roman Riverside Wall there exist only three documentary sources: two landgrants purportedly of the late 9th century and probably relating to a single Thames-side property, and two literary works, one dating from within a decade of the Norman Conquest which pointedly does not mention the wall, and another, dating from the mid-1170's which equally pointedly does. Apparently the nature and weight of this evidence was not such as to convince those who were inclined to doubt the existence of a river-side wall, but now that a section at least of this elusive amenity has definitely been located the value of the historical notices is at once confirmed, and a fresh re-appraisal merited.

Later than the 12th century, and as documentation becomes increasingly profuse, there is no further reference to a river-side wall, and even though the military justification had not appreciably diminished since the Roman and Saxon periods it is perfectly clear that none existed. An instructive City memorandum dating from the outset of the Hundred Years' War, when a French invasion was thought to be imminent, shows that London was content to rely on *ad hoc* defensive measures as circumstances required. But it also provides a clue as to why permanent defences were not considered. On 11 October, 1338, the mayor, aldermen and an 'immense' commonalty decided for the purpose of day and night watches to allocate sections of the Thames waterfront between Baynard's Castle and the Tower to individual aldermen and the men of various wards; to drive piles into the Thames (an operation for which a special tax was levied) so as to prevent ships from passing more than one at a time; and to require all persons holding quays on the Thames between the Tower and the bridge to construct brattices of wooden boards as a defence.²⁷ What is interesting is that only the section of the waterfront downstream and east of the bridge was felt to need protection of this kind and the obvious implication seems to be that the bridge, with the help of piles, was in itself an adequate defensive work for the riverfront beyond it. On the construction of the stone bridge with its numerous formidable piers and narrow intervals in the late 12th and early 13th centuries, the passage of even peace-time traffic must have been constricted, and the City authorities concerned for trade could well have been anxious not to compound the difficulties with a permanent river-wall which would gravely hamper the business of the wharves and quaysides.²⁸

Returning to the early evidence, the latest and in some ways the least equivocal reference to the former existence of a permanent wall appears in a description of London written c. 1173 by William FitzStephen to serve as a prologue to a projected biography of Archbishop Thomas Becket in whose chancery he had once served. The fact that Becket, like FitzStephen, was a Londoner, was seized upon as a pretext for an elaborate account which, though couched in the panegyric and over-literary style of the day, is generally accepted as a reliable and informed source. Of the defences FitzStephen wrote that on the south side 'London was once walled and towered in like fashion [to the landward wall], but the Thames . . . which runs on that side with the sea's ebb and flow, has in course of time washed away these bulwarks, undermined and cast them down.'²⁹ Whether this statement was based upon the survival of some of the collapsed remnants or whether on tradition is quite uncertain, but there is no reason to doubt the factual and dispassionate nature of the passage in which this observation appears.

Along with FitzStephen's testimony should be considered the brief but important allusion to the defences of London in the *Carmen de Hastingae Proelio*, a detailed account of the battle of Hastings and of Duke William's subsequent manoeuvres composed before 1075 and very probably as early as Easter, 1067, by Guy, bishop of Amiens. A recent edition of this work, whose importance and early date had not been generally recognised, demonstrates that it should be regarded as a 'fuller, more honest and reliable source than either William of Jumièges' *Gesta Normannorum Ducum* or William of Poitiers' *Gesta Guillelmi*, two slightly later accounts usually regarded as prime sources for the Norman campaign.³⁰ In addition the *Carmen* is particularly full and detailed on the siege of London, not only providing 'an unique and detailed picture of events, but also [demonstrating] knowledge of the internal politics and institutions of the city.'³¹

In this particular context Bishop Guy wrote that, 'protected on the left side by walls, on the right side by the river, [the City] neither fears enemies nor dreads being taken by storm.'³² The placing of left and right is determined not so much by the modern designation of river banks as by the position of Duke William's headquarters at Westminster, a short distance upstream, but the very precision of this detail is important for the much more significant contrast made between the existence of the wall on one side and the river on the other. Even though the *Carmen* is not a prose work, but is written in elegiacs which might require a certain subordination of content to form, it is difficult to see the point or sense of this choice of words if it does not mean that at the time of the Conquest there was effectively no riverside wall guarding London. Brought together, then, the *Carmen* and FitzStephen's *Prologue* indicate that the general collapse of the Roman riverside wall pre-dated the Conquest, a conclusion to some extent supported further by the silence of the local post-Conquest monastic chronicles to which such calamities, like the numerous recorded fires, had so strong an appeal.

The earliest evidence of the existence of the riverside wall consists of two purported grants of King Alfred. One, dating from 889, is a grant to Bishop Waerferth and the church of Worcester for market purposes of a courtyard (*curtem*), 'an ancient stone building known to the citizens as *Hwaetmundes stan*', which extended from the public street (*strata publica*) to the City wall (*usque murum eiusdem civitatis*). Although measurements are provided, there is no further location, except that the sequel sought to regulate trading by the bishop's men outside the courtyard, on the public street or at the riverside market (*ripa emtoralis*). Very probably the last reference is to Queenhithe; certainly it indicates that the courtyard was close to the river.³³ The second grant purports to date from 898 or 899 and was issued jointly to Plegmund, archbishop of Canterbury, and, again, to Bishop Waerferth of Worcester, during the course of a council (*conloquium*) held at Chelsea to discuss the restoration (*instauracione*) of London. The grant consisted of two plots of land (*iugera*) at Queenhithe (*ad locum qui dicitur Aetheredes hyd*). The head (*caput*) of the two plots was defined by a road (*semita*), and both plots were also bounded by a wall (*murum*) on the far side of which the beneficiaries were to have the right of mooring (*navium staciones*) along the width of their respective properties.

On the grounds of diplomatic, the authenticity of these documents and particularly that of 898-9, has often been questioned.³⁴ But for present purposes it is sufficient to note that the earlier, Worcester, charter of 889 is known from a single copy in a reliable source of the early 11th century. Since for the purposes of establishing a claim to the property no forger would

profitably confect a fictional description which could immediately be demonstrated as false, and since most monastic forgeries were in any case usually an innocent attempt to make good the loss of original records incurred through negligence or accident, there is no reason to doubt the existence of the wall before the early 11th century. If genuinely Alfredian, the grant implies that the wall was standing in Alfred's day and was probably, but not necessarily, standing at the time of the copy; if a forgery, that it was standing at the time of the forgery and therefore, presumably, in Alfred's day also.

It is at least likely that the Worcester *curtis* of 889 and the Worcester *iugerum* of 898-9 are identical and that their descriptions are not so much different as complementary. What, at any rate, is common to both is the 'wall' and 'city wall' which formed the southern boundary of the property and which, according to the 898-9 grant, stood immediately to the north of the river, so that boats could be moored on its far side. There is, of course, no detail of the physical nature of the wall and the documents do not in themselves constitute evidence of the existence of the wall elsewhere than at Queenhithe. But the reference to the 'city wall' in the 889 grant and the more casual reference to 'the wall' (or even 'a wall') in the 898-9 grant might well suggest that a contemporary could have no doubt as to what was meant and that the city wall here was, like the landward stretch, a well-known and extensive feature, rather than a chance local survival.

The balance of the available evidence is that a riverside wall, comparable with the surviving land wall, had once existed at some unspecified period previous to the second half of the 12th century (FitzStephen); that there is good reason for supposing that such a wall had existed at the end of the 9th century (the Alfredian documents), but that by 1066 the wall no longer survived, at least in any real defensive sense (Guy of Amiens). FitzStephen clearly attributed its collapse to river erosion, but he was equally clearly ignorant of dates. This is consistent, for no particular date could be put to a process like erosion, even if its operation was comparatively recent. A gradual, piece-meal, collapse is also consistent with the absence of contemporary comment, in a way in which a sudden and general demolition, however caused, would certainly not be. Despite the evidence of strong and persistent Danish pressure on London in the early 11th century, culminating in the onslaught of 1016,³⁵ so particular an explanation of the collapse of the London riverside wall *in toto* is less than satisfactory. This does not, of course, exclude the possibility that particular sections of the wall may have been demolished for particular purposes at any time.

Archaeological evidence indicates that in the area of excavation the Roman River Wall lay along the present line of Upper Thames Street, and that the river lay immediately south of the wall. The documentary evidence, in the shape of the 899 grant, confirms that the latter circumstance also applied at Queenhithe and details the wall to the south of properties limited by minor thoroughfares on all other sides. The 889 grant strongly suggests that the ancient building known as *Hwaetmundes stan* extended continuously from a public street in the north to the city wall in the south. In neither case is there a specific reference to Thames Street which, if it existed, must have run directly north of the wall. Although technically the absence of such a reference in a pre-Conquest charter cannot in itself be taken to indicate the absence of the street,³⁶ certain other circumstances combine to suggest that this may well have been the case. While, as has been seen, numerous walls parallel with the street have been noted, no trace of Roman road metalling has been recorded along, or close to, the whole length of Thames Street. The remains of the Huggin Hill baths extended as far south as the

north side of Upper Thames Street³⁷ (before the recent widening), and therefore very close to the projected alignment of the Riverside Wall. Neither here, nor at the Roman Palace site to the east, near Cannon Street station, is there any evidence of a formal contemporary riverside street in the early Roman period,³⁸ and though it is possible, even likely, that one was eventually provided behind the line of the Riverside Wall in the 4th century, it has yet to be confirmed. It is also possible that in the post-Roman period a track of some sort wound its way in and out of the remains of earlier riverside buildings.

But the fact remains that the only public road mentioned in the 889 grant lay at the far end of the property from the city wall, at a distance which identifies it with the later Great Trinity Lane.³⁹ This lane, with Cloak Lane, Great St. Thomas Lane and Knightrider Street — much of which was also known as Old Fish Street — formed a continuous thoroughfare between Dowgate Hill and St. Andrew's Hill, and was only relegated to its present insignificance in 1853-4 when Cannon Street was extended westward beyond Walbrook. Little is known of the early history of this alignment, but along it were once six churches to three of which (St. Mary Magdalene, St. Thomas the Apostle and St. John Walbrook) the earliest reference dates to the mid 12th century.⁴⁰ But its antiquity may well be far greater than this: a Roman wall extending between 120 to 165m along the north side of Knightrider Street between Peters Hill and Distaff Lane has been interpreted as a probable boundary wall⁴¹ which, in itself, implies a flanking road alignment.

The profusion of minor roads, suddenly appearing in the later, 899, Queenhithe grant, and leading northwards from the wall towards this alignment points to a similar conclusion: that by the turn of the 9th and 10th centuries there was apparently no Thames Street, but that its function was served by the Knightrider Street alignment to which, upon the development of the waterfront, it was necessary to provide the means of direct access. There is, therefore, at least the possibility that at the turn of the 9th and 10th centuries Knightrider Street and its extensions, as the closest thoroughfare parallel with the Thames, performed the function later served by Thames Street. This is more certainly the case at the most westerly quarter of the city waterfront. The recent excavation across Thames Street near the Mermaid Theatre demonstrated that the earliest street level there was no earlier than the 12th century.⁴² Indeed, it may well be that until this date there was no *local* necessity for such a street: on the present site, the earliest post-wall structures located to the south were the timbers of a medieval waterfront whose C.14 date range centres on A.D. 1170, with probably 13th century pottery behind it.⁴³ An act of Bishop Richard Belmeis I of London which can be dated to 1111-27 refers to what was later known as Paul's Wharf as being newly built on the open shore (*arida barena*).⁴⁴ Further east, between Paul's Wharf and Queenhithe there are strong indications that the commercial development of the riverfront adjacent to Trig Lane dates only from the late 12th century,⁴⁵ while the late 13th century is the earliest period in which there is clear documentary evidence for a similar development and for the viability of Thames Street through to the Tower of London in the corresponding eastern area of the city in All Hallows Barking parish.⁴⁶ Though subject to the findings of future archaeological activity, itself limited by the continuing use of the street, consideration might be given to the possibility that Thames Street did not exist in any formal sense until the 10th century at the earliest, and to the probability that until well after the Conquest it extended little or no further than the pre-Conquest quays of Queenhithe in the west and Billingsgate in the east.

PART II

PART TWO

THE EXCAVATIONS

(a) INTRODUCTION

In order to resolve some of the problems outlined in Part One, the Museum of London's Department of Urban Archaeology undertook two excavations between 1974 and 1976 at Baynard's Castle, Upper Thames Street, in the south-west corner of the Roman city (Figs. 1, 2 and 3) on a site being redeveloped by the Department of the Environment. During the summer of 1974, as a result of the re-alignment of Thames Street east of Blackfriars and the demolition of adjacent buildings, the opportunity arose to excavate a section across the original line of the street. The excavation, directed by Martin Millett, involved the cutting of a trench 3.5m x 12.5m across the street about 20m east of the Mermaid Theatre (Fig. 3). The aim of the excavation was to establish how long the street had been in use and to test the existence of a Roman Riverside Wall. The discovery of a large fragment of collapsed walling at the bottom of this trench renewed the hopes of proving conclusively the existence, or otherwise, of the Wall, and led directly to a prolonged watching brief carried out during redevelopment on the rest of the site from January 1975 to January 1976, by Charles Hill with Peter Ellis and John Maloney.

THE SITE (Figs. 1, 2 and 3)

The site lay in the extreme south-west corner of the Roman city, where, hitherto, little excavation had taken place. It was bounded on the north by Queen Victoria Street, to the west by the Mermaid Theatre and Castle Baynard Street, and to the east and south by White Lion Hill (the flyover) and the eastern offshoot of Castle Baynard Street. Upper Thames Street itself, the removal of which occasioned the watching brief, ran obliquely east-west across the site and has since been resited as an underpass to the south.

During the Roman period the line of Upper Thames Street was immediately adjacent and parallel to the river, so that the fundamental importance of the site is that it straddled an important area of interaction between the Roman river, its foreshore and immediate hinterland, which no single excavation in the City had so far achieved. Since the Roman period dumping had raised the ground level by as much as 6m from the early Roman ground surface to the level of modern Upper Thames Street.⁴⁷ From the early medieval period onwards successive waterfronts have progressively been pushed forward with the result that the modern frontage lies approximately 120m to the south. It is unfortunate that the nature of the excavations (below, p. 27-8) did not allow for a more detailed examination of this interesting area.

The geology of the site⁴⁸ (Fig. 3, contour survey) is of crucial importance, not only in attempting to reconstruct the pre-Roman landscape, but also to an understanding of the difficulties encountered by Roman engineers in building the Riverside Wall, and of the methods adopted to overcome them. The site lies on the Tertiary blue/grey London Clay, which drops gradually, not only from north to south, but also both to the east and west at the extreme ends of the site. It thus forms an irregular peninsula (illustrated best by the — 1m

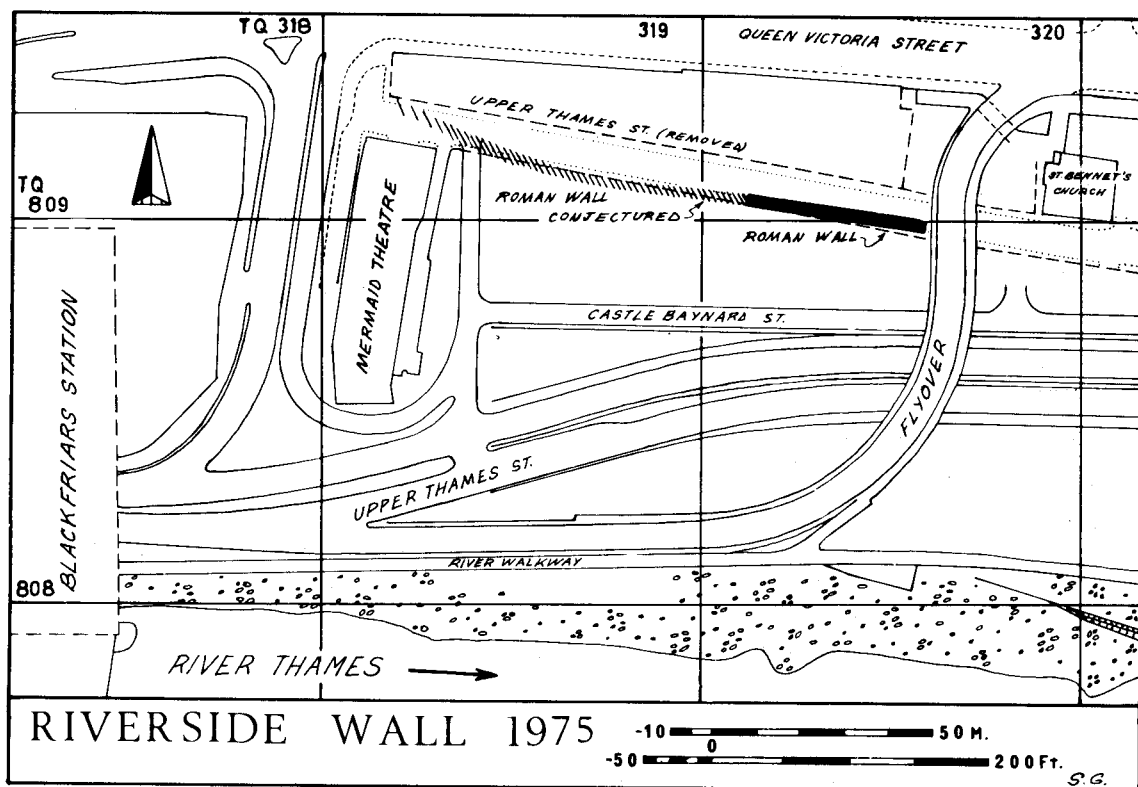


Fig. 2. Roman Riverside Wall: The south-west corner of the Roman city. Site location map with actual and suggested (western) course of the Wall.

O.D. contour, Fig. 3 Contour Survey) rilled and pockmarked by small streams. Isolated pockets of the sand and gravel of the Flood Plain Terrace (Quaternary) occur across the site, but more especially at the extreme east and west ends. Subsequent river erosion in the post-Roman period probably accounts for the marked absence of substantial amounts of these Quaternary gravels over most of the site, apart from its eastern end. Here, the presence of the gravels explains, to a large extent, the level of the natural terrain, higher than elsewhere on the site.

The most interesting and important geological feature was a wide, deep channel at the eastern end of the site, which had been cut, presumably by the river, and filled with loose, wet, natural gravels. The way in which these geological difficulties, especially the channel, were faced, will be discussed below, pp. 30 and 57-61.

Finally, it should be stressed that any Roman riverside structure in this south-west corner of the City would have been vulnerable to the cumulatively erosive effect of a number of natural agencies. The site lies on the curving north shore of the Thames and would thus have been highly susceptible to erosion caused by the northward sweep of the Thames at this point. In addition, the River Fleet, whose mouth lies just to the west of the site, may also have been an erosive agent, cutting away the south-west corner of the City. Lastly, further erosion would have been caused during the marine transgression of the post-Roman period. This

involved the subsidence of South East England with a consequent rise in sea and river levels, now well attested at a number of sites in the City.⁴⁹

(b) THE THAMES STREET SECTION: 1974

BY MARTIN MILLETT

PERIODS OF OCCUPATION

The area investigated produced material dating from the 4th century A.D. and, with the exception of a period immediately prior to the 12th century, when the site was marshy and unoccupied, the sequence was continuous. From the 12-13th centuries until 1972 the area investigated served as a street, a usage which can for convenience be subdivided by the total destruction wrought by the Fire of 1666. The strata may thus be divided chronologically:

Period I: 4th century A.D. to 11-12th century A.D.

Period II: 12-13th century A.D. to 1666.

Period III: 1666 to 1972.

Period I may be subdivided into Period Ia, a phase of dumping, and Period Ib, a period of abandonment during which marshy conditions prevailed. However, Periods II and III consist only of road surfaces with a few associated structures, and these have not therefore been subdivided into separate phases.

The dates given in parenthesis after each phase represent a consensus based on the finds reports. The evidence for these dates is given there, at the end of the report (p. 105).

PERIOD IA (Figs. 12 and 13) (4th to 6-8th centuries) (see also Area VIII below, pp. 49-51)

The natural London Clay and Quaternary gravel were overlain by the following sequence of layers:

201: Layer of mixed gravel and black earth, a maximum of 50mm thick.

199: Thick layer of brown organic material (up to 1m thick). This layer was waterlogged but contained no leather and only tiny fragments of wood.

181: Layer of black earth with pebbles containing:

196: A mass of ragstone lumps.

197: A pebble band near the top of 181.

198: A mass of ragstone lumps.

The top of this group of deposits, where undisturbed, appeared almost level at 1.60m O.D.

Discussion

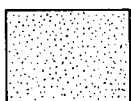
Layer 201 was very thin and the material it contained indicates a 4th century date of deposition. The lack of earlier material would seem to confirm the probability that this area of the site was unoccupied until the later Roman period;⁵⁰ the material representing a sparse scatter of rubbish beside the river.

The thicker layers, 181 and 196 to 199, may be dealt with as one unit. They appear to represent deliberate dumping to the north of the Riverside Wall on the edge of the river, being at most 1.80m thick and the top being virtually level at about 1.60m O.D. The environmental evidence shows that layers 181 and 199 contained marsh species (see environmental report, below, p. 82).

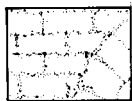
The dumping sequence is dated by three sherds of pottery of 6th to 8th century date from layers MM 199 and BC 402 (see below, pp. 96-7). This dating based on only three sherds of pottery is unsatisfactory and the date can only be accepted as the sherds in question were well stratified in the middle of layers MM 199 and BC 402 where they could not have been intrusive. These sherds were found with large quantities of Romano-British material dating to the 4th century and the most likely interpretation is that these dumps represent the redeposition of Romano-British material in the 6-8th centuries A.D. It is on this basis that the large group of bones from the same deposit (below, p. 83) are considered as late Romano-British. The interpretation of these deposits is considered below, p. 51.

RIVERSIDE WALL 1975

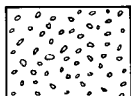
SYMBOLS



SAND



BRICKWORK



GRAVEL



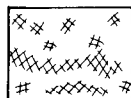
CHALK



CLAY



TILES



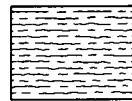
CHARCOAL



WOOD



MORTAR



BLACK
HUMUS RICH
DUMPING

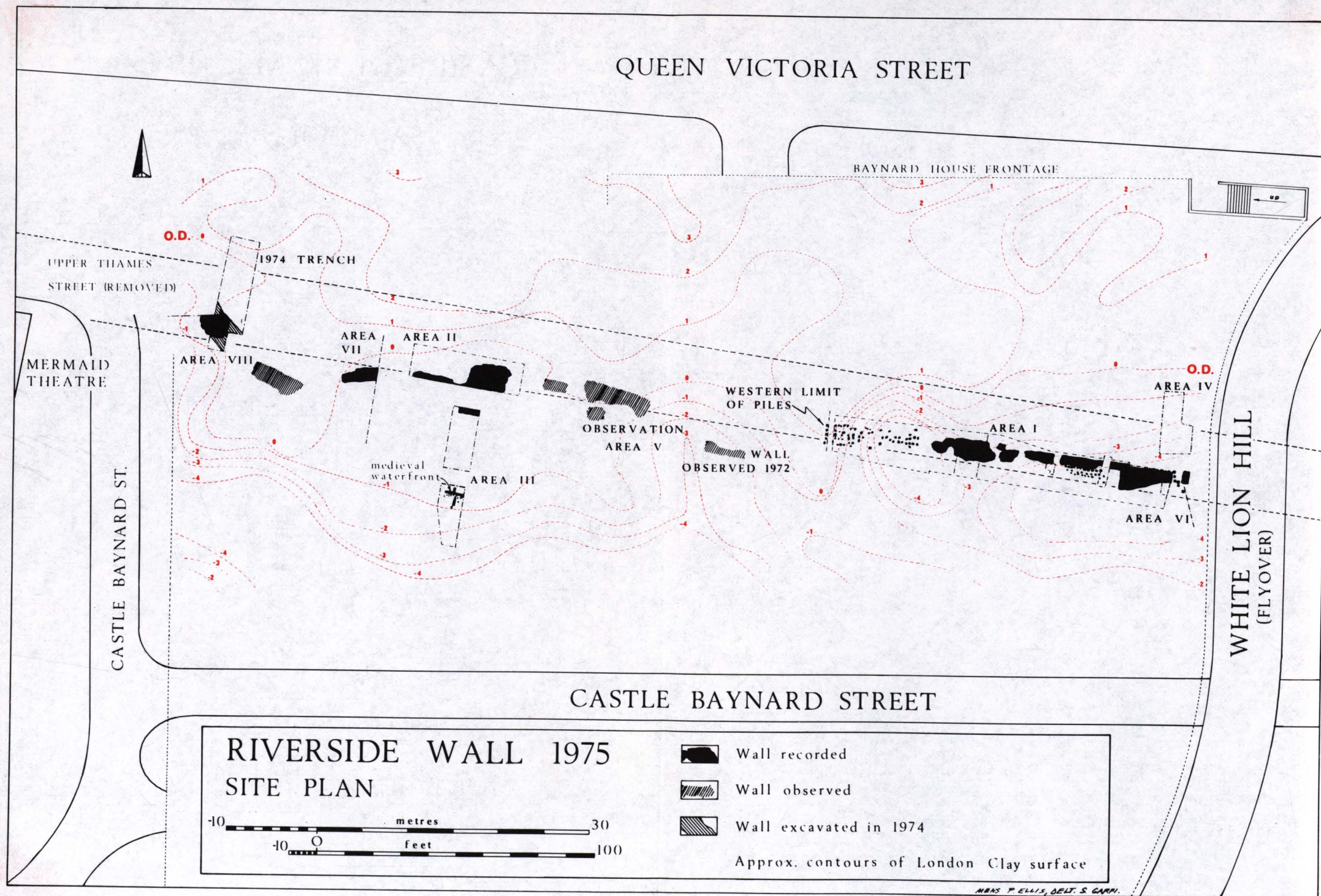


Fig. 3. Roman Riverside Wall: Major site plan with contour survey (see Note 48, p. 74). Eight main areas of excavation with surviving fragments of Wall shown.

PERIOD IB (Figs. 4, 12 and 13) (8th (?) to 11-12th centuries).

The sequence 181 and 196-9 was overlain by the following:

153: (see also Area VIII, below, pp. 49-51). A massive wall 1.6m thick (this was measured on the west section but must represent a minimum thickness as the facing stones on the upper, south facing side, had been robbed). The fragment examined was at least 3m 'high' (because it was lying on its side this was measured across the 'top' as it lay). The stone courses ran approximately east to west (Fig. 4) and from the bottom (i.e., the south as it lay on the ground) were:

- Four courses of ragstone (800mm);
- One course of red tile-*tegulae* (40mm);
- Two courses of ragstone (300mm);
- One course of red tile-*tegulae* (40mm);
- About ten courses of ragstone (1.60m);
- One course of red tile-*tegulae* (40mm);
- Two courses of ragstone (200mm).

Because the upper face of the wall had been robbed it was difficult to see the tile courses in plan (see Fig. 4), but examination of the face where the sewer cut through the collapsed wall (*cf.* Fig. 13) showed them more clearly. Two courses below the topmost of the ten courses of ragstone was a longitudinal crack in the wall running between two of the ragstone courses. The mortar was not noticeably different on either side of this crack. It was impossible to dig through the wall because of the limits on time, but where on the western side of the trench the sewer had cut through the wall (Fig. 13) a small fragment was left to the north of its trench and a mortar layer at its bottom. It is to be noted that here the strata discussed above (Period IA) continued beneath the wall.

178: Layer of grey-black semi-waterlogged earth containing rubbish. This layer lay to the north of, and against, the collapsed wall 153.

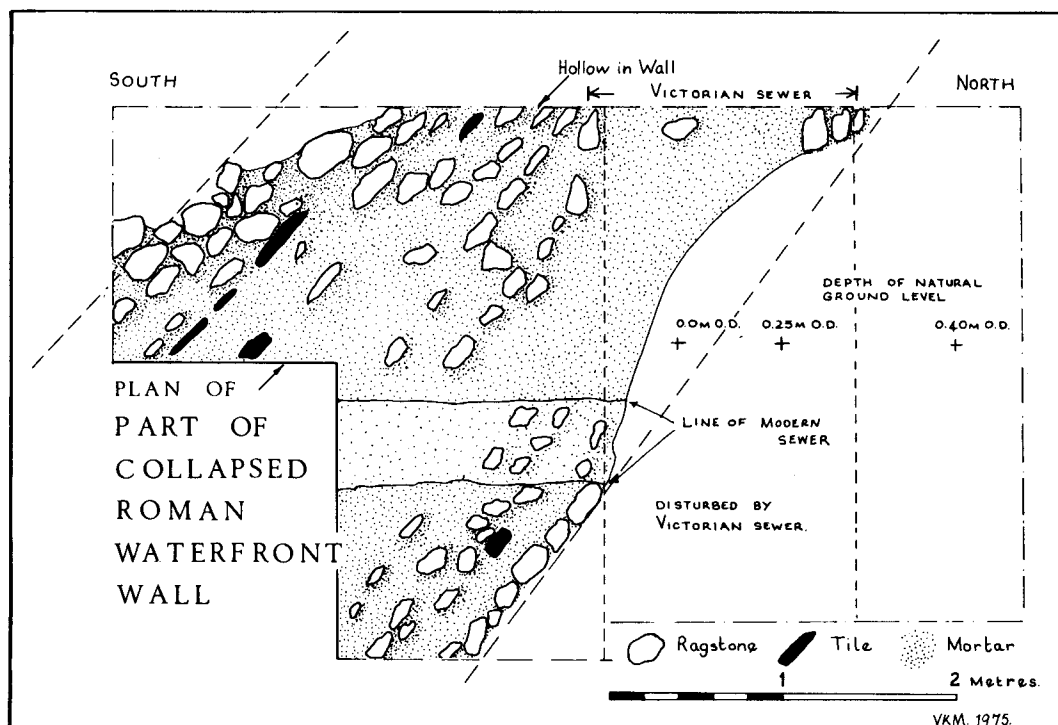


Fig. 4. Roman Riverside Wall: Plan of part of collapsed Wall.

162: A layer of fine rubble and mortar lying above 178 and spreading away from 153, getting thinner until it petered out 400mm to the north of 153.

Discussion

There is an absence of deposits that can be dated to between the 6-8th century and 12-13th century. The top layer of the dumps (layer 181) and layer 178 of Period IB both contained marsh species (see environmental report, below, p. 82). This evidence together with that from other London sites⁵¹ would indicate that a rise in river level in the late Saxon and early medieval periods caused the site to become marshy, as a result of a marine transgression. The evidence from this site indicates that this occurred between the 6-8th century and the 12-13th century A.D.

The wall, 153, appears to be the Roman Riverside defensive Wall. The evidence from this site cannot date its construction but this is available from other recent excavations (below, pp. 69-71). However, the character of the wall fits in well with that found elsewhere and leaves no doubt that it is the same. Wall (below, pp. 49-51). The evidence from the position of the wall suggests that it had fallen backwards (northwards) so that it was lying on its back with the riverside (south) face upwards (see below Areas VIII and II). The backward collapse of the Wall is difficult to explain as water action in front is more likely to have caused it to fall forwards. It may be significant that the area behind the Wall here lacked a bank comparable with those located further east (below, p. 51, and discussion, p. 61).

PERIOD II (12-13th century to 1666)

This Period consisted of a series of street surfaces and associated structures. Although the usage of the site did not change until 1972 a break does occur in the sequence with the total destruction of 1666. Because all the features encountered can be related to these street surfaces this Period and Period III are phased on this basis. In places modern disturbance makes the principal relationship between the structures and roads uncertain. However, in all these cases the relationship can be inferred.

Pre-road level I (12th century A.D.)

This phase is represented by two layers, in two areas, apparently identical.

155 and 161: Layer of dark greyish-brown earth containing gravel and lumps of ragstone.

Discussion

Layer 161 (Fig. 12) was much thinner (100mm) than 155 (600mm) as it was adjacent to the Roman Wall and thus overlay the rubble spread from the wall, 162. Nevertheless, in both areas these layers underlay Road level I and their surfaces were within 100mm of the same level (2.20m O.D.). This makes it almost certain that layers 155 and 161 represent dumping before the construction of Road level I to raise and level the ground.

Road level I (Figs. 12 and 13) (12-13th century).

This phase is represented in three areas, separated by the 16th and 19th century sewer trenches (Fig. 12), the sequence of layers being thus:

Area 1 — above layer 161 (Fig. 12):

160: thin (30mm) layer of orange gravel

159: thin (30mm) layer of grey silty earth

158: layer of hard, yellow, sandy gravel (50mm)

152: thin (30mm) layer of grey sand

151: layer of hard, orange, sandy gravel (80 to 100mm)

150: layer of grey-black earth (120mm).

Area 2 — above layer 155 (does not appear in section):

154: an apparently homogeneous layer of hard, rammed, yellow gravel, about 100mm thick.

147: mixed layer of black earth with chalk and flint. This layer was much disturbed by subsequent activity and it was thus impossible to determine its original thickness.

Area 3 — to the south-west, and on top of the Roman Wall, 153 (Figs. 12 and 13):

193: layer of clayey gravel with charcoal and occupation debris. Excavation did not go below this level, and its thickness was not determined.

189: layer of redeposited London Clay above the Wall, 153; the thickness varies considerably.

191: lens of silt within 189.

190: layer of mixed gravel and clay.

Discussion

The layers representing this phase are taken as contemporary, despite severe disturbance, as all the groups of layers are sealed by Road level II. Those of Areas 1 and 2 correlate well as the successions are similar: Area 2 had two distinct layers, the upper of which (147) can be correlated with 150 in Area 1 as it was similar in colour and consistency and both were directly sealed by 149. In Area 2 below this was an apparently homogeneous layer of gravel which seems to correlate with the group of thin layers (160, 159, 158, 152 and 151) in Area 1. None of these layers was thick enough to be a road level on its own and thus they are best interpreted as different constructional spreads of gravel. This road seems to have used the collapsed Wall, 153, as its southern kerb. The dark coloured layer on top of this road (147 and 150) probably represents a usage deposit. Both layers were relatively thick but no conclusion can be drawn about the length and intensity of usage, owing to the small amount of dating evidence. The road was probably little used as the street seems to have had no westerly continuation beyond St. Andrew's Hill until the 18th century.

Area 3, on top of the Wall, 153, to the south of the road, was composed of layers not indicative of occupation. Interpretation is not possible as not enough of the strata was seen. Dumping to level up on top of the Wall before Road level II was built seems likely. In this context it is notable that although the phase as a whole is dated by the pottery to the 12-13th century those layers (and others of this phase) contained a proportion of residual Saxon pottery (pp. 97-8, below). The presence of such late Saxon pottery is significant as it might imply occupation in this corner of the City where it has not before been suspected,⁵² but this conclusion is dependent on the origin of the dumped material. It seems unlikely that earth would have been brought from any distance to dump and if this is accepted it might significantly affect our ideas on the size of the City in the late Saxon period.

Road levels II to VIII

While the phases described above were straightforward and there were few problems in correlation, this is not the case with the succeeding Road levels. For reasons of space full discussion of the correlation of these layers is omitted but a complete typescript with full arrangement and justification for correlations together with a full description of all the post-medieval layers lodged with the finds in the Museum of London. For the sake of convenience the descriptions of the strata of the phases are collected together below (pp. 25-7).

In general these phases consist of a series of road make-up layers which varied in materials but were consistent in function, and in a number of cases, these road levels had associated structures in addition to their usage layers. By the very nature of roads there was little dating evidence for the constructional phases and although a probable date is given for the surfaces this cannot be accurate. However, in view of the importance of these dates full details of the pottery is given below (pp. 102-105). These dating problems make it difficult to know how long each surface was in use; this in turn makes consideration of the intensity of usage virtually impossible.

Road level II (Figs. 8, 12 and 13) (no dating evidence, probably pre-13th century)

The road was resurfaced and extended to the south over the Roman Wall (Fig. 13, 153) and the greater thickness of the make-up layer can be regarded as necessary to infill irregularities in the Wall. The spreading of the road to the south (*cf.* Road level I) is interesting as on the earliest accurate map of the area a crossroads appears at this point on Thames Street.⁵³ Although this map is post-Great Fire, there is no reason to believe that the crossroads did not exist before, and thus the extension of the road over the Wall (153) indicates that the trench was on this crossroads. This means that the road to the south (variously Hepper's Wharf, or Rutland's Wharf/Place) came into being during this phase, indicating increased activity on the waterfront and, hence, an expanding economy. This is presumably associated with the construction of the 1170±60 waterfront in Area III (below, pp. 46-7).

Road level III (Fig. 12) (late 13th to 14th century)

The resurfacing of this phase covered the same areas as previously and no change is indicated.

Road level IV (Figs. 5, 7, 9 and 12) (14th century)

In this phase a drain (Fig. 9, 143) was constructed and the road resurfaced (138) over the top of its construction trench. This drain was the first of a series of north-south drains running across beneath Thames Street on the line of the side street. It had only chalk and tile walls bonded with London Clay with neither floor nor top. The clay (142) within the channel indicated that the drain had a timber top, as no top was found and the street showed no sign of having been dug up. The drain had silted up with gravel and clay before the top had rotted as only slight sinkage of the road was observed. The street surface over the drain was not a major resurfacing, but a patch associated with the construction of the drain as it was thickest over the construction trench and petered out to the east. The drain was the first in a sequence of culverts and later sewers which demonstrates an increase in human activity in the area, as the capacity increased with each replacement culminating with the large 19th century sewer (Figs. 12 and 13). These drains all ran along the line of the street, perhaps indicating a communal function rather than one limited to a single property.

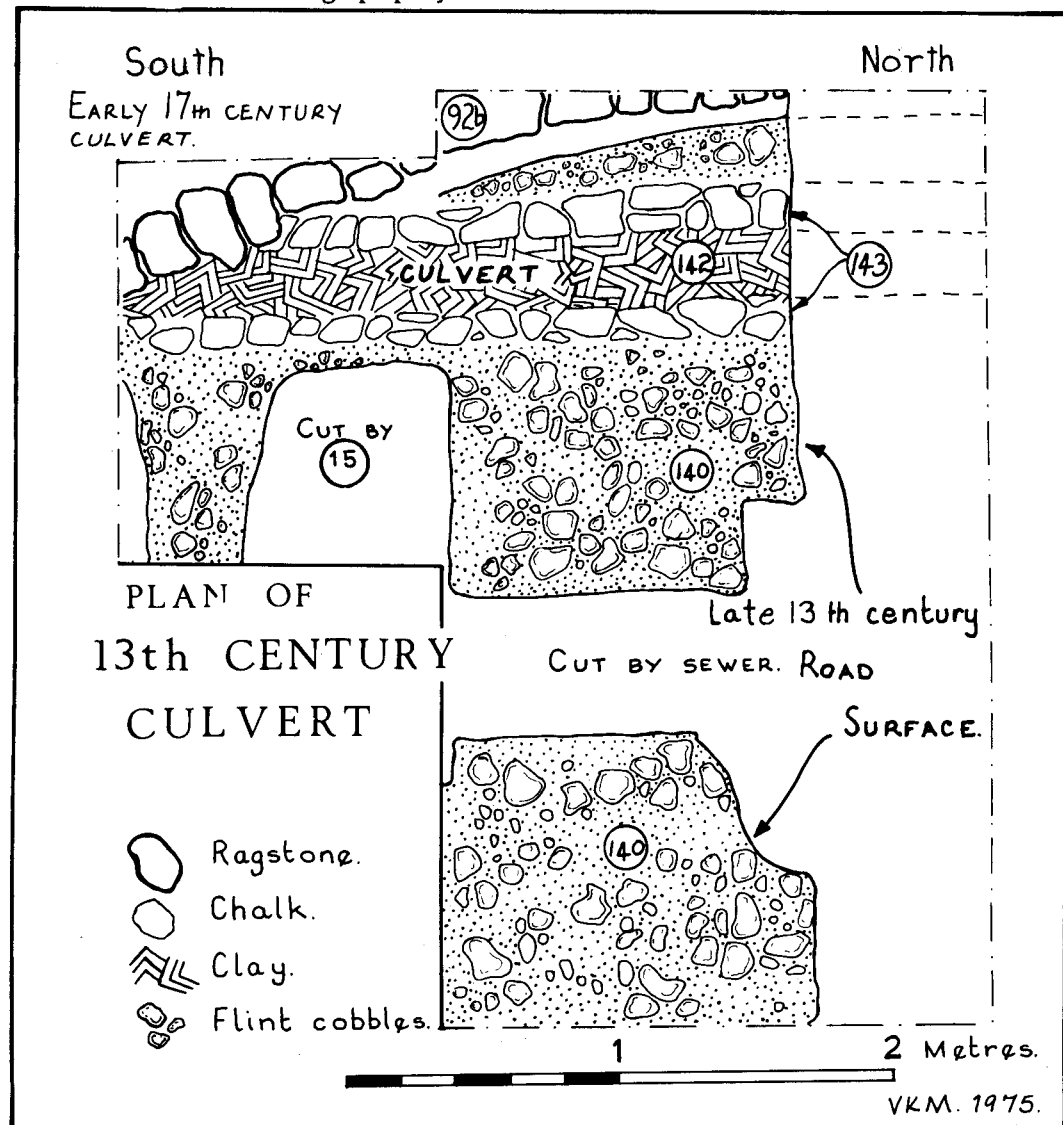


Fig. 5. Roman Riverside Wall: Plan of 13th century culvert.

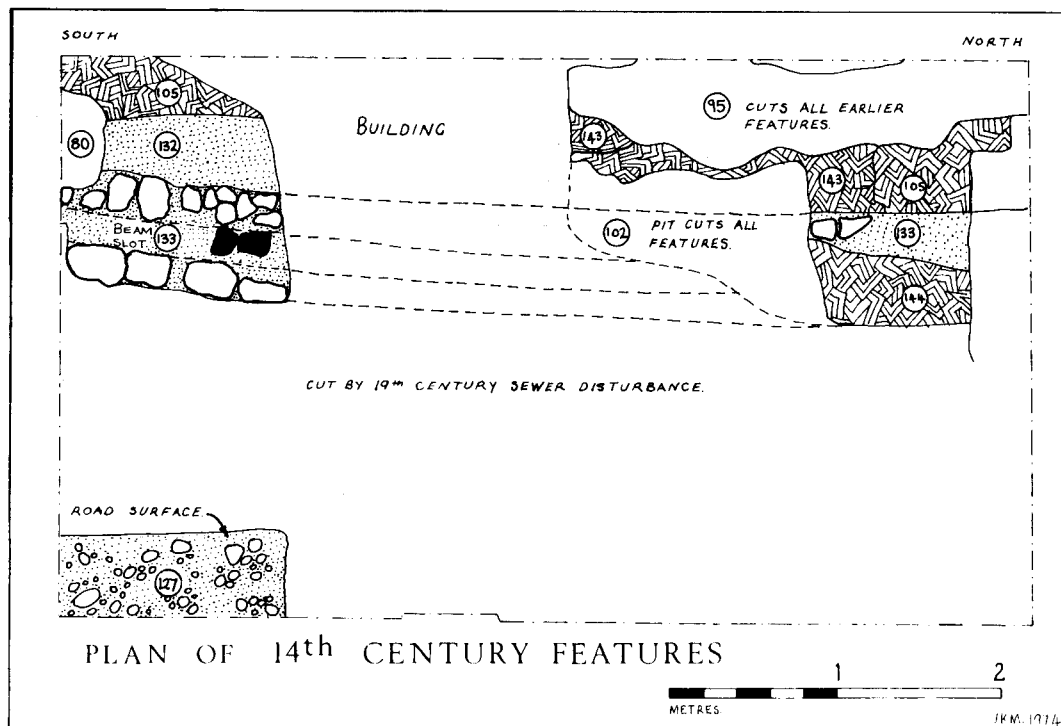


Fig. 6. Roman Riverside Wall: Plan of 14th century features.

Road level V (Figs. 6, 7, 8 and 12) (14th century)

Several areas (Fig. 6) are considered to be of the same phase despite their different sequences. The south-east corner simply consisted of another resurfacing of the street (127), together with its usage layer (126) and a rubbish layer (122). The rubbish layer was probably associated with the strata in other areas where a north-south ragstone wall (92a), with a beam slot in the top (133), represented the remnants of the eastern wall of a building, the floor of which survived only in a small area (129, 132, Figs. 6 and 7)). Below this the construction trench (136, 137) cut into previous road levels. This building blocked Thames Street on the western side of the former crossroads and appears to have encroached on the side street itself (*cf.* area covered by Road levels II and III). This encroachment on the side street and the blocking of Thames Street at first sight seems remarkable in view of the laws against this, but examination of the Agas map of the 1560s shows that a building did block Thames Street. On the map it is shown beside St. Andrew's Hill, but in view of the uncertain accuracy of the map regarding other details in this area of the City it is probable that this building represented the building found here. The blocking of Thames Street indicates that it was not a very important thoroughfare at this time (from the 14th century to its demolition in Period II phase VIII, post 1560s). This is perhaps unremarkable as the street did not then continue to the west of St. Andrew's Hill.

Road level VI (Fig. 12) (no dating evidence)

The road was again resurfaced and the building continued in use.

Road level VII (Figs. 9 and 12) (late 16th century to early 17th century)

Again, several areas of deposits are considered as contemporaneous and part of a major constructional activity. This activity involved the removal of much of the strata on the site and the construction of a massive sewer complex (92). The work can be divided into a series of phases:

- 1) Excavation of a construction trench just large enough for the planned structure and with a slope to the south (Fig. 12, 125). This trench undercut the eastern wall of the building to the west (92a) and probably occupied the whole of the side street to the north.

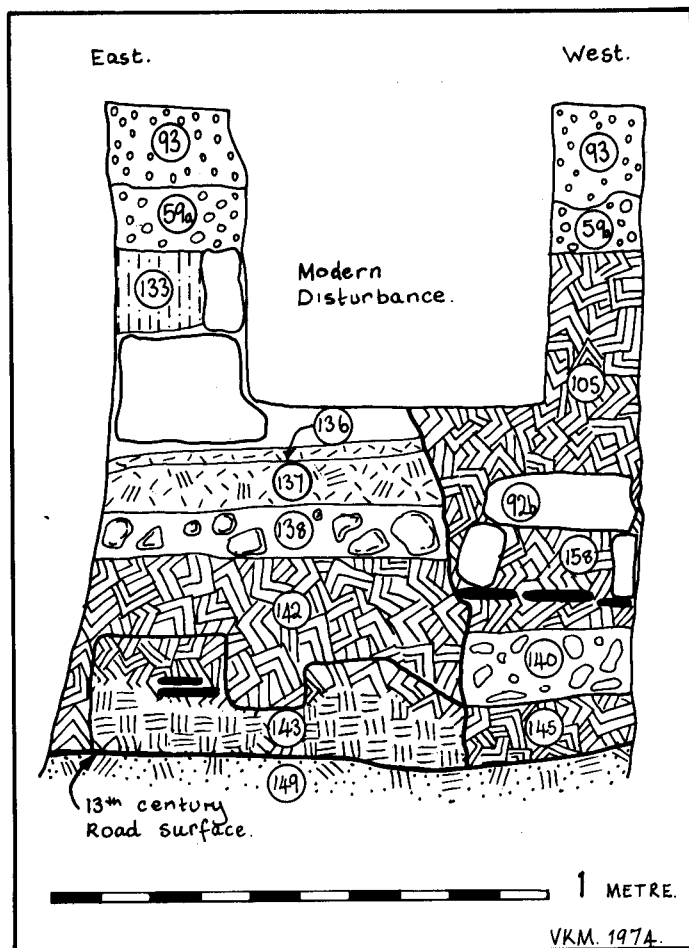


Fig. 7. Roman Riverside Wall: Road level V, showing overlying floor of post-14th century building.

- 2) Construction of the sewer in chalk blocks with mortar right against the sides of the trench, the floor of the sewer being laid after the walls, and thus the vault, had been completed.
- 3) Infilling of the construction trench and remaking of the street.

The sewer complex is of interest, although difficult to understand completely, as it was obviously part of a much larger system which was also seen on the Baynard's Castle and Riverside Wall excavation⁵⁴ (Area II, p. 42). The part examined in this excavation consisted of a single vaulted east-west channel (Fig. 12) which turned northward in the centre of the trench with a "dogleg" and terminated in a sump (164). The north-south section was double vaulted for at least part of its length but whether this continued for the part adjacent to the sump is uncertain due to modern disturbance. Adjacent to, and built with, the north-south channel was a well, the bottom of which was not reached. The piece of the structure found on the Riverside Wall excavation to the east was of the same build and consisted of a similar sump. The structure found on the Baynard's Castle site was on a north-south alignment and presumably emptied into the Thames. It is probable that the whole system consisted of a main sewer which emptied into the Thames with a series of side channels terminating in sumps to collect the sludge. The Thames would then periodically flood the system, keeping it clear.

The implications of this sewer complex are considerable as its capacity was great, suggesting a substantial population in the area, and its scale indicates a corporate venture since the co-operation of a

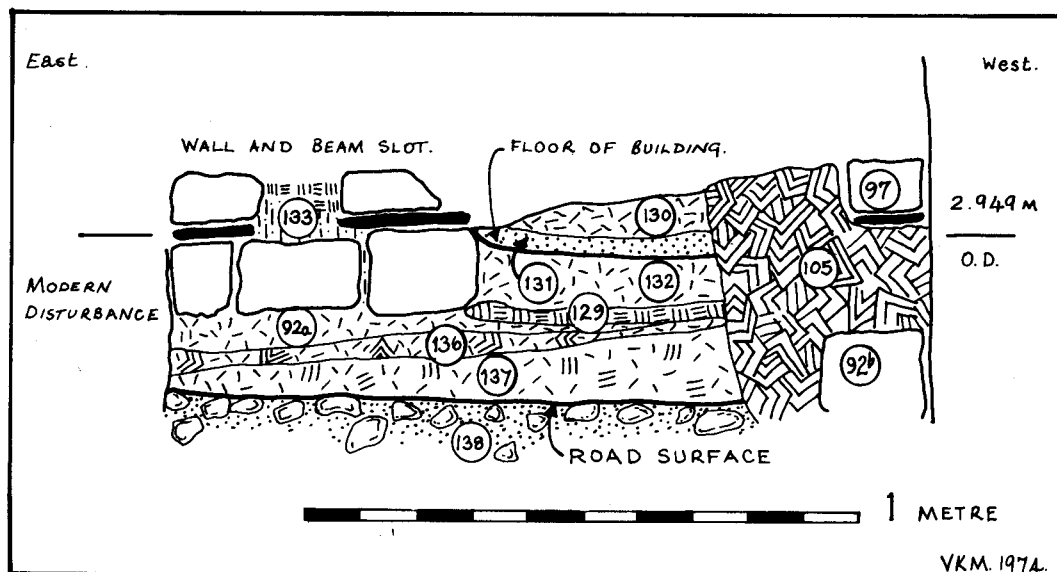


Fig. 8. Roman Riverside Wall: Road levels II-V, VIII, showing chalk and tile wall on north-south alignment.

large number of property owners would be required to construct a sewer complex like this over such a large area. Whether or not this was a co-operative project it represents a considerable change in the scale of activity on the site in late Tudor times.

Road level VIII (Figs. 12, 8, 10, 5 and 11) (early 17th century to 1666)

This phase is a further reflection of a considerable activity which was represented in several areas. Essentially there were two areas of activity. Firstly, the sewer of the previous phase was altered and, secondly, the building of phase IV was demolished and a road constructed over the footings.

In the former area the “dogleg” was removed at the corner of the sewer (*cf.* Figs. 9 with 10) and the corner made good with brickwork. At the same time the sump was altered from a rectangular to a circular shape and the whole floor relaid in brick. As a result of recent disturbance it was impossible to see how the new sump and corner were roofed over: it is, however, clear that the original vault over the sump went out of use. Essentially the function of the sewer does not seem to have changed. Alterations in brick similar to these were also observed on the Riverside Wall excavation and are probably of the same phase. This is again indicative of large scale co-operative or centralised alterations.

On the western side of the trench the building (92a) was demolished and a large trench (95/121) dug through its floor. This trench, which was very large (95; Fig. 13), cut down to natural, and as it only just appeared in the trench interpretation is impossible. The top of its fill was cut by the construction trench of the north-south culvert (92b) of this phase. This drain dipped towards the Thames and again seems to follow the line of the side street. Both the construction trench of the culvert, and the demolition debris of the building, were sealed by a new road surface which consisted of cobble stones set in gravel (Figs. 11 and 13). This surface represented a marked improvement in the quality of the street surface, and continued for some distance along Thames Street, as it was seen on the Riverside Wall excavation and as far east as the Salvation Army Headquarters (TQ 3208 8088) during road works. This street surface is the first where there are indications of centralised or co-operative action.

The final group of deposits assigned to this phase again only just appeared in the trench. They consisted of the floor (89) of a building and the robber trench (87; Fig. 12) of its south wall. This building must have stood at the north-east corner of the crossroads (Fig. 11), and although there is no evidence for the exact location of its western wall it is obvious that it was encroaching on the street. Indeed, if the western edge of the side street was still on the line of the building just demolished (92a)

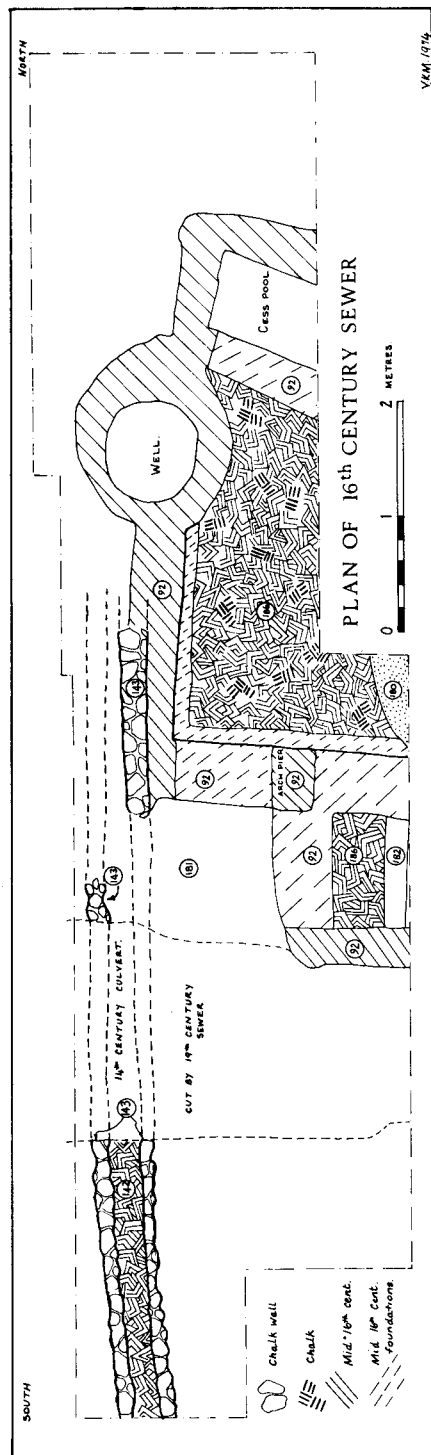


Fig. 9. Roman Riverside Wall: Plan of 16th century sewer.

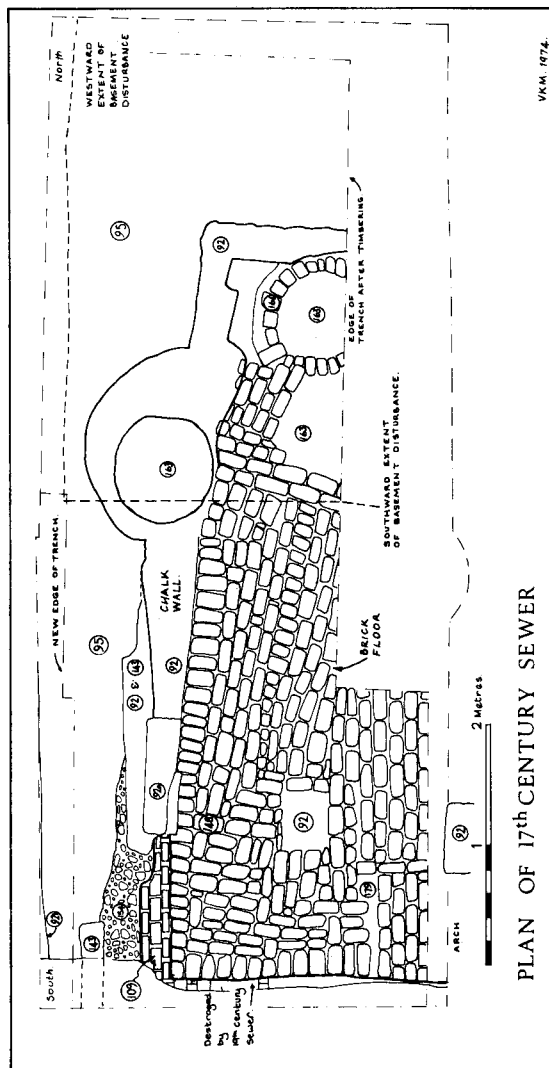


Fig. 10. Roman Riverside Wall: Plan of 17th century sewer.

the north-south street was little more than an alley. Both this building and the cobbled street surface soon went out of use as a result of the Great Fire.

PERIOD III (1666 to 1972/3)

Both the beginning and end of the Period are closely dated. It began with the destruction of the area in the Great Fire: in fact, we know that this area of the City was destroyed on Monday 5th September 1666.⁵⁵ The Period ended when the street went out of use and the buildings were demolished in 1972/3. Activity since 1666 has, from the evidence of this trench, accelerated rapidly, and has changed in nature from rubbish accumulation to a process of cutting into and removing earlier strata, so that the sequence is obscured by fragmentation of the deposits. Phasing is thus difficult and only a summary is given here, but a typescript report discussing them in full is lodged with the finds in the Museum of London.

The Great Fire and its aftermath

Deposits representing the Great Fire destruction survived in four areas and can be divided into the following phases:

- A (Figs. 12 and 13: 54, 55, 58, 78, 88). Group of layers consisting of burnt brick, tile and mortar with distorted window glass.
- B (45, 53, 77)
 - 45: a layer of grey-brown clayey silt with domestic rubbish (Fig. 13).
 - 53: thin layer of maroon silt with a little mortar (Fig. 13).
 - 77: layer of orange mortar with some gravel (Fig. 12).
- C (44, 52, 87, 114 and 115)
 - 44: layer of crushed brick and chalk blocks (Fig. 13).
 - 52: thin layer of brick and tile rubble (Fig. 13).
 - 87: a cut containing brick and tile rubble with pink mortar (Fig. 12).
 - 114 and 115: layer of chalk, mortar, brick and tile rubble with a large quantity of burnt daub, distorted glass, brick and charcoal (Fig. 12).
- D (Fig. 13; 41, 42, 43 and 51)
 - 41: light brown silt with iron and bronze staining.
 - 42: closely packed brick, tile and mortar rubble.
 - 43: layer of maroon silt with chalk fragments.
 - 51: layer of light brown clayey silt.

These phases represent the Great Fire and the rebuilding: (A) represents the burnt debris which fell and buried the street. Following the Fire little attempt seems to have been made to clear the rubble, but rubbish and silt (B) accumulated over it during the period 1666-7 when no decision had been made about the rebuilding.⁵⁶ This period was followed by a phase of demolition (C) and reconstruction. The street line seems to have remained in use although still unmade. When rebuilding was complete the road was remade (layer 49). The road was remade twice more (layers 47 and 171) within the archaeological record. There was no dating evidence from these layers, which survived only in limited areas (Fig. 12).

Other Period III features

Several other features, both buildings and drains, were found which belong to this Period but they could not be phased because of later disturbance.

- 1) A drain (97) of brick and tile on a north-east to south-west alignment (Figs. 11 and 13). Although there was no dating evidence the fact that it was cut through the post-Fire destruction deposits indicates a late 17th or 18th century date.
- 2) Layers 60, 113 and 108 (Fig. 11) representing the south-west corner of a building at the crossroads, which was by this time about 2m to the west of its pre-Fire position. The interior was

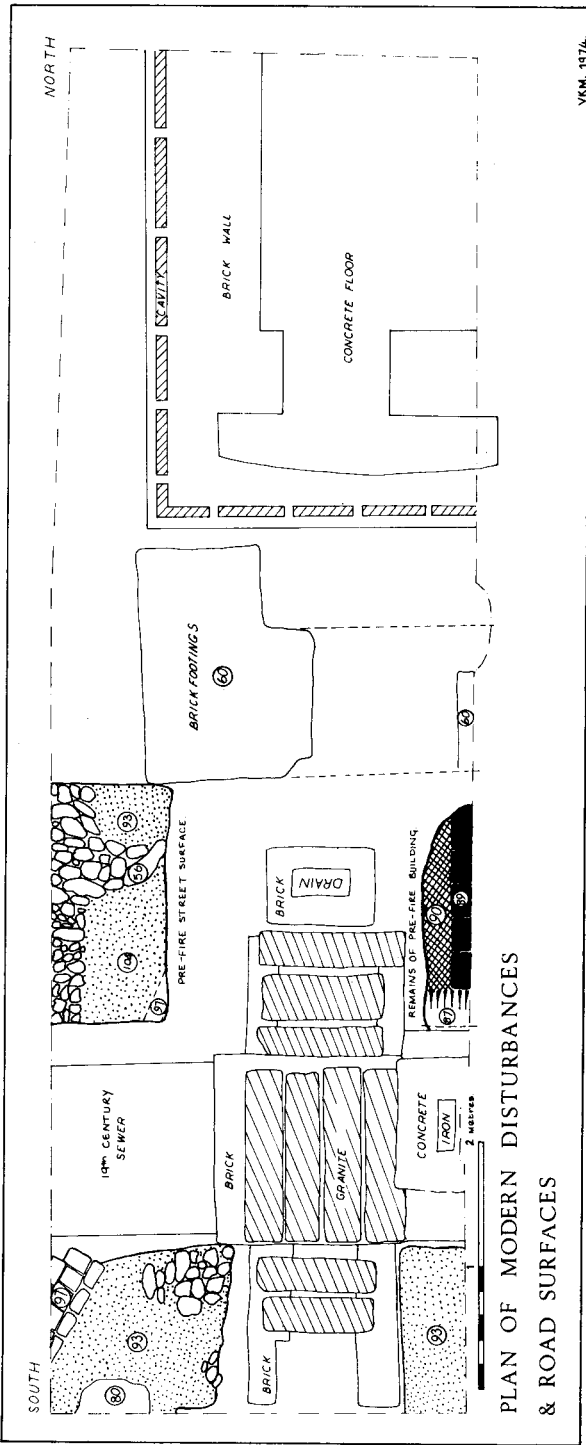


Fig. 11. Roman Riverside Wall: Plan of modern disturbances and road surfaces.

plastered and must thus represent a semi-basement although no floor was located. Although there was no dating evidence, an 18th century date is probable.

- 3) The 1850-1852 sewer (Figs. 11, 12 and 13) was excavated and drawn in detail. Unfortunately, the trench revealed an inspection cover and side inlets which had destroyed much of the earlier strata.
- 4) The basement of the building demolished in 1972/3 was also excavated (Figs. 12 and 13) revealing detail of the construction method and two phases of alteration.

THAMES STREET SECTION (MM 74): LIST OF STRATIGRAPHICAL UNITS

Road level II (Figs. 12 and 13)

Layers survived in two areas, in the southern part of the trench above the Roman Wall (153). The sequence was:

- 149: Solid layer of rammed sandstone rubble, chalk rubble and mortar with a little gravel. Thickness varies from 120 to 250mm.
- 145: Grey clayey layer about 120mm thick.

Road level III (Fig. 12)

Sequence was:

- 140: Layer of hard, yellow gravel (200mm thick) with a cobbled surface of gravel and greensand.
- 139: Dark grey, clayey layer with a little gravel and charcoal (about 120mm thick).

Road level IV (Figs. 5, 7, 9 and 12)

The following sequence represented this phase:

- 143: A pair of parallel walls on a north-south alignment built in chalk and tile bonded with London Clay (Figs. 5 and 8). The walls were two to three courses high (a total of 230mm) and were between 280 and 350mm broad with a channel (160mm wide) between them. These walls were set in a trench cut through Road levels III and II. The trench was completely filled by the structure, the walls of which were laid against the edges of the trench such that only the sides facing into the channel were shaped. This feature was best preserved in the south-west corner of the trench but appeared again to the north of the nineteenth century sewer where its eastern wall had been incorporated in the structure of the sixteenth century sewer and its western wall had been almost completely removed by a feature associated with Road level VIII (layer 95).
- 142: Layer of grey to brown, clayey earth with some gravel, London Clay and chalk. This layer filled the channel between the walls of 143, and overlay the feature infilling its construction trench.
- 138: Layer of flint cobbles between 50 and 100mm thick.
- 128: Greyish-brown, clayey layer with oysters, charcoal, pottery and bone varying between 80 and 160mm thick.

Road level V (Figs. 6, 7, 8 and 12)

Three areas of deposits can be associated with this phase. These were in sequence:

Area 1 (south-east corner of trench; Fig. 6)

- 127: Hard packed chalk and gravel surface with two cobbles remaining *in situ* on the surface (about 100mm thick).
- 126: Thin layer (20-30mm) of greyish-black silt with some charcoal. A lens of mortar lay on the surface of this.
- 122: Layer of brown, loosely packed earth with some oysters. Varied from 140mm in the south to 40mm in the north.

Area 2 (south-west corner of the trench; Fig. 6)

- 137: Mortar and chalk rubble.
- 136: Greyish, mortary clay.
- 129: Thin (20mm) layer of rammed chalk.
- 92: Structure built of ragstone blocks and red tile (see Fig. 7) set together with mortar on a north-south alignment (Fig. 6). The structure could be traced for 5.4m from the original edge of the trench.⁵⁷ To the north of this the eighteenth century cellar (60) had destroyed the deposits of this phase.

- 133: A slot 140mm wide by 120mm deep set into the top of 92a. This slot contained much black soil in its base with loose rubble filling the top.
 132: Layer of sandy mortar lying against the western side of 92a and above 129 (90mm thick).
 131: Thin (40mm) layer of black silt with charcoal, above 132, lying against 92a.

Area 3 (western side of trench, central portion; Fig. 6)

- 144: Greyish clay with charcoal, chalk and oysters underlying 92a.

Road level VI (Fig. 12)

The building with Road level V continued in use but in the south-east corner the sequence was:

- 120: Layer of crushed mortarly chalk (200mm thick).
 119: Thin layer of greyish silt (10mm thick).

Road level VII (Figs. 9 and 12)

Two areas of deposits were present, Area I being the south-east corner of the trench and Area 2 being the central area (Fig. 10). In Area 1 the sequence was:

- 125: A cut on an east-west alignment lined with yellowish-brown clay. Almost totally destroyed by the nineteenth century sewer.
 112: Layer of chalky mortar and gravel filling part of cut, 125.
 124: Solid brown stoney layer filling the rest of 125. The top of this layer was level with the top of 112.
 111: Thin (10mm) layer of greyish clayey silt.

Area 2

In this Area the layers were all related to one structure, which is described below. These layers may be divided into the constructional layers (92, 174, 180, 185, 187, 188, 192 and 195) and the usage (169). The walls of the structure (Figs. 9 and 12) were all built of chalk blocks, with a few re-used architectural fragments of ecclesiastical windows in greensand. These walls were bonded with orangey mortar. The internal surfaces were made with faced and squared blocks. Below floor level neither side of the wall was faced. The inside face of the well,⁵⁸ which was also part of the structure, was made with faced stones (chalk at the bottom and ragstone at the top) which were again squared and slightly concave. These blocks were also set in orangey mortar. The majority of the structure had a rammed chalk floor (174) but the sump at the northern end which was deeper than the rest of the structure (0.40m O.D. compared with 1.50m O.D. for the floor of 174) had no floor and was cut into natural London Clay. The floor itself dipped towards this sump. The vaulted top (in the east-west channel) was built with a similar construction to the wall and was 1.70m high at the maximum. What remained of the north-south vault was of similar construction but was higher, 2.0m above the floor. The sump also appeared to have been vaulted and the projection of its remains gave it a height of 1.4m above its clay base.

Road level VIII (Figs. 5, 8, 10, 11 and 12)

This phase was represented in four areas of the trench (Fig. 11). In three of these areas a consistent sequence emerged:

- 130: Layer of sandy mortar 60mm thick.
 121 and 95:

Material filling a deep and irregular cut on the western edge of the trench. 121 consisted of greyish-black, stoney material on the edge of the cut. 95 consisted of redeposited London Clay.

- 92b: Long structure with a square box-shaped section on a north-south alignment sloping to the south at 1 in 10. The top and base of the box were of ragstone whilst the sides were of chalk. The line of this structure was slightly off the line of the trench side.
 105: Mixed layer of greyish-brown earth above 92b.
 157: Greyish silt with small animal bones partly filling the structure 92b. The majority of the material occurred to the south owing to the slopes of the feature.
 59a: Layer of very compact, yellow gravel between 200mm and 50mm thick.
 93: Layer of dark brown/black silt.

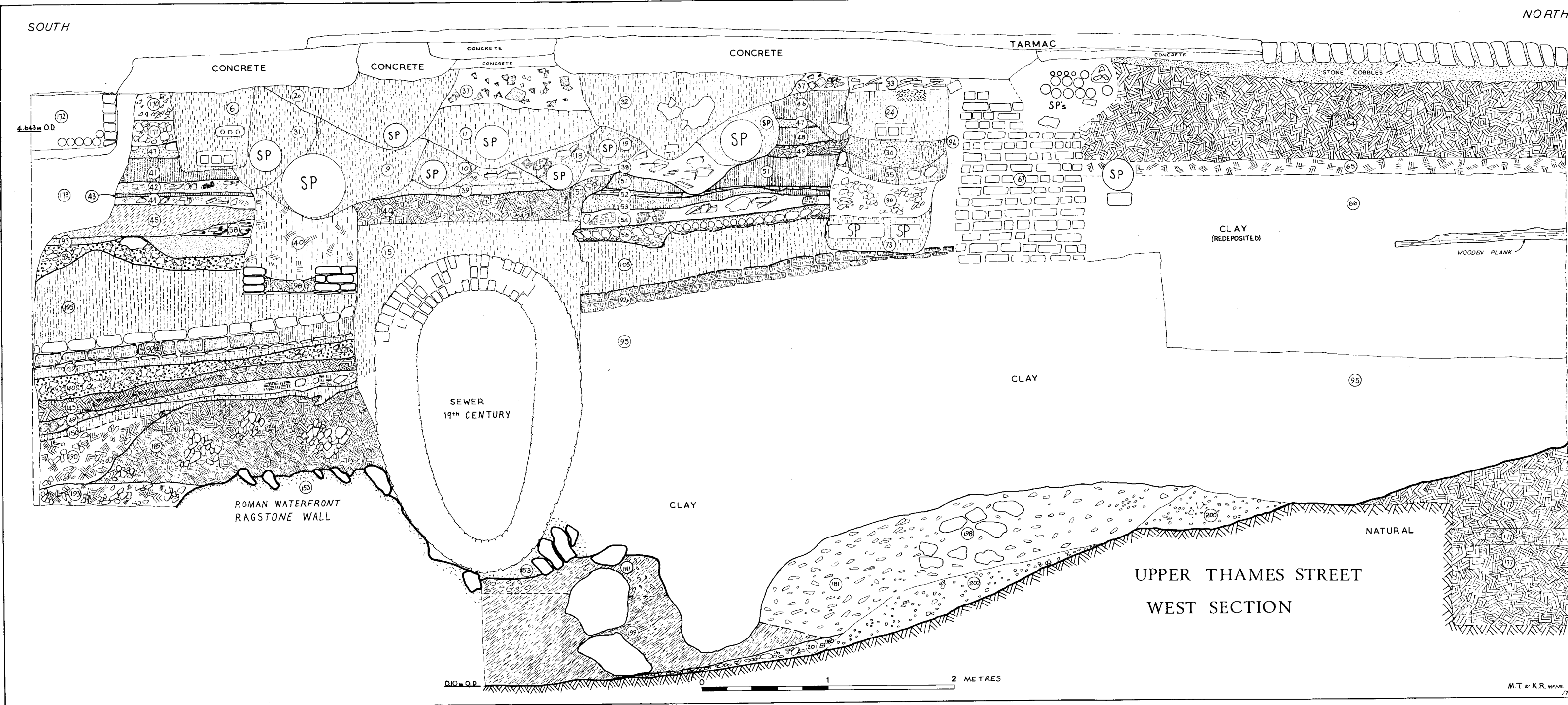


Fig. 13. Roman Riverside Wall: Upper Thames Street, west section.

NORTH



74

56, 57, 59, 101:

A group of layers consisting of some road cobbles (56) set in light, compacted mortar (57) and sandy gravel (59) on a gravel surface (101). These deposits survived best on the west side of the trench whilst in the south-east corner most of the cobbles were worn away or displaced.

In the area on the eastern side of the trench the sequence was:

95a: A patch of London Clay above the vault of the sewer (92).

92: A layer of crushed and decayed chalk above 95a (originally thought to have been part of the phase VII sewer).

91: Layer of dark grey clay with charcoal.

90: Layer of chalk, clay, brick rubble, plaster and greensand.

89: Layer of evenly laid tile, one course thick, accompanied by some charcoal on their burnt surface.

The main area on the middle of the trench consisted of a complex of layers. These can be divided into the constructional layers of the centre of the sewer alteration, and the usage layers of the sewer.

Constructional: 109, 148, 156, 164, 165, 167, 168, 175, 179, 182, 183, 184 and 194.

Usage: 123 and 166.

The alterations consisted of the following changes:

- a) The south-west corner of the sewer was extended so that instead of the turn being a "dogleg" (Fig. 12) it was a normal right-angle corner in red brick (Fig. 13), two courses thick (109), 110mm, and the breach of the original west and south walls at this point connecting the extension with the original part of the sewer.
- b) The cesspool at the north of the structure was relined, again in red brick (164) so that it was almost circular, rather than square.
- c) The whole of the sewer, both the original area and the small extension, was given a brick floor (148) set in mortar (167 and 172; see Figs. 10 and 12).

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(c) THE RIVERSIDE WALL EXCAVATIONS, 1975-6

BY CHARLES HILL

(WITH PETER ELLIS, SALVATORE GARFI AND JOHN MALONEY)

INTRODUCTION

Following the discovery of a large collapsed fragment of Roman wall at the bottom of the Upper Thames Street section (above, p. 15) it was decided to conduct an extensive watching brief over the remainder of the site and especially along the line of Upper Thames Street, where the alignment of the Riverside Wall, if it existed, might reasonably be expected. The watching brief began in January 1975 and continued intermittently until almost exactly a year later.

The nature of the excavations is of major importance not only to our understanding of the problems involved, but also to an assessment of the quality of the results achieved. In all, the

report represents a total of only 28 days of hasty, difficult and sometimes hazardous excavation on a site where the contractors had already moved in and were actively engaged in lowering the over-burden and piling. In these circumstances it was only the goodwill and compromise of both parties that enabled the excavations to take place at all. Consequently the report represents only a very small, but significant, fraction of the total archaeology available on site prior to redevelopment. Throughout the prolonged brief the priority was, initially, to prove the existence, or otherwise, of the Roman Riverside Wall and, following its discovery, to uncover as much of it as possible, examining where time and reasonable safety allowed its structural detail and immediate relationships. In the later stages of the excavations when the sculptured stonework began to appear and its relationship with the Riverside Wall was quickly ascertained, archaeology, to all intents and purposes, was abandoned altogether and a policy of outright and selective collection adopted.

The *modus operandi* of the excavations was invariably to cut sections and rapidly open up areas with machinery in the first instance, followed by a hasty, manual cleaning. After photography and limited recording, further excavation was attempted where the circumstances allowed. Only where it was considered archaeologically important and stratigraphically safe were finds collected and environmental samples taken. These qualifications should be borne in mind throughout the report.

THE EXCAVATIONS

The excavations of the Roman Riverside Wall (henceforward the Wall) were carried out in eight main areas, numbered I to VIII (Fig. 3). These eight areas, each one producing different results, will be described separately, the archaeology being subdivided into five main periods, summarised in the diagram below (Fig. 14). Areas I, IV and VI were on the eastern half of the site and Areas II, III, V, VII and VIII on the western. Area I was the main initial area of excavation, in which a 38m length of the Wall was discovered, proving conclusively its hitherto uncertain existence. Areas IV and VI, subsequently amalgamated, produced important pre-Wall deposits, the Wall itself with its clay bank, and possibly a road behind the Wall. Area II produced a substantial collapsed section of the Wall with three sculptured blocks re-used in it. Area III, to the south of Area II, produced an eroded fragment of the foundations of the Wall *in situ* and the remains of a medieval waterfront 9m to the south. Area V, in which observation alone was possible, produced a large number of sculptured blocks, removed hastily from various collapsed sections of the Wall. Area VII produced an important section of the foundations, which had tipped northwards, and Area VIII, at the far west end of the site, involved a partial re-examination of the Wall fragment earlier uncovered in the Mermaid Trench. It produced the final section of the Wall, which featured re-used sculptured stonework in the foundations, and had again collapsed northwards.

Detailed descriptions of all the stratigraphical units will not be given in the text, except in cases where their nature is of crucial importance to the argument. Lists of the stratigraphical units are published on pages 52-6, and cross-reference should be made between these numbers, those given in brackets in the text and those on the illustrations. The evidence for Periods IV and V, by and large inadequately observed in section only and consequently limited, will be reviewed by Peter Marsden in his forthcoming Baynard's Castle report. The present information is intended only as a summary of the results obtained. A full discussion of the conclusions appears at the end of the report, below, p. 56-73.

<i>Period</i>	<i>Activity</i>	<i>Date</i>
Period I	Pre-Wall timber structure and dumps	3rd century
Period II	The Roman Riverside Wall	4th century
Period III	Erosion Phase	Late Roman to 12th/13th centuries
Period IV	Collapse of Wall Construction of Upper Thames Street. Land Reclamation and Waterfront construction	c. 12th/13th centuries
Period V	Features and Walls (various)	Post-medieval to modern

Fig. 14. Roman Riverside Wall: Excavations 1975-6: Main Periods.

EXCAVATIONS AT THE EASTERN HALF OF THE SITE

AREA I (Figs. 3, 15-18; Plates 1-6)

PERIOD I (Pre-Riverside Wall)

No major activity was recorded in Area I for this period apart from the dumping of deposits of dirty sand and gravel (Fig. 16, layers 24 and 25) discovered beneath a section of the Wall at the eastern end of the Area (Figs. 15 and 18) following the removal of the Wall by machinery to obtain dating evidence. This material could represent either dumping to raise and level the land surface when the Wall was constructed, or more probably deposits associated with earlier waterfront activity, observed and described in Area VI (below, pp. 35-6). A small quantity of pottery, none definitely later than the late second century (Finds Report, p. 95), obtained from these deposits and a lack of mortar in the material supports the suggestion of earlier activity rather than association with the 4th-century Wall. The construction of the Wall, however, would have involved the partial removal and levelling of these deposits to provide a suitable surface on which to commence building.

PERIOD II (The Riverside Wall)

The excavations in Area I uncovered a total length of 38.30m of the Roman Wall, comprising 29m of standing masonry to the east and a further 9.30m of the timber piles and chalk footings to the west (Figs. 15 and 16; Plates 1-2). Both the Wall and the clay bank behind were progressively better preserved towards the eastern end of the Area and this in all probability is more the result of differential erosion across the Area in the post-Roman period than chance survival. The builders (as far as could be seen) seem not to have dug foundation trenches for the Wall, which was constructed upon, rather than into, the levelled land surface. At its highest the Wall was preserved 2.20m above the chalk raft and timber piles on which it was constructed (Plates 3-4). The north (landward) face of the Wall, protected by a substantial clay bank, was well preserved, having three offsets coinciding with three surviving tile courses. The south (or riverside) face, however, had been destroyed by river action and the resulting sand and gravel deposits had formed a foreshore partially overlying the Wall's former foundations. This process, which accounts for the destruction of over half the Wall's thickness, accords well with the graphic 12th century account of William FitzStephen, discussed above, p. 7.

The Construction of the Riverside Wall (Fig. 16; Plate 4)

The construction of the Wall conforms closely with the length of walling observed by Roach Smith in 1841 (above p. 3) except in the one important respect that the present excavations produced none of the re-used sculptured stonework which Roach Smith discovered in the foundations immediately above the chalk raft.

The first stage in the construction of the Wall involved the levelling and preparation of the existing ground surface. Squared oak piles (each one from the heart of the tree, below, p. 88, Fig. 38) on

average 200mm x 2.00m (or 2.60m in certain cases) and pointed with an adze were then rammed through the dumped material into the fine, loose, wet sand and gravel filling of the natural channel below (Fig. 18; above, p. 13). The piles did not penetrate the solid London Clay some 3m below (Fig. 28). They were arranged in five neat rows with the longest piles, on average 2.60m long, where tested, occupying the outside rows. At the western end of the Area (Fig. 15; Plate 2), where the Wall had been completely eroded and river gravels washed in, the piles were worn and slightly rounded, and the rows, although still discernible, were slightly out of alignment. However, at the eastern end of the Area, where the northernmost three rows had been protected beneath the surviving wall (Figs. 15 and 18; Plate 4) the piles were laid in almost perfect rows and were distinctly rectangular. But the two southernmost rows of piles, set in loose gravels, had suffered river action and were accordingly out of alignment. The piles in the northernmost row and perhaps also in the southernmost, set closer together, were more numerous. The tops of these protected piles showed no wear marks or splintering due to ramming, suggesting either that the tops had been carefully sawn off level after ramming or that intermediate blocks were employed to prevent splitting of the pile heads. Samples of the timbers were taken for Carbon 14 and dendrochronological dating (below, pp. 88-94).

The purpose of these timber piles was undoubtedly to provide the Wall with a sound base over a subsoil that was clearly unstable (above, p. 13). It is unfortunate that Roach Smith provided no description of the nature of the subsoil in his 1841 discovery (above, p. 3) for comparison. The piles, rammed into the loose gravels, were intended to act as load-spreading 'anchors' for the Wall, a well-attested Roman technique for overcoming this sort of problem (see Discussion, pp. 57-9).

In this connection it is important to note that the point further west (Fig. 3, western limit of piles) where the natural sand and gravels of the river channel gave way to the rising level of the blue/grey London Clay, corresponded almost exactly to the point where the rows of timber piles were seen to halt abruptly. The Roman engineers were evidently fully aware of the adverse nature of the subsoil in this particular area and built accordingly. The success of their method can perhaps be measured in the survival of the Wall (erosion apart) to serve as the foundations for medieval building (below, pp. 34-5).

Following this elaborate piling operation, in which it can be estimated that at least 750 green timbers were methodically rammed into the gravels in the 38m stretch of the Wall uncovered, a compact layer of chalk (Fig. 16) partly crushed with some flint and ragstone, at least 2.6m (8½ft) wide and on average 300mm thick, was rammed between and above the protruding rows of piles to provide a platform or raft, approximately level, on which the Wall could be constructed. The selective use of chalk in this position was presumably due to its permeable and malleable nature which rendered it highly suitable for the purpose, producing a necessary cushioning effect during the settling period of a wall newly constructed on unstable ground. No other readily available material would have adequately served this dual function. Parallels for this specific use of chalk are given below (pp. 59-61). The main body of the Wall was then constructed directly upon this chalk raft.

The suggestion that the 4th century Riverside Wall on this site utilised an earlier chalk raft, with supporting piles, on a terrace⁹⁹ similar to those found at Lambeth Hill (p. 66) is not substantiated by the evidence of the excavations. The foundations at Baynard's Castle were clearly provided to overcome unstable geological conditions (p. 13). Moreover, the Wall and piles ran parallel with one another without deviation for at least 40m. The chalk raft clearly did not extend northwards beneath the internal clay bank and although the southern edge of the raft had been eroded, the fact that the piles did not extend any further south argues against any significant southern extension of the chalk raft. Finally, the main body of the Wall was built immediately after the construction of the chalk raft, which showed no evidence of wear and still retained a clean, fresh appearance.

At the eastern end of the Area, a hollow, 300mm high x 300mm wide, (Figs. 16, 27; Plate 4) was observed just above the chalk raft running at least 400mm diagonally north-eastwards into the structure. Though its function remains uncertain, it is possible that the void represented the position of a timber, since decayed, intended to act as a lateral strengthener through the core at the base of the Wall, rather than a small culvert for which provision had already been made only 6.00m to the west (below, pp. 32-3). Such a timber would have decayed following the erosion of the Wall's riverface and its exposure to the elements.

The first structural component of the Wall, between the chalk raft and the first tile course (Fig. 16) consisted of four courses of ragstone set in an exceedingly hard green mortar. The associated facing

RIVERSIDE WALL 1975

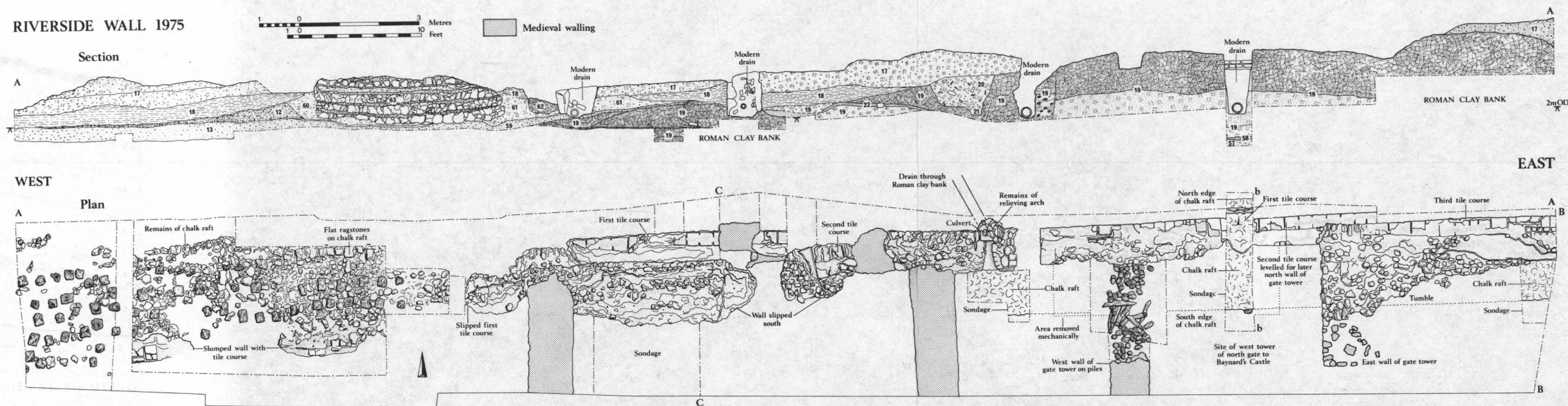


Fig. 15. Roman Riverside Wall: Plan of Wall and section A-A through deposits immediately to the north.

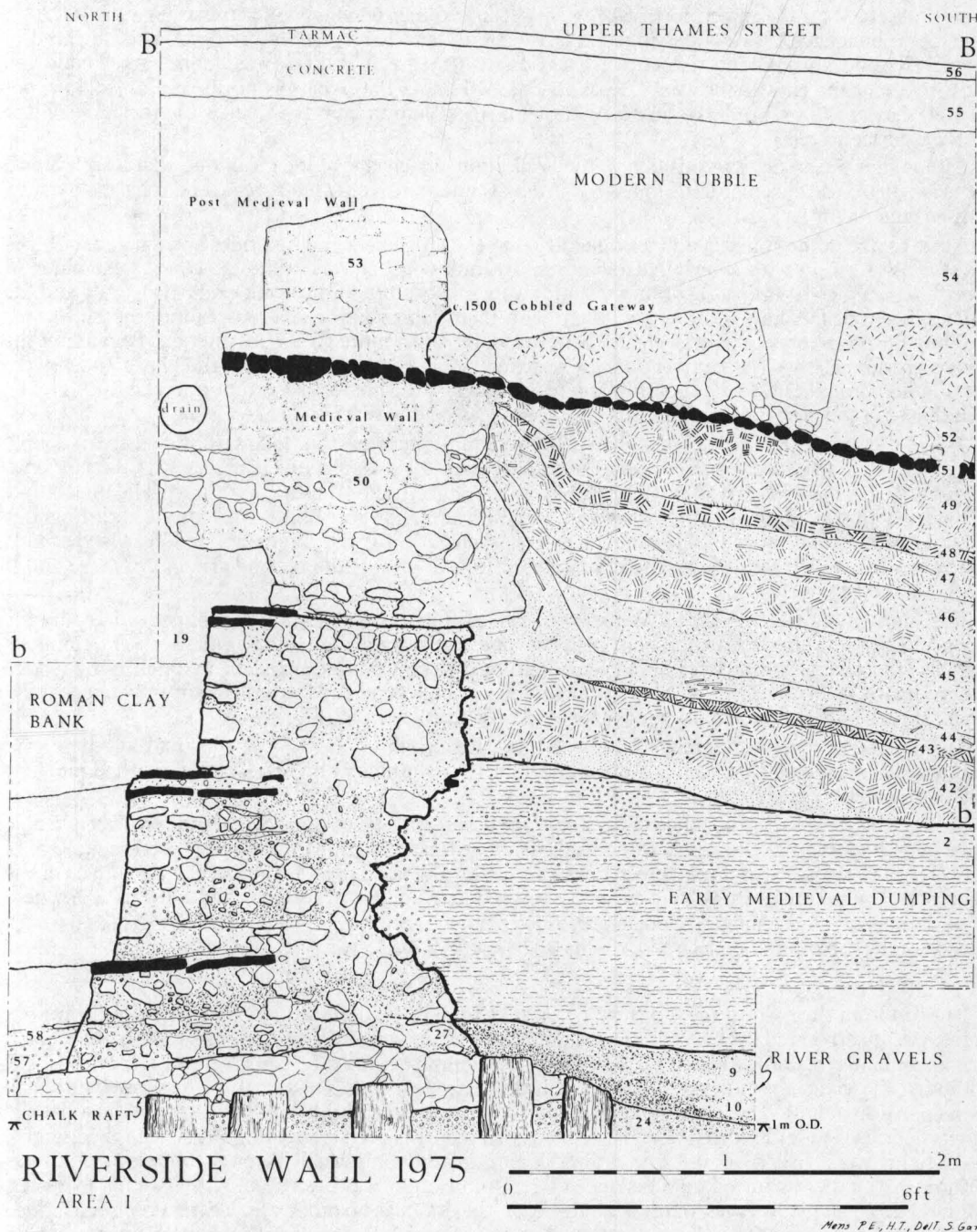


Fig. 16. Roman Riverside Wall: Area I. Composite section B B, b-b, through the Wall and later walls and deposits.

stones, observed on the intact north face, were set in a rough herringbone pattern (Fig. 17; Plate 5). This correspondence between herringbone facing stones and hard green mortar was also observed in Area VII, and throughout the entire excavations the green mortar was found repeatedly and consistently at the base of the Wall (Areas III, VI, VII and VIII). Analysis of this mortar (below, pp. 116-20) has, however, produced no explanation for this colouration, other than as the result of contact with the adjacent soils.

Although it was at just this position in the Wall, immediately above the chalk raft, that Roach Smith recorded the re-use of sculptured stonework in 1841, an intensive search revealed no trace of any such re-used material in Area I.

At this stage in the construction a single tile course, using both building bricks and flanged roof tiles (*tegulae*), was put in with a fairly narrow offset, 100mm wide, above. In the tile courses examined in Area I, *tegulae* (c. 300mm x 340mm x 50mm) were most commonly but not exclusively used and the builders seem deliberately to have used them with their flanges keyed downwards into the mortar for levelling purposes, presumably to ensure better stability and a more rigid construction. Because of the severe erosion of the Wall's river face it was impossible to decide whether the tile courses were continuous throughout the core of the structure though subsequent observation in Areas II (Fig. 21), VIII (Fig. 27) and perhaps also Area VI (Fig. 19) suggested that this was not so.

Above this single (first) tile course, five courses of ragstone were laid, followed by a (second) double tile course, then five more courses of ragstone and a final (third) double tile course. It was directly onto this course that a medieval wall (Fig. 16 (50)) was later constructed (below, pp. 34-5). The tile courses coincided with two offsets, both remarkably wide (300mm). The core of the Wall consisted throughout of strata of ragstone, mixed with random pieces of chalk, flint, tile fragments and even some *opus signinum*. A few clay bands were also observed in the structure, both here and also in Areas VI and II (Figs. 19 and 21).

The surviving north face of the Wall showed two distinct types of facing stones, demarcated by the second tile course. Between the chalk platform and the second tile course, where observation was possible, the facing stones were simply crude lumps of ragstone arranged in a rough herringbone pattern (Plate 5). In contrast, the facing stones between the second and third tile courses were generally small, fairly neatly cut, rectangular ragstone blocks (or *petit appareil*) (Fig. 15, inset).

The mortar, or more accurately, concrete (Mortar Report, pp. 116-7) above the first tile course, was distinctly yellow with a slight reddish tinge in colour, containing much gravel, chalk, crushed tile, flint fragments and flecks of charcoal.⁶⁰

Neither the tile courses nor the facing stones on the north face of the Wall would have been visible since here a substantial clay bank was added, rising at least as high as the highest preserved piece of Wall (Fig. 16, layer 19) and was directly responsible for the good preservation of the north face of the structure. The nature of this clay bank was observed more fully in Areas IV and VI (Fig. 19) where some dating and environmental evidence was also obtained (below, pp. 36-7). The probable and partial erosion of the bank in Period III is also discussed below (p. 33).

The Culvert

14.00m from the eastern section (Fig. 15; Plate 6) a culvert, designed to carry a southward flow of water, was incorporated in the Wall to accommodate a drain, and a cutting or opening, backfilled with Roman building material (Fig. 15, layer 20), was found in the clay bank behind (Fig. 15 (21)). Although the greater part of the culvert had been destroyed, sufficient remained to show that it had been approximately 0.70m wide; its channel, c. 200mm wide and 200mm high, capped by a flat tile and its floor level at + 2.00m O.D. The remains of a relieving arch, consisting solely of broken bricks, set upright, were visible above. The drain, sloping gently southwards through the clay bank, was 230mm wide and was traced for a distance of 1.30m before it was destroyed by the Victorian sewer. Running diagonally north-westwards from the Wall, the drain, as no other suitable material such as lead or tile was found, was presumably constructed in timber which, being exposed to the elements, would have decayed allowing the building material (layer 20) above to collapse into it.

It is difficult to ascertain whether the culvert and drain were contemporary with the construction of the Wall, or insertions of a later date. The problem of inserting a culvert into an existing wall and the apparent lack of a break in the construction or change in the mortar, strongly argues that the culvert

and drain were original arrangements with the construction of the Wall. The lack of silting at the bottom of the opening in the clay bank shows that it was backfilled as soon as the drain was inserted. It is probable therefore that the opening in the bank represented a temporary arrangement made while the drain was being constructed and was quickly backfilled with building material, probably that used in the Riverside Wall.

PERIOD III (Late Roman to Early Medieval)

After the completion of the Riverside Wall there began the slow but effective erosion and partial destruction of the structure by river action during the marine transgression of the post-Roman period (above, p. 16 and Discussion, p. 71). River deposits, consisting of finely sorted layers of sand and gravel, with abraded Roman and medieval pottery (Figs. 16 and 17, layers 9 and 10; Plate 4) had eaten into the base of the Wall immediately above the chalk footings, causing its river face to topple and wash away. Over half the Wall's thickness had been destroyed in this manner. Furthermore, a large section of the Wall in the centre of Area I (Figs. 15 and 17; Plate 5) had thus been undermined, the whole structure tipping slightly southwards off the first tile course; its superstructure, if surviving at the time of collapse, presumably toppling into the river. The gap formed by this forward movement was filled by clay from the bank, presumably forced into position by pressure from behind. At the far west end of the Area the Wall had completely vanished and river gravels (Fig. 15, layers 11, 13 and 59) had washed in over the timber piles set in loose gravels, causing wear and displacement of the neatly aligned rows. It is probable that the river had broken through the Wall at this point, penetrating behind the structure and partially eroding the clay bank behind.

Although it is difficult to pinpoint a precise date for this river erosion, the river deposits are stratigraphically sandwiched between the construction of the Wall (Period II) and early medieval dumping (Fig. 16, layers 2 and 5; Fig. 17, layers 5, 6, 7 and 8) in Period IV. A date between the 4th and 13th centuries is thus indicated. The discovery of early medieval abraded sherds in the river deposits (Finds Report, pp. 98-101) indicates that this river activity continued at least until the early 12th century, by which time a gravel foreshore had formed against the southern surviving portions of the Wall. The resulting eroded state and unstable structure of the Wall would probably by this time have rendered it a

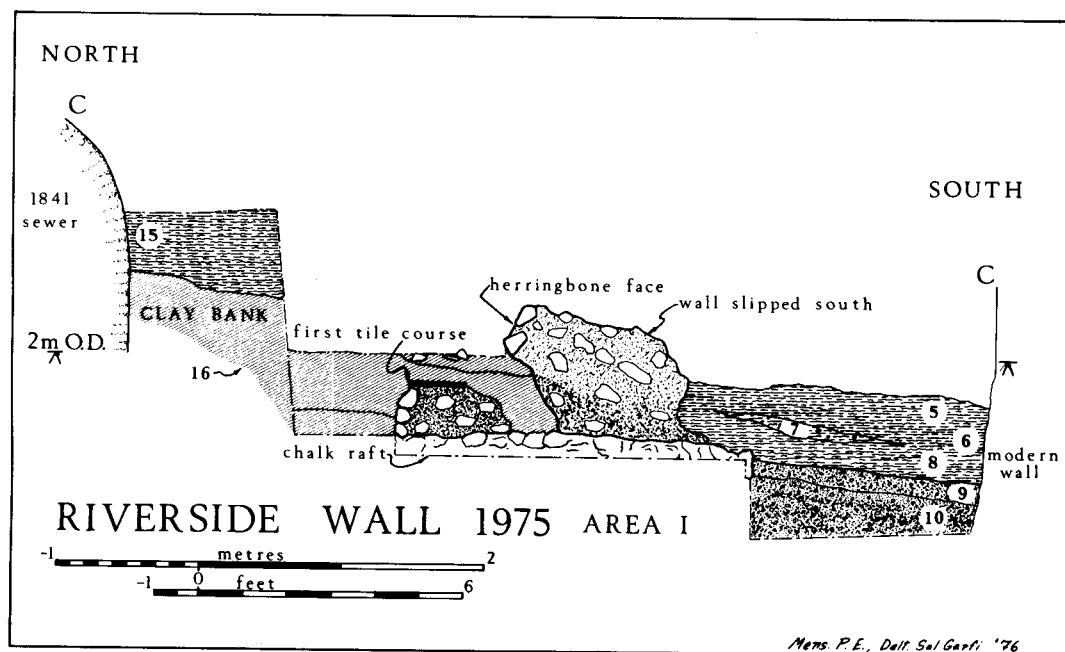


Fig. 17. Roman Riverside Wall: Area I. Section C-C, showing collapsed section of the Wall, the clay bank behind and post-Roman deposits to the south.

considerable hazard. What cannot be decided at present is whether this river activity was concentrated at any particular time or whether it should be seen as a lengthy process, spanning the whole period concerned.

PERIOD IV (12th to 13th centuries)

During the early medieval period large scale dumping occurred on both sides of the Wall (Fig. 15, layers 17 and 18; Figs. 16 and 17, layers 2, 5, 6, 7 and 8). To the north, mixed materials (layers 17 and 18) were dumped directly on to the Roman clay bank, while to the south the material was dumped directly onto the contemporary foreshore of Period III (described above, p. 33). The material to the south of the Wall (layers 2, 5, 6, 7 and 8) was similar in character to layer 18 north of the Wall and comprised soft, black, humus-rich material containing fern fronds, weeds, pottery, leather and building debris. The pottery (Finds Report, p. 101) indicates a mid 13th century date for this dumping activity. The material, perhaps street sweepings and cleanings, is best interpreted as planned dumping on to the existing foreshore as part of a deliberate policy of land reclamation associated with the construction of a waterfront further south. Similar highly organic deposits were uncovered in Area III in direct association with the remains of a medieval waterfront (below, p. 47). The inclusions of freshwater mollusca in samples of this material (Environmental Report, p. 82) suggests that it encountered some river action during the construction of the waterfront further south.

At some later date in the medieval period, the Roman Wall was capped by a medieval wall (Fig. 16, 50) constructed of ragstone and chalk, perhaps robbed from the Roman structure. In addition, further dumping of mixed materials (Fig. 16, layers 42-49) occurred immediately south of the Roman Wall. Although no direct dating evidence was obtained for either activity, both are firmly stratified between the 13th century dumping below and a cobbled surface (51) laid *c.* 1500 above. The building of this medieval wall directly upon the Roman Wall, which appears to have been deliberately levelled down to the third tile course to provide a secure foundation, might possibly have followed soon after the construction of the waterfront to the south (pp. 46-7).

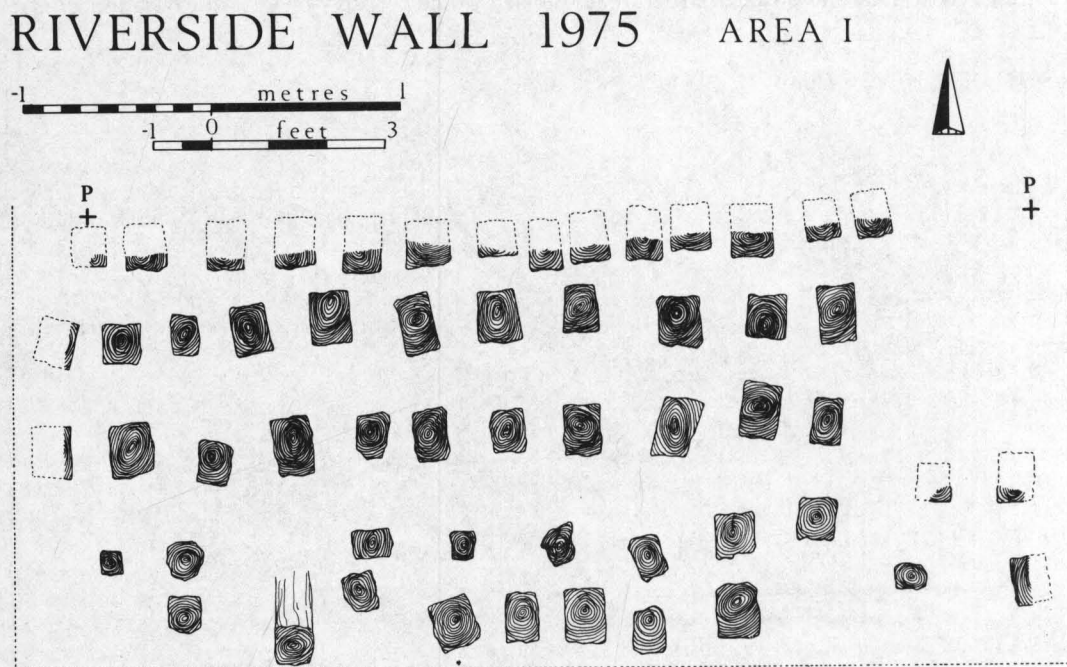


Fig. 18. Roman Riverside Wall: Area I. Plan of Roman piles beneath the Wall (removed mechanically); registered to Fig. 15.

Both the medieval wall and the dumping were sealed by the charred, cobbled surface (Fig. 16, layer 51) of the passageway through the north gateway of Baynard's Castle, constructed as part of the Tudor extension of *c.* 1500.⁶¹

The foundations of the west tower of this gateway in part re-used the Roman Wall (Fig. 15; Plate 3), the north wall being built directly upon the second tile course, levelled down for the purpose; the west wall, abutting the Roman structure to the north, being constructed on a foundation of circular piles, and the east wall cutting and re-using the tumble from the Roman Wall. In addition, the main north wall of Baynard's Castle in part re-used the Roman structure, but further west the Roman and medieval walls diverged. The Roman Wall was also pierced by a number of medieval chalk foundations (Fig. 15, keyed as such) for which no dating evidence was obtained. Finally, another undated medieval wall (Fig. 15 (63)), constructed in courses of chalk and set in bands of gravel and mortar, was observed in section at the far west end of the Area.

PERIOD V (Post-medieval to Modern)

Above the early 16th century cobbled passageway, burnt in the Great Fire of 1666, a wall of brick and chalk (Fig. 16 (53)) was constructed, completing a remarkable sequence of structures on the same line. No dating evidence was obtained for this wall, which is probably of late 17th or 18th century date. The remaining deposits (Fig. 16, layers 54 and 55) were modern built-up levels, rising to the modern tarmac surface (56) of Upper Thames Street, now removed. These modern deposits, machined off over the rest of the Area, do not appear on Fig. 15 (section).

AREAS IV AND VI (Figs. 3 and 19; Plate 7)

At the extreme eastern end of the site (Fig. 3) two small Areas, IV and VI, were examined and the results subsequently amalgamated (Fig. 19, composite section). In addition to the Riverside Wall the excavations revealed important deposits immediately to the north and south of the structure. Area IV, to the north, although primarily a narrow machine-cut trench, its north-south step section hastily recorded, allowed some excavation of a few key deposits from which some dating evidence was obtained. Area VI to the south, a contractor's machine-cut section revealing the Wall and important pre-Wall deposits, probably of two periods, immediately to the south, was also examined.

PERIOD I

Area VI produced the only certain evidence for pre-Wall activity on the whole site. Securely stratified beneath major dumping (Fig. 19, layers 302 and 305) and ante-dating the construction of the Wall, it involved the cutting of a shallow step (150mm high) in the natural sand and fine gravel filling (layer 304) of the channel (discussed above, p. 13; Fig. 3, Contour Survey), and also the levelling of an area for at least 3.40m to the south. An oak plank (Fig. 19, 308; superimposed onto the section), tentatively dated to *c.* 200 A.D. (below, pp. 93-4), was then positioned against the step and into the gravel to a depth of 80mm. Its insertion clearly pre-dated the timber piling for the foundations of the Roman Wall. Although the ramming in of the eastern-most of the southern row of piles (Fig. 19) did not in fact damage the plank, for it did not continue that far, other piles on the same alignment (not illustrated), which were uncovered immediately to the west, had clearly damaged the plank in this way. Against this plank and prior to the dumping a rich organic deposit formed (Fig. 19, layer 303). This resulted from a variety of activities, including not only some slight dumping but also, and far more significantly, the natural growth on the strand, colonised with reeds and sedge (Environmental Report, pp. 78-80). This deposit might occasionally have encountered river action, but the Thames could only have affected this area sporadically in the early third century.

The date of the plank, *c.* A.D. 200, provides a *terminus post quem* for the formation of this deposit, and in turn for the subsequent dumping (Fig. 9, layers 302 and 305). There is no precise date for the latter but it must pre-date the construction of the Riverside Wall in the 4th century (pp. 69-71). An estimate of the length of the time required for the formation of this humic deposit (layer 303) cannot be given with any degree of certainty. Equally, the purpose of the levelling and insertion of the plank can only be conjectured, but perhaps the most reasonable explanation, albeit unsatisfactory, for this pre-Wall waterfront activity is that the plank was inserted as a shallow barrier along the river's edge, a

theory which is supported by the marginal activity of the Thames at this period (Environmental Report, pp. 78-80 and Discussion, p. 57). The plank would presumably have been secured in position either by pegs inserted against its southern face or alternately by small piles, grooved to accommodate the ends of the plank. In the latter instance, it is perhaps interesting to note the 1911 discovery in Lower Thames Street (above, p. 5) of such a grooved pile, re-used to support the horizontal beams of the Roman Wall's foundation.

Both the plank and layer 303 were sealed by dumped deposits (Fig. 19, layers 302 and 305) which extended both to the north and south of the Wall. These deposits, though undated, are best related to layers 24 and 25 in Area I (above, p. 29; Fig. 16) and probably, therefore, belonged to a period prior to, rather than contemporary with, the construction of the Wall. Two piles seen in section (Fig. 19, 300 and 301) perhaps belonged to this phase of activity. The dumping layers (302 and 305) are best seen as a deliberate attempt to raise the existing land surface (layer 303), and were perhaps associated with these two piles, possibly the remnants of a waterfront structure.

PERIOD II

As in Area I, the Riverside Wall was probably constructed upon, rather than into, the levelled surface of earlier dumping (Fig. 19, layer 305). Although further deposits to the south of the Wall (layers 309, 310 and 311) might also belong to this earlier phase, an alternative explanation is that they were dumped around the base of the Wall during construction to protect the foundations, like layer 312 to the north of the Wall, which overlay the northern edge of the chalk raft. In any event, a thin mortar layer (313), north of the Wall, undoubtedly reflects the commencement of the Wall's construction.

The structural details of the Wall are generally similar to those already observed in Area I; the arrangement of the piles and chalk raft, the tile courses and offsets, the materials employed, the facing stones and colour variations in the mortar, the lack of re-used blocks and the addition of a clay bank behind, all showed a noteworthy conformity. The chalk raft in Area VI however did not extend beyond the northern face at the base of the Wall, as in Area I, and this difference probably reflects the work of a separate gang of labourers. The other variation in this section of the Wall was the inclusion of a timber beam (314) running diagonally south-eastwards into the core of the structure one course above the chalk raft. It was suggested in Area I (above, p. 30) that a hollow in the Wall possibly represented the position of a decayed lateral timber rather than a small drain. Area VI, however, actually produced such a timber preserved, which should be seen either as a random timber in the Wall, or, more probably, a diagonal lateral strengthener in the base of the structure. If this is correct, and as lateral strengtheners of the kind used at Richborough, Pevensey and Porchester⁶² seem not, as far as could be observed, to have been regular features in this structure, it can perhaps be suggested that they were only employed at weak points — for example, at the junction of the work of two gangs of labourers.

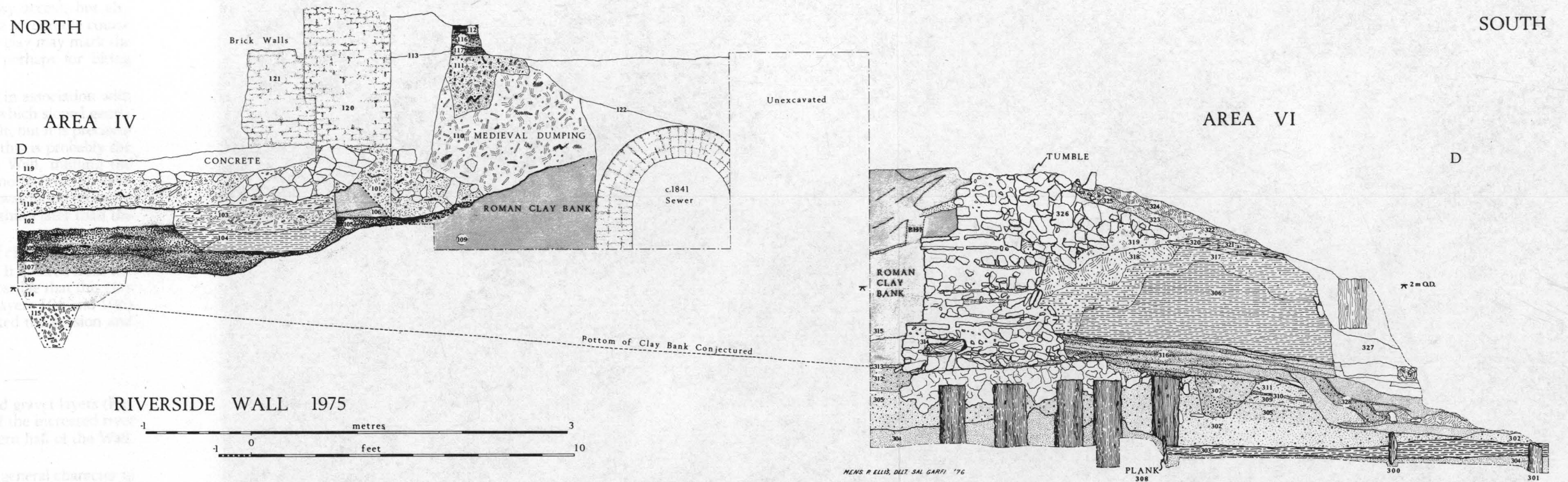
At some later date, between the dumping of layers 309, 310 and 311 and, in the post-Roman period, the formation of the sand and gravel deposits (layer 316), two pits (307 and 328), containing mixed gravel, sand and clay, were cut into the dumped material south of the Wall. Unfortunately, no dating evidence was obtained for either, and no positive interpretations can be given for them.

The Clay Bank

As already stated (p. 32) Areas IV and VI produced evidence of a substantial clay bank behind the Riverside Wall. In Area I the bank was an extensive feature, running behind the Wall for most of its length (Fig. 15), but due to the large Victorian sewer, noted by Roach Smith in 1841 (above, p. 3), it was impossible to section the deposit and determine its precise nature. In Area IV, however, this was achieved.

The clay bank (Fig. 19, layers 315, 109 and 114), laid directly against the north face of the Wall, which it protected, dropped at a steady gradient to a point 6.60m from the rear base of the Wall, and levelled out before being destroyed by a modern pile cap (not illustrated). At its tail the bank showed signs of undulations, which might indicate that it was originally stepped or revetted.⁶³

The clay used to construct the bank was light brown in colour and of a compact consistency and was, no doubt, chosen for its resistance to rapid erosion. Although it contained much mortar, pebble, pieces of tile and flecks of charcoal, of greater interest are the freshwater mollusca found in the environmental samples taken from the centre of the bank (Environmental Report, p. 80). This would seem to



indicate that the Romans obtained the material, probably natural London Clay, mixed with the building materials used in the construction of the Wall, from near at hand and probably from the river-laid deposits.

All the evidence points to the clay bank being contemporary with the construction of the Wall. As no cutting was observed in the clay for the insertion of the Wall, it is certain that the bank was either contemporary with the structure or a later addition. The small amount of Roman pottery obtained from the clay and the deposits above (Fig. 19, layers 107, 105 and 102) and the absence of any of a later date argues a Roman date for the construction of the bank. Moreover, the bank seems to have been deliberately built up in stages during the construction of the Wall, as several thin layers of mortar and minor variations in the colour of the clay in Areas I (Fig. 16) and VI (Fig. 19) normally corresponded with the tile courses. It is possible that in the simultaneous building of bank and Wall, a series of platforms was thus provided at the back of the structure, providing not only easy access, but also lessening the need for elaborate scaffolding on either side of the Wall. Just above the second tile course (Fig. 19) a distinct break in the mortar layers and a corresponding darkening in the clay may mark the position of a post employed temporarily during the construction of the Wall, perhaps for lifting purposes.

The surface of the clay at the tail of the bank, intentionally levelled, is best seen in association with the dumping of gravel and sand (Fig. 19, layers 107, 105 and 106), the surface of which sloped gently northwards. The limited examination of these deposits renders interpretation difficult, but it is precisely in this position that a road running behind the Wall could be expected. Although this is probably the best interpretation, alternatively it can be suggested that the gravels behind the Wall, infilling the hollow formed by the slope of the clay bank on the south and the hillside from the north (Fig. 3), were intended to provide a terrace or levelled area for buildings, though no trace of these was found. As with the material from the clay bank, the pottery from these gravels (p. 95) included nothing later than the third century, and must therefore be residual.

Above the gravel and sand (Fig. 19, layers 107, 105 and 106) a further deposit of clay (Fig. 19, layer 102), containing some 4th century pottery (below, p. 95), was observed in section. It differed from the clay in the bank only in that it was dirtier and had a more liquid consistency. It is possible that this clay (layer 102) represented a heightening of the original bank with the suggested road (layers 105 and 106) going out of use. However, it is considered more likely that the deposit represented the erosion and slumping of the clay bank in the post-Roman period.

PERIODS III, IV AND V

As in Area I (above, p. 33) Period III saw the deposition of well sorted sand and gravel layers (Fig. 19, layer 316), containing gastropods (Environmental Report, p. 82), the result of the increased river action in the post-Roman period, causing the erosion and destruction of the southern half of the Wall. By the 12/13th centuries a foreshore had been thus formed.

During Period IV major dumping took place on either side of the Wall, similar in general character to that in Area I. To the South a black, humus-rich deposit (Fig. 19, layers 306 and 317) which was laid directly on to the early medieval foreshore (layer 316) can be equated with the similar deposit in Area I (Figs. 16 and 17, layers 2, 5, 6, 7 and 8). A faint line cutting through this deposit (layer 306) and traced also in layers 317, 318 and 319, perhaps represented a backfilled robber trench dug to obtain building material from the Wall. Further dumping of mixed materials (layers 319-325) then occurred, above tumble from the Wall, which itself showed signs of having been cut back to a straight southern face.

To the north of the Wall prior to the dumping of layer 118 in Area IV, a medieval pit with two fills (layers 103 and 104) had been dug, together with another possible pit (layer 101). Layer 118 itself is probably best interpreted, together with layer 110, as part of a substantial medieval dump directly on to the Roman clay bank. A later pit (layer 111), cut into layer 110, was sealed by three thin layers of sand and gravel (layers 117, 116 and 112), showing signs of burning. It is possible that they represent the earliest Upper Thames Street levels (see p. 16).

Period V is represented simply by a cutting (327) in Area VI, containing a number of deposits with some modern wood, by two brick walls (120 and 121) of which the earliest (120) had a construction

trench (layer 113) along its south side, and finally the sewer (122), constructed *c.* 1841. A concrete floor (layer 119) to the north, which lay beneath wall 121, represented the basement of the last standing building.

THE EXCAVATIONS AT THE WESTERN HALF OF THE SITE

Introduction

The excavations at the western end of the site, in which five main Areas, II, III, V, VII and VIII (Fig. 3) were examined, produced a series of striking differences in the overall character of the Riverside Wall from those already described on the eastern half (Areas I and VI). This clear division perhaps occurred at the point where the piled foundations of the Wall suddenly halted, due no doubt to the correspondingly marked change in the geology (above, pp. 13, 30). No evidence for the timber-piled and chalk raft foundations came to light on the western half of the site. Indeed the sections of foundations uncovered in Areas III, VII and VIII, differ markedly from those in Areas I and VI, and were undoubtedly less substantial. This perhaps contributed to the collapse, invariably northwards or inland, of most of the sections of the Wall. Only one small fragment of the foundations in Area III, badly eroded, can be claimed to be *in situ*. Minor differences in the construction technique of the Wall, not only between the eastern and western halves of the site but also between the various western sections themselves were observed and undoubtedly reflect the random nature of the Wall's construction. No positive evidence for the clay bank behind the Wall came to light on this half of the site. All the re-used sculptured stonework, a total of fifty-two blocks, employed in two quite distinct positions in the structure, was recovered from the western half. No re-used material had been found in Areas I and VI to the east. Finally, no certain evidence for Period I activity was discovered.

AREA II (Figs. 20-23; Plates 8, 9)

PERIOD II

This excavation produced a large collapsed section of the Roman Wall, discovered during an exploratory operation by the contractors (Fig. 20; Plate 8). It was quickly cleared first by machine and then manually. The Wall, 2.80m long and 1.80m thick, had collapsed northwards, or inland, through 90°, almost certainly on to its back or north face and showed clear evidence of two builds, demarcated by a distinctive, horizontal fissure, running through the core of the Wall.

The structure of the fallen Wall from south to north (i.e. from bottom to top) was as follows (Fig. 21; Plate 9). A double (perhaps treble, as it had been partially destroyed by a modern brick wall) tile course, using *tegulae*, with flanges pointing southwards, was followed by ten courses of ragstone. The fissure occurred between the ninth and tenth courses. This, in turn, was followed by a double tile course, using building bricks, then two courses of ragstone, followed probably by a single tile course (confirmed in Area V), again with building bricks. Then came a further ragstone course and finally three large sculptured blocks re-used in a line along the Wall (Fig. 22). Beyond this point the Wall was destroyed by a 16th century sewer wall built directly against the Roman masonry (Fig. 23).

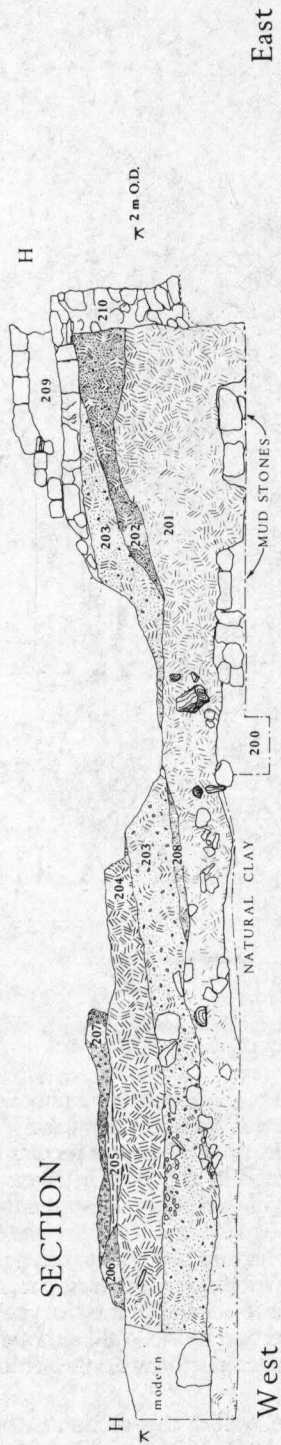
The materials used in the core of the Wall showed no noticeable variations from those observed in Areas I and VI. Only the lower or original internal face of the Wall was preserved, the upper or outer face having been robbed or eroded in antiquity. The tile courses were not continuous through the core of the Wall, penetrating only to a depth of two tiles.

A number of striking differences were observed in the construction of the Wall on either side of the fissure (Figs. 21 and 23). Firstly the mortar to the north of the fissure was white in colour and much harder than the mortar to the south which, in comparison, was yellow, softer and generally similar in appearance to the mortar observed in the upper parts of the Wall in Areas I and VI. The analysis of the white mortar (p. 117; Sample 34) shows that its hardness is due to the presence of sharp-grained quartz. This, together with the absence of red flint fragments, shows that the white mortar was not

RIVERSIDE WALL 1975 AREA II



SECTION



PLAN

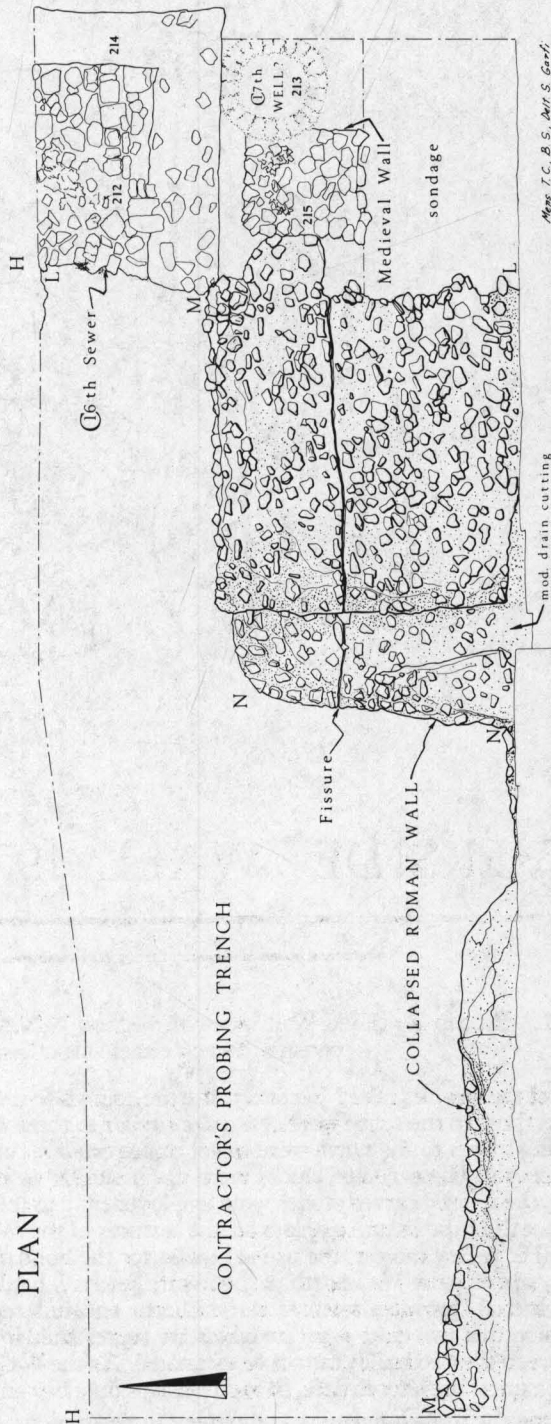
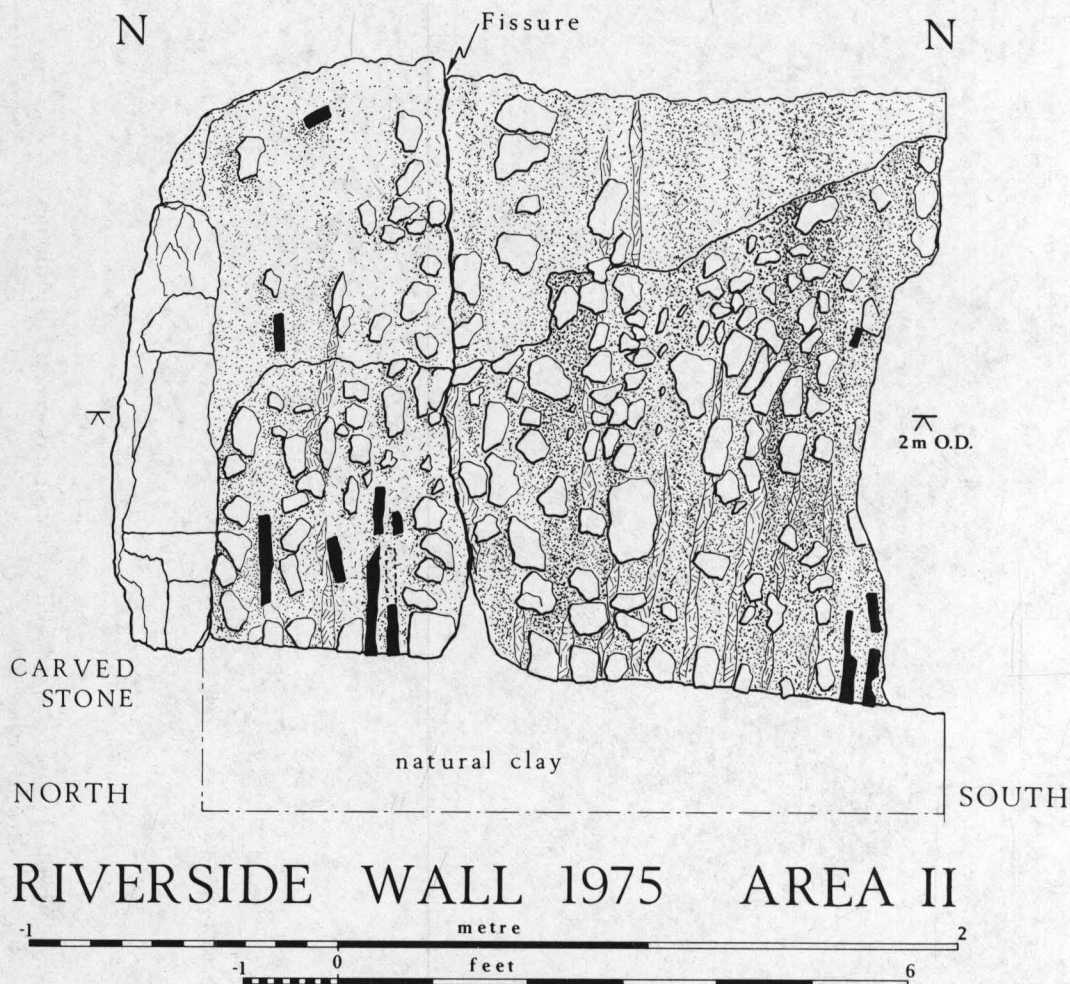


Fig. 20. Roman Riverside Wall: Area II. Plan of collapsed section of Wall and section H-H through deposits to the north.

After T.C. B.S., After S. Gardi.



Mems. P.E., Delt. S. Garfi '76

Fig. 21. Roman Riverside Wall: Area II. Section N-N through collapsed Wall, with differences in construction on either side of fissure (see Plate 9).

typical of the samples taken. Secondly, the tile courses to the north of the fissure were of building bricks whereas those to the south were of *tegulae* similar to those used in the Wall in Areas I and VI. Thirdly, the facing stones to the north were larger, more crudely cut, blocks than the neater rectangular stones to the south. These neater blocks were again similar to those used in the Wall in Areas I and VI. Finally, the re-used carved stones were employed only to the north of the fissure. In summary, the Wall to the south of the fissure displays all the features of the Wall in Areas I and VI above the second tile course (i.e. yellow mortar, the use of *tegulae* for the bonding courses and neatly cut rectangular facing stones), whereas the Wall north of the fissure, with its hard white mortar, cruder facing stones and re-used material, provides features not hitherto encountered. This evidence points inevitably to the conclusion that two quite separate builds are represented in this section of the Wall, although the time lag between the two builds cannot be estimated. As the Wall had fallen northwards, the structure north of the fissure is the later in date, though perhaps only marginally.

Perhaps the most interesting component in the structure of the Wall in this section is the re-use of three large sculptured blocks, with traces of the position of a fourth (Figs. 21 and 22) to the west. Re-

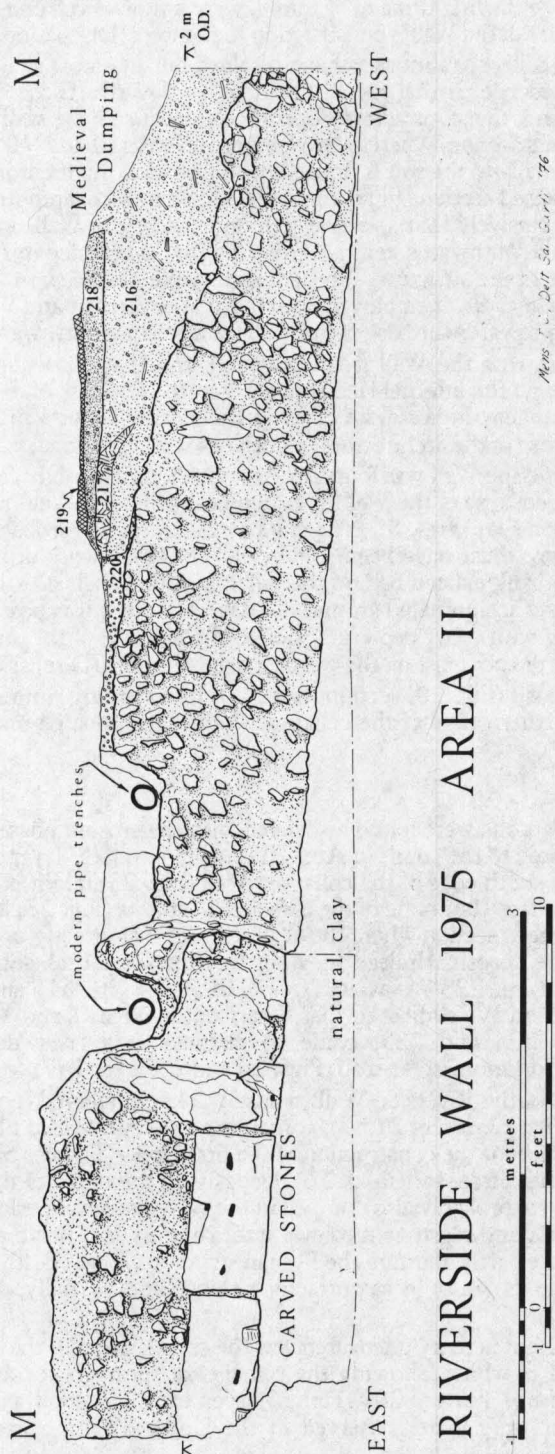


Fig. 22. Roman Riverside Wall: Area II. Section and elevation M-M of Wall, showing the re-use of the sculptured blocks and medieval dumping, possibly for Upper Thames Street.

used blocks, of which these were the first three to be found, were not observed on the eastern half of the site, but are an important feature of the Wall's construction to the west (Discussion, pp. 62-5).

The direction of the Wall's collapse cannot easily be resolved but the most satisfactory explanation, agreeing with the available evidence, is that it fell inland or northwards. Close observation over the western half of the site during the contractors' operations produced no walling, foundations or otherwise, north of this collapsed section, whereas two lengths in Areas III and VII, both sections of the foundations, were found marginally to the south. Indeed the foundation fragment in Area III was found immediately south of this collapsed section. In addition, the sections discovered in Areas VII and VIII to the west (Fig. 3) show conclusively that some large fragments of the Wall undoubtedly collapsed northwards. Had the Wall fallen southwards, tell-tale erosive signs, as revealed in Area I and VI, might have been expected at the base of the structure. No such signs were observed on the lower face of the Wall. Finally the flanges on the *tegulae*, if employed, as was usual in Areas I and VI, keyed downwards into the mortar, point correctly towards the base of the Wall for a collapse northwards.

It is therefore almost certain that the Wall fell northwards and that consequently the sculptured blocks were used fairly high up on the internal face of the structure. The lack of mortar on the exposed upper faces of the blocks presumably indicates an offset in this position. For a fuller discussion of the collapse of the Wall and the re-use of the architectural stonework see Discussion, pp. 62-5.

No evidence for a bank behind the Wall was found in Area II, though it might formerly have existed and been removed prior to the collapse of the Wall. It is significant that the Wall had fallen northwards directly on to the natural London Clay (Figs. 21-2; layers 223-227 (Fig. 23) probably infilling a hollow, see below, p. 42) and that there must have been some prior clearance work around the base of the standing structure. Even if no bank existed behind this section of the Wall, no sign was found of any deposits which must surely have accumulated around its base. Although it is possible that an existing bank had been removed, along with other deposits, prior to the collapse of the structure, it is argued elsewhere that a bank probably did not exist on the western half of the site (Discussion, p. 61).

A thick, blue-grey, clay deposit (Fig. 20, section, layer 201), containing timber and ragstone, was seen in section beyond the northern edge of the collapsed Wall. This undated material was evidently redeposited.

PERIODS III, IV AND V

In Area II no certain river deposits were found associated with the erosion phase (Period III) and the evidence for this activity appeared to the south in Area III (Figs. 24 and 25, layer 147). The undercut profile of the surviving broken south edge of the collapsed Wall (Fig. 23) might possibly indicate river erosion of the structure after collapse but none of the associated deposits (Fig. 23, layers 223-8), which did not extend as far as the western section where the Wall (Fig. 21) sat directly upon natural clay, can certainly be claimed as riverine deposits. Indeed they are best interpreted as dumping, firstly into a hollow in the natural clay (layers 223-7), as in Area VIII (below, p. 51) and secondly as land reclamation (layer 228) in Period IV, similar to that described in Areas I and VI. Only layer 226, perhaps scouring into layers 224 and 225, could be claimed as a river deposit, possibly the northernmost extension of the foreshore in Area III (Figs. 24 and 25, layer 147).

Directly sealing the surface of the Riverside Wall, whose thickness tapered, perhaps as a result of robbing, a number of layers (Fig. 22, layers 215-7), containing medieval glazed tiles, were dumped in Period IV to raise the land surface for the construction of the first Upper Thames Street (perhaps layers 218 and 219; see Upper Thames Street trench, p. 16). Deposits to the north of the Roman Wall (Fig. 20, section, layers 202-208) were probably also dumped in the early medieval period. To the east of the collapsed Riverside Wall, a chalk and ragstone medieval wall, running in a north-south direction, was constructed with its westerly face partly abutting the Roman structure. It was destroyed to the north by the large 16th century sewer, to the south by a contractor's trench and, partially, to the east by a brick wall, perhaps of 17th century date.

For Period V the most important activity uncovered was the construction of the 16th century chalk-built sewer, the southern wall of which, showing the remains of springers for an arch, abutted the Roman structure (Figs. 20 and 23). Feature 209 (Fig. 20), seen only in section, is a chalk-lined drain. Both this drain and the sewer were better observed in the Upper Thames Street trench, and are discussed above, p. 18.

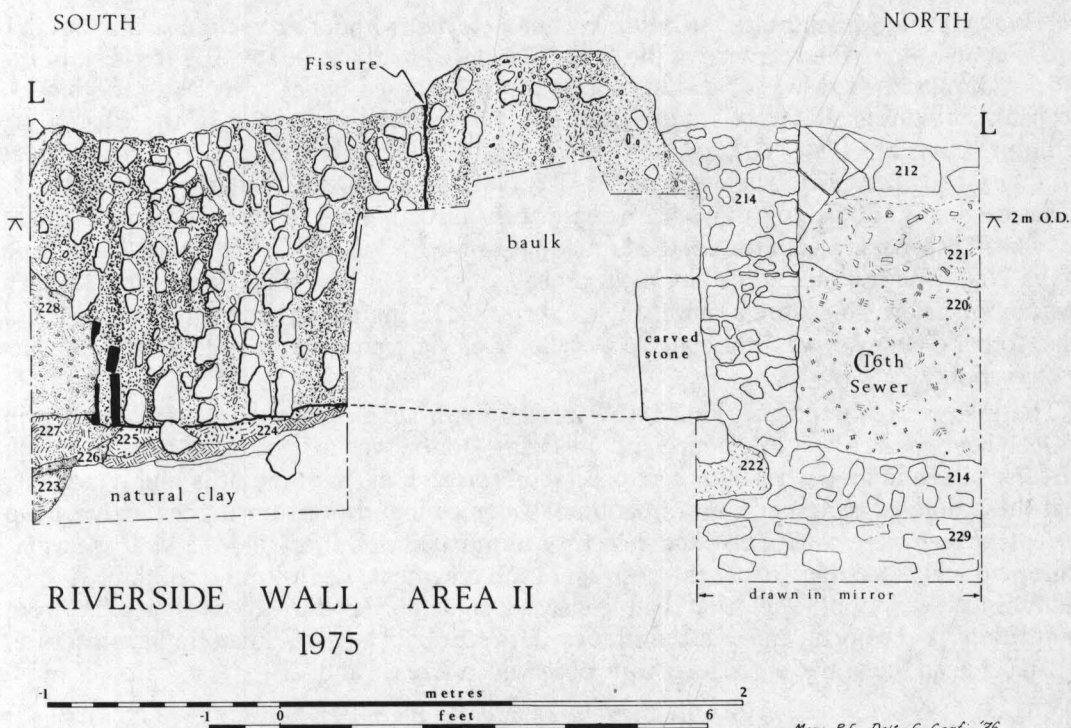


Fig. 23. Roman Riverside Wall: Area II. Section L-L (part drawn in mirror, see Fig. 20) through Wall and 16th century sewer abutting it.

AREA V (Fig. 3; Plate 10)

The excavations in Area V were severely handicapped by the lowering of the overburden with extensive 'probing' and piling on the part of the contractors. Consequently, a detailed examination of the Riverside Wall, which had in any case been badly damaged by disturbances from the medieval period, would have been unrealistic in the circumstances. It was therefore decided simply to observe the Area, giving priority to the retrieval of the sculptured stonework re-used in the Wall. After basic relationships had been observed and photographed, the carved blocks were quickly removed by use of the available site machinery and taken to safe storage. By adopting this policy, as many carved blocks as had survived were retrieved. They are reported below, pp. 124-200.

In the event, it is perhaps fortunate that no features of the Riverside Wall came to light which differed in any significant way from those already observed and recorded in Area II. All the fragments of the Wall observed in Area V had collapsed directly on to the natural London Clay, and apart from the most easterly section, first observed in 1972, had probably fallen northwards or inland, like the fragment in Area II to the west. No significant variation in constructional detail was observed in these fragments; the core materials, the mortar, bricks and tile coursing, the fissure and the re-use of sculptured blocks, all showed a remarkable conformity, suggesting a uniform building technique for at least 20m of the Wall's length. Unfortunately, no fragment of the foundations had survived immediately east of Areas II and III, perhaps due to river erosion.

As in Area II, the sculptured stonework was employed, without exception, strung out in a single course along the rear face of the Wall. This fact greatly facilitated the retrieval of the blocks. Similarly there was a lack of mortar on the exposed upper surfaces of the blocks, probably indicating an offset in this position. Of special importance is the line of six sculptured blocks (Plate 10), including two inscribed altar blocks and the magnificent Mother Goddesses relief. The re-use of this last block is perhaps particularly noteworthy, as it was originally laid flat in the Wall. The base of the block, where an inscription panel might have been expected, was in the exposed offset position with the high relief set flat in the core of the Wall. The rear face of the block was probably used to provide a flat area of contact with the mortar below, to ensure a more stable cohesion. During construction the high relief of the Mother Goddesses was impregnated with liquid clay, a factor which undoubtedly aided its preservation.

The easternmost fragment (Fig. 3) in Area V was first uncovered by Peter Marsden in 1972 (above, p. 5). This fragment, without facing stones, was part of the core of the Wall. Circular piles and gravel deposits were observed beneath it at that time. It is highly unlikely that these timbers represent a continuation of the piled foundations uncovered in Area I to the east, which were rectangular and moreover terminated well short of Area V. It seems far more reasonable to suggest that the position of this fragment, c. 3m to the south of Area I, indicates a section of Wall that had collapsed southwards, due to river action, from foundations to the north, and that the circular piles represent a post-Roman timber structure, constructed on the gravel of the foreshore, observed in Areas I and VI.

AREA III (Figs. 3, 24 and 25; Plate 11)

Over a weekend a large north-south trench was excavated by machinery immediately south of Areas II and V. The purpose of this excavation was two-fold. Firstly, it was hoped to locate *in situ* any surviving foundations of the Riverside Wall south of the collapsed fragment in Area II. This would not only prove the northward direction of that collapse (argued above, p. 42) and confirm the position of the re-used sculptured stonework, but would also help to determine the uncertain alignment of the Wall on the western half of the site (Discussion, p. 65). Secondly, the trench was extended southwards to locate and examine any possible waterfront structures and determine their relationship to the Wall. The trench (Fig. 25), 15.60m long and 3.00m wide to the north, tapering to 1.30m to the south, was effectively divided into two halves by a large modern concrete foundation. In the time available only the eastern section of the trench was recorded, the western showing little significant difference.

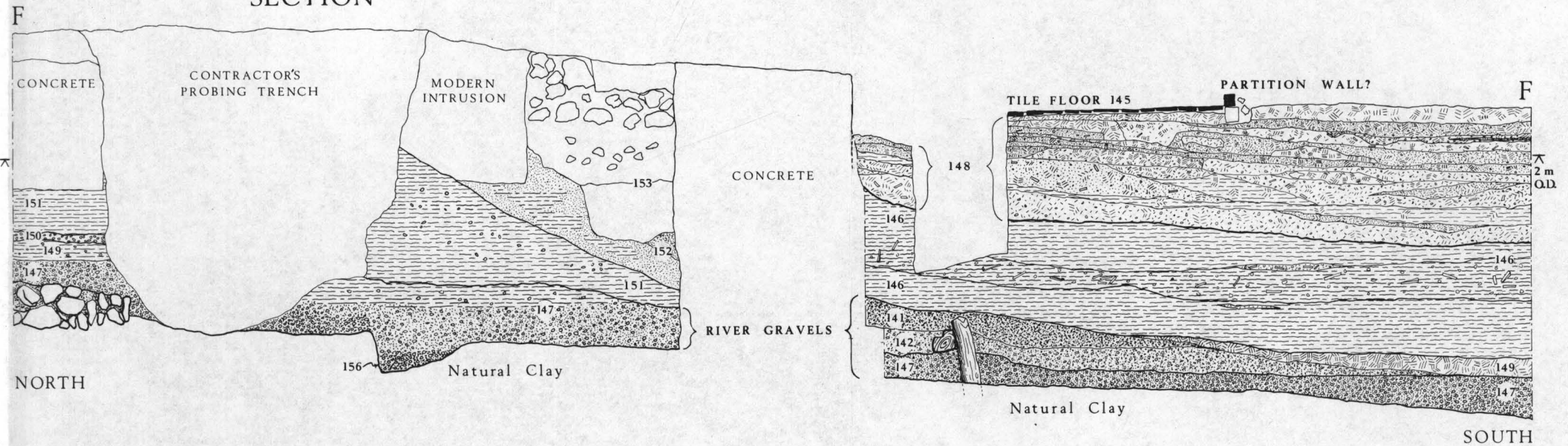
PERIOD II

In the northern half of the trench the mechanical excavator reduced the level to the surface of a compact, well-sorted, sand and gravel layer (Figs. 24 and 25, layer 147), which probably represented the post-Roman foreshore. The removal of these sand and gravel deposits by hand revealed an eroded fragment of the Riverside Wall at the extreme northern end of the trench. This fragment, disappearing into the northern section (Fig. 25), discontinued before it met the western section. A small sondage, excavated into the natural clay to trace its western course, revealed no sign of the structure which may have terminated at this point. No cutting for a robber trench was found.

The two surviving courses of the Wall were constructed in ragstone, set in a hard green mortar (Mortar Report, pp. 116-7; Context 28), similar in character to the mortar from the foundations of the Wall in Areas I and VI and later discovered in Areas VII and VIII. Indeed, initially, the fragment in Area III resembled the foundations discovered in Areas I and VI. Below the two surviving courses, however, the structure differed considerably, for there was no chalk raft supported on oak piles. This variance, caused no doubt by a change in the geology (Fig. 3; above, pp. 12-13), was later observed in

RIVERSIDE WALL 1975 AREA III

SECTION



PLAN

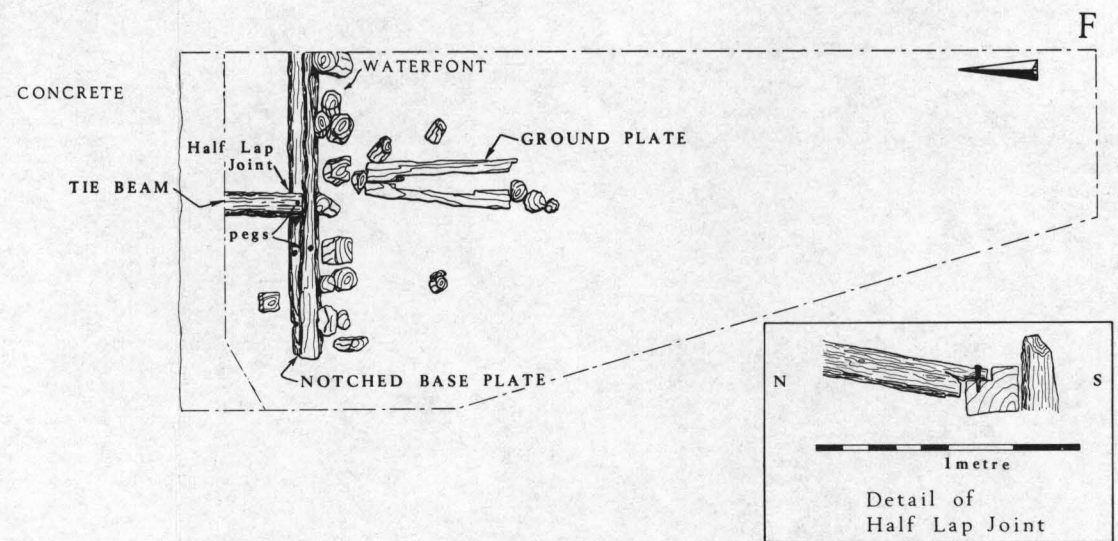
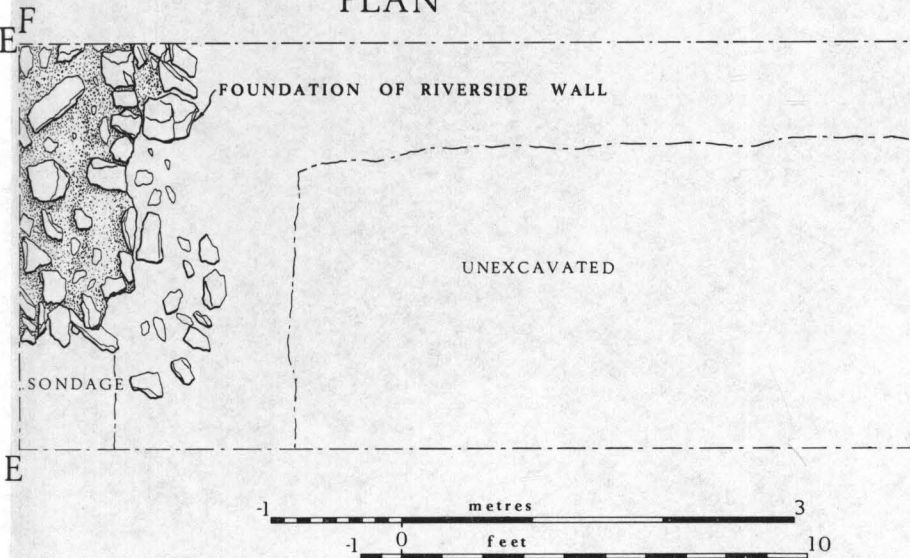
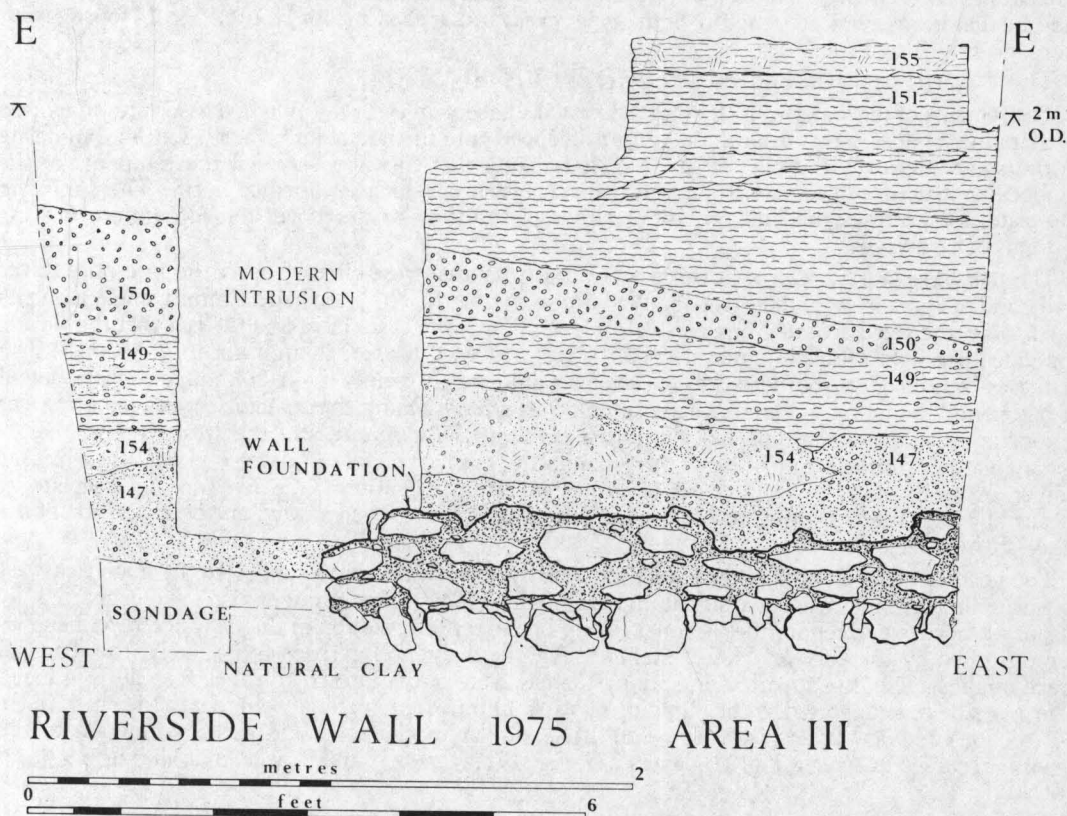


Fig. 24. Roman Riverside Wall: Area III. Plan and section F-F showing the foundations of the Wall and its relationship to a timber waterfront, probably early 13th century.

Areas VII and VIII. Instead, the Area III structure consisted of large ragstone blocks, some wedge-shaped (better observed in plan; none illustrated on Figs. 24 and 25) with smaller ragstones interspersed, set in a black mud containing no mortar. The larger blocks at the bottom had undoubtedly been rammed into the natural London Clay, and the wedge-shaped ones had been driven in point first.

The wall had all the appearances of being a remnant of the foundations, much eroded, but *in situ*. The large ragstones, rammed into the natural clay, had not moved and the two courses above, set in the characteristic green mortar found only at the base of the Wall, were still *in situ* in a horizontal plane. Furthermore, the Roman construction method for this type of wall (Discussion, p. 61) would not normally allow the use of such a large ragstone blocks elsewhere than in the foundations, and certainly not in the core of the structure. The stones used in the core cannot be larger than the corresponding facing stones, as this would hinder the careful horizontal coursing stages of construction. Finally, this type of foundation, using large ragstones, was later uncovered in Areas VII and VIII. This fragment of the foundations, although the smallest section of the Wall recovered, proves conclusively that the Wall in Area II had collapsed northwards. In turn this has an important bearing on the re-used sculptured stonework (Discussion, pp. 62-5). The absence of a chalk raft, supported on piles, in the foundations is also significant and reveals a distinct change in the construction technique, due to the change in the underlying geology (Fig. 3; above, pp. 12-13). On the western half of the site, where deep, loose Quaternary sand and gravel deposits (Fig. 3, Contour Survey) were absent in any significant amounts, elaborate piling into the natural London Clay was presumably thought to be unnecessary, or even too difficult, especially as the material contained large mudstones just beneath the surface. It may even be



Mens E.C.H., Delt. S. Garf. '76

Fig. 25. Roman Riverside Wall: Area III. Section E-E through the foundations of the Wall and later riverine and dumped deposits.

suggested that the failure to provide the more substantial piled type of foundation directly accounted for the collapse of the Wall in the post-Roman period or perhaps rendered it easier for demolition (Discussion, p. 71).

At 2.50m to the south of the Wall (Fig. 24, section 156) a gravel-filled cut into the natural clay was observed. Its nature and position relative to the structure is reminiscent of another cut (307) in Area VI, though no conclusive interpretation can be given for it (above, p. 36).

PERIOD III (Late Roman-12th/13th centuries)

During this period the Riverside Wall was gradually eroded, its foundations, after the collapse northwards, becoming covered with layers of compact, clean, well-sorted sand and gravel (Figs. 24 and 25, layer 147). By the eleventh or twelfth centuries these deposits had formed a foreshore which extended at least to the southern limit of the trench. The possible continuation of this foreshore northwards, perhaps represented in Area II by layer 226 (Fig. 23), has already been noted (p. 42). Had there been any deposits of Periods I and II to the south of the Wall, these would undoubtedly have been eroded by river action.

PERIOD IV

The first activity on this extensive foreshore was the construction of a 12th or 13th century timber waterfront some 8m to the south of the foundation fragment of the Riverside Wall. Although the waterfront had been largely robbed out by the 14th century, sufficient of its forestructure survived to indicate that it was a braced structure of the types excavated at the Custom House,⁶⁴ Seal House⁶⁵ and, more recently, Trig Lane.⁶⁶

The Waterfront⁶⁷ (Carbon 14 date A.D. 1170±60)⁶⁸

The remains of the waterfront (Fig. 24) consisted solely of an east-west notched baseplate, supported by a number of piles, a north-south tie-beam half lapped onto the notch, and a north-south groundplate to the south supported by piles (Plate 11). It is likely that these represented the remnants of the supporting structure of a waterfront, the main quayside of which lay further north. The surviving baseplate, for example, had no provision, either of mortices or a groove, for accommodating the uprights of a quayside.

The oak baseplate (2.36m x 200mm x 170mm) lay east-west directly upon the foreshore (layer 147), and ran parallel with the Riverside Wall 8m to the north. The plate had a running notch along its north edge, the step becoming progressively wider towards the east. This, and the fact that the timber contained peg holes, probably indicated that it was a re-used timber, though not from a ship.⁶⁹ The plate was secured on its southern side by eleven retaining piles, mainly of beech, though perhaps not all of one period. Some may represent later attempts at strengthening the structure, weakened by river action, as may also a ragstone block inserted between the baseplate and the westernmost pile. A rectangular pile, immediately north of the groundplate, grooved on its southern side, was also a re-used timber. A north-south tie-beam of oak (600mm x 170mm x 140mm) was fixed to the baseplate by means of a peg (Fig. 24, inset) through a half-lap joint and further supported on the other side of the baseplate by a pile.

The northern end of this tie-beam had been destroyed but would have supported the main east-west baseplate, holding the main quayside uprights (Fig. 28). The tie-beam might also have supported, by means of mortice and tenon, the diagonal raking brace, set into the top of the quayside revetment, as demonstrated by the Custom House example. Alternatively, and perhaps more likely, the diagonal brace might have been supported directly by the baseplate of the forestructure, as seen at Trig Lane. The quayside was supported by the dumping of black, humus-rich, material behind it to the north (Figs. 24 (section) and 15; layers 149, 150 and 151), similar in character and perhaps function to the deposits recorded in Area I (Fig. 16, layers 2-5; Fig. 17, layers 6, 7 and 8) and Area VI (Fig. 19, layer 306).

A groundplate was discovered to the south of the surviving baseplate described above, and this consisted of an oak beam (1.12m x 260mm x 100mm), originally morticed to take a diagonal raking brace, which had since spread. It was supported on the north side by a pile, both unusual and not altogether necessary, and on its south side by a line of three piles.

No example of a supporting structure consisting of an east-west baseplate and a north-south groundplate, both contemporary and serving as supports for a single quayside revetment, has yet been excavated in London. It seems likely therefore that they represent two different methods of supporting either two separate quayside structures on the same east-west alignment, but of different dates, or two support systems for a single quayside, the groundplate acting perhaps as a temporary strut during construction. The latter suggestion is more likely especially as there was no great difference in the relative levels of both the notched baseplate and groundplate, constructed on the same foreshore.

A precise date for the construction of the waterfront is difficult to pinpoint, though a Carbon 14 date of 1170 ± 60 years has been obtained from the baseplate. If, as seems to be the case, deposits dumped in front of the Wall in Area I (Figs. 16 and 17, layers 2-5, 6, 7 and 8) were also associated with this waterfront, a date in the first half of the 13th century would be likely.⁷⁰

Against the southern face of this waterfront (relationship destroyed) a new foreshore formed, consisting of two main deposits (Fig. 24, layers 142 and 141), a clean, hard, grey-green gravel (142) covered by a fine grey sand (141). The grey sand, in particular, was rich in freshwater mollusca (Environmental Report, p. 82), indicating river deposition. The marked difference in the character of these two deposits perhaps resulted from a change in the flow of the Thames. Pottery obtained from the deposits suggested a 14th century or later date for their formation (Finds Report, p. 101).

A cut into layer 151, backfilled with layer 152, perhaps indicates that the waterfront was robbed to provide material for a successor constructed to the south of the excavation. This new waterfront would in turn have been supported to the north by a fresh dumping of material directly on to the foreshore and would be represented by layer 146 (Fig. 24).

Above layer 146 a sequence of mixed deposits (148) followed. These were overlain by a tile floor, separated by a partition wall from a chalk layer, perhaps also a floor. Unfortunately, no dating evidence was obtained for any of this activity.

AREA VII (Figs. 3 and 26; Plates 12-13)

Excavation of this Area produced a further collapsed section of the foundations of the Riverside Wall some 30m west of the fragment uncovered in Area III and marginally south of the collapsed Wall in Area II (Fig. 3). The Wall was quickly cleared and its immediate relationships recorded on a north-south section (Fig. 26; Plate 12).

PERIOD II

The section of Wall, 1.60m wide and 3.80m long, was preserved to a maximum height of 1.30m with seven intact courses on its north face. The structure, aligned approximately north-east to south-west, had undoubtedly moved from its original course, which cannot be located with any precision. In addition, the Wall had tipped northwards or inland, presumably also throwing its superstructure, had it existed at the time of collapse, in this direction. The north face of the Wall was well preserved, whereas the southern face had been destroyed, presumably by the post-Roman river erosion.

This fragment is interpreted as a part of the foundations of the Wall, for it displays all the characteristics already observed in the remains in Area III (pp. 44-5) and subsequently in Area VIII (p. 51). It was constructed onto the natural clay with large ragstone blocks, some significantly wedge-shaped (Plate 13), rammed in. Smaller lumps of ragstone, set in a black mud, were interspersed amongst them. The base of the northern face of the structure had a narrow offset (80mm wide) and was 0.50m below the surface of the natural clay.

This perhaps points to the use during construction of foundation trenches on the western half of the site. However, the gradual rise in the surface of the natural clay beneath the Wall to the south suggests alternatively that the Wall had simply slumped into this position. The void beneath the structure, as formed by this tipping movement, was filled with a liquid clay. The courses above were set in the characteristic green mortar seen elsewhere only at the base of the Wall. The facing stones on the preserved northern face were arranged in a rough herringbone pattern (Plate 12). This correspondence between herringbone facing stones and green mortar has already been observed in Areas I and VI and in a similar position at the rear base of the Wall (above, pp. 30, 32 and 36). The material used in the core of the Wall showed no noticeable variations from those employed elsewhere, and no re-used

RIVERSIDE WALL 1975 AREA VII

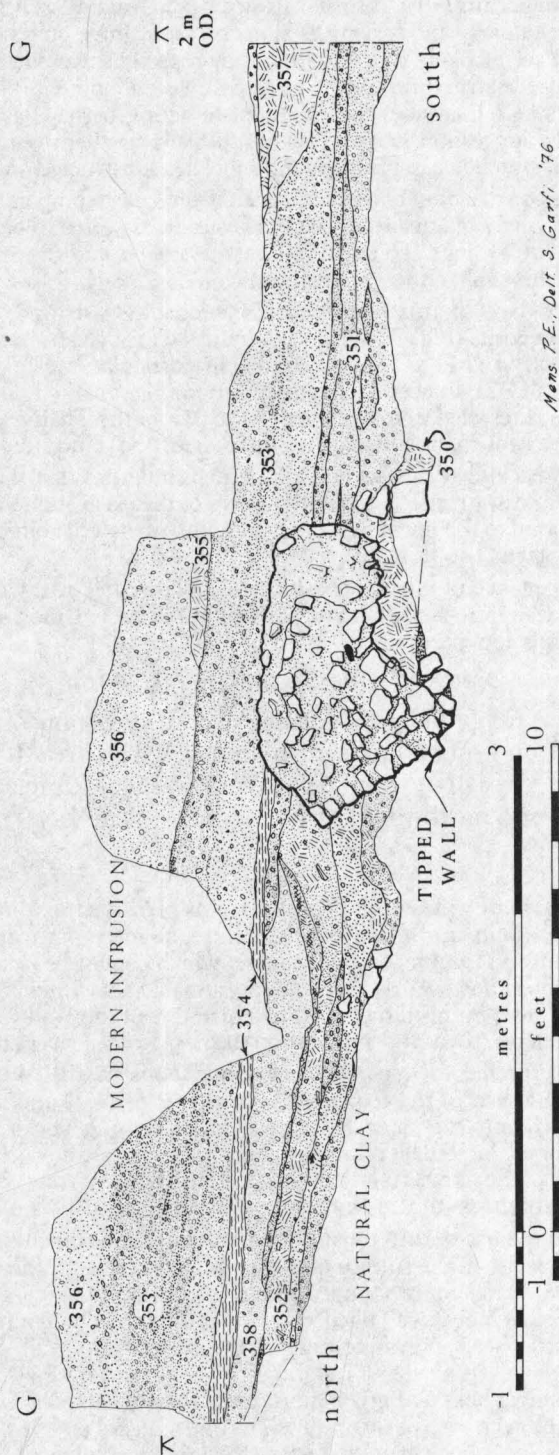


Fig. 26. Roman Riverside Wall: Area VII. Section and elevation G-G (see Fig. 3 for plan) through the collapsed Wall and associated deposits.

sculptured stonework was employed in this section. Finally, no tile courses were found though seven courses were preserved, but this absence is probably best seen as a minor variation in a random-built structure rather than as a detail of major significance.

PERIODS III AND IV (Late Roman to 12th/13th centuries)

Little evidence for activity during these periods was uncovered in Area VII. Firstly it seems unlikely that any of the deposits to the north of the Wall were Roman in date. A cut made into the natural clay 3.30m north of the collapsed Wall was filled with mixed deposits (Fig. 26, layer 352) displaying overall similarity. This strongly indicates, especially as some of the top layers overlay the collapsed Wall, that the material as a whole was dumped subsequent to the collapse and disappearance of the superstructure. Had a bank, contemporary with the Wall, existed behind this section, it must have been removed to facilitate demolition (Discussion, p. 42).

Mixed sand and gravel deposits to the south of the Wall (Fig. 26, 351) although not examined in detail, probably represented the post-Roman river deposits of Period III, accompanying the erosion of the southern face of the Wall. The organic deposit (Fig. 26, layer 354) to the north of the Wall perhaps represented the western continuation of the major dumping of similar humus-rich material found in other areas further to the east (Fig. 16, layer 2; Fig. 19, layer 306; Fig. 24, layer 151).

The remaining deposits, predominantly of sand and gravel, were dumped on either side and on to the levelled surface of the tipped Wall. The material probably related to the process of land reclamation, associated with the building of a waterfront to the south.

AREA VIII (Figs. 3 and 27; Plates 14-15)

The purpose of this final excavation, which involved a partial re-examination of the Wall uncovered by Martin Millett in 1974 (Fig. 3; report, p. 000) was threefold. Firstly it was hoped to uncover a further section of the Riverside Wall at the extreme western end of the site in order to examine its structural detail for comparison with the earlier discoveries (Areas I-VII). Secondly, the contour survey (Fig. 3) had suggested that at the far west end of the site the level of the natural London Clay was dropping in a westerly direction into a natural channel, running north-south partially under the north arm of Castle Baynard Street. If this was the case, and if appreciable amounts of quaternary sand and gravels existed as a result, it was likely that the westerly continuation of the Wall would have been constructed upon a foundation of timber piles and chalk raft similar to that observed in Areas I and VI. Finally, it was hoped to recover more sculptured stonework from the Wall.

Prior to the main excavation in Area VIII, a large collapsed fragment of the Riverside Wall was observed some 7m to the east, between Areas VII and VIII (Fig. 3) from which a large number of sculptured blocks was salvaged. It was unfortunately only possible to observe the Wall and retrieve the carved blocks, without taking full records. However, the use and position of the blocks and their relation to a double tile course were precisely similar to those of the section of Wall found in Area VIII immediately to the west.

In Area VIII a large section of the Riverside Wall and a number of deposits were excavated (Fig. 27, pre-excavation section and elevation; Plates 14-15. The Wall lay immediately south of the fragment partially excavated in 1974 (Report, pp. 14-16) and is interpreted as a length of Wall foundation which had collapsed northwards into a natural hollow, perhaps a stream bed running north-south (Fig. 3, contour survey; Fig. 27, layer 406). Prior to collapse the hollow had been filled in with a black organic deposit (Fig. 27, layer 402). The construction details, although closely resembling the foundation fragments in Area III and VII, differed from the latter in two important respects: it had a double tile course and incorporated sculptured stonework.

RIVERSIDE WALL AREA VIII 1975

Charles Hill, Martin Millett and Thomas Blagg

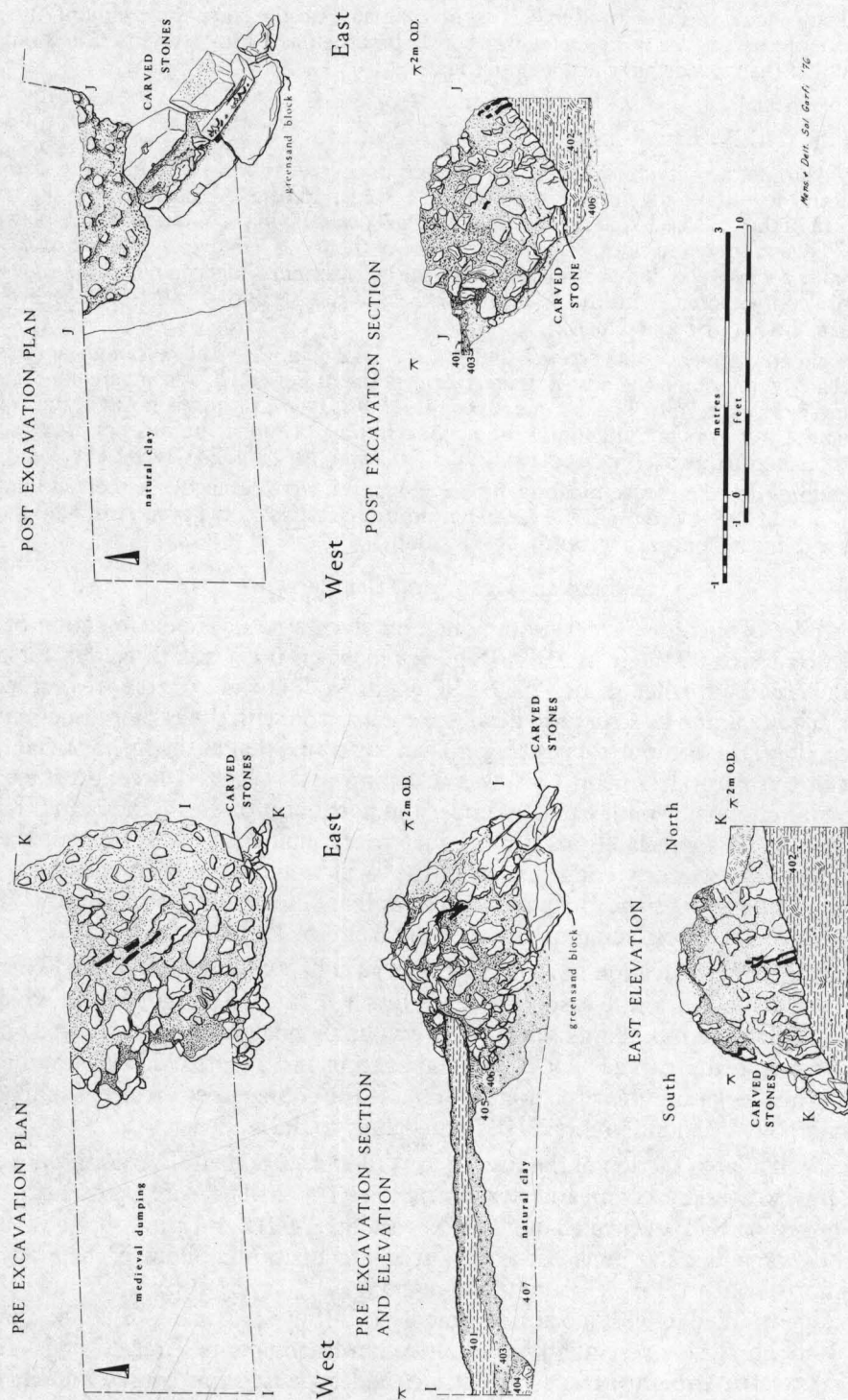


Fig. 27. Roman Riverside Wall: Area VIII. Plans, sections and elevations of the Wall showing re-used sculptured stonework in the foundations.

PERIOD II

The fragment, 1.80m thick, was preserved to a height of 1.90m or twelve courses, including the sculptured blocks, on its north face. The Wall, with foundations intact, had fallen northwards on to its north face, and onto the deposits filling the natural hollow. It is clear that the level of the London Clay, although showing some evidence of dropping to the west, as was predicted (Fig. 27, pre-excitation section and elevation), had probably not reduced sufficiently for the Romans to recommence construction with the piling method observed in Areas I and VI.

The foundations, similar in most respects to those in Areas III and VII, included large ragstone blocks, some set on end, with smaller ragstones in black mud interspersed among them. At the base of the structure was incorporated a large, undecorated, greensand block, laid on edge. The materials used in the core of the Wall were well preserved, while the south face had been destroyed, presumably as a result of river action prior to collapse, and perhaps also of later robbing. The structural sequence on the north face (Fig. 27, east elevation; Plate 4) comprised the greensand block, three courses of sculptured blocks, five courses of ragstone, a double tile course using ordinary tiles and two courses of ragstone. Subsequently the Wall had been destroyed by a modern contractor's trench. The section of the Wall uncovered in 1974 originally occupied this disturbed area to the north (Fig. 3) and represented a later stage in the Wall's construction. The bricks penetrated the core of the Wall only to the width of two bricks, a feature which has already been observed in Area II and possibly also in Areas I and VI. The mortar, although identical in most respects (Mortar Report, pp. 117-20) clearly showed three colour differences. At the base of the Wall the normal green mortar (Fig. 27, heavy stipple) was found, with a yellow mortar (Fig. 27, medium stipple) as usual above it. Around the sculptured blocks a distinctly pink mortar (Fig. 27, light stipple) was seen. Unfortunately no reason for these colour variations can be given but they were presumably due to later contamination (Mortar Report, p. 120). As in Area VII, no certain evidence for a bank behind the Wall was found.

The facing stones of the Wall, observed during the removal of the sculptured blocks, were not arranged in a herringbone pattern, as at the rear base of the Wall in Areas I, VI and VII, but consisted of large squared blocks of ragstone set into the core of the Wall. The sculptured blocks in this section had been re-used in the foundations of the Wall. They were not laid as a solid base continuous through the Wall, but were used only at the rear base of the Wall, set in a single band, diminishing from three courses high to the east (Fig. 27, post-excitation plan) to a single course to the west (Fig. 27, post-excitation section). In one place where the width of a block was less than those on either side the resulting gap was infilled with ragstone and concrete (Fig. 27, post-excitation plan).

PERIODS III AND IV

It has already been suggested that this section of Wall had collapsed northwards, or inland, into a natural hollow, perhaps a stream bed, running approximately in a north-south direction. Some time prior to the collapse, however, the hollow had been deliberately infilled with a black, organic material (Fig. 27, layer 402; *cf.* also the 1974 excavation, p. 14, Figs. 12-13, layer 199). The environmental evidence (below, p. 82) supports the conclusion that this material represented deliberate dumping, rather than the natural accumulation. The pottery recovered from the deposit was Roman in date with the exception of two sherds of Saxon pottery (5th to 8th century) and a small, glazed, medieval sherd, possibly intrusive. These sherds, in addition to the Saxon sherd recovered by Martin Millett (above, p. 14), also dated from between the 5th and 8th centuries (Pottery Report, pp. 96-8, Nos. 11-13), provide a date after which the dumping must have occurred and the Wall collapsed. The collapsed Wall was sealed by deposits consisting of possible river gravels, organic dumping (Fig. 27, layers 403 and 401 — both of 12th/13th century date) and make-up levels for the Upper Thames Street (above, p. 16; Figs. 12-13) of similar date. A date for the collapse of this section of the Wall must be sought therefore between the 5th and 13th centuries (Discussion, pp. 71-3).

The Wall was sealed directly by a clean gravel deposit (Fig. 27, layer 403), perhaps a post-Roman river deposit similar to those observed in other Areas. Above this deposit, mixed clay, earth and gravel material (Fig. 27, layer 401) had been dumped and was probably associated either with land reclamation and a waterfront further south (*cf.* Area III) or the first Upper Thames Street (above, pp. 16-17).

RIVERSIDE WALL (BC 75): LIST OF STRATIGRAPHICAL UNITS

Only the numbers of the stratigraphical units used in the text and on the illustrations are described here. The complete site records are housed in the Museum of London and are available on request. For convenience during excavation one series of numbers was used for all the Areas with blocks of numbers allocated for each Area, and this arrangement has been retained. Missing numbers within the separate Areas relate to samples and set numbers.

AREA I (Figs. 15-18) (Excavated 4th-16th January, 1975)

- 2-8 Soft, black, humus-rich material with fern fronds, weeds, pottery, bone, shell, building materials, wood fragments, leather and cloth. Layer 7 contains in addition more sand and gravel. It possibly represents street sweepings, dumped in the 13th century on to the foreshore and against the southern eroded face of the Riverside Wall.
- 9 Fine, blue, silty, well-sorted sand and gravel with bone, shell and abraded Roman and early medieval pottery. River deposit dating from the 4th-12th centuries.
- 10 Fine, brown, well-sorted sand and gravel. River deposit similar in date to 9.
- 11 Fine, compact, light-brown gravel. River deposit similar in date to 9 and 10.
- 12 Dark grey clay with flints, pottery and fragments of medieval tile. Medieval dumping onto the foreshore, probably in the 13th century.
- 13 Fine, grey, well-sorted sand and gravel. River deposit extending downwards from the top of the eroded Roman timber piles, which originally were beneath the Riverside Wall. The material contained 12th-century pottery.
- 14 Set number given for all unstratified pottery and finds.
- 15 Similar to layers 2-8.
- 16 Light brown, compact clay with greenish tinge, containing gravel, mortar, tile, flecks of charcoal, shell and some pottery. Remains of internal clay bank added to the rear of the Riverside Wall in the 4th century.
- 17 Dark brown clay soil with greenish tinge, containing much gravel and building material. 13th century dumping.
- 18 Similar to layers 2-8, though dumped to the north of the Riverside Wall.
- 19 Roman internal clay bank material, equivalent to 16. It showed minor differences in colour and had small layers of mortar in it, both of which coincided with the tile courses in the Riverside Wall.
- 20 Greenish-brown clay soil with much building material — ragstone, Roman tile, mortar, charcoal, etc. (probable residue from the construction of the Riverside Wall). 4th-century pottery was found in the material, which was probably dumped at the time of the Wall's construction.
- 21 Material precisely similar to layer 20, representing slumping into a decayed (timber ?) drain.
- 24 and 25 Light brown clay soil with sand and gravel. Dumped material beneath the Riverside Wall, containing nothing later than 2nd-century pottery.
- 26 Void in Riverside Wall, running north-eastwards into the structure, possibly representing the remains of a lateral strengthening timber.

Layers 42-49 represent post-13th-century (2-5) and pre- *c.* 1500 (51) dumping, as part of the land reclamation process, following the construction of waterfronts to the south.

- 42 Compact, brown clay with gravel with red sand beneath.
- 43 Thin layer of black clay.
- 44 Fine, light brown sand, containing glazed medieval tiles.
- 45 Mixed deposit of sand and mortar.
- 46 Light brown clay with much mortar.
- 47 Dark brown clay soil with much sand and tile.
- 48 Mixed clay and sand with fragments of chalk.
- 49 Compact brown clay.

- 50 Chalk and ragstone wall, constructed directly upon the Roman Riverside Wall. Dating from between the 13th-century to *c.* 1500.
- 51 Layer of large cobbles, representing the passageway through the north gateway of Baynard's Castle. Part of the extension of the Castle, *c.* 1500. The cobbles were burnt, perhaps in the Great Fire (1666).
- 52 Chalk rubble and mortar. Post-medieval dumping.
- 53 Brick and chalk wall, constructed directly upon the earlier medieval wall (50). Possibly late 17th or 18th-century.
- 54 Modern demolition rubble, containing two drains. Make-up layers for Upper Thames Street, removed in 1974-5.
- 55 and 56 Concrete (55) and tarmac surface (56) of Upper Thames Street, now destroyed.
- 57 Dark brown clay soil with fine gravel. Dumping onto exposed northern edge of the chalk raft during the construction of the Roman Riverside Wall (4th century).
- 58 Layer of different coloured mortars, dumped during the construction of the Riverside Wall.
- 59 *cf.* 13.
- 60 Dark brown, mixed clay and gravel. Fill of construction trench for wall 63. Undated, but probably early medieval.
- 61 Dark brown mixed clay and gravel. Probably early medieval dumping.
- 62 Light brown, compact clay. Modern dumping associated with drain immediately to the east.
- 63 Medieval chalk wall foundations composed of alternating layers of dry stone and layers of pebble and mortar. Undated but probably early medieval.

AREA II (Figs. 20-23) Excavated 8th-10th March, 1975)

- 200 Natural blue/grey Tertiary London Clay with mudstones.
- 201 Similar to 200 though containing timber and ragstone deep within it. Considered to be dumped natural clay (p. 42). Dumping undated.

Layers 202-208 comprise dumped material, probably medieval in date.

- 202 Dark grey clay soil with gravel.
- 203 Grey/brown clay soil with orange sand and gravel.
- 204 Dark grey clay, probably redeposited London Clay.
- 205 Brown, organic material.
- 206 Red/orange sand and gravel.
- 207 Yellow sand and gravel.
- 208 Light grey silty clay and gravel.

- 209 Chalk and ragstone walls of drain. Probably 13th-century (p. 42).
- 210 Chalk and mortar wall of 16th-century drain (p. 000) *cf.* 214.
- 212 Chalk blocks and mortar. Collapse (undated) of arch of 16th-century drain.
- 213 Well, possibly 17th-century.
- 214 *cf.* 210.
- 215 Chalk and ragstone wall set in yellow mortar. Medieval.
- 216 Light brown, sandy soil with gravel and medieval tile fragments. Probably make-up deposits for the 12th-13th-century Upper Thames Street.
- 217 Brown clay with gravel. Layer within 216.
- 218 Brown sand and gravel. Medieval dumping, *cf.* 216.
- 219 Burnt sand and gravel with burnt organic matter.
Possibly first Upper Thames Street level (12th-13th century).
- 220 Brown, organic clay soil with rubble, mortar, gravel and charcoal. Filling of 16th-century sewer.
- 221 Rubble, set in brown clay. Filling of 16th-century sewer.
- 222 Yellow mortar.

Layers 223-227: mixed deposits, beneath collapsed Riverside Wall. Undated.

- 223 Brown clay soil with sand and gravel.
- 224 Crushed chalk.
- 225 Black clay soil with fine gravel and charcoal.
- 226 Fine sand and gravel. Possibly river deposited.
- 227 Brown, sandy clay with gravel and black silt.

- 228 Dark grey clay soil, with medium gravel and brown sand. Dumping, possibly medieval, against undercut profile of Riverside Wall.
- 229 Faced ragstone wall. Probably foundations for 16th-century sewer.

AREA III (Figs. 24-25) (Excavated 28th March to 2nd April, 1975)

- 141 Fine, grey sand with tile fragments and molluscs. 14th-century river deposit.
- 142 Compact grey/green, gravelly silt with shell, tile fragments and leather. 14th-century river deposit.
- 144 Natural blue/grey Tertiary London Clay.
- 145 Brick and undecorated tile floor. Undated.
- 146 Thick, black, highly organic material with leather, some gravel, bone, pot and building material. 14th-century dumping associated with waterfront (not excavated) to the south of the excavation.
- 147 Compact, well-sorted, grey, silty gravels and sand with some clay and tile fragments. Early medieval foreshore extending the whole length of trench. Overlies eroded Riverside Wall foundations at northern end of trench. Probably foreshore equivalent to layers 9 and 10 (Area I).
- 148 Set number given to mixed deposits of sand, gravel, chalk and clay, sealed by tile floor 145. Undated dumping.
- 149 Black, highly organic material. Medieval dumping, perhaps equivalent to layers 2-5, 15 and 18 (Area I). 13th century (?).
- 150 Gravel and sand with iron staining. Medieval (13th century ?) dumping.
- 151 Similar to 149. 13th century (?) dumping.
- 152 Brown/green sand and gravel. Probably backfilling (14th century ?) of trench to rob waterfront.
- 153 Sand, chalk rubble and mortar. Pit fill. Undated.
- 154 Brown, sandy clay soil with much gravel, some oyster, chalk, tile fragments and charcoal. Early medieval river deposit. Equivalent to 147.
- 155 Dark grey, organic clay soil with oysters. Medieval dumping.
- 156 Material precisely similar to 147, filling earlier undated pit.

AREA IV (Fig. 19) (Examined 9th and 10th April, 1975)

- 101 Dark brown/green clay soil with stone rubble and flecks of charcoal. Possibly a medieval pit though both dating and feature are uncertain.
- 102 Brown clay with mortar, tile fragments and flecks of charcoal, containing 4th-century pottery. Similar to 109, though darker and having a more liquid consistency. Possibly slumping from internal bank (109).
- 103 Dark grey clay soil with gravel, oyster shell and medieval tile fragments. Backfilling of medieval pit.
- 104 Very hard, brown/black organic clay, becoming greener lower down. Possibly primary filling of medieval cess pit (*cf.* 103).
- 105 Compact orange/yellow gravel with a slightly greenish tinge containing sand and silty clay. Roman dumping, possibly for a road.
- 106 Light brown sand with horizontal dark grey zones. Possibly upper levels of Roman road.
- 107 Similar to 105.
- 109 Light brown, compact clay with mortar, gravel, flecks of charcoal, tile and bone fragments. The inclusion of freshwater mollusca in samples of this material (p. 80) indicates that it was derived from river-laid deposits. Equivalent to 315 in Area VI. Roman internal bank for Riverside Wall.



Plate 1. Roman Riverside Wall: Area I. View of excavation showing the Wall progressively better preserved to the east. View looking east. Scale: 10 x 10cms.

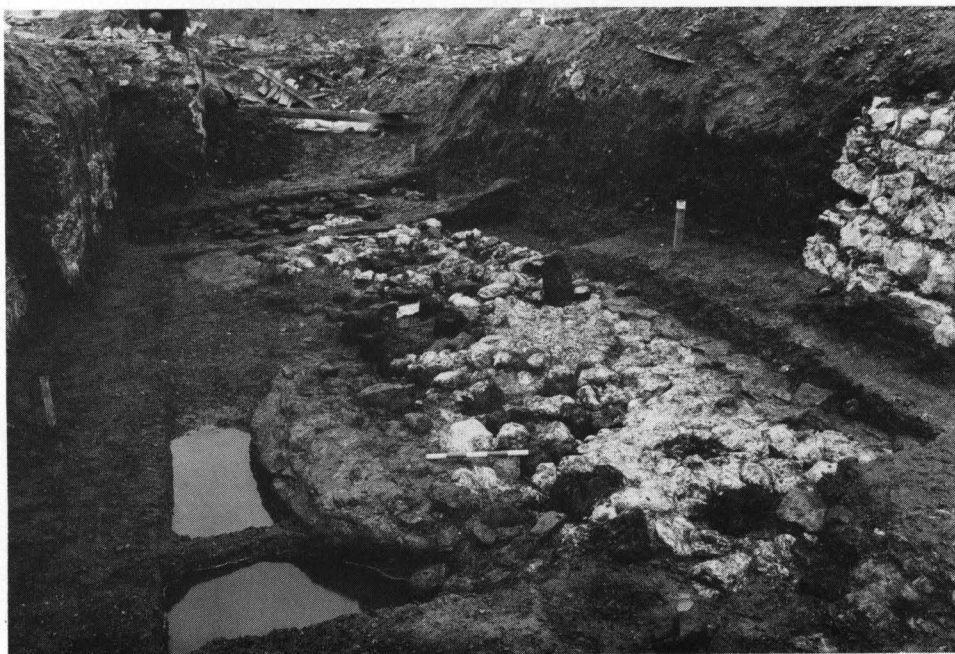


Plate 2. Roman Riverside Wall: Area I. Timber piles and chalk raft remains of the foundations of the Wall at the western end of the site. View looking west. Scale: 5 x 10cms; 10 x 10cms.



Plate 3. Roman Riverside Wall: Area I. The Wall at the eastern end of the Area, prior to its removal by machinery, showing the second tile course levelled to provide foundations for the medieval wall, seen in section. View looking east. Scales: 10 x 10cms; 5 x 10cms; 2m rod.



Plate 4. Roman Riverside Wall. The Wall (3) at the eastern end of Area 1, showing its construction on timber foundation piles (1) supporting a chalk raft (2). Over half the wall's thickness has been destroyed by post-Roman river erosion, the gravel foreshore (4) deposited by the river, seen below the thick, black early medieval dumping (5). A medieval wall (6) caps the Roman wall and a remarkable sequence of structures on the same alignment is completed by a post-medieval brick wall (7) and the tarmac surface (8) of Upper Thames Street, recently removed. View looking east. Scales: 10 x 10cms; 2m rod.

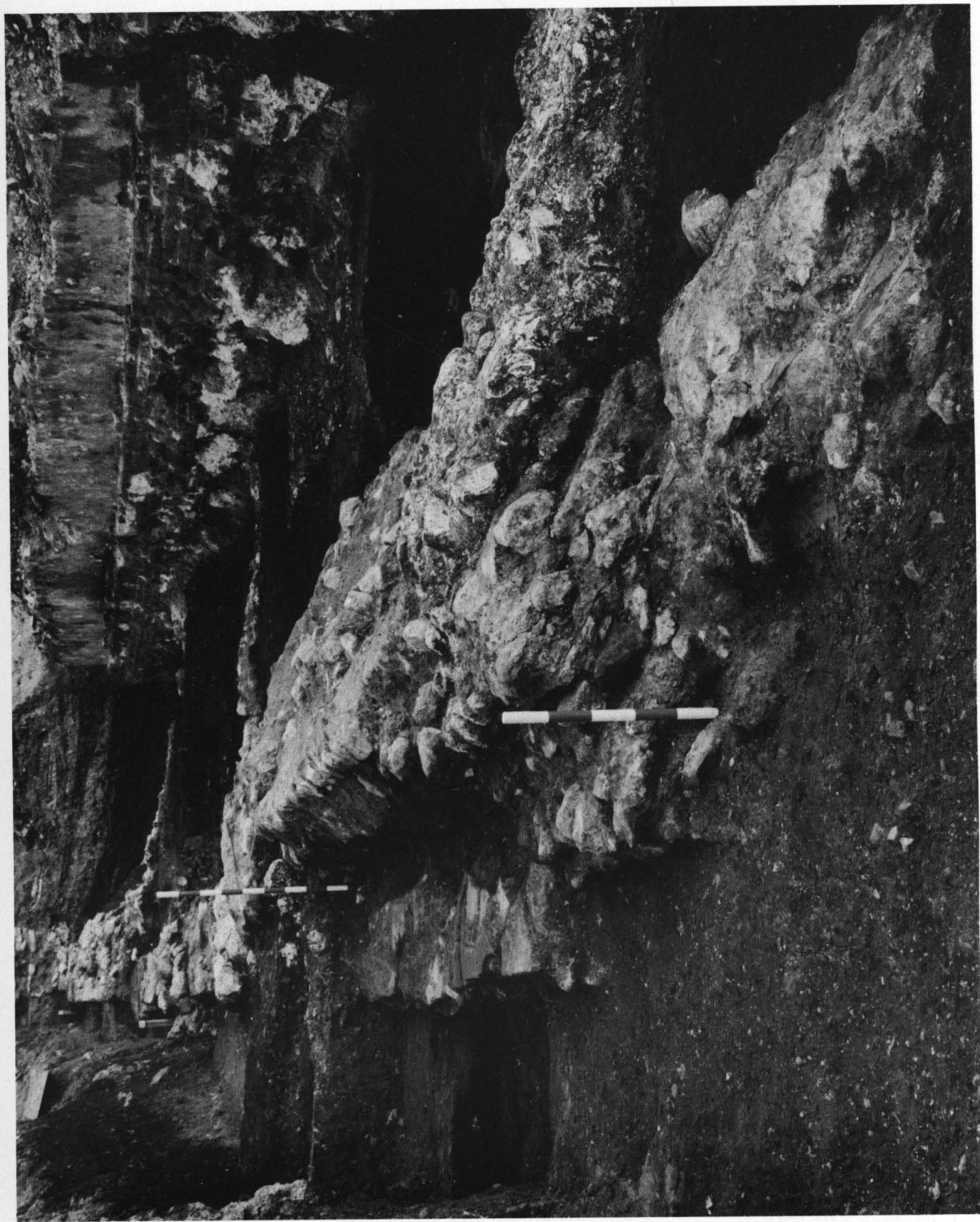


Plate 5. Roman Riverside Wall: Area I. Collapsed section of the Wall, showing herringbone facing stones on the preserved northern face. View looking east. Scale: 5 x 10cms; 10 x 10cms.

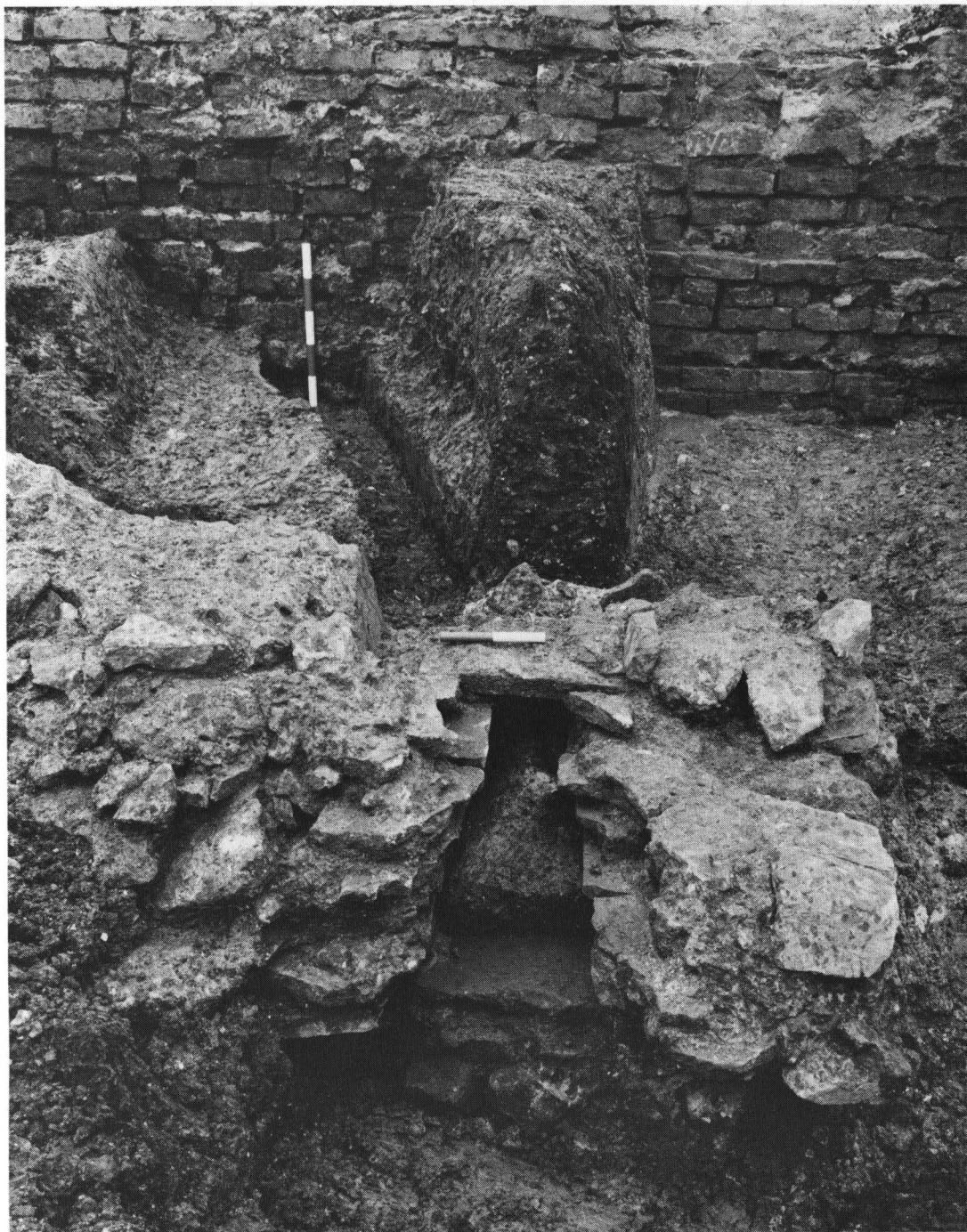


Plate 6. Roman Riverside Wall: Area I: Remains of culvert in the Wall, showing diagonal drain and cutting (fill removed) through the clay bank behind. The 1841 brick sewer can be seen in the background. Scale: 2 x 10cms; 5 x 10cms.



Plate 7. Roman Riverside Wall: Area VI. Machine-cut section through the Wall showing wall construction with the remains of a diagonal internal lateral timber and the clay bank laid against its northern face. View looking east. Scale: 5 x 10cms.

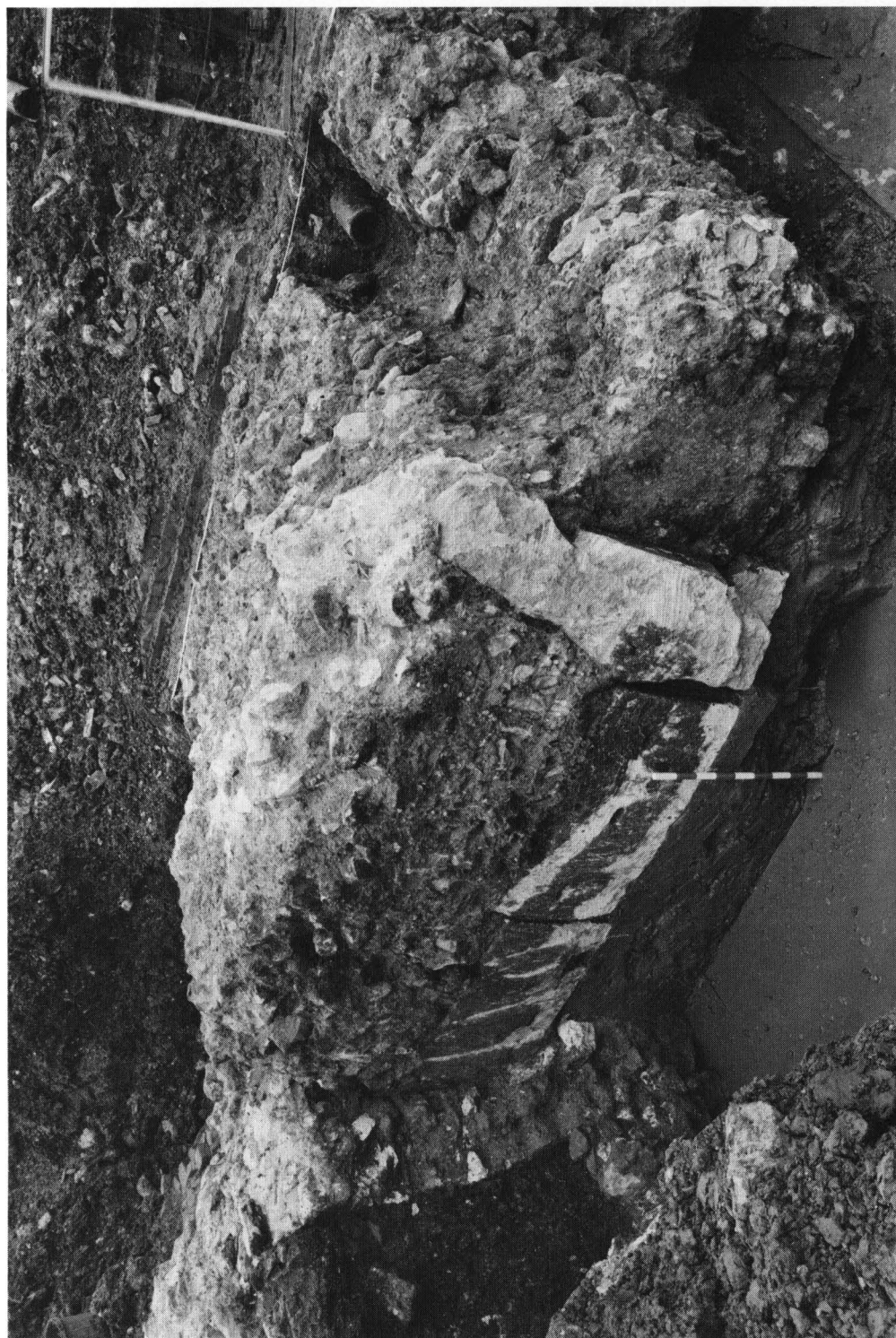


Plate 8. Roman Riverside Wall: Area II. Collapsed section of the Wall with three carved blocks re-used in it. A 16th century sewer abuts the northern face of the Wall. View looking south-east. Scale: 10 x 10cms.



Plate 9. Roman Riverside Wall: Area II. Section through the collapsed Wall showing its construction on either side of fissure (see Fig. 21, p. 40). View looking east. Scale: 5 x 10cms.



Plate 10. Roman Riverside Wall: Area V. Line of re-used carved blocks including inscribed altars and reverse side of Mother Goddesses relief, following the removal of the collapsed Wall seen in section. View looking east. Scale: 10 x 10cms.



Plate 11. Roman Riverside Wall: Area III. Remains of the supporting structure of a timber water-front probably of early 13th century date. View looking north. Scale: 5 x 10cms.

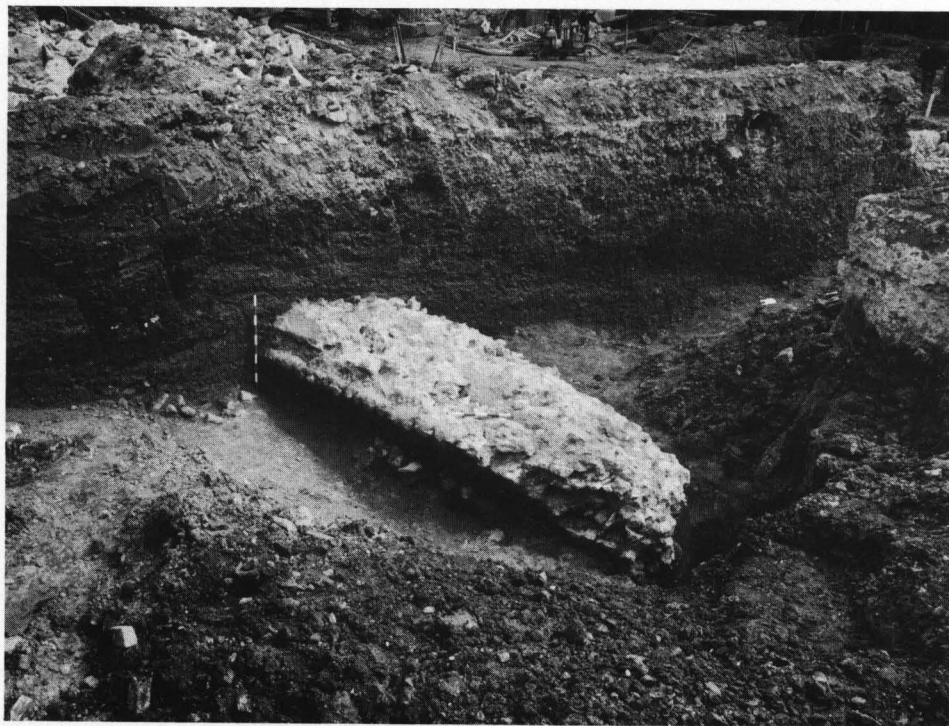


Plate 12. Roman Riverside Wall: Area VII. General view of the Wall showing the preserved northern face with herringbone facing stones. View looking south-east. Scale: 5 x 10cms; 10 x 10cms.

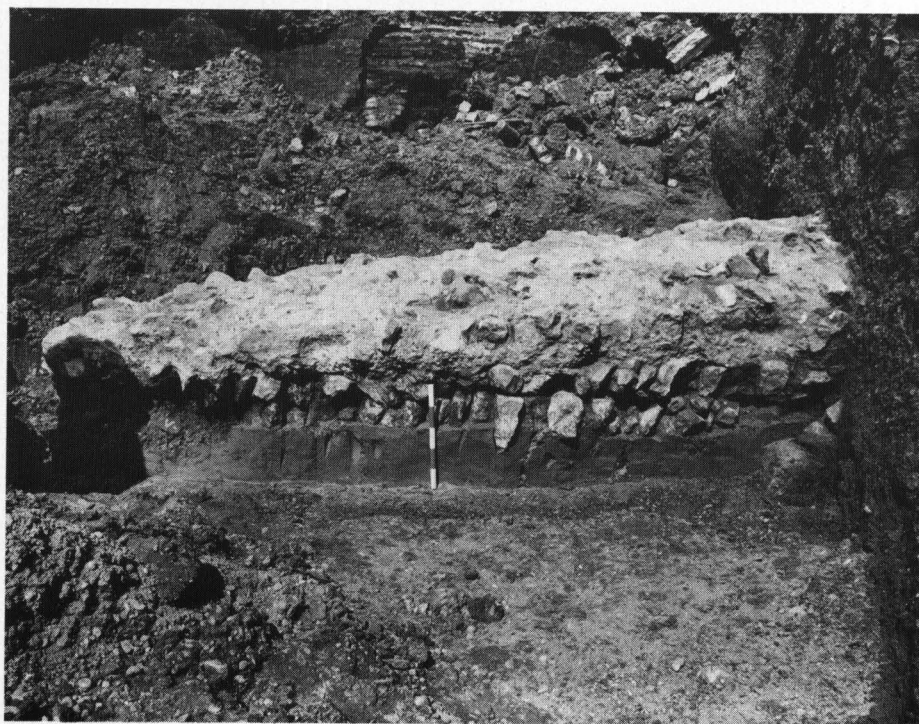


Plate 13. Roman Riverside Wall: Area VII. Southern eroded face of the Wall showing foundations containing large unmortared ragstone blocks, some wedge-shaped. View looking north. Scale: 5 x 10cms.

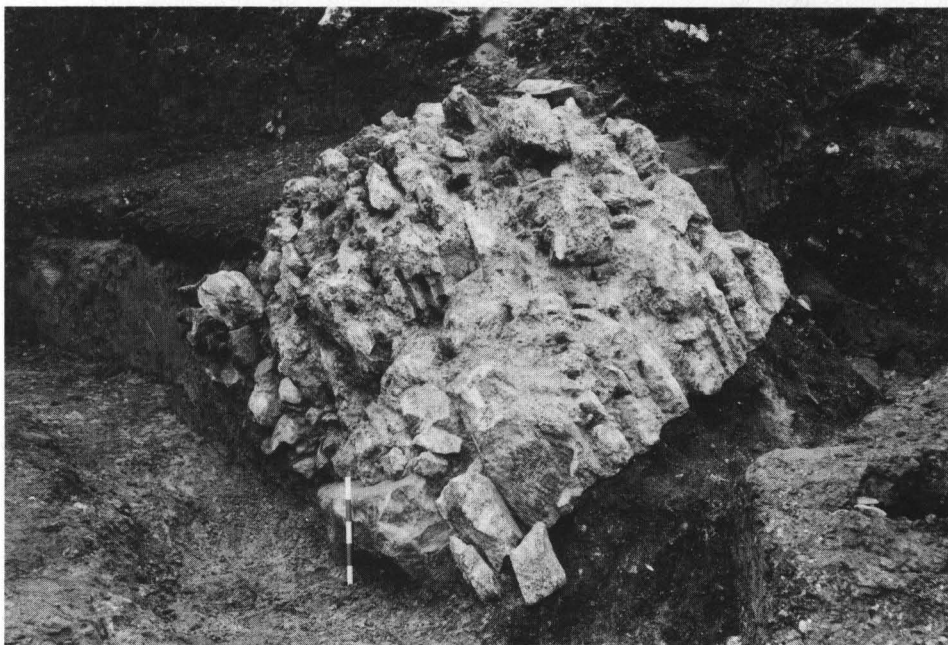


Plate 14. Roman Riverside Wall: Area VIII. (A) (above) The Wall, prior to excavation, collapsed northwards, showing the preserved northern face with large re-used sculptured blocks in the foundations. View looking north-west. Scale: 5 x 10cms. (B) (below) The Wall, following excavation, showing sculptured blocks re-used in the foundations. View looking north-west. Scale: 5 x 10cms.



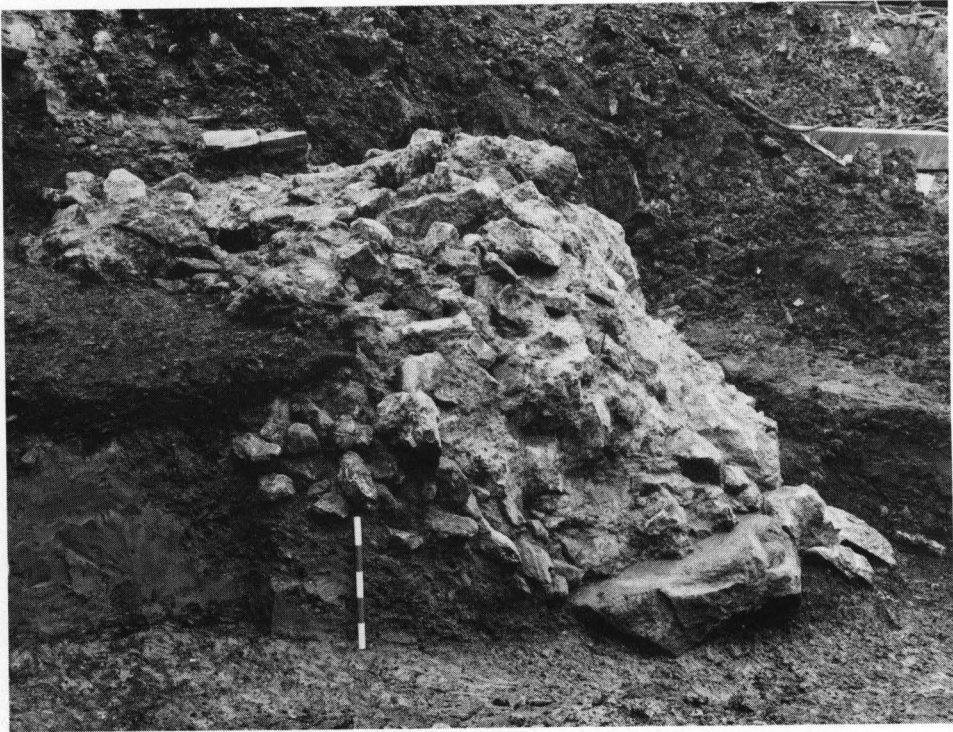
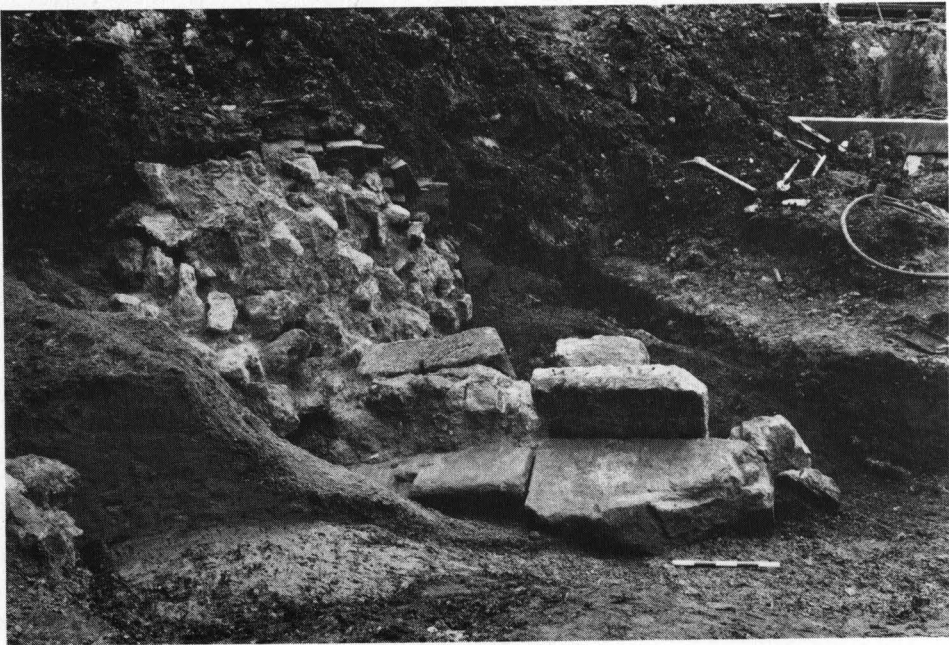


Plate 15. Roman Riverside Wall: Area VIII (A) (above) The Wall prior to excavation, showing the southern eroded face at foundation level. Note the natural gravel-filled cut into the London Clay, into which the Wall has slumped. View looking north. Scale: 5 x 10cms. (B) (below) The Wall, following excavation, showing detail of the re-used carved blocks. View looking north. Scale: 5 x 10cms.



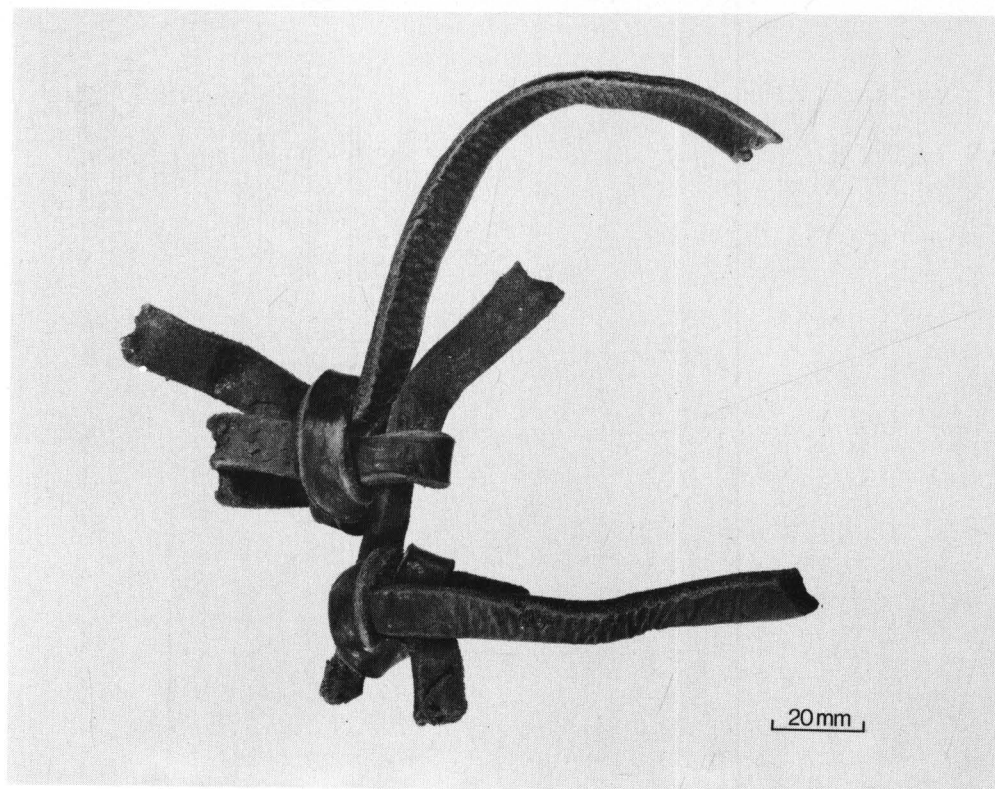
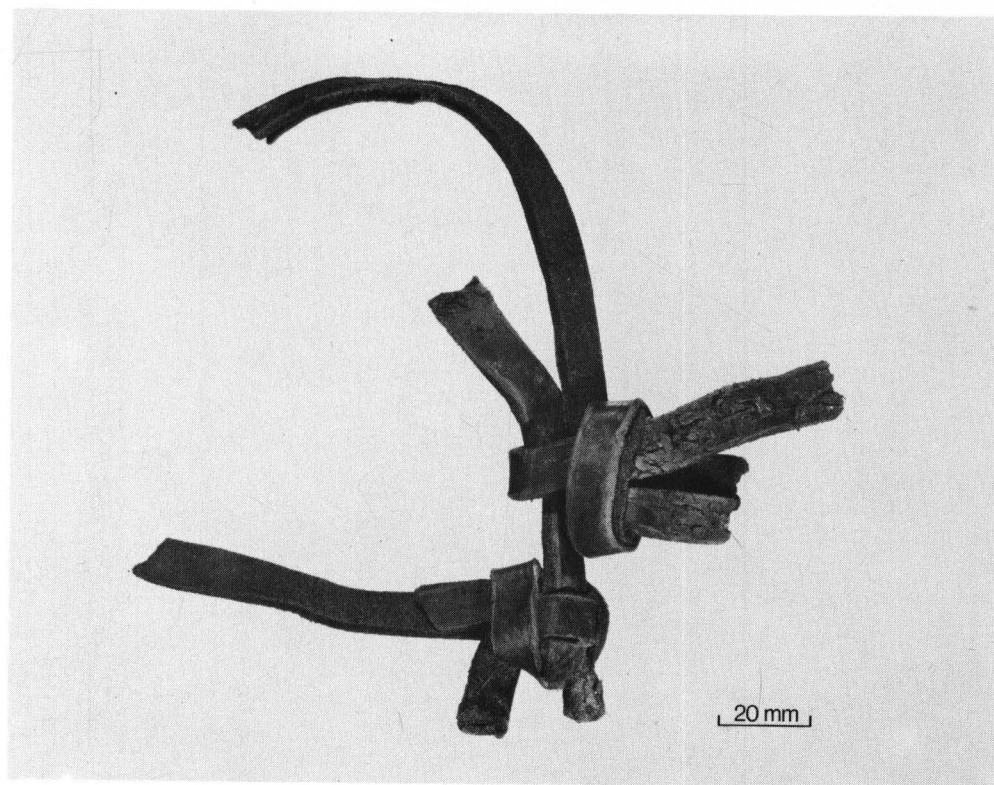


Plate 16. Roman Riverside Wall: Leather object, No. 140.



10mm

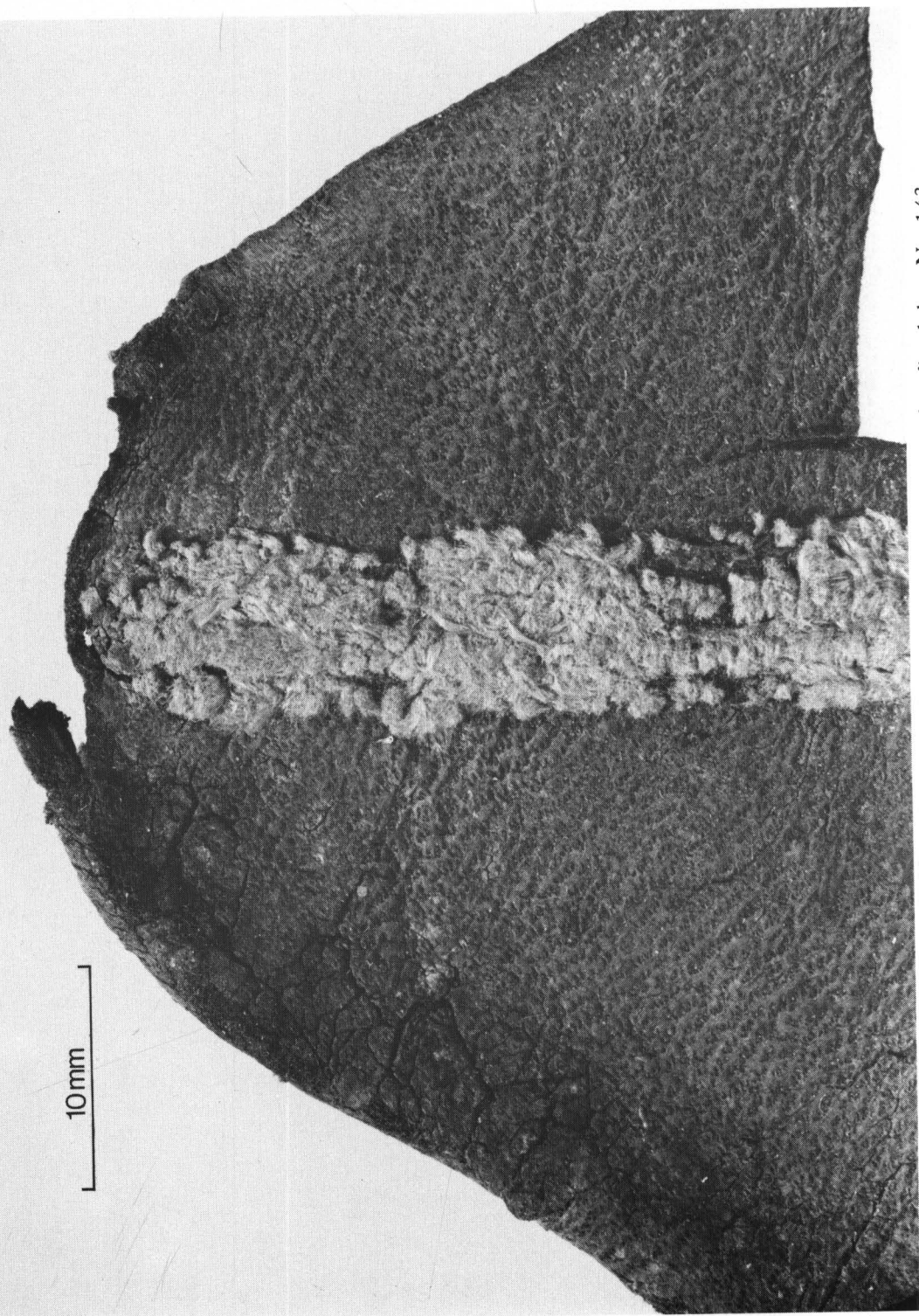


Plate 17. Roman Riverside Wall: Detail of embroidered decoration on vamp of medieval shoe, No. 143.

- 110 Dark grey/brown clay soil with patches of green clay, much gravel, charcoal and tile fragments. Medieval dumping, probably 12th-13th century, possibly for the construction of Upper Thames Street.
- 111 Green/brown clay with gravel and charcoal. Medieval pit fill.
- 112 Burnt sand and gravel. Possibly Upper Thames Street road level (*cf.* 116 and 117). 12th-13th century?
- 113 Black clay soil with brown patches, burnt wood, brick, gravel and mortar. Fill of construction trench for brick wall 120. Possibly 17th century.
- 114 Light brown clay with reddish tinge, containing a few tiles; marginally different from 109. Roman internal bank of Riverside Wall.
- 115 Similar to 114 but containing much gravel, chalk, tile fragments and mortar (possibly debris from the construction of the Riverside Wall).
- 116 Yellow sand and gravel, *cf.* 112.
- 117 Red stained sand and gravel, *cf.* 112.
- 118 Brown clay soil with gravel and chalk blocks. Medieval dumping probably similar to 110 and possibly also 101.
- 119 Modern concrete basement floor.
- 120 Brick wall with bright orange/red bricks in soft, light grey/brown mortar. Possibly 17th century.
- 121 Brick wall containing predominantly dark red bricks in hard white mortar. Modern wall, though its precise relationship with 119 and 120 was not determined.

AREA V (Excavated intermittently during June, 1975)

No stratigraphical units recorded.

AREA VI (Fig. 19) (Examined 3rd and 4th June, 1975)

300 and 301

- Oak piles. Pre-Riverside Wall (4th century).
 - 302 Grey clay soil with gravel and sand. 3rd or 4th-century dumping.
 - 303 Thin layer of brown/black, highly organic material with weeds, sedge, etc. (p. 35). Natural formation along riverfront, dating post *c.* 200 A.D. (308). Probably therefore first half of 3rd century.
 - 304 Natural sand and fine gravel of Flood Plain Terrace. Colour varies from yellow to grey/green.
 - 305 Grey clay soil with much gravel. Roman dumping beneath Riverside Wall. 3rd or 4th century.
 - 306 Thick, black, organic medieval dumping. Similar in character and probably also in date to layers 2-8, 15 and 18 (Area I).
 - 307 Brown clay soil with sand, gravel and some organic content. Undated pit fills, but sealed by river gravels (316).
 - 309 Fine, yellow sand and gravel with some tile fragments. Probably Roman dumping.
 - 310 Thin, dark brown clay layer with some sand. Probably Roman dumping.
 - 311 *cf.* 309.
 - 312 Dark grey clay soil with much gravel. Dumping contemporary with the construction of the Riverside Wall *cf.* layer 57 (Area I).
 - 313 Thin band of green mortar *cf.* layer 58 (Area I).
 - 314 Oak beam running diagonally southwards into Riverside Wall. Lateral timber strengthener *cf.* 27 (?) in Area I.
 - 315 Light brown, compact clay with mortar bands. Internal bank of Riverside Wall. Equivalent to layer 19 (Area I) and 109 and 114 (Area IV).
 - 316 Mixed, well-sorted layers of sand and fine gravel with some grey clay. Colour varying from light grey to light brown.
 - 317 Reddish brown, highly organic material *cf.* layer 306 though more pebbly.
 - 318 Sand deposit with clay and tile fragments. Medieval dumping.
- Layers 319-325 are medieval dumping later than 306 (13th century).
- 319 Green, gravelly clay.

- 320 Brown, organic material with charcoal.
- 321 Brown, organic clay.
- 322 Light yellow, sandy mortar.
- 323 Brown clay with mortar and gravel.
- 324 Brown, compact clay.
- 325 Yellow mortar.
- 326 Tumble from Riverside Wall, perhaps the result of medieval demolition.
- 327 Mixed deposits of chalk, clay and gravel with modern wood. Modern pit fill.
- 328 Mixed deposits of sand and gravel. Pit fill, pre-dating river erosion (316).

AREA VII (Fig. 26) (Excavated 4th July, 1975)

- 350 Light brown, liquid clay. Fill of small undated pit.
- 351 Layers of fine, yellow/brown, well-sorted sand and gravel. Probably post-Roman river deposits.
- 352 Mixed brown sand, gravel and clay layers. Possibly medieval dumping.
- 353 Mixed layers of sand and fine gravel with some organic content. Medieval dumping.
- 354 Soft, dark brown (slightly reddish) organic material with fine gravel and shell. Medieval dumping.
- 355 Reddish-grey clay. Undated dumping.
- 356 Mixed sand, gravel and clay. Undated dumping.
- 357 Blue/grey clay. Redeposited London Clay. Undated dumping.
- 358 Compact blue/black clay, gravel, oyster, wood and off-white mortar patches. Probably medieval dumping.

AREA VIII (Fig. 27) (Excavated January 5th to 12th, 1976)

- 401 Black clay soil with sand, gravel, organic material and medieval tiles. 12th-century dumping.
- 402 Black/brown clay soil with mortar, gravel, shell, Roman tile fragments and bone. Material contains a large amount of residual Roman pottery, two Saxon sherds (dated 5th to 8th centuries) and one early medieval sherd, possibly intrusive. Dumping (perhaps Saxon) into natural hollow to the north of the Riverside Wall, prior to its collapse. Equivalent to MM (Upper Thames Street) 199 and 181.
- 403 Grey sand and gravel. Possibly early medieval river deposit.
- 404 Mixed black sand, gravel and clay. Dumping into hollow or pit. Undated.
- 405 Mixed clay, sand and gravel. Undated dumping.
- 406 Finely graded, yellow sand and gravels of Flood Plain Terrace. Natural deposit filling hollow, possibly a water course.
- 407 Natural blue/grey London Clay.

(d) DISCUSSION

BY CHARLES HILL

The following discussion is chronologically arranged to bring together all the relevant information from the eight main excavation Areas within distinct periods (see Fig. 14).

PERIOD I (Pre-4th century)

Little evidence of occupation prior to the 4th century was gained from the excavations, a result which may be due to the destruction of the majority of earlier Roman levels south of the Riverside Wall during the post-Roman river erosion (Period III) and also to the nature of the excavations themselves (pp.27-8). Nevertheless, such activity as was traced seems to have been confined to the eastern part of the site (Area VI and probably also Area I) for none was observed to the west. The controlled excavation of the Upper Thames Street trench in

1974 (pp. 14-27) produced no evidence of occupation prior to 4th century dumping, possibly contemporary with the construction of the Riverside Wall.

In Area VI, to the east, was found the plank structure and the accompanying levelling of the area immediately to the south of it (pp. 35-6). It is possible that the timber wall and the floor of a riverside building are represented, though no direct parallels are provided by the known foreshore structures at Old England (Brentford)⁷¹ and Tilbury.⁷² As no vertical posts to support the plank were found, it is unlikely that the remains represent a waterfront comparable with the late 1st and early 2nd century examples at the Custom House⁷³ and New Fresh Wharf.⁷⁴ These were simple revetments of horizontal planks, supported in front by vertical posts. In fact, since layer 303 (Fig. 19), immediately to the south of the plank, was not seriously affected by river action (p. 35), there can have been no need for an elaborate waterfront structure in this position.

The plank, tentatively dated by Carbon 14 and dendrochronology to *c.* A.D. 200 (p. 94) is later than the impressive second century waterfronts downstream in the important quayside area around London Bridge and this suggests a slightly later date for riverside development in this peripheral south-western quarter of the Roman city. Consequently, it is best to interpret the plank as representing a shallow barrier, perhaps one of a series, protecting the adjacent area to the north, perhaps occupied by buildings, against freak tides.

The problem concerning the mean high tide level of the River Thames in the Roman period is both complex and controversial.⁷⁵ The evidence from the City, however, suggests a high tide level of *c.* 0.00m O.D. by the latter part of the 2nd century,⁷⁶ though there is strong evidence that this was a regressive phase and that in the 1st century the river had reached a level of approximately 1.50m O.D.⁷⁷ Layer 303 (Area VI, Fig. 19), predating the construction of the Riverside Wall and probably of early 3rd century date, represents, in environmental terms, a natural accumulation on the strand. Occasionally, this deposit at *c.* 0.30m O.D. might have encountered river action, though normally the tidal effect was marginal. This layer therefore indicates a mean high river level below 0.30m O.D. in the early 3rd century, supporting the evidence of a Roman regression.

PERIOD II (The 4th century Riverside Wall)

THE CONSTRUCTION OF THE WALL

The 115m length of the Riverside Wall uncovered on site showed two principal methods in the construction of the foundations, involving those built upon a chalk raft with supporting timber piles on the eastern part of the site, and those without chalk and piles on the western. On the eastern part (Area I and VI), where the localised adverse nature of the immediate subsoil (pp. 13, 30) made construction particularly difficult, two possible methods were available for overcoming this geological problem. Firstly, the Wall could have been constructed on a wide, compact raft, which, without supporting timber piles, would have spread the weight of the wall above evenly throughout the width of these foundations. The second option, and that actually selected, was a narrower raft supported on piles, which provided the Wall with foundations of an equally effective load-bearing capacity.⁷⁸ This choice might have been due either to an attempt at reducing the quantity of chalk needed, or to space restrictions, the Wall being constructed on a narrow corridor of land, perhaps already occupied by buildings, between the river's northern edge and the foot of the hillside behind.

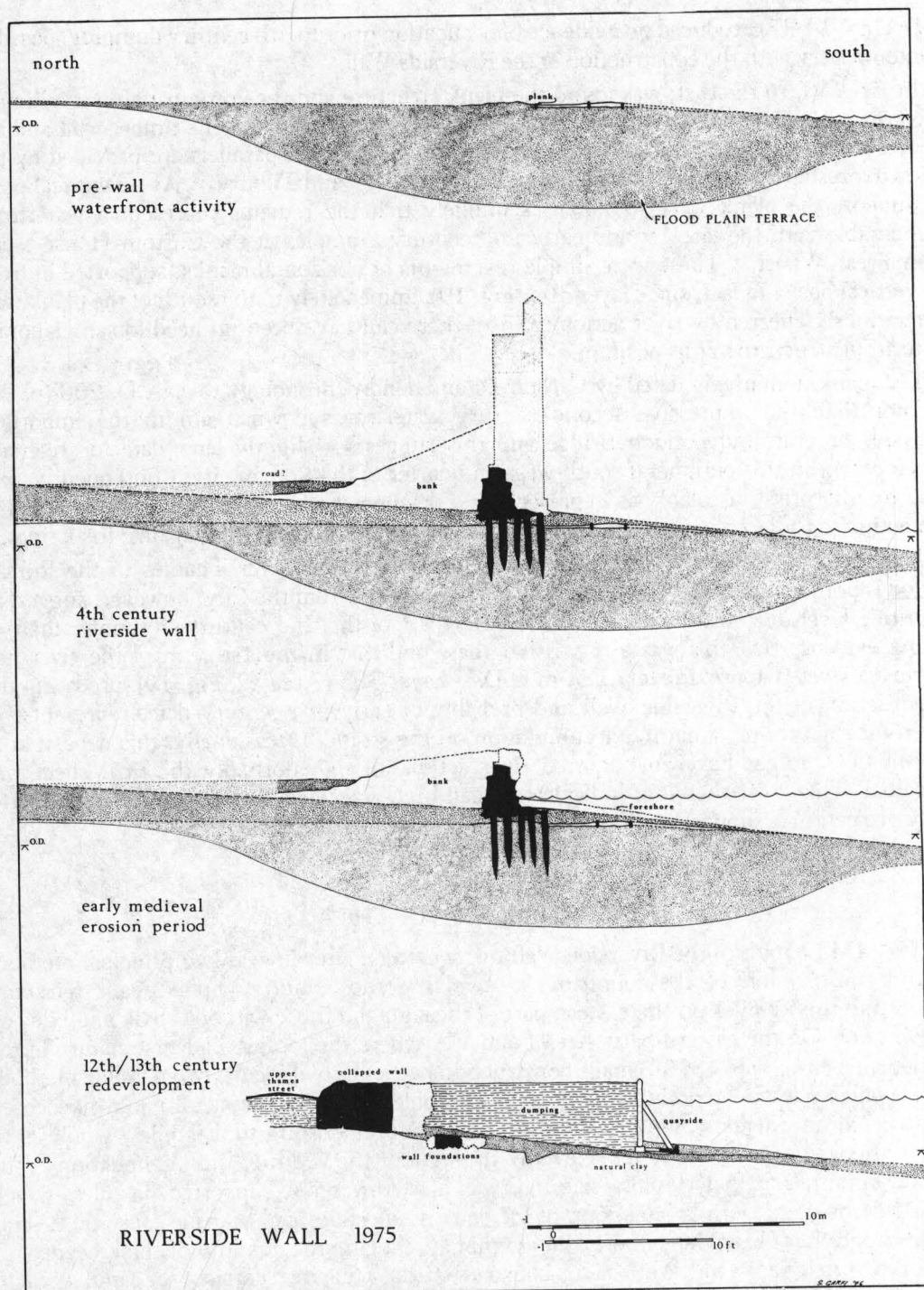


Fig. 28. Roman Riverside Wall: The development of the Baynard's Castle site from the 3rd century to the 12th/13th centuries.

This method was a well-recorded building technique, used throughout the Roman period. The Augustan architect, Vitruvius, describing the construction of temple foundations on unstable ground, recommended the complete excavation and clearance of loose or marshy material, to be replaced with timber piles, driven closely together with the intervals filled with charcoal.⁷⁹ It is unlikely that the construction of the Riverside Wall directly on to a pre-existing, levelled land surface entailed any such clearance of loose material as Vitruvius favoured, since the occurrence of large amounts of sand and gravel of the Flood Plain Terrace along the riverfront would have rendered this impracticable. But the use of chalk at the base of the Wall might well correspond to his suggested use of charcoal between the piles for its likely 'cushioning' effect (p. 30)⁸⁰

The construction of walls and buildings on timber piled foundations, both with and without the use of chalk rafts, has many parallels in south-east England, and cases of the use of chalk rafts without piles are also known. Of special significance is that the use of a chalk raft supported on piles, as was found in the Riverside Wall, was apparently a feature of later Roman construction, due perhaps to a large scale exploitation of chalk at this period.⁸¹

The separate use of piles and of chalk may be briefly reviewed. Piled foundations are attested in London by the land wall, constructed c. A.D. 200,⁸² where unstable conditions, such as stream beds, prevailed. A section of the north-eastern circuit uncovered at Jewry Street in 1861 was described as 'of Roman construction throughout and [resting] on massive piles which had been driven for a foundation on account of the badness of the soil'.⁸³ Outside London the south-east section of the Silchester defences, probably constructed in the late 2nd or early 3rd centuries, employed pile foundations because of localised boggy conditions.⁸⁴ The much later instance at Clausentum (Bitterne) of a 9ft wide band of closely set post-holes across the line of the inner defences has been considered to represent a piled underpinning for the stone circuit wall built c. A.D. 370 and subsequently totally removed.⁸⁵

Chalk, on the other hand, was probably not employed extensively in London until the 3rd and 4th centuries. The land wall, for example, made no use of it even in the core, though presumably it was both easier to quarry and to transport than the Kentish ragstone actually employed. The use of chalk in foundations without supporting piles was found at Great Tower Street in 1930 where the ragstone and flint wall of a room or corridor, possibly of 3rd century date, had footings composed of large, squared blocks of chalk set in hard, yellow mortar.⁸⁶ In addition, some of the eastern group of bastions, probably added to the land wall in the late 4th century, were constructed on thin chalk rafts (p. 69), and the surviving east wall of a recently discovered late 3rd century signal tower at Shadwell was constructed in chalk and mortar with a knapped flint facing.⁸⁷

Outside London this specific and exclusive use of chalk in foundations occurs in the pre-fort 'Great Foundation' of Richborough as early as c.A.D. 80-90.⁸⁸ It is necessary to distinguish between instances where chalk was used simply because it was a readily available local material (not the case in London), and instances where it was used only for this specific purpose. At Portchester in Hampshire, for example, the foundations of the 15ft wide circuit walls, probably of c.A.D. 285-290, were rammed layers of chalk and flint which had been laid through the natural brickearth and coombe rock to the solid chalk beneath.⁸⁹ But here, as at Richborough, chalk was used predominantly only in the foundations. Similarly at Springhead in Kent, on the site of a religious complex with four temples, probably of Antonine date, the northern *temenos* was constructed upon a 2ft thick chalk raft laid into a

shallow depression excavated for the purpose.⁹⁰ A similar method was used at Cobham, in Surrey, where a bath building of *c.* A.D. 320-60 was constructed upon a raft of crushed chalk about 6 inches thick which extended beneath the walls and hypocaust.⁹¹

While the introduction of the use of chalk appears to have come appreciably later to London, the combined use of chalk and timber was generally late Roman in date. Peter Marsden's excavations immediately to the north of Roach Smith's find at Lambeth Hill (p. 000) uncovered in 1961 two chalk terraces laid on supporting circular timber piles and retained by ragstone walls. Re-used building material was found in association, though no dating evidence was obtained.⁹² The walls enclosing the Bucklersbury pavement, uncovered in 1809 and tentatively attributed to the early 3rd century, were of tiles with blocks of chalk and ragstone, laid on a chalk foundation which was supported by square piles.⁹³ But the Riverside Wall represents the prime London example of the chalk and pile technique and instructive comparison can be made with similar constructions in south-east England.

A house and bath building (*c.* A.D. 300) at Farnham, in Surrey, had been

'erected on a raft of rammed chalk, 1 ft 7 inches in thickness and the ground on which it was set had been strengthened by means of timber piling, the piles 9 inches in diameter and only 6 inches apart in places, had decayed away completely, but had left cavities once occupied by the timbers . . . The need for such piling was evident from weak, unstable patches in the underlying sandy clay . . .'⁹⁴

In the north-east corner of the Saxon shore fort at Richborough (dated A.D. 276-285)⁹⁵ a 3rd or 4th century building had walls 2 ft 6 inches thick composed of chalk blocks set in mortar. The foundations consisted of 6 inches of broken chalk capped with a 3 inch layer of mortar, and had been strengthened with two parallel rows, 1 ft apart, of piles 6 inches in diameter and 3 ft long, set at intervals of 1 ft.⁹⁶ In addition, foundations for the east wall of the fort, considered to have been prepared in error and not actually used, consisted of two rows of piles supporting a chalk raft.⁹⁷ The other circuit walls seem to have had similar foundations.

At Pevensey Castle in Sussex, probably dating from the 340s A.D.⁹⁸, Charles Roach Smith observed in 1852 that, due to unstable conditions caused by springs, one of the towers had been built on piles.⁹⁹ In 1906-7, Salzmann's excavations revealed that the ragstone circuit walls had chalk and flint footings, supported by timber piles.¹⁰⁰ Cottrill's unpublished excavations in the 1930s produced further evidence for the use of chalk and piles with horizontal timber lacing in the formations of the walls and west gateway.¹⁰¹ A variation of this type of construction, similar in some respects to the foundations of London's Riverside Wall discovered in Lower Thames Street in 1911 (p. 5), was found at the Saxon shore fort at Burgh Castle in Suffolk, considered by Johnson to date to the decade A.D. 276-85.¹⁰² Here, the foundations of the circuit walls were of rammed chalk and lime covered with a layer of earth and sand upon which were laid oak planks, 2 inches in thickness, and finally a layer of mortar.¹⁰³ The destroyed east wall of the fort was probably constructed on piles. Rumbelow was of the opinion that the circuit wall was constructed, as was the Riverside Wall in London, directly on to the original levelled land surface without the use of foundation trenches.¹⁰⁴

Above the chalk raft some evidence for lateral timbering to strengthen the base of the structure was found (Area I, Fig. 16, 27 and Area VI, Fig. 19, 314). Unfortunately, the nature of the excavations made it impossible to determine whether this method, as exemplified by Richborough, Pevensey and, more recently, Portchester Castle,¹⁰⁵ was constant throughout the foundations of the Wall. The recent excavations at the Tower of

London, however, have shown that this method was extensively used in that eastern section of the Riverside Wall.¹⁰⁶

On the western part of the site (Areas III, VII and VIII) the Riverside Wall, generally more varied in construction, was provided with foundations which differed from those described above. This was due to the improved subsoil — here solid London Clay with mudstones just beneath (pp. 45, 48, 50). Consequently, large ragstone blocks, some wedge-shaped, had simply been rammed into the clay to form foundations, which, though generally slight in appearance and certainly less substantial than those to the east, owed their stability to the weight and thickness of the wall above them. These foundations without piles were evidently laid onto the existing levelled land surface, as were those on the eastern part of the excavation and also those recently discovered in the Tower of London.¹⁰⁷

The method of construction above the foundations was uniform across the whole site. When one mortared surface had dried sufficiently, the builders could walk on it in order to lay the next course of tightly packed core materials and at the same time position the corresponding facing stones, which, being 200-250mm long, were bonded back into the core of the wall. Mortar was then grouted into the core, though where it had not properly penetrated, interstices were observed. After the mortar, which was used in great quantity, had dried, this process was repeated.

Cunliffe has pointed out that while the mortar remained fluid, slumping of the external facing stones could occur.¹⁰⁸ At Portchester this problem may have been overcome by laying horizontal poles, 51mm in diameter, at regular intervals through the core of the structure. Either by themselves, or attached to external timber shuttering, these poles provided extra stability. As only one, uncertain, case of a void left by such a pole was observed in the Riverside Wall (Area V, not illustrated) it may well be that the bands of clay which were observed running through the core of the London Wall throughout the excavations (Figs. 16, 19, 21) served instead to secure the core materials and to reduce lateral movement during the drying process.

An important aspect of the Wall's construction on the eastern part of the site (Areas I, IV and VI) was the provision of an internal bank, which was almost certainly contemporary with the construction of the Wall (pp. 36-7). Internal banks, normally composed of the material derived from the accompanying ditch cutting, were designed to give additional strength to the base of the wall. The Riverside Wall, however, had no ditch and the material used for the bank probably came from river laid deposits, perhaps the result of dredging the river bank close by, or even the River Fleet to the west. An internal bank behind the landwall was found at Christ's Hospital,¹⁰⁹ Cooper's Row,¹¹⁰ Trinity Place¹¹¹ and Warwick Square¹¹² and it is likely to have been a constant feature of these early defences. Whether this was also the case with the Riverside Wall is difficult to determine. No evidence for a bank was found in Areas II, V, VII and VIII, though, had one existed, it would have been removed immediately prior to the collapse of the Wall (p. 42).

In Area IV some evidence was found to suggest a gravel road, running behind the Riverside Wall. Definite evidence for such a road has not yet been found behind the landwall, though it certainly occurred behind the earlier wall of the Cripplegate Fort at Noble Street.¹³ No evidence for a ditch south of the Riverside Wall was found in any of the Areas and presumably the shelving foreshore and river provided sufficient defence.

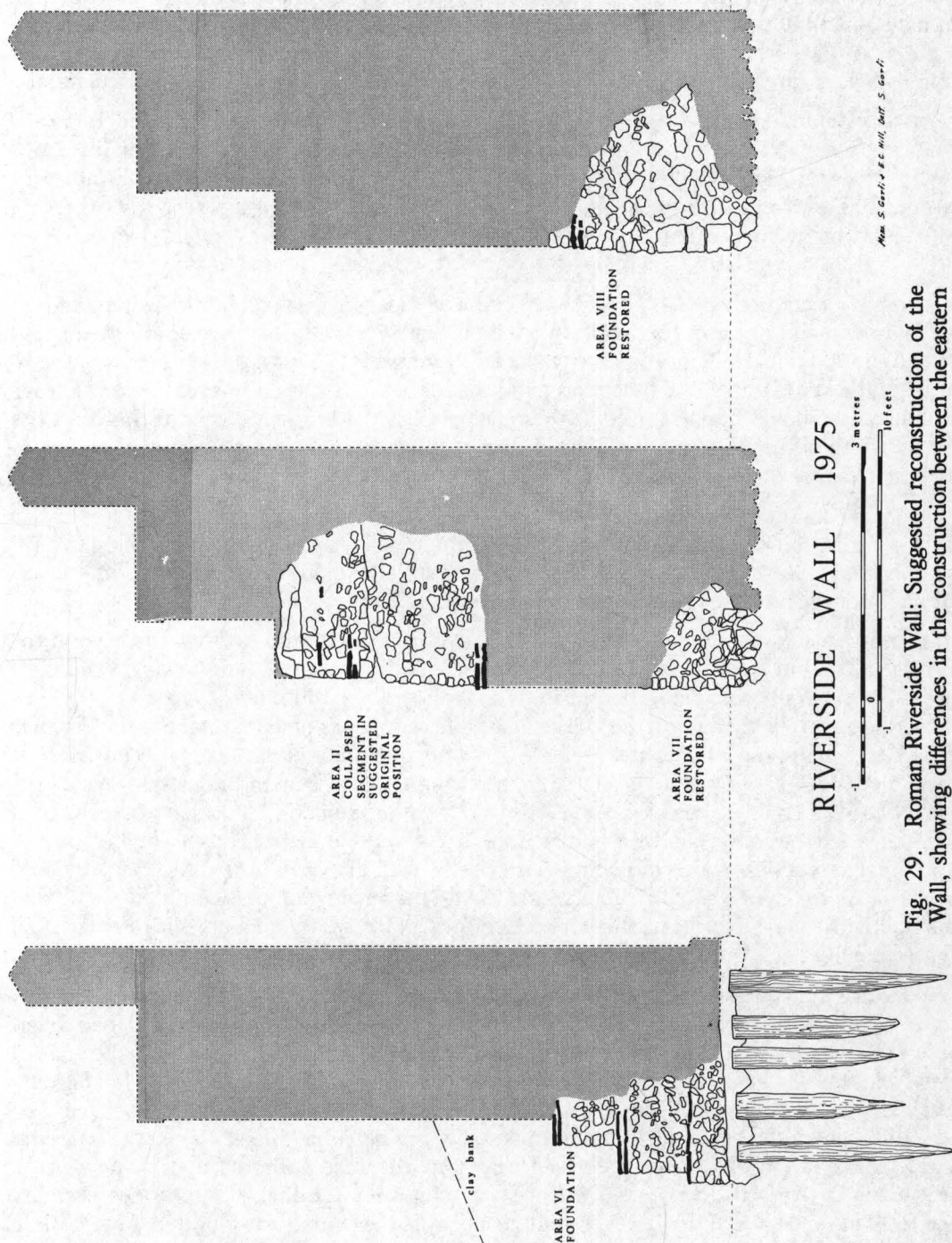
THE RE-USE OF THE CARVED BLOCKS

Perhaps the most distinctive feature in the construction of the Riverside Wall was the re-use of fifty-two sculptured blocks, found only on the western part of the site. Although such earlier material could have been employed in the eastern section (Areas I and VI), perhaps as external plinth stones or even higher up as an internal offset, such as in Areas II and V (p. pp. 42, 44), none was found, apart from a little *opus signinum*. This is particularly noteworthy in view of Roach Smith's similar findings in 1841 between Lambeth Hill and Queenhithe, though he recorded the re-use of earlier building material immediately above the chalk raft (p. 3). Consequently, re-used material might have been expected, had it been readily available, in Areas I and VI at Baynard's Castle. A possible inference from its absence is that none was available in the immediate neighbourhood and it could be argued that as sculptured blocks were extensively re-used on the western part of the site, the primary source of the material, i.e. the Monumental Arch, Screen of Gods and Goddesses, etc. might have originally been situated to the west of Areas I and VI (pp. 191-3).

The fifty-two blocks retrieved from the western Areas of the site represent only a small fraction of those originally employed in the Monumental Arch and probably also of those re-used in the Riverside Wall. Unfortunately, a large number could have been destroyed during the post-Roman river erosion or removed by medieval robbing and later building activity. For instance, had the collapsed sections of the Wall in Areas VII and VIII survived to a higher level carved blocks might still have been found re-used in a line at offset level, as were those in Areas II and V (pp. 42, 44). Additional blocks might have been found re-used as plinth stones, had the southern face of the Wall not suffered such severe river erosion.

As already suggested, the surviving blocks were employed in two quite distinct positions in the Wall. In Areas II and V, where the Wall collapsed northwards or inland (pp. 42-3) they had been deliberately re-used set in a line along the internal face of the Wall. This specific re-use was a feature of the Wall's construction for at least 20m, and, whatever the purpose, it was sufficiently important to justify the effort of lifting the heavy blocks to a position fairly high up on the Wall. The blocks, which showed no signs of wear, were too narrow for a wall walk and the core of the Wall, which projected slightly higher than the blocks, would in any case have been thicker than was required for crenellations. Moreover, it can be estimated from the surviving fragment of the foundations *in situ* in Area III, immediately to the south, that the blocks were originally employed at c. 5.00m high on the internal face of the Wall. This would seem an insufficient height for the parapet level of a normal defensive wall, and it is concluded that the blocks, which bore no signs of mortar on their upper surfaces, were simply employed at an offset position and as a bonding and levelling course in place of tiles. Surviving parallels for the use of large blocks in Roman defensive walls, elsewhere than in the base, are rare. However, this particular function is paralleled at Pevensey. During Cottrill's unpublished excavations in the 1930s, a trench cut against the internal face of the north wall, revealed a line of unsculptured blocks larger than the surrounding facing stones and used as an offset.¹¹⁴ The city walls at Silchester, constructed c. A.D. 200, employed large undecorated slabs of Jurassic limestone as bonding and levelling courses, in place of tiles, but, contrary to the usage at London and Pevensey, these blocks were laid in courses continuous throughout the core of the wall.¹¹⁵

The use of the sculptured blocks in the Riverside Wall was in the unpiled foundations excavated in Area VIII, and this was probably more typical of later Roman construction,



exemplified by other Romano-British sites¹¹⁶ and by the Gallic fortifications built after A.D. 276.¹¹⁷ The blocks in Area VIII, however, did not form a continuous solid base for the Wall, but penetrated the core only to the width of one block (p. 51). Although the southern face of the Wall had been destroyed, it can be suggested that there was originally a similar arrangement of carved blocks here, with the intervening core comprising the usual materials.

An assessment of the original width of the Riverside Wall and whether it varied significantly between the eastern and western areas of the site is made difficult by the post-Roman river erosion of the southern face. The surviving widths of the Wall vary considerably, the highest degree of survival being found on the western part of the site (Area I — 1.30m on average; Area VI — 1.10m; Area II — 1.80m; Area VII — 1.60m; Area VIII — 1.80m).

Generally, early Roman (i.e. pre mid-3rd century) defensive walls, both in Britain and on the Continent, were narrow (between 4ft [*c.* 1.2m] and 8ft [*c.* 2.4m] wide above the plinth) and had the additional support of internal banks. Later walls (i.e. post mid-3rd century) were normally thicker (10ft [3.04m] or more) and therefore did not need internal banks. Earlier building material was often re-used in these later walls.¹¹⁸ On this basis an estimate of the original width of the Riverside Wall has been attempted, though caution is necessary due to the limited nature of the evidence (Fig. 29).

The construction of the Riverside Wall in Areas I and VI was systematic and it is likely that the timber-piled foundations were laid symmetrically since the longest piles (where tested) occupied the outside rows. For reasons of stability the original, southern, face of the Wall cannot have projected far south of the southernmost row of piles.

The northern edge of the chalk raft in Area I projected 200mm northwards beyond the base of the Wall. In Area VI, however, both the edge of the chalk raft and the northern face of the base of the Wall coincided. This apparent difference in the width of the chalk raft between the two Areas probably reflects the work of two different gangs of labourers, but the distance between the centre row of piles and the base of the northern face of the Wall was consistent at 1.50m in both Areas (Figs. 16 and 19). On the argument of symmetry, the total width of the base of the Wall could be calculated at $1.50\text{m} \times 2 =$ approximately 3m. If allowance is then made for a narrow offset above a plinth stone and for three known offsets higher on the internal face (totalling *c.* 700mm) the width of the Wall above the third tile course would have been approximately 2.20m. This would leave a minimal width to accommodate the wall walk and battlements, so that a further reduction is unlikely. By analogy with Pevensey, a suggested height of 7.00m has been given for the Wall up to parapet level.¹¹⁹

Additional difficulties arise from reconstructing the eroded and collapsed western sections of the Wall. It was argued (p. 42) that the largest collapsed section in Area II had fallen northwards from foundations in Area III, immediately to the south, and that the line of carved blocks was re-used 5m high above the base of the Wall. It is possible that the specialised re-use of the blocks in Areas II and V may originally have extended to Areas VII and VIII of which the upper parts had been destroyed. The Area VII section was used in the reconstruction as it was better preserved than was the case with the apparently similar foundations in Area III. Since no evidence was found for internal offsets in the sections uncovered in Areas VII and VIII, even though a double tile course was found in Area VIII, it is argued that the northern face of the Wall on the western part of the site rose vertically

without offsets from the base until it reached the line of re-used carved blocks. At this point an offset of *c.* 700mm probably occurred in Area II.

Although the width of the Wall above the carved blocks cannot accurately be determined, it is likely that, where possible, uniformity with the eastern sections of the Wall was observed as this would not only facilitate construction, but would reduce inconsistencies which might have affected the Wall's defensive purpose, especially perhaps towards parapet level. It is tentatively suggested, therefore, that the approximate width of 2.20m calculated for the eastern section of the Wall would have been repeated here. The allowance of an offset of *c.* 700mm at the level of the carved blocks, which, significantly, equals the combined total of three internal offsets both in Area I and VI, and the addition of *c.* 2.20m would give a total base width for the Wall of approximately 3m, similar to that in Areas I and VI. As the Wall is unlikely to have been narrower than 3m, this can be regarded as a minimum thickness for the western sections.

In the absence of conclusive evidence, it is perhaps most logical to assume that the foundations of the whole Riverside Wall at Baynard's Castle were originally laid out approximately 3m wide. But on the eastern part of the site measures were taken during construction to overcome the geological difficulties (pp. 30, 57-61). These included not only the provision of timber-piled foundations with a chalk raft, but perhaps also of wide offsets with frequent tile courses, intended to reduce the Wall's thickness and weight. Consequently, the narrow-gauged wall thus formed was given the additional support of an internal clay bank. This no doubt counterbalanced the weight of the Wall which otherwise would have rested largely on the southern half of the foundations. However, on the western part of the site, where no such geological difficulties were encountered, the Wall, whose foundations were presumably similar in width to those in the east, was constructed without major internal offsets. The Wall, thus thicker up to the line of the carved blocks, would not have required an internal bank. Certainly, without a bank, the thicker western section of the Wall, which definitely incorporated earlier material, would be more normal for the 4th century. The apparent reversal to an earlier tradition of construction in the eastern section is thus probably best explained as an attempt to overcome the prevailing geological difficulties.

Before discussing the Wall in more general terms, it should be noted that the course of the Wall probably made one or perhaps two deviations (Figs. 2 and 3). In order to link successfully the foundations in Area I with those in Area III one such alteration in alignment, taking the western course of the Wall from Area I slightly further south, is required. Precisely where this deviation occurred cannot be pinpointed but it is perhaps most likely where the construction of the Wall changed, *i.e.* where the timber-piled foundations ceased (Fig. 3). The original alignment of the Wall west of Area III is more difficult to determine as none of the sections was found *in situ*. The Area VII section, for example, had probably moved to the north of its original position and was found in an improbable north-east/south-west alignment. The relative positions of both the collapsed sections of the foundations in Area VIII may, however, suggest that the course of the Wall was beginning to curve slightly north-westwards to meet the return line of the landwall from Ludgate. This course was perhaps influenced by the curving east bank of the mouth of the Fleet to the west. If this was the case the junction of the two walls would lie under the western end of Queen Victoria Street.

In general, the construction on this site of the Riverside Wall, with a major variation between the eastern and western lengths and with no two Areas producing identical sections, is best described as random. In the absence of any evidence that the building of the Wall was interrupted or significantly delayed after it was begun, this irregular construction probably results from a combination of factors including the marked change in the local geology already noted (p. 12, 57), the availability and supply of materials, the work of different gangs of labourers and perhaps also, though there is no direct evidence, from a hasty operation following a period of turmoil. For instance, the apparent disparity in the width of the chalk raft between Areas I and VI probably reflects the work of individual gangs, as do the minor differences between the sections in Areas VII and VIII. The facing stones preserved on the northern face of both sections vary and in Area VIII a tile course was used which was not found in Area VII. The use of carved blocks in the foundations in Area VIII and not in Area VII was perhaps due to supply problems, though individual whim cannot be ruled out. In Area II the distinctive change in the construction technique observed on either side of a fissure (pp. 38-40) probably resulted from a pause during construction rather than from two separate phases in which the section above the fissure represented a secondary refurbishing. This is supported by the inclusion of a re-used voussoir block in this Area II section and the re-use of eight similar blocks in the foundations in Area VIII.

THE PURPOSE OF THE WALL

The excavations have also provided evidence that the Wall's initial and prime function was defensive. It is most unlikely that it was constructed to support a terrace to the north, as were walls at Lambeth Hill, because no deposits were found on the eastern part of the site which could have formed part of such a terrace, Fig. 19. The excavations in Area IV revealed

A further suggestion, which has recently received much support (p. 6), is that the Wall were deposited with certainty in the Roman period. These were sealed directly by layer 102, possibly representing post-Roman slumping from the bank and 12th/13th century dumping, probably associated with the construction of Upper Thames Street. Quite clearly the Wall was free-standing in the 4th century.

A further suggestion, which has recently received much support (p. 000), is that the Wall was constructed as an embankment or quayside structure. The excavations however provided no evidence to suggest that the river seriously affected the area immediately to the south of the Wall at the time of construction. It was argued (pp. 35, 57) that layer 303, at + 0.30m O.D., did not normally sustain river action in the early 3rd century. The base of the Wall, at *c.* + 1.30m O.D. in Area VI, lies approximately 1m above this deposit and it is unlikely from current knowledge that the river level could have risen sufficiently to account for the construction of the Wall as embankment in the 4th century.

On the western part of the site, due to the collapse of the Wall, the post-Roman river erosion of deposits to the south and the suggested removal of material to the north (p. 42), it was impossible to determine the ground level from which the Wall was constructed. Generally, however, the foundations were lower on the western part of the site, no doubt reflecting the original ground surface which sloped from the east. The only foundations located *in situ* were found in Area III and these lay at approximately + 0.40m O.D. It has been suggested (p. 60) that foundation trenches were not used during construction and that the Wall was laid directly on to the existing surface, as in Area I. Moreover, it is likely that the contemporary 4th century river level was in fact below + 0.40m O.D., even though only

marginally. In any case, it is doubtful whether the slight foundations on the western part of the site would have been adequate to serve as an embankment wall.

In summary, it is unlikely that the Thames was in the fourth century at a level sufficiently high to require the construction of a massive embankment wall, the height and size of that recovered on site. Had an embankment been needed, a less formidable timber revetment, such as the earlier waterfronts discovered downstream, would surely have been constructed. The Wall, a well-established defensive type, was built initially as a defensive measure, which due to the rise in river level in the post-Roman period inadvertently became an embankment.

The defensive nature of the Riverside Wall, thus established, also supports the argument that the whole length of the Wall on site was constructed at one time. It is inconceivable that the eastern section of the Wall, though apparently using an earlier technique, was constructed much before the western section. Alternative reasons for this difference in construction have already been discussed (p. 66).

THE RIVERSIDE WALL IN ITS LONDON CONTEXT

The excavations have thus shown that the south-west corner of the City was provided in the late Roman period with a 115m length of Riverside Wall, the function of which was defensive. It follows that the whole waterfront between Blackfriars to the west and the Tower of London to the east was similarly defended, for it is highly improbable that a defensive wall was built only along one part of the riverfront. The portion found on the eastern part of the site (Areas I and VI), which was similar in character and width to that discovered in 1841 by Roach Smith between Lambeth Hill and Queenhithe (RW3; p. 3) should probably be seen as the western limit of a long section of wall constructed on a chalk raft with supporting timber piles. If, further to the east, the length of wall discovered in 1863 in the south-east corner of Suffolk Lane (RW5; p. 5), which was considered at that time to be Roman and aligned with Roach Smith's find to the west, was also, as seems more than likely, a section of the Riverside Wall, there is little difficulty in accepting a continuous defensive wall from Blackfriars to the west bank of the Walbrook.

At the Walbrook, the Wall's eastward course might have been interrupted to allow for the southward flow of the Walbrook stream. Alternatively, the Wall, provided with culverts, could have been constructed across the mouth of the Walbrook, as were northern sections of the landwall where tributaries of the Walbrook met it. Although little is known about the mouth of the Walbrook, observations about 130ft west of Dowgate Hill in 1959 revealed that at a point admittedly slightly to the north of the Wall's projected alignment (Fig. 1), the Walbrook stream was only 20-21ft wide (6.0-6.4m).¹²⁰ This measurement, even if slightly increased to allow for some widening of the mouth, which had perhaps become silted by the 4th century,¹²¹ would not have been a major obstacle to the construction of the Wall.

Although there is less evidence for the continuation of the Riverside Wall eastward from the Walbrook to the Tower of London, it is hard to imagine that the eastern riverfront was left unprotected. Indeed it was probably the City's eastern riverfront, especially the port area downstream of London Bridge, which was most vulnerable to attack from the east and therefore in most need of protection. It is argued that the sections of Wall discovered in Lower Thames Street in 1859 (RW4; p. 3) and in 1911 (RW6; p. 5) should be considered as remnants of the Riverside Wall. The 1911 discovery is particularly noteworthy as it not only employed timber in the foundations (though admittedly differently from that at

Baynard's Castle), but also earlier masonry, though it was apparently undecorated. These two sections, together with the recent discovery of a 25m length of a massive Roman wall c. 3.30m wide along the line of Henry III's curtain wall at the Tower of London, confirm that this eastern section of the City was also defended with a Riverside Wall.

The various lengths of wall discovered along Upper and Lower Thames Streets are thus considered to have formed part of the original, continuous, late Roman Riverside Wall. Although no two lengths are precisely similar, a lack of uniformity is evident in the random nature of the Wall's construction at Baynard's Castle and would also apply to the Riverside Wall as a whole.

If the whole riverfront from Blackfriars to the Tower was thus defended, gates and posterns in the wall would also have been provided. A gateway might, for instance, be reasonably expected in the bridgehead area of the Roman city, providing access between the forum, the bridge and Southwark. It is also possible that the section of riverside Wall discovered by Roach Smith in Upper Thames Street (Fig. 1; RW3), 'of extraordinary strength, which formed an angle with the Hill' (i.e. Lambeth Hill), could represent a gateway or postern in the Riverside Wall. Only further excavation can test this suggestion, but it is perhaps worth noting that the *via praetoria* or main north-south road of the Cripplegate Fort (constructed c. A.D. 100) in the north-west corner of the city, if extended on a direct line southwards (reflecting the modern street alignments of Old Change and Lambeth Hill) would meet the Wall at this point.¹²²

The construction of the Riverside Wall, though generally similar to that of the landwall, especially on the eastern part of the site (Areas I and VI) where it had a narrow gauge and internal bank, also shows a number of marked differences from the landwall which link it typologically with the eastern group of bastions.¹²³ The irregular nature of the Riverside Wall's construction (pp. 57-61) constitutes the main dissimilarity from the landwall. The latter, approximately three miles (4.8km) in length and re-using the north and west walls of the earlier Cripplegate Fort, is remarkable for the uniformity of its construction. Although minor inconsistencies occur, due perhaps to geological factors and to the work of individual gangs, generally, as it survives, it has a neat, ordered appearance, which no doubt resulted from a methodical single construction. In addition, the landwall probably used entirely new material — Kentish ragstone for the core and facing stones, sandstone, also apparently from Kent, for the external chamfered plinth and fresh bricks for the tile courses. The Riverside Wall, however, although it used a large amount of fresh material — timber and chalk in the foundations and a large quantity of fresh ragstone — also made use of earlier material, such as *opus signinum* and, of course, the large sculptured blocks.

Further, minor, differences between the two walls occur. The mortar in the landwall was generally white, whereas the Riverside Wall mortar was yellow, with a slight reddish tinge, though a green variation was found consistently at the base of the Wall. A white mortar was found in the Riverside Wall only in Area II but this mortar was not typical of the samples taken (Mortar Report, p. 116). The bonding courses in the landwall, consisting only of building bricks, were carried through the core of the structure. The corresponding courses in the Riverside Wall, however, using both *tegulae* and building bricks, penetrated the core only to the width of two bricks. Finally, the offsets on the internal face of the landwall were considerably narrower (40mm) than the corresponding ones (300mm) on the eastern section of the Riverside Wall.

The main differences between the two walls, therefore, lie in the random nature of the Riverside Wall's construction as opposed to the neat, consistent build of the landwall, and the re-use of sculptured material which has never been found in the landwall. Significantly, it is in these differences that the Riverside Wall closely resembles the construction of the eastern group of bastions. The construction of the bastions varies considerably and they embody a large amount of earlier Roman material. Furthermore, some of these bastions were built on chalk rafts, though not as thick as that in the Riverside Wall. The Castle Street bastion was constructed on a foundation of flint and puddled clay surmounted by a thin layer of chalk.¹²⁴ The Camomile Street bastion was laid on the natural clay

'which had simply been levelled by compressing together masses of chalk into the clay for a thickness which varied from two to three inches'¹²⁵

The All Hallows bastion¹²⁶ was constructed on a rectangular platform, overlying in part the original Roman ditch, filled with 'chalk, flint and broken stones'. The other bastions also employ chalk in the core of the structure, which has not so far been found in the landwall. Patches of pink mortar, probably similar to that found, with crushed tile and reddened flints, in the Riverside Wall, have also been recorded in the bastions.¹²⁷ Whether tile coursing was generally used in the bastions is more difficult to ascertain, though the Castle Street bastion had a double tile course of bricks 8½ ft from the foundations, penetrating the core only to the width of one tile.¹²⁸ Both the bastions at Duke's Place E¹²⁹ and Duke Street W¹³⁰ possibly also had tile courses, as attested by Woodward and Maitland, and an 18th century drawing of the latter shows four triple courses still intact.¹³¹ Although the neatly spaced courses, illustrated on this drawing, cannot with certainty be claimed as Roman, there are no parallels for the use of bonding courses in London in the post-Roman period. It is argued therefore that they were originally employed in the construction of these bastions.

The similarity between the construction of these fragments of the Riverside Wall and the eastern group of bastions has already been suggested by the Royal Commission, which further argued that the construction of both defensive systems was contemporary.¹³² The present excavations have confirmed this similarity, and greatly increase the likelihood of their contemporaneity. Although the dating evidence for the eastern bastions is at present insufficient to confirm a Roman date, the suggested use of tile coursing, and the dating evidence from the bastion at All Hallows,¹³³ where deposits post-dating its construction contained nothing but Roman material, implies a Roman date for their construction. Moreover, the bastion at Duke's Place has recently produced a post-construction deposit containing coinage of the House of Theodosius and nothing later.¹³⁴ Thus, it may be concluded that there is a strong case for regarding the eastern group of bastions as a late Roman addition to the existing landwall and as contemporary with the Riverside Wall with which they share distinctive stylistic characteristics.

THE DATE OF THE RIVERSIDE WALL

The use of a large amount of fresh timber for the piles beneath the Riverside Wall has provided a date after which the Wall was constructed. The Carbon 14 and dendrochronological analysis of the timbers has concluded that

'they were felled in about A.D. 330-350 in radio carbon terms; calibrated dates would bring the Wall's construction closer to A.D. 400' (p. 93).

This shows that the Wall was constructed sometime after A.D. 330 which agrees with the pottery, some later than A.D. 320, recovered from the drain filling and opening in the bank

which, it was argued, was backfilled at the time of the construction of the Wall (p. 32). None of the carved blocks, including the inscribed altar block of Marcus Martiannius Pulcher, can be more closely dated than to the 3rd century (p. 199).

This evidence excludes the possibility of a contemporary construction between the Riverside Wall and the landwall (c. A.D. 200), a conclusion already suggested by the difference in constructional styles (p. 68). It also eliminates a potentially more feasible late 3rd century date (A.D. 287-296), during the short lived but active British empire of Carausius and his successor Allectus.¹³⁵ It is interesting that London was not only without walled river defences at this time, but also, and more surprisingly in view of the havoc inflicted upon London by Allectus' retreating Frankish army, that no such defence was undertaken immediately after these events.

The period after A.D. 330 provides three major historical events with which the construction of the Riverside Wall might be connected. Firstly, it might have resulted from the hurried, unexpected and as yet unexplained visit of the Emperor Constans in the winter of 342-3.¹³⁶ Although the relevant books of Ammianus Marcellinus, which might have clarified the events, have been lost,¹³⁷ this date is perhaps supported by the similarity in the construction of the Riverside Wall and Pevensey Castle (pp. 60, 62), a later addition to the Saxon Shore fort series, which, according to Cunliffe, dates from the 340s.¹³⁸

Secondly, and certainly more likely, the Wall might have been built during the large-scale and well-documented Theodosian reconstruction of the early 370s, in the aftermath of the *barbarica conspiratio* of A.D. 367.¹³⁹ Ammianus Marcellinus informs us that Count Theodosius, a *comes rei militaris*, was sent by the Emperor Valentinian to restore the situation. The Count, with four regiments of the field army, after clearing the countryside of marauding bands of barbarians and deserters and relieving the beleaguered London, 'turned his attention to making any necessary improvements, restoring the cities and the defences'.¹⁴⁰ Conclusive evidence from London, as elsewhere, is still lacking but the addition of bastions to the existing walls would not be inappropriate to a period which has been described as probably the last major intervention of the central government in Britain.¹⁴¹ Furthermore, the suggestion that London might have been renamed *Augusta* for official purposes at this time would perhaps accord with a change in status accompanying a major addition to the city's defences.¹⁴²

Finally, it is possible that the construction of the Wall was the work of Stilicho, Honorius' Vandal general, between A.D. 395 and 399. Although the court poet, Claudian, described, with poetic imprecision, his military achievements in Britain, as yet no certain archaeological trace of his activities has been found.¹⁴³ The recently discovered section of the Riverside Wall in the Tower of London, however, has produced coinage of Valentinian (A.D. 388-392) in material dumped against the internal face of the Wall, possibly at the time of construction.¹⁴⁴

Documentary support for this date might be found in the culminating edict of Arcadius and Honorius, issued in A.D. 396, which authorised urban authorities to fortify with materials drawn, if necessary, from disused temples and other buildings.¹⁴⁵ If this preliminary dating at the Tower is confirmed then the construction of the Riverside Wall might be directly associated with this edict, which can then be seen as more than a mere affirmation of a practice that had undoubtedly long since existed. This date if correct would have considerable consequences for the history of Roman Britain, providing evidence for the first time of major Roman defensive work later than that of Count Theodosius.

In any event, the riverfront, following the construction of the landwall, *c.* A.D. 200, was open for at least 130 years, and probably longer, before the civic authorities, goaded no doubt by increasing Saxon pressure, decided on major defensive work. This, then, might have involved not only the construction of the Riverside Wall, but perhaps also the addition of the similarly constructed eastern group of bastions to the City wall.

PERIODS III AND IV (Late Roman to Twelfth/Thirteenth Centuries)

Period III, between the construction of the Riverside Wall in the 4th century and the redevelopment of the site in the 12/13th centuries, probably saw little or no activity. During this period the area to the south of the Wall became increasingly affected by the rising level of the River Thames which, by the 12th and early 13th centuries, had deposited a gravel foreshore against the surviving, eroded, southern face of the Wall. The levels for the top of this foreshore at various points across the site (*c.* + 1.45m O.D. in Areas I and VI; *c.* + 1.30m O.D. in Area I, western end; *c.* + 1.00m O.D. in Areas III and VII), while reflecting the natural western slope across the site (p. 12), are generally similar and indicate a mean river level by the 12th and 13th centuries in excess of + 1.50m O.D.¹⁴⁶ This river erosion had destroyed any Saxon activity to the south of the Wall. To the north, however, little excavation was possible, but no certain evidence of activity in this period was found. The first signs of activity above the Roman levels was the dumping of levelling material immediately prior to the construction of Upper Thames Street in the 12/13th centuries.

It may therefore be concluded that this site in the south-west corner of the City, an inhospitable area increasingly affected by tidal action to the south of the Wall and with marshy conditions prevailing to the north, was largely neglected in the Saxon and early medieval periods.

THE COLLAPSE OF THE RIVERSIDE WALL

The cause, and date, of the collapse of the Riverside Wall in general and of this south-western portion in particular present severe problems. What is apparent on the present site is that in Area I the Wall, though still standing, had been severely eroded on its south face, but that in Area II and V and in Areas VII and VIII, the Wall had fallen to the north. The erosion in Area I would fit William FitzStephen's definite statement that the general collapse of the Wall was due to tidal action (p. 7), though such a cause would not so readily explain the northward collapse in the other Areas. It is possible that, as a secondary effect, the river had penetrated behind the Wall and then undermined it, but while any possible evidence of this in the deposits to the north of the Wall had been removed, the removal itself, which must have occurred before the collapse, would strongly suggest that the collapse was at least partly due to deliberate demolition. If this were the case, the direction of fall may well have been determined by convenience; if oxen were used for the purpose it would clearly have been easier to deploy them on the firmer ground to the north of the Wall, than on the shore to the south.

Conclusive dating evidence for the collapse was absent, the only pottery recovered from beneath the collapsed Wall in Area VIII being late Roman, apart from three Saxon sherds, dated to the 5th and 8th centuries (p. 97) and a single 12/13th century sherd, to be discussed shortly. But in any case the two Saxon Queenhithe grants suggest that the Wall was still standing in the late 9th century (pp. 8-9). Thereafter, the next positive reference to the Wall, in the *Carmen* of *c.* 1067, indicates its absence as an effective defence at the time of the

Conquest (p. 8). Further refinement of the date of collapse depends upon inference rather than fact: the successful resistance offered by the Londoners between 994 and 1016 to the Danish invaders, who clearly controlled the river above and below the bridge,¹⁴⁷ might indicate that the wall was still intact. On these grounds it might seem that the collapse of the Wall occurred between 1016 and 1066 and since there is no reason to suppose that after 1016 the Danish rulers of England would be less in need of an intact defensive wall than their English predecessors had been, it would seem likely that the cause of this was largely erosion, as William FitzStephen stated. Perhaps more conclusively, the fact that the Anglo Saxon Chronicle, which devoted much attention to London at this period, has nothing to say of the collapse, would also favour the explanation of a gradual, imperceptible erosion more than that of a deliberate demolition, which could be expected to have excited contemporary comment.

It may well be that by the mid 11th century the Wall had gradually eroded to such an extent that it no longer served as an effective defensive measure, but that nevertheless certain portions of it remained standing until such a time as they were considered a nuisance or an obstacle to local activity. In general, the earliest period at which activity is recorded in this area of the City is the 12th century. The building of Paul's Wharf in 1111-1127, the dating by Carbon 14 of the timber waterfront found to the south of the Wall (Area III) to the 12th or early 13th centuries, the attribution of the earliest level of Upper Thames Street, which abutted a fallen portion of the Wall, to a date no earlier than the late 12th century (p. 16), all seem to point to the beginnings of economic development in this district at this period. Such development would certainly provide a convincing impetus for the difficult and costly work of demolishing the Wall.

It seems most probable that the demolition of the Wall in Area II and the establishment of Thames Street, as seen in the Upper Thames Street trench 30m distant, are connected. It is likely that the section of Wall between Areas VIII and V, including Area II, was demolished in one operation. Evidence from the Upper Thames Street trench, immediately north of Area VIII, showed that the first street dated to the 12/13th centuries and that it used the collapsed Wall as its southern kerb (p. 17). Below the demolished Wall in Area VIII was found a small sherd of medieval glazed pottery of at least the late 12th century which, though possibly intrusive, would approximate to this general date. Thus there are grounds for concluding that the establishment of Thames Street was an effect, if not a cause, of the deliberate demolition of this section of the Wall.

Associated with the demolished portions of the Wall in Areas II and III was evidence of a distinct interval in time between demolition and subsequent development to the south. This is indicated first by the accumulation of the foreshore layer (Area III; Fig. 25, 147) over the foundation which had survived the demolition, and also, more definitely, by signs of considerable erosion which had taken place on the southern edge of the demolished, horizontal portion of the Wall (Area II; Fig. 23). Such deposition and erosion occurred in the interval between demolition and the appearance of the timber waterfront to the south. This feature, dated by Carbon 14 to A.D. 1170±60, compares in its relative position to the site of the wall with a waterfront discovered by Peter Marsden in this general area in his 1972 Baynard's Castle excavation.¹⁴⁸ This later structure has been provisionally dated by pottery evidence to the 13th century and the conclusion is that both structures are contemporary.

In the absence of firm evidence the most satisfactory sequence of events on this section of the London waterfront is that while the Wall apparently survived effectively to 1016, this

does not seem to have been the case in 1067. Thereafter the western portion of the Wall, which had survived severe erosion, was possibly demolished in the late 12th century at a time when evidence of commercial activity is available in historical sources and shortly before the construction of the earliest Thames Street, dateable to the same period. This was followed, after an indeterminate interval, by the erection of a timber waterfront in the first half of the 13th century.

NOTES AND REFERENCES

1. R. Merrifield *The Roman City of London* (London 1965) 45-53, 101-111.
2. Documentary Survey, above, pp. 7-10.
3. In order to distinguish the sections of the Riverside Wall from those of the landwall, the Merrifield gazetteer of Wall sites (*op. cit.* in Note 1, 298-316) has been expanded. For this report a series of RW numbers (Fig. 1), arranged in chronological order of discovery, has been introduced. Earlier discoveries, which possibly relate to the Riverside Wall, retain their Merrifield gazetteer numbers.
4. J. T. Smith *The Streets of London* (London 1861) 380; *Victorian County History: London* (henceforward V.C.H.) I (London 1909) 70; *Royal Commission on Historical Monuments in London*, 3: *Roman London* (henceforward R.C.H.M.) (London 1928) 92-3; Merrifield (*op. cit.* in Note 1) gazetteer No. 123.
5. Charles Roach Smith 'On Roman Remains recently found in London' *Archaeologia* 29 (1841) 150-1; and *Illustrations of Roman London* (London 1859) 18-19; R.C.H.M. (*op. cit.* in Note 4) 92-3; V.C.H. (*op. cit.* in Note 4) 70; Merrifield (*op. cit.* in Note 1) gazetteer No. 114; City Sewer Plans (City of London Record Office, Guildhall) No. 315.
6. Note by T. Gunston J. *British Archaeol. Assoc.* 1st ser. 24 (1868) 296; V.C.H. (*op. cit.* in Note 4) 71; R.C.H.M. (*op. cit.* in Note 4) 94; Merrifield (*op. cit.* in Note 1) gazetteer No. 354.
7. W. H. Black 'Observations on the Primitive Site, Extent and Circumvallation of Roman London' *Archaeologia* 40 (1866) 47-8; V.C.H. (*op. cit.* in Note 4) 71; R.C.H.M. (*op. cit.* in Note 4) 93; Merrifield (*op. cit.* in Note 1) gazetteer No. 279.
8. P. Norman 'Further discoveries relating to Roman London, 1906-12' *Archaeologia* 63 (1912) 306-11; R.C.H.M. (*op. cit.* in Note 4) 93-4; Merrifield (*op. cit.* in Note 1) gazetteer No. 311.
9. P. R. V. Marsden 'Excavations at Baynard's Castle in 1972' (report forthcoming).
10. R.C.H.M. (*op. cit.* in Note 4) 143; Merrifield (*op. cit.* in Note 1) gazetteer No. 310.
11. R. Kelsey *A description of the sewers of the City of London* 90 (an MS. book in the charge of the City Engineer, Guildhall); R.C.H.M. (*op. cit.* in Note 4) 143; Merrifield (*op. cit.* in Note 1) gazetteer No. 315.
12. Information from the City Engineer's Department, Guildhall.
13. T. Tatton-Brown 'Excavations at the Custom House Site, City of London, 1973' *Trans. London Middlesex Archaeol. Soc.* 25 (1974) 122.
14. A. W. Clapham and W. H. Godfrey *Some famous buildings and their Story* (London 1913) 32-5; *History of the King's Works*, 2 ed. H. M. Colvin (London 1963) 706-792; H. Jones 'Report on Excavations at the Tower of London' *Archaeologia* 60 (1906) 239.
15. S. Butcher in *J. Roman Studies* 46 (1956) 139-40. I am extremely grateful to Sarnia Butcher for providing me with this information prior to publication.
16. G. Parnell 'Excavations at the Tower of London, 1976-7' *London Archaeol.* 3 (1977) 97-9.
17. V.C.H. (*op. cit.* in Note 4) 71-3.
18. R.C.H.M. (*op. cit.* in Note 4) 79-80.
19. R. E. M. Wheeler *London in Roman Times* London Museum Catalogue No. 3 (London 1930) 23.
20. Gordon Home *Roman London (A.D. 43-457)* (London 1948) 144.
21. F. Cottrill in W. G. Bell, F. Cottrill and C. Spon *London Wall through Eighteen Centuries* (London 1937) 28.
22. R. Merrifield (*op. cit.* in Note 1) 110.
23. W. F. Grimes *The Excavations of Roman and Medieval London* (London 1968) 56-64.
24. P. R. V. Marsden 'The Riverside Defensive Wall of Roman London' *Trans. London Middlesex Archaeol. Soc.* 21 (1967) 149-56.
25. C. N. L. Brooke with G. Keir *London 800-1216: The shaping of a City* (London 1975) 114.
26. J. Wachter *The Towns of Roman Britain* (London 1974) 95-7.
27. *Calendar of the Plea & Memoranda Rolls of the City of London, 1323-1364* ed. A. H. Thomas (Cambridge 1926) 176-7.
28. In this connexion see the illumination from a late 14th century copy of John Lydgate (B.M. Royal MS. 18D II, f. 148) reproduced by P. Norman and F. W. Reader 'Further Discoveries relating to Roman London', *Archaeologia* 63 (1912) 311, in which a view of the City from Southwark features a turretted riverside wall. The perspectives and placings of known features are so accurate as to suggest that the artist was very well acquainted with London and, as the authors comment, the illustration is an epitome of what it was considered London should be like, and as it had been represented by FitzStephen.
29. The Prologue is printed, in a translation by H. E. Butler as *A Description of London* in F. M. Stenton *Norman London* (London 1934) 26-32. The passage quoted is on p. 27.
30. *The Carmen de Hastingae Proelio*, ed. C. Morton and H. Muntz (Oxford 1972) xxxv.
31. *Ibid.*, xlii.
32. *Ibid.*, 40-1, 11. 639-40: 'A leva muris, a dextris flumine tuta/Hostes nec metuit nec pavet arte capi'.
33. *Cartularium Saxonicum*, ed. W. de G. Birch ii (London 1887) No. 561; P. H. Sawyer *Anglo-Saxon Charters: an annotated list and bibliography* (London 1968) No. 1628. A translation appears in A. E. E. Jones *Anglo-Saxon Worcester* (Worcester 1958) 91-2. For *curtis*, see R. E. Latham *Revised Medieval Latin Word List* (London 1965) 127.

34. For a fuller discussion of these documents see T. Dyson 'Two Anglo-Saxon land grants for Queenhithe' in *Collectanea Londiniensia: Studies... presented to Ralph Merrifield* ed. J. Bird, H. Chapman and J. Clark, London Middlesex Archaeol. Soc. Special Paper No. 2 (1978) 200-15.
35. *Anglo-Saxon Chronicle*, s.a. 1009 (E), 1012 (E), 1016 (D, E, F).
36. My thanks are due to Mr. Alex Rumble of the English Place-name Society for his comments on this point.
37. P. R. V. Marsden 'Two Roman Public Baths in London', *Trans. London Middlesex Archaeol. Soc.* 27 (1976) 27 and Fig. 3.
38. P. R. V. Marsden 'The Excavation of a Roman Palace in London' *Trans. London Middlesex Archaeol. Soc.* 26 (1975), 52-4; Fig. 28.
39. See Note 34 above.
40. As listed on Marjorie Honeybourne's map of London under Henry II in F. M. Stenton (*op. cit.* in Note 29).
41. R. Merrifield (*op. cit.* in Note 1) 92, 124-5, 146; gazetteer Nos. 93-9.
42. Below, pp. 16-17.
43. Below, pp. 46-7.
44. St. Paul's Cathedral Muniments, A Box 4, 702. The act of 'R. episcopus', is undated, but the diaconate of William de Maren, who is mentioned in the text, is 1111 to 1138 (J. le Neve *Fasti Ecclesiae Anglicanae 1066-1300: St. Paul's Cathedral* comp. D. E. Greenaway (London 1968) 5). This in turn identifies 'R. episcopus' as Bishop Richard Belmeis I (1108-27).
45. More recent excavations at Trig Lane have shown that the earliest structures so far uncovered date to the mid-13th century. Documentary evidence would suggest that this particular area was at least partly developed by the late-12th century.
46. T. Dyson in T. Tatton-Brown 'Excavations at the Custom House site, City of London, 1973 — Part 2' *Trans. London Middlesex Archaeol. Soc.* 26 (1975) 112-3.
47. Building work since 1974 has removed all the archaeological deposits from the site.
48. The contour survey of the surface of the blue/grey Tertiary London Clay (which generally takes no account of the sand and gravel of the Quaternary Flood Plain Terrace) was prepared from a large number of readings (on average 8m apart) taken from the contractors' records of bore and pile holes. Though admittedly the margin of error in these readings could be wide, they were found to be compatible with one another and to provide a uniform picture across the site. They also compared well with our own records and observations. This survey not only demonstrates the deep stream channel at the east end of the site, which accounted for the distinct change in the construction of the Riverside Wall's foundations, but also provides a picture, fairly detailed and for the first time, of a large area of London's surface geology. Together with the environmental data, it indicates an area, next to the Thames, cut by streams running down from Ludgate Hill, and susceptible to periodic flooding.
49. G. H. Willcox 'Problems and possible conclusions related to the history and archaeology of the Thames in the London region' *Trans. London Middlesex Archaeol. Soc.* 26 (1975) 285-292.
50. Map opposite p. 52 in M. Biddle, D. Hudson and C. Heighway *The Future of London's Past* (Worcester 1973).
51. G. H. Willcox (*op. cit.* in Note 49) e.g. Note 10.
52. Cf. M. Biddle and D. Hill 'Late Saxon planned towns', *Antiq. J.* 51 (1971) 84.
53. J. Ogilby and W. Morgan *A large and accurate map of the City of London* (London 1677).
54. Information from Mr. P. Marsden who directed the excavation (he tells me that although the finds have not yet been examined, a 16th century date is likely).
55. T. F. Reddaway *The Rebuilding of London after the Great Fire* (London 1940) 25.
56. *Ibid.*, 25 n. 20.
57. This small extension in the south-west corner of the trench was cut by machine in order to trace the Roman Wall, so that the deposits above, including this structure, were destroyed. The presence of a cellar cutting in from the south at this point destroyed the section.
58. The well was not excavated below +0.40m O.D., as it had been filled with concrete in the present century.
59. R. Merrifield in 'The Archaeology of the London area: Current knowledge and problems: Roman' *London Middlesex Archaeol. Soc. Special Paper No. 1* (1976) 52-3.
60. N. Davey *A History of Building Materials* (London 1961) 103. These crushed elements have been regarded as a pozzolanic substitute in Britain, lacking a natural pozzolana of its own, which would have given it an hydraulic or weather-proof quality against rain and, perhaps more important, groundwater. This might have been an important requirement for the Wall in its exposed damp position next to the Thames.
61. Information from Peter Marsden.
62. J. P. Bushe-Fox 'Some notes Roman on coastal defences', *J. Roman Studies* 22 (1932) 60 ff.; B. Cunliffe *Excavations at Portchester Castle I: Roman* Report of the Research Committee of the Society of Antiquaries of London 32 (London 1975) 14-15.
63. The clay bank behind the landwall at Cooper's Row, excavated in 1962, showed similar undulations, noted by P. R. V. Marsden *J. Roman Studies* 53 (1963) 139, Pl. XVI.
64. T. Tatton-Brown (*op. cit.* in Note 13) 132-138, Fig. 18.
65. J. Schofield 'Excavations at Seal House, London, 1974' (report forthcoming).
66. G. Milne *et al.* 'Excavations at Trig Lane, London, 1974-6' (report forthcoming).
67. I am grateful to Mark Harrison, Gustav Milne and John Schofield for their advice in the preparation of this section.
68. Atomic Energy Authority: Carbon 14/Tritium Measurements Laboratory, Harwell, Ref. HAR 1201 (A.D. 1170 \pm 60 years).
69. Information from Peter Marsden.
70. This date accords well with the information obtained by Peter Marsden during his Baynard's Castle excavation in 1972 and is also consistent with the available documentary evidence.
71. R. E. M. Wheeler 'Old England, Brentford' *Antiquity* 3 (1929) 20.
72. *Royal Commission on Historic Monuments: Essex, South-East* (London 1928) 38-9.
73. T. Tatton-Brown (*op. cit.* in Note 13) 122.
74. J. Schofield and L. Miller 'Excavations at New Fresh Wharf, London, 1974-5' (report forthcoming).
75. A. V. Akeroyd 'Archaeological and historical evidence for subsidence in South Britain' *Phil. Trans. Roy. Soc.* 272 (1972) 151-169.
76. G. Willcox (*op. cit.* in Note 49).

77. J. T. Greensmith and E. V. Tucker 'Holocene Transgressions and Regressions on the Essex Coast, Outer Thames Estuary' *Geologie en Mijnbouw* 52 (1973) 193-202.
78. I am grateful to Mr. Alistair Long, B.Sc., A.M.I.C.E., for discussion of these points.
79. Vitruvius *De Architectura* III, cap. IV, 2 (Loeb edition by F. Granger, I (London 1931) 181).
80. The intricate ramming of thousands of piles (between Baynard's Castle and Queenhithe) undoubtedly required the use of efficient machinery of the type described as *machinae* by Vitruvius (*De Architectura* X, cap. 2, (*ibid.*, ii. 275-93)) and as *astucae* by Caesar during the construction of the Rhine bridge (*De Bello Gallico* IV, cap. 17 (Loeb edition by H. J. Edwards (London 1918) 203)).
81. For the use of chalk in south-east England see J. H. Williams 'Roman building materials in south-east England' *Britannia* 2 (1971) 166-185.
82. R. Merrifield *Roman London* (London 1969) 118-9.
83. E. P. Loftus Brock 'Description of an ancient crypt at Aldgate . . . ' *J. British Archaeol. Assoc.*, 1st ser. 36 (1880) 163; Letter by D. A. Cobbett *Gentleman's Magazine* 201 (1861) 646; *R.C.H.M. (op. cit. in Note 4) 85*; Merrifield (*op. cit. in Note 1*) gazetteer No. W18.
84. G. C. Boon *Silchester: The Roman Town of Calleva* (Newton Abbot 1974) 89-90, 100.
85. M. A. Cotton and P. W. Gathercole *Excavations at Clausentum, Southampton 1951-54* (London 1958) 38; B. Cunliffe (*op. cit. in Note 62*) 13. As the width of the base of the stone wall (9ft) at Clausentum corresponds with that of the band of post holes, and as the excavations in 1937-8 (D. M. Waterman 'Excavations at Clausentum, 1937-8' *Antiq. J.* 27 (1947) 151-71) revealed that sections of the wall had indeed been totally robbed out, the latter interpretation is preferred.
86. Noted by G. C. Dunning *J. Roman Studies* 21 (1931) 239-40; R. Merrifield (*op. cit. in Note 1*) gazetteer No. 359.
87. T. Johnson 'A Roman signal-tower at Shadwell, E.1 . . . ' *Trans. London Middlesex Archaeol. Soc.* 26 (1975) 280.
88. D. E. Strong 'The Monument' in *Richborough V* ed. B. Cunliffe Report of the Research Committee of the Society of Antiquaries 23 (London 1968) 40-73.
89. B. Cunliffe (*op. cit. in Note 62*) 13.
90. W. S. Penn 'The Romano-British Settlement at Springhead, Kent' *Archaeologia Cantiana* 73 (1959) 1-61; 74 (1960) 113-140.
91. S. Frere 'The excavation of a late Roman bath house at Chatley Farm, Cobham' *Surrey Archaeol. Collect.* 50 (1946-7) 73-98.
92. P. R. V. Marsden (*op. cit. in Note 24*).
93. J. E. Price *A Description of the Roman Tessellated Pavement in Bucklersbury* (London 1870) 66-7; Merrifield (*op. cit. in Note 1*) gazetteer Nos. 193 and 194.
94. A. W. G. Lowther 'Report on the excavations, 1946-7, of a Roman site at Farnham, Surrey' *Surrey Archaeol. Collect.* 54 (1953-4) 47-56.
95. J. S. Johnson 'The date of the construction of the Saxon shore fort at Richborough' *Britannia* 1 (1970) 240-248.
96. J. P. Bushe-Fox *Richborough IV* Report of the Research Committee of the Society of Antiquaries 16 (London 1949) 75-7, Fig. 23.
97. J. P. Bushe-Fox, *Richborough II*, Report of the Research Committee of the Society of Antiquaries 7 (London 1928) 22-4; B. Cunliffe (*op. cit. in Note 88*) 245.
98. B. Cunliffe (*op. cit. in Note 62*) 422.
99. C. R. Smith 'Report on Excavations of the Roman Castrum at Pevensey, Sussex, in 1852' in *Victoria County History of Sussex III* (London 1935) 6.
100. L. F. Salzmann 'Excavations at Pevensey, 1906-7' *Sussex Archaeol. Collect.* 51 (1908) 102-4.
101. Noted by F. Cottrill *J. Roman Studies* 27 (1937) 245.
102. J. S. Johnson *The Roman Forts of the Saxon Shore* (London 1976) 109.
103. J. Ives *Remarks upon the Garianonum of the Romans* (London 1803 ed.) 26; A. J. Morris 'The Saxon Shore Fort at Burgh Castle' *Proc. Suffolk Inst. Archaeol.* 24 (1946) 103-9.
104. See A. J. Morris (*op. cit. in Note 103*) 105.
105. B. Cunliffe (*op. cit. in Note 62*) 14-17, Figs. 9-10.
106. See Parnell (*op. cit. in Note 16*) 98.
107. *Ibid.*
108. B. Cunliffe (*op. cit. in Note 62*) 18.
109. P. Norman 'Further discoveries relating to Roman London, 1906-12' *Archaeologia* 63 (1912) 278-80; *R.C.H.M. (op. cit. in Note 4) 91, 96*; Merrifield (*op. cit. in Note 1*) gazetteer No. W54.
110. P. R. V. Marsden (*op. cit. in Note 63*).
111. Unpublished excavation by Peter Curnow for the Department of the Environment.
112. P. R. V. Marsden 'Archaeological finds in the City of London, 1966-9' *Trans. London Middlesex Archaeol. Soc.* 22 (1970) 1-4, Figs. 3, 5.
113. W. F. Grimes (*op. cit. in Note 23*) Fig. 3.
114. F. Cottrill (*op. cit. in Note 101*) Pl. XLII (2); S. J. Johnson (*op. cit. in Note 102*) 57.
115. G. C. Boon (*op. cit. in Note 84*) 100.
116. P. Corder 'The Reorganisation of the Defences of Romano-British Towns in the fourth century' *Archaeol. J.* 112 (1955) 20-42.
117. A. Blanchet *Les Enceintes Romaines de la Gaule* (Paris 1907); R. M. Butler 'Late Roman Town Walls in Gaul', *Archaeol. J.* 116 (1959) 25-50, esp. 40; J. S. Johnson 'A group of late Roman City Walls in Gallia Belgica' *Britannia* 4 (1973) 210-223.
118. B. Cunliffe (*op. cit. in Note 62*) 419.
119. This conjectural height is 1m less than the known height of the wall, up to wall walk level, at Pevensey (B. Cunliffe *op. cit. in Note 62*) 15, Fig. 17). The height of the crenellations, reconstructed at 1.50m, has been used for the Riverside Wall, though this may be insufficient.
120. Note by W. F. Grimes in *J. Roman Studies* 49 (1959) 125; Merrifield (*op. cit. in Note 1*) gazetteer No. 260.
121. R. Merrifield 'Coins from the bed of the Walbrook and their significance' *Antiq. J.* 42 (1962) 38-52.
122. Such a projection of the Cripplegate *Via Praetoria* as far as the Riverside Wall would be impeded by the line of the Knighttrider Street wall (Merrifield (*op. cit. in Note 1*) 146, gazetteer Nos. 93-9) but there is no evidence that this structure survived into the late Roman period.
123. For a discussion of the differences between the eastern and western groups of bastions, see Merrifield (*op. cit. in Note 1*) 111-3.
124. P. Norman 'The Roman Bastion near Castle Street, now Goring Street, E.C., excavated and destroyed in 1884' *Antiq. J.* 7 (1927) 518-521, Pl. 64; Merrifield (*op. cit. in Note 1*) gazetteer No. B9.

125. J. E. Price *On a Bastion of London Wall* (London 1880); *R.C.H.M. (op. cit. in Note 4)* 100-3; Merrifield (*op. cit. in Note 1*) gazetteer No. B10.
126. P. Norman and F. W. Reader 'Recent discoveries in connexion with Roman London' *Archaeologia* 60 (1906) 200 ff.; P. Norman (*op. cit. in Note 8*) 271 ff.
127. *R.C.H.M. (op. cit. in Note 4)* 80.
128. P. Norman (*op. cit. in Note 124*).
129. R. Merrifield (*op. cit. in Note 1*) gazetteer No. B6 for further references.
130. R. Merrifield *ibid.*, gazetteer No. B7 for further references.
131. W. Maitland *History of London I* (London 1756) 31; *R.C.H.M. (op. cit. in Note 4)* Pl. 28.
132. *R.C.H.M. (op. cit. in Note 4)* 80.
133. P. Norman and F. W. Reader (*op. cit. in Note 126*).
134. R. Merrifield (*op. cit. in Note 59*) 52-3.
135. S. Frere *Briannia: A history of Roman Britain* (London 1967) 335-345.
136. *Ibid.*, 347.
137. Ammianus Marcellinus, *Res Gestae* (Loeb edition by J. C. Rolph, i (London 1935) xvi).
138. B. Cunliffe (*op. cit. in Note 62*) 422.
139. S. Frere (*op. cit. in Note 135*) 350-359.
140. Ammianus Marcellinus (*op. cit. in Note 137*) XXVIII, cap. 3, 7 (iii (London 1939) 135).
141. S. Frere (*op. cit. in Note 135*) 255-6, 357-9.
142. R. Merrifield (*op. cit. in Note 1*) 65-66.
143. R. G. Collingwood and J. N. L. Myres *Roman Britain and the English settlements* (Oxford 1936) 288-290; S. Frere (*op. cit. in Note 135*) 362-4.
144. Parnell (*op. cit. in Note 16*).
145. *Codex Theodosianus* XV, i. 34, 40, cited by *R.C.H.M. (op. cit. in Note 4)* 82; A. Blanchet (*op. cit. in Note 117*) 311.
146. This level is confirmed by recent excavations in the City of London, notably at Trig Lane (report forthcoming).
147. Anglo-Saxon Chronicle (ed. G. N. Garmonsway (London 1953) 148; Version F — 'Then at Rogation days [7-9] May the Danish ships came to Greenwich, and soon went on to London. They dug a channel on the south bank and dragged their ships to the west side of the bridge and afterwards built earthworks outside the borough so that no-one could get in or out, and attacked the borough repeatedly, but they withstood them valiantly'.
148. Information from Peter Marsden.

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PART III

PART THREE THE SPECIALIST REPORTS

(a) THE ENVIRONMENTAL EVIDENCE AND BONES

1. THE ENVIRONMENTAL EVIDENCE

BY G. WILLCOX

The site at Upper Thames Street is situated on the north bank of the Thames in the westernmost part of the City where the river curves slightly southward. Here a relatively thin layer of gravel and in some cases apparently bare London Clay presumably results from the erosion and scouring of the outermost bank of the bend. Immediately to the west and just upstream, the waters of the Fleet (sometimes referred to as the Holebourne) would also have contributed to this erosion. This stream was covered over in the 18th century and its water is now channelled into the general drainage system of London.

During the Roman period it is known (Willcox 1975, 285) that the sea level in the Thames estuary was lower relative to the land than at present. Since the last period of glaciation there has been a positive rise in sea level which, over the past 2000 years, has probably been due to subsidence of the land (Akeroyd 1972, 157) which caused the lower reaches of the Thames to be increasingly flooded by the sea. However, during the Roman period there are indications of a relatively minor regression (Greensmith and Tucker 1973, 200) and since the base of the Wall lies at approximately 1.3m above Ordnance Datum Newlyn, it is unlikely that the Wall in the Roman period would have been affected by river action (except perhaps in the case of freak high tides). By the 7th or 8th centuries the river level increased, due to a transgressive phase, causing the base of the Wall to be regularly inundated.

Given the position of the Wall (which in the east of the City is north of the Roman quayside) and its relation to both the Thames and local topography, it is clear that its function at the time of its construction was as a defence and not as an embankment. This is substantiated by the fact that the top of the Roman waterfront structures in the City, for example at Custom House, Seal House and New Fresh Wharf, are at least a metre below the base of the Wall and environmental evidence from Westminster provides further confirmation of a low level in the 3rd century (Evans 1974, unpublished report). On the present site an outlet channel, which presumably drained hillwash coming down off the Taplow Terrace into the Thames, was located at the base of the Wall. It was blocked, possibly to prevent water flowing in behind the Wall as the river level rose in the late Roman period (Fig. 15). The site in general must have been progressively affected by river action as the level rose, the Wall being transformed by the medieval period into a tidal barrier. There is documentary evidence that this was already the case in the late 9th century (above, p. 8).

Deposits associated with structures were sampled with a view to showing the interaction between the Wall, the rising river levels and the medieval waterfront. Samples of between five and ten kilos (the weight to volume ratio varied) were examined for mollusca and plant remains preserved as a result of waterlogged conditions. Much of the organic material recovered may have been misplaced or derived due, on the one hand, to river action and, on the other, to human interference in the form of casual dumping, infilling behind waterfronts, or the deliberate raising of the level of the land to keep pace with the rising level of the Thames. While secondary deposition of this kind reduces the value of this environmental evidence, the processes, if identified, are in themselves a source of information. Of the plants (Fig. 30), a high percentage were no doubt introduced by man and are not therefore necessarily indicative of the local environment: others may have been introduced by animals, while the water-loving species may have been grown locally or were possibly deposited by river action, as is attested by the high percentage of freshwater mollusca. The ratio between freshwater and terrestrial mollusca (Fig. 31) from different deposits is particularly significant on this site, as will become clear below.

A sample from layer BC 75 (pp. 35-6, Fig. 19, 303) was taken from a thin (10cm) highly organic layer from Area VI in the extreme east of the excavation. The areal distribution could not be recorded, due to modern disturbance, but it lay at about +0.3m O.D. to the south of the Wall, which post-dates it. Weeds, together with other species associated with man, e.g. *Prunus avium* and *Pinus pinea*, were present, but the former were less numerous compared with the other samples. Mollusca were not plentiful: only seven species were recorded, three being freshwater and four terrestrial (Fig. 31). *Theodoxus fluviatilis* and *Bithynia* sp. are usually found in large bodies of free-flowing water. Given the

Scientific name	Common name	Context numbers							
		303	199	181	178	2	306	146	141
Pinaceae									
<i>Pinus pinea</i> L.	Stone pine	1							
Ranunculaceae									
<i>Ranunculus cf. acris</i> L.	Meadow buttercup	6	2			7			
<i>R. cf. repens</i> L.	Creeping buttercup	74	2		1	53	106	25	
<i>R. sceleratus</i> L.	Celery-leaved crowfoot			150	350	50			
<i>R. spp.</i>						26		20	
Papaveraceae									
<i>Papaver</i> spp.	Poppy		18		1				
Cruciferae									
<i>Brassica</i> sp.	e.g. Cabbage		1			1	1	2	
<i>Reseda luteola</i> L.	Dyers rocket	7				4			
Caryophyllaceae									
<i>Silene</i> spp.	Campion	3	10		1				4
<i>Agrostemma githago</i> L.	Corn cockle					4	1	15	
Chenopodiaceae									
<i>Chenopodium bonus-henricus</i> L.	Good King Henry		2						
<i>C. polyspermum</i> L.	All-seed								
<i>C. album</i> agg.	Fat hen	2	20	1	9	13	87	4	
<i>C. spp.</i>			58	3	2	4	9	16	
Leguminosae spp.			2	1					
Vitaceae									
<i>Vitis vinifera</i> L.	Grape								1
Rosaceae									
<i>Rubus fruticosus</i> agg.	Blackberry	2	4	2	2	1	2	1	
<i>Potentilla</i> Sp.	Cinquefoil	4	1					1	
<i>Prunus domestica</i> L.	Plum					1	2		
<i>Prunus avium</i> L.	Cherry	1				1	2		
<i>Sorbus</i> sp.	Rowan						1		
Umbelliferae									
<i>Aethusa cynapium</i> L.	Fool's parsley						3		
<i>Cf. Daucus carota</i> L.	Carrot							13	
Polygonaceae									
<i>Polygonum persicaria</i> L.	Willow weed					2			
<i>P. convolvulus</i> L.	Black bindweed					3	11		
<i>P. cf. hydropiper</i> L.	Water-pepper					2	4	5	
<i>P. lapathifolium</i> L.	Pale persicaria					24	2		
<i>P. sp.</i>		1	2				23		
<i>Rumex</i> spp.	Dock		5		2	2		1	
Urticaceae									
<i>Urtica dioica</i> L.	Stinging nettle		31	150	300				
Moraceae									
<i>Morus nigra</i> L.	Mulberry							3	
<i>Ficus carica</i> L.	Fig							1	1
Corylaceae									
<i>Corylus avellana</i> L.	Hazel	1				1	1		
Solanaceae									
<i>Solanum nigrum</i> L.	Black Nightshade		1	26	20				
Labiatae									
<i>Lycopus europaeus</i> L.	Gipsy-wort	10		1	4				
<i>Menyanthes trifoliata</i> L.	Bogbeam					4		3	

Fig. 30. Roman Riverside Wall: List of plants, showing absolute number of seeds recovered.

Scientific name	Common name	Context numbers						
Compositae								
<i>Bidens tripartita</i> L.	Bur-marigold						1	
<i>Senecio</i> sp.	Groundsel	1						
<i>Chrysanthemum segetum</i> L.	Corn marigold				20	91	17	
<i>Centaurea nigra</i> L.	Lesser knapweed				11	17	2	
<i>Leontodon</i> ap.	Hawkbit					4	2	
<i>Picris</i> sp.	Ox-tongue	1		1				
<i>Arctium minus</i> Bernh.	Lesser burdock		1	7	16			
Juncaceae spp.	Rush	2	1		2			
Cyperaceae spp.	Sedge	114	122	6	15	34	14	43
Cereales spp.	Cereal					3	1	2
Caprifoliaceae								
<i>Sambucus nigra</i> L.	Elderberry		400	32	54	2	42	2
Potamogetonaceae								
<i>Potamogeton</i> sp.	Pondweed	2						

Fig. 30 (*contin.*) Roman Riverside Wall: List of plants, showing absolute number of seeds recovered.

position of this deposit, it is by no means inconceivable that some of this material derived from river action during times of flooding, though plants such as *Ranunculus cf. repens*, *Polygonum hydropiper*, *Lycopus europaeus* and the sedges (which could not be more accurately identified due to lack of reference material) could have been growing locally. Similarly the terrestrial mollusca may have been local. The deposition of this layer would appear to have been less affected by human agencies than those described below, suggesting that the mixed assemblage of plants and animals resulted from the position of the deposit relative to the river than from human interference, of which there would inevitably have been less before the construction of the Wall in what is thought to have been a sparsely inhabited area of the City.

Of particular interest from this deposit was a bract of a cone from *Pinus pinea*, the Stone Pine (Willcox 1977, 269-82). The number of specimens of this species found in Roman London is intriguing: they have been found on the site of the Royal Exchange and the National Safe Deposit Company premises (Norman and Reader 1904, 217), the temple of Mithras (Grimes 1968, 114) and St. Swithin's House (Museum of London Acc. No. 24195). More recently finds have come from New Fresh Wharf, Seal House, the Triangle site (with two separate finds in different layers), and two from the present excavation, one being unstratified. In some cases nuts and/or bracts have been found; in others whole cones, which might be thought to imply local cultivation rather than an import, since it might seem unlikely that the nuts would have been imported in their cones. Recently, however, one hundred cones of this species have been unearthed on the Madraguc de Giens wreck (1st century B.C.) in the Mediterranean by Patrice Pomey (personal communication) showing that pine cones were in fact objects of trade. Pollen of the *Pinus* genus has been found in London, but no specific identification is possible at present. There is no evidence to suggest that it was grown locally. The presence of cultivated plants in Roman deposits from London is expanded in another article (Willcox 1977, 269-82).

No reliable deposits contemporary with the construction of the Roman Riverside Wall Period II were located on its southern side, probably being lost to erosion, but to the north a clay bank (BC 75; Fig. 15, layer 19; Fig. 19, layer 109), probably associated with the construction of the Wall, was sampled. The clay, which superficially resembles natural Eocene London Clay, is relatively impermeable and resistant to erosion, which possibly accounts for its use rather than the more manageable gravels available locally. A rich assemblage of freshwater mollusca was recovered from the sample, which appeared to be dispersed throughout the clay, together with charcoal and mortar fragments (Fig. 31). No plant remains were present which, like layer BC 75, 141 (see below), may result from conditions of deposition. Since the clay bank is artificial, and the mollusca were dispersed throughout its depth, the only explanation one can offer is that the material is redeposited London Clay, which was obtained from the river bed and used to construct the bank.

TERRESTRIAL SPECIES	Layer number	109	303	199	178	402	350	2	306	146	141
<i>Carychium minimum</i> (Müller)						13					1
<i>C. tridentatum</i> (Risso)						29	14				
<i>Cecilioides</i> sp.		2				90					
<i>Cepaea nemoralis</i> (L)		1	1			6					
<i>Cepaea</i> sp.						1					
<i>Clausilia bidentata</i> (Strom)						10	1				
<i>Cochlicopa lubrica</i> (Müller)						58	1				
<i>Columella</i> sp. (Müller)						12					
<i>Discus rotundatus</i> (Müller)			2	5	1	48	27				
<i>Euconulus fulvis</i> (Müller)							1				
<i>Helix aspersa</i> (Müller)						81					
<i>Hygromia hispida</i> (L)		3	1	6	5	33	25				
<i>Lauria cylindracea</i> (da Costa)						5					
<i>Monacha cantiana</i> (Montagu)						1					
<i>Oxychilus alliarius</i> (Müller)		1					1				
<i>O. cellarius</i> (Müller)						10	6				
<i>O. sp.</i> (Müller)							9				
<i>Pomatias elegans</i> (Müller)											4
<i>Pupilla muscorum</i> (L)						4	1				
<i>Retinella nitidula</i> (Draparnaud)						2					
<i>Succinea</i> sp.									1		
<i>Vertigo antivertigo</i> (Draparnaud)							1				
<i>Vallonia excentrica</i> Sterki			1				1				7
<i>Vallonia</i> sp.						288					
<i>Zonitidae</i>						223					
<i>Zonitoides nitidus</i> (Müller)											1
FRESHWATER SPECIES											
<i>Acroloxus lacustris</i> (L)											6
<i>Bithyria leachi</i> (Sheppard)											3
<i>B. tentaculata</i> (L)							22				391
<i>B. tentaculata</i> (L) opercula											1771
<i>B. spp.</i>		41	1					24	11	41	681
<i>Lymanaea peregra</i> (Müller)		76					2	7		2	114
<i>L. truncatula</i> (Müller)				1			8	1			8
<i>L. sp.</i>			1	2							
<i>Pisidium amnicum</i> (Müller)											89
<i>P. benslowanum</i> (Sheppard)											52
<i>P. spp</i> including											839
<i>P. supinum</i>											
<i>P. subtruncatum</i> Malm											
<i>P. casertanum</i> (poli)											
<i>P. nitidus</i> Jenyns											
<i>Planorbis olacronicus</i> Ferussac										3	205
<i>P. albus</i> (Müller)											38
<i>P. carinatus</i> (Müller)											49
<i>P. contortus</i> (L)		61					5				3
<i>P. crista</i> (L)											54
<i>P. leucostoma</i> Müller							11				69
<i>P. planorbis</i> (L)											2
<i>P. vortex</i> (L)		3					1	1	1		1
<i>P. spp</i>										1	177
<i>Physa fontinalis</i> (L)											1
<i>Segmentina nitida</i> (Müller)											4
<i>Sphaerium corneum</i> (L)											25
<i>Theodoxus fluviatilis</i> (L)		3	1					2		6	562
<i>Valvata piscinalis</i> (Müller)		6					5	3		6	334
<i>V. cristata</i> Müller											5
<i>V. sp.</i>											546

Fig. 31. Roman Riverside Wall: List of mollusca, showing absolute number of individuals recovered.

Proceeding chronologically, the next group of samples (layers MM 74, 178, 181, 199: Fig. 12, pp. 14-16; and BC 75 402: Fig. 27, p. 51) to be considered were taken in the western area of the site. They post-date the construction of the Wall, but pre-date its collapse. Like many urban deposits the pottery covers a wide date range, in this case from late Roman to the 8th century, indicating that much of the pottery and therefore the environmental evidence is residual — primarily late Roman. This makes any interpretation highly tenuous, particularly as these deposits appeared to be artificial dumping (with no associated surfaces) which raised the levels behind the Wall from *c.* 0.0 to at least 1.0m O.D. Species such as *Ranunculus sceleratus* and the marsh snail *Lymnaea trunculata* suggest wet conditions; however the negative conditions for the freshwater mollusca and the abundance of terrestrial examples in layer BC 75, 402 suggests that the river did not encroach behind the Wall. Further interpretation of the mollusca and plant list is complicated by the human factors which governed their deposition: for example, the mollusca from layer BC 75, 402 include examples from a range of habitats, some shaded, others open. This may result from changing conditions on site or from their artificial introduction by man from other localities. To take some hypothetical cases, grassland plants could have been introduced with manure from domestic animals, or as spilt fodder (for a study of this kind of dispersal in London, see Jones 1958, 193); others e.g. *Arctium* sp. for medicinal uses, *Rubus fruticosus* for food, *Urtica dioica* and *Sambucus nigra* for a variety of industrial uses. Reid (1901, 253) suggests that sedge was introduced at Silchester for thatch, and fern fronds found in layers BC 75, 2, 146 and 306 (pp. 34, 47, 37) may have been brought in and used for animal bedding. Thus it is not possible to separate the background 'noise' created by human activity from the relevant environmental indicators. But the positive evidence for a continuous terrestrial environment is significant.

Layers BC 75, 2 and 306 to the south of the Wall seen in section in the eastern area of the excavation (see Figs. 16, 19) are early 13th century in date, post-dating the collapse of the Wall in the western area of the site. Freshwater species of mollusca predominate, and were clearly observed in layer 316 in the section (see Fig. 19), running in banks up to the eroded south face of the Wall, separated by layers of organic material which presumably represent dumps into what by now must have been a tidal zone (Fig. 31). *Diptera* larvae were also found in bands, the death assemblage possibly resulting from anaerobic conditions brought on by further dumping, so sealing the deposits below. The plant list from layer 306 and 2 consists of species from a variety of habitats and was very probably derived, though some, like *Menyanthes trifoliata* and *Ranunculus sceleratus*, may have been more local. The evidence for river action confirms that the river was washing up against the Wall in the early medieval period and it also implies that this deposit was laid down prior to the insertion of the medieval waterfront (Fig. 19) with which it was associated (p. 46).

Samples from in front of the medieval waterfront (p. 47) which lies to the south of the Wall were taken from layer BC 75, 141 (see Fig. 24). This formed a bed of clean, sorted sand with thin lenses containing a very rich assemblage of freshwater mollusca (Fig. 31) — clearly river-deposited. Plant remains were wanting, with the exception of one seed of *Vitis vinifera* and one of *Ficus carica*. A highly organic layer BC 75, 146 which lay immediately above 141 contained a wide variety of terrestrial plants of similar composition to those found in other deposits on the site, yet the mollusca assemblage found amongst the organic material of this deposit was mostly freshwater. This apparent contradiction presumably resulted from the dumping of rubbish, which included plant remains, over the waterfront and into the docking area — implying that the vast majority of the plant remains were derived, and therefore of no ecological significance. Since the plant remains in the docking area are similar in composition to those in the other deposits, there is good reason to believe that the majority were derived, largely through human action. No dumping accompanied the deposition of the river sand in layer 141, hence the scarcity of terrestrial plant remains.

In conclusion it is apparent that the plant remains were of little use as ecological indicators because the majority appeared to be derived or misplaced through human agency, though the palaeoethnobotany of some finds was significant. Evidence from mollusca appeared more reliable, showing that in the Roman period the Wall was only marginally affected by the river, but that by the medieval period deposits lying up against the surviving south face of the Wall had been laid down in freshwater conditions. Whether the collapse of the Wall was due to river action or deliberate demolition cannot be established.

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2. MAMMAL BONES FROM THE UPPER THAMES STREET SECTION

BY A. C. KING

The samples analysed come from four different stratigraphic units in the Upper Thames Street trench. The earliest, and largest, is the dump deposit dating from the eighth century, but which contained mostly Roman pottery. This makes it likely that the deposit also contained a high proportion of Roman bones. The layers examined are MM 74 199 (E.R. 1499), 201 (E.R. 1500), 181 (E.R. 1489) and 178 (E.R. 1487). The next group is an early 12th century dump (MM 74, layer 155, E.R. 1476). Another deposit comes from the construction and fill of a sewer dating partly to the 16th and early 17th centuries (MM 74, layers 185, E.R. 1491; 195, E.R. 1498; 174, E.R. 1485; 180, E.R. 1488; 188, E.R. 1494; 169, E.R. 1484) and partly from the early 17th century to c. 1666 (MM 74, layers 166, E.R. 1481; 167, E.R. 1482; 157, E.R. 1477; 165, E.R. 1480; 93, E.R. 1446; 121, E.R. 1457; 59, E.R. 1441; 95, E.R. 1447). Lastly, there is a small dump deposit dating to c. 1680 (MM 74, layer 114, E.R. 1456). These are dealt with in turn below.

1. SIXTH-EIGHTH CENTURY DEPOSITS

The statistics of the sample are presented in Figs. 32 and 33. The difference between bone and minimum numbers illustrates the wide variation that can be encountered in using these two methods. Which is more representative in this case? The number of bones is a count of the fragments present and does not permit a more positive interpretation. A calculation for minimum numbers of animals shows the least number of animals killed in order to produce the sample. For an urban site this has little relevance, unless the sample is very large, because of the size of the town's hinterland, the smallness of the sample compared with the hinterland's animal population and hence the probability of selection in the meat consumed. Thus, economic considerations of 'on the hoof' proportions are ruled out. Neither method holds much promise of giving a significant comparison of the species when considered in this way. However, since the sample is part of a dump, consisting partly of domestic refuse, it can be assumed that the bones are probably food remains. Meat is generally served as joints, and by noting a combination of the butchery practices and bone counts, it can be ascertained which joints seemed to have been used and which joints of which species were most common.

	Bone numbers	%	Minimum numbers	%
<i>Bos taurus</i> (Cow)	171	50	5	29
<i>Ovis/Capra</i> (Sheep/goat)	58	17	4	24
<i>Sus scrofa</i> (Pig)	98	29	7	41
<i>Equus caballus</i> (Horse)	2	1	1	6
<i>Cervus elaphus</i> (Red Deer)	2	1		
<i>Capreolus capreolus</i> (Roe Deer)	8	2		
<i>Lepus</i> sp. (Hare)	1	1		
<i>Bos</i> size ribs	52			
<i>Ovis/Sus</i> size ribs	37			
Large longbone fragments	50			
Small longbone fragments	20			
Other fragments	18			
Totals	517	101	17	100

(Note that this table includes teeth, but little difference in the numbers occurs if they are omitted, save for Roe Deer, which was represented by a single mandible with complete dentition).

Fig. 32. Roman Riverside Wall: Species represented by bones.

	<i>Bos</i>	<i>Ovis</i>	<i>Sus</i>
Cranium	8	3	1
Maxilla	2	—	1
Mandible	8	5	11
Scapula	5	6	7
Humerus	4	4	2
Radius	4	5	2
Ulna	6	—	1
Metacarpal	7	6	3
Pelvis	4	2	1
Femur	5	4	4
Tibia	8	5	1
Calcaneum	2	—	1
Astragalus	2	—	—
Metatarsal	8	2	2
Phalanges	4	1	—
Vertebrae	13	—	1

Fig. 33. Roman Riverside Wall: Bones represented for *Bos*, *Ovis/Capra* and *Sus* only.

Before this is done, a word should be said about the size of the sample. Firstly, it is small and thus the percentages are a general indication only. More important, however, is the size of the sample when compared with the potential of the site, in this case Roman London, or, more specifically, all its late rubbish deposits. The proportion is so small that the sample can hardly be taken as representative of anything but itself until more deposits are found for comparison, and the results should be viewed with this in mind.

Cattle carcasses, being large, tend to be chopped up more than the smaller animals to make them into manageable units and so butchered bones are fairly common. The chop marks noted are as in Fig. 34. It is not clear which marks were made on the bones before removal of the meat and which after, but it can be assumed that the bones were split and broken, after the meat had been removed, to obtain the marrow. The many long bone fragments also testify to splitting for marrow and some are abraded, perhaps suggesting boiling for glue or grease (for a deposit at Little Chester (Derbys.) where most of the bones seem to have been split and boiled for grease, see Askew 1961).

Apart from marrow extraction other butchery marks seem to indicate the separation of the mandible from the skull, and of the skull from the body, the parting of the scapula from the humerus, and the humerus from the ulna and radius. The ulna was probably split from the radius subsequently, after removal of the meat. On the hind leg the femur seems to have been separated from the tibia and the ankle cut to sever the naviculo-cuboid and metatarsal from the upper limb.

Thus, if these joints are representative, we have the skull, the tongue, the shoulder, upper fore limb, lower fore limb, the haunches, and upper and lower hind limbs. The numbers (Fig. 35) show an increase in the numbers of joints from the lower limb, those generally regarded as having poorer meat. Also, hand and foot, although well represented by metapodials, have very few of the extremities. Whether the acidity of the soil has destroyed them or whether it was not usual practice to leave them on joints in this deposit is not known.

When the same methods are applied to *Ovis* and *Sus* difficulties arise due to lack of numbers and the small proportion of butchered bones. However, it can be noted that *Ovis* scapulae often have cut marks on the articulation indicating separation from the humerus. Modern shoulders generally leave these two bones together. The numbers, in general (Fig. 33), also show that the axial skeleton is badly represented for *Ovis*. The post-cranial skeleton of *Sus*, save the scapula, is also low compared with the numbers of mandibles. In the case of *Sus* differential preservation may partially account for the lack of post-cranial bones. Counts from sixteen Roman sites in Britain give the following mean values of the percentage of cranial bones to total bones (King 1975a, Table 12).

Bone	Number	Nature of butchery
Mandible	1	anterior split sagittally
Mandible	1	ascending ramus cut to sever ramus
Vertebra	1	chopped dorso-ventrally at proximal end (cervical)
Scapula	2	chopped on blade
Scapula	1	cut in half laterally and cut on blade
Humerus	1	split laterally at proximal end
Humerus	1	with shaved articulation at proximal end
Humerus	2	split sagittally at distal end
Humerus	1	chopped laterally at distal end
Ulna	4	broken near articulation with radius
Radius	3	split sagittally at proximal end
Radius	2	split shafts
Metacarpal	4	split sagittally on the shaft
Metacarpal	1	chopped dorso-ventrally near distal end
Femur	1	trochanter minor chopped from shaft
Femur	1	lateral part of distal end chopped off
Tibia	2	cut marks on proximal articulation
Tibia	7	split or broken shafts
Naviculo-cuboid	1	chopped on proximal side
Metatarsal	7	split or broken shafts

Fig. 34. Roman Riverside Wall: Butchery marks on *Bos* bones.

Skull	2
Tongue	5
Shoulder	5
Upper fore limb	4
Lower fore limb	6
Hand	7
Haunches	4
Upper hind limb	5
Lower hind limb	8
Foot	8

Fig. 35. Roman Riverside Wall: Numbers of joints for *Bos*.

This would suggest a loss of *Sus* material due to poor preservation. Therefore, it is difficult to use bone counts in any economic way until these factors can be taken account of.

Discounting the difficulties of poor bone preservation and small sample, it can be seen that beef joints figure most prominently, even the poorer joints of which were more common than mutton, and that pork *seems* to be the least popular.

Another factor to consider is the age of the animals when killed. For *Bos*, there is a large number of elderly joints present, since 31% of the vertebrae had fused epiphyses, indicating an age at death of at least five years (Silver 1969). This is not common, for the majority of Roman and post-Roman deposits studied for ages at death have very few fused vertebral epiphyses. The data for *Ovis* and *Sus* do not permit interpretation.

When compared with bone groups of the Roman period in other parts of the country, it is apparent that the deposit conforms to a high *Sus*, low *Equus* pattern noted from many late Roman sites, which perhaps suggests a greater amount of woodland in the region than in Iron Age and early Roman times when *Ovis* was usually more common than *Sus* (see King 1975a for the data and a consideration of this).

- Bos* Cranial and mandibular bones are 29% of total *Bos* bones
Ovis Cranial and mandibular bones are 37% of total *Ovis* bones
Sus Cranial and mandibular bones are 64% of total *Sus* bones

Fig. 36. Roman Riverside Wall: % of cranial to total bones from 16 Roman sites in Britain.

To summarize, although the sample is very small when compared with the animal waste potential of London, it does conform in broad terms with the typical late Roman/Saxon pattern of the region and is thus compatible with the high percentage of residual Roman pottery. The species present are the usual Roman food animals, although it is difficult to decide in this instance whether *Equus* was definitely eaten. The joints came from the poorer classes of meat and the lack of skulls and extremities would suggest that, for *Bos* at least, butchery took place elsewhere. Adult meat is more common than usual.

2. EARLY TWELFTH CENTURY DEPOSITS

This small collection is summarised in Fig. 37. All the *Bos* bones are from lower limbs save two upper hind limb fragments and four jaw fragments. Similarly *Ovis*, save a mandible and some teeth. Other late Saxon and early medieval sites in London have many *Sus* bones (Clutton-Brock 1975a; Chaplin 1971, 124; Locker 1976, 176-8). The deposit is probably anomalous in the light of this.

3. SIXTEENTH CENTURY — 1666 DEPOSITS

The layers which make up this deposit have two origins. The majority of the bones are from the construction of the sewer and a few from deposits within it. The feature has two phases and the samples can, therefore, be further subdivided (Fig. 37).

The small sample precludes much interpretation but it can be seen that *Sus* is less common than *Ovis* in both construction layers. This is a feature of late medieval sites in London (Fleck-Abbey and King 1975; Clutton-Brock 1975b) and elsewhere and these deposits seem to follow the same pattern.

The two bones in the first usage phase are parts of a *Bos* femur, both fairly heavy pieces. It may be that the sewer was fast-flowing and that only the heaviest fragments have not been washed away. The second usage phase comprises rather more, and lighter, bones, suggesting a weaker flow in the sewer. However, some of the smaller bones may have been thrown away articulated, such as the thirteen fairly complete sheep ribs that were found, and what may have been the rear portions of a hare, which would have made them heavy and less liable to be washed away before sinking into the sewage sludge.

As for the construction deposits, a nearby dump may have been incorporated into the sewer or else it may represent the remains of workmen's meals (for a workman's bone deposit from medieval Winchelsea, see King 1975b, 141). The ages of the animals when killed are, for the most part, sub-adult since only one vertebra had a fused epiphysis and most of the long bones had already fused.

4. c. 1680 DEPOSIT

This dump deposit comprised the almost complete foetus of a pig, parts of an adult pig and food remains of *Bos* and *Ovis* (Fig. 37).

	<i>Bos</i>	<i>Ovis</i>	<i>Sus</i>	<i>Canis</i>	<i>Felis</i>	<i>Lepus</i>	<i>Rattus</i>	Ribs	Fragments
2. Early 12th century	20	7	—	—	—	—	—	11	7
3. 16th-early 17th century construction	30	19	3	3	8	1	1	23	4
16th-early 17th century usage	2	—	—	—	—	—	—	—	—
Early 17th century — 1666 construction	16	30	13	3	—	—	—	30	11
Early 17th century — 1666 usage	1	2	—	—	—	6	—	21	11
4. c. 1680	5	28	4*	9	—	3	1	44	—

Adult only: 19 bones of a foetus were also found.

Fig. 37. Roman Riverside Wall: The species represented (fragments present) for deposits 2, 3 and 4.

The majority of the bones come from *Ovis*. Limb bones are most common, but skull and feet are rare, probably indicating food remains. Most vertebrae were unfused, but few of the other bones had any unfused epiphyses, indicating a sub-adult age range. A foetal humerus was present.

The *Sus* foetus consisted of both femurs, tibiae and ulnae, a pelvis, radius and humerus, four ribs, one cervical vertebra, and from the skull the supraoccipital, both frontals, a zygomatic and a tympanic bulla. It was probably discarded after the killing of the mother.

The rat pelvis is presumably the black rat (*Rattus rattus*), since the brown rat (*Rattus norvegicus*) is said to have been introduced in the 18th century. The pelvis found cannot be identified down to species.

3. FISH BONES FROM THE UPPER THAMES STREET SECTION

BY A. K. G. JONES

The majority of the bones were picked out by hand during excavation. Two small samples of soil were wet sieved using a 0.3mm mesh. Bones from these samples are also considered.

Period 2, Phase VIII

MM 74, Layer 156, E.R. 1453 (sieved sample)

Pike *Esox lucius* 2 vertebral centra

Eel *Anguilla anguilla* 4 vertebral centra

Cod *Gadus morhua* 2 large vertebral centra

Flounder *Platichthys flesus* 3 vertebral centra and 1 maxilla

MM 74, Layer 157, E.R. 1477

Salmon *Salmo salar* vertebral centrum

5 vertebral centra (2 specimens at least)

Gurnard *Trigla* sp. 2 frags. sculptured cranial bone

Flatfish (Plaice or Flounder) 4 vertebral centra

MM 74, Layer 157, E.R. 1477 (sieved sample)

Herring *Clupea harengus* 2 vertebral centra and 1 dentary

Whiting *Merlangius merlangus* 1 vertebral centrum

MM 74, Layer 166, E.R. 1481

Flatfish (Plaice or Flounder) 3 vertebral centra and 1 anal pterigiophore.

Period 2, Phase VII

MM 74, Layer 174, E.R. 1485

Large gadid clavicle (probably cod)

MM 74, Layer 180, E.R. 1488

Unidentified

MM 74, Layer 185, E.R. 1491

Flatfish (Plaice or Flounder) 2 vertebral centra

Period I Phase A

MM 74, Layer 181, E.R. 1489

Unidentified

MM 74, Layer 199, E.R. 1499

Flatfish (Plaice or Flounder) 4 vertebral centra and 1 anal pterigiophore

Some doubt exists over the determination of salmon. One vertebral centrum was identified to Salmonidae (Salmon family). Its size indicated that it was from a medium sized salmon.

The flat-fish remains were generally unidentifiable to species because the majority of the bones (vertebral centra and anal pterigiophores) are not sufficiently diagnostic. Thus in layers 157, 166, 185 and 199 flatfish remains have been identified as either flounder *Platichthys flesus* or plaice *Pleuronectes platessa*.

One maxilla made the determination of flounder possible.

Taken as a group the bones from this phase represent fish from a wide variety of habitats. Pike are freshwater; eels, flounders and salmon can be found in rivers, estuaries or the sea. The other fish are exclusively marine, occupying different ecological niches, i.e. gurnards live mainly on the sea bed, herrings are pelagic fish. The methods used in catching different fish also vary, i.e. herrings would have been caught mainly in drift or seine nets, cod with hooks and line, eels by spearing or in traps.

The fish represented by this group of bones are likely to have been taken from the River Thames, its estuary and the southern North Sea. It is possible that some were caught in more distant waters.

It is clear that a highly diversified fishing industry was supplying the site.

Due to paucity of material from other phases any further discussion is unprofitable.

ACKNOWLEDGEMENT

I wish to thank Mr. A. C. Wheeler (British Museum, Natural History) for his advice and encouragement in writing this paper.

4. THE CARBON 14 AND DENDROCHRONOLOGY

BY RUTH A. MORGAN

Oak piles forming the foundations of the stone Riverside Wall excavated at Baynard's Castle early in 1975 offered the potential of accurate dating by means of tree-ring examination and radiocarbon analysis. Archaeological evidence suggested a 4th century date, and one C14 date determined on known annual rings of a pile confirmed this with a result of A.D. 240 ± 80 (HAR 1083), to which must be added approximately eighty years growth allowance (see Fig. 43). A further guide to the dating is the inscription of A.D. 251-259 which the Wall's construction must post-date (see Report on Inscriptions, below, p. 198). The aim of the dendrochronological study was therefore to locate as nearly as possible the exact date of the felling of the timber and in all probability the construction of the Wall.

Thin cross-sections of ten piles, four from the eastern area below the standing Wall and six from the west where the Wall had been destroyed, were sawn and split into segments ready for analysis. The cross-sections showed that all the piles were complete trunks hewn to a square or rectangular shape of uniform size, about 25-30cm by 19-25cm, with a radius of 14-18cm. Six of the piles examined had some outer sapwood remaining at one or two corners (piles 1, 5, 7, 8, 10 and 11 in Fig. 38), the amount depending on the degree and position of trimming. The importance of sapwood is discussed below.

Hewing splits down the wood cells and prevents the entry of agents of decay, thus providing a more durable timber, particularly under waterlogged conditions. The total absence of any radial cracking caused by drying out or of insect attack confirmed that the wood had probably been used soon after felling while still green (usual Roman practice; see Hollstein, 1965). Green wood is easier to work, and the seasoning of piles would be unnecessary.

The wood sections were deep-frozen in order to consolidate the wood, particularly the soft sapwood, for cutting with a sharp knife along the radius; having dried slightly, the cut edge allows the wood structure to be examined easily even in blackened waterlogged wood. Oak has a ring-porous structure; each annual ring is composed of a line of large earlywood vessels formed in spring, followed by a zone of dense latewood formed in summer. Each annual ring is clear even to the naked eye (Morgan 1975).

The ring-widths are measured to an accuracy of 0.1mm and each value is plotted on a logarithmic scale to produce a graph of the growth pattern for each timber. The graphs must then be compared and if possible matched by visual assessment and by computer, which can calculate objectively the degree of similarity between two curves (two programmes are available — Baillie & Pilcher 1973; Eckstein & Bauch 1969. Discussed in Baillie 1974; Morgan 1976).

The ten Baynard's Castle piles provided tree-ring sequences of between 53 and 100 years in length, including between 3 and 23 rings of sapwood (details in Fig. 38). Such sequences are quite short in dendrochronological terms, since at least 50 years of overlap are preferred for accuracy in matching, and it is usual to omit the first 20 growth rings around the pith due to erratic fast growth. Some of the growth patterns produced are shown in Fig. 39; the annual rings tend to fall in width as the tree grows older (the age trend) and here they fall quite rapidly from about 4mm down to 1-2mm. Growth is however sensitive; that is, the widths of the rings fluctuate widely from year to year to produce the pattern essential for cross-matching. Certain outstanding rings, such as the wide one in arbitrary year 62, are known as signatures.

Computer comparison of each pair of curves (using the German programme, Eckstein & Bauch 1969) gave some indication of the levels of similarity between each; the very high similarity values

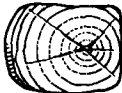
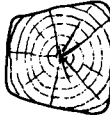






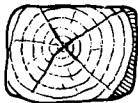


<i>Sample no.</i>	<i>Context</i>		<i>No. of rings</i>	<i>No. of sapwood rings</i>	<i>Dimensions</i>	<i>Sketch</i>
1	BC	W	53	3	28 x 20cm. radius 16cm.	
2	BC	W	68	—	27-33 x 25cm. radius 17.5cm.	
4	BC	E	100	—	27 x 19cm. radius 16cm.	
5	BC	W	82	23	32 x 22cm. radius 16cm.	
6	BC	W	71	—	25 x 20cm. radius 15cm.	
7	BC	W	76	3	30-32 x 25cm. radius 16cm.	
8	BC	E	75	4	29 x 22cm. radius 14cm.	
9	BC	E	72	—	28 x 21cm. radius 16.5cm.	
10	BC	E	74	13	27 x 22cm. radius 17cm.	
11	BC	W	100	22	29 x 22cm. radius 18cm.	
12	Revetment to S. of wall, earlier.		129	—	24 x 4cm.	

Fig. 38. Roman Riverside Wall: Details of the ten Baynard's Castle oak piles with sketches of their cross-sections (hatching shows sapwood), and of an earlier plank (sample 12) found in the revetment south of the Wall.

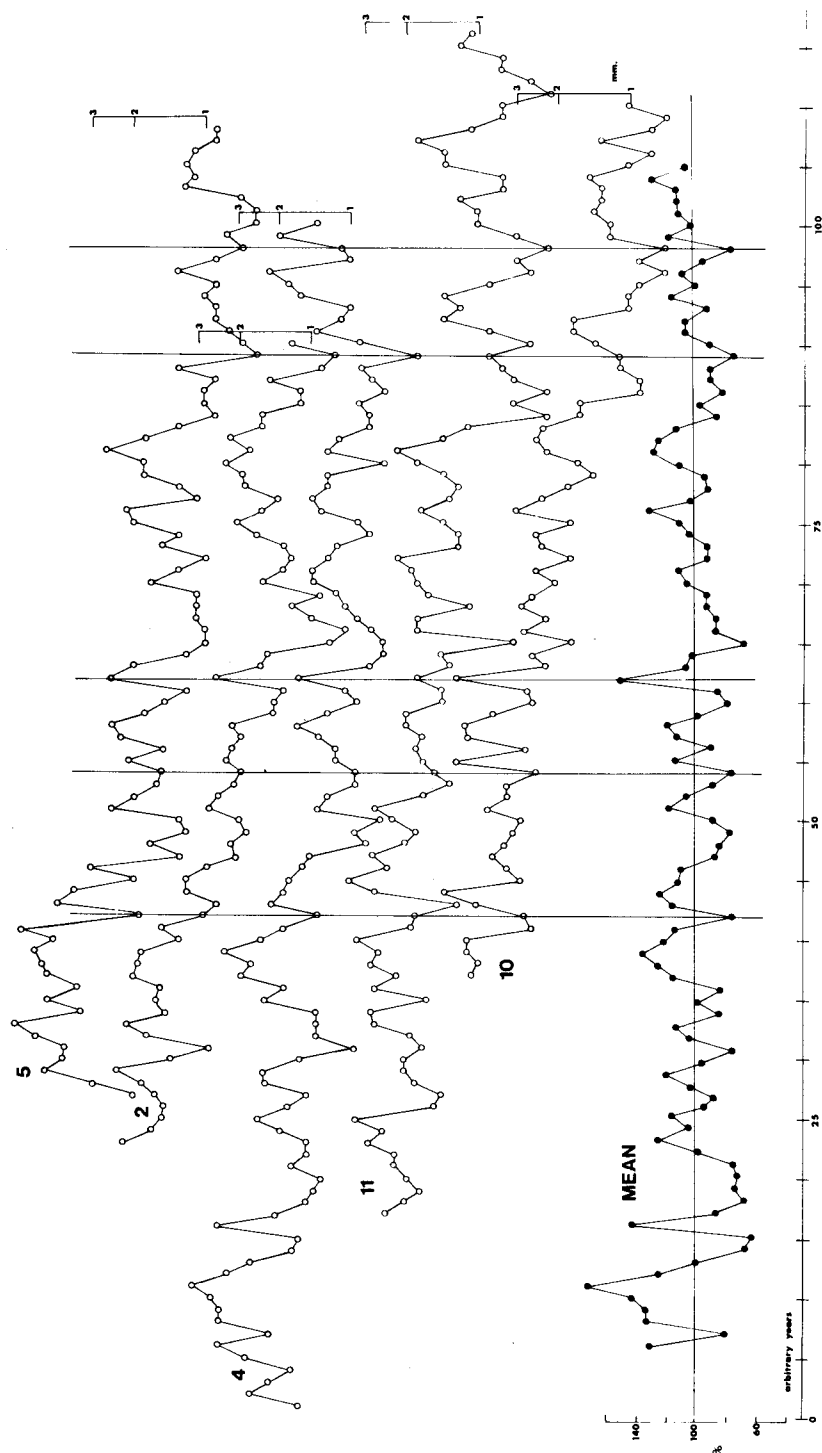


Fig. 39. Roman Riverside Wall: The ring-width curves of five oak piles (2, 4, 5, 10 and 11) in their synchronous positions with the resulting mean curve below. The ordinate scale is in mm and is logarithmic, while the abscissa represents arbitrary years; each circle represents the width of the annual ring. The mean curve values have been converted to percentage deviations from the mean in order to eliminate the age trend (since this is based on a ten year running mean, the first five and last eleven values have to be omitted); vertical lines connect significant wide and narrow rings. The last few rings on the right of piles 5, 10 and 11 consist of sapwood.

(70% or more) picked out in Fig. 40 suggest that several of the piles may have originated in the same tree, and definitely in adjacent trees in the same woodland. High values are found for pairs 2 and 5, 4 and 5, 5 and 8, 6 and 10 and 9 and 10 with overlaps of 60-73 years, and indicate that pile 5 may have come from the same tree as one or all of 2, 4 and 8, and that 6 and 9 may have come from the same tree as 10. The piles are between 2 and 3m long; a tree such as these, 100 to 150 years of age and about 0.4m in diameter, might produce between 5 and 10m of clear bole (trunk to the height of the first branch) and could easily provide sufficient timber for 2 or even 3 piles. The estimate of over 750 piles supporting the wall implies the felling of an extensive area of woodland of straight fast-grown oaks.

Nine out of ten of the tree-ring curves could be synchronised and their relationship in time established, the only exception being pile 1, which had the shortest and least sensitive ring-width sequence. Fig. 41 shows how the nine curves are related. Each block represents the time span in arbitrary years covered by the curve, the hatching on the right representing the outer sapwood. The sapwood of oak is very important as it maintains a uniform width which is predictable according to region and age of tree; thus with the recognition of only one sapwood ring, it is possible to estimate the year in which the tree was felled. Having lost all the sapwood through decay or trimming, there is no method of finding out where the boundary may have been and how much heartwood has also gone.

The sapwood width in oak averages 25 annual rings in a mature tree with average ring-widths of 1-2mm. Two of the piles have almost their full sapwood zone remaining (piles 5 and 11). However, the boundary between the heartwood and sapwood fluctuates widely between arbitrary year 85 (pile 5) and subsequent to arbitrary year 105 (pile 6), unless it is supposed that timbers 4, 6 and 9, which have no sapwood remaining and whose final measured heartwood rings fall later than the sapwood boundary on other timbers, were felled several years later.

The sapwood boundary lies at an average of arbitrary year 94.3 ± 10 (left vertical dotted line in Fig. 41). On the basis of an estimated width of 25 years, the felling date would occur in about arbitrary year 120 ± 10 (right vertical dotted line in Fig. 41).

Attempts to locate the actual date of arbitrary year 120 have been made by means of dendrochronological comparisons and by C14 dating. The corresponding annual values for each of the nine curves were averaged to give a mean curve illustrated at the base of Fig. 39 (converted to percentage deviations from the mean to eliminate the age trend). The annual values are listed in Fig. 42. The mean curve can then be compared to any available contemporary tree-ring data, to see if any similarity of growth pattern can be ascertained.

	Pile no. 2	4	5	6	7	8	9	10	11
2	—								
4	x	—							
5	<u>72.2</u> 63	<u>69.9</u> 73							
6	x	66.3 66	65.1 70	—					
7	62.9 66	64.7 75	63.2 68	x	—				
8	65.9 66	63.5 74	<u>71.2</u> 66	65.3 59	63.7 73	—			
9	x	60.6 71	60.0 70	x	64.5 69	65.7 67	—		
10	x	x	60.6 71	<u>75.5</u> 70	x	61.6 56	<u>70.8</u> 60	—	
11	x	60.7 84	60.5 81	67.9 70	x	x	x	63.7 73	—

Fig. 40. Roman Riverside Wall: Matrix showing the similarity values (as %) calculated by computer (German programme, Eckstein and Bauch 1969) for each pair of curves with the length of overlap in years below each value. Some of the values are extremely high (70% and above) and their significance is discussed in the text.

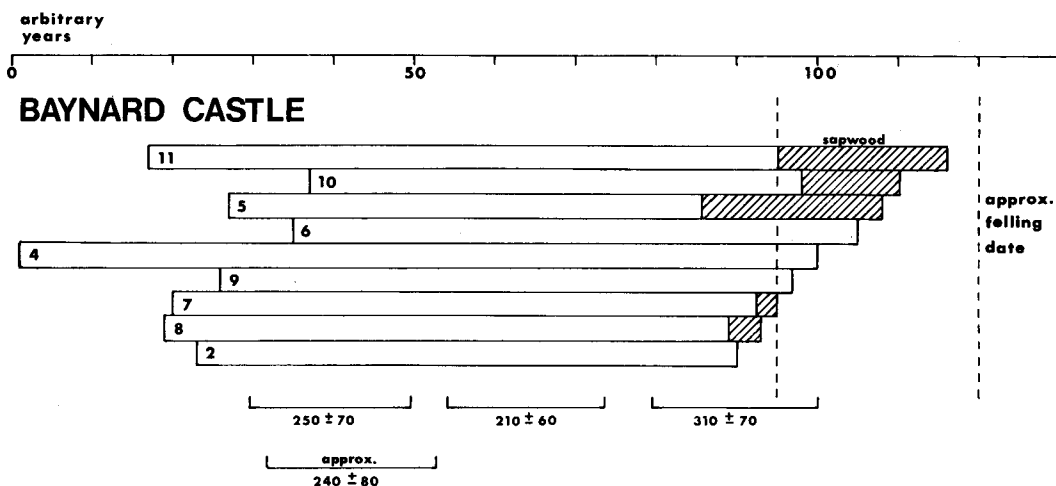


Fig. 41. Roman Riverside Wall: The block diagram shows the relationship between the nine tree-ring sequences from the oak piles; each block shows the period in arbitrary years spanned by the growth rings, and the outer sapwood is represented by hatching. The vertical dotted lines at about arbitrary years 95 and 120 indicate the probable limits of the sapwood zone, and the latter year is the approximate date of felling. Below are the positions and results of the C14 samples. (Correction The date 310 ± 70 should read 275 ± 50).

BAYNARD'S CASTLE MEAN TREE-RING CURVE

	0	1	2	3	4	5	6	7	8	9	No. of samples
0		15.0	24.0	20.0	16.0	25.0	33.0	20.0	33.0	33.0	1
10	35.0	42.0	30.0	24.0	16.0	15.0	34.0	21.5	17.0	19.3	3
20	19.5	19.7	27.5	34.8	29.6	33.6	28.0	25.6	30.6	36.1	7
30	28.6	23.1	31.8	35.4	26.0	31.0	25.9	35.5	37.0	39.5	9
40	33.7	31.5	20.0	30.3	31.1	26.8	25.8	20.1	19.1	16.9	9
50	18.7	25.5	22.1	18.5	15.3	22.2	17.1	21.1	22.2	18.4	9
60	14.4	15.5	26.4	17.8	16.8	11.4	14.0	13.8	15.1	15.0	9
70	16.7	18.1	15.5	15.5	16.9	18.2	21.5	16.3	13.8	13.9	9
80	15.7	17.6	17.2	15.1	11.4	12.2	9.6	11.1	11.3	9.3	9
90	10.8	13.2	12.6	11.4	13.6	12.3	12.8	10.7	9.2	13.6	5
100	12.2	12.7	13.0	13.5	14.7	12.0	11.0	13.3	9.3	7.5	2
110	9.0	5.0	6.0	8.0	8.0	12.0	11.0				1

Fig. 42. Roman Riverside Wall: Average annual values (0.1mm) for the mean curve of 116 years from nine Baynard's Castle piles, based on the positions shown in Fig. 41.

No dated reference curve in England yet extends as far back as the Roman period, and construction is hindered still further by the frequent use of young wide-ringed timber, particularly in the late Roman period, which is not usually suitable for inclusion in reference data. Several floating chronologies for this period have been constructed by the writer, but no matches were located from visual and computer comparison. Furthermore, the German reference curve, which now extends back into Hallstatt and La Tène contexts (Hollstein 1967; 1972), is as yet unpublished prior to A.D. 822, and a weak link still exists in the late Roman period which may affect the dating of earlier timbers.

It must therefore be concluded that dendrochronological dating of this 116 year floating curve is not possible at the present time, and may only be so when a tree-ring reference curve for oak in southern England has been extended back into Roman times (progress is being made; e.g. Fletcher & Dabrowska 1976), or when Roman timber has been reliably dated by means of the German reference curve.

In view of the tree-ring dating problems, C14 sampling of selected annual rings offered the only chance of fixing the date of the timbers with any accuracy. Three samples associated with the tree-ring data were examined at Harwell; they consisted of 20 annual rings each, and came from 25 year intervals of the mean curve at arbitrary years 40, 65 and 90 (see Figs. 40; 43). Knowing the intervals in calendar years between each sample and between the samples and the felling of the tree, it is possible to give a much more accurate construction date than for one C14 date alone on material such as charcoal.

Harwell No.	Mid-point, arbitrary years	No. of growth rings	Approx. growth allowance years	Date AD $t\frac{1}{2} = 5568$	Date AD $t\frac{1}{2} = 5730$	\pm	Final date with growth allowance (uncalibrated)
1590	timber 12 119	20	35 +	180	185	80	220 +
1083	14 timbers 4 & 5	22	77 +	240	247	80	324 +
1456	40	20	80	250	257	70	337
1457	65	20	55	210	216	60	271
1464	90	20	30	310	275 283	70	313
1724				240		70	

Fig. 43. Roman Riverside Wall: Details of the five radiocarbon dates based on the tree-ring curve from the Baynard's Castle timbers. HAR 1590 is from an earlier plank in the south revetment to the Wall, HAR 1083 was determined on known annual rings of a pile, and HAR 1456, 1457 and 1464/1724 form a series of three from 25 year intervals of the 116 year mean tree-ring sequence based on nine piles; with growth allowance added, they give three final dates for the felling of the trees. (HAR 1724 is a re-run using wood from the same annual rings as 1464, so the results of both are averaged). For discussion, see text.

The C14 results are given in Fig. 43 using both half-lives, and the right hand column gives the final uncalibrated date consisting of the date using the 5730 half-life added to the growth allowance (based on the tree-ring results) in column 4. HAR 1456 and HAR 1464/1724 are extremely consistent, as is also the date already mentioned, HAR 1083, indicating a felling date in the second quarter of the fourth century; HAR 1457 is somewhat older, but consistent within one standard deviation. It may then be concluded that the piles were felled in about A.D. 330-350 in radiocarbon terms; calibrated dates would bring the Wall's construction closer to A.D. 400.

Finally a wide radially cut plank (sample 12 in Fig. 38) was discovered in the revetment south of the Wall and is of an earlier date. Planks cut in this way are particularly valuable for dendrochronology, as they usually provide a long series of growth rings along most of the radius of a large straight-grown tree; in this case, a series of 129 growth rings with an average width of 1.2mm and a high degree of sensitivity could be measured, but no sapwood remained on the outer edge. The ring-width values are given in Fig. 44.

TIMBER 12	0	1	2	3	4	5	6	7	8	9
	0	23.0	17.0	14.0	7.0	7.0	7.0	8.0	7.0	7.0
	10	6.0	8.0	11.0	19.0	18.0	14.0	13.0	18.0	23.0
	20	18.0	13.0	14.0	26.0	18.0	13.0	14.0	14.0	12.0
	30	16.0	13.0	17.0	21.0	21.0	19.0	11.0	19.0	22.0
	40	15.0	10.0	16.0	18.0	27.0	19.0	20.0	25.0	15.0
	50	10.0	14.0	11.0	11.0	13.0	26.0	19.0	23.0	27.0
	60	22.0	16.0	10.0	14.0	21.0	18.0	20.0	22.0	18.0
	70	14.0	10.0	11.0	14.0	20.0	22.0	23.0	19.0	16.0
	80	9.0	8.0	11.0	9.0	8.0	10.0	9.0	12.0	17.0
	90	16.0	17.0	23.0	25.0	15.0	15.0	17.0	20.0	25.0
	100	24.0	15.0	23.0	29.0	20.0	22.0	23.0	17.0	19.0
HAR 1590	110	17.0	19.0	23.0	27.0	22.0	23.0	15.0	17.0	17.0
180 \pm 80	120	33.0	31.0	30.0	23.0	21.0	27.0	24.0	34.0	30.0

Fig. 44. Roman Riverside Wall: The annual ring-width values (0.1mm) for the plank, sample 12, found in the revetment to the south of Baynard's Castle wall, with its C14 date.

Since the timber was known to pre-date the Wall, it was compared to several floating or tentatively dated tree-ring sequences from the 2nd century waterfronts in London (Custom House by Fletcher 1974; New Fresh Wharf and Seal House by Morgan 1977) and from a Roman well at Wederath in Belgium (Hollstein 1972) which spans the period A.D. 39 to 245 approximately. No agreements were forthcoming from the London curves; one possible match occurred with the Wederath curve giving a tentative date of A.D. 150 to the final ring of the Baynard's Castle plank, which would place the felling date at some time after A.D. 175 (sapwood allowance).

A radiocarbon sample cut from the final 20 annual rings of the plank was determined at A.D. 180 ± 80 (HAR 1590) (see Fig. 43) which confirms the approximate tree-ring dating, and suggests a probable date of around A.D. 200.

Addendum

Subsequent work in 1978-79 by Jennifer Hillam on piles from the Wall at New Fresh Wharf and the Tower has confirmed cross-dating of the tree-ring pattern along its length. However, as suggested above, the timber had evidently been cut at varied times and may have been stockpiled or reused; some felling dates from these sites could be 20 or so years later i.e. around A.D. 350-370, when parts at least of the Wall must have been built. Interpretation of the tree-ring results is complex (for further discussion see, Hillam and Morgan 1979).

(b) THE FINDS

EDITED BY MARTIN MILLETT

INTRODUCTION

The finds reported upon come from two separate excavations, and although the reports have been amalgamated as far as possible the differences in collection procedure determined by the nature of each excavation makes some variation inevitable. The Upper Thames Street Section was a controlled, but limited, excavation and although no sieving was undertaken the aim was total collection. Despite this the small scale of the excavation and the consequent paucity of finds preclude close dating. The Riverside Wall excavation presented a completely different problem with a large building site area for which only limited time was available, so that here finds were only kept from important and stratigraphically safe deposits. Readers should bear this in mind when considering the material and its interpretation.

The deposits from which the finds come are referred to by the site codes and layer numbers used during the two excavations, MM 74 referring to the Upper Thames Street trench and BC 75 to the Riverside Wall excavations. Every individually described object or pot-sherd is given a *Catalogue Number*, these also being used in the illustrations. A Museum of London group accession number, prefixed by the letters *E.R.*, is given with the layer number of each group of finds. Accession Numbers for individual finds are also given, these being in two parts of which the first is the *E.R.* number of the group to which each belongs. All the finds have been added to the collections of the Museum of London.

ACKNOWLEDGEMENTS

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The catalogues were prepared by Linda J. Hall. The metal finds were radiographed by John Price of the Department of the Environment. The conversation was carried out by Bill Rector, Joyce Andrews, Andrew Argyrakis and Ann Edmondson of the Museum of London; the photographs are by Trevor Hurst and the illustrations by Elisabeth Crowfoot, Linda Hall, Martin Millett, Mark Redknap, James Thorne and Michael Rhodes.

1. THE POTTERY

(a) THE ROMAN POTTERY

BY MARTIN MILLETT

The Roman pottery from the excavations consists mainly of a series of small groups from the Riverside Wall excavations (BC 75), and of a large dump discovered both in the Thames Street Section (MM 74: Period IA, Layers 181, 199, and 201) and on the Riverside Wall site (BC 75: Period III, Area VIII, Layer 402). As this dump contained three Saxon and one medieval sherd, the Roman pottery is residual. However, since the pottery from the dump consists of a group consistent with a late 4th to early 5th century date, several sherds of intrinsic interest are published. I am indebted to Mr. G. B. Dannell, F.S.A., for examining the stratified samian ware and to Dr. M. G. Fulford for discussing the Mayen ware with me.

Fig. 45, Nos. 1-10

RIVERSIDE WALL, PERIOD I

BC 75, Layer 24, E.R. 1519

Samian ware:

- One Drag. 18, probably Flavian, South Gaulish.
- One Drag. 18/31, Hadrianic, Central Gaulish.
- One Drag. 27, Flavian, South Gaulish.
- One Drag. 37, Hadrianic, Central Gaulish.

Coarse ware:

Ten sherds, including one rim (Fig. 45, No. 1) in dark grey, sand-tempered ware with burnished slip, which dates to the 2nd century (*cf.* Cunliffe 1971, Fig. 105 Types 207-8); and a single sherd of rouletted 'London ware' which is probably of 1st century date, together with a small sherd of poppy beaker which is probably of 2nd century date.

BC 75, Layer 25, E.R. 1520

Four sherds including one rim of Farnham ware dish (Fig. 45, No. 2) in dark grey fabric with fine multi-coloured sand temper. Probably post *c.* A.D. 170.

RIVERSIDE WALL PERIOD II

BC 75, Layer 12, E.R. 1510

Samian ware:

- One Drag. 35, Flavian, South Gaulish.

BC 75, Layer 16, E.R. 1513

Samian Ware:

- One Drag. 18R, late 1st century, South Gaulish.
- One Drag. 37 or 38, Hadrianic, Central Gaulish.

Coarse ware:

Three body sherds.

BC 75, Layer 23, E.R. 1518

Coarse ware:

One dish rim (Fig. 45, No. 3) in hard burnished ware (probably from the Farnham kilns). Probably post *c.* A.D. 170.

BC 75, Layer 107, E.R. 1527

Coarse ware:

Four sherds including one fragment of rope rim storage jar, probably 3rd century or later; and one body sherd of Oxfordshire ware mortarium, which is probably post *c.* A.D. 270.

BC 75, Layer 108, E.R. 1528

Coarse ware:

Two sherds including one base of an Oxfordshire ware mortarium which is probably post *c.* A.D. 270.

BC 75, Layer 20, E.R. 1516

Coarse ware:

Four sherds including one 'Castor Box' rim (Fig. 45, No. 4) in a hard, off-white fabric with a reddish-brown colour coat. Probably 3rd or 4th century A.D.; and an Oxfordshire red colour coated bowl of Young (1973) Type 30 which is probably post *c.* A.D. 270 (Fig. 45, No. 5).

BC 75, Layer 102, E.R. 1524

Coarse ware:

Thirteen sherds mainly from the base of a single Nene Valley ware beaker. A single rim sherd (Fig. 45, No. 6) from another such beaker, in hard orangey ware with a reddish-brown colour coat, probably dates to the late 3rd or 4th century A.D.

BC 75, Layer 21, E.R. 1517

Coarse ware:

Six sherds, two of which are diagnostic, the first being the rim of an Oxfordshire bowl (*cf.* Young 1973, Fig. 2, 19 and 20) which dates to the 4th century. The second is a body sherd from a rilled jar in 'Tilford' ware (Clark 1949, 26-56). This fabric is one of the range of 4th century Farnham wares and does not appear before *c.* A.D. 320. The fabric is, however, most common in the later 4th to 5th century (Millett, forthcoming).

RIVERSIDE WALL PERIOD II? POSSIBLY PERIOD IV

BC 75, Layer 101, E.R. 1523

One residual Samian sherd and five other sherds including the rim of a flanged bowl in Farnham ware (Fig. 45, No. 7) of late 3rd or 4th century date. Two of the other sherds are of Nene Valley ware and similar in date.

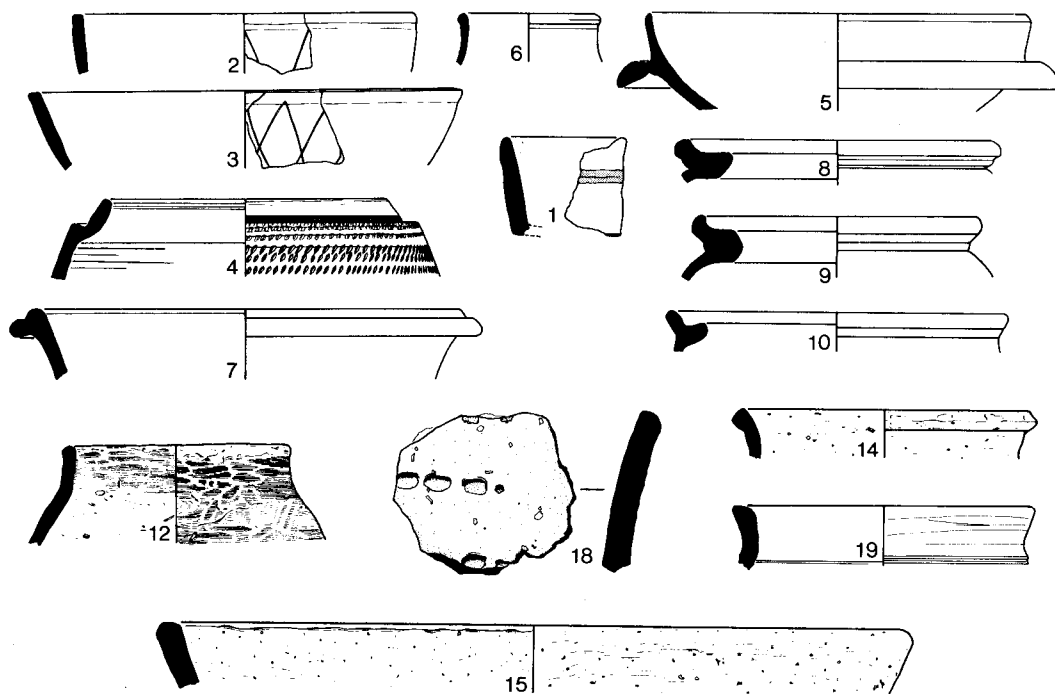


Fig. 45. Roman Riverside Wall: Roman pottery 1-10 ($\frac{1}{4}$), Saxon pottery 12-19 ($\frac{1}{4}$ except 18, $\frac{1}{2}$).

THE DUMP

RIVERSIDE WALL PERIOD III

BC 75, Layer 402, E. R. 1537

Thames Street Section Period IA

MM74, Layer 181, E. R. 1489, Layer 199, E. R. 1499, Layer 201, E. R. 1500

This deposit contained a large quantity of late Roman pottery in addition to the three Saxon sherds (below, p. 97) which date to at least the 6th century A.D. As the

Roman material is residual, only sherds of intrinsic interest are illustrated. The summary below lists the wares present.

The only sherds from this group illustrated are the three rim sherds of Mayen ware (Fig. 45, Nos. 8-10) as these late, German, imports are not common. The remainder of the assemblage is typical of other late Roman deposits in London.

Fabric type

	Thames Street MM 74, Layers 201, 199, 181			Riverside Wall BC 75, Layer 402
Samian	2	5	2	3
Oxfordshire colour-coats	6	2	2	14
Nene Valley	2	2	4	20
New Forest	—	—	1	2
'London Ware'	—	—	1	—
Amphorae	1	1	2	3
Oxfordshire mortaria	3	—	—	4
Farnham ware	2	7	7	55
Orange 'mica-dusted' ware	—	1	—	—
Mayen ware	—	2	1	1
Late Roman shell-gritted ware	—	2	—	4
Others	7	12	9	80

Fig. 46. Roman Riverside Wall: Summary of wares present in Period III dump.

(b) THE SAXON POTTERY

BY MICHAEL RHODES

Three sherds of 'chaff-tempered' pottery were recovered, one from the Upper Thames Street Section (MM 74, Layer 199, E.R. 1499) and two in the course of C. Hill's subsequent excavations nearby in Area VIII during earthmoving work (BC 75, Layer 402, E.R. 1537). All are thought to be from the same layer, a dark brown/black clayey earth with mortar flecks, small pebbles, some tile and shell. This is interpreted as a dumped deposit and clearly predates the collapse of a section of the Roman Riverside Wall (Area VIII) which immediately overlay it. Other ceramic finds from the same layer consist of about 200 abraded residual sherds, mostly of late Roman date and a small sherd of medieval glazed pottery (late 12th century or later), possibly an accidental intrusion (below, p. 72). The date of this crucially important layer therefore depends on the chaff-tempered sherds, which, for this reason as well as for their rarity in the City of London, have been accorded special attention. All the pottery fabrics in this report are described according to the conventions outlined by Orton (1977, 28-30).

Fig. 45, Nos. 12, 14-15, 18-19

11-13 are handmade in the same fabric: hard, irregularly fractured with abundant, very coarse chaff with moderate, ill-sorted, sub-angular, bimodal (very fine and very coarse) quartz in a slightly micaceous matrix. Reduced, dark grey or black.

- | | |
|---|---|
| <p>11. Flat base, smooth on the underside indicating that the vessel was constructed on a flat surface of stone or wood, since it is unlikely that the base of such a vessel would have worn smooth in use. From MM 74, Layer 199, E.R. 1499.</p> | <p>12. Rim sherd burnished on the outside and the inside of the neck, perhaps with a pebble. From BC 75, Layer 402, E.R. 1537 (Illustrated).</p> <p>13. Thick (max. 14mm) body sherd of indeterminate form. Provenance as for No. 12.</p> |
|---|---|

Saxon chaff-tempered pottery is extremely uncommon in the City of London. Two other examples are known to date:

- a) from the site of Bastion 6 excavated by P. Marsden in 1971 (E.R. 1345; for location of Bastion 6 see map in Merrifield 1965).
- b) a small residual (?) sherd in a late Saxon pottery group dated by C14 to A.D. 870±80 (uncalibrated) at New Fresh Wharf (excavated by J. Schofield; see Miller 1977, 47-53).

Outside London many examples of 'chaff-tempered' and 'grass-tempered' pottery (the terms have unfortunately tended to be synonymous) have been recovered in systematic excavations over the last decade. Most frequently the type has characterised sites of early- rather than mid-Saxon date, *v.* Hurst (1976, 294). The date range roughly covers the 5th to 7th centuries although in some areas, notably in and around Greater London, it does seem to occur later in the Saxon period (see Northolt, 8th-9th centuries (Hurst 1961, 255-6); Old Windsor, until the 11th century (Hurst 1959, 21); and associated with middle (?) - Saxon Ipswich-type fabrics at Waltham Abbey (Huggins 1976, 101-8); Whitehall (Haslam 1975, 221); and Arundel House, The Strand (*ibid.*)).

With regard to the shape of the pot-sherds, if the flat base (No. 11) and rim (No. 13) belong together they would come from a vessel comparable to Myres Type 7 (Myres 1969, 160-1) but since the forms of rough Saxon handmade pottery appear to be too variable for close definition, *v.* Hurst (1976, 292-295) and Myres (1969, 25), it must suffice to say that the vessels represented by these sherds of pottery fall well within the range of known early Saxon types, although a middle-Saxon date is just possible.

RESIDUAL SHERDS

Six residual sherds of middle Saxon and late Saxon to early Norman date were recovered from four separate layers in the Upper Thames Street Section. Because so few sites in the City of London have produced pre-Conquest Saxon pottery and little of this has been published, the sherds are described in detail. The Upper Thames Street Section is in a part of the City which has so far produced few Saxon finds (see plan in Biddle and Hudson 1973) and is remote from the area of the Saxon street plan proposed by Biddle and Hill (1971, 83-4).

Apart from the fragment of Ipswich ware the dating of this pottery is very difficult because of the lack of comparative material, and will be subject to revision as the number of excavated groups increases.

14. Cooking pot: everted rim sherd of a handmade vessel. Reduced soft, black fabric (5 YR 2.5/1) with red margins (10 R 5/8) and very pale brown (10 YR 7/4) surfaces. Rough to the touch and irregularly fractured. The inclusions are abundant, ill-sorted, sub-angular, coarse quartz; moderate irregular, coarse to very coarse limestone and shell; and moderate, sub-angular, coarse to very coarse grog. For similar forms see Clark (1973, Fig. 19, Nos. 2, 6 and 7) dated to the 11th century, and Cunliffe (1964, Fig. 31, No. 5) dated as late 11th century. Residual in MM 74, Layer 155, E.R. 1476 (illustrated).
15. Bowl-rim: handmade. Fairly hard, smooth to soapy fabric with dark grey core (N6) and reddish brown (2.5 YR 6/6) margins and surfaces. Irregular fracture. The inclusions are abundant, very coarse, irregular limestone and moderate, sub-angular, fine, black ironstone. Fabrics of the same general type come from the St. Nicholas Acon site in a context dated between A.D. 1025 and 1084 (E.R. 879) *v.* Marsden (1967, 219-210) and from the St. Mildred Bread Street site (E.R. 1379) where a late Saxon date is suggested *v.* Rhodes (1975, No. 103). Open bowls are known from early Saxon times onwards. Residual in MM 74, Layer 193, E.R. 1497 (illustrated).
16. Body sherd from a thin-walled handmade vessel in a fairly hard, dark (5YR 5/1) fabric with reddish brown margins (2.5 YR 5/6) and surfaces (7.5 R 4/2). The feel is rough to smooth and the inclusions are abundant, medium to very coarse limestone and moderate, irregular, black ironstone. Closely similar sherds come from the St. Nicholas Acon site, particularly from E.R. 879 (see No. 15). Probably 11th century. Residual in MM 74, Layer 193, E.R. 1497.
17. One sherd from a handmade vessel in fairly hard fabric, powdery to the touch with irregular fractures. The external surface is black (2.5 N), the core light brown (10 Y 6/1) and the internal margin and surface is brown (7.5 YR 6/4). Inclusions are moderate, medium to very coarse, ill-sorted, sub-angular quartz; moderate to abundant, very coarse shell; moderate, fine sub-angular black ironstone and moderate, very fine white mica. The surfaces are wiped. Date uncertain. Residual in MM 74, Layer 140, E.R. 1465.
18. Body sherd in a hard, dark grey (N 2.5) fabric, rough to the touch and with irregular fracture. Inclusions are moderate to abundant, coarse, white, sub-angular quartz and moderate, very coarse (up to 2 mm) chalk which has burnt away on the inside. Punctate decoration in the form of parallel rows of oval marks. The form of decoration is unusual but is found on a sherd from St. Nicholas Acon (E.R. 889) dated pre-A.D. 1084. Residual in MM 74, Layer 122, E.R. 1458 (illustrated).
19. Pitcher rim, from a wheel-turned vessel in a very hard, powdery fabric with finely irregular fractures, light grey core (10 YR 7/1), greyish brown margins (7.5 YR 5/2) and dark grey (N4) surfaces. Ipswich ware; rills indicate the sherd is probably from a spouted pitcher *v.* Hurst (1959, Fig. 5, 1 and 3) dated A.D. 650-860. From BC 75, Layer 401, E.R. 1536 (illustrated).

(c) THE MEDIEVAL AND POST MEDIEVAL POTTERY

BY JAMES C. THORN

A. POTTERY FROM THE RIVERSIDE WALL EXCAVATIONS (BC 75)

Fig. 47, Nos. 20-37.

THE INVENTORY

PERIOD III

The artifacts from this period, comprising largely a mixture of Roman and medieval pottery, all show the abraded surfaces that might be expected from erosion deposits.

BC 75, Layer 10, E.R. 1508

Medieval pottery consisting of body sherds of possible Pingsdorf, Andenne and Northern French wares. Also a few amorphous sherds of grey ware and a rim sherd in shell-tempered ware (Fig. 47, No. 20).

BC 75, Layer 11, E.R. 1509

Amorphous body sherds in oxidized and reduced wares.

BC 75, Layer 13, E.R. 1511

Some medieval shell-tempered wares as rims (Fig. 47, Nos. 21-22) with some body sherds.

PERIOD IV

The artifacts from this period seem to be of two groups with physically different types of material. Those found as medieval dumpings, group A, contained Roman residual pottery in a reduced quantity and those associated with the medieval waterfront, group B, contained no Roman residue.

GROUP A

BC 75, Layer 5, E.R. 1505

Medieval pottery consisting of a rim sherd of a cresset (Fig. 47, No. 23) in red sandy ware, some rim sherds of cooking pot (Fig. 47, Nos. 24-25) with some sherds in grey ware and shell-tempered ware.

BC 75, Layer 3, E.R. 1504

Amorphous medieval sherds of grey and shell-tempered ware.

BC 75, Layer 2, E.R. 1503

Medieval pottery consisting of fragments of cooking pots in grey ware with a rim of a jug (Fig. 47, No. 26) and some amorphous sherds of shell-tempered ware.

BC 75, Layer 18, E.R. 1515

The medieval pottery contains a fragment of Pingsdorf ware identical to that found in Period III (BC 75, Layer 10). Body sherds of glazed red wares from jugs similar to an example found in Southwark, *cf.* Thorn (1978, 128-131, Fig. 50:2). Rim sherds of cooking pots and a jug (Fig. 47, Nos. 27-29) with amorphous buff and grey wares.

BC 75, Layer 401, E.R. 1536

(Medieval dumping over collapsed Roman Wall)

The medieval pottery includes a piece of Ipswich ware (above, p. 98, No. 19) and a rim sherd of a cooking pot (Fig. 47, No. 30). There are also sherds belonging to cooking pots in grey ware, a piece of shell-tempered ware and two sherds of a red ware jug decorated with vertical strip decoration under a deep olive-green glaze.

GROUP B

For convenience this material is compared with examples found at the Custom House site, *viz.* Tatton-Brown (1975, 118-151, Figs. 4-24) and is referred to the illustrated item with description as *e.g.* "Custom House 178."

BC 75, Layer 143, E.R. 1532

White ware: Jug, similar to Custom House 175 and a White slipped red ware: Body sherd.

BC 75, Layer 142, E.R. 1531

White ware: Polychrome jug with vertical applied strip decoration. A plain jug similar to Custom House 175 and cooking pots Custom House 45 and 191 with green glaze body sherds.

Red ware: Jugs similar to Custom House 242 and 251 with base of cooking pot.

White slipped red ware: Jug similar to Custom House 26 with decoration as Custom House 98 but without stabbed holes. A combed jug similar to Custom House 302.

Shell-tempered ware: A base fragment of cooking pot.

BC 75, Layer 141, E.R. 1530

White slipped red ware: Jug, similar to Custom House 60.

BC 75, Layer 140, E.R. 1529

White ware: Jug, similar to Custom House 43 and 183 but unfingered base and a cooking pot Custom House

BC 75, Layer 1, E.R. 1502

(Post-medieval disturbance)

This comprises mostly post-medieval sherds such as a stoneware Bellarmine jug medallion, a Surrey Tudor Green ware candlestick (?) and body sherds of large red earthenware crocks with white slipped interiors in yellow and green glaze.

BC 75, Layer 17, E.R. 1514

The medieval pottery consists of cooking pots mostly in grey ware with a piece of base in red ware partially covered with green glaze on interior. Also two spouted pitchers in hard grey ware (Fig. 47, No. 31) and a small sherd of fine white ware with clear, pale green glaze.

191. A rim sherd of cooking pot (Fig. 47, No. 32).

Red ware: Cooking pot handle only, similar to Custom House 259 but the fabric is more fawn-coloured.

White slipped red ware: Jug handle of possibly Custom House 26 but with pear-shaped finger impressions on side of handle, and a jug like Custom House 58. A jug neck very straight (Fig. 47, No. 33) and two decorated body sherds (Fig. 47, Nos. 34-35).

Grey ware: Two jug handles similar to Custom House 342, one with sets of five-pronged combed vertical lines, and the other with slash and dot decoration with fragments of saggar base. A body sherd with strip decoration as used for Custom House 342 and a rim sherd of a cooking pot (Fig. 47, No. 36).

BC 75, Layer 146, E.R. 1533

White ware: Bowl base similar to Custom House 12.

Red ware: Cooking pot foot.

White slipped red ware: Jug rim fragment (Fig. 47, No. 37).

Grey ware: Body sherds only, some with strip decoration, possibly parts of jugs similar to Custom House 342 and cooking pot 348.

CATALOGUE OF ILLUSTRATED SHERDS *Fig. 47, Nos. 20-37*

PERIOD III

20. Cooking pot: Grey fabric with fine shell-tempering, soapy surface, lightly finger-impressed rim with sooted exterior. Similar to two examples found in the ditch at the Tower of London, dated to the 11th century (information from Brian Davison) *cf.* Davison (1967). A slightly different fabric in developed St. Neot's ware was found in the provinces at Northolt Manor, Middlesex, which was ascribed to 1050-1150, *cf.* Hurst (1961, 258, Fig. 66) and in Layer 150 at the Upper Thames Street Section, Period II, Phase I (*cf.* p. 102). From BC 75, Layer 10, E.R. 1508.
21. Cooking pot: Grey sandy fabric with some shell-tempering, slightly oxidized surface with sooted exterior. The profile is similar to an example found in Pit P4 at Aldgate which is ascribed to the latter

part of the 11th century or the beginning of the 12th, *cf.* Clark (1973, 40-41, Fig. 19). BC 75, Layer 13, E.R. 1511.

22. Cooking pot: Similar fabric to No. 20 above, deep diagonal finger impressions on rim, sooted exterior. A similar example was found in Pit P4 at Aldgate, as mentioned in No. 21. BC 75, Layer 13, E.R. 1511.

PERIOD IV GROUP A

23. Cresset: Light red, fine sandy fabric with small white inclusions, thick sooted encrustation on interior. The fragment would suggest a cone-shaped example similar to one from Nicholas Lane. *Cf.* Dunning (1940, 175 and Fig. 54: 8). BC 75, Layer 5, E.R. 1505.

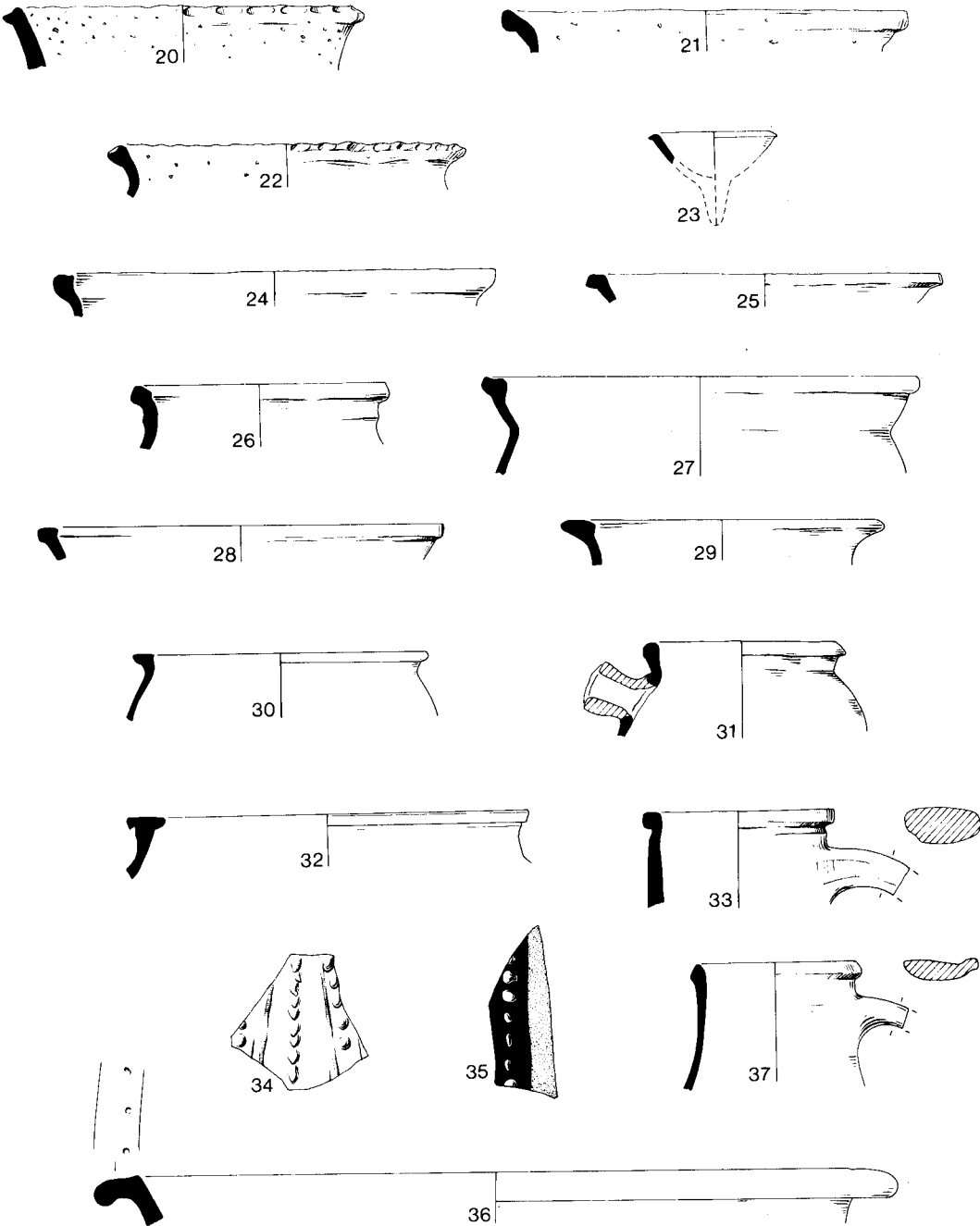


Fig. 47. Roman Riverside Wall: Medieval pottery (1/4).

- 24-25 Cooking pots: Light grey, sandy fabric with some white shell inclusions, black reduced surface with slightly sooted exterior. These seem to have affinities to forms produced in a Hertfordshire kiln such as Chandlers Cross kiln, which made reduced wares. In rim form, No. 24 compares with a large example Chandlers Cross 257 and No. 25 with Chandlers Cross 179. Both of these were found in the backfill of the kiln. A suggested marginal date of the early 13th century is ascribed to this. *Cf.* Neal (forthcoming). BC 75, Layer 5, E.R. 1505.
26. Jug: Similar fabric to Nos. 24-25 above. This also compares fairly reasonably with jugs found at the Chandlers Cross kiln, of which Chandlers Cross 13 is a good example, found in the flue of the kiln. *Cf.* Neal (forthcoming). BC 75, Layer 2, E.R. 1503.
27. Cooking pot: Buff sandy fabric with dull reduced surfaces with sooted exterior. BC 75, Layer 18, E.R. 1515.
28. Cooking pot: Dull grey sandy fabric with white shell inclusions, similar to No. 31 and profile similar to No. 25. BC 75, Layer 18, E.R. 1515.
29. Cooking pot: Light grey sandy fabric, sooted exterior. BC 75, Layer 18, E.R. 1515.
30. Cooking pot: Light grey, fine sandy fabric with light red inner margin. BC 75, Layer 401, E.R. 1536.
31. Spouted pitcher: Hard grey sandy fabric with white shell inclusions similar to that of No. 28. The applied spout is roughly joined to the shoulder, also there is another identical example from the same layer. A number of unstratified examples come from the City of London. A slightly larger example was found at Lime Street (Mus. of Lon. LM. A 27530) in light grey ware with sagging base and having no strap handle on rim. *Cf.* Wheeler (1935, 157, Fig. 33:2). An example of similar rim diameter was found at Regis House (Mus. of Lon. GM. 12,933). This showed rilling on shoulder and contained no

shell inclusions. Another was found in London (Mus. of Lon. GM. 2893) without rilling. Recently a spouted pitcher in a very similar fabric was found in pit A at Westminster Hall which is tentatively dated to the late 11th century or 12th century. *Cf.* Whipp and Platts (1976, 354, Fig. 3-4). In the provinces an example was found at Eynsford Castle which is considered to be of an early 13th century origin. *Cf.* Rigold (1971, 162, Fig. 18). BC 75, Layer 17, E.R. 1514.

PERIOD IV GROUP B

32. Cooking pot: White, fine sandy fabric with light green mottled glaze over interior and under exterior rim. BC 75, Layer 140, E.R. 1529.
33. Jug: Sandy, buff fabric with red inclusions, white slipped surfaces, with a lustrous mottled green glaze over exterior. BC 75, Layer 140, E.R. 1529.
34. Jug: Body sherd, light grey sandy fabric with dull red margins, the exterior is covered with thin white slip over which are applied vertical strips, scales and pellets in red fabric with a mottled green glaze over the slip. BC 75, Layer 140, E.R. 1529.
35. Jug: Body sherd, light red sandy fabric with grey core. The exterior is covered in white slip over which is a red band of slip (shown black). Over this are blobs of white slip, and a border of shiny mottled green glaze. A similar example showing zones of decoration was recovered as a surface find at the Bank of England (Mus. of Lon. GM. 5671), *cf.* Borrajo (1908, 183, item 104, Pl. LXVII:6). BC 75, Layer 140, E.R. 1529.
36. Bowl: Light grey, fine sandy fabric with white inclusions. The rim has a row of round stabbed holes. BC 75, Layer 140, E.R. 1529.
37. Jug: Hard, red, sandy fabric with grey core and margins. The exterior shows a thin white slip, partly covered by a bright olive-green glaze. BC 75, Layer 146, E.R. 1533.

DISCUSSION AND DATING

The abraded nature of the residual Roman sherds found in the layers of Periods III and IV, Group A, suggests that they are not primary deposited material, and it would seem that they were still being displaced for some considerable time even in the medieval period.

In Period III recognizable pieces of early pottery appear, *cf.* Fig. 47, Nos. 20-22, which suggest a late 11th to early 12th century date. This is comparable with a piece found in disturbed levels in the Upper Thames Street section in Period II, Phase I (*cf.* p. 102). In BC 75, Layer 10, Pingsdorf, Andenne and northern French wares were found. These compare with the range of associated material found at Dowgate. *Cf.* Dunning (1960, 73-77, Fig. 40), ascribed to the early 12th century. They are also comparable to examples in the Upper Thames Street section in Period II, Phase I and II (*cf.* p. 102).

The medieval dumpings in Period IV Group A retain some Roman residual pottery but are predominantly medieval. There is a piece of middle Saxon Ipswich ware from BC 75, Layer 401 (above, p. 99) but a fragment found in association suggests a 13th century date for the deposition. The other pottery found in this period, *cf.* Fig. 47, Nos. 23-31, also suggest a similar date range. For example, there was a noticeable quantity of Hertfordshire reduced ware, *cf.* Fig. 47, Nos. 24-26, and a possible Surrey off-white sherd (Fig. 47, No. 27). In BC 75, Layer 17, were two spouted pitchers (Fig. 47, No. 31) which may be earlier than the 13th century.

Some of the material from this Period IV Group A compares extremely well in fabric with that found in the "bottom 3ins. of dark soil under ground floor" (Layer 2) of Bastion 11a at Cripplegate, *cf.* Grimes (1968, 75, Figs. 17-18). The homogeneous pottery found at the Waterfront in Period IV Group B compares extremely well with material found mostly in Group C.2 at the Custom House which suggests a contemporary deposition in the 14th century. It also compares with the non-homogeneous layers in the Upper Thames Street section, Period II, Phases III-V (*cf.* p. 102).

B. POTTERY FROM THE UPPER THAMES STREET EXCAVATION (MM 74)

THE INVENTORY

PERIOD II

PHASE I

MM 74, Layer 154, E.R. 1475

Fragment of a medieval cooking pot.

MM 74, Layer E.R. 1497

Two pieces of Saxon pottery (above, p. 98; Nos. 15 (Fig. 45), 16).

MM 74, Layer 147, E.R. 1469

Piece of Andenne ware with fragments of medieval cooking pots, one being similar to Custom House 196.

MM 74, Layer 150, E.R. 1472

Medieval shell-tempered cooking pot, slightly similar to an example from BC 75, Layer 10 (*cf.* Fig. 47, No. 20).

PHASE II

MM 74, Layer 149, E.R. 1471

Two body sherds of Pingsdorf ware, with some amorphous sherds.

PHASE III

MM 74, Layer 140, E.R. 1465

A sherd of Saxon pottery (above, p. 98, No. 17).

MM 74, Layer 139, E.R. 1464

Jug sherd in West Kent ware suggesting a conical form similar to Rackman (1973, Pl. 25).

PHASE IV

MM 74, Layer 142, E.R. 1466

Body sherds from jugs in Surrey White ware and West Kent ware plus a decorated sherd similar to Custom House 402.

MM 74, Layer 128, E.R. 1461

Sherd of medieval shell-tempered cooking pot.

PHASE V

MM 74, Layer 122, E.R. 1458

Body sherd of Saxon pottery (above, p. 98, No. 18). This phase mostly contained body sherds of Surrey White ware (Layers 122, 126, 131, 132 and 144).

MM 74, Layer 191, E.R. 1495

Cooking pot similar to Custom House 191, plus some sherds of red ware.

PHASE VI

No pottery.

PHASE VII

In this phase post-medieval pottery makes its first appearance.

MM 74, Layer 192, E.R. 1496

Medieval flanged rim similar to Custom House 57, and a body sherd of a jug in red ware.

MM 74, Layer 180, E.R. 1488

Fragment of a jug in Tudor Green.

MM 74, Layer 169, E.R. 1484

A flanged rim with a sherd of stoneware Bellarmine.

PHASE VIII

This phase contained the largest amount of pottery.

MM 74, Layer 168, E.R. 1483

Near complete tin-glaze charger (Fig. 48, No. 38).

MM 74, Layer 167, E.R. 1482

Predominantly plain red ware sherds, unglazed with a

few fragments in friable condition, as if they had been in contact with heat. Also in red ware is the rim sherd of a mug covered with a tortoiseshell glaze, and a rod handle covered with a deep brown iron glaze. There are examples of Tudor Green ware, a base (Fig. 48, No. 39) and five examples of small dishes, some of which are flanged. Also fragments of two unglazed chargers, three Bellarmine and a medieval jug.

MM 74, Layer 166, E.R. 1481

The largest collection of Tudor Green wares found in any one layer. These consist of a costrel (Fig. 48, No. 40), a flanged dish (Fig. 48, No. 41), one decorated and three undecorated plates, a jug and a pedestal base. In the same ware but with yellow glaze are a plate, flanged dish and a pipkin. The red wares include a tyg (Fig. 48, No. 42), a lid (Fig. 48, No. 43), a small flanged plate like Fig. 48, No. 58, flanged dish, skillet, pedestal base and a large crock. Examples with white slip on the interior consist of a jug and several possible milk pans. There are also fragments belonging to three Bellarmine.

MM 74, Layer 165, E.R. 1480

Mostly red earthenware, comprising a jug, a dripping pan, a brown glazed bowl, a white slipped jug similar to one from Dean's Yard, Westminster (Hurst 1960, Fig. 2, No. 11) and one piece of grey glazed stoneware.

MM 74, Layer 123, E.R. 1459

A medieval red earthenware cooking pot, a rim sherd of a metropolitan plate, a cooking pot (Fig. 48, No. 44) and a rim sherd of a china plate covered in pale grey glaze.

MM 74, Layer 95, E.R. 1447

A medieval body sherd of Normandy type white ware with white pellet decoration. Also a neck sherd of a Bellarmine.

MM 74, Layer 93, E.R. 1446

The body sherd of a possible drinking jug of Beauvais type ware, with fragments of tin-glazed chargers and drug jars. White ware body sherds of pipkin mostly with Tudor Green or pale yellow glaze. A sherd of red ware pipkin with light brown glaze, also an iron-glazed tyg and fragments of a stoneware Bellarmine.

MM 74, Layer 59, E.R. 1441

Body sherd of a medieval Spanish lustreware albarello and a jug fragment of Surrey White ware.

MM 74, Layer 57, E.R. 1439

This produced the first burnt fragment of post-medieval ware to show the same intensity of burning as sherds found in Period III. This was a base sherd of a tin-glaze charger (Fig. 48, No. 45) found with an unburnt sherd of stoneware and a Bellarmine.

MM 74, Layer 56, E.R. 1438

A small sherd of Langerwehe stoneware, tin-glazed charger, pipkin fragments of Tudor Green ware and red ware.

PERIOD III

PHASE A

MM 74, Layer 58, E.R. 1440

Mostly red earthenware, mainly unglazed, but some showing a pale brown glaze or a white slip covered with pale green glaze. Also a fine flanged bowl (Fig. 48, No. 46).

MM 74, Layer 55, E.R. 1437

About half the material is fire-blackened, consisting of a tin-glaze salt and charger rim (Fig. 48, Nos. 47-48). The remaining material comprises a drug jar similar to Norfolk House (Bloice 1971, Fig. 55, No. 90), an earthenware plate rim covered with brown glaze and fragments of a Bellarmine.

PHASE B

No pottery.

PHASE C

MM 74, Layer 114, E.R. 1456

This produced the largest collection of fire-blackened material (Fig. 48, Nos. 49-53), consisting of a tin-glaze

charger rim, porringer handle, drug jar, red earthenware storage jar, a base, four body sherds and a stoneware Bellarmine. The unburnt material from this consisted of a tin-glaze charger, caudle cup, fragments of three stoneware Bellarmine and a Saintonge chafing dish (Fig. 48, No. 54). There are also Tudor Green wares, one of which is covered with yellow glaze, a porcelain tea bowl and a piece of Mocha ware (probably intrusive).

PHASE D

MM 74, Layer 43, E.R. 1434

A few sherds of fire-blackened material (Fig. 48, Nos. 55-56).

CATALOGUE OF ILLUSTRATED MATERIAL (Fig. 48, Nos. 38-58)

PERIOD II

PHASE VIII

38. Small charger: pale yellow fine sandy ware with some red inclusions. The interior is covered with white tin-glaze and decorated in various shades of blue with some dull orange on pyramid border. Marks from the trivet show on the middle. The exterior is covered with a dull yellow lead glaze. The design is slightly similar to examples found at Potters Bar which are considered to be mid-17th century (Ashdown 1970, Fig. 1, No. 2). MM 74, Layer 168, E.R. 1483.
39. Jug: pale yellow fine sandy ware covered with a bright mottled green glaze, cordon on the exterior just below the girth. This fragment would seem to be of a type most commonly found in London. In the Inns of Court "a green pot" is mentioned between 1586-1615 (Matthews and Green 1969, 1-6), although fragments have been found in the latrine groups at Nonsuch suggesting a date of 1650/55-1688 (Biddle 1961, 15, Fig. 5, No. 8). MM 74, Layer 167, E.R. 1482.
40. Costrel: similar ware to No. 39 but smoother, covered with a bright mottled green glaze. This is similar in form to an example from the Westminster Abbey pit group, which was deposited early in the 17th century (Hurst 1960). MM 74, Layer 166, E.R. 1481.
41. Flanged dish: identical ware and glaze to No. 40 above, but glaze over top of rim and inside. MM 74, Layer 166, E.R. 1481.
42. Tyg: dull red, hard, sandy ware, covered completely in black/brown lustrous iron glaze, raised cordon around base and remains of applied strap handle. A similar example to this comes from Potters Bar and is considered to be mid-17th century (Ashdown 1970, Fig. 2, No. 19). MM 74, Layer 166, E.R. 1481.
43. Lid: dull red, hard, sandy earthenware covered on exterior with a clear light brown glaze over which is a thin film of soot. MM 74, Layer 166, E.R. 1481.
44. Cooking pot: light red, soft, sandy earthenware covered on interior with a clear pale brown glaze. The exterior shows a film of soot. MM 74, Layer 123, E.R. 1459.
45. Small charger: fire-blackened piece, dull pale yellow ware with red inclusions. The tin-glaze decoration on the interior is a botanical motif in dull white, with the leaves in pale yellow, on a background of

dull grey. The exterior shows only a black, crazed glaze. MM 74, Layer 57, E.R. 1439.

PERIOD III

PHASE A

46. Flanged bowl: fire-blackened piece, grey sandy ware with remains of glaze over rim and interior. MM 74, Layer 58, E.R. 1440.
47. Salt: fire-blackened piece partly altered, pale yellow ware with red inclusions covered entirely in white tin-glaze and decorated on exterior with a lattice pattern. MM 74, Layer 55, E.R. 1437.
48. Small charger: fire-blackened piece. Pale yellow ware, covered with tin-glaze on interior (now black), lead glaze on exterior. MM 74, Layer 55, E.R. 1437.

PHASE C

49. Small charger: fire-damaged piece in pale yellow, fine sandy ware. The interior shows a bubbled and blistered white tin-glaze with patches of blue and pale pink showing. The exterior shows no lead glaze. MM 74, Layer 114, E.R. 1456.
50. Porringer handle: fire-blackened piece in pale yellow ware, covered with a thin white tin-glaze. This type of handle has been found on wasters at Southwark and at the Norfolk House kiln site in Lambeth where, although found in disturbed contexts, a 1660-1680 date was assigned to them (Bloice 1971, Fig. 54, No. 60). A complete example was found in the latrine deposit at Nonsuch Palace, datable to 1650/55-1688 (Biddle 1961). MM 74, Layer 114, E.R. 1456.
51. Squat drug jar: fire-blackened piece in grey ware completely covered with pale grey tin-glaze and decorated in blue. There were four fragments in this layer and another possible piece from layer 108 (residual). This type of jar is very common and was manufactured in Southwark or at Lambeth. Late examples from the 18th century were found as wasters at Norfolk House, Kiln B (Bloice 1971, Fig. 60 Bb). MM 74, Layer 114, E.R. 1456.
52. Storage jar: fire-blackened piece, in red, sandy earthenware. Applied strip decoration under rim, lightly fingered. Deep brown, crackly glaze partly covering interior. MM 74, Layer 114, E.R. 1456.
53. Bowl: fire-blackened piece in grey, sandy ware, black crackly glaze on interior. MM 74, Layer 114, E.R. 1456.

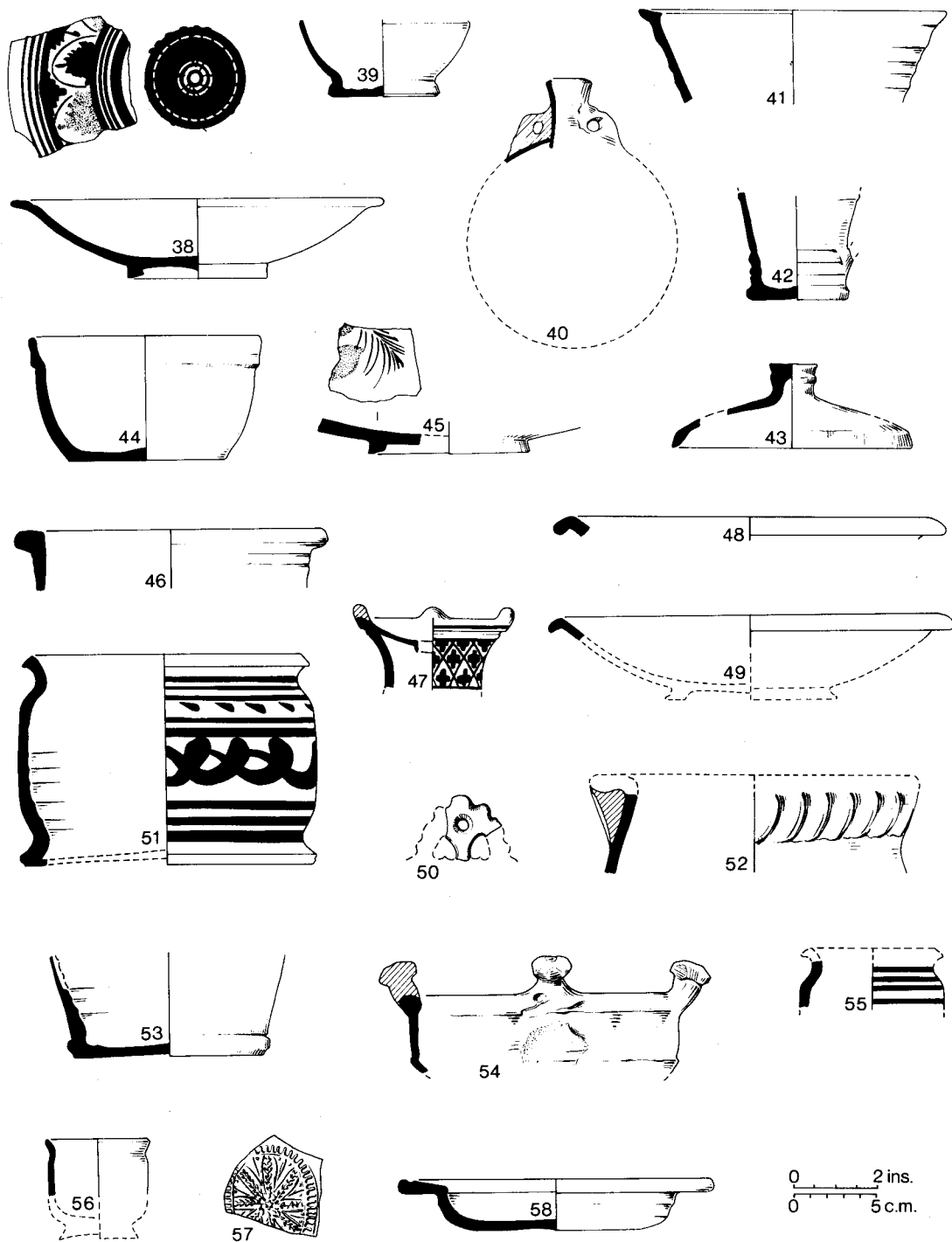


Fig. 48. Roman Riverside Wall: Post-medieval pottery from the Upper Thames Street section ($\frac{1}{4}$).

54. Chafing dish: pale yellow, fine sandy ware, applied spur on rim and possible mask below. Covered on interior with a pale apple-green glaze with a splash of purple-brown over exterior. This piece is a Saintonge product (Hurst 1974, Type C.VI), which compares in form with examples in the Van Beunigen Collection, showing face masks with headdress and ruff. These are considered to be 17th century (Hurst 1974, Fig. 9, Nos. 38-40). MM 74, Layer 114, E.R. 1456.

PHASE D

55. Small drug jar: fire-blackened piece, partly altered. White tin-glaze on interior now grey with dull white exterior decorated in pale blue. This piece is reminiscent in decoration of an example from Potters Bar, having a mid-17th century date

(Ashdown 1970). MM 74, Layer 43, E.R. 1456.

56. Small drug jar: fire-blackened piece in pale yellow ware covered with white tin-glaze (now grey). These are common products of Southwark or Lambeth and have a wide range from the early 17th century. MM 74, Layer 43, E.R. 1434.

RESIDUAL

57. Bellarmine: fire-blackened piece in grey stoneware with light brown mottled glaze (now discoloured black) and an applied medallion. This type of motif is similar to examples found in 17th century contexts. MM 74, Layer 65, E.R. 1443.
58. Small plate: bright red, sandy earthenware covered on interior with white slip over which is a deep yellow glaze. The author believes this to be an early 17th century piece. MM 74, Layer 65, E.R. 1443.

DATING:

The dating of the Periods II and III can only be given in relative terms. In most of the phases the material has a wide chronological range, making close dating impossible.

PERIOD II

Phase I: Indications of some Saxon occupation nearby, obviously residual as 12th and 13th century material was present.

Phase II: Possible pre-12th century material, residual.

Phase III: Late 13th century date at the earliest.

Phase IV: 14th century.

Phase V: 14th century.

Phase VI: No dating evidence.

Phase VII: Noticeable change to post-medieval material of the 16th and 17th century.

Phase VIII: 16th and 17th century, burnt material from MM 74, Layer 56.

PERIOD III

Pottery very similar to Period II, Phase VIII. The dates that can be given to the burnt material place it very close to the Great Fire of 1666.

ACKNOWLEDGEMENTS

The writer wishes to thank John Clark, Brian Davison, David Neal, Elizabeth Platt and Harvey Sheldon for allowing him to use their information in this report.

2. THE COINS

BY CHRISTOPHER CATLING

59. (E.R. 1503/2) Silver (debased), 18mm dia., 1.66g. *obv.* SEVERUS PIVS AVG Head laureate, right. *rev.* FVNDATOR PACIS Septimius veiled, standing left, holding branch and roll. Residual from BC 75, Layer 2, Period IV. c. 202-210 A.D. (R.I.C. 265).
60. (E.R. 1437/74) Copper, 16mm dia., 1.08g. Fragment. Probably 3rd or 4th century A.D. No detail visible. Residual from MM 74, Layer 55, Period IIIA.
61. (E.R. 1481/64) Copper, 16mm dia., 1.32g. *obv.* Single masted vessel at sea with flag and streamer. Legend in French and indeterminate. *rev.* A lozenge of France — Ancient (shown as four *fleurs-de-lis*) within a granulated inner circle. Three annulets in

each spandrel. A common casting counter probably struck at Nuremberg for use in France. The obverse and reverse faces combine elements of the arms of Paris. They spread widely and are commonly found in England, and were therefore evidently made in great numbers in the sixteenth century and possibly also later with antique features preserved as a convention. From MM 74, Layer 166, Period II phase VIII.

62. (E.R. 1456/12) Lead, 26mm dia., 2.35g. Lettering of the 17th century, probably a token or counter. From MM 74, Layer 114 (Illustrated: Fig. 50, No. 62).
63. (E.R. 1442/11) Silver, 19 mm dia., 11.34g. Florin of George V, dated 1926. From MM 74, Layer 63. Modern disturbance.

64. (E.R. 1430/1) Bronze, 17mm dia., 4.34g. Modern, probably a 19th or 20th century farthing. From MM 74, Layer 15. Modern disturbance.

3. CLAY PIPES FROM THE UPPER THAMES STREET SECTION

BY STEPHEN WALKER

The bowl typology is that of Atkinson and Oswald 1969.

PERIOD II, PHASE II

MM 74, Layer 145, E.R. 1468

A large stem with a large bowl. Late 16th to early 17th century. Intrusive.

PERIOD II, PHASE VII

MM 74, Layer 111, E.R. 1454

Stem with the beginning of the bowl. The shape would indicate an early to mid 17th century date.

PERIOD II, PHASE VIII

MM 74, Layer 93, E.R. 1446

Five stems of mid 17th century date.

MM 74, Layer 165, E.R. 1480

Stem, the thickness and bore of which would indicate an early 17th century date.

MM 74, Layer 167, E.R. 1482

Bowl similar to type 5 (1610-1640), the bowl shape and size correspond but the angle between bowl and stem is slightly lower than that in the published example. Stem with part of the heel attached. The underside of the heel

- bears a circular stamp (in relief) with the faint initials B (I?). This type of marking is rare after 1670. Eleven stems including one mouthpiece.

PERIOD III, PHASE A

MM 74, Layer 54, E.R. 1436

Bowl type 18 (1660-1680). Three stems of 17th century date.

MM 74, Layer 55, E.R. 1437

Bowl type 15 (1660-1680). Two bowls of type 18 (1660-1680). Two stems of 17th century date.

MM 74, Layer 58, E.R. 1440

Bowl type 18 (1660-1680). One heel from a type 18. Five stems of 17th century date.

PERIOD III, PHASE C

MM 74, Layer 114, E.R. 1456

Bowl type 18 (1660-1680). Bowl type 13 (1660-1680) but with smaller bowl. Fragment of a small bowl similar to types 7-9. Mid- to late 17th century. Thirty stems of mid- to late 17th century date, including five mouthpieces. Three of these show signs of intensive burning. One stem of early to mid-19th century date. Probably intrusive.

4. OTHER FINDS FROM THE UPPER THAMES STREET SECTION

BY MARK REDKNAP

These are grouped according to the period divisions used in the site report and then according to material. Where appropriate the date of residual finds is given in the residual descriptions.

Fig. 49, Nos. 66-101

PERIOD I (Roman to 12th/13th century)

TILE

66. (E.R. 1430/125) Fragment of stamped tile. Probably [PR.BR.LO]N or variant, stamp width 23mm. Merrifield (1965, 72, 82), Chapman and Johnson (1973, 68, Fig. 32 No. 10), and Lon. Mus. Cat. 3 (1930, 51, Fig. 6 No. 1). MM 74, Layer 181. (Illustrated).

GLASS

67. (E.R. 1499/59) End of glass pin, round head and circular shaft which swells in centre, point missing. Light blue glass. Iridescent. Length 27mm. Rahtz (1961, 96, Fig. 13 No. 10), Chapman and Johnson (1973, 48, No. 18; Fig. 22 No. 18). MM 74, Layer 199. (Illustrated).

COPPER ALLOY

68. (E.R. 1500/60) Pin with flat perforated lug on one side and rounded shaft. Hinged arm of metal instrument? Length 46mm. MM 74, Layer 201. (Illustrated).

STONE

69. (E.R. 1499/86) Hone. Medium grained sandstone, split along bedding planes. Signs of wear on four sides. Length 107mm, width 63mm. MM 74, Layer 199. (Illustrated).

PERIOD II (12th/13th century to 1666)

GLASS

70. (E.R. 1459/14). Three fragments of the side of a fine-walled goblet, vertical sided. Pale green. Iridescent. Diameter 50mm. Early 17th century. MM 74, Layer 123.
71. (E.R. 1483/6) Two fragments of rim and side of a thin-walled goblet in greenish-white 'cristallo' glass. Weathering and incipient iridescence. Diameter 65mm. Popular in the late 16th and early 17th century. Platt and Coleman-Smith (1975, II, 221, Fig. 224 and No. 1568). MM 74, Layer 168. (Illustrated).
72. (E.R. 1481/83) Goblet stem with merese beneath bowl, solid stem with central knob resting on bottom merese. Dark blue. Air bubbles. Height 32mm. 17th century. Moorhouse (1971, 65, Fig. 7). MM 74, Layer 166. (Illustrated).
73. (E.R. 1459/13) Two fragments of a vessel in thick mottled brown glass. Flaking and iridescence. 5mm thick. MM 74, Layer 123.
74. (E.R. 1482/87) Fragment of 'millefiori' glass rod, blue-green in centre and outer rings, white in between. Opaque and iridescent. Length 37mm, diameter 6mm. MM 74, Layer 167.
75. (E.R. 1464/67) Small glass bead. Opaque green glass. Conical perforation. Diameter 5.5mm. MM 74, Layer 139. (Illustrated).

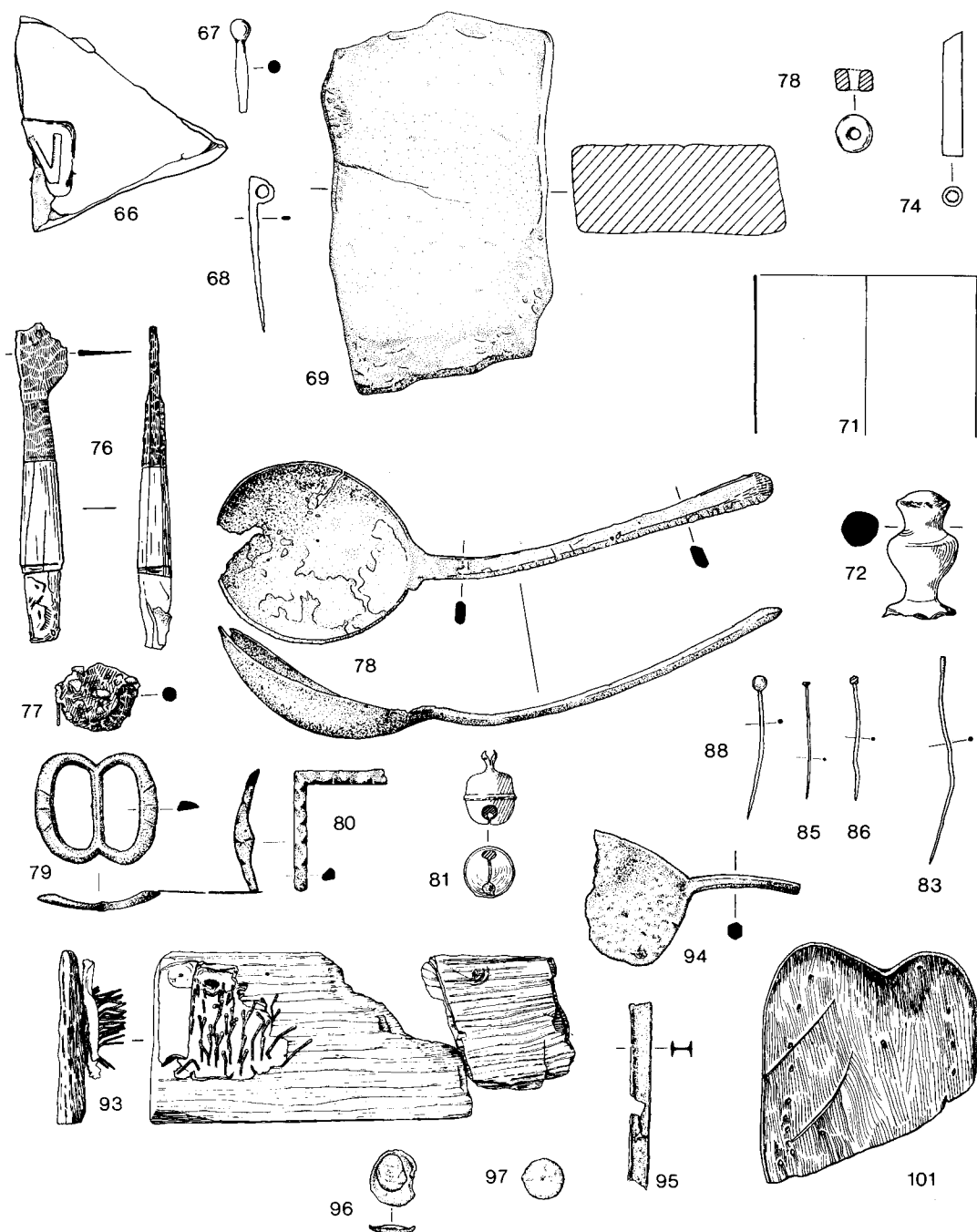


Fig. 49. Roman Riverside Wall: Finds from the Upper Thames Street section, 66-101 (1/2).

IRON

76. (E.R. 1481/48) Knife, slender type with broken single-edged blade. Solid bolster with tang travelling through the handle of bone and wood. Bone handle and bolster are of flattened oval section with flat top and bottom, and each section is decorated by single incised line at butt end. Length 91mm. Moorhouse (1971, 36, Fig. 5). Early 17th century. MM 74, Layer 166 (Illustrated).
77. (E.R. 1482/99) Iron ring, heavily rusted. Incomplete brass pin of wound wire type encrusted to corrosion. Ring diameter 20mm. Pin length 12mm. MM 74, Layer 167. (Illustrated).

COPPER ALLOY

78. (E.R. 1430/63) Spoon, fig-shaped bowl, plain 6-sided 'slipped-in-the-stalk' stem, Length 165mm, width of bowl 53mm. 16th-17th century. Lon. Mus. Cat. 7 (1940, 306, No. 12). Unstratified. (Illustrated).
79. (E.R. 1430/72) Buckle, double-sided 'spectacle' type with prong missing. Decorated either side by three lines radiating from centre point. Probably 16th century. Platt and Coleman-Smith (1975, 260, Fig. 243, No. 1789) though see also Hassall (1972, 19). Unstratified. (Illustrated).
80. (E.R. 1430/105) Fragment of shoe buckle, rectangular missing central bar. Punched notches on inside edge, pie-crust pattern decorating outer face. Probably early 17th century. Unstratified. (Illustrated).
81. (E.R. 1482/47) Bell of 'rumbler' type, two equal hemispheres welded together. Attachment loop cast in one with top. Bottom half has slit of conventional dumbbell shape. Iron ball clapper. Diameter top to bottom 14mm, laterally 15mm. Probably 17th century. Platt and Coleman-Smith (1975, II, 262, Fig. 243, No. 1808). MM 74, Layer 167. (Illustrated).
82. (E.R. 1486/79) Pin with head of wire rolled twice round shaft. Length 25.5mm. MM 74, Layer 175.
83. (E.R. 1485/82) Pin with head missing. Length 59.5mm. MM 74, Layer 174.
84. (E.R. 1482/80/1) Pin with round head, bead length 37.5mm. MM 74, Layer 167.
85. (E.R. 1482/80/2) Pin with wound wire head (bottom half missing). Length 37mm. MM 74, Layer 167. (Illustrated).
86. (E.R. 1482/80/3) Pin with wound wire head. Length 38.5mm. MM 74, Layer 167. (Illustrated).
87. (E.R. 1482/80/4) As above except 23mm in length.
88. (E.R. 1482/80/5) Pin with round bead head. Length 41mm. MM 74, Layer 167 (Illustrated).
89. (E.R. 1482/80/6) Pin-point. Length 26.5mm. MM 74, Layer 167.
90. (E.R. 1490/81/1) Pin with spherical bead head. Length 38mm. MM 74, Layer 184.
91. (E.R. 1490/81/2) Pin with wound wire head. Length 25.5mm. MM 74, Layer 184.
92. (E.R. 1490/81/3) Pin-point. Length 23.5mm. MM 74, Layer 184.
93. (E.R. 1491/108) Carding comb (fragmentary). After 'teasing' short wool had to be carded before spinning (the long wool was combed) to disintegrate the locks and interlace the fibres. This is an example of one of the pair of hand-cards used and is made from a wooden board, the lower surface covered in

leather through which are inserted bent wire teeth. The production of wire for the cards was a problem for the British economy during the medieval period and the 17th century, and it had to be imported until 1662 when an Act was passed prohibiting the import of both the wire and the wool cards. The industry did not recover until about 1712. This may, therefore, considering its pre-1666 context, be a French import. Length of individual teeth (two being bent from a wire strip) 15mm. Lateral spacing of teeth 8mm, longitudinal spacing 3mm. Board 120mm by 49mm. Tylecote (1972, 183 f). MM 74, Layer 185. (Illustrated).

WHITE METAL, LEAD AND OTHER METALS

94. (E.R. 1488/71) Fragment of spoon, part of bowl and stem missing. White metal. Plain six-sided stem. Length 63mm. Tatton-Brown (1974, 196). MM 74, Layer 180. (Illustrated).
95. (E.R. 1482/76) Two fragments of window-leading, 'H' section. Total length 55mm. Inset width 4mm. Platt and Coleman-Smith (1975, Fig. 246 No. 1895). MM 74, Layer 167. (Illustrated).
96. (E.R. 1446/65) Flat lead oval, edges pressed from one side towards second adhering blob. Possibly a lead seal. No visible markings. Diameter 11.5mm. MM 74, Layer 93. (Illustrated).
97. (E.R. 1481/75) Lead musket ball, casting 'flash' around centre. Diameter 11.5mm. Probably early 17th century. MM 74, Layer 166.
98. (E.R. 1453/111) Sample of mercury. Not examined. MM 74, Layer 109.
99. (E.R. 1482/110) As above. MM 74, Layer 167.
100. (E.R. 1481/114) Piece of leather shoe sole. Heel. Probably a repair. Average stitch length 9mm. MM 74, Layer 166.
101. (E.R. 1481/38) As above with two knife slashes on top surface. MM 74, Layer 166. (Illustrated).

Fig. 50, Nos. 103-6, 108, 110, 114-9, 122, 127-8

102. (E.R. 1490/113) Fragment of leather sole from inside wooden bucket strip (No. 103 below). Tunnel stitching, suggesting use as a patch. MM 74, Layer 184.

WOOD (Identifications by Miss J. Sheldon)

103. (E.R. 1490/113) Fragment of a wood band, probably support for the sides of a bucket. Appears to be a porous hardwood. Contained No. 102 and wood waste chip. MM 74, Layer 184. (Illustrated).
104. (E.R. 1481/42) Wooden bowl or platter, no evident base ring. MM 74, Layer 166. (Illustrated).
105. (E.R. 1494/52) Wooden stake 350mm long. MM 74, Layer 188. (Illustrated).
106. (E.R. 1481/43) Wooden peg. Rounded end. Maximum diameter 28mm. Length 108mm. MM 74, Layer 166. (Illustrated).
107. (E.R. 1494/51) Wooden peg, as No. 106, broken end. Poplar or willow. Maximum diameter 23mm. Length 47mm. MM 74, Layer 188.
108. (E.R. 1483/33) Cork bung. 25mm by 29mm by 20mm. MM 74, Layer 168. (Illustrated).
109. (E.R. 1481/56) Wood waste. Conifer plank 189mm by 125mm by 8mm. Sawn ends, two waste chips one 66mm by 82mm and the other a sawn strip 85mm by 50mm. MM 74, Layer 166.

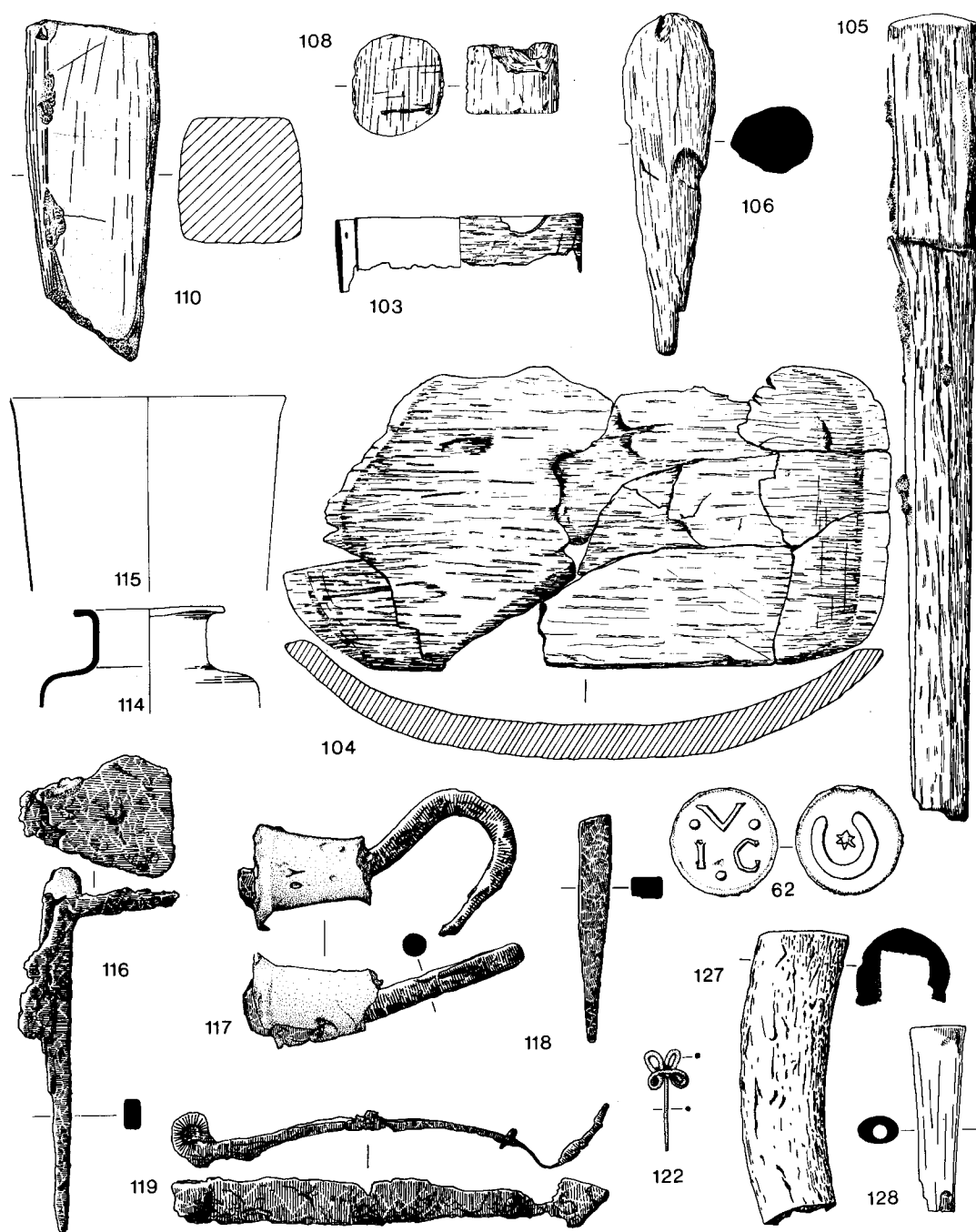


Fig. 50. Roman Riverside Wall: Finds from the Upper Thames Street section, 62 ($\frac{1}{2}$), 103 and 119 ($\frac{1}{4}$), 104 ($\frac{1}{4}$), others ($\frac{1}{4}$).

STONE

110. (E.R. 1497/88) Fragment of hone. Blue-grey quartzite. Two bedding planes visible. Signs of use on all four sides. Length 94mm. Maximum width 40mm. MM 74, Layer 193. (Illustrated).

PERIOD III (Post 1666)

GLASS

111. (E.R. 1456/94) Fragment of rim and upper part of side of thin-walled bowl? Bluish-green. Rim splayed horizontally. Incipient iridescence. Diameter 55mm. MM 74, Layer 114.
112. (E.R. 1456/93) Fragment of shoulder of vessel. Thick bluish-green glass tapering towards neck. Iridescent. Air bubbles. Length 41mm. MM 74, Layer 114.
113. (E.R. 1456/95) Two fragments of shoulder of vessel. Yellowed and flaking surfaces. One side bubbled. Signs of subjection to heat. MM 74, Layer 114.
114. (E.R. 1430/44) Fragment of bottle top. Neck and shoulder. Yellow-green. Flat, everted rim, short neck. Iridescent. Probably a medicine bottle. Platt and Coleman-Smith (1975, II, 223, Fig. 226, No. 1602). Unstratified. (Illustrated).
115. (E.R. 1430/15) Fragment of side and rim of plain beaker. Yellow-green. Iridescent and weathered. Diameter 80mm, length 55mm. Unstratified. (Illustrated).

IRON

116. (E.R. 1430/66) Spike with dovetail head perpendicular to tapering shaft, which is rectangular in section. Wood cleat? Length 97.5mm. Unstratified. (Illustrated).
117. (E.R. 1435/78) Iron hook with lead casing one end. End of iron shank bent at 90° and encased by lead which tapers towards hook, probably to secure iron to another object, perhaps a pulley block. MM 74, Layer 45. (Illustrated).
118. (E.R. 1456/68) Point of iron spike. Rectangular section. Length 66mm. MM 74, Layer 114. (Illustrated).
119. (E.R. 1456/118) Iron strap hinge, pin socket fashioned from same piece of metal folded back.

Tapering strap with expanded foliate terminal. Corroded nail *in situ*. Signs of having been torn off wooden structure — a door? Length 500mm. Common in 17th and 18th century. Sutermeister (1968, 116 Fig. 5) and Moorhouse (1971, 42 Fig. 44). MM 74, Layer 114. (Illustrated).

120. (E.R. 1456/108) Fragment of iron. 57mm long. MM 74, Layer 114.
121. (E.R. 1440/61) Corroded nail 37mm long. MM 74, Layer 58.

COPPER ALLOY

122. (E.R. 1456/10) Pin with end turned back on itself into an elaborate 'clover' motif. Square section, end missing. Length 30mm. MM 74, Layer 114. (Illustrated).
123. (E.R. 1456/84) Key cut from metal sheet — 'Yale' type. Head perforated by square hole. Probably intrusive. MM 74, Layer 114.
124. (E.R. 1430/85) Rivet, dome headed. Length 19mm. Unstratified.
125. (E.R. 1430/89) As above.

LEAD

126. (E.R. 1430/62) Piece of very thin lead sheeting. Length 46mm, width 17mm. Unstratified. (See also No. 62 above, p. 000).

BONE

127. (E.R. 1433/124) Knife handle from horn-core (*Bos*) with fragment of iron tang corroded in centre. Length 85mm, maximum diameter 27mm. Probably 18th century. MM 74, Layer 41. (Illustrated).
128. (E.R. 1430/39) Knife handle, polished bone. Flattened oval section, expanding at butt. Circular socket or dowel hole for insertion of tang. Length 50mm. Probably 17th century. (Illustrated).

LEATHER

129. (E.R. 1456/117) Fragment of sole from boot. Two sets of parallel small square nail holes along both sides. Probably late 17th century. Moorhouse (1971, 61, 190, Fig. 26). MM 74, Layer 114.

5. OTHER FINDS FROM THE RIVERSIDE WALL EXCAVATION

BY MICHAEL RHODES

(a) COPPER, BONE, WOOD AND LEATHER ITEMS

Fig. 51, Nos. 130-4, 136-8, 141-3

COPPER

130. (E.R. 1537/96) Needle in copper alloy. Very bent with long, deepening grooves on both sides which run towards an eye, which was missing. Not a common type from London where very few have been recovered from probable Roman contexts *e.g.* Museum of London Accession No. 19566 (information from John Clark). From BC 75, Layer 402, which contains mostly residual Roman finds (see p. 000). (Illustrated).
131. (E.R. 1501/51) Flat-headed pin in brass. The damaged head is stamp decorated with what appears to be a hexafoil design surrounded by a circle. Probably late medieval. Unstratified. (Illustrated).

BONE

132. (E.R. 1512/6). Fragment of a thin bone plate filed smooth on one side and decorated with inscribed concentric circles, best interpreted as a bone mount from a wooden casket (Waterman 1959 86 and Pl. 17, dated 10-11th century). Nine similar mounts of 11th to 12th century date (evidence for this dating is unfortunately not recorded) were recovered from excavations at Northampton Castle in 1879 (Central Museum, Northampton, Accession Nos. D216/1961, D217/1961, D218/1961, D219/1961 and D220/1961. No parallels are known from London. From BC 75, Layer 15 and therefore not later than 13th century. (Illustrated).

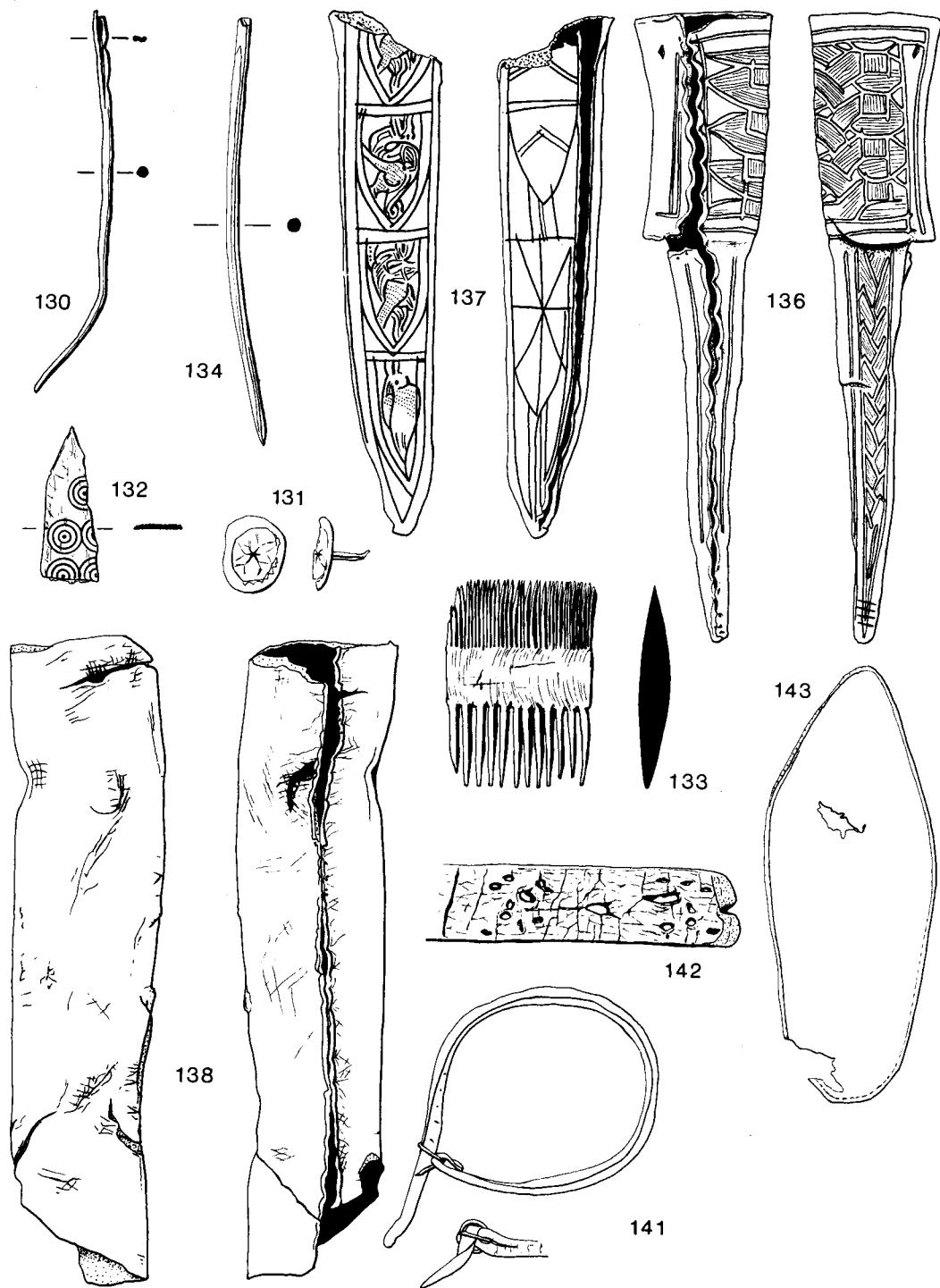


Fig. 51. Roman Riverside Wall: Medieval finds, 130-1 ($\frac{1}{1}$), 141 ($\frac{1}{3}$), 143 ($\frac{1}{4}$), others ($\frac{1}{2}$).

WOOD

133. (E.R. 1533/20) Comb: ends missing; wood probably hazel. Teeth cut in two modules. Cf. Tatton-Brown (1975, Fig. 25, Nos. 5, 7 and 8). From BC 75, Layer 146 and therefore probably 14th century. (Illustrated).
134. (E.R. 1533/19) Pin: headless with round section. Carved in pine. From BC 75, Layer 146 and probably 14th century. (Illustrated).
135. (E.R. 1501/34) Pin: as above but unstratified.

LEATHER

136. (E.R. 1501/46) Sheath for knife or dagger of vegetable tanned calf, with back seam. Linear ornamentation done with a blunt tool of wood or bone, the leather having been damped first. Some spaces between the impressed lines are filled with "hatching" done with a sharpened metal tool. A small hole near the top, formed by thrusting a narrow blade through both thicknesses of leather, could be used by a lace for fastening to a belt. Probably 14th century. Unstratified. (Illustrated).
137. (E.R. 1529/28) Sheath: lower part only, with back seam and linear ornamentation of similar character to No. 136 but consisting of shield shapes, those on the front filled with images representing dragonesque beasts. Vegetable tanned calf skin. From BC 75, Layer 140 and therefore probably 14th century.
138. (E.R. 1529/35) Part of a sword scabbard of vegetable tanned calf skin (rather thin for the purpose) with a central back seam. From BC 75, Layer 140 and therefore probably 14th century. (Illustrated).
139. (E.R. 1529/26) Leather strap of vegetable-tanned cattle hide. Between 8 and 12mm in width, 4mm thick and 840mm long. One end tapers slightly, the other has been cut off abruptly and the strap split along its length for 29mm. A longitudinal cut 27mm long was made 437mm from the tapering

end which was then inserted through this opening. From BC 75, Layer 140, dating as for No. 138.

140. (E.R. 1529/29) Leather strap similar to No. 137 but having only 102mm of its total length extant. Onto this two knots of similar strapping have been tied, apparently being intended to slide on the main strap. It is possible that both this and No. 137 are part of the same object. From BC 75, Layer 140, dating as for No. 138. (Plate 16).
141. (E.R. 1529/24) A small strap of vegetable-tanned hide with a circular iron buckle and at least five alternative holes for the tongue. From BC 75, Layer 140, dating as for No. 138. (Illustrated).
142. (E.R. 1533/25) A short strap (or "point") between 18 and 22mm wide, about 4mm thick and now cut down to a 350mm length in vegetable-tanned cattle hide. At the narrower end are three irregularly placed holes for the tongue of a buckle and at the opposite end (illustrated) are clear signs of where the leather has been bent over to slide a buckle. At the middle of this bend is an oval crudely punched hole to accommodate the tongue and in addition there are nine other holes apparently for the stitches which secured the turn-over. From Layer 146 and therefore probably 14th century.
143. (E.R. 1505/36) Shoe of simple turnshoe construction for left foot. The sole (illustrated) of vegetable tanned bovine hide, has worn through and has been patched with a roughly triangular piece of leather fixed with "tunnel" stitches. Most of the upper, which was probably of one-piece construction, has been cut away leaving the forepart of the vamp (see Pl. 17). This is very unusual in that it has an 8mm wide strip of embroidered decoration. It appears that this was formed by making four parallel lines of incision at an angle acute to the surface, raising the resultant flaps of skin in turn and making rows of individual stitches through these with silk thread (now of a light brown colour) knotting each and then cutting and fraying the loose ends. From Layer 5 and therefore not later than 13th century.

The late John Waterer was kind enough to comment on these leather objects and many of his opinions have been incorporated into the text.

(b) THE TEXTILES

BY ELISABETH CROWFOOT

Only four textile items have been recovered from the medieval levels, three of wool — one tabby weave, one four-shed (2/2) twill, and one three-shed (2/1 diamond) twill — and a diagonal silk braid.

Selvedge is preserved only on one of the twills, but comparison with other examples of medieval tabby, and the construction of the three-shed weave, make it clear in these other two woollen pieces which thread system is warp and which weft. The direction of spinning twist of the fibres is indicated by the letters Z and S. Samples of the wool fibres were submitted to M. L. Ryder for analysis and his findings are included in the Wool Fibre report (pp. 114-6).

BC 75, Layer 5: probably 13th century

144. (E.R. 1515/10) Fragment of wool strip from selvedge of weave, 155mm x 12mm overall. Warp, Z, S ply, medium brown; wefts, medium brown, Z, dark red and dark brown, both S; weave four-shed

diagonal twill, warp count 7 per 10mm. At intervals of c. 50mm there are groups of narrow dark red and dark brown weft bands in extended tabby (Fig. 52) but the weave is heavily fulled and deteriorated.

145. (E.R. 1505/11) Four fragments of wool, measuring *c.* 100 x 75mm, 65 x 55mm, 60 x 50mm, and 40 x 70mm. Warp and weft both dark brown wool, fine, hard-spun, shiny worsted type, Z; weave, fine three-shed twill, with striped effect due to narrow chevron reverses, producing in places bands of small diamonds, count 26/16 threads per 10mm; unfulled. (Fig. 53).

BC 75, Layer 140: probably 14th century

146. (E.R. 1529/27) Fragment silk braid, medium brown, length preserved 370mm. For 90mm this measures width 6mm, dividing at either end of this

section into two narrow tails each 3mm wide; greatest length of tails preserved 195mm. Diagonal braid of ten threads, of silk lightly S ply, used in pairs; each tail contains five threads (Fig. 52).

147. (E.R. 1529/30) Fragment cut from garment, overall measurement 160 x 220mm, with slit possibly for insertion of gore, or for dart, in longer edge. Wool, medium brown, spinning Z one system, S the other, weave tabby, count 12/12 threads per 10mm; fulled but worn; fairly even spinning and weaving. Heavy felting at the edges suggest they may have been in a seam, though no stitch holes are preserved.

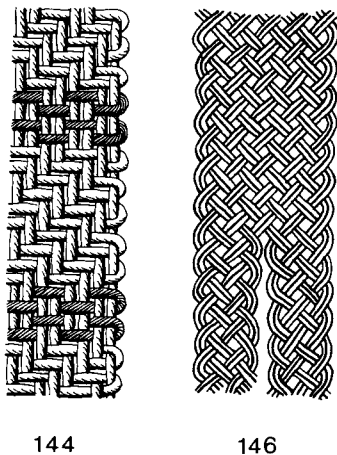


Fig. 52. Roman Riverside Wall: Diagram of selvedge on medieval striped twill 144; diagram of 10-thread medieval silk braid 146.

This small group of textiles is of some interest, particularly when seen in conjunction with the very large collections from the deposits of *c.* 1350 and 1499 associated with a nearby medieval dock on the Baynard's Castle excavations by Peter Marsden in 1972/3.

One scrap (No. 145) comes from a garment, with traces of a seam at the edge and a slit, perhaps a dart, or place for the insertion of a gore. This fulled tabby weave, with Z spinning in one system and S in the other, is of a type common to most medieval periods and places, but the other two woollens have features unlike any so far catalogued from the later deposits.

No. 142, a coarse selvedge fragment, has dark red and brown weft bands on a lighter brown four-shed twill. The piece has been well fulled. As far as can be seen the bands are worked on two sheds (extended tabby) instead of four, to give a more solid line of colour. From the 1350 Baynard's Castle deposits are numerous fulled fabrics with similar bands, but these are all on simple tabby weaves, not twills.

Although there is some evidence of fulled cloth in Britain in the Roman period (Wild 1970, 82-86) any such treatment is rare among Anglo-Saxon textiles, and there are no fulled fabrics among those from 11th century refuse pits at Winchester. Professor Carus-Wilson (1954, 189) points out that fulling mills were probably introduced into England late in the 12th century, and from this period on a greater proportion of cloths of all qualities were presumably treated in this manner than had been possible when the fulling had to be done by hand or foot. This selvedge fragment suggests a time before craftsmen had decided which were the most suitable materials for fulling, and a wider variety of weaves were being so treated.

The finer twill (Fig. 53, No. 145) is a three-shed construction with reverses in warp and weft producing areas of chevron twill and bands of small regular diamonds. The wool is of worsted type —

that is, prepared by combing, so that the fibres lie smoothly side by side — used for weaves where the pattern is intended to be seen and not obscured by any finishing process. This type of wool is used in the 1350 Baynard's Castle dock for a few fine four-shed twills, simple 2/2 diagonals, but from the presence with them of silk fragments of the 12th-13th centuries it is possible they are also of earlier date. The three-shed twills in that collection are simple 2/1 fabrics, fairly coarse and well fullled. To find three-shed weave and worsted wool together it is necessary to go further back, to textiles of the Viking period. In excavations at York a number of variants of this weave, very similar in thread and count to ours, were identified by John W. Hedges (see Hedges 1976, Figs. 3-6); many other examples, some considerably finer, were found at the famous Viking port of Birka in Sweden (see Geijer 1938, 26-29, Nos. w. 14-21, Pl. 5.1, 3-5).

Recent examination of fine Anglo-Saxon four-shed diamond twills suggests that they were woven with threads of different dyes or natural pigments in warp and weft to throw up the pattern, but there is no evidence so far that anything but a solid colour was used for the three-shed Viking diamonds; in spite of their fineness the designs seem to have been entirely in the texture.

The question of the loom on which three-shed twills were woven has been discussed at length by Dr. Marta Hoffmann (1964, 200-204 and 251-256). Though Viking loom weights of the 9th-10th century have been found in Shetland (Henshall 1952, 17 ff.) the number of Anglo-Saxon three-shed twills suggest that another loom, perhaps of Roman origin, was also in use in England. An early Mishnah commentary by Rashi (1040-1105 A.D.) in which he refers to men weaving with their feet, clearly suggests that by the 11th century the horizontal treadle loom, far better suited to the production of asymmetrical fabrics, was in use in Europe (see Hoffman 1964, 260). The origin of the fine worsted twills, whether three- or four-shed, has also raised considerable discussion (see Hoffman 1964, 237 ff and 256-257). Whether they were being produced in England, in Friesland, or much further east, there is no doubt that they are a highly skilled professional product.

The fourth textile item (Fig. 52, No. 144), a diagonal silk braid worked on ten threads, is a good example of a technique used from at least early medieval times. A fine woollen braid on 24 threads comes from the Mammen find, *c.* A.D. 1000 (Hald 1950, 245-247, Figs. 246-247), narrow five-thread silk pieces from Southampton, *c.* 1300 (Crowfoot 1975, 336 and 338, Fig. 275), Oxford and the *c.* 1350 deposits associated with the Baynard's Castle dock. These latter are all possibly shoe-laces, but the separation of our braid into two narrow tails at each end suggests perhaps some decorative use on the seams of a garment, or perhaps, from its likeness to an undivided silk braid in a different technique attached to a hair net, some use in hairdressing.

(c) THE WOOL

BY M. L. RYDER

148. (E.R. 1505/12) Some short lengths of spun wool recovered from BC 75, Layer 5, and therefore not

later than 13th century. For details of the fibre see Fig. 54.
149. (E.R. 1505/9) A small sample of raw wool from BC 75, Layer 5, and therefore not later than 13th century.

Medieval England had a reputation for fine wool yet until recently few samples in the form of textiles were available for examination. Raw wool remains are even more rare, and so this specimen is of particular interest in indicating the narrow staple form and fleece length. There is no natural pigmentation, so the wool is from a white sheep.

The staple length is 40mm and the number of crimps per inch (25.4mm) is 8. The crimp tends to form small curls, as seen in some modern fine-woolled Shetland sheep. The fibre diameter ranges from 16 to 34 microns with a mean of 22.6 ± 3.9 (SD) and a mode (most frequent value) of 20 microns. These values and the symmetrical diameter distribution define the fleece type as true fine wool (Ryder 1969). In terms of wool quality this is 64s Merino.

No evidence is found of the brush ends that are formed at the root of fibres in primitive moulting sheep when the wool ceases to grow, nor are any root ends of growing fibres to be found. The wool therefore appears to be from a shorn fleece, but whether or not it is native or imported cannot be ascertained.

This sample (No. 149) dated not later than 13th century is of extreme interest in providing the first direct evidence of the fineness of medieval English wool. It is a true fine wool with a symmetrical

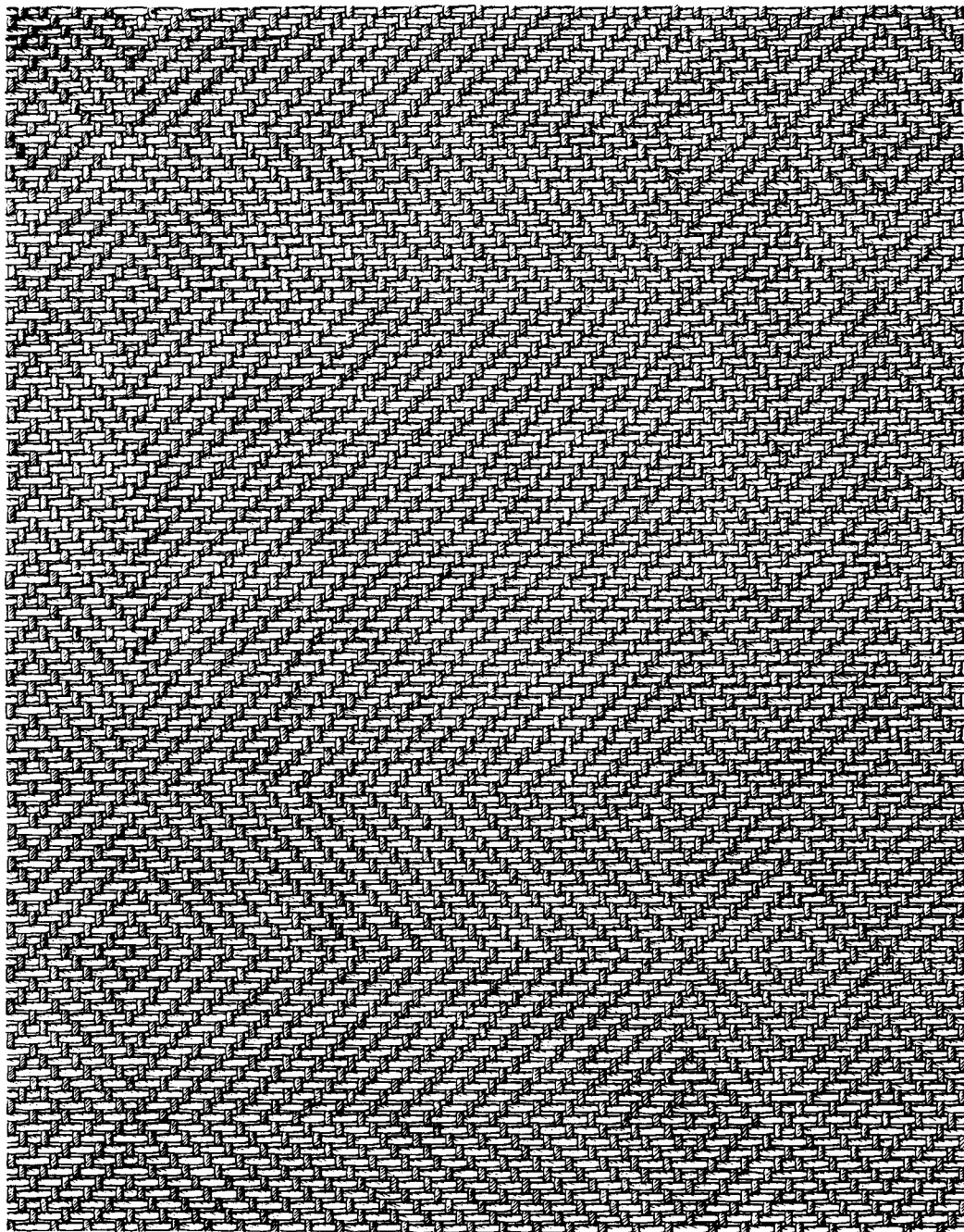


Fig. 53. Roman Riverside Wall: Diagram of medieval three-shed diamond twill 145.

SPECIMEN NO.	FIBRE DIAMETER RANGE	MODE	MEAN S.D.	COEFF. OF VARIATION %	DIAMETER DISTRIBUTION	PERCENTAGE MEDULLATED FIBRES	NATURAL PIGMENTATION	FLEECE TYPE
149 (raw wool)	16-34	20	22.9 3.9	16.8%	symmetrical	—	—	Fine
147 warp	14-44	20	24.0 6.3	26.4%	skew fine	—	—	Gen Med
weft	14-42, 48	(21)	24.7 6.4	25.8%	skew fine	1%	—	Gen Med
145 warp	18-54, 62	22	30.8 9.2	29.8%	skew fine	1%	—	Gen Med
weft	18-54	(26)	32.8 9.3	28.3%	skew fine	1%	—	Gen Med
144 warp	14-42	24	29.9 8.5	28.4%	skew fine	2%	moderate	Gen Med
weft	20-58, 60 (3)	40	45.6 11.8	26.0%	symmetrical	24%	—	Hairy Med
	70, 72							
148	14-62	24	32.4 11.8	36.3%	skewed to fine	21%	—	Hairy Med

Mode = most frequent diameter

Fig. 54. Roman Riverside Wall: Measurement of wool fibre. Diameter in microns (1 micron = 0.001mm).

diameter distribution and crimp number expected today only in sheep of Merino type which emerged in Spain during the Middle Ages. The staple length of 40mm is not necessarily the maximum annual growth, but is in keeping with the short fleece length expected in fine wools, but compares with 60mm in three staple samples of 11th century date from Winchester (Ryder 1974). One of these had root ends suggesting (in the context of a possible tannery pit) "skin wool", *i.e.* wool pulled from a skin by a fellmonger after the death of the sheep.

The fleece types of the Winchester samples comprised one true hairy type, four hairy medium wools, and two generalised medium wools, *i.e.* the ancient fine wool. Another fleece sample found with the skin in a Saxon level at Durham dated about 1000 appears to be of true medium type (Ryder, unpublished) but this is still being investigated.

The fineness of the London sample is of further interest in view of the comment of Ryder (1974, 100-110) that earlier (Saxon) wools were finer than the medieval ones examined, which were from a period when selection for fine wool is supposed to have taken place.

This diameter today would be expected to be associated with a crimp number of about 12 (Ryder and Stephenson 1968, 641) although the figure of 8 is within the range that is known to occur in Australia (*ibid.*, 649). The standard deviation, too, is less than the value expected for this diameter, today (*ibid.*, 645).

In addition to the raw wool (No. 149) described above (and by Ryder, 1977) and the spun wool (No. 148), several pieces of cloth (Nos. 144, 145, 147) also yielded yarns. The fibre diameter measurements of all these are shown in Fig. 54. Five are of generalised medium type, which is the typical primitive fine wool from antiquity to the Middle Ages. Two yarns are hairy medium wools and therefore even more primitive and another (in No. 144) is primitive in having moderate natural pigmentation. The raw wool remains the finest.

6. MORTAR SAMPLE ANALYSIS

BY JOHNEVANS

During the excavations some variations in the colour and texture of the mortar used in the Riverside Wall were observed and samples were taken for comparative analysis. It was hoped that the investigation would produce an explanation for the variety of colours observed. Of particular interest was a green mortar, observed in Areas I, III, VI, VII and VIII, which was found consistently at the base of the Wall and nowhere else. Two representative samples of the green mortar, Nos. 28 and 415, were removed for examination from Areas III and VIII respectively. In addition, three samples of a yellow mortar, used higher up in the body of the Wall, were removed from Areas II (No. 38), VI (No. 340) and VII (No. 414). No sample was taken from Area I but it is felt that the Area VI sample was representative of the yellow mortar employed on the eastern half of the site. Two other mortars were noticed on site and samples were removed for examination; a hard, white mortar from Area II (No. 34)

and a pink mortar from Area VIII (No. 413), perhaps connected with the re-used sculptured blocks. Duplicates of all these samples were retained by the Museum for future study. Their accession numbers are as follows: 1520/47.1 (No. 28); 1521/48.2 (No. 34); 1522/49.2 (No. 38); 1535/119.2 (No. 340); 1539/97.2 (No. 413); 1540/98.2 (No. 414) and 1541/99.2 (No. 415).

EXPERIMENTAL

Visual examination of the seven samples showed them to be in good condition and not friable, although some leaching out of calcium salts had taken place. The aggregates appeared to be mostly flint and brick fragments with chalk inclusions (approximately 5%). Samples Nos. 28, 34 and 413 also contained a few fragments of charcoal. All samples had an off-white to pale yellow colour; no trace of their reported colourations in the field was observed.

The coarseness of the aggregates strongly suggested that these samples were not mortars in the usual sense of the word but concretes.

The samples were first dried at 110 °C to constant weight. 200g of each sample was then treated with dilute hydrochloric acid to remove acid-soluble material (mainly calcium salts) and thus reduce the concrete to its aggregate. The aggregate was filtered off, thoroughly washed and dried to a constant weight. It was then passed through a series of sieves and the various quantities retained noted. In order to enable comparison of the aggregates to be made, the weights retained were converted into a percentage of the total aggregate weight and plotted against sieve mesh size. The results of this exercise are shown in Fig. 55. All analyses were carried out in duplicate and the mean values plotted.

Geological examination of the aggregates indicated that the larger aggregates in all samples were composed of flint fragments showing natural fractures and quartzite pebbles. In sample No. 340 the larger aggregate contained, in addition, a substantial proportion of brick/tile fragments. Several of the flints in the samples, with the exception of those from No. 34, had a reddish appearance reminiscent of having been fired, but the absence of sharp fractures suggested that this was probably a natural phenomenon.

The finer aggregates were composed of small flints, sub-rounded quartz and fragments of oxidised pyrites. The sample No. 34 had, in addition, a small quantity of sharp-grained quartz and No. 340 had some brick/tile fragments.

DISCUSSION

It can be seen from Fig. 55 that the aggregate-size distribution curves all exhibit a similar shape. As the samples come from different areas of the Wall, such similarity suggests that either the concretes are contemporary or following a recipe.

If one reconsiders the results in the absence of the coarsest material (which is often atypical) the curves (Fig. 56) with the exception of those for Nos. 28 and 340, show a very close resemblance to each other. Such consistency is exceptional in a structure of this size and would seem to indicate a contemporary origin for the concretes. The geological evidence, on the whole, supports this conclusion but the presence of sharp sand and unreddened flints in the sample No. 34 does raise some doubts.

Further doubts were raised as the excavator reported that some difficulty had been experienced in obtaining sample No. 34 owing to its extreme hardness and the fact that it appeared to be separated from the neighbouring concretes by a distinct fissure (p. 38). Such observations would be in keeping with the experimental evidence. The sharp sand could produce a hard concrete and the fissure could result from a repair of the Wall in which the new concrete failed to key properly with the neighbouring material. While this interpretation would be in keeping with the mortar analysis, it is argued elsewhere (above, p. 40) that this section of the Wall is in fact contemporary with the whole structure.

Support for the use of a recipe is given by the data from samples Nos. 28 and 340. Although their distribution curves do not fall within the close limits defined by the other samples they do show the same essential features. It could be argued in the case of sample 28 that, as the aggregate has a similar geological make-up to the other samples, it comes from a similar source and hence would be expected to show a similar distribution curve. Such an argument, however, cannot be advanced in the case of sample 340, as the bulk of its aggregate is composed of brick/tile fragments. Any similarity observed, therefore, must be either coincidental (unlikely) or deliberate. If deliberate, it could be brought about

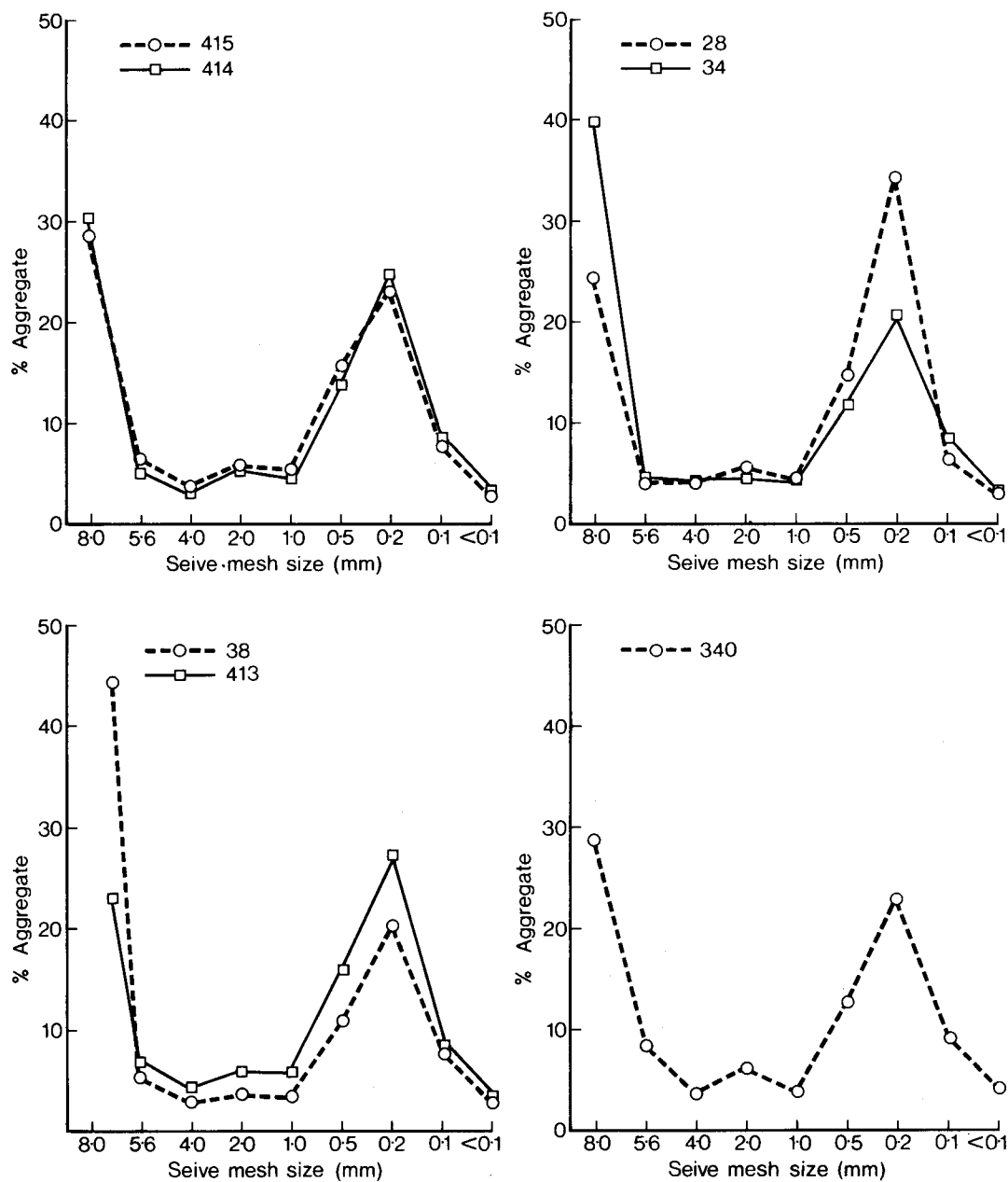


Fig. 55. Roman Riverside Wall: Riverside Wall mortars: aggregate distribution curves 1.

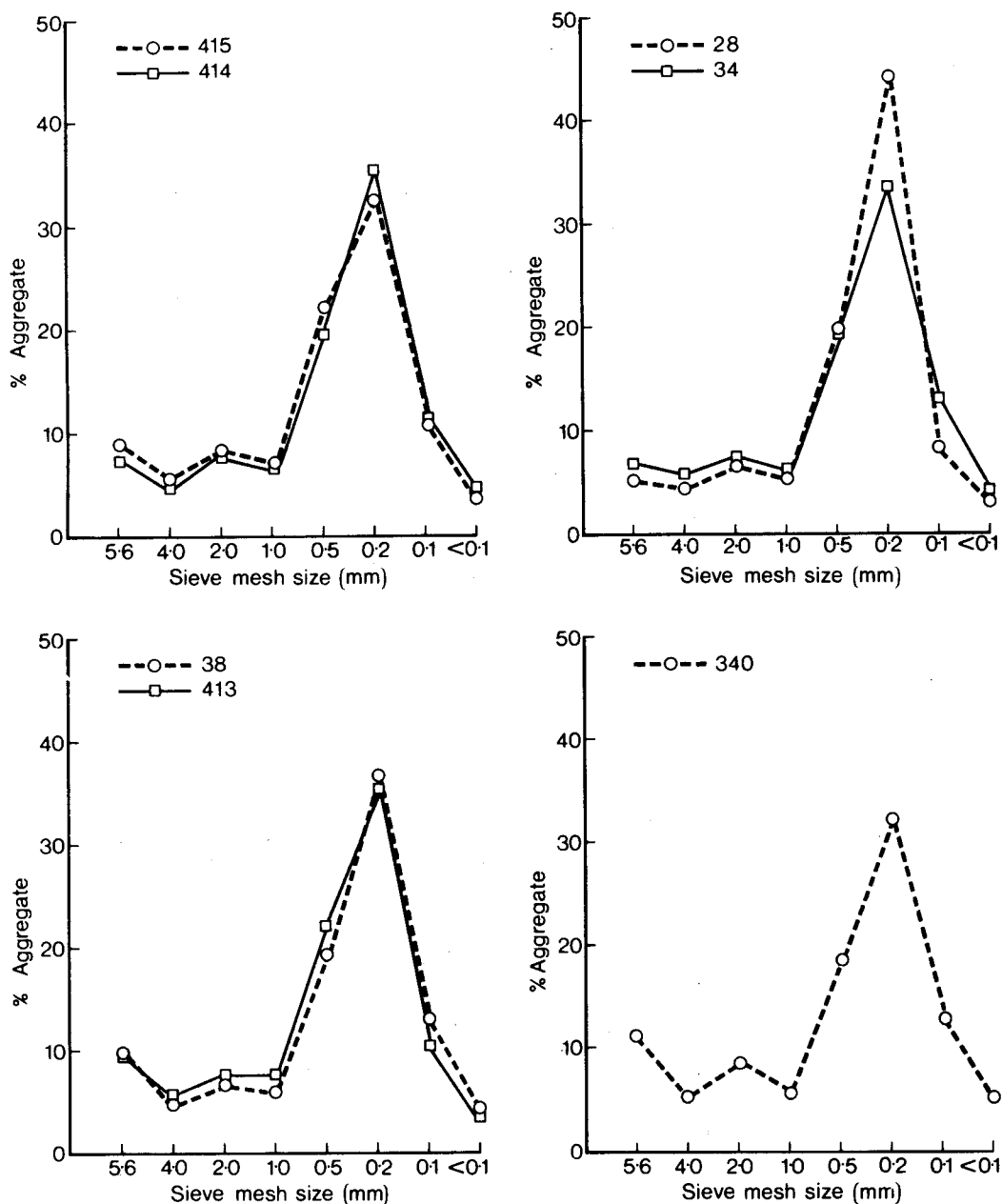


Fig. 56. Roman Riverside Wall: Riverside Wall mortars: aggregate distribution curves excluding coarse aggregate.

only if the makers of the concrete were following a recipe and sizing the necessary portions of aggregate using some form of sieving technique.

In general, it is concluded that the various sections of the Wall are most likely to have had a contemporary construction rather than falling into separate and major building phases. The presence of some sharp-edged quartz in the fine aggregate of sample 34 might have been deliberate, indicating an improvement in technique, but it was more likely to have been crushed accidentally during the preparation stages.

The marked similarity between the aggregate distribution curves strongly suggests that the builders graded their materials prior to use and did not use the natural aggregates directly. This in turn suggests that the builders were following a recipe. It would be interesting to note if similar distribution curves are to be observed in other major Roman structures.

No substances were detected in the samples to explain variations in the colour observed during excavation and it must be concluded, therefore, that such colours were transient and resulted from the immediate soil environment. Such variations as were observed could all be explained by the presence of iron oxide in varying concentrations.

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PART IV

PART FOUR THE SCULPTURED STONES

(a) FOREWORD

BY PROFESSOR JOCELYN TOYNBEE

1975 was a momentous year in the history of the rediscovery of ancient London. On the north bank of the Thames, within the area of Roman *Londinium*, a team of archaeologists from the Museum of London uncovered a large section of the Roman Riverside Wall, in which numerous re-used, carved and inscribed Roman blocks were incorporated, probably in the second half of the 4th century A.D. This was a defensive wall, possibly constructed in haste, and in part with old material. It was at first thought that the built-in carvings came from tombstones, as did much of the re-used material incorporated in the bastions on the eastern and north-eastern sectors of the Roman city's landwall. But the sources of these sculptures, which are by and large of high artistic quality and rank among the most important acquisitions of the new Museum of London, have turned out to be much more novel and exciting. Intensive research by Mr. Thomas Blagg, who has been engaged in work on Roman architecture and architectural ornament, and the drawings of Miss Sheila Gibson, an architect and a skilled archaeological draughtswoman, have revealed that most of them represent relics of two imposing public monuments that adorned Roman London probably from the late 2nd or early 3rd century to the second half of the 4th: a monumental Arch and a monumental decorative Screen.

Hitherto the public buildings of civilian Roman Britain — its temples, baths, market-places, theatres and so forth — have been known to us from their ground-plans alone; or, in cases where substantial portions of their superstructures remain, these have nearly always been stripped of any decoration that they once may have had. But of Roman London's Arch and Screen enough has been retrieved not only for part, at least, of their dimensions and the general character of their construction to be more or less precisely recreated, but also for considerable portions of their sculptural ornament to be accurately placed, so that both the overall effect of that ornament and many of its details can be visually appreciated today. To the excavators and joint authors of these reconstructions — which are a truly notable achievement — all students of Roman Britain in general and of Roman London in particular will be deeply indebted for new and unexpected knowledge of the Roman province.

Whereabouts in *Londinium* the Arch and Screen once stood and exactly what purposes they served we may probably never know. Nor can we tell at present precisely when and under what circumstances they became the prey of late Roman wall-constructors. The generally excellent state of preservation of the surfaces of the carvings that remain suggests that both were still standing intact in the first half of the 4th century and were deliberately dismantled to serve as a quarry. But while there is much about the monuments of which we are still ignorant, we can learn not a little of their background from the subjects of their sculptured reliefs. They were clearly civilian and religious, not military or political, in character — more akin, in the case of the Arch, to the *Porte de Mars* at Reims and the *Porte Noire* at Besançon than to the triumphal arches of Rome, Beneventum, Orange, Oea and Lepcis Magna.

The new sculptures cannot claim to share the spectacular brilliance of the imported marble heads and figures in the round that the Walbrook Mithraeum has yielded, but inasmuch as

they are carved — and most attractively and competently carved — in native stone, whether by native sculptors or by immigrants trained in the work-shops of Gaul, they are more genuinely British and offer evidence of a more widespread public interest in classical art and culture.

Of the sculptured stones from the Riverside Wall that cannot be associated either with the Arch or with the Screen the most interesting is the votive relief of four “Mother Goddesses” seated in a row on a bench within a projecting frame. Three is the standard number of Mothers in such scenes, the appearance of four in this case being, so far as I can discover, unparalleled elsewhere. A possible explanation of this anomaly is that the sculptor, starting from the right-hand side, miscalculated the area at his disposal for carving, and instead of spacing out his figures (as did the carver of the well-known Mothers relief at Cirencester) placed the first three (reckoning from the right) too close together, and would thus have been faced with the alternatives of either leaving an ugly gap on the left-hand side or of filling it with an extra goddess. The fourth figure, on the extreme left, does, indeed, appear to have been rather tightly squeezed in: her right side is close up against the frame and her left shoulder slopes down at somewhat too sharp an angle.

On the other hand, it must strike one as most improbable that so skilful and experienced a craftsman as the sculptor of this relief would have made such a gross miscalculation when roughing out the picture, and there is another and much more acceptable explanation of the four goddesses anomaly. The fourth figure on the right, on whose right shoulder the third Mother Goddess from the left lays a kindly and reassuring hand, may have been intended to represent, not a goddess, but a worshipper, whom the carver has failed to distinguish from the three divinities in scale, attitude (one might expect her to have stood), dress and attributes. His error could be due to some misreading of his copy-book, or to forgetfulness of the details of his model if he worked from memory.

J.M.C.T.

(b) THE SCULPTURED STONES

BY THOMAS BLAGG

1. INTRODUCTION

The existence along the bank of the Thames of the southern defensive wall of Roman London had been the subject of debate for many years. The recent discovery and excavations which form the subject of the first part of this report thus came more as a demonstration than as a revelation. The incorporation within it, however, of the remains of two other monuments from Roman London was an unexpected bonus, and one which is all the more welcome, since so little has remained for us to see of the public architecture of the Roman provincial capital.

Out of the stones which were re-used in the City Wall, it has been possible to reconstruct part of a monumental Arch, and an ornamental Screen decorated with figures of gods in relief. The Arch is represented by its middle stage, that which included the archway itself. Nothing from the supporting pillars or walls could be identified, nor any attic, though the proportions of the surviving remains suggest that there might have been an additional superstructure. On both its long sides the arch was flanked to right and left by niches containing standing figures. These included Minerva and Hercules, and a third god holding a staff; no part of the fourth was found. The spandrels of the arch contained busts in roundels,

and sea monsters. Vine scrolls rising from canthari decorated the two short sides. Above the archway there was probably an inscription on the front, but this is now represented only by one of the cupids who would have supported the panel. On the other sides there was a frieze of busts of gods and goddesses, including Mars, Mercury, Venus and probably Luna on the rear, and Apollo on one of the short sides. Two cornice blocks, decorated with acanthus foliage, may have crowned the frieze.

It is this decoration, rich not only with figured sculpture but also with a wide variety of architectural ornament, that permitted a detailed reconstruction that can be offered with some assurance.

The Arch's purpose is not known, but nothing in its decoration refers to military activities. It thus appears to have been civilian rather than triumphal. While the part which we have was carved on all four sides and may have come from a free-standing monument, it may equally well have stood above the gateway through a precinct wall. The character of the ornament suggests a date no earlier than the late 2nd century, and more probably the 3rd, possibly Severan.

The Screen can be restored as a monument carved on both front and back with figures in three pairs or niches framed between pilasters. On the front, representations of deities included, from left to right, Vulcan, Minerva, probably Mercury, Diana, an unknown god and Mars. Lesser mythological figures were carved on the back and one end. Like the Arch, the Screen was made from Lincolnshire limestone, but the style of its sculpture and ornament is distinct, and it cannot be suggested on that ground that the two were contemporary in their construction, or stood on the same site. The Screen probably belongs to the 2nd or 3rd century.

Only about a fifth of the original total of stones from each monument survives. Fortunately, many of those parts remained on which the gods' distinctive attributes were carved. This permitted identifications, but their number was insufficient for all parts to be related and restored to their places in the overall design without further information. The most fruitful source of this seemed to be the varied and highly specific architectural ornament. As will be seen below (p. 183), no less than twenty-three motifs have been identified. On this basis four groups were isolated, among which almost all the stones could be assigned.

One, with figures in round-headed niches separated by columns with a single flute, proved to belong to the Screen of Gods. The other three groups were thought at first to belong to different buildings, but subsequently it proved possible to relate them all to different structural parts of the Arch. This was largely the result of the fortunate discovery of a further stretch of the Wall in January 1976, with one of the key pieces which linked two of these groups. These three groups consisted of the mouldings of the archway itself, which was decorated with three different schemes on front and back, and also on the underside; busts from the frieze over the arch, which were framed by pilasters with three flutes or with a foliate motif; and vinescrolls and full-length figures of deities in square-headed niches, flanked by pilasters with five different ornamental motifs.

As almost all the surviving blocks were carved with one or more of these pilasters, the rationale of the scheme of decoration could be inferred. One type of pilaster framed the vinescrolls on the short sides; two others, on adjacent sides of the corner blocks to the first, could be placed at the outer margins of the front and back of the monument; the other two

could be assigned to inner pilasters which adjoined the archway. Some stones from the bottom of the niches also carried part of the outer margins of the arch, and the associated elements of the front and back designs thus became clear.

This gave a framework of architectural ornament within which the fragments of figure sculpture could be placed. This was done with the aid of one-fifth scale three dimensional cardboard models of each block, made by Sheila Gibson from her drawings. Although there are only a few instances in which one block could be shown to fit next to or above another, the relative positions of all but one of them within the framework could be established with some confidence.

In the following pages, the individual stones assignable to the Arch and the Screen will be described and the reconstruction of each monument argued in detail. The other decorated stonework which is separate from or which cannot be assigned with certainty to the monuments will then be considered. There follow discussions of the architectural and historical significance of the discoveries, a more detailed analysis of the ornament, and studies of the building and masonry techniques, the re-use of the stones and a petrological report.

ACKNOWLEDGEMENTS

This report could not have been completed without the help of many people, and I wish to thank them all most warmly. Sheila Gibson spent many hours preparing the splendid drawings of the individual stones and from them the cardboard models used in working out the reconstructions. Additionally, her observations and comments in the course of our work were invaluable, and it is a just reflection of this that she should appear as joint author of the section on the reconstruction of the Arch. It was immensely helpful to have Professor Jocelyn Toynbee's advice, given with characteristic generosity, in the identification of the sculpture and in her comments on the draft of the report. J. B. Ward-Perkins made valuable suggestions on the reconstruction of the monuments and their architectural significance. Ralph Merrifield and Hugh Chapman of the Museum of London have been a ready source of stimulating ideas and criticism. I am grateful also to the encouragement of Brian Hobley as Chief Urban Archaeologist of the Museum of London's Department of Urban Archaeology, and Charles Hill, who directed the work on site and kept adding to the stock of stones and our thoughts about them with great enthusiasm. Francis Dimes and Martyn Owen of the Geological Museum took samples of the stones and contributed the Petrological Report, and Trevor Hurst, John Bailey and Jenny Orsmond of the Department of Urban Archaeology have devoted much time and care to the photography. To these, to other members of the Museum staff who helped with the arrangements for the study of such bulky material, and to those who have contributed ideas and suggestions, most grateful thanks are given.

All drawings are by Sheila Gibson unless otherwise acknowledged in the caption.

2. THE MONUMENTAL ARCH

The rich ornament displayed by many of the stones provided an obvious basis for the classification of the material. Three groups were distinguished initially, which were thought to have come from different buildings. Subsequently it proved possible to relate the groups to one another, and to show that they came from a monumental arch. The groups represent three structural parts of it, namely the archway itself, figures of deities in niches flanked by pilasters on each side of the archway, and reliefs from the frieze which surmounted the rest. The reconstruction will be argued in detail below (pp. 153-7), but the observed divisions will be used in describing the material. Altogether, twenty-nine pieces, representing twenty-seven original blocks, can be assigned with certainty to this monument (Fig. 57). For a glossary of architectural terms, see D. S. Robertson *A Handbook of Greek and Roman Architecture* (2nd ed., Cambridge 1943) 379-90.

(The scale on the plates measures 200mm in 100mm divisions)

(a) THE ARCHWAY

1 (*Plates 18-19, Fig. 58*)

Height, front 0.225m, back 0.285m

Width 1.17m

Depth, top 0.625m, bottom 0.64m

Although it has suffered some damage at the edges, this voussoir stone preserves best the main features of the highly ornamented arch. The decoration of the right face consists of concentric bands beginning (from the inside) with leaves scrolled in alternate directions, and continuing with a bead-and-reel, a guilloche, a second bead-and-reel, an acanthus-palmette scroll and a third bead-and-reel. The other face is rather more simply carved and probably decorated the back of the monument. It is carved with two different bead-and-reel motifs separated by a plain concave moulding, and then two wide bands of overlapping leaves and half-leaves, separated by a similar moulding. The soffit is in two parts, 0.46 and 0.71m wide, the longer being rebated back 75mm. It is decorated with an acanthus scroll which includes one half of a coiled stem and a petalled flower. The shorter division of the soffit bears part of a hexagonal coffer which contains an acanthus wreath with a cinquefoil flower in the middle.

There is a lewis-hole in the top and two holes for bar-cramps at the back. Unlike most of the other voussoirs this piece does not have dove-tail cramp-holes, which suggests that it must have come from a position in the upper part of the arch, at too high an angle for dove-tail cramps to have been effective. The bar-cramp holes are themselves at a steep angle to the top surface. The top has been chiselled flat and smooth, the underside left rather rougher, retaining some of the pitting from the point used in the preliminary dressing. A secondary groove 60mm deep has been cut through the bottom from back to front, damaging the rosette.

2 (*Plates 20-21, Fig. 59*)

Height, front 0.27m, back 0.365m

Width 1.16m

Depth, right 0.69m, left 0.615m

The right-hand side is little damaged, and preserves the entire profile of this side of the arch, the outer- and inner-most mouldings of which were not complete in No. 1 above. The corners of the top have been damaged, particularly on the left-hand side. The acanthus scroll on the rebated part of the soffit is well-preserved between cyma mouldings on each side, though the centre of it is damaged. Only part of the coffering survives, but there is a small bird in the angle, its head looking backwards.

3 (*Fig. 60*)

Height, front 0.265m, back 0.30m

Width 1.16m

Depth, top 0.58m, bottom 0.565m

The block is broken in two across the middle. The outer part of the ornament is curtailed on each face. The left-hand corner of the block has been knocked off. In the hexagonal coffer on the soffit there is a double corona of ten leaves, the upper leaves lobed and channelled. In its centre is a rosette of four fleshy petals, upon which is superimposed a flower with four pairs of petals. In the upper angle between the hexagon and the edge is the tail or wing of a bird. This, and the details of the ornament, show that this block was laid underneath No. 2 above. There are traces of cream limewash on the soffit.

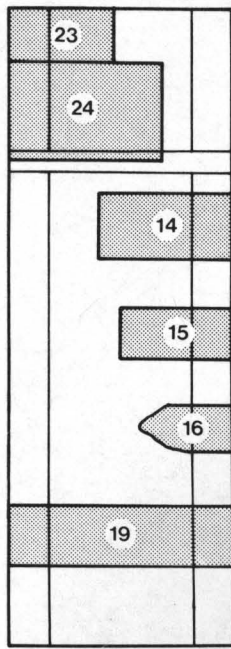
4. (*Fig. 61*)

Height, front 0.23m, back 0.32m

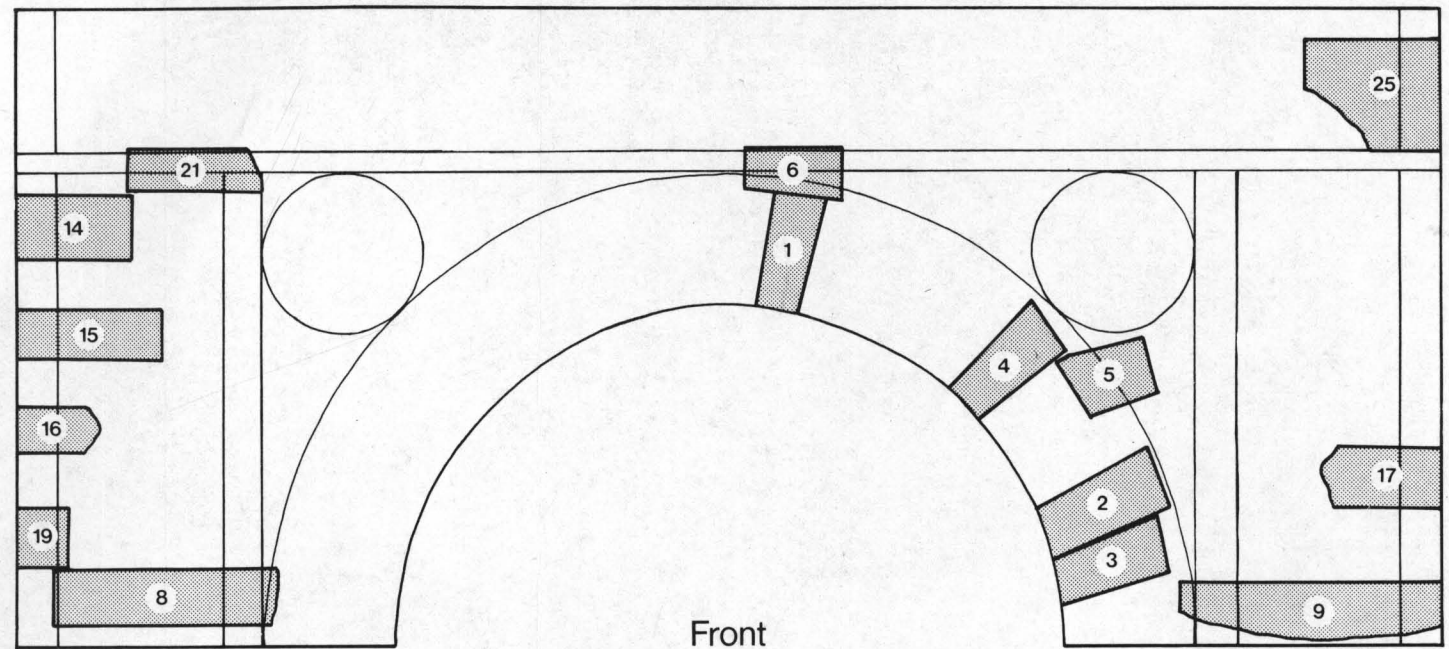
Width 1.15m

Depth, right 0.67m, left 0.58m

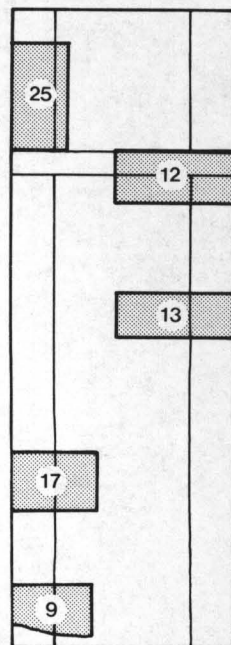
As with the previous example, the outer part of the arch ornament was carved on an adjoining block. The soffit is worn and damaged, but the head of a bird is preserved to the left of the coffering. Two dove-tail cramp holes are cut with their bottoms at an angle to the top of the stone, indicating that the block was placed between one third and half-way up the arch. The left-hand part of the upper edge has been chamfered off, presumably to accommodate the block above.



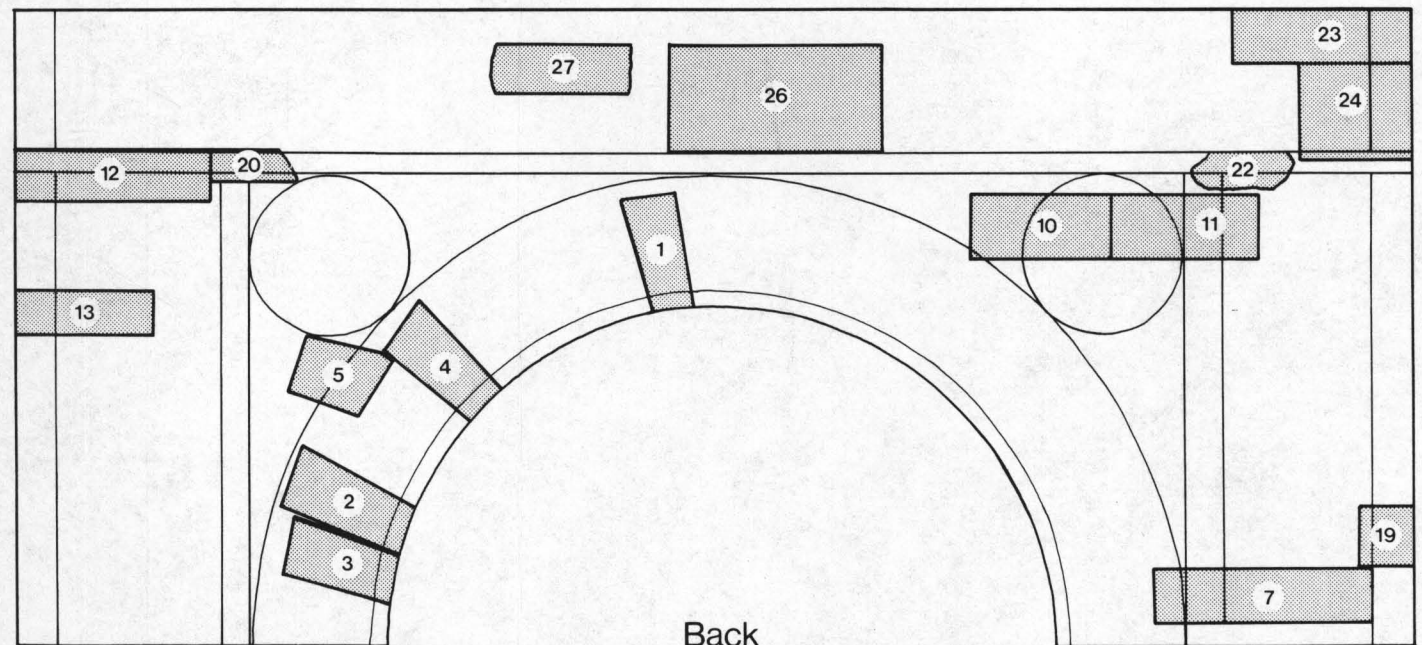
Left



Front



Right



Back

Fig. 57. Roman Riverside Wall: The London Arch. Elevations, with the stones numbered (1:40)
(T.F.C. Blagg)

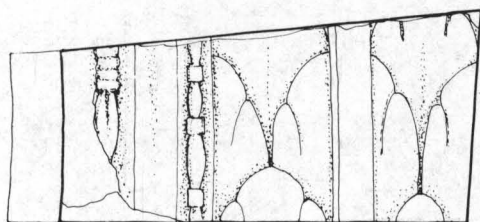
5. (Plates 22, 23; Fig. 62)

Height 0.34m

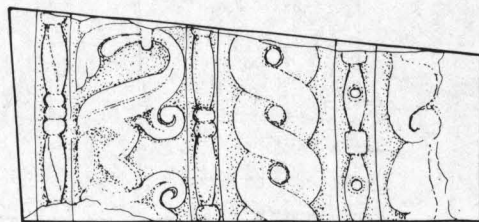
Width 1.17m

Depth, top 0.455m, bottom 0.37m

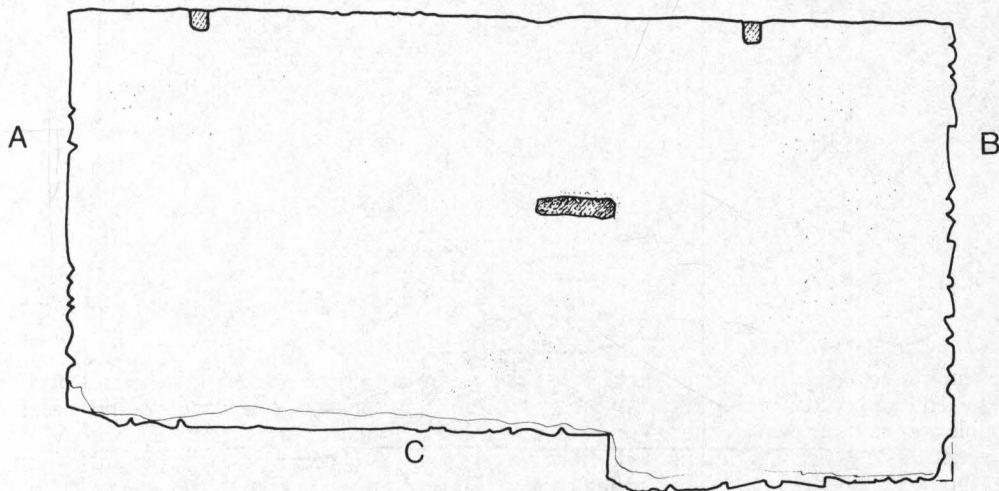
At each end are the outer mouldings of the archway. Above these are on each side parts of figures in relief, with curved fin-like attachments. The figures must come from the spandrels of the arch, and seem best interpreted as marine creatures, probably dolphins. The top is slightly ridged, to present two facets, and each of their outer edges has a pair of cramp-holes, angled downwards and outwards. One half of a bar-cramp hole is cut obliquely in the rear edge of the underside, and must be associated with the re-use of the stone. The back shows a marked anathyrosis in which the rough marks of a heavy point are clear, between smooth chiselled borders approximately 0.16m wide at each end, which provided a close-fitting joint.



A



B



C



Fig. 58. Roman Riverside Wall: Block 1. (The Arch: Archway) (1:10).

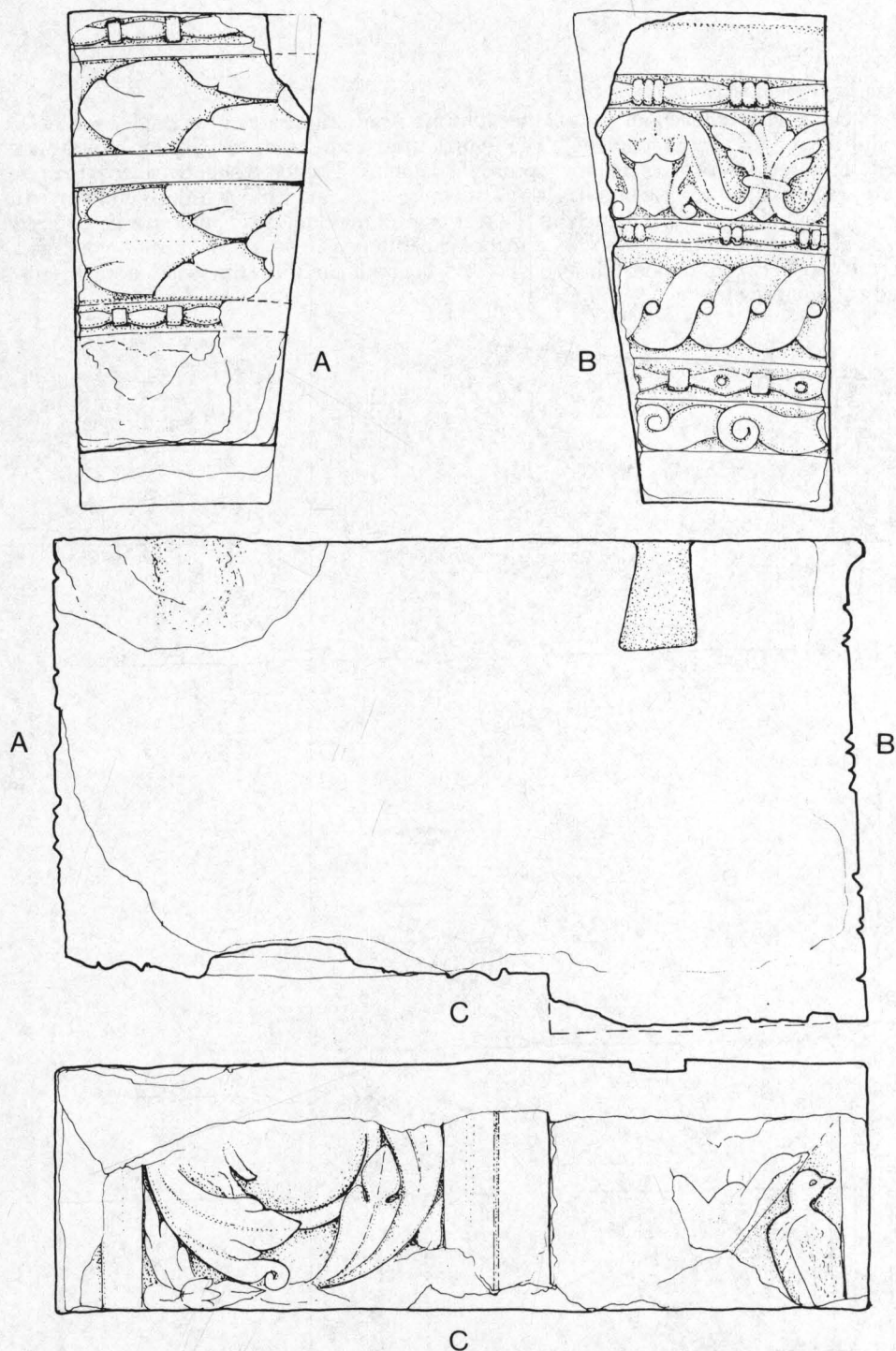


Fig. 59. Roman Riverside Wall: Block 2. (The Arch: Archway) (1:10).

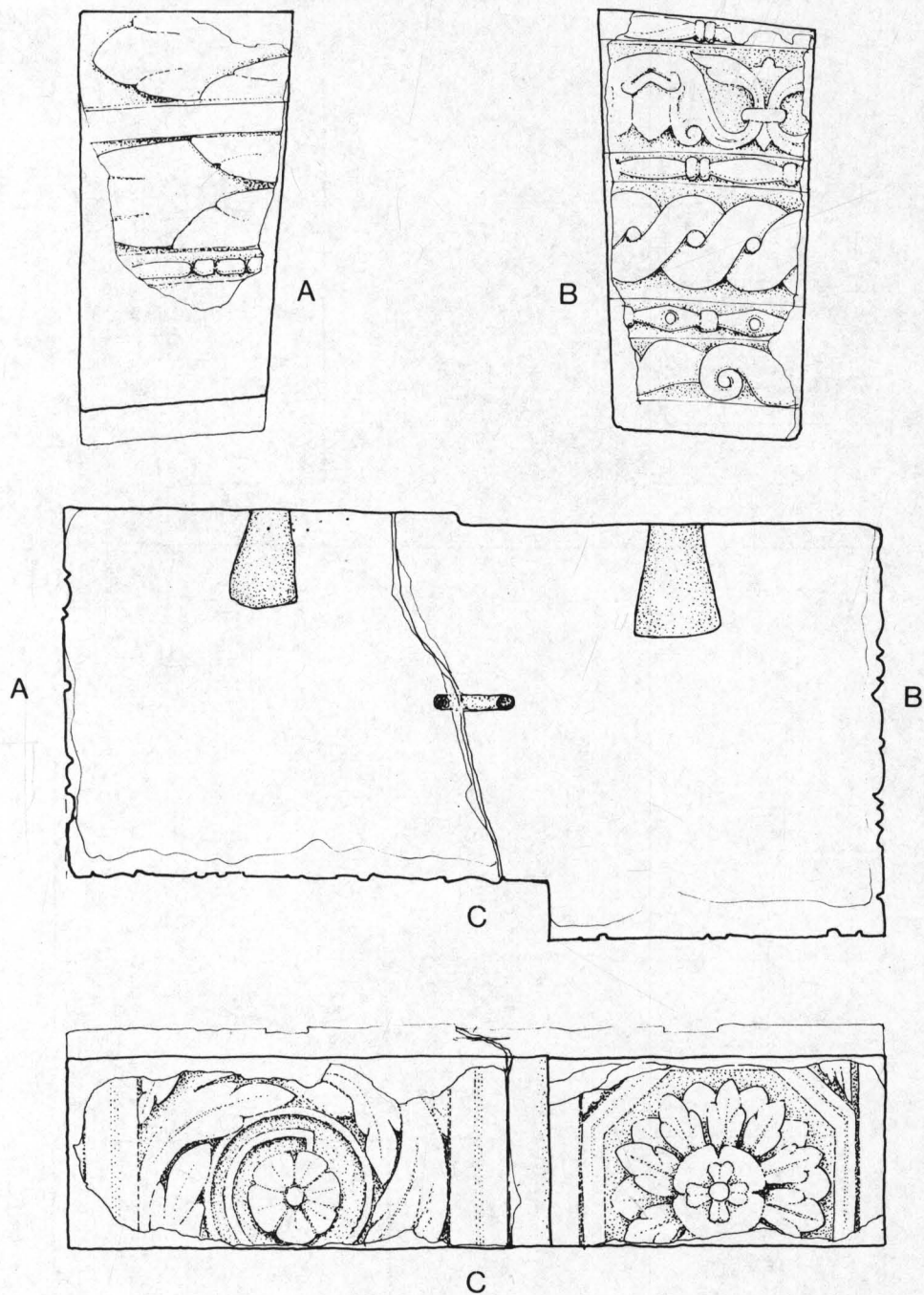


Fig. 60. Roman Riverside Wall: Block 3. (The Arch: Archway) (1:10).

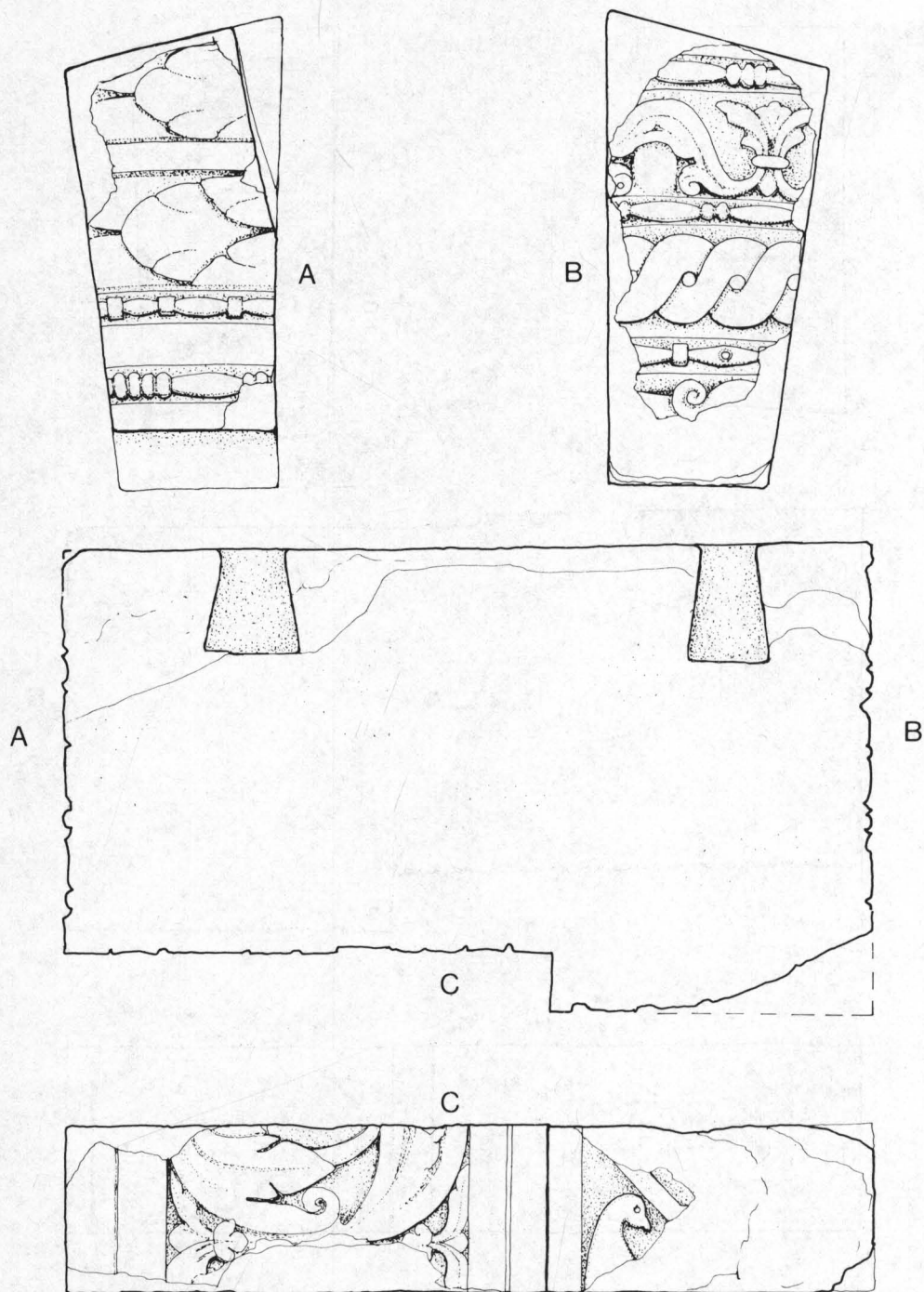


Fig. 61. Roman Riverside Wall: Block 4: (The Arch: Archway) (1:10).

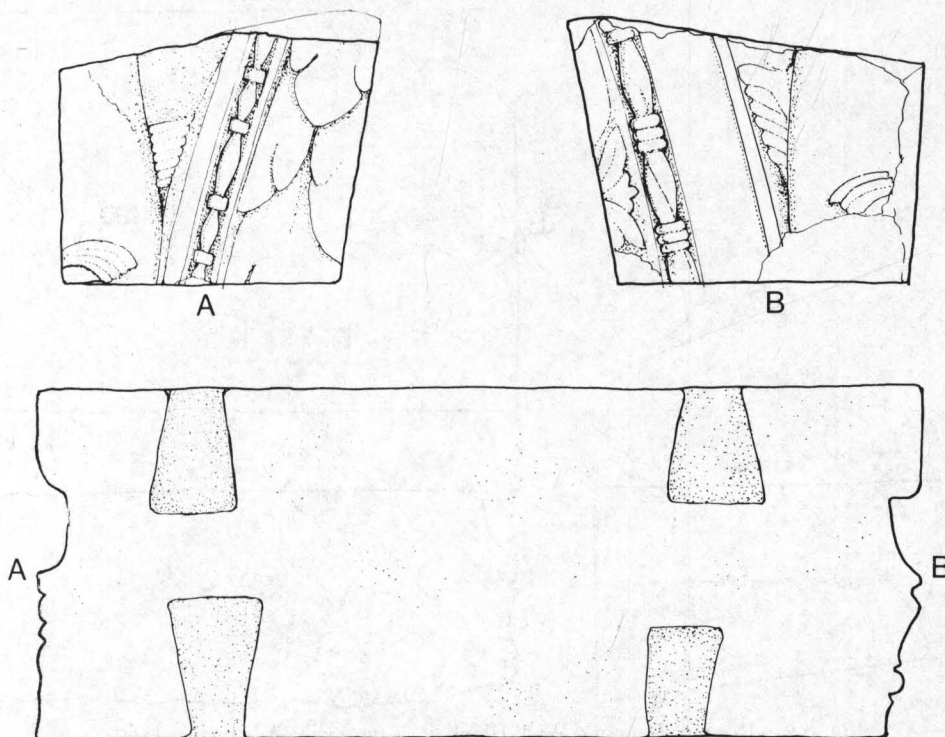


Fig. 62. Roman Riverside Wall: Block 5. (The Arch: Archway) (1:10).

6. (Fig. 63)

Height, left-hand side 0.235m, right-hand side 0.28m

Width 0.54m

Depth 0.75m

The upper part of the face is decorated with a horizontal cyma reversa moulding, 0.115m high, below which is a curved hollow moulding identical to that which forms the outermost moulding of the front (the acanthus and guilloche side) of the archway. The bottom of the stone is flat but at an angle to the top, indicating that the tops of the upper voussoirs, upon one of which this stone must have sat, were not horizontal. No. 1 above was probably one of them. The left-hand end has been broken off.

(b) THE NICHED FIGURES

Many of these pieces can only be assigned to their places by the ornament on their pilasters. For convenience the five types are defined briefly here, though they will be discussed in more detail below (pp. 183-4) in common with other decorative features.

- i. *Imbricated Leaves*: leaves which overlap in the manner of fish scales.
- ii. *Sun and Moon*: roundels and crescents.
- iii. *Drooping Flower*: horn-like cauliculi twisting in alternate directions, from which acanthus leaves spring and flowers droop down.
- iv. *Scroll*: alternating spirals of acanthus leaves.
- v. *Acanthus Spray*: acanthus foliage, shooting upwards, with at intervals double sprays of small leaves from which the new shoots start.

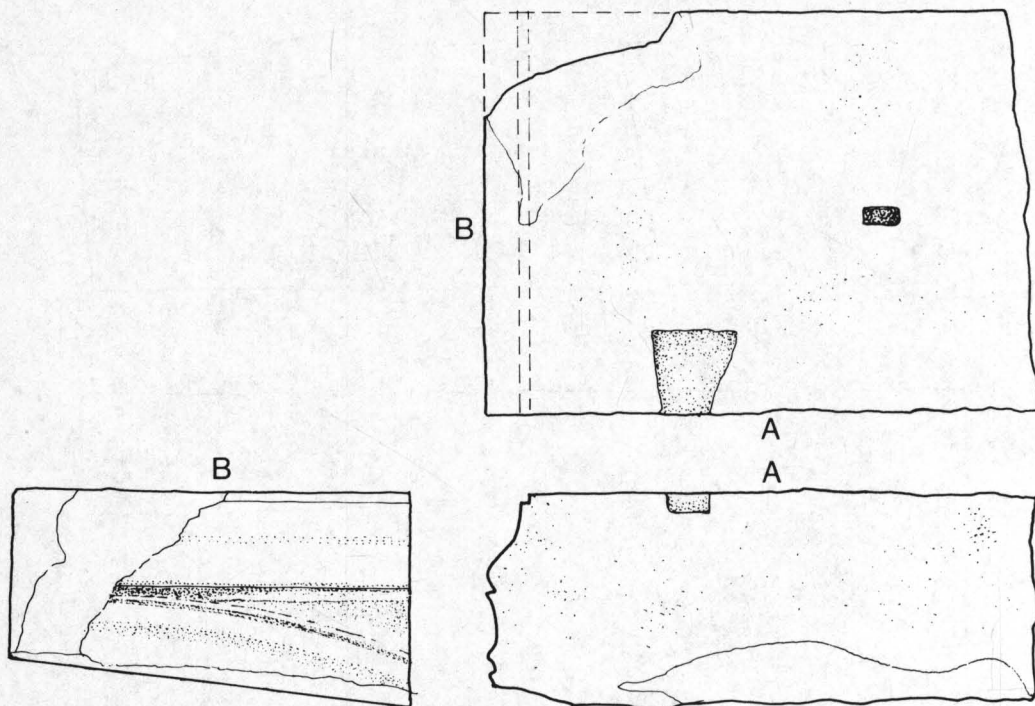


Fig. 63. Roman Riverside Wall: Block 6. (The Arch: Archway) (1:10).

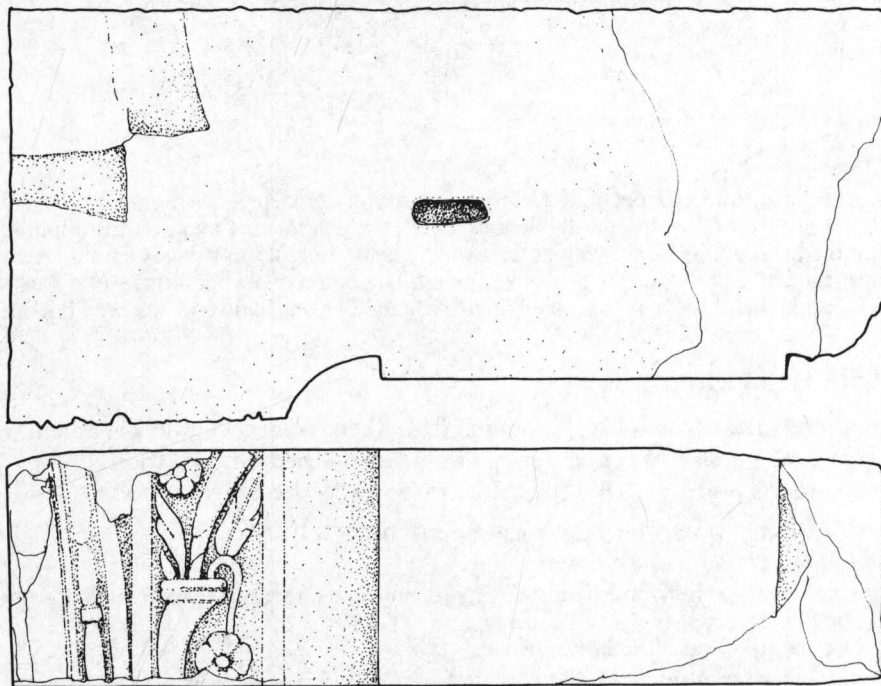


Fig. 64. Roman Riverside Wall: Block 7. (The Arch: Nighed figures) (1:10).

7. (Plate 24, Fig. 64)

Height 0.34m
Width 1.15m
Depth 0.55m

At the left is a section of the outer moulding of the less elaborate side of the archway, with part of an overlapping leaf and a bead-and-reel motif. This is joined at the bottom by a pilaster, 0.21m wide, of drooping flower type. To the right is the beginning of a curved niche approximately 0.79m wide within which is a rectangular projection 0.535m wide and tapering very slightly upwards. The niche is 80mm deep and the projection comes forward 30mm from the rear of it. The face is smoothly dressed.

This is therefore one of the key pieces by which the decoration of the archway can be linked with the figures in niches formed by pilasters. Both ends have first been neatly dressed with an adze, and their front edges were then drafted with a chisel. The back has been roughly dressed with a point. The other faces do not retain toolmarks.

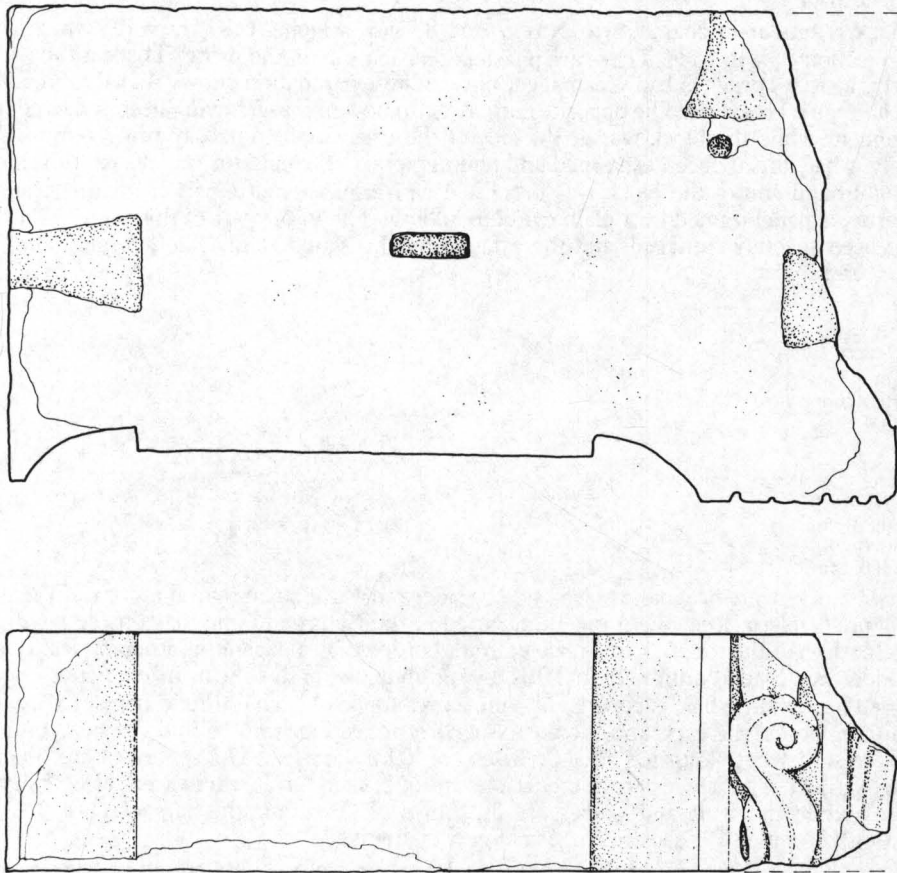


Fig. 65. Roman Riverside Wall: Block 8. (The Arch: Nighed figures) (1:10).

8. (*Fig. 65*)

Height 0.34m
Width, top 1.18m, bottom 1.16m
Depth 0.65m

This block is similar to the preceding in having a curved niche with a rectangular projection, in this case 0.895 and 0.60m wide respectively. To the right of the niche is a pilaster with scroll (type iv) ornament, and at the right-hand edge of the block a plain moulding. This corresponds with the outermost moulding of that side of the archway decorated with guilloche ornament, i.e. the opposite side to that in which No. 7 appeared. The moulding inclines outwards only slightly, in such a way as to suggest that this block probably came from the course at which the springing of the arch began.

The face has been neatly cut and smoothed, indicating that the rectangular projection was intended to be seen, and did not, for example, have a block or pedestal attached to the face of it. The top and sides, though neatly levelled, retain the closely-set marks of the tool used, which was either an adze or a broad chisel held at a steep angle. The right-hand end is damaged.

9. (*Plate 25, Fig. 66*)

Height 0.30m
Width 1.40m
Depth 0.465m

This block is similar in character to Nos. 7 and 8, with a niche, 0.875m wide, which contains a regular projection 0.59m wide. There are pilasters on each side of the niche. That on the left survives very poorly, as that corner is badly damaged, but careful examination shows that the broad part of a scrolled leaf (type iv) remains. The opposite corner is also now missing, having been removed overnight by a delinquent while the block was at the side of the excavation trench awaiting removal to store. Fortunately it had already been examined and photographed. The pilaster was of acanthus spray type, and the right-hand end of the block was decorated with a pilaster of type i (with imbricated leaves) which adorned a panel framed by a plain cyma moulding. The lower part of this piece, as it originally stood, has been severely damaged, and the original height is uncertain. The left-hand end, where it survives, is dressed flat.

10. (*Plate 26, Fig. 67*)

Height 0.35m
Width 0.76m
Depth 0.38m

11. (*Plate 26, Fig. 67*)

Height 0.35m
Width 0.79m
Depth 0.44m

These two blocks were originally placed side by side, and as the main figural motif is divided between them, it is preferable to treat them together. No. 11, the right-hand one, has on the right, part of a niche 0.12m deep at the top, 0.15m at the bottom, bordered by a pilaster of drooping leaf type. Filling the remainder of 11 and continued on 10 is a plain-moulded arch 0.86m in diameter, containing a finely carved head whose hair is covered by vine-leaves topped by small round fruits, with bunches of grapes hanging beside the ears, and three ears of corn projecting from behind the head on each side. The eyes are somewhat elongated and the irises are lightly incised. The eyebrows are modelled and have a slight frown. The lower part of the face has been broken off. It would seem at first sight to be a Season, but while the fruit and grapes are attributes of Autumn, the ears of corn are normally associated with Summer. Perhaps a composite figure is intended.

The interpretation of the rest of the carving on 10 is uncertain. There are two curved bands to the left of the arch, both slightly ribbed, and of rounded section. The relief figure to the left has light modelling which suggests the musculature of the body of some creature. Its nature is discussed further below (p. 154).

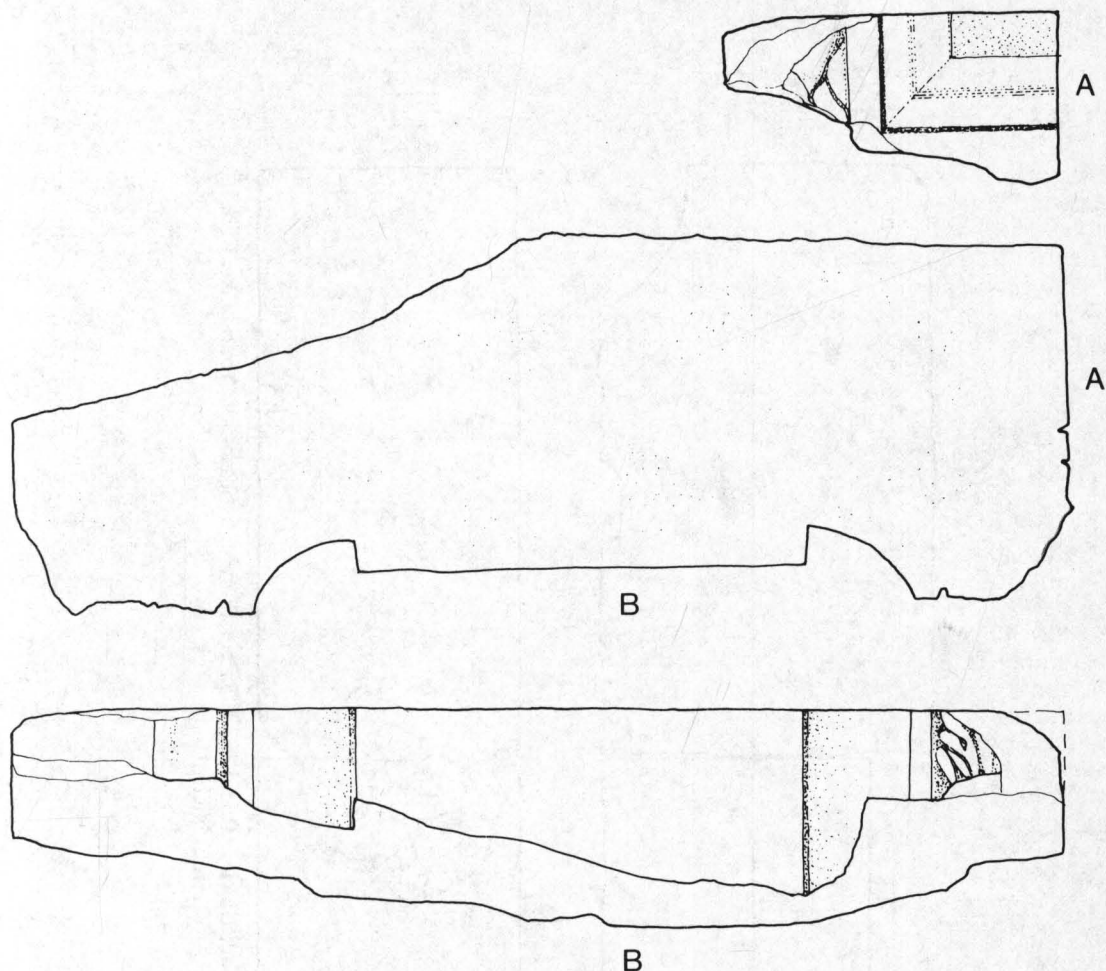


Fig. 66. Roman Riverside Wall: Block 9. (The Arch: Nighed figures) (1:10).

12. (Plate 27, Fig. 68)

Height 0.28m

Width 1.07m

Depth 0.57-0.62m

The block is carved on two faces. Each is surmounted by a band of guilloche, but that on the end is set 10mm higher than that on the front. The latter has below it a niche containing a crested helmet and a raised right hand which clasps the end of a shaft with a knobbed butt; the index finger is extended. To the left of the niche is a pilaster with a roundel in relief. Association with block No. 13 below, which bears the drapery of a female figure, permits her identification as Minerva, standing with spear reversed, as on the Screen of Gods (below, p. 166). While it is more usual for the goddess to be represented with an upright spear, the version here finds several continental parallels, mostly in the Rhineland.

The left end has a pilaster with imbricated leaves bordering the top right-hand corner of a panel framed by a cyma reversa moulding. The only decoration which remains is part of a curved twisted stem which, by comparison with No. 14 below (p. 139) can be identified as part of a vine-scroll.

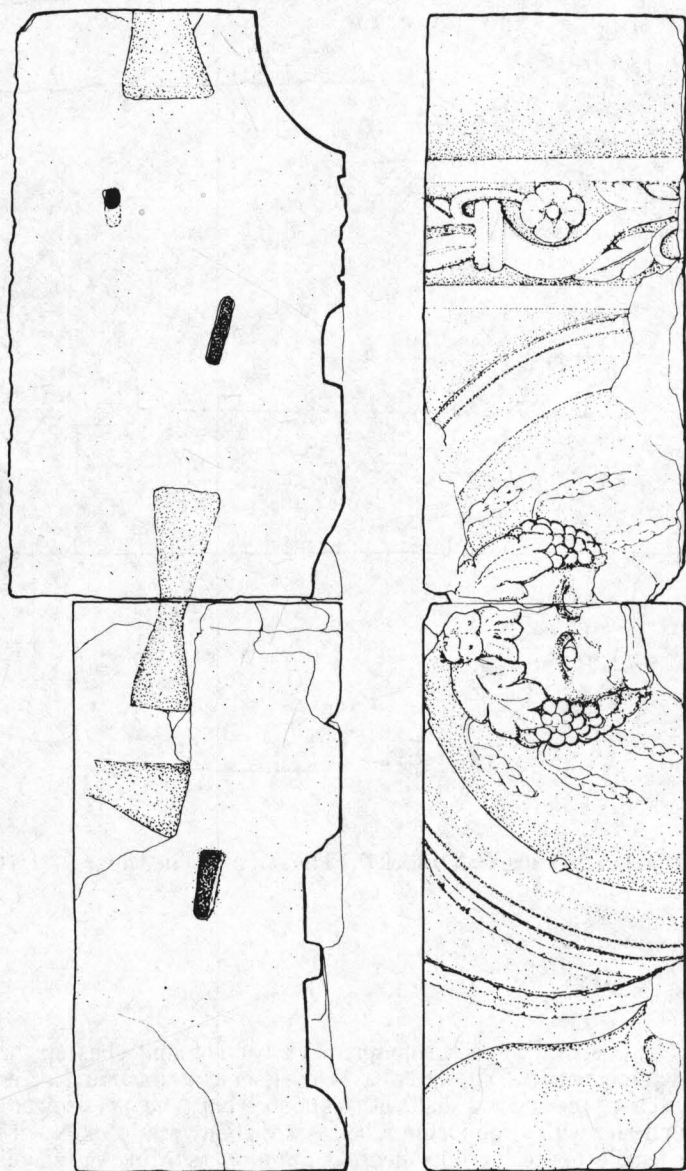


Fig. 67. Roman Riverside Wall: Blocks 10 and 11. Bust personifying a Season or Abundance. (The Arch: Nighed figures) (1:10).

The right-hand side and the back of the block have been neatly dressed with an adze. The top was dressed with a point, carefully, so as to provide a level bedding for the course above. The left-hand 0.40m is cut very slightly — about 5mm — lower, giving a distinct step down. This suggests that during the construction of the Arch this corner block had been laid, and when the rest of the course on one side was brought up to it, it was found that the level was slightly out of true. A step had to be cut in order to accommodate the end of the block above. A similar small error in levelling would probably also account for the difference in the height of the guilloche on the end and that on the front.

13. (*Plate 28, Fig. 69*)

Height 0.25m
Width 0.68m
Depth 0.595m

The front is carved with a pilaster on the left, bearing an upturned crescent. This borders a niche in which is part of the waist of a draped female figure with a shaft to her right, slightly inclined from the vertical. This can be identified as coming from lower down the figure of Minerva (above, No. 12). The decoration on the left-hand side of the block has, like No. 12, an imbricated-leaf pilaster and a cyma-moulded frame of a panel, the face of which is damaged, so that only part of a curved stem and tendril remains. Vertical rasp-marks are visible on the cyma moulding.

14. (*Plates 29, 30, Fig. 70*)

Height 0.355m
Width 0.62m
Depth 0.685m

On the front a pilaster with spray decoration stands to the left of a niche with the damaged upper part of a figure in relief: its left shoulder remains, and the position of the head is shown in outline where it was broken off.

The left end of the block is carved with an imbricated-leaf pilaster, and a cyma moulding framing a panel carved with an inhabited vine-scroll. From the twisted stems leaves hang down, their veins carved as ribs standing out in relief. At the bottom right-hand corner a bunch of grapes is contemplated by a dove-like bird.

The right 0.23m of the back has been rebated 50mm. The mortar which now adheres to the upper surface partially fills the cramp holes and must derive from secondary use.

15. (*Plates 31, 32, 33, Fig. 71*)

Height 0.27m
Width 0.78m
Depth 0.59m

This block was broken in antiquity, but the two surviving pieces join, so that the decorated face and left side are substantially preserved, though the rear right-hand corner is missing. On the front, to the right of an acanthus-spray pilaster, is the elbow, forearm and middle torso of a sturdy male. The related decoration of block 16 below, on which a club is carved, allows him to be identified as Hercules.

The left side has a panel framed by a cyma moulding with an imbricated-leaf pilaster next to it. On the panel, the left-hand side of which is defaced, is part of a figure in a short-sleeved belted tunic, holding a basket, to the left of a curved stem.

16. (*Plate 34, Fig. 72*)

Height 0.25m
Width 0.46m
Depth 0.45m

The top, rear and right-hand side are all broken, so the above dimensions relate to the block as it survives. On the front is the tapering, knobbly shaft of Hercules' club in a niche bordered by the acanthus-spray pilaster which enables the various parts of the figure to be related. The left-hand side has an imbricated-leaf pilaster and part of the plain cyma moulding: the rest of the decoration is lost.

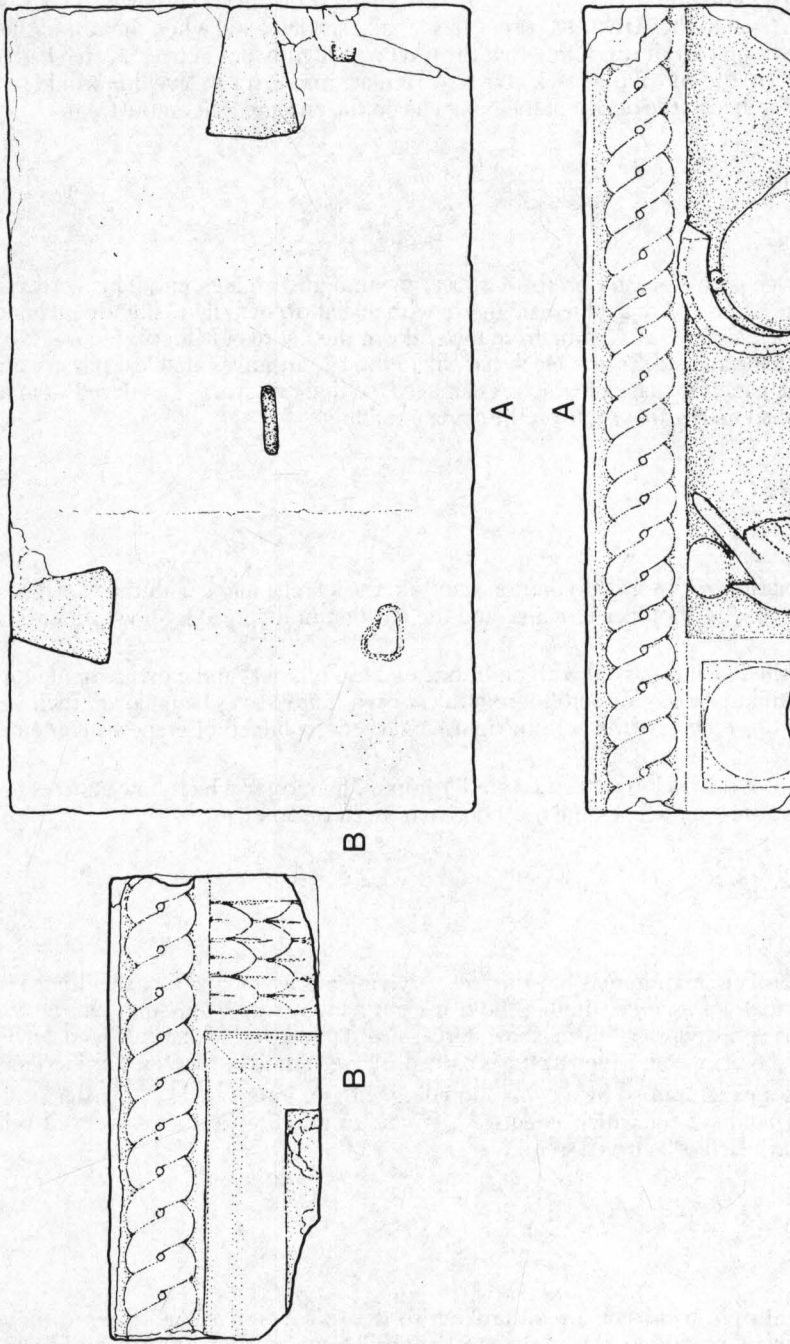


Fig. 68. Roman Riverside Wall: Block 12. Hand and Helmet of Minerva. (The Arch: Nighed figures) (1:10).

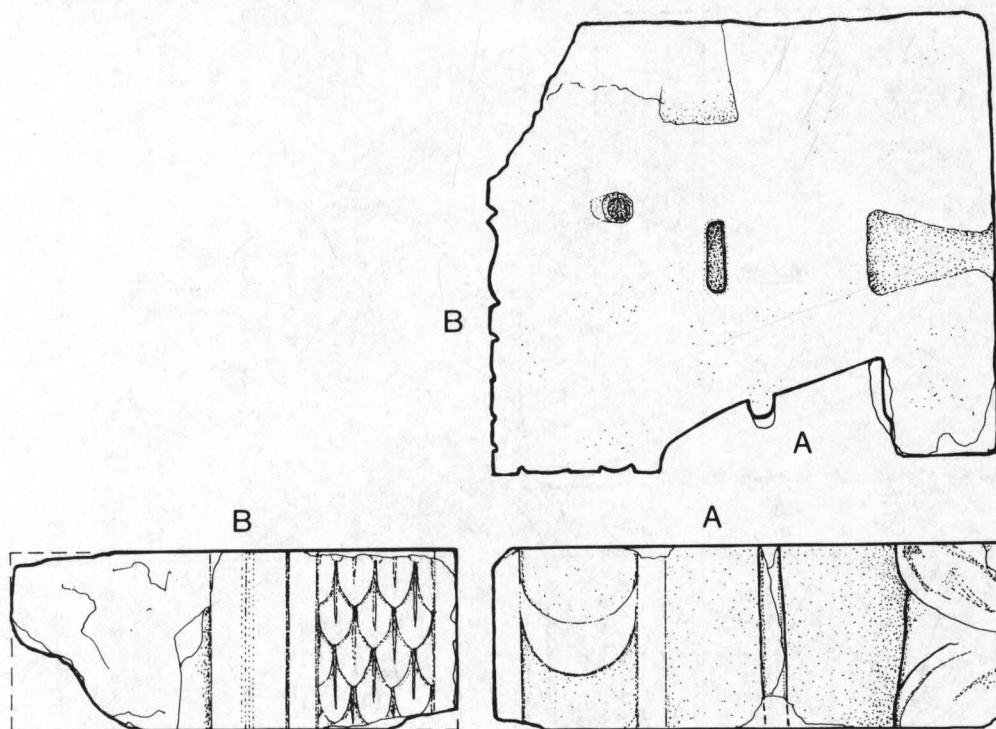


Fig. 69. Roman Riverside Wall: Block 13. Waist of Minerva. (The Arch: Nighed figures) (1:10).

17. (Plate 35, Fig. 73)

Height 0.33m
Width 0.65m
Depth 0.445m

The front has a damaged pilaster on the right-hand side with acanthus-spray decoration. In the niche to the left of it is a shaft, similar to that of Minerva on No. 13 above, but on the opposite side of the niche, and inclined from top right to bottom left. The right side has an imbricated-leaf pilaster, also damaged, a cyma moulding and then a relief of what looks like a figure similar to that in 15 above, wearing a tunic and carrying a basket of fruit, probably grapes. Below this is a knobbed, vertical stem with a broader curved shaft rising up to the right. Not enough survives for it to be certain what this is, but it may well be part of the handle of a cantharus into which grapes are being tipped in a conventional vintage scene.

The left-hand side of the block is broken.

18. (Fig. 74)

Height 0.28m
Width 0.39m
Depth 0.61m

The front face has been broken off, and the left-hand side which was the other decorated face is also badly damaged. It was carved with vine-scroll ornament, of which a curved stem and two lobes of a ribbed leaf remain, similar to those in 14. Not enough decoration remained for this piece to be found a sure place in the reconstruction, and it does not appear therefore in the reconstructed elevations.

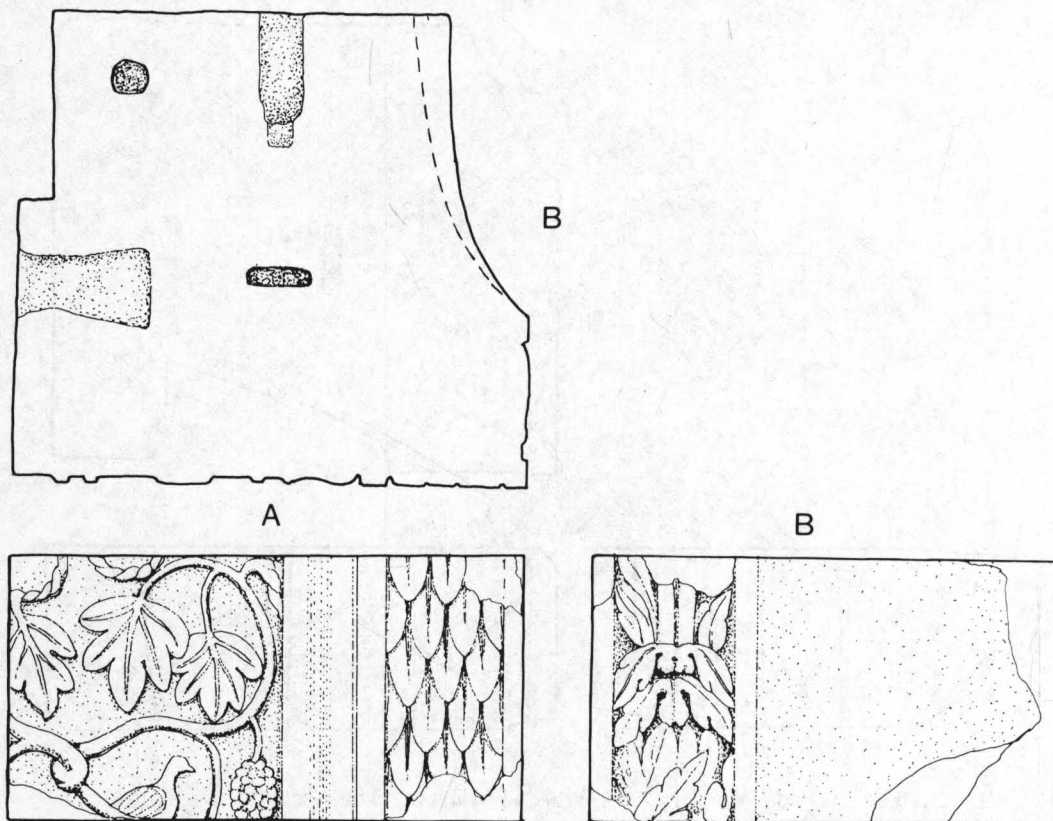


Fig. 70. Roman Riverside Wall: Block 14. Shoulder of Hercules. (The Arch: Nighed figures) (1:10).

19. (*Plate 36, Fig. 75*)

Height, front 0.325m, back 0.35m

Width 1.175m

Depth 0.29m

The block is decorated on the front and at both ends. The front face is intact save for some damage to the right edge and to the lower left corner. At each end is a pilaster with imbricated leaves. In the centre panel, framed by a cyma moulding each side, is most of the belly and part of the neck of a cantharus, with the scrolled lower terminals of its handles. In place of the more usual gadrooning, the belly is decorated with acanthus foliage.

At the left end of the block is a pilaster with an inverted crescent, broken at its left edge. The right-hand end bears a pilaster with acanthus spray, to the right of which is the beginning of the recess of a niche. These pilasters decorated the outer margins of the rear and front of the arch respectively.

20. (*Fig. 76*)

Height 0.19m

Width 0.47m

Depth 0.56m

The right-hand side of the block is broken. There is a dove-tail cramp hole in the left upper edge, and the left-hand side is dressed smooth. This shows that the pilaster, the top of which appears at the left of the front face, was not one of those at the corner of the monument (as those in the previous example). It bears the tip of an acanthus leaf which does not appear at the top of the scroll (type iv) ornament (see

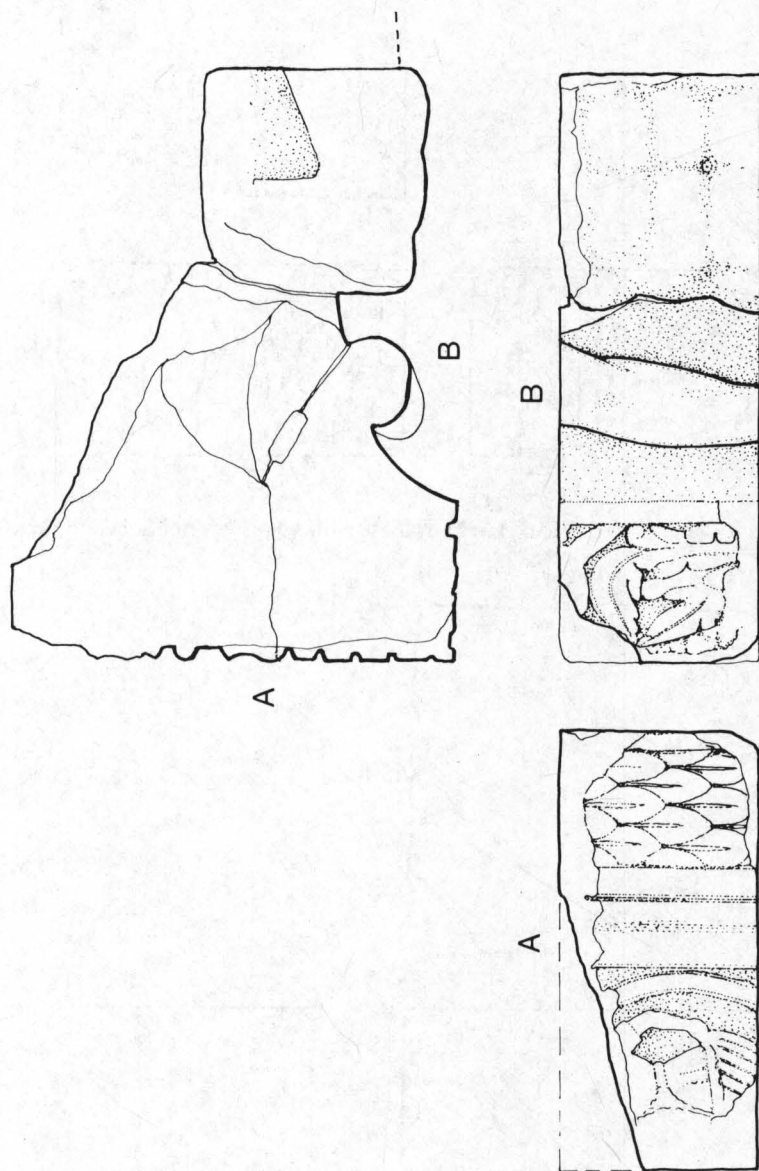


Fig. 71. Roman Riverside Wall. Block 15. Forearm and waist of Hercules. (The Arch: Nighed figures) (1:10).

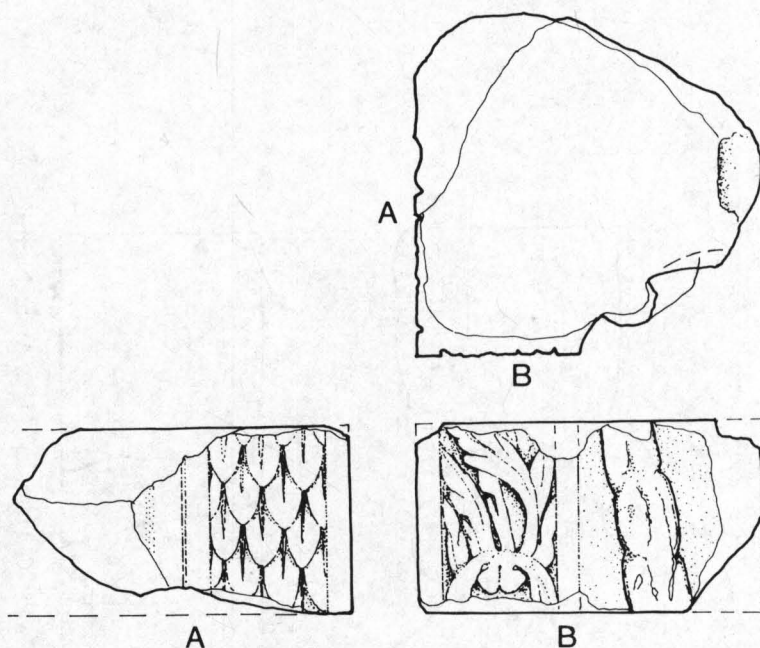


Fig. 72. Roman Riverside Wall. Block 16. Hercules' club. (The Arch: Nighed figures)(1:10).

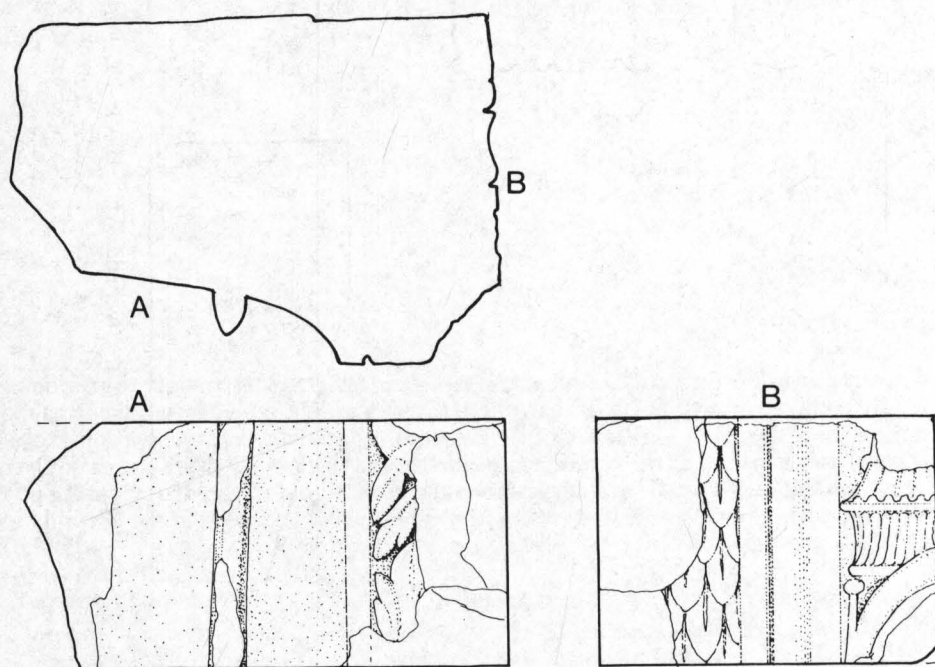


Fig. 73. Roman Riverside Wall: Block 17. Shaft held by unknown figure. (The Arch: Nighed figures) (1:10).

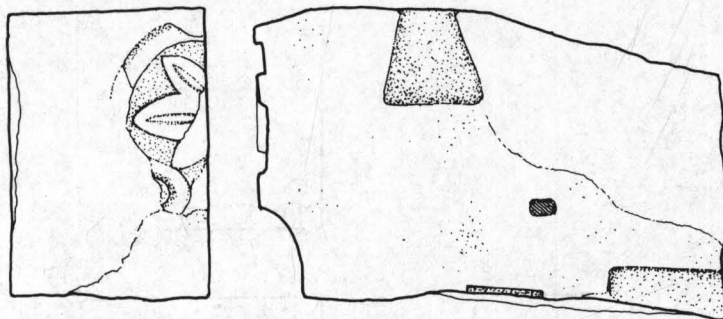


Fig. 74. Roman Riverside Wall. Block 18. (The Arch: Nighed figures).

No. 21 below). It must therefore surmount the type iii pilaster which, as will be argued, is the only other type decorating the inner part of the Arch. To the right is the upper part of a recess, and over the top is a band of guilloche. There is also a bar-cramp hole in the left underside, which has been driven through the stone so that it pierces through the dove-tail cramp-hole above it.

21. (Fig. 77)

Height 0.255m
Width 0.70m
Depth 0.59m

Like the preceding block, this one is decorated on one face with a band of guilloche at the top. Below this is the upper part of a niche recess and the top of a pilaster, the latter, however, being at the right-hand edge and bearing a different motif from 20, a leaf-scroll. The block is broken to the right of this. There is slight damage to the lower edge, which might have carried the topmost part of a head.

22. (Fig. 78)

Height 0.23m
Width 0.55m
Depth 0.58m

Both sides are broken. The front has a band of guilloche along the top, below which is the beginning of a niche, but the bottom of the stone is broken so it is not clear what form the rest of it took. The top of the guilloche band must have been carved on the block above.

(c) THE FRIEZE

23. (Plate 37, Fig. 79)

Height 0.275m
Width 0.945m
Depth 0.55m

The two decorated faces correspond in the manner of their design with those of the previous section, in that they are bordered by pilasters of similar width, flanking panels framed by a plain cyma moulding with an incised line at the angle, like those of the vine-scroll. The front carries the upper part of a female head. Her wavy hair is parted at the centre and bushes out in thick curls above the ears. Over it she wears a simple diadem with a small semi-circular loop above the right ear: the corresponding part of the left side is broken away. Her eyes are well-carved, the pupils lightly incised, and the lids and brows are rendered in a manner identical with those of the Season on blocks 10 and 11. She is probably Venus. The marks of a rasp appear on the surface of the niche and in the moulding, and traces of stucco or limewash in the hair, which appears to have been coloured yellow.¹ The pilaster has three flutes.

The right-hand side of the block has a pilaster with foliate decoration of a kind different from any in the preceding section, consisting of a central stem expanding to a triangular calyx from each side of which a heart-shaped ivy-leaf hangs down, its tip curling in towards the stem, and with a raised midrib. At the bottom are two upright lanceolate leaves. The border of the panel is the same as that of the face, but the right-hand side is damaged and nothing remains of any decoration or figure.

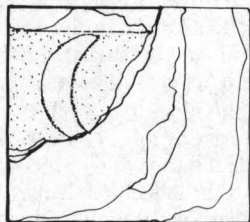
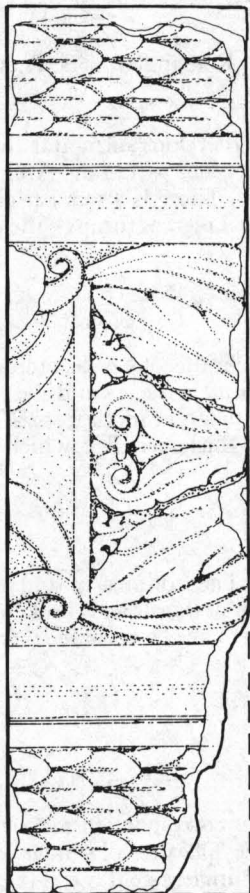
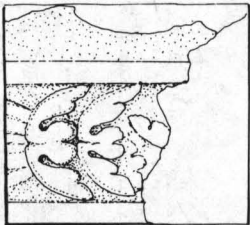
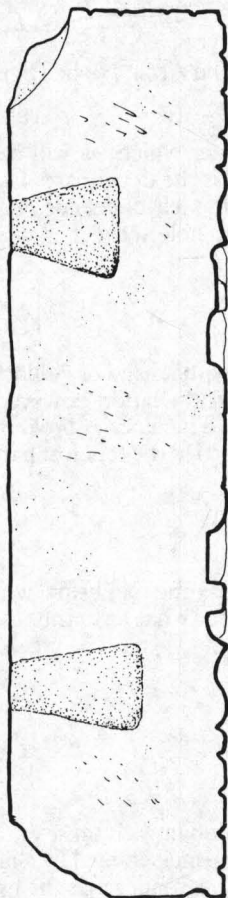


Fig. 75. Roman Riverside Wall. Block 19. Cantharus (The Arch: Nighed figures) (1:10).

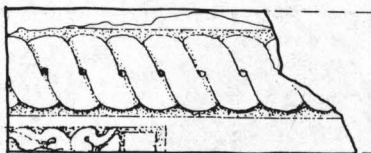
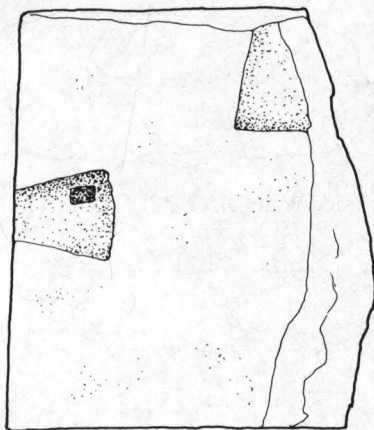


Fig. 76. Roman Riverside Wall: Block 20. (The Arch: Nighed figures) (1:10).

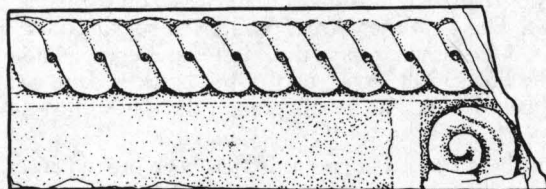
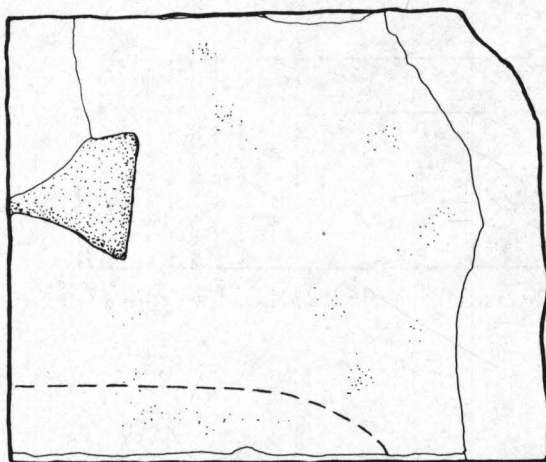


Fig. 77. Roman Riverside Wall: Block 21. (The Arch: Nighed figures) (1:10)

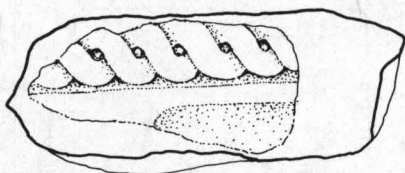


Fig. 78. Roman Riverside Wall: Block 22. (The Arch: Nighed figures) (1:10).

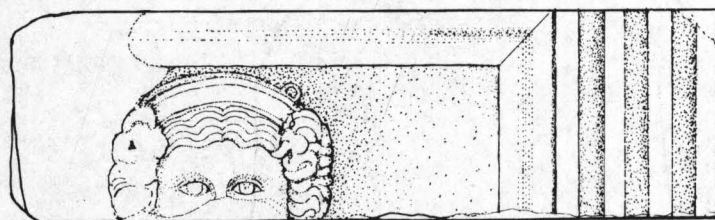
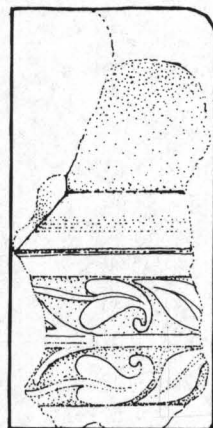
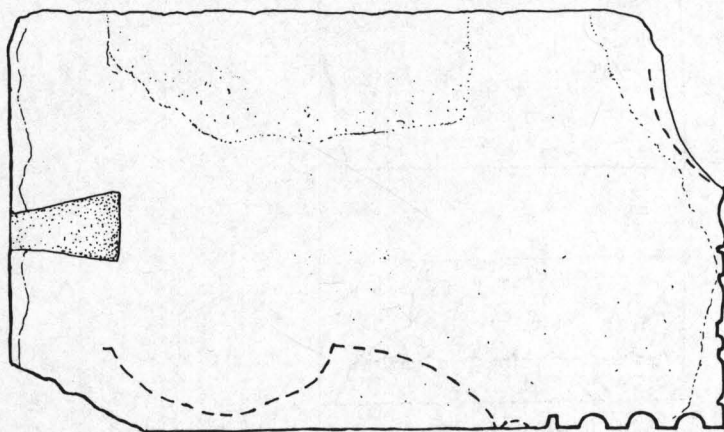


Fig. 79. Roman Riverside Wall: Block 23. Head of Venus. (The Arch: Frieze) (1:10).

24. (Plate 38, Fig. 80)

Height 0.53m
Width 0.83m
Depth 0.54m-0.585m

The front has a fluted pilaster similar to that on the preceding stone, except that the fluting is stopped, and the lower part of a panel framed in a plain cyma moulding. Along the bottom edge is the top of a band of guilloche, most of which must have been carved on the block below. In the panel is the naked left shoulder of a bust. This is in the correct position to belong to the figure whose head was in the block described above, and the dimensions of the pilaster also correspond exactly, even to the slight variation in the width of the flutes. The upper part of the block is damaged, so it seems virtually certain this one was placed below No. 23, the stopping of the flutes must have terminated just at the top of No. 24.

The right face is badly weathered, and its upper third has been broken away. On the pilaster it is just possible to distinguish foliate decoration of the same type as on the corresponding face of block 23, with two scrolled bands at the bottom. There is also the topmost part of a guilloche band below the pilaster

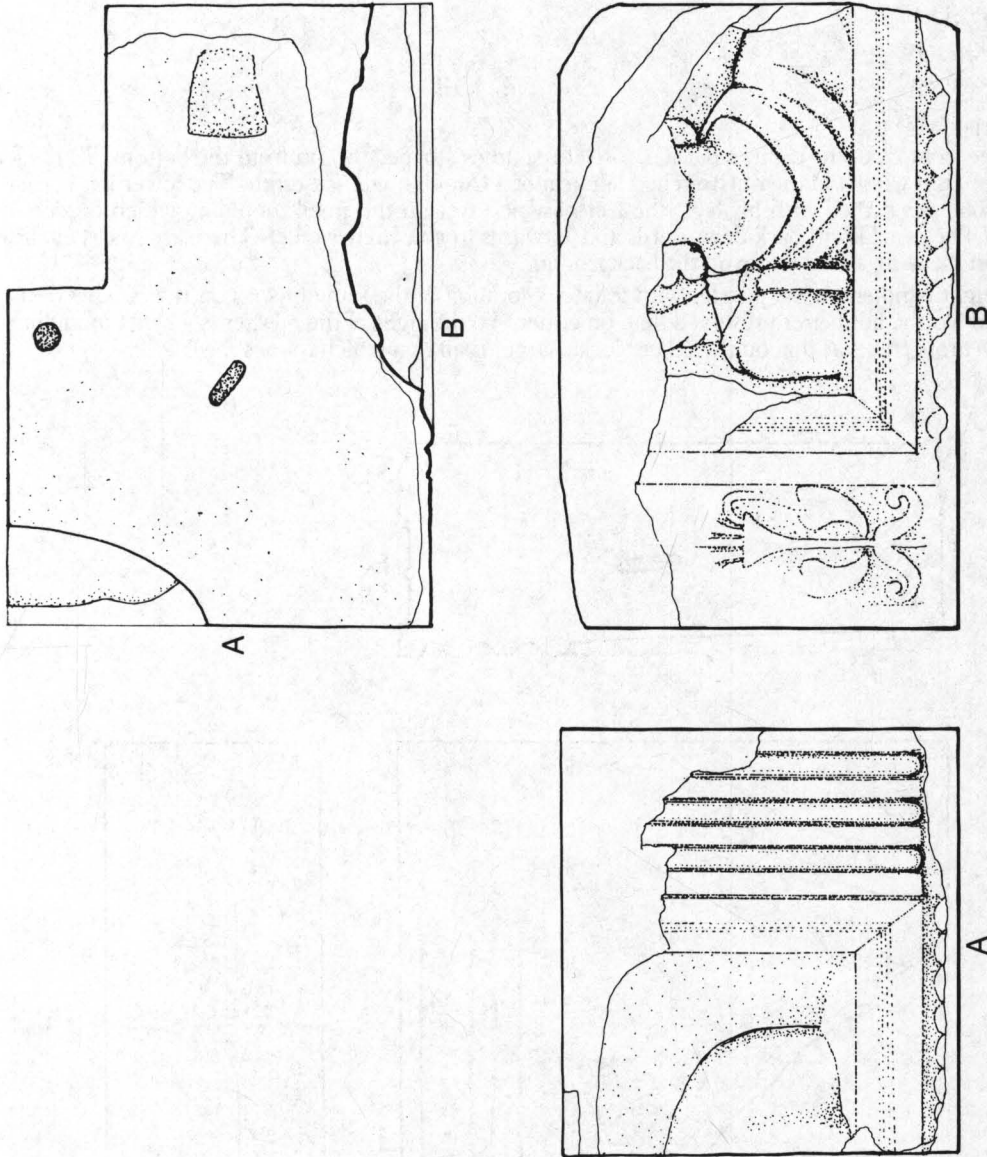


Fig. 80. Roman Riverside Wall: Block 24. Shoulder of Venus and draped bust. (The Arch: Frieze) (1:10).

and the panel. The latter has the bust of a male, draped in a cloak which is pinned at his right shoulder. Behind the shoulder is a curved object, the left side of which is indented. It could be a quiver, presumably Apollo's. At all events it seems to be a divinity rather than a mortal figure who is represented. None of his face survives, but the locks of his hair hang down to the shoulders on each side. The scale is rather smaller than that of the figure on the front.

There is a rebate 0.17m deep in the back at the right-hand side, no doubt for the fitting of the adjoining block.

25. (*Plates 39, 40, Fig. 81*)

Height 0.605m

Width 0.72m

Depth 0.285m

On the front is, to the right, a pilaster with three flutes stopped 0.33m from the bottom. To the left, at the top, is a wing and the outstretched left arm of a Cupid, holding a torch. The lower left corner is broken but was carved with his legs, the feet of which rest on the small moulding which borders the pilaster. The panel is cut back downwards and leftwards to give higher relief. There are traces of chisel-marks on the wing and of a rasp on the background.

The right-hand end has a pilaster with foliate decoration of the same type as on the two previously-described blocks, but better preserved than on either. To the right of the pilaster is a cyma moulding of the same proportions as that on the other blocks, larger than that which frames the Cupid.

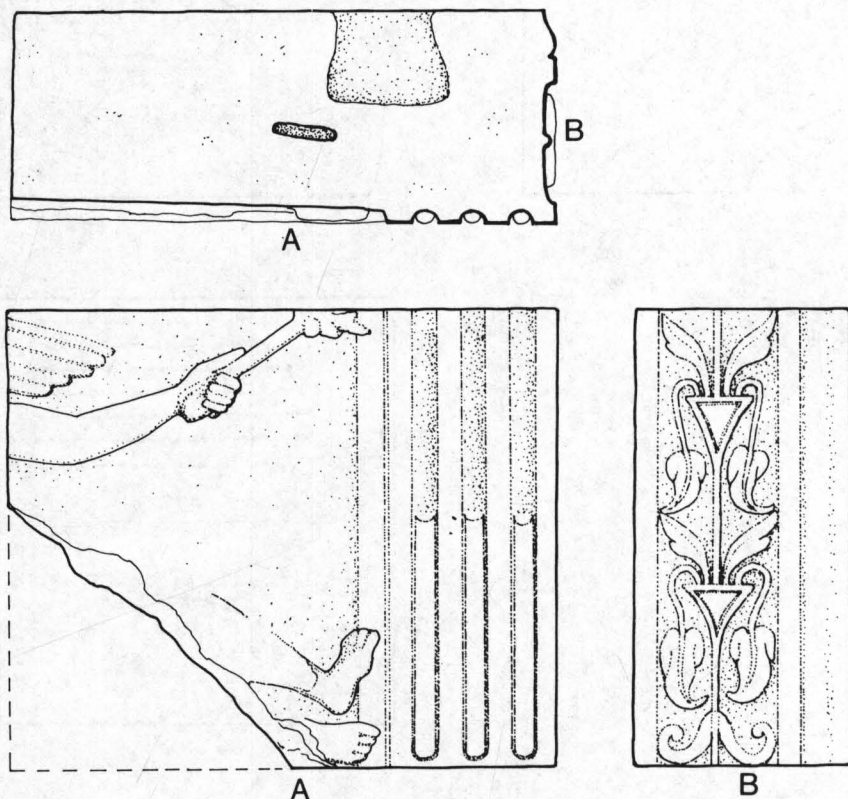


Fig. 81. Roman Riverside Wall: Block 25. Tip of wing, arm and feet of Cupid. (The Arch: Frieze) (1:10).

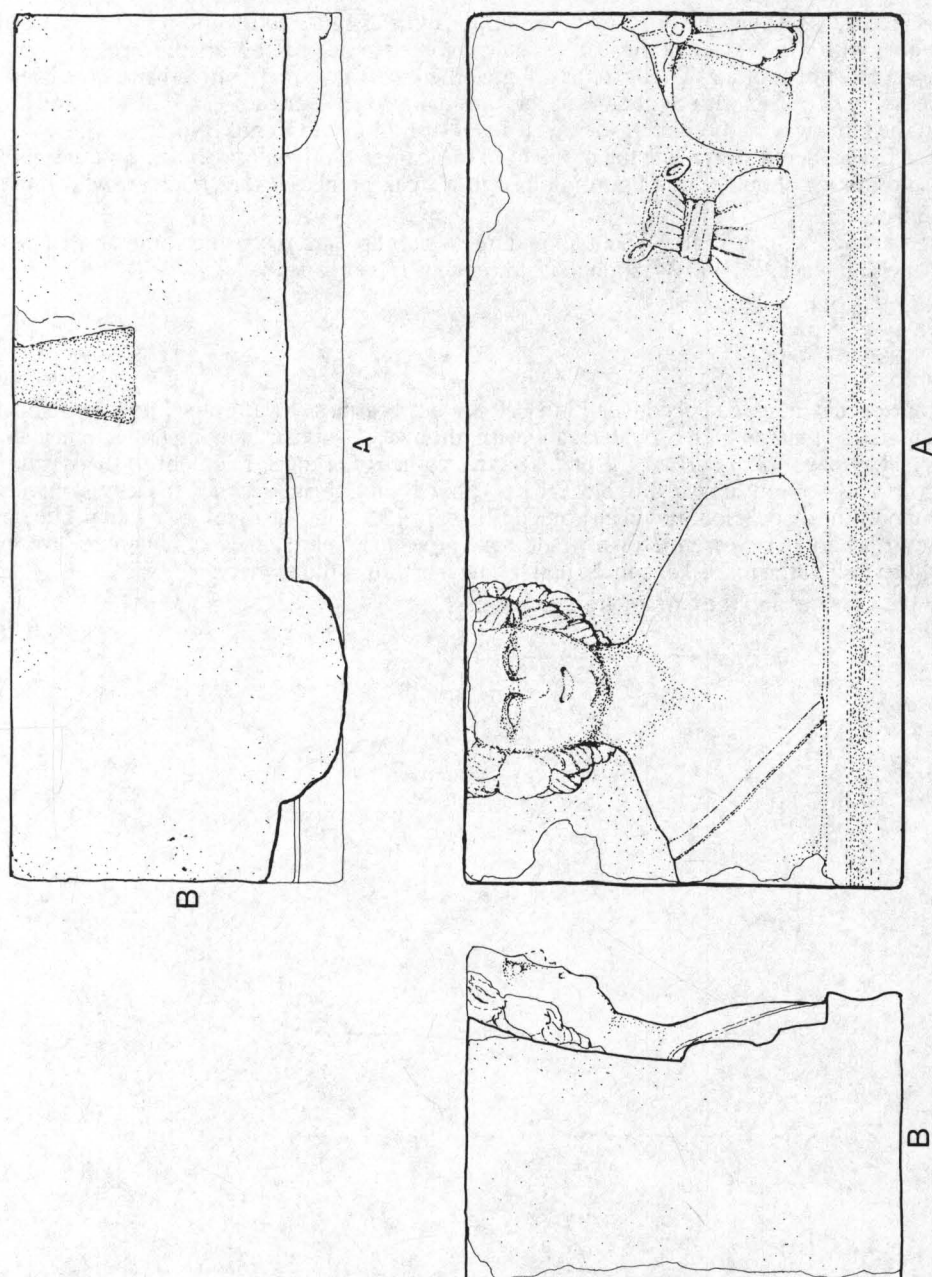


Fig. 82. Roman Riverside Wall: Block 26. Mars (left) and purse and shoulder of Mercury (right).
(The Arch: Frieze) (1:10).

26. (Plate 41, Fig. 82)

Height 0.58m
Width 1.155m
Depth 0.45m

While this piece lacks diagnostic ornamental detail, it can be assigned to the monument on the basis of the techniques with which some of the features of its figures are carved. It bears the larger part of one bust and the shoulder of another. To the left is an unclothed, beardless male with a band over his right shoulder. Heavy locks of hair with tight curls at the ends hang down over each ear. The eyes and brows are carved in the same way as those of the Season (Nos. 10 and 11) and Venus (No. 23). The nose and mouth are partly weathered away. The top of the head was carved on the block above. To the right is a money bag and the left shoulder of a figure, draped in a cloak pinned at the shoulder, who must be Mercury.

Below the two figures is a shallowly-cut moulding, which appears to be the same as that which frames the panels on blocks 23 and 24, though its lower edge is poorly defined.

27. (Plate 42, Fig. 83)

Height 0.35m
Width 0.78m
Depth 0.55m

On the front of this much damaged block is a defaced but beardless bust, draped in a garment, the folds of which may be seen on both shoulders, and with lumpy locks of hair hanging down to just above the shoulder. They have spiral curls at the end, and the similarity of their treatment to that visible on other blocks in this section allows this block to be linked with them, though it lacks ornamental features to support the association. It will be argued below (p. 155) that the figure is of Luna. The upper part of the head, where her crescent crown would have projected, is broken away. There are traces of yellowish-white wash in the incised channels, both of the hair and of the drapery.

The right and left sides and the bottom are all broken.

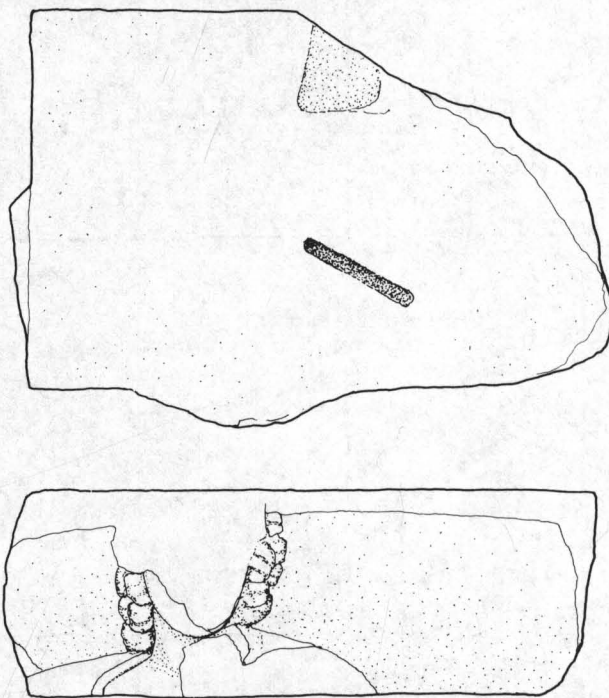


Fig. 83. Roman Riverside Wall: Block 27. Luna (?). (The Arch: Frieze) (1:10).

3. THE RECONSTRUCTION OF THE ARCH

BY THOMAS BLAGG AND SHEILA GIBSON

In the preceding section, the stones have been described according to three structural divisions: those from an archway; those carved with figures of deities in niches framed by pilasters, one of which deities flanked the archway at each side on both front and back; and reliefs from the frieze which surmounted the rest. It remains to set out the evidence for this reconstruction of the monument (see Fig. 84).

The voussoirs of the archway itself are decorated on both front and back, as well as on the underside. Their measurement from front to back varies from 1.15 to 1.17m. That the niches with their flanking pilasters were placed on each side of the opening is demonstrated by Nos. 7 and 8, both of which have a pilaster adjoining the lowest part of the archway's outer mouldings. The Arch was also decorated on its short sides, as is shown most clearly by No. 19, which is 1.175m wide and is decorated on the front and at both sides. The Arch, at any rate in the part above the springing of the archway, was free-standing.

Five different types of pilaster are found on the blocks upon which the figures in niches were carved (above, p. 133). Block 19 shows that those with imbricated leaves come from the short sides of the monument. It also shows that those with the roundels and crescents mark the outer margins of one long side, and that those with the acanthus-spray motif belong to the outer margins of the opposite face. That this is also true of the other end of the monument is established by Nos. 9 and 13, where the relationship of the imbricated-leaf pilasters to the others is the reverse of that on No. 19. On the latter the acanthus spray is on the right and the moon is on the left end of the block; on No. 9 the acanthus spray is on the left of the imbricated leaves, and on No. 13 the moon is to their right. These types of pilaster are only found on blocks which come from one of the corners of the monument. The inner pilasters must have been decorated in a different manner, and each figured niche therefore seems to have been flanked by pilasters of two types.

The relationship of the decoration of the archway to that of the niches may now be established. Block 7 has a pilaster of drooping-flower type next to the outer mouldings of the 'back' of the archway (see above, No. 1), the side with wide bands of overlapping leaves and half-leaves. No. 8 has the other remaining type of pilaster, the scroll, next to the outermost plain moulding of the 'front', the side with more elaborate ornament including a guilloche. Just enough of the same motif survives to be recognisable on the left of the niche on No. 9, to the right of which is an acanthus-spray. Thus the front of the arch had its figures framed by the acanthus-spray and the scrolled-leaf pilasters, and the back by the sun and moon and the drooping-leaf pilasters.

Blocks 7, 8 and 9, the first two of which can be seen to come from the level of the springing of the arch, have a rectangular projection from the middle of their niches, which must have provided a pedestal on which the figure above stood. Only two of these figures can be identified with certainty. Hercules stood to the left of the front elevation of the Arch. The disposition of the pilasters shows that Nos. 14, 15 and 16 belonged to him, and No. 19 must have come from lower down, as it carries the middle of the cantharus from which sprang the vine-scroll which decorated this short side of the arch. No. 8 was at the bottom, and No. 21, which has a top of the niche to the left of the scroll pilaster, must come from the top. There is slight damage to the lower edge which might indicate that the top of his hair had been carved

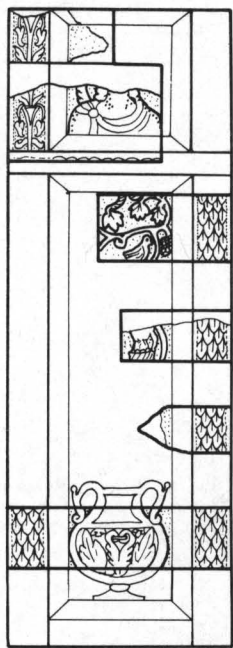
on it, now broken away. Apart from block 9, all that survives from the niche to the right of the Arch on this side is No. 17, which carries part of the shaft of a staff. This could be Jupiter or Juno's sceptre or Neptune's trident, all attributes carried in the left hand by the deities to whom they respectively belonged.

At the rear of the Arch, the left-hand niche contained a helmeted figure who held a reversed spear in the right hand (block 12), whom the drapery on a block from waist-level (No. 13) strongly suggests should be identified as Minerva. No. 20 join the right-hand side of No. 12 to complete the top of this niche. No part of the figure which accompanied Minerva in the right-hand niche has been found. However, part of this niche was carved on block 11 which joins with No. 10 in bearing the head of the Season in a moulded arch 0.86m in diameter. There are two ways in which this could be fitted in to the design. Instead of the reconstruction outlined above, in which the archway was flanked on each side by a single figure in a square-headed niche, with a band of guilloche running along the top, it could be suggested that between these niches and the archway there were other figures in round-headed niches. There are several objections to this. The head in the round-headed niche would be at a lower level than that in the square-headed niche next to it; 10 does not have a pilaster at the left corresponding to that on the right, but part of some figure in relief, whereas we know from No. 7 that the archway was bordered by a pilaster of the same drooping-flower type; and no part of any other niched figure survives which requires this explanation. It would seem desirable to propose a reconstruction which re-assembles the surviving parts in as compact a form as possible.

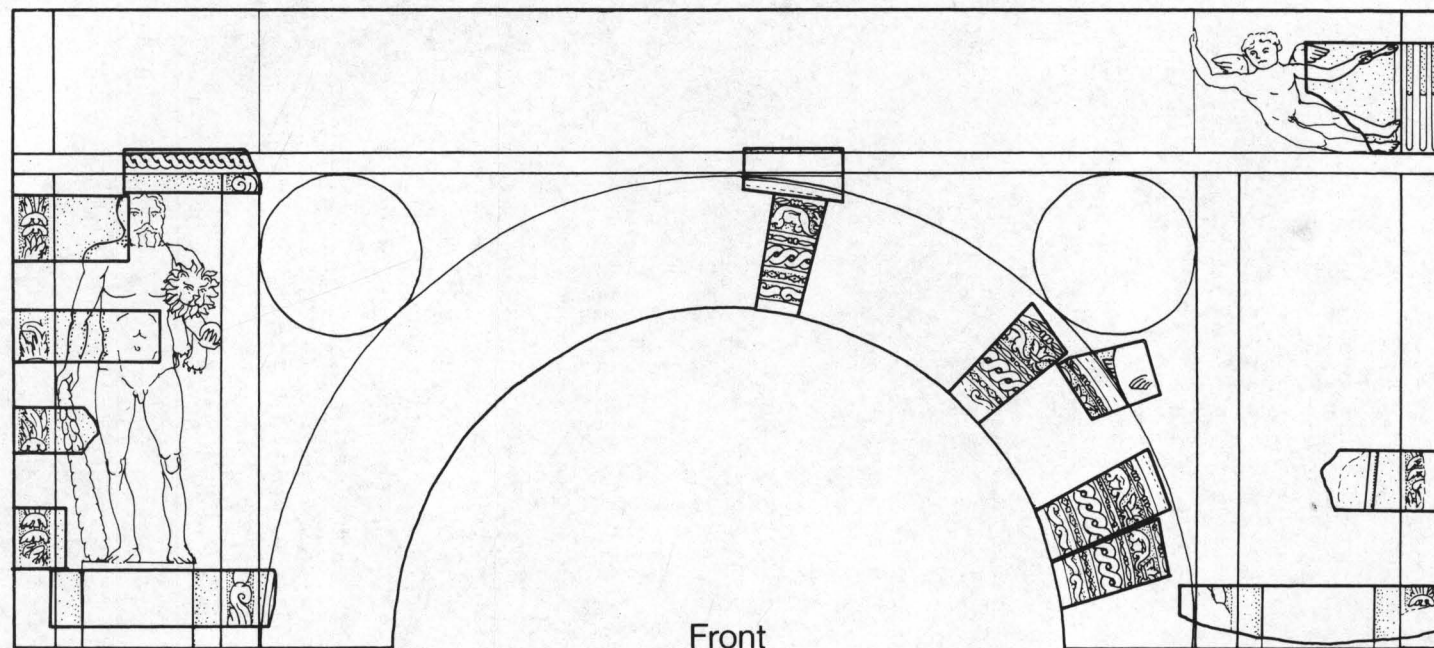
The alternative proposal is that instead of being part of a full-length figure in a niche, the head should be restored as a bust in a roundel, of which the two blocks carried the upper half. This seems most convincingly confirmed by the fact that, when drawn out, the circle fits precisely into the spandrel between the archway, the pilaster and the moulding which ran across the top of the archway. The position of this moulding is inferred from its presence on block 6 from the other face of the monument, with the topmost moulding of the arch below it. It continues as a guilloche over the top of the niches, and it is likely that a moulding of this height was carried all round the monument.

The other motifs which filled the spandrel are more difficult to restore in detail. To the left of the roundel is part of a relief figure from which two curved bands rise, that on the left overlapping that on the right at the bottom, each with a central shallow channel and incised transverse ribbing. The 'body' is lightly modelled and seems to be part of an animal, and there is an ear-like feature at the bottom right corner, below the ribbed bands. It has been suggested that this might be the top of the horned head and the upper part of the body of a capricorn or sea-antelope, whose tail would have ascended to the left over the top of the arch.² The possibility that some sort of marine monster may be involved is given some support by the appearance of part of another creature above the arch mouldings on No. 5, which seems to have two fins and may be a dolphin. This cannot be fitted into the arch at as high a level, and must have filled the part of the spandrel below the roundel, but on the left-hand side of the arch, as seen from the back. These suggestions are offered very tentatively, as too little of the figures survives for a convincing identification to be established.

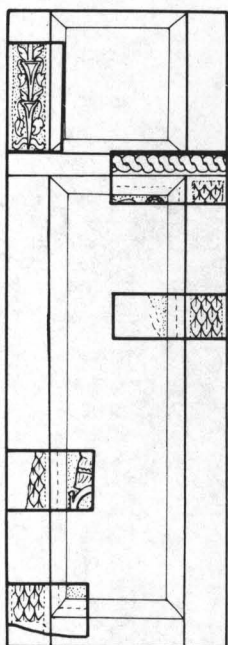
It will be appreciated from the reconstruction drawing that only a small proportion survives of the stones which made up the part of the monument that has just been described.



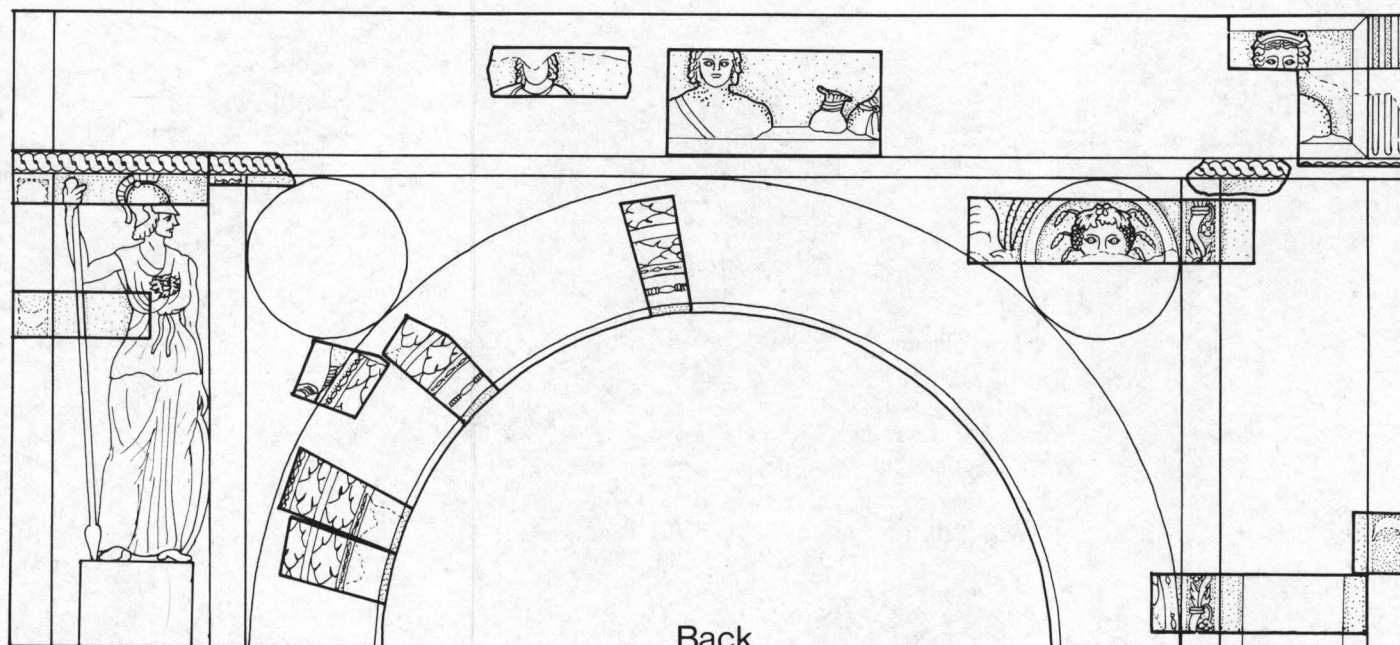
Left



Front



Right



Back

Fig. 84. Roman Riverside Wall: The London Arch. Restored elevations (1:40) (T.F.C. Blagg)

Nevertheless, those which remain are well enough spread around it, and are sufficiently specific in their decorative features, for the reconstruction to be offered with some assurance.

Those which belong to the frieze cannot all be placed with such certainty. Three of the blocks are ornamented with pilasters of different designs from those of the stage below, but of corresponding width. One is carved with three flutes, stopped in the lower half; the other bears trumpet-shaped calyces from each of which a pair of ribbed ivy-leaves hangs down on long stalks while another pair of different leaves points upwards. Block 25 has part of a winged Cupid with a torch on the fluted column side, and the others (Nos. 23 and 24) have a bust on two adjacent sides. On the premiss that the design on the front face of this upper part of the arch might be different from that on the back face, but that the minor designs on the two short sides are likely to be similar, one might propose that the panels bordered by the ivy-leaf pilasters were at the short sides of the arch, and those with the fluted pilasters were at the outer margins of the long sides. Thus the dissimilar designs — the Cupid and the diademed female head — would appear on the long sides. This suggestion is supported by the dimensions of the panel containing the female head which, assuming that she was placed centrally, would have been too wide for one of the short sides by about 0.20m. The figure of Cupid would have been even wider. The draped figure on block 24, allowing for the addition of the pilaster and cyma moulding to his right, would have occupied 1.15m, which fits the short side almost exactly. The length of the short side at the bottom is established by block 19 to be 1.175m.

Although no fragment of any inscription was discovered, the highly elaborate character of the monument suggests very strongly that it had one. The occurrence of Cupids as supporters of inscription tablets is sufficiently common in Roman sculpture that there can be little doubt that it was the function of this Cupid too, and that he can accordingly be placed on the front face of the upper part of the Arch. The back face was therefore carved with a row of busts of deities, of whom four remain, whole or in part. The goddess of blocks 23 and 24 was at the right-hand end. The busts on No. 26 (one of whom is Mercury) and No. 27 came from the middle, but their precise position cannot be established by any decorative feature. Nor is it possible to establish with certainty how many busts there were altogether, as it is not clear with what regularity they were spaced nor whether they were in a serried rank or, say, in pairs divided by pilasters. The moulding at the bottom of No. 26 is the same as that below the goddess on No. 24, but there are no lateral mouldings. If all were as openly spaced as the two on No. 26, there would have been room for seven but not quite for eight; but eight could conceivably be accommodated if they did not all have attributes like Mercury's money-bag taking up extra space. The number seven suggests that possibly the divinities of the Days of the Week were represented; their busts, in a row such as we seem to be dealing with here, are not uncommon in the western provinces.³ By such reckoning the right-hand figure would be Venus, and the beardless figure to Mercury's left would have to be identified as Mars. The baldric over the figure's shoulder is consistent with this interpretation, and it is possible that he originally had an attribute such as a spear by his right shoulder which would have identified him more obviously.

The other draped bust lacks the beard of Jupiter or Saturn and must, if the proposed scheme is correct, be Sol or Luna; more likely the latter, since, although the top of the head is broken, something of the former's radiate diadem should have remained had it been he. The right-hand end of 27 is now broken away, but the block could originally have joined the

left-hand end of 26. The interpretation does not extend to explain the identity of the deities which were represented on the short sides of the monument, but the apparent quiver behind the shoulder of the survivor suggests Apollo or Diana.

At the bottom of block 24 there is the top 10-20mm of the guilloche moulding which ran along the top of the niches in the stage below. This must be accounted for by a slight irregularity in the coursing, as on Nos. 12 and 21, above Minerva (on the same face of the monument) and Hercules (on the opposite face) the guilloche is complete. Although the top of the guilloche is also missing on No. 22, this block does not quite fit below 24, and has therefore been inserted to the left of it, though this implies another irregularity in the coursing.

The relief with the diademed goddess, No. 23, includes the top of the plain moulded panel which frames her; the top of the motif on the pilaster on the adjoining short side is damaged, and it is not clear whether it should have continued on to a block above. It is likely that there was a crowning moulding, and there were possibly capitals to the pilasters which flanked the frieze, though none of the other pilasters on the monument has them. Though it is possible that the two cornice blocks described below (Nos. 35 and 36) may have surmounted the arch, this cannot be established with certainty. The restoration of the topmost part of the Arch is thus conjectural, adding the cornice, but not inserting any pilaster capitals. The frieze to a large extent fulfils the function of the more usual attic storey, but the Arch might have been carried considerably higher than the drawing shows, though not necessarily with any further decoration. One might also expect it to have carried statuary on top, but there is no actual evidence for this. The structure below archway level is equally conjectural. Indeed, although the Arch is drawn free-standing (Fig. 97), it is quite possible that what we have was a structure which rose up above the wall of a precinct to which it provided a grandiose entrance.

In giving the dimensions, therefore, the overall height can only be estimated. The central stage (the archway and the niched figures) was 2.51m high, and above that the guilloche and the attic frieze adds a further 0.86m from those pieces which survive. The whole monument must have been at least 8m high. Its width can be calculated to have been 7.57m at the front and 7.46m at the back. The discrepancy results from variations in the dimensions of some of the parts. For example, the widths of the niches are, on the front, 0.895 and 0.875m, but on the back the niche with Minerva is 0.83m and the right-hand niche is only 0.79m wide. The widths of different pilasters range from 0.20 to 0.225m. The inner diameter of the archway was 3.56m at the front. Because of the rebate the inner diameter at the back was 0.12m wider: the rebate would have made this 0.16m but for a deliberate tapering of the soffit. As the mouldings of the arch were wider at the front than at the back, the outer diameter was the same, 4.96m, on both sides.

This diameter was reconstructed initially by calculation from the curvature of the mouldings; this, however, lacked precision, because of the state of wear, and the shortness of the segments. The drawing out of the ornament of the soffit (see below, p. 186) showed that each band of decoration was divided into twelve repeated elements, with hexagons containing rosettes at the front and a running acanthus scroll on the rebated panel, slightly longer because of the greater diameter. The dimensions of these elements allowed the calculation of the archway's diameter to be refined, and also made it possible to locate the surviving segments precisely round its circumference. There is likely, however, to have been a central

motif on the keystone, in the case of the running scroll probably a cantharus from which it sprang. While there remains, therefore, an element of imprecision, a further check was the manner in which the roundel on blocks 10 and 11 was to fit, given that the dimensions of the arch had already suggested that it should be placed in the spandrel.

The segments of the arch are not regularly-cut voussoirs, in that most of them have their ends cut obliquely at an angle of between 65° and 85° to the horizontal coursing and as a chord through the moulding. Such a feature can be observed elsewhere in Roman architecture, as, for example, on the Arch of Marcus Aurelius in Tripoli, though there only two of the voussoirs are cut in this manner, nor is the ornament of the Arch cut through. The heights of the courses on one side of the archway are different from those of the other, and this resulted in a 60mm discrepancy in height at the level of the top of the archway which was resolved by using a block, No. 25, with a slanting base. Above this, there was a further irregularity in the coursing, as is clear from the blocks on which the guilloche moulding was carved. The top of No. 12, with Minerva's helmet, is 70mm above the bottom of No. 24, at the opposite end of the rear face. The technique used in the construction involved the tailoring of the blocks to their places in the structure in a totally *ad hoc* way, and not according to an overall design in which symmetry in the cutting of the blocks was regarded as important, nor precise regularity in the coursing. It may be that in this way better use could be made of the stone, carried as it had been from Lincolnshire and thus expensive and not to be wasted.

The rebate cut into the soffit of an archway is a feature commonly found in gateways, where the hinges or pivots of the doors are set behind them. Whether this Arch had doors is, of course, uncertain, since we do not have the lower part of the monument which might have given us positive evidence. One may, however, make two observations. Such doors could only have risen to the level at which the archway began, as if they had been higher, they would have impinged against the sides of the arch and they could not have been opened. Also, the depth of the arch from the rebate to the rear face is considerably less than the width of a leaf of a double door, which would have projected about a metre when open, in a rather unsightly and inconvenient manner. Although these are not conclusive objections, one might suggest that the rebate here was not functional, and that if, as is possible, the Arch provided the monumental entrance to a precinct, the passage into it was left open.

4. THE SCREEN OF GODS

The nine pieces from this group represent six original blocks, or parts of them. They can be reconstructed as a long screen, decorated on both sides with figures in niches framed by pilasters; at least one of the ends is also decorated (Fig. 85).

28. (Plates 43, 44, 45, Figs. 86, 87)

Height 0.325m
Width 0.90m
Depth 0.57m

The block is carved on three faces. The front bears the bearded, helmeted head of Mars, turned to the left and looking upwards. His Corinthian helmet, which would seem to be several sizes too small, is tilted to the back of his head. Its crest overlaps the cavetto-moulded arch which frames the niche in which the figure stands. The hair sweeps back from the brows in short lumpy locks terminating in tight spiral curls. The eyes, eyebrows and nose are sharply and sensitively cut; the pupils do not appear to have been indicated by carving. Some of the detail of the full beard has been lost by weathering. Altogether, it is a finely executed figure. There is a convex disc in the spandrel above the arch, and to

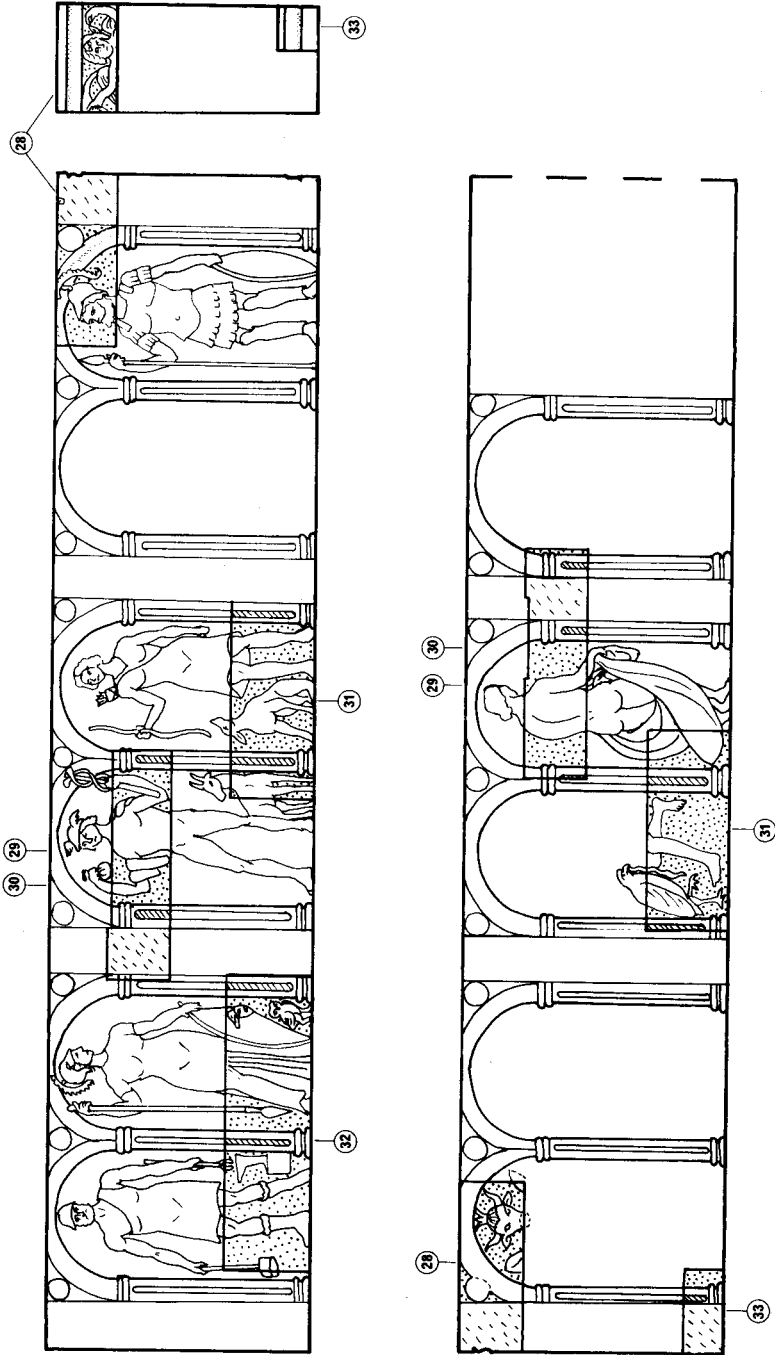


Fig. 85. Roman Riverside Wall: The Screen of Gods. Restored elevations (1:40) (T.F.C. Blagg)

the right the remainder of the block consists of a panel, 0.26m wide, dressed flat and smooth. It still carries noticeable chiselmarks, in contrast with the decorated part of the face, which has the finer striations from having been finished with a rasp. There is also a groove for a bar-cramp cut in the top of the panel. These features suggest the attachment of an engaged half-column or pilaster at this end of the block.

The right-hand end has, at the top, a fascia and a cyma reversa moulding, below which is the head and upper part of the raised arms of a winged figure (Fig. 87, Plate 44). His right hand holds what appears to be some drapery which trails behind his head, and his left hand is outstretched, touching but not apparently grasping the end of the drapery. The hair hangs in long tresses; a topknot of two opposed

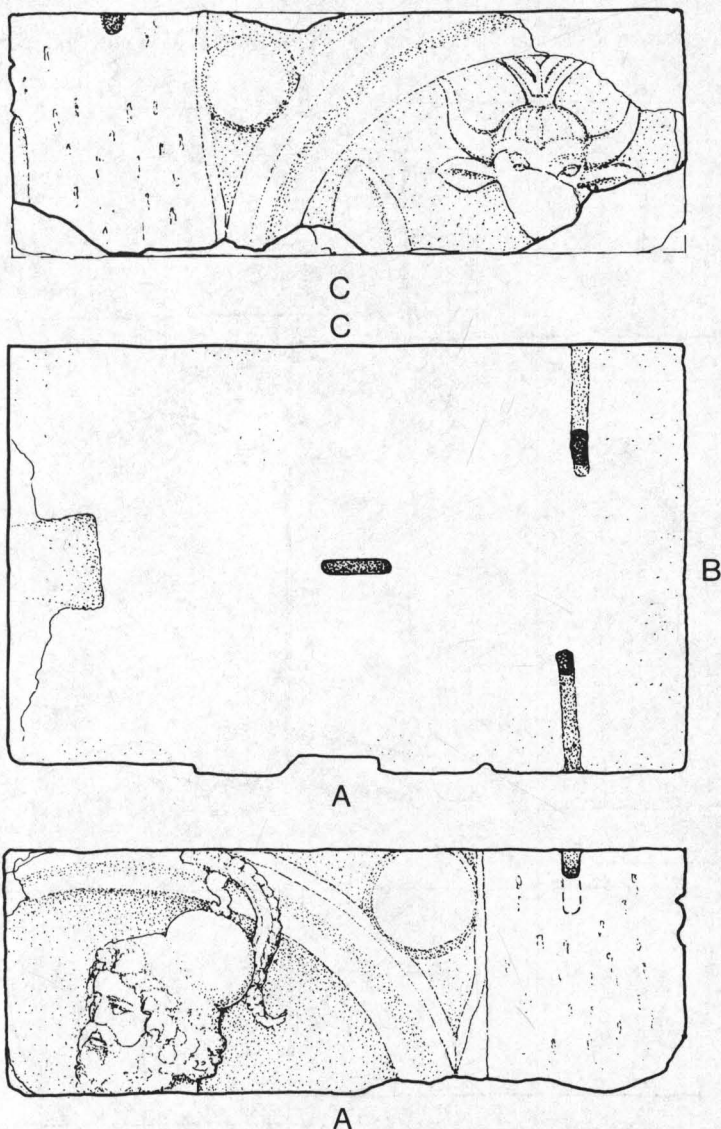
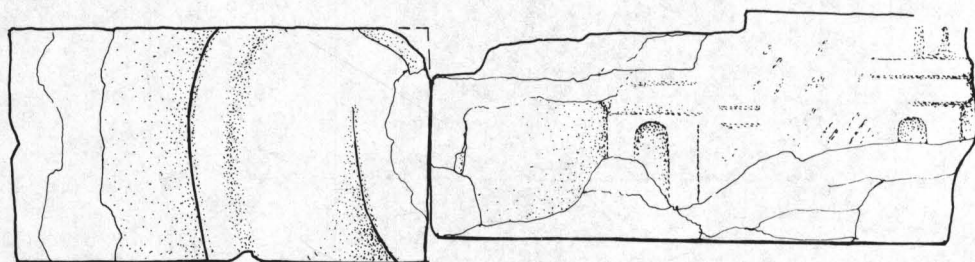


Fig. 86. Roman Riverside Wall: Block 28. Heads of Mars (below) and a bull (above). (The Screen) (1:10).



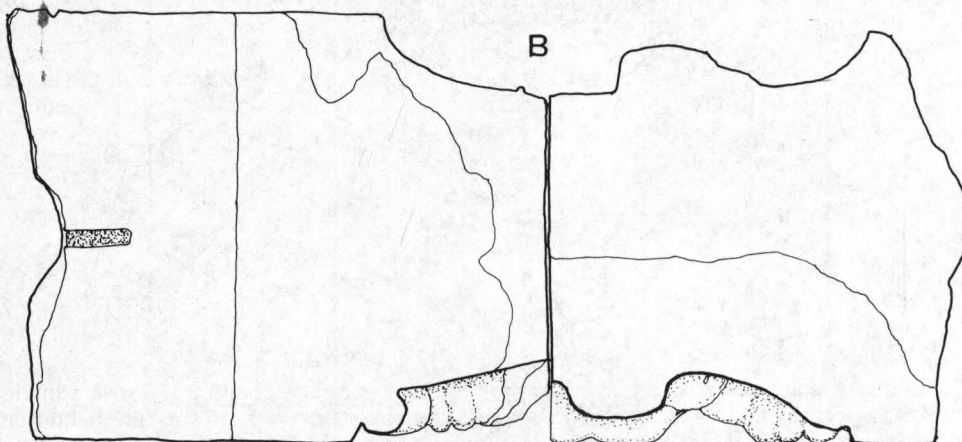
B

Fig. 87. Roman Riverside Wall: Block 28. (right end). Wind God. (The Screen) (1:10).

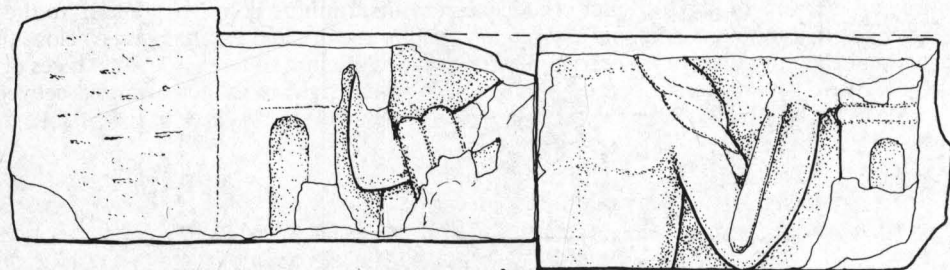


B

B



A



A

Fig. 88. Roman Riverside Wall: Blocks 29. Face A (right); B (left). 30 Face A (left); B (right). Mercury (below), back of female (above). (1:10).

spirals seems to represent locks of hair and not a foliate headdress. Although the wings might at first sight have suggested that the figure represented Cupid, the trailing drapery (which Cupid rarely carries) and the upstanding locks of hair suggest that a Wind God was intended.⁴ There is no moulding at the sides corresponding with that at the top, and the figure fills the whole available space below the latter. This supports the above suggestion that the corners of the block were marked by engaged columns or pilasters, which would have completed the frame round the figure.

The reverse corresponds in layout with the front, with a figure in a round-headed niche with a cavetto moulding above, a disc in the spandrel, and a smooth-dressed panel at the end, with the hole for a bar-cramp above it (Plate 45). In the niche is a bovine head. The top of the head is somewhat domed, and bears a crest. Long ears jut out below the upswept horns. The lower left part of the muzzle is damaged. To the left of the head, at the side of the niche, is a conical feature, possibly the top of a swag, though not enough survives for certain interpretation. It has an incised fold suggesting drapery. Alternatively, it might be some sort of garland. Bulls' heads and bucrania are common enough features in Roman architectural decoration, being found, for example, on the keystones of arches, and alternating with swags of fruit and flowers on friezes. In such a position as this they are less common, and the prominence of this head suggests that it might have more significance than the purely decorative. Although the lower part of the head is damaged, enough seems to survive to show that no body continued below, and that we are not dealing with some bull-headed Minotaur figure.

A bull's head is occasionally found with sacrificial implements on altars, representing the victim, and the garland (if such it is) and the unusual crest decoration might be intended to suggest this purpose here. Such a crest appears in another context on the tombstone in Bonn of Vellaunus, an *equus* of the Ala Longiniana, which shows the cavalryman holding in his right hand an ensign 'whose emblem is a protome of a leaping bull with a pompom, probably of wool, between its horns'.⁵ Alternatively, the head might represent some divinity, but it is difficult to find a convincing identification. A bull appears occasionally as the attribute of a Celtic diety,⁶ but usually in a subordinate position. This is not one of the three-horned bulls more normally found as free-standing figures but occasionally in reliefs, nor is there anything to suggest that it represents the Tarvos Trigaranos of Celtic mythology.⁷ In view of these negative factors, and of the Olympian nature of identifiable deities on this monument, one should discount any definable relation to the native religions of the western provinces.

The left-hand end and the top of the block are chiselled smooth. Cut into the top, in addition to the bar-cramp holes at the front and back which have been interpreted as for the securing of engaged pilasters at the corners, are a lewis-hole in the middle and a dove-tail cramp-hole in the inside edge.

29. (Plates 46, 47, Fig. 88)

Height 0.32m

Width 0.55m

Depth 0.55m

Two opposite faces of the block are carved. On the front is most of the torso and the raised left arm of a male figure, in a niche 90mm deep framed on the right by a pilaster 125mm wide, with a single flute and a capital consisting of two plain torus mouldings. The block is broken on the right-hand side, and the corners are also damaged. The left-hand side is chiselled smooth, so the figure's right arm and side were carved on an adjoining block. The folds of a mantle rest on his left shoulder, and the left hand had been holding an instrument of which part of the staff remains, running down the forearm to the crook of the elbow. The figure can be identified as Mercury, but for the detailed arguments see below, p. 162. The drapery and the musculature are executed without much attempt to render detail. Traces of white paint or colourwash survive in the deepest grooves, e.g. to the right of the forearm and between the torus mouldings of the pilaster capital. There also seem to be traces of yellowish colour on the background to the right of the cloak and below the forearm.

The rear face is carved with the naked back and right upper arm of a woman. The curvature of the spine is gently portrayed, and the figure is half turned to the right. Naked or partly-clothed female figures whose backs are turned to the spectator usually, in western provincial Roman art, represent dancers, occasionally identifiable as Maenads.⁸ They appear most commonly, but not exclusively, on funerary monuments.⁹ The closest parallel to the figure in Britain, not only in the actual representation but also in something of the feeling of the carving, is the pedestal from Chichester dedicated to Jupiter Optimus Maximus.¹⁰ On one side of this are the upper parts of two female figures, one with her back to

the spectator, each with her right arm on the other's left shoulder. They have been interpreted as two of the three Graces. Here there is no suggestion that the figure formed one of a group, and it would seem that a dancer is the most likely subject. She stands in a niche 90mm deep of which the left-hand side remains, though damage to that end of the block has removed the pilaster which, by analogy with the other face, and with the corresponding side of No. 30 below, one may assume to have framed the niche.

A ledge about 30mm below the top surface has been cut back from the front of the block by about 250mm. The top preserves no jointing holes.

30. (*Fig. 88*)

Height 0.31m

Width 0.73m

Depth 0.56m

The front face carried the remainder of the male upper torso described above (p. 161). Because of damage to the lower right-hand corner, none of the body survives, but only the figure's right arm, bent at the elbow, with the forearm vertical and the folds of a mantle draped over the upper arm and hanging down behind. The arm stands out in relief against the back of the niche, and all the rest of the body must have been at the missing right edge. A ledge 30mm deep and 420mm wide has been cut in the top surface at the right-hand side. That this corresponds with the upper surface of block 22 can be shown by the relative heights of the capitals of the pilasters and of the right and left arms. Presumably this was to accommodate a block from the course above.

In the absence of specific attributes (though see below, No. 31, p. 164), the figure can be identified with probability as Mercury from his stance. The god is one of the most commonly represented in western provincial sculpture. He regularly wears the petasos and carries the caduceus, and frequently carries also a purse and is accompanied by a cockerel. Occasionally a ram joins them. His state of dress is variable, but usually partial: with a mantle either covering the upper part of the body, pinned at the right shoulder, or, as here, draped round a shoulder and looped over an arm;¹¹ or nude. These features of dress are, however, shared with Hercules and Apollo. It is possible to rule out both these gods in this case. While Apollo often has his right arm raised, either holding a plectrum or resting his hand behind his head, he does not hold a staff, though he may hold a lyre. Hercules is most frequently found holding his club, downwards, in his right hand, and with the Nemean Lion's skin or the Apples of the Hesperides in the other. He may, instead of one or the other of these, be holding a spear or staff, but he is not represented with both arms raised at the same time; nor are other possible staff-carrying gods such as Jupiter and Neptune, who are normally clothed differently in any event. Mercury may hold the caduceus and the money bag either raised or lowered. His holding both aloft is unusual, but is paralleled in reliefs at Worms and Frankfurt.¹² In each of these cases the end of the caduceus with its entwined snakes is held up well above the shoulder, as it must have been in this instance if the interpretation is correct, as only the shaft survives. It must also have overlapped the arched top of the niche.

To the left of the niche is a pilaster with a single flute, and to the left of that a smoothly chiselled panel 250mm wide before the beginning of a second pilaster at the extreme edge of the block where the left end is broken away. The nature of this feature is clearer from the opposite face where slightly more of its length is preserved and both pilasters survive to their full width. This panel is similarly dressed to those which have been described above on block 28, with adze and chisel marks which have not been cleared away. It was thus not intended to be seen, and it would appear that here the screen was interrupted by an engaged column or pilaster, separating the fluted pilasters of the two niches on each side, which are slightly recessed behind it. The rest of this face contains part of a niche, broken at the bottom corner, but completing the niche on 29 with the naked female figure.

The top has, in addition to the ledge mentioned above, a lewis-hole, but no jointing holes. The bottom is much damaged.

31. (*Plate 48, Fig. 89*)

Height 0.435m

Width 1.05m

Depth 0.58m

The block has been broken into three pieces, the first break dividing it almost exactly in half vertically, the second splitting one of the halves horizontally. In common with those already described,

it spans the complete width of the screen, with two decorated faces and two neatly chiselled ends, and it comes from the bottom of the screen. The front face has the lower part of a niche, 0.64m wide, complete except for where the bottom edge and the right-hand margin have been broken away.

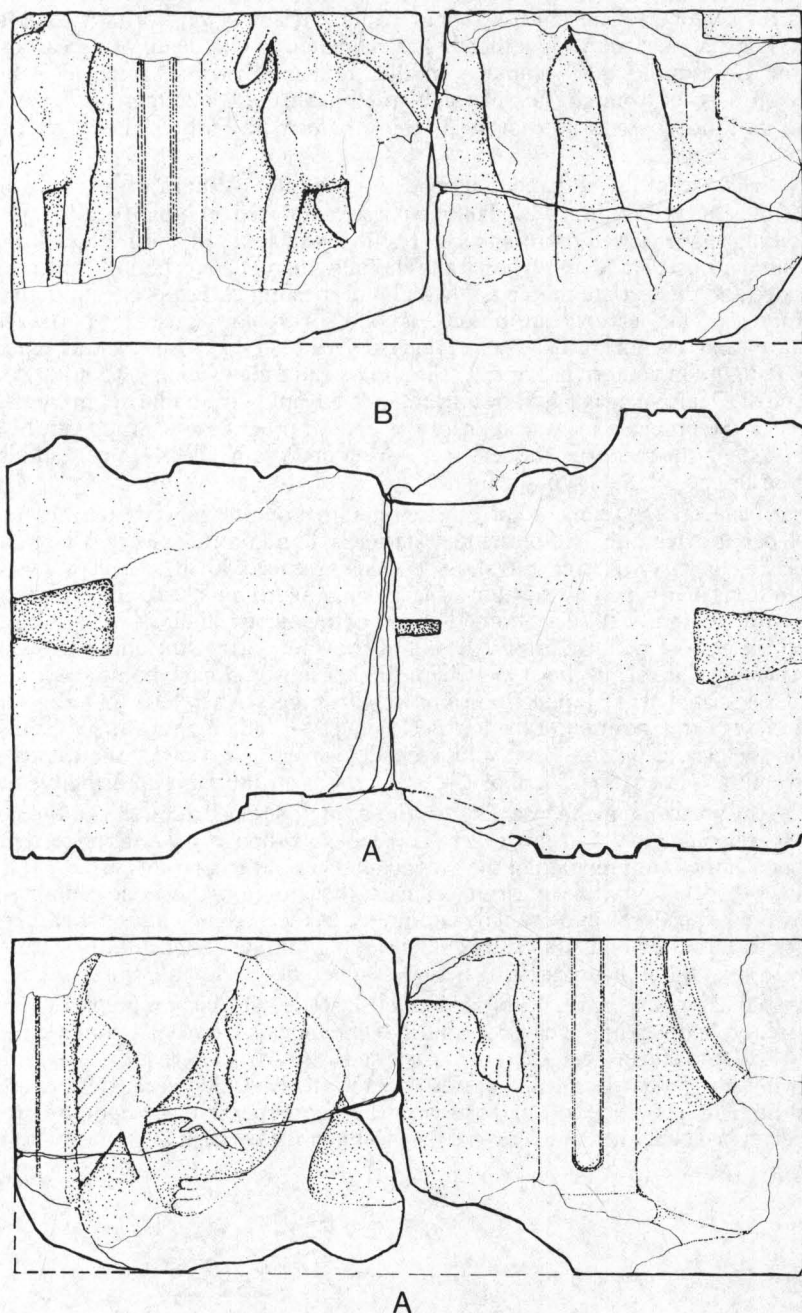


Fig. 89. Roman Riverside Wall: Block 31. Hound and legs of Diana (above); Eagle and legs of Ganymede (?) (below). (The Screen) (1:10).

The subjects, though considerably abraded, are clearly identifiable. A hound, looking upwards and backwards (though only the back of its head is carved on this block), squats on its haunches beside the legs of a figure of Diana, dressed in a tunic which reaches to just above her knees in front, but hangs down behind them. The form of representation is one already known from London itself, in the altar of Diana found on the site of the Goldsmith's Hall in 1830.¹³ Diana is too worn for comment about the standard of carving, but the hound is rather better rendered, in the detail of its ear and its splayed foreleg, than the Goldsmith's Hall animal. Another Romano-British example of a hound in this attitude occurs on a relief from the temple at Nettleton Shrub,¹⁴ but there its pose is much less naturalistic and its hind quarters are not seen, being hidden by Diana's dress, which reaches the ground.

The niche is divided from its left-hand neighbour by a pilaster 120mm wide with a single stopped flute, and not by the engaged column with flanking pilasters inferred on No. 30 (above, p. 162). In that part of the adjoining niche carved on this block are the forequarters of another quadruped with long thin legs and a similar neck, standing higher at the shoulder than Diana's hound. The head was carved on the block above and the feet are missing. The build of the animal, however, limits the possibilities, even though more specific features are absent. Apollo's gryphon is usually portrayed in a more crouching posture, and as more robust, and Dionysus' panther likewise. Neither is common, and Dionysus is a rare figure in western provincial reliefs as an equal companion with other deities. It could be another hound or a stag, such as might be attributed to Silvanus,¹⁵ but one might most economically suggest, in view of the probable identification of the god on other blocks which can be satisfactorily placed above this one in the reconstruction, that it is Mercury's ram. Clearly, a certain identification is not possible in the absence of the rest of the figure.

The rear of the block contains a niche corresponding to that on the front, though set further towards the end of the block, so that only half of the left pilaster is found on this piece. A bird stands with its back to this pilaster; it survives from the shoulders downwards, with its left claw raised, and has a sinuous object in front of it which is probably a snake dangling from its beak. The feathers of the wing are indicated by straight lightly-chiselled lines. The rest of the niche contains two bare legs. The subject was standing on its left foot with the right leg bent at the knee so that the shin was parallel with the ground. Unfortunately the part of the stone where the knees would have been is lost. The eagle and snake is a bird associated with Jupiter, and one might suggest therefore that the legs belong to Ganymede.¹⁶ However, the position of the feet is closely paralleled on a relief from Saint-Laurent-sur-Othain, in Gallia Belgica, depicting satyrs and a female dancer.¹⁷ In view of the dancer identified on another block from this screen (No. 29, above, p. 161), this is an alternative possibility.

Separated from the preceding niche by a pilaster with a single stopped flute, that at the right-hand end is carved with overlapping curves in low relief. This looks as though it is meant to represent rather formalised drapery. If the interpretation of the second animal on the opposite side as Mercury's ram is accepted, it follows that this curvilinear feature occurs at the bottom of the niche containing the back of the female figure (above, p. 161), and could be interpreted as the sweeping folds of her dress or of a long veil which she swirls around her as she dances. The carving of the pilaster fluting is noticeably deeper than that on the front of the stone, suggesting perhaps a different craftsman's work.

The top is dressed flat with a drove,¹⁸ a broad-bladed chisel, leaving clear tool-marks, and has a lewis-hole in the centre, broken where the block is split in half. There is a dove-tail cramp-hole at each end. Underneath the left-hand end (as seen from the face first described) is a hole for a bar-cramp which may have been cut when the piece was re-used upside down in the Riverside Wall. Both ends are chiselled smooth; that at the right has an area of anathyrosis, cut rather deeper into the stone and from which the adze marks have not been chiselled away, as that part would not have been in contact with the adjoining block.

32. (Plate 49, Fig. 90)

Height 0.46m

Width, front 1.56m, rear 1.59m

Depth 0.32m

In contrast with the other stones of the monument considered so far, this does not extend through its full thickness, and is decorated on one side only. It comes from the bottom of the monument, but joins

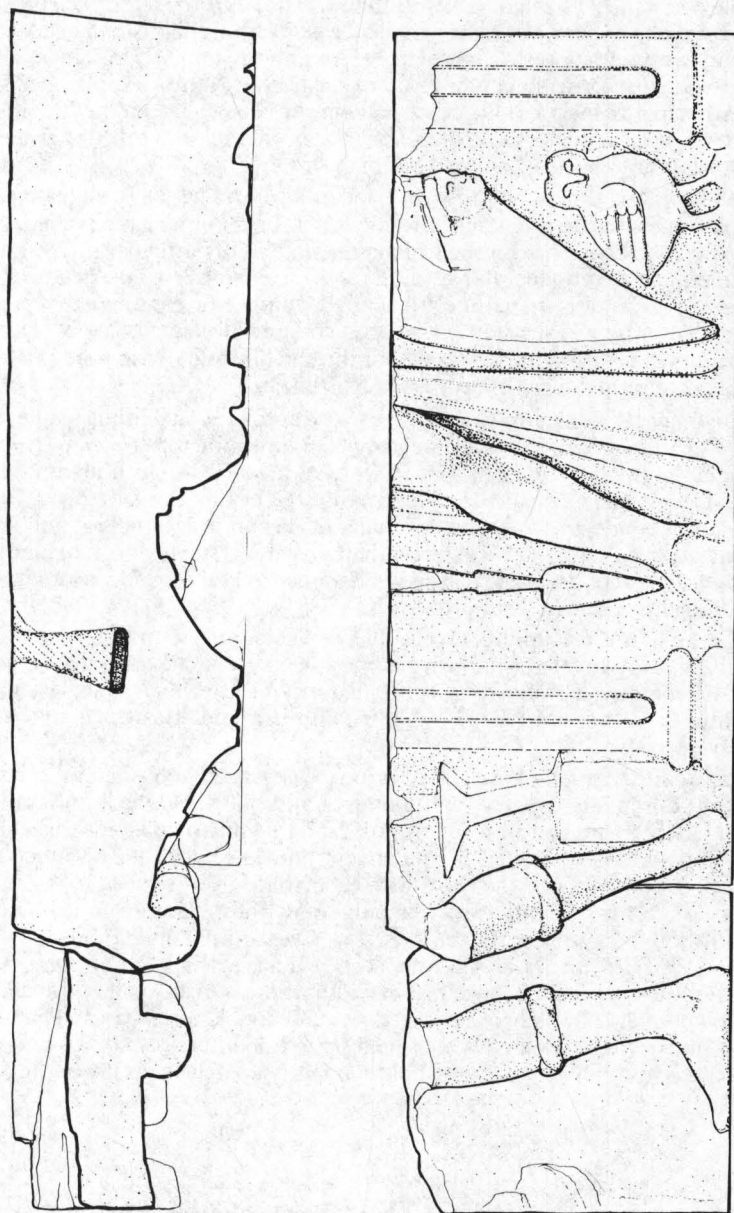


Fig. 90. Roman Riverside Wall: Block 32. Legs and anvil of Vulcan (left); leg, shield and owl of Minerva (right). (The Screen) (1:10).

neither end of No. 31. It contains one complete niche with a figure of Minerva and the greater part of a second containing Vulcan. The block is broken in two along the inside of Vulcan's left leg.

Minerva stands fully draped, her right leg extended and her left concealed behind her shield, which bears on its centre a grimacing Gorgon's mask with prominent wings.¹⁹ Below the shield stands her owl, its body in profile and its head turned to regard the spectator. To the left of her is the head of her reversed spear, suspended above her right foot. The upper part of the shaft is damaged. There are two unusual features of this representation, though neither is without parallel. The first is the position of the owl. When it appears, it is normally perched on a pillar behind Minerva, or on her shoulder. It is found at the foot of Athena or Minerva only occasionally in the classical art of the Mediterranean,²⁰ in representations which are otherwise not close to this relief, but there is a number of western provincial examples.²¹ It does not appear to have been noted before in Britain.²²

The reversed spear, however, occurs not only on London's Monumental Arch (above, p. 137), but also on the Jupiter column- or statue-pedestal from Chichester, held in that case by a figure probably to be identified as Victory.²³ Its occurrence on the Chichester stone is of particular interest, remembering the back view of the female mentioned above (p. 161) which is also paralleled on the Chichester pedestal. The reversed spear is also a feature of a limited number of continental representations of Minerva in sculpture;²⁴ it is more usual for the weapon to be held point upwards. The detail of the carving does not show much refinement. To the left of the shield a fold of the robe hangs down stiffly and woodenly, and the features of the owl are very simply delineated.

The same criticisms may be applied to the figure of Vulcan in the adjoining niche. Both legs are preserved from just below the knee downwards, wearing boots with the tops rolled over in folds, which are indicated by oblique incisions. The right foot is splayed outwards to an unnatural extent, placed parallel with the face of the stone, whereas the right knee is seen from a frontal aspect. This may be an attempt to render the god's lameness rather than a crudity of execution. To the right of him is an anvil, with the tip of his tongs above it. At the extreme left-hand edge is a stepped rectangular protuberance which is probably the head and part of the shaft of his hammer. The forms of the anvil and tongs are discussed by Dr. Manning in section (d) below (page 195).

The portrayal of Vulcan in relief sculpture, especially when standing by himself, as here, and not just one of the participants in a mythological narrative scene, seems to be a feature particular to western provincial Roman art. Brommer has shown that the majority of known representations cluster in a quadrilateral approximately bounded by Metz, Frankfurt, Stuttgart and Strasbourg, in the region of the middle Rhine and its tributaries.²⁵

This may be the first representation of the god in stone to have been published from Britain.²⁶ He is most commonly portrayed frontally, as here, with hammer and tongs, of which one usually points up and the other down. Here both are pointing downwards, and the only parallel for this among the fifty-five which Brommer illustrates is a relief from Brötzingen, now in Karlsruhe,²⁷ a much more crudely carved figure. The stance, however, and the boots with their rolled over, slashed tops, are more closely echoed in two reliefs from near Mannheim,²⁸ and in one from Hausen an der Zaber, now in Stuttgart.²⁹ In a fourth from Senon, perhaps the closest in style to the London relief, the weight is, as there, on the right foot.³⁰ Both niches are 90mm deep. Minerva's is 710mm wide and Vulcan's, which as it survives is 630mm, was probably equal in width: there remains half of the hammer head to be accommodated. The pilasters have single stopped flutes and double torus bases. That to the right of Minerva is slightly (15mm) wider. Both ends and the top are smoothly dressed. The upper part of the relief at the left-hand end is lost. There is a cramp hole cut approximately centrally in the top rear edge.

33. (Fig. 91)

Height 0.225m
Width 0.48-0.60m
Depth 0.42m

Two adjacent sides are broken; of the others, one has a fascia and a cyma reversa moulding, 190mm in total height. The other has a flat panel with adze-marks, next to it the bottom of a pilaster with single stopped flute and double torus base, and then the beginning of a niche. This ornamental detail places it within the group, and the piece formed one of the bottom corners of the screen, probably at the end of which No. 28 forms the top.³¹ The break at the rear was deliberate, as it is scored by the long rough grooves of a point.



Plate 18. Roman Riverside Wall: Block 1. (The Arch: Archway). (*J. Orsmond*)



Plate 19. Roman Riverside Wall: Block 1 (left-hand end). (The Arch: Archway). (*J. Orsmond*)



Plate 20. Roman Riverside Wall: Block 2 (right-hand end). (The Arch: Archway). (*J. Bailey*)

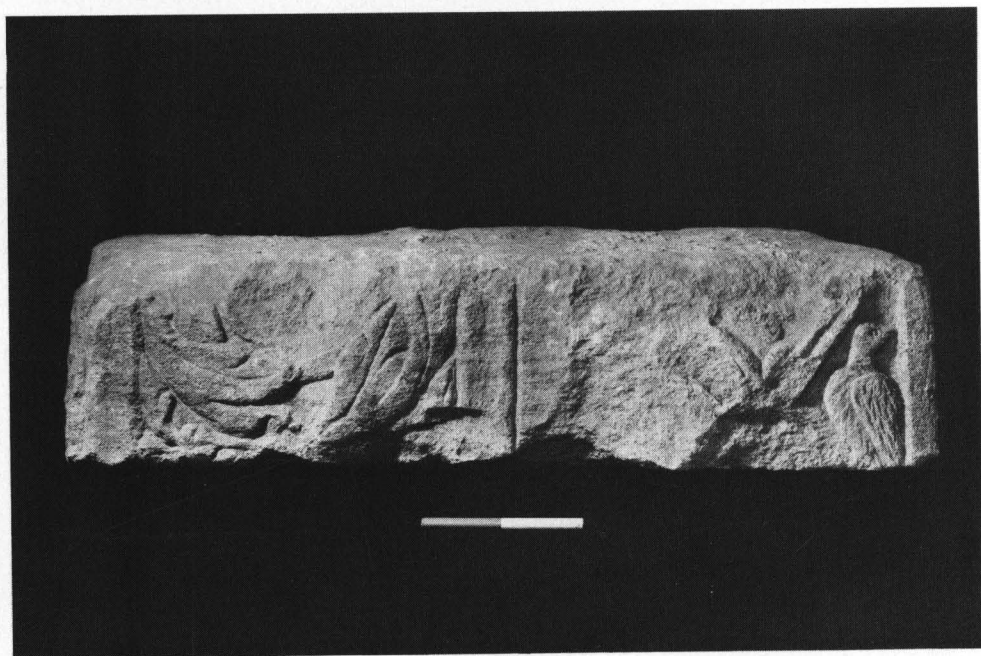


Plate 21. Roman Riverside Wall: Block 2. (The Arch: Archway). (*J. Orsmond*)



Plate 22. Roman Riverside Wall: Block 5 (end mouldings). (The Arch: Archway).



Plate 23. Roman Riverside Wall: Block 5 (end mouldings). (The Arch: Archway). (*J. Orsmond*)



Plate 24. Roman Riverside Wall: Block 7. (The Arch: Nighed figures).



Plate 25. Roman Riverside Wall: Block 9. (The Arch: Nighed Figures). (*T.F.C. Blagg*)

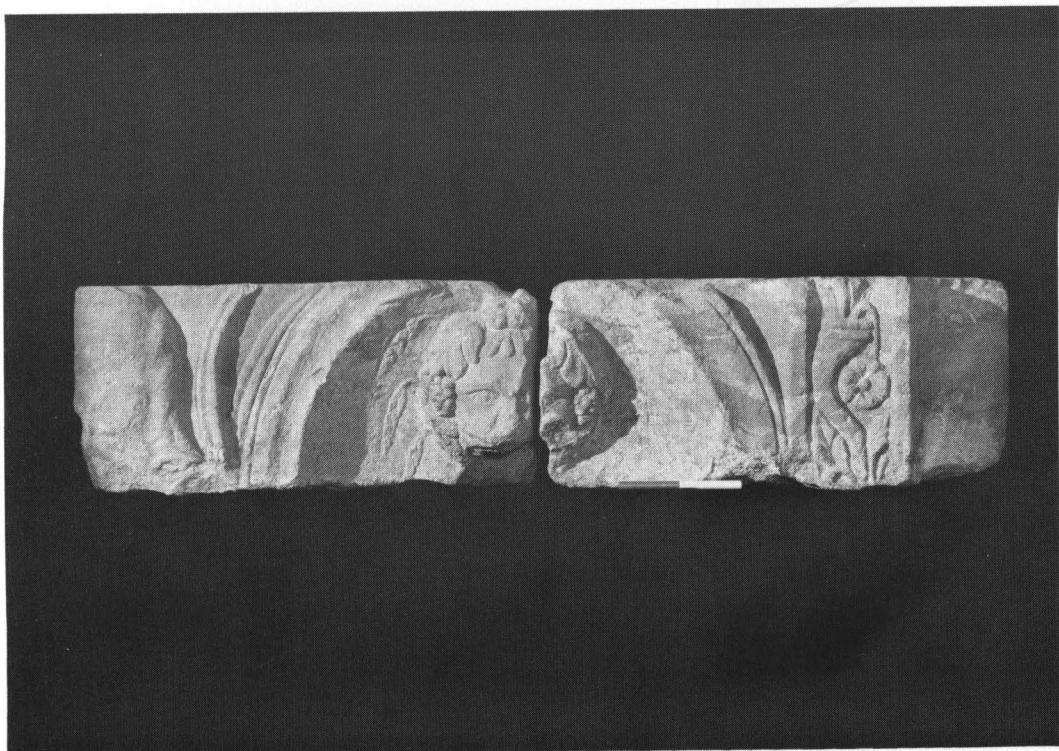


Plate 26. Roman Riverside Wall: Blocks 10 (left) and 11. Bust personifying a Season or Abundance (The Arch: Nighed figures).



Plate 27. Roman Riverside Wall: Block 12. Hand and helmet of Minerva (The Arch: Nighed figures).

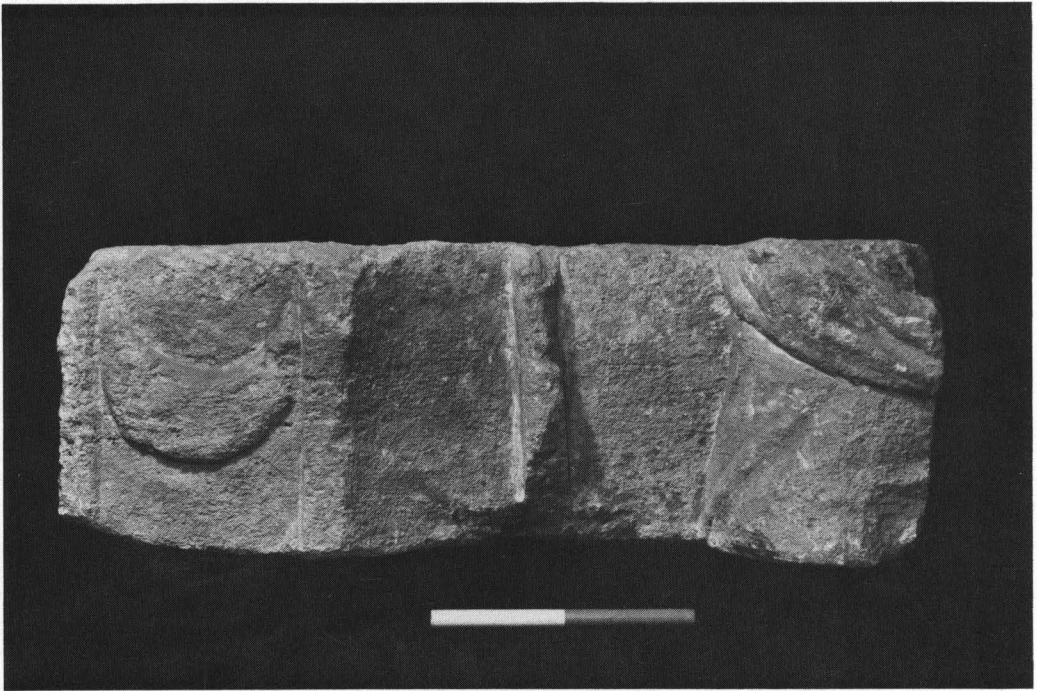


Plate 28. Roman Riverside Wall: Block 13. Waist of Minerva (The Arch: Nighed figures).
(*J. Orsmond*)



Plate 29. Roman Riverside Wall: Block 14 (front). Shoulder of Hercules (The Arch: Nighed figures).



Plate 30. Roman Riverside Wall: Block 14 (left end). (The Arch: Nighed figures).



Plate 31. Roman Riverside Wall: Block 15 (front). Forearm of Hercules (The Arch: Nighed figures).
(*J. Orsmond*)



Plate 32. Roman Riverside Wall: Block 15 (front). Waist of Hercules (The Arch: Nighed figures).
(*J. Orsmond*)



Plate 33. Roman Riverside Wall: Block 15 (left end) (The Arch: Nighed figures). (*J. Orsmond*)



Plate 34. Roman Riverside Wall: Block 16. Hercules' club (The Arch: Nighed figures). (*J. Orsmond*)



Plate 35. Roman Riverside Wall: Block 17. (The Arch: Nighed figures). (*J. Orsmond*)

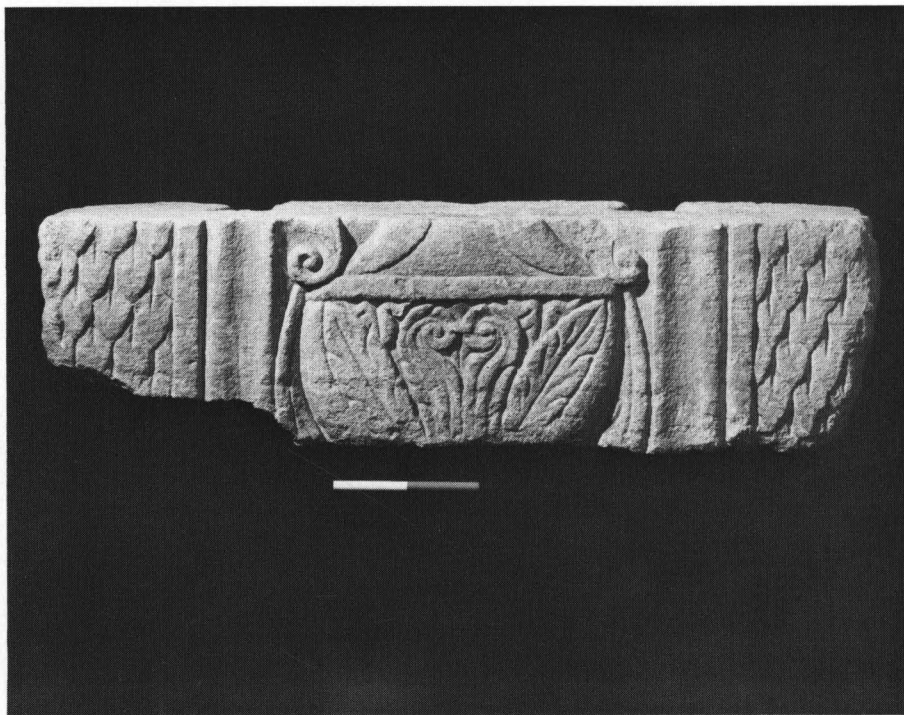


Plate 36. Roman Riverside Wall: Block 19. Cantharus (The Arch: Nighed figures).



Plate 37. Roman Riverside Wall: Block 23. Head of Venus (The Arch: Frieze).



Plate 38. Roman Riverside Wall: Block 24 (side). Draped bust (The Arch: Frieze).



Plate 39. Roman Riverside Wall: Block 25 (front). Cupid (The Arch: Frieze).



Plate 40. Roman Riverside Wall: Block 25 (right end). (*The Arch: Frieze*).



Plate 41. Roman Riverside Wall: Block 26. Mars (left) and purse and shoulder of Mercury (right) (*The Arch: Frieze*). (*B. Gray*)



Plate 42. Roman Riverside Wall: Block 27. Luna (?) (The Arch: Frieze). (*J. Bailey*)



Plate 43. Roman Riverside Wall: Block 28 (front). Head of Mars (The Screen).



Plate 44. Roman Riverside Wall: Block 28 (right end). Wind God (The Screen).



Plate 45. Roman Riverside Wall: Block 28 (reverse). Head of bull (The Screen).



Plate 46. Roman Riverside Wall: Block 29 (front). Mercury (The Screen). (*J. Orsmond*)



Plate 47. Roman Riverside Wall: Block 29 (reverse). Back of female (The Screen). (*J. Orsmond*)

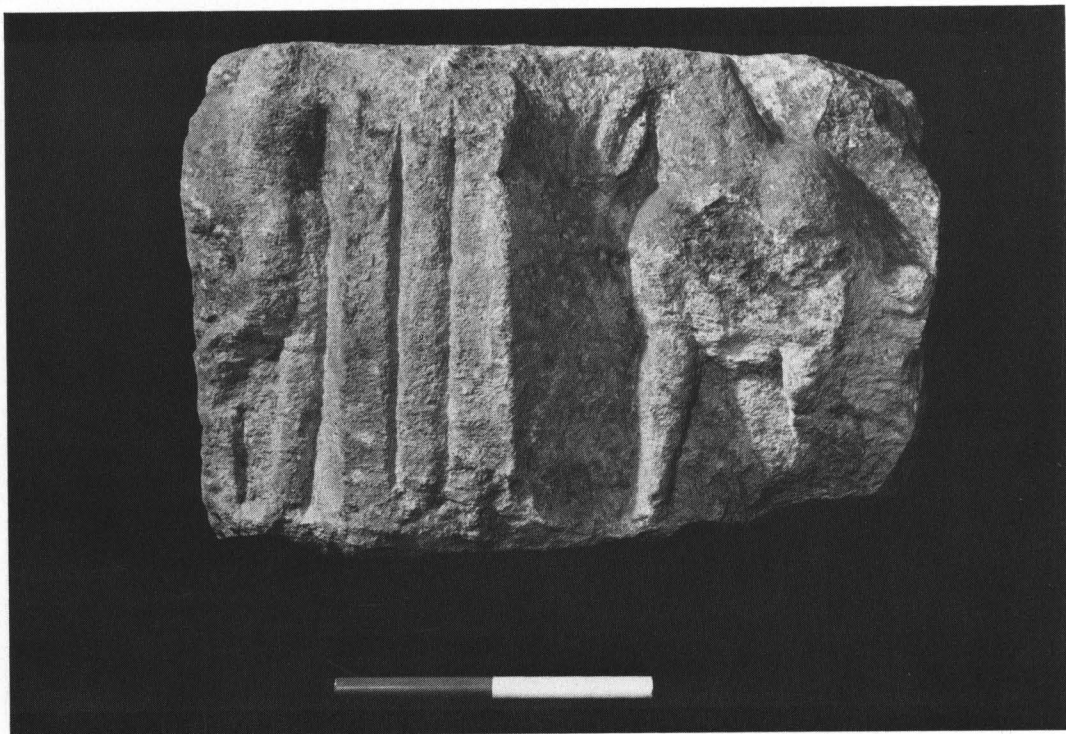


Plate 48. Roman Riverside Wall: Block 31. Mercury's ram (?) (left); Diana's hound (right) (The Screen). (*J. Orsmond*)



Plate 49. Roman Riverside Wall: Block 32. Legs and anvil of Vulcan (left); leg, shield and owl of Minerva (right) (The Screen).



Plate 50. Roman Riverside Wall: Block 34. Relief of 'Mother Goddesses'.



Plate 51. Roman Riverside Wall: Block 34. Reverse of 'Mother Goddesses' relief.



Plate 52. Roman Riverside Wall: Block 34. Right end of 'Mother Goddesses' relief.

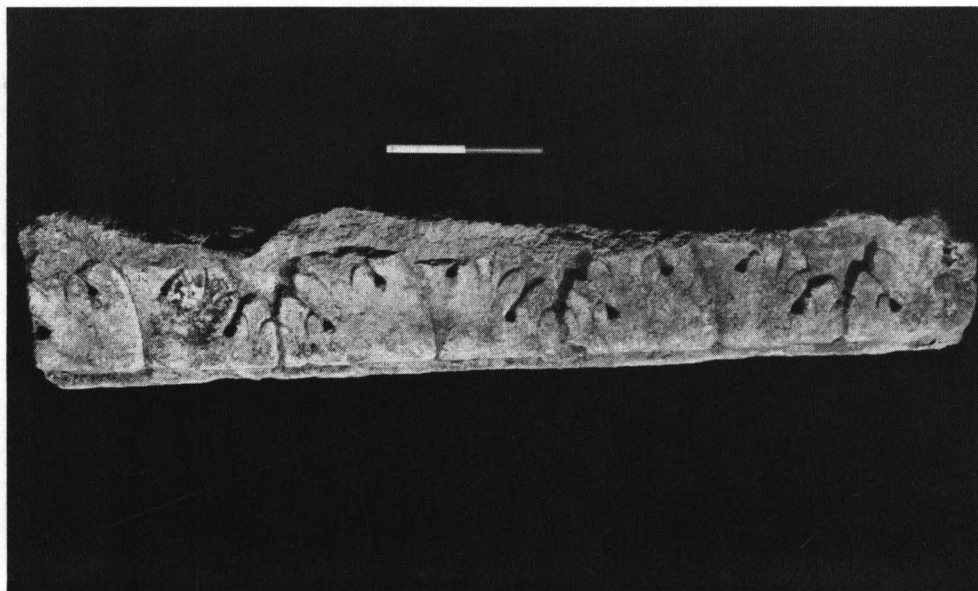


Plate 53. Roman Riverside Wall: Block 35. Decorated cornice (Miscellaneous). (*J. Orsmond*)

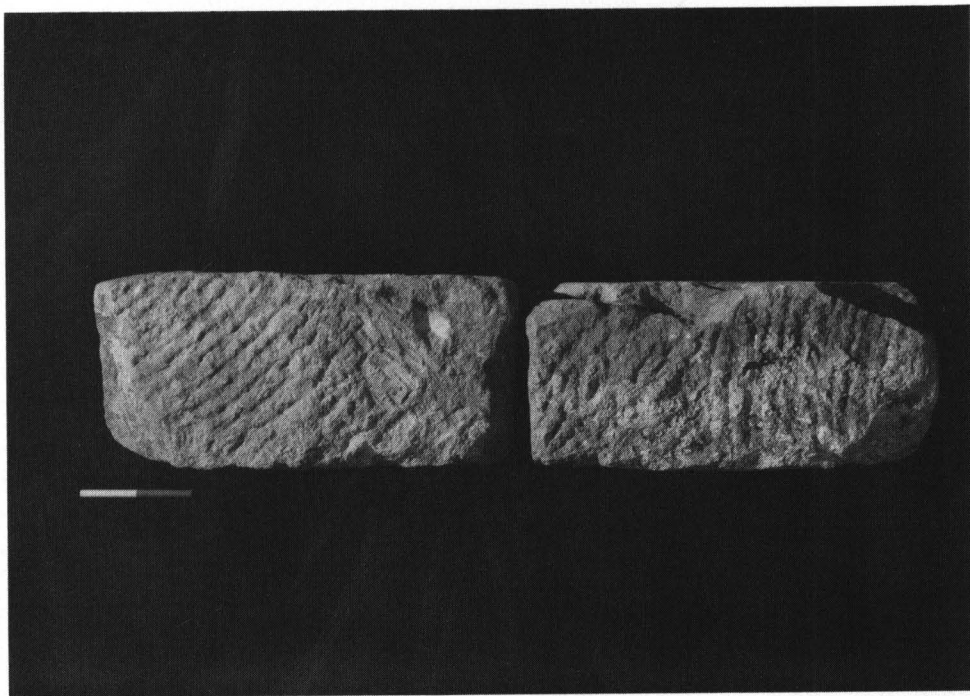


Plate 54. Roman Riverside Wall: Rear of Block 10 (right) and 11 (left), showing the grooves made by the mason's point and, to the right of Block 11, the marks left by the blade of an adze.



Plate 55. Roman Riverside Wall: Left-hand side of Block 28, with chiselled surface and, in the upper edge, a cramp-hole.

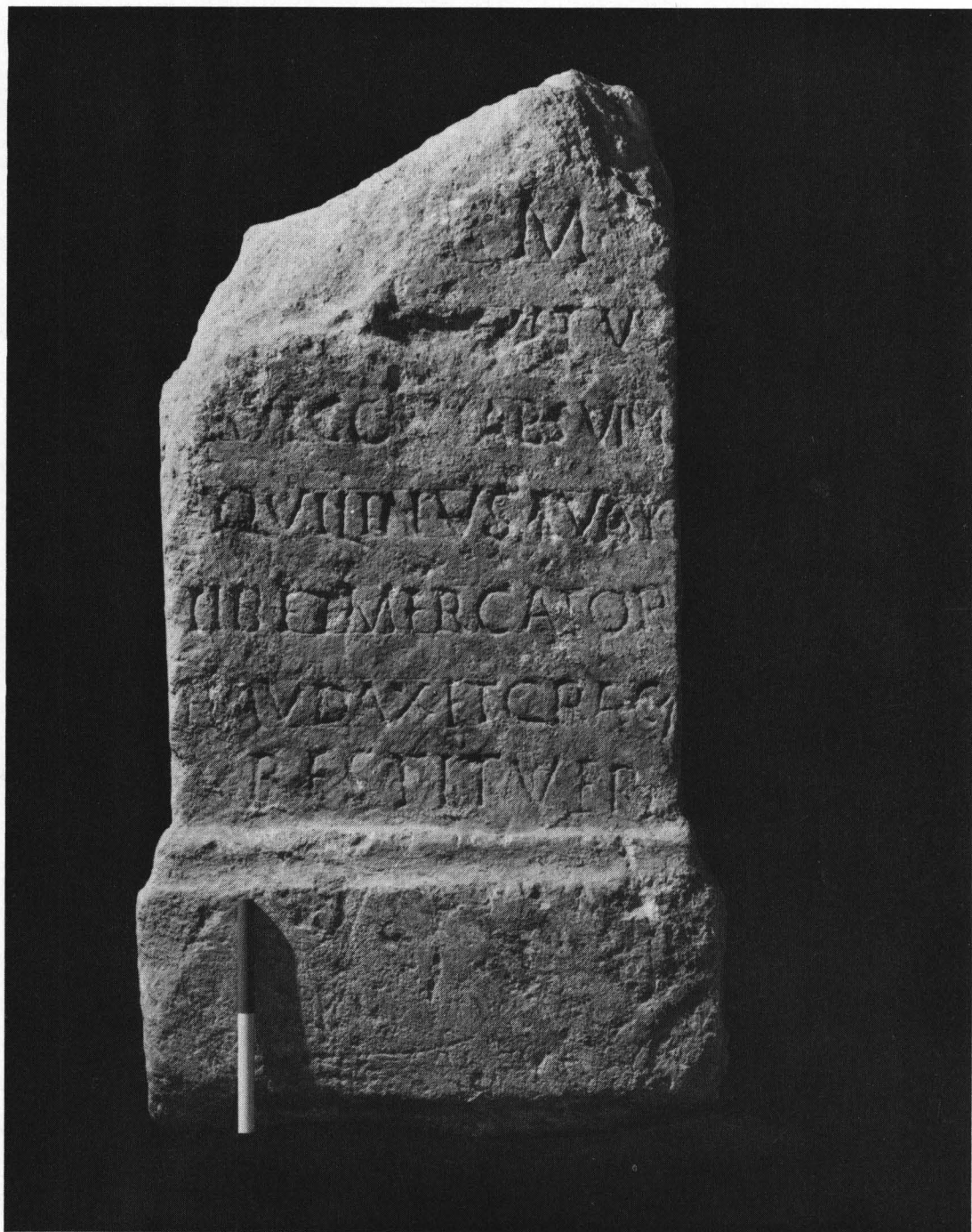


Plate 56. Roman Riverside Wall: Inscribed altar recording the rebuilding of a temple to Jupiter.
(p. 195).

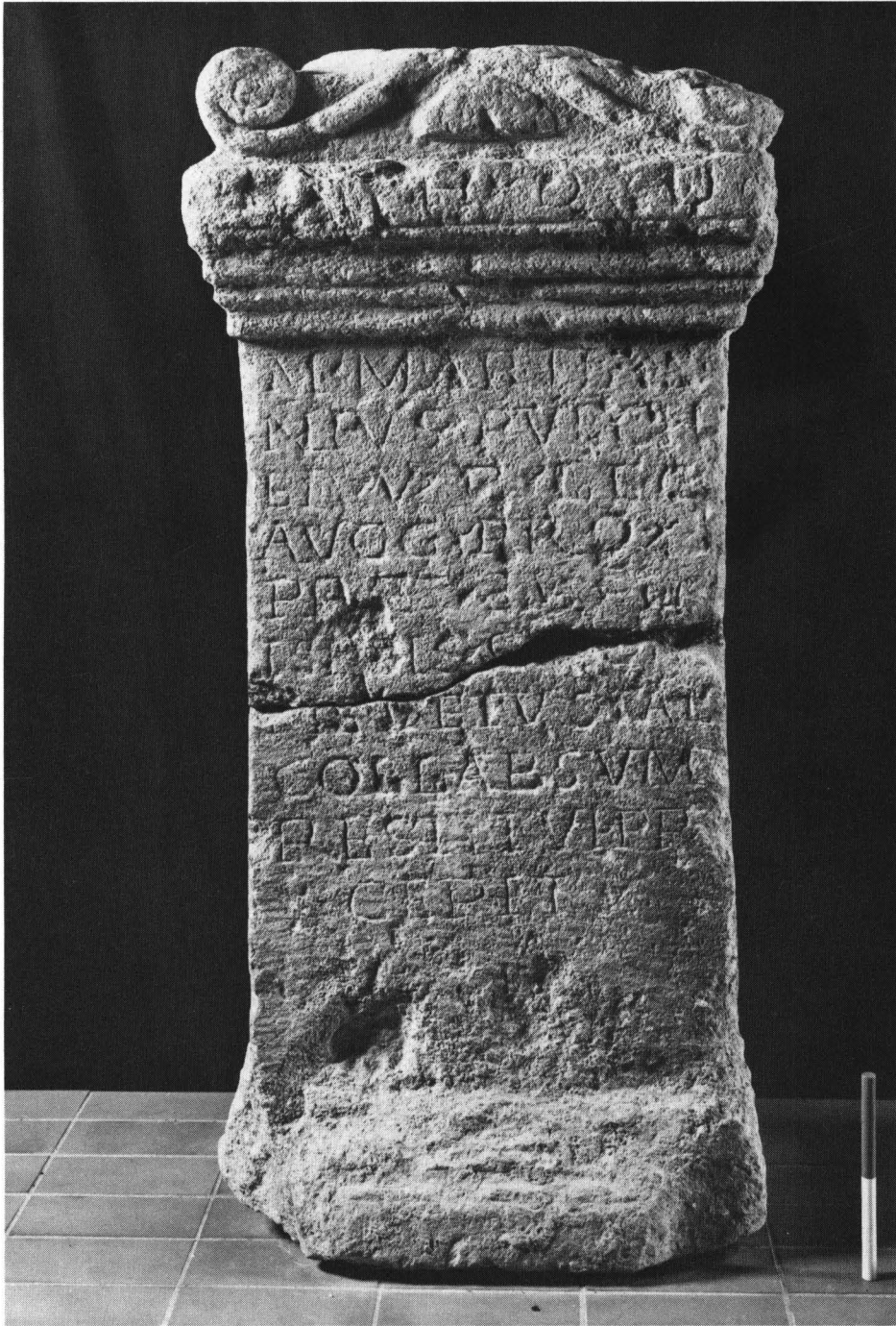


Plate 57. Roman Riverside Wall: Inscribed altar recording the rebuilding of a temple of Isis. (p. 196).
(B. Gray)

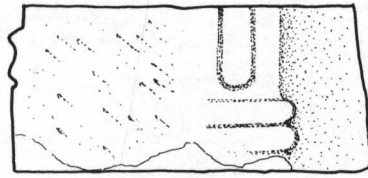


Fig. 91. Roman Riverside Wall: Block 33. (The Screen) (1:10).

5. THE RECONSTRUCTION OF THE SCREEN

In proposing a reconstruction of the monument, two main features must be borne in mind: the subject matter of the reliefs, and the decorative framework in which they were placed. The former can be divided into the two categories of deities and of lesser mythological subjects. Five deities can be identified: Mars, Diana, Minerva and Vulcan with certainty and Mercury with probability. The other figures consist of a bull's head: an eagle with a snake and a bare-legged figure, possibly Ganymede; and a female dancer. Both categories of subject are placed in niches about 90mm deep with, where the upper stones are preserved, arched heads. The niches are separated in two ways: either with simple pilasters with single flutes, stopped in the lower halves; or by a plain panel to which, as has been argued above, a half-column or pilaster was engaged, and flanked on each side by a pilaster of the type already described.

In the two cases where pairs of figures are seen next to one another (31 and 32), the deities appear together on one side and the lesser figures together on the other. It seems logical to suppose that this division of subject-matter applied to the whole monument, so that all the deities were grouped together on the front of it. The blocks (where decorated on both sides) vary in width between 0.55 and 0.58m. There is no sign of any angle or attached wall, and the simplest interpretation is that the monument was a free-standing screen, intended to be seen from both sides, and with at least one end also decorated. The evidence does not survive for it to be possible to say whether the other end was also free, or was attached to other masonry, whether the screen was inside or outside a building, or at what height it stood relative to the ground. It is likely to have been raised up a certain amount above ground level, and there must have been at least one course above the topmost we have (represented by No. 28), which stops short of the top of the arch moulding.

It is accepted that these stones represent only a small proportion of the original number, and that it is possible that several other deities might also have appeared. One must, however, observe an economy of hypotheses, and the reconstruction proposed here is that into which the available evidence fits most compactly. It seems reasonable to assume that the figures were symmetrically disposed. Two pairs survive separated by a single pilaster (Diana and Mercury, Vulcan and Minerva). The Diana and Mercury were separated from the next figures to the right by a pilaster and part of a panel, implying a corresponding pilaster beyond the panel on the adjoining stone. If 30 is correctly linked with 29 as representing the upper part of Mercury, the pair was flanked on the left also by a panel between two pilasters. One may thus propose a division of the screen into pairs of niches framed by fluted pilasters, the pairs separated by attached columns, which also occurred at the ends of the screen (see No. 28, pp. 159, 161, above). Mars stood at one end, and, if a symmetrical disposition is accepted, must have had a companion of whom nothing now remains. Taking those who appear most commonly on the *Viergöttersteine* of the Rhineland, the pedestals with niches

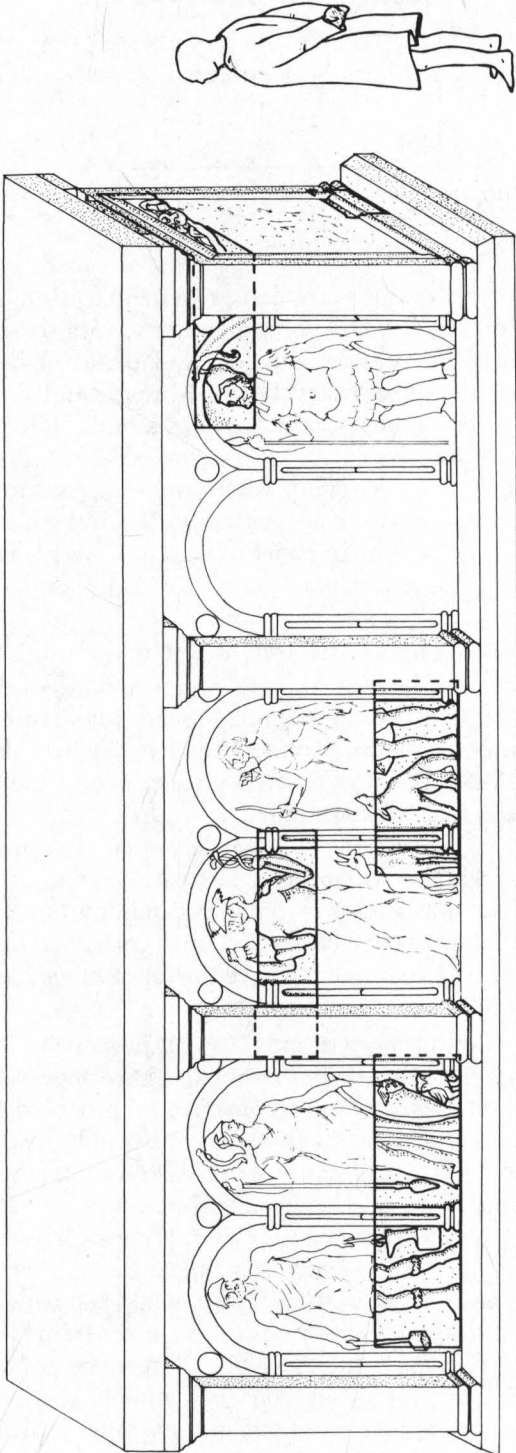


Fig. 92. Roman Riverside Wall: The Screen of Gods. Isometric reconstruction (1:40) (T.F.C. Blagg)

containing relief figures of divinities, which often supported Jupiter columns, two obvious absentees are Juno and Hercules.³² Of these, one might prefer Hercules, on the ground that Juno attracted little regard in Britain, appearing very rarely in either sculpture or dedications.

The reconstruction drawing (Fig. 92) shows a screen with three pairs of gods in a regular architectural framework of engaged columns and decorated niches. The rear of the monument is less easy to reconstruct, partly because block 32 presents only the front and not the rear face of the screen, so that less of the back survives. Enough remains for it to be clear that its division into niches follows the way in which the front was treated, but it is also clear that the widths of the niches varied slightly, as the position of the pilasters on one side does not correspond precisely with those on the other. Nor does the evidence allow one to suggest a coherent theme, or to conjecture what subjects filled the other three niches. The overall length of the monument as reconstructed is 6.20m (22 Roman feet).

As to the order in which the figures are shown, the position of Mars is the only one fixed with certainty, but the positions of the other two pairs can be argued with some confidence. First, Mercury could not have terminated the screen, as block No. 30 has, at its broken left-hand end, the remains of a fluted pilaster which began an adjoining niche. Secondly, on the basis that the lower part of Mercury's niche is carved on block No. 31, pairing him with Diana, that adjoining niche should have been Minerva's. It is unlikely that Diana appeared to the left of Vulcan, as that would have required an intervening block only about 0.55m wide, to carry the pilasters and the rest of Vulcan's hammer; all the other blocks used in the monument are wider than this, and furthermore such an arrangement would require the addition of another pair of niches to the left of Mercury for whose inhabitants there is no evidence whatsoever. It is accepted that other arrangements are possible, but none that would account so economically for the evidence we have.

The reconstruction would require, if the monument were completely free-standing, a short block about 0.45m wide to complete it at Vulcan's end. This is open to the same objection as above against its length relative to the remainder of the stones, which perhaps allows the inference that this end of the screen was not standing free. In any event it shows that block No. 33 could not have been at this end, as even in its broken state it is too wide. It must therefore have been at the bottom of the end panel in which the Wind God appeared.

6. THE OTHER DECORATED STONEWORK

There are seven pieces from the collection which are decorated in one way or another, but which cannot be linked for certain with either of the two monuments which have been reconstructed above.

34 (*Plates 50, 51, 52, Fig. 93*)

Height 0.90m

Width 1.20m

Depth 0.335m

This relief of four seated female figures is perhaps the most important single piece in this collection. On the front is a rectangular recess, 0.59m high and 0.99 wide. The four subjects sit on a plain bench with a curtain draped behind them at shoulder height. For the purpose of description they will be referred to from left to right by the letters A-D. All hold something on their laps. A has a large round object, possibly a loaf (? or pomegranate), in her right hand, a bunch of small round fruit (grapes ?), and another, unidentifiable, object in her left hand. B nurses a naked, suckling infant, looking down into its eyes as she plays with its uplifted right leg. Her left hand and the infant's left arm are lost. On C's lap there is a dog, its hindquarters on her left thigh. Its head has been broken off. She rests her left hand on

the right shoulder of D, who is holding a basket of fruit, a gesture paralleled on a relief of two seated Mother Goddesses from Trier.³³ A and B are seated slightly closer together than the others.

This is the work of a sculptor whose technique, though competent, was not of the first rank. The facial features are very simply rendered, and the drapery is carved in a somewhat stiff and formal manner with deeply incised channels between the folds. Nevertheless, in his composition and vision he has shown himself to be a man of sensitivity and imagination. This is revealed not only in the intimate touches of B's attention to the baby on her knee, and C's left hand gently resting on D's shoulder, but also in subtle variations in the hairstyles and the drapery. A has tightly bunched curls, picked out with small jabs of the mason's point. B has long tresses or possibly a veil gathered behind the head, while C's rather shorter locks are piled more on top of her head. D's hair is similar to C's, but the locks are heavier. All four wear a long dress and an over-mantle. A and D both have a bodice and wear their mantles like a shawl. The edge of A's, however, is drawn over both knees, while D's hangs between her knees. B's mantle hangs similarly, but with a fold gathered on the left thigh. C wears hers with a gathered fold at the left shoulder. All the carving of the figures appears to have been chiselled: there is no evidence that a drill was used to cut the deep channels.

Below the relief there is a slightly recessed panel measuring 0.18m high by 1.12m wide. It has some irregular scratches but although it appears to have been prepared for an inscription there is no indication that any lettering was ever carved, though it could have been painted. At each side of the relief there is a panel of stylised acanthus leaves, scrolled in alternate directions, rendered in a different manner from those on the pilasters of the Monumental Arch (above, p. 133). Each edge of the stone has a panel carved with upright leaves. The back is divided horizontally in half. The upper part is rather roughly carved with a curtain draped in two festoons, intended to give the illusion of being the curtain behind the figures on the front. Below this the lower part of the stone which projects 60mm has been hollowed out in a stepped recess, the top part 110mm deep and 210mm high, that below 180mm high and 30mm deeper. The work was done initially with a point, but the sides and upper part of the back were chiselled smooth. The best interpretation of this would seem to be that it was to accommodate the masonry of the structure upon which the tablet sat. Being carved on all four sides, the relief was clearly not built into the wall of a structure, but was meant to stand up above it.

In the absence of an inscription, an element of doubt must attach to the interpretation of the relief. One might just canvass the possibility that it is funerary, and surmounted a grave monument; reliefs of the deceased, seated, occasionally with infants or pet dogs, are known from the Gallic provinces and beyond. They include, for example, the three on the tomb of the Prisciani at Celeia in Yugoslavia;³⁴ Candidia, the wife of Vigellius, who holds a basket of fruits and a dog, and is shown seated with her husband and father-in-law on their tombstone from Neuernheim;³⁵ and the single woman with a fan, a bird on her lap and a child standing beside her, from Old Carlisle.³⁶ Nevertheless to find four women represented together on a funerary relief would be highly unusual.

The other interpretation, and one that in view of their attributes is far more likely, is that they are Mother Goddesses. It is well known, of course, that Mother Goddesses should come singly or in threes, and though they are occasionally represented with another or other figures to make a complement of four,³⁷ the representation of four goddesses together would seem to lack any close parallel. The four Deae Quadruviae on an altar from Cannstatt, now in Stuttgart Museum,³⁸ for example, are not Mothers, and are also standing.

It is quite common for Mother Goddesses to be holding baskets of fruit or other produce. Infants or dogs are much less common. Ralph Merrifield, in a recent paper, has cited the comparative evidence in the course of his full discussion of this relief.³⁹ Among the examples he quotes, the series of altars to the goddess Nehalennia, from Dombourg, are of particular interest in view of their decorative treatment.⁴⁰ The goddess is usually shown seated between a basket of fruit on one side and a dog on the other. Many of the altars have the feature of the

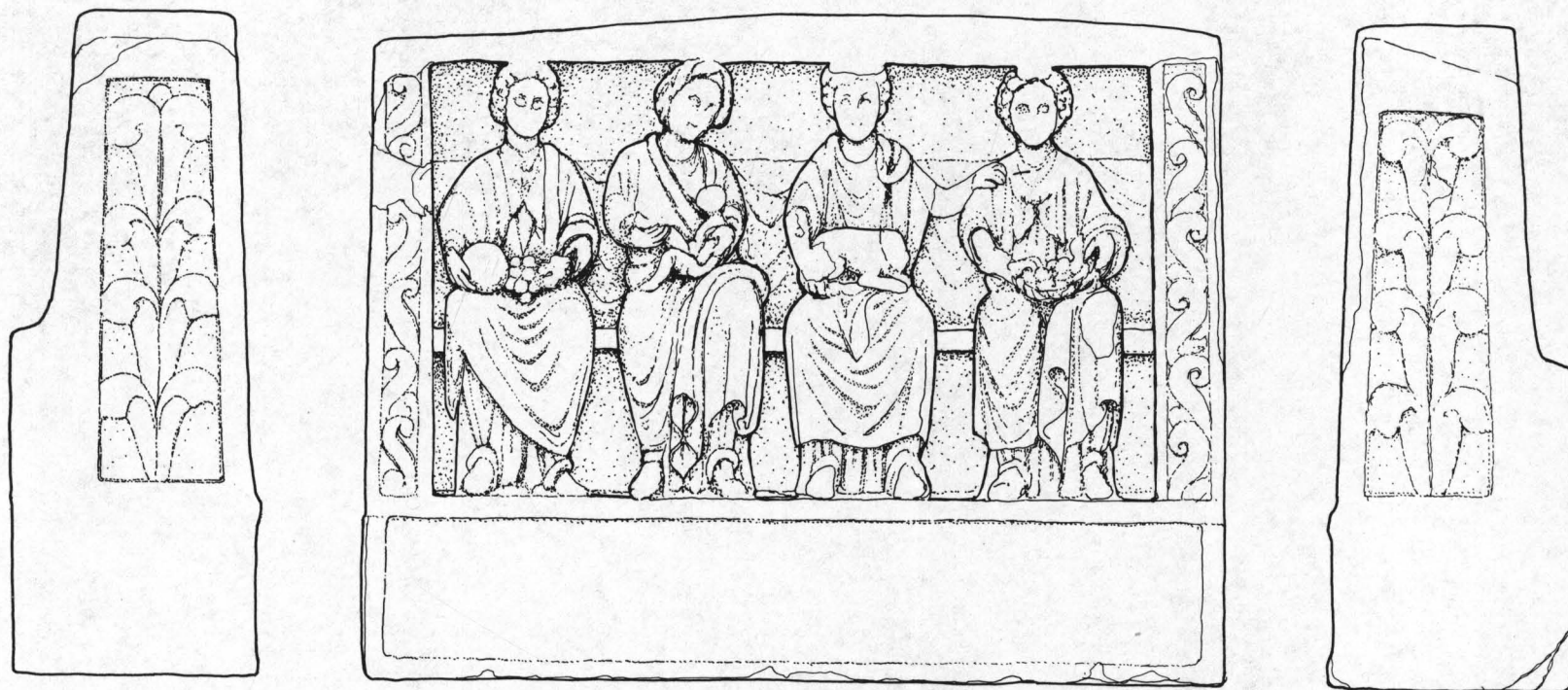


Fig. 93. Roman Riverside Wall: Block 34. Relief of four 'Mother Goddesses' (1:10)

curtain carved on the back, and their sides and the pilasters which provide the frame for the relief are also ornamented with foliage in a manner similar to those on the London relief, though the style in which the motifs are carved is not identical.

If these four figures are, as would seem to be the case, Mother Goddesses, the presence of a fourth can be accounted for in a number of ways. Professor Toynbee, in her Foreword, considers the possibilities of error on the part of the sculptor; either in the initial spacing, which one might consider unlikely in view of his otherwise evident skill and experience; or in copying a model (either sketched or memorised) in which in fact the original fourth figure was a worshipper or attendant, whose distinctive attributes have been forgotten or not obviously appreciated by the sculptor. It might indeed still have been his intention, or that of his patron, that the fourth figure should represent a human rather than a divine being. I feel that this interpretation has a little more to be said for it than Merrifield accepts. Its weakness is that the iconography is not sufficiently clear for us now to be able to decide which of the four is thus to be distinguished, though this might have been more obvious to contemporaries, particularly if there was a painted inscription.

Figure B, with the infant, is singled out by her attitude and her veil or hairstyle. She is also the one selected by Merrifield in his alternative interpretation. He identifies her as a *Dea Nutrix*, and explains the veil, an attribute of a divine empress, as belonging to such an empress, probably Julia Maesa, represented in the form of this goddess. The interpretation as a *Dea Nutrix* is persuasive, if all four figures are to be seen as goddesses. One might perhaps remark that the veil, or hair covering, is also a feature of western provincial dress.⁴¹ As Merrifield observes, Gaulish goddesses are occasionally shown with this headgear, though it is not characteristic of *Deae Nutrices*. If, on the other hand, the sculptor's patron has perhaps had herself portrayed in her daily dress, she has not accepted a subordinate position on the relief.

No doubt other suggestions will continue to be offered, and one must also allow that the sculptor intended from the outset to carve four *Matres*, and that it is the cult and not the sculptor that is unusual.

35. (*Plate 53, Fig. 94*)

Height 0.24m
Width 1.31m
Depth 0.595m

This cornice decorated with acanthus leaves may have surmounted the Monumental Arch, but it is placed in this section because there is no specific evidence to show that the association with other stones from the Arch in the Riverside Wall resulted from a common origin. There are three broad leaves divided into five toothed lobes, and half of a fourth. The central channels are inclined to the left, but the top of the middle lobe bends back to the right, giving the impression that the foliage is blowing in the breeze. There are large patches of white paint or limewash on the surface of the leaves, with the brush strokes showing clearly, red colour in the grooves between the leaves, and yellow on the underside of the projecting top fascia.⁴²

The delicate projection was broken off, but one large fragment survived which fitted in the centre, but is not shown on the photograph. The right-hand end of the block is broken.

36. (*Fig. 95*)

Height 0.225m
Width 0.89m
Depth 0.81m

A cornice moulding with similar acanthus foliage to the preceding example. The projecting upper part of the moulding is also broken off.

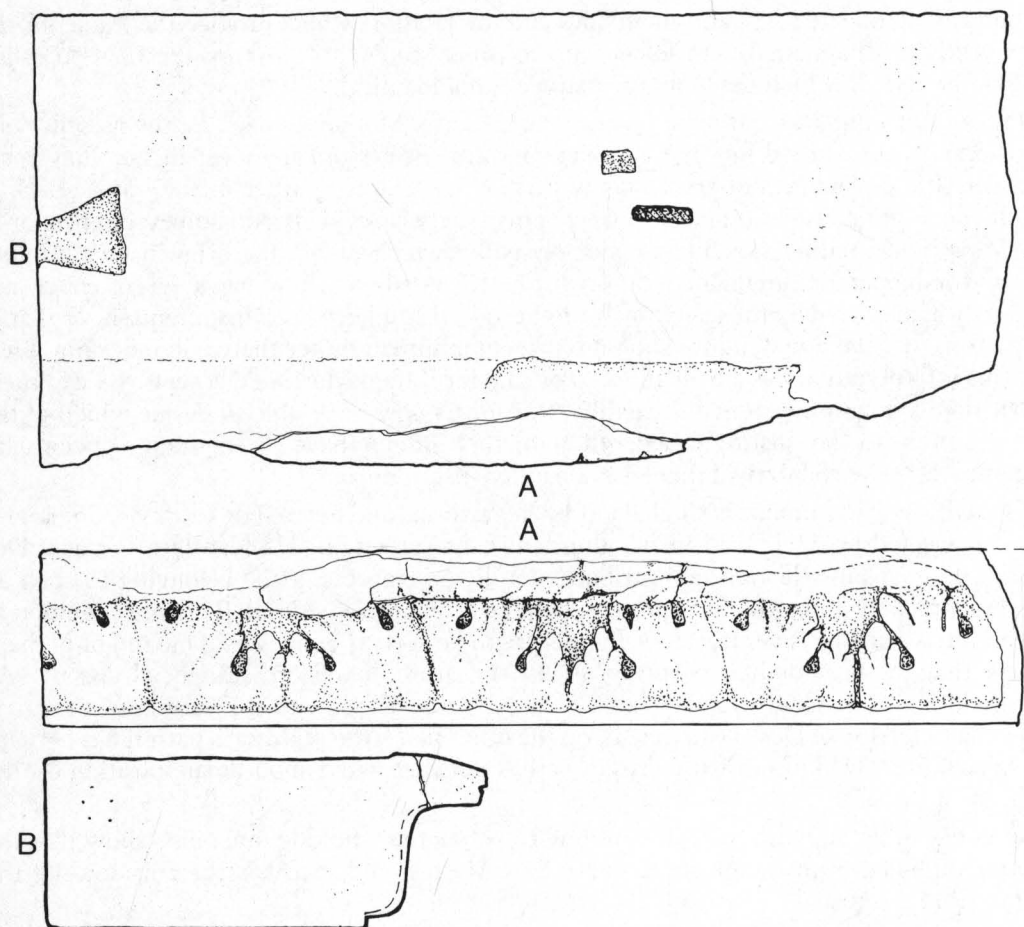


Fig. 94. Roman Riverside Wall: Block 35. Decorated cornice. (Miscellaneous). (1:10).

37. (Fig. 96)

Height 0.49m
Width 0.525m
Depth 0.74-0.79m

Three sides of the block are decorated with oblong panels in a moulded frame. The work has been very poorly accomplished. None of the panels is truly rectangular, and although the sides are longer at the top than at the bottom in any case, few of the edges of the panels are parallel with them.

The top has been drafted round the edges with a strip between 30 and 60mm wide, and 250mm wide at the rear, where a dove-tail cramp-hole shows that the block was joined to masonry at the back. Within the drafted strip an island of stone measuring about 0.45 x 0.50m has been left as it was originally roughed out with a point. The block would seem to have been intended to support a statue, or maybe a column free-standing in front of a wall. It is conceivable that the base of the statue or column could have been hollowed out to fit over the 'island,' or it may be that the shoddy carving of the panels

led to the abandonment of the block before the top surface had been fully cleared. The latter is less likely for two reasons: if it had been intended to dress the top smooth, that would normally be done before any decorative carving was started; and the fact that the block was found re-used with other worked stones which had indisputably come from dismantled monuments rather than from a pile of rejects suggests that the source of this block was similar. Nevertheless, the poorer quality of the carving suggests that the stone did not form part of the London Arch or the Screen of Gods.

38. (*Not illustrated*)

Height 0.275m
Width 1.24m
Depth 0.61-0.64m

One face of the block is chamfered. The top has a rebate 12mm high and 40mm wide cut in the front and the bottom has a band 50mm wide at the front which is free of mortar, suggesting that the block projected beyond the courses above and below. It is not clear whether this was in its first or second period of use. There were certainly two, as the block has cramp-holes on both top and bottom.

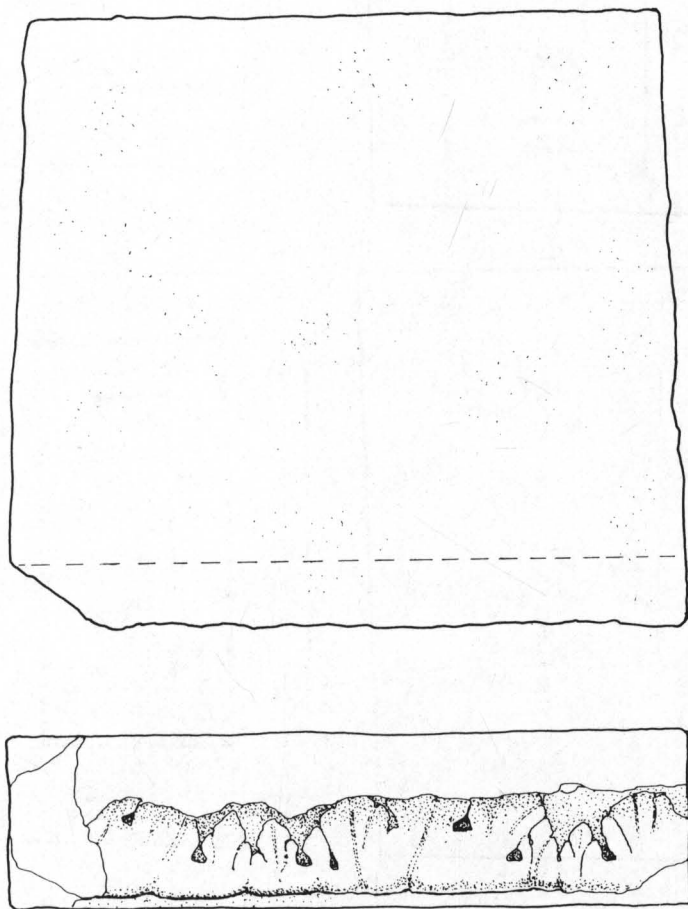


Fig. 95. Roman Riverside Wall: Block 36. Decorated cornice. (Miscellaneous). (1:10).

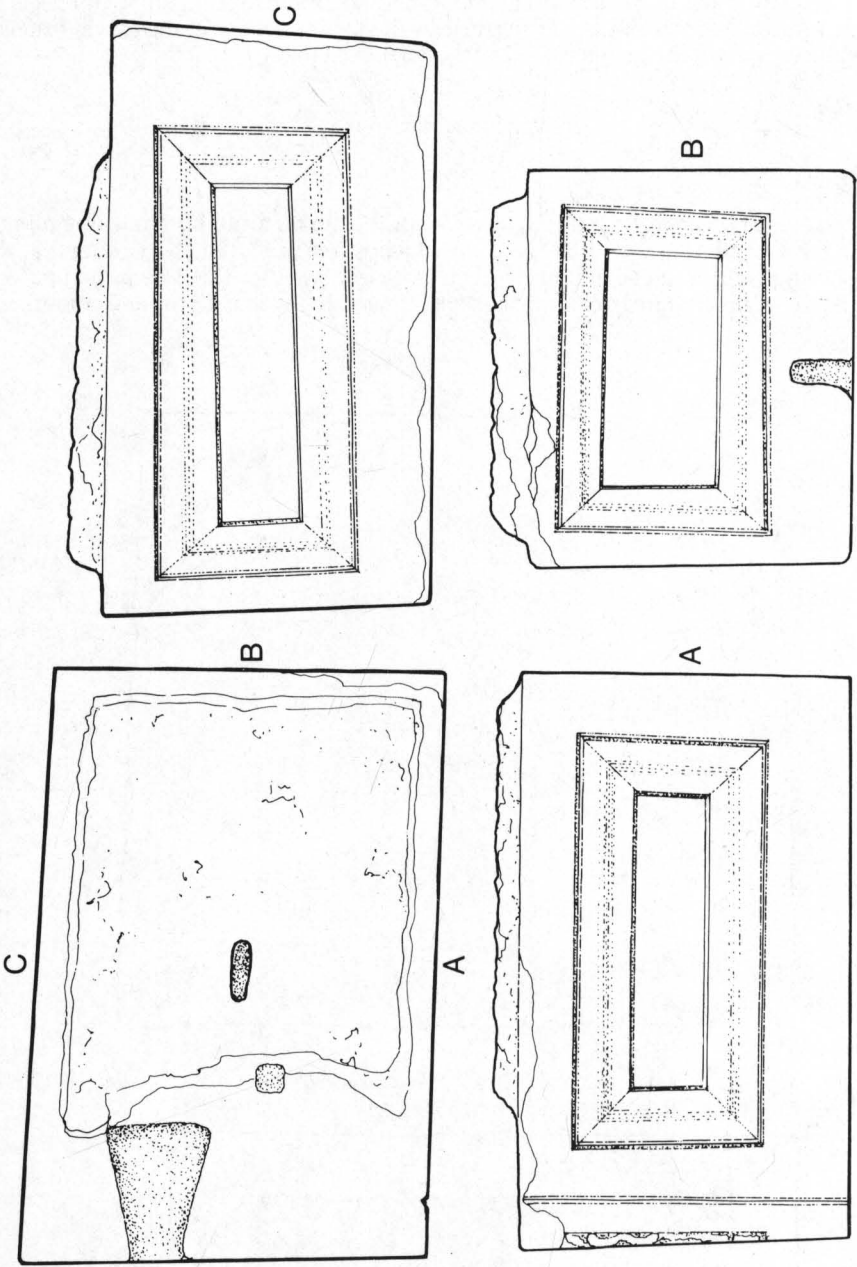


Fig. 96. Roman Riverside Wall: Block 37. Pedestal. (Miscellaneous). (1:10).

39. *(Not illustrated)*

Height 0.28m
Width 0.76m
Depth 0.92m

One face is chamfered back a distance of 85mm with a vertical fascia 70mm high at the bottom. The opposite face is slightly inclined, by 35mm. The block was intended to be seen from both sides, as the edges of each end have been chiselled smooth at both front and back for a close fit. There is a suggestion of an obliquely-carved ornamental motif on the fascia, possibly the trace of a guilloche, but the stone is extremely worn and abraded at this point so it is impossible to be more precise. The block thus provided part of a continuous plinth 0.80m wide at the top. There are cramp-holes at each end.

40. *(Not illustrated)*

Height 0.23m
Width 0.96m
Depth 0.86m

Two opposite sides are both chamfered, but most of one of them has been broken off. On the unbroken side there is a fascia 85mm high. There is a hole for a bar-cramp in the left-hand end at the top, which has been neatly chiselled, whereas the bottom appears to be rougher. The bottom is 0.62m wide.

Several undecorated, dressed blocks of limestone and greensand were also recovered, but are not included in this report.

7. DISCUSSION

The two monuments which have been described above present a most valuable addition to our knowledge of Roman architecture and sculpture in Britain, and indeed in the western provinces of the Empire. It is also fitting and gratifying that London, the capital of the province and later presumably of the diocese of Britain, should now have allowed us to see something of the grandeur of which the city's subsequent thriving history has too often left us only the bare and scarred foundations. It is all the more tantalising that the demolition of the monuments in the 4th century to provide materials for the Riverside Wall, while preserving enough to allow their superstructures to be reconstructed with some certainty, has meant that we are never likely to know exactly where they once stood.

(a) THE MONUMENTAL ARCH

This is the first arch from Roman Britain for which a detailed reconstruction of its original appearance can be proposed. Of the three which were excavated at Verulamium,⁴³ only the foundations survived, and the same is essentially true of the quadrifrons arch at Richborough, where remains of its marble cladding were too fragmentary to do more than hint at the overall design.⁴⁴

The reconstruction drawing of the London Arch (Fig. 97) shows it as a free-standing structure, but even this is uncertain. The only identifiable parts which are preserved are those from the upper part, above the point at which the arch springs. It is true that most monumental structures of this kind which are known were free-standing, normally spanning one of the major streets of the towns which they adorned. There is no architectural reason, however, why it should not have graced the entrance to such a precinct as the Forum, public baths, a temple enclosure, or the official headquarters of the provincial legate or the procurator. Some of these possibilities might, however, be thought less likely on historical, archaeological or topographical grounds. In particular, the structure must have been one that could be treated as redundant, and is likely to have stood in the western part of the city, since presumably the stones were carted to the nearest part of the Riverside Wall site.

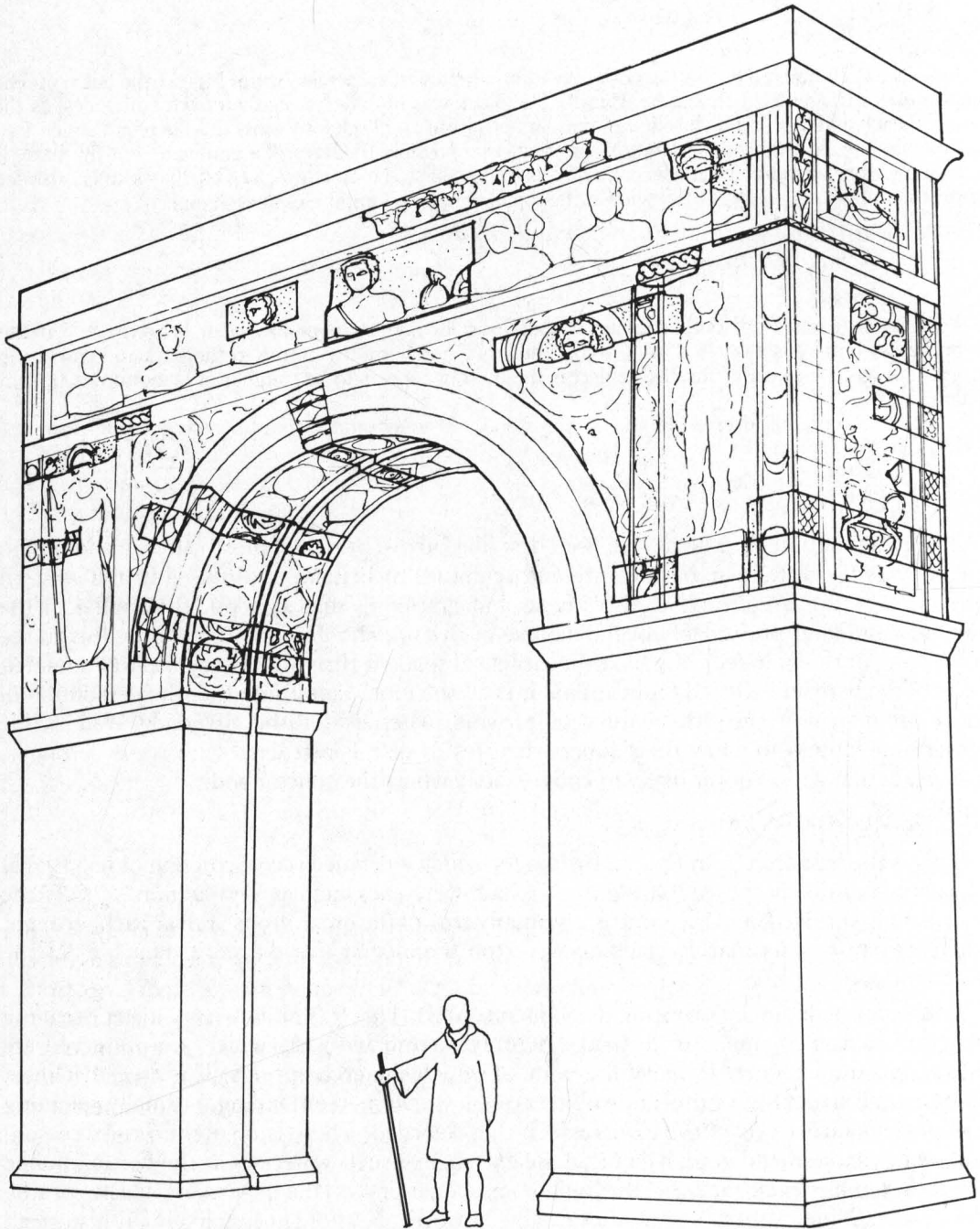


Fig. 97. Roman Riverside Wall: The London Arch. Perspective reconstruction.

One may perhaps exclude the possibility that the Arch formed part of one of the gates of the city, which are likely to have had two main carriageways or at least side-portals. Nor is there any ground for describing it as a Triumphal Arch, as there are nowhere in its elaborate decoration any of the battle scenes, trophies or Victories which would surely have been present had it been intended to commemorate military success.

If the Arch was free-standing, its width of 7.57m (25 feet) would have been comfortably accommodated in one of the major streets of the city, which are up to 9m (30 feet) wide.⁴⁵ The constriction of traffic which a single portal would have occasioned does not seem to have been an obstacle to the siting of such monuments in other cities of the Empire.

The assertion that this was not a triumphal arch does not imply that it was not commemorative of some other occasion. Frere has suggested that two of the arches at Verulamium were built to mark the original limits of the town, perhaps at a date when the town walls were constructed.⁴⁶ For a city of London's status, the historical possibilities are manifold, even were the arch precisely datable, and only epigraphic evidence could decide the point.

Though it is highly likely that the Arch did carry an inscription (see above, p. 155), no part of it was among the stones that have been retrieved. For the dating of the monument and for suggestions as to its purpose, we must rely on the form and manner of its decoration. The figural sculpture consists of full-length representations of classical divinities; Minerva, Hercules, and two others who cannot be identified, though there is evidence to suggest that one of them was Jupiter, Juno or Neptune. There were busts of Seasons and probably other personifications in roundels in the spandrels of the arch, with sea-monsters filling the remaining space in the corners of the spandrels. In the attic frieze were busts of other classical divinities which can be interpreted as the Gods of the Week, and on the opposite side to them, winged Cupids flanking the space where the inscription is likely to have been. The short sides were decorated with inhabited vine-scrolls ascending from canthari.

Busts in the spandrels of an arch, though not in roundels, appear on the Porta Marzia at Perugia, of late Republican or early Imperial date, and are surrounded by prominently projecting circular wreaths on the Arch of Augustus at Rimini, which is dated to 27 B.C.⁴⁷ Busts in roundels appear more commonly on monumental architecture of and after the Antonine period, when they may be seen, for example, on the Arch of Marcus Aurelius at Tripoli, though in that case above the pedimented niches which flank the archway.⁴⁸ They appear in a similar position on the Porte de Mars at Reims, to which Crema assigns a Severan date,⁴⁹ and a female bust, draped and crowned, in a beribboned roundel, survives from a water collection basin at Besançon, dated to after A.D. 167.⁵⁰ Similar in its subject matter to the London bust, though not in the detail of its carving or its ornament, is a roundel from Lyon containing a beardless male bust with a leaf crown and carrying various fruit.⁵¹ Others which may be cited from the Gallic provinces include a bust of Mars from a monumental gate at Mandeure, and a female bust with mural crown and cornucopia, now lost, from Arlon.⁵² A later parallel for the roundel in the spandrel of an arch occurs in the busts of Galerius and 'Fortune' on the fragments of a marble arch from Thessaloniki.⁵³

The subjects contained within the three other roundels of the London Arch are conjectural. Had the figure of blocks 10 and 11 been one Season, rather than a figure with the conflated attributes of Summer and Autumn, the other three Seasons would have appropriately filled the remaining roundels, providing a nice annual counterpart to the Gods

of the Week who line the frieze on the back of the monument. A corresponding composite Winter/Spring might be suggested for the roundel to the left of the archway. Alternatively, if our 'Season' represents such a personification as *Abundantia*, others such as *Tellus*, *Oceanus*, *Fortuna* or *Bonus Eventus* might be suitable companions. One is reminded of the possibility, and plausibility, of other conflated personifications by Engemann's recent discussion of a mosaic from Carthage, in which *Tellus* is represented, in the company of the attributes of *Oceanus* as well as those proper to her, holding a crab.⁵⁴ Cosmic personifications of this kind, whether simple or composite, would go well in a scheme of decoration in which the Days of the Week, figures symbolic of earthly abundance and marine creatures can be identified.

Sea-monsters are quite unusual creatures to find in the spandrels of an arch. The most usual occupant of this space is a Victory, for whom in this instance the roundel would have left no space and, probably, the purpose of the Arch no occasion. The roundels on the arches which have been cited above are not surrounded by further ornament. Sea-monsters appear, however, in the spandrels of an arch from the baths-theatre-temple complex of *Ruines de Champlieu* (Aisne), from which a parallel for the diademed bust of the goddess on the attic frieze also comes.⁵⁵

The restoration of the frieze as carrying the Gods of the Week, on a monument which has as its main decorative subjects *Minerva*, *Hercules* and two other presumably classical divinities, leads to comparison with another class of monument, common in the north-western provinces, in which this combination is found, the *Jupiter* and *Giant* columns which have their main distribution in the area of the Middle Rhine and Moselle. *Juno*, *Minerva*, *Hercules* and *Mercury* appear in niches on the four sides of a square pedestal from Castel, near Mainz, which is surmounted by an octagon with busts of the Gods of the Week occupying seven sides and an inscription in honour of the *Domus Divina* on the eighth.⁵⁶ The column erected at Hausen an der Zaber, Kr. Heilbronn, to *Jupiter* and *Juno* by C. Vettius Connougus in fulfilment of a vow, stood on a similar pedestal, surmounted by an octagonal shaft bearing busts of the Gods of the Week, with Victory filling the eighth space.⁵⁷ In this case, the gods on the square pedestal were *Venus*, *Vulcan*, *Diana* and *Apollo*; one of the last two appears on one of the short sides of the London Arch.

The *Mars* in the Hausen Gods of the Week is beardless. This lends support to the identification as *Mars* of the beardless figure to *Mercury*'s left on block 26 (above, p. 155), though indeed there are other instances. A young beardless and unhelmeted *Mars* appears, for example, on the Arch of *Trajan* at Beneventum, and in a mosaic from Orbe (Vaud) in Switzerland, on which the Gods of the Week are represented with *Ganymede*, *Narcissus*, *Nymphs* and *Tritons*.⁵⁸

The pedestal of a second column from Hausen bore figures of *Juno*, *Minerva*, *Hercules* and *Mercury*, and the same gods featured on the *Viergötterstein* of the column from Walheim in the same region. In this case the eight gods who decorated the intermediate shaft were not the Gods of the Week, but the column itself is of some interest in relation to other motifs on the London Arch, in that it was decorated in its upper part with inhabited vine-scrolls, and in the lower, rather less than half, with imbricated leaves.⁵⁹

In none of these Rhineland examples is the detail of the carving of the sculpture and ornament close enough to that of the London Arch to suggest a direct association. Rather, they show a common source for the repertoire, and a connection in subject matter and thus

possibly in purpose. It was suggested above that the Arch might have formed the entrance to a Temple enclosure. It should be observed that, apart from the stones assigned to the Arch, the find from the Riverside Wall includes stones from a Screen of Gods, and a relief of Mother goddesses. It also includes two altars, one to Jupiter (as restored) and the other to the Domus Divina, the usual subjects for the dedication of the Jupiter columns. These altars refer to the restoration of temples, in the first case presumably that of the dedicatee, in the other, of Isis. It is true that there is no close stylistic or ornamental connection between these different groups or items; even if there were, it would not prove that they came from the same site originally. But a circumstantial case can be made for attributing the Arch to a Temple complex. A monumental arch, with two portals, has also been proposed for the entrance to the Temple precinct of Sulis Minerva at Bath.⁶⁰

This does not, of course, in any way exclude other possibilities. The sea-monsters in the spandrels, if correctly identified as such, would be appropriate to any monument in a city of whose importance as Roman port we are reminded by other recent excavations along the Thames. In terms of conventional Roman architecture, however, they might be taken as indicating that the public baths might have provided a suitable context for a grand entrance-way. It is difficult to believe that, when the Huggin Hill baths were demolished in the 2nd century,⁶¹ they were not replaced, and in all probability replaced by something larger and more impressive. As Merrifield's map shows, space is not lacking to the west of the Huggin Hill site; to date, this area has yielded little information, and its proximity to the part of the Riverside Wall from which these remains come is suggestive.

It will be appreciated that these proposals of possible purposes for the London Arch are made as cautious speculations, and that the evidence is not substantial enough to support an argument of great weight.

The date of the monument can only be argued on stylistic grounds. Apart from the figural decoration, it was carved with rich architectural ornament. This is considered in more detail below (p. 183), but included no less than seven different types of pilaster and, on the archway, elaborate mouldings including five versions of the bead-and-reel motif, guilloche, acanthus and palmette and other foliate designs. Another type of guilloche divided the attic from the middle stage of the Arch, and the attic may have been surmounted by a cornice with acanthus foliage. One is tempted to suggest that the masons had employed every design in their manual of ornament!

In the architecture of Rome itself the somewhat florid Flavian taste in ornament was succeeded in late Trajanic and early Hadrianic buildings in particular by a reversion to the more restrained forms of Augustan decoration.⁶² Under the late Antonines, but much more noticeably in the grandiose building programmes of the Severans, the styles of several earlier periods were copied, and among them the luxuriance of the Flavian, which may be seen revived in spirit and often in detail in the Arch of the Argentarii and the Baths of Caracalla in Rome and the Arch of Septimus Severus and the Forum in Lepcis Magna. By then, as Ward-Perkins has remarked, Italy's importance in architecture had declined in relation to the rest of the Empire.⁶³ It is a matter of the greatest difficulty to assess how far changes in fashion which can be observed in Rome or in the Mediterranean were reflected in the remotest of the western provinces, or after what lapse of time. In the absence of a systematic study of western provincial architecture, not even can the process of transmission of ideas be defined in more

than a general way, and where so much architectural stonework remains unpublished, regional styles and traditions remain largely unidentified.

With due qualification, therefore, one may suggest that the elaboration of motif, and in particular the abundance of foliate decoration, reflects the fashions that appeared further south in the later 2nd century, and are unlikely to be earlier than late Antonine in date. This is supported by such features of the design of the Arch as the roundels with busts and the niched figures, which are found on arches of the same period and later in other parts of the Empire (see above, p. 177), and by some specific motifs such as the elongated form of the bead in some of the bead-and-reel motifs, characteristic of Severan architecture.

The Porte Noir at Besançon, which has been dated to after A.D. 166,⁶⁴ is highly ornamented with figures in niches on each side of the arch, framed by engaged imbricated columns, with figural scenes lower down in the niches and on the piers which frame them, as well as rich conventional architectural ornament.⁶⁵ The Porte de Mars at Reims is rather more restrained, with engaged fluted Corinthian columns and aediculae or pedimented niches with roundels above them containing busts. Espérandieu considered it to be Antonine, but Crema preferred a Severan date.⁶⁶ The rich collection of architectural sculpture excavated at the Ruines de Champeleu (Aisne), which included the remains of a decorated, arched entrance, from which two specific parallels for motifs have already been cited, has also been dated to late in the 2nd century.⁶⁷

Other arches whose ornament, in the form of acanthus foliage, guilloche, bead-and-reel, etc., is comparable, include one from Trier, which has coffered rosettes on the soffits, another with two sorts of bead-and-reel and a scene of Hercules and Hesione, and a third from Charlottenau on the outskirts of the city.⁶⁸ An arch and porticus at Mainz erected to Jupiter in honour of the Imperial Family had pilasters with vine-scrolls and other ornament, and was decorated with figures which are no longer identifiable.⁶⁹ It, and the Trier arches, are undated.

Although the dates of the other arches cited are not absolute, it may perhaps be acceptable to take them collectively as lending support to the argument that the London Arch is not earlier in date than late Antonine, or, more probably, Severan in date.

Although none of the motifs is of a form or quality which would suggest that Mediterranean craftsmen were employed to carve them, the presence of Severus himself in the province between A.D. 208 and 211, and that of his son Geta in London as governor of Britannia Superior, may well have led to the erection of buildings of monumental character in the capital, and stimulated Romano-British masons to acquaint themselves with fashions current elsewhere, in however devolved a form the ideas were put into practice. This said, it must be observed that the Arch could be considerably later, and only the *terminus ante quem* provided by the re-use of the stones in the Riverside Wall, with an allowance for a reasonable time during which the Arch was standing, can set a lower limit for its construction.

The assertion that Romano-British masons were employed was made advisedly, though it cannot be proved. Many of the motifs employed are highly distinctive, but none of them finds a precise parallel in published continental material. Some of the closer similarities may just as easily be accounted for in the local development of traditions derived from the Gallic and German provinces in the first and early second centuries, such as Kähler has pointed to in the case of Corinthian capitals.⁷⁰ Indeed, the devolved nature of some of the forms suggests just such a local development. Nevertheless, where so much of the comparative material on the

continent is unpublished, dogmatism is out of place. It is true, also, that the writer's collection of material for a *Corpus of Roman architectural stonework in Britain*⁷¹ includes nothing that is comparable in the precise terms which would permit an attribution to the same school of masons. Certainly, the only other collection where ornament of this quality is present, that from Bath,⁷² is quite distinct stylistically. The individuality of the decoration suggests a local school, though one acquainted with developments in the mainstream of Roman architecture; by the date that this monument was probably erected Britain had been a Roman province for a century and a half at least, and London in particular is likely to have provided regular work for stonemasons. For these reasons, and in default of evidence against the hypothesis, it would seem reasonable to argue that the work was carried out by Romano-British masons.

(b) THE SCREEN OF GODS

The individual figures in the Screen have already been discussed, and it remains only to consider the general significance of the monument. The idea of such a screen is uncommon in Roman architecture, as it is not part of the regular layout of standard forms of building, such as a temple or a forum and basilica. Only in the more imaginative treatment of a large interior or of the precinct surrounding a building or group of buildings of particular importance would a suitable context occur. Thus the only comparable structure in the province of Britain is the Façade of the Four Seasons at Bath, which stood somewhere in the temenos of the Temple of Sulis Minerva.⁷³ This is restored as a series of alcoves separated by fluted pilasters, containing seated figures, with winged cupids above bearing various objects. It is carved on one side only, and not on both as is the London Screen. Although its form is broadly comparable, the detail of its design and ornament are rather different.

Shorter reliefs carved with a row of divinities but not in an arcade are found occasionally, including one from Le Châtelet known from an 18th century drawing, with five figures of whom Neptune, Apollo, Minerva, and possibly Juno, are identifiable.⁷⁴ The most usual way in which the figures of gods in niches occur is singly on each of the four sides of the square pedestals, found particularly in Gallia Belgica and Germania, which often supported Jupiter or Giant columns. On some of these the figures are paired, as on one from Dannstadt in the Rhineland.⁷⁵ The placing of a row of gods in columnar niches is also a feature of late Roman sarcophagi deriving from the east Mediterranean, which may originate in monumental architecture, but is unlikely to be of direct relevance here. Pairs of figures in adjoining niches occur in other reliefs and funeral monuments, such as the one with two soldiers in niches with plain pilasters and another with two togate figures separated by decorated pilasters, both from Augsburg.⁷⁶ In considering a possible context for the London Screen, one should remember that the precinct of the Temple of Claudius at Camulodunum was fronted by a screen wall with bays and niches, veneered with imported marble.⁷⁷ These examples can do no more than demonstrate that the Screen of Gods was one of a class of monument the members of which are diverse both in their individual character and in their collective antecedents.

It is not now clear whether it stood out of doors or inside a building. If the former, it is likely that it adorned a temple precinct, but the fact that its reliefs are of divinities and lesser mythological or symbolic figures would not be inappropriate in a secular building complex. It

is not possible to say whether it came from the same site as the Monumental Arch. The technique with which the figures on the Screen were carved is different from that visible on the Arch, notably in the rendering of facial features, and a little inferior. The very simple ornament of its single-fluted pilasters also contrasts notably with the richness with which the Arch was decorated. That it appears to have been carved by a different group of masons does not, of course imply that it came from a different site. There is no evidence, however, that the two formed part of the same structure. Both are of Lincolnshire limestone, but this need imply no more than that they might be contemporary, or that Lincolnshire provided a regular source of the building stone required in London for sculptural decoration at any period. It is interesting to notice, however, that although one of the types of stone identified in the Petrological Report (below, p. 199) was common to both monuments and to the unassigned stones, the other type was employed solely on the Arch.

It is also impossible on present evidence to assign a firm date to the Screen. Its ornament lacks diagnostic detail, and while the sculpture does not show the characteristic features of Late Antique art in the Mediterranean, this could just as well be accounted for by provincial conservatism. It would seem rash to say anything more exact than that it probably belongs to the 2nd or 3rd centuries.

Something more profitable can be said about the affinity which is shown by some of the specific features of the sculpture to those which occur in one particular area. This is, broadly speaking, those parts of Germania Superior, the Agri Decumates and the eastern Gallia Belgica, lying north-east of a line between Metz and Strasbourg, and including the middle reaches of the Rhine and the Moselle. One of the features is the representation of Vulcan, the main area of whose distribution in relief sculpture has been noted above (p. 166). Two features in the representation of Minerva also seem to occur predominantly in this area, her reversed spear and the owl which stands at her foot, examples of which are also noted above (p. 166). It is not claimed that these distributions are exclusive, but it is interesting that of the eight occurrences of the owl by Minerva's foot in Espérandieu's massive collection, only one comes from outside the area, from Bordeaux. One cannot be quite so certain about the reversed spear, as the ends of it are sometimes damaged or not clearly discernible in published illustrations, and the feature is not always noted, but again, there seems to be only one, from Alzey, which lies outside the area.⁷⁸ Though Minerva is often represented with the Gorgon's head on her breast, the carrying of the device on her shield seems to be quite exceptional. Among the very few comparable instances is the Gorgon on the shield, not of Minerva but of Mars, on the pedestal of the Neronian Jupiter column at Mainz, and that on the shield of Virtus in one of the Cancelleria reliefs at Rome. Another motif for which it is difficult to find a parallel is that of the eagle with a snake, though one appears, with two snakes, on one side of a block from Trier which carries an inscription to Jupiter.⁷⁹ It is of interest that Mainz and Trier are also within the area which has been identified above.

The stylistic traits and standards of execution exhibited by the examples which have been cited from that area vary considerably, and they are obviously the work of several men, not necessarily contemporaries. What have been identified are some of the features of their common repertoire, a tradition which is limited in its geographical extent, and one in which the sculptor or sculptors of the Screen of Gods from London seem to have shared. It would seem reasonable to argue that he or they either had come from the Middle-Rhine-Moselle area themselves, or had been trained by one who had.

(c) THE ORNAMENT

It would seem useful to conclude this general discussion with a formal analysis of the rich and varied ornament which this collection displays, most notably on the Monumental Arch. Its value in the reconstruction of the latter will be appreciated, but the further study of such features in a wider context may also be said to provide the key to the understanding of how the architecture of the western provinces developed, and how its regional traditions were formed and related to one another. The value of such analysis in the study of the monuments of Italy and the Mediterranean has long been appreciated, but the wealth of similar evidence in the western provinces has largely been neglected. Architectural ornament, over which the eye of the average observer passes lightly, even unconsciously, in appreciating the overall effect to which it contributes, reveals through the subtle variations in the manner in which its standard range of forms is executed the trademarks of the individual masons and the local traditions in which they had been trained. If some of the comparanda which are cited below seem to be eclectic or inconclusive, that is only because this wider study has barely begun.

PILASTERS

I Imbricated leaves

The use of leaves in rows, overlapping like roof-tiles or fish scales, probably derives from the bundles of laurel leaves carved on the more elaborate altars, an example of which may be seen on the altar-tomb of the procurator Classicianus in London.⁸⁰ Perhaps by association with the idea of the scales on the trunk of the date palm, which occasionally was carved to serve as a column or pillar,⁸¹ they came to be applied vertically, normally pointing upwards, as decoration of columns or pilasters. On columns they were particularly favoured in north-east Gaul, notably on the shafts of Jupiter columns, but they appear only rarely in Aquitaine and not at all in Provence, as Walter has shown.⁸² Their appearance on pilasters has not been studied. They also occur on the ogive-profiled roofs of such funeral monuments in north-east Gaul as that of the Secundinii at Igel,⁸³ and fragments of such a roof were found among the re-used stones in the Camomile Street bastion of London, and a column shaft bearing the same decoration was also found.⁸⁴ These two are technically different from the pilasters of the Monumental Arch in that they have mid-ribs carved in relief, whereas the latter have incised central veins. This may not be of great significance, however, for both types are carved on the sides of a block which bears a female figure in relief, possibly Abundantia, found at Richborough⁸⁵ (Nos. 9, 12, 13, 14, 15, 16, 17, 19).

II Sun and Moon

The decoration consists of discs and crescents, the latter of which are found with their horns pointing both up and down. I do not know of parallels for this motif in Britain (Nos. 12, 13, 19).

III Drooping Flower

From a horn with a moulded lip a bunch of stylised leaves surrounds the tip of the next horn above, which arises from its mouth. A four-petalled flower hangs down on a long stalk. As a continuous motif this is most unusual. Single cornucopiae with fruit, leaves and a dangling flower appear at the sides of altars, for example at Bonn and at Tickelt, near Nijmegen.⁸⁶ It is from such an idea that this pilaster decoration was probably derived (Nos. 7, 11, 20).

IV Scroll

The individual motif which is repeated with the scrolled tip turning alternately to right and left is a stylised acanthus leaf and tendril selected from the continuous running scroll of classical ornament.⁸⁷ It was a favourite form of decoration in Gaul, both on pilasters and as an entablature moulding, sometimes remaining close to the pattern, at others so stylised that its origins in acanthus foliage are forgotten. The Quadrant Monument at Bath had a well-executed moulding of this type on its architrave.⁸⁸ In this London collection it also occurs in different versions among the mouldings of the Arch and on the relief of the four Mother Goddesses (below, Nos. IX and XIX) (Nos. 8, 9, 21).

V Acanthus spray

Rising shoots of acanthus foliage, punctuated at intervals by one or two small sprays of leaves, found particular favour on the highly decorated tombstones of the Rhine and Moselle valleys, at such places as Mainz, Neumagen and Cologne. In Britain a more spreading and luxuriant version of the design may be seen at the sides of the block which bears a figure identified as a Tyche, at Lincoln.⁸⁹ At Bath, a more richly-modelled version of the motif appears on the Quadrant Monument and it would also seem to be present on two fragments of pilasters drawn by Lysons, but now lost.⁹⁰ Generally it is very rare in the province (Nos. 9, 14, 15, 16, 17, 19).

VI Fluting

There are three flutes, the lower parts of which are stopped, the upper edge of the stopping being concave. Fluting is more frequent on pilasters in Britain than on columns, but stopped, or concave and convex, fluting is less common here, though as Strong has remarked, popular in Roman architecture from the Flavian period onwards⁹¹ (Nos. 9, 23, 24).

VII Calyx and Ivy Leaves

This decoration is most unusual, and there is no other example of it in Britain, simple though it is. Rather similar in idea to No. III above, it consists of vertical trumpet-shaped calyces with a pair of leaves pointing upwards and another pair of ivy leaves hanging down on drooping stems. The tips of each pair of drooping leaves are turned alternately outwards and inwards, and the midribs are carved in relief. The calyx has an incised inner triangle. It is very stylised, and seems to have been abstracted from that normally found surrounded by acanthus shoots, as it is on the left side of an altar at Chester⁹² (Nos. 9, 23, 24).

VIII Fluting

A single flute, stopped in its lower half (Nos. 29, 30, 31, 32, 33).

IX Scroll

A simpler version of the motif above, No. IV. The tip of a leaf emerges from between the scrolled head of one of the main leaves and the back of the next (No. 34).

X

A panel carved with upright leaves whose broad fleshy tips are turned over and outwards. This style of leaf carving is one which contrasts with the more usual serrated and lanceolate forms. In Britain it is most common in the south-west, where it may be seen on the frieze of the Quadrant Monument at Bath,⁹³ and on a frieze now built into the inside wall at the west end of the south aisle in Caerwent parish church⁹⁴ (No. 34).

Of the above pilasters, Nos. I to V come from the middle stage of the Monumental Arch, and Nos. VI and VII from its attic frieze. No. VIII is on the Screen of Gods, and Nos. IX and X on the Mother Goddess relief.

MOULDINGS

XI-XV Astragalus

All versions of the bead-and-reel come from the Monumental Arch, Nos. XI to XIII from the front and the others, of which XIV is repeated, from the back. None of them is close to the original motif as it was developed in Greek architecture of the Ionic order and taken over in Italy. There, until the 1st century A.D., the bead was shorter, no more than one and a half times its height, and the reel was shaped either as its name implies, with two plano-convex discs set on edge with their convexities face to face, or as two bi-convex discs separated from one another and from the head by a short horizontal bar. A tendency towards elongation of the bead becomes more pronounced from the late 1st century in Rome, on such buildings as the Forum of Nerva,⁹⁵ and the bi-convex discs of the reel, which are preferred in the early Hadrianic reversion to Augustan ornament, become thicker and the horizontal bar eventually disappears.⁹⁶ In this instance, Britain can be shown to have shared directly in this development. Astragali of this type are found among the decorative marble facings of the Quadrifrons Arch at Richborough which was under construction in the last two decades of the 1st century, and which as 'an imperial project of considerable importance' is likely to have involved the employment of

Italian or Gaulish masons with experience of marble working.⁹⁷ The versions shown on the London Arch show the extremely devolved forms in which these tendencies culminated in provincial architecture, though other bead-and-reel motifs which are closer to the traditional forms do exist in Britain, such as on a large cornice moulding from Cirencester, which has a plano-convex reel.⁹⁸ In these very different London examples, the reel has turned into two, three or four rings of uniform thickness (Nos. XI, XII and XV), or to a square (Nos. XIII and XIV). The bead has also become extremely elongated and in No. XIII has adopted a lozenge shape, while that in No. XIV approaches a biconical form. Some of them have also been carved with transverse or diagonal lines or, in No. XIII, circles. The elongated form is one which has been noted particularly as a feature of Severan architecture, as on a frieze from the palace on the Palatine at Rome, or in the Basilica at Lepcis Magna⁹⁹ (Nos. 1, 2, 3, 4, 5).

XVI Anthemion

Based on a running scroll of acanthus leaves alternating with palmettes, this motif has devolved a long way from its original; although the fleur-de-lys is recognisable as a palmette, the humped figure next to it, with a shield-shaped central panel, is of a form which shows that the mason cannot have understood that it was really supposed to be an inverted acanthus calyx. This manner of carving the acanthus calyx, reduced to a pair of spirals with a shield-like panel between them, is strikingly paralleled on a fragment of stucco found in the excavation of the Roman cemetery at Bavilliers (Territoire de Belfort) in Franche-Comté, though on that piece the palmette also has been debased, and appears as a pair of horn-like leaves.¹⁰⁰ It is of further interest that the same fragment has an astragalus with long lumpy beads and reels with two and three rings, *cf.* No. XI above (Nos. 1, 2, 3, 4, 5).

XVII and XVIII Guilloche

The motif appears twice on the Arch, as a moulding on the archway itself (No. XVII), and as a band dividing the main part of the Arch from the attic frieze. The two examples are carved differently, in that the first is twisted towards the right and the 'eyes' between the ribbons, which are at 8mm centres, are in relief, whereas the second moves leftwards and the eyes, at 5.5mm centres, consist merely of small round cavities. These are rather small differences; the flat ribbons are carved in a similar manner, without the raised seams or the hollowing out between the edges that often appear on examples of the motif¹⁰¹ (XVII: Nos. 1, 2, 3, 4; XVIII: Nos. 12, 20, 21, 22).

XIX Scroll

The most simplified version of the motif discussed above, p. 183, No. IV (Nos. 1, 2, 3, 4).

XX Overlapping leaves

The ornament consists of a band in which whole leaves with three lobes alternate with pairs of half-leaves set edge to edge. The same motif occurs, carved in more detail and in much higher relief, on the inner of the two circles which surround the Gorgon's head on the pediment of the Temple of Sulis Minerva at Bath.¹⁰² In the more simple version which we see here, it is a common pilaster decoration in the Rhineland, and it is from there that the sculptor of the tombstone of M. Favonius Facilis at Colchester probably acquired it. On that monument the motif is, as it were, split longitudinally, so that the left and right halves of the leaves alternate¹⁰³ (Nos. 1, 2, 3, 4, 5).

XXI Acanthus

This comes from a cornice with a strong cyma moulding, and the decoration consists of large leaves, 38mm wide, divided into five lobes, the bottom two of which have three, and the remainder five teeth. The central channel is inclined to the left, but the ends of the upper lobes are bent over to the right, giving the impression that the leaves are waving in the breeze.¹⁰⁴ As was noted above, p. 171, they were painted. The design, and the gentle modelling of the surface of the leaves, is rather unlike anything that appears on the Arch, so although one or two technical features permitted the suggestion that the two cornice blocks with this ornament might have come from the Arch, its carving does not support the idea. Nor does it exclude it, for there is no reason why two or more masons with rather different repertoires should not have worked on different parts of the monument (Nos. 35, 36).

XXII Acanthus scroll

The running scroll based on acanthus foliage was used principally to decorate the frieze of a building, but also appears on the soffits of architraves and, as here, arches, and on pilasters. It was a form with almost limitless possibilities for variation and invention in the combination of leaves, calyces, tendrils and flowers, and is often found inhabited by birds, beasts or small mythological figures.¹⁰⁵ There are several examples of it in Britain, where it may be seen on the Quadrant Monument at Bath,¹⁰⁶ and on two friezes from Chester.¹⁰⁷ The heavy wreaths turn alternately clockwise and anti-clockwise, and surround rosettes on spiral stems. The spaces outside the roundels are filled with fleur-de-lys-like sprays of leaves (Nos. 1, 2, 3, 4).

XXIII Coffering

Hexagonal coffers containing rosettes or acanthus wreaths also ornament the soffit of the arch. Small birds are carved in the angles between the hexagons (Nos. 1, 2, 3, 4).

The ornament which has been described above is not the finest in quality to be found in the province. That is still to be seen among the architectural stonework from Bath and on some of the Cirencester material. If several parallels from Bath have been cited in the above pages, that is because many of the types of ornament observable in this collection from London may also be seen there, but it must be repeated that the manner in which they are carved shows considerable differences. Several motifs which are found there and in other collections are not present on these London stones, notably the egg-and-tongue, and the cyma, or ogive, moulding decorated with vertical acanthus leaves, both of which may be exemplified by the cornice of the Temple of Sulis Minerva. The reason for this is probably structural. Such mouldings are used to reduce the extent to which a cornice projects to the width of the wall below. As the ornamental motifs from London are applied to vertical and not to projecting surfaces, there would not be the need for the others, and their absence should not be seen as the result of a selection made against the motifs as such, rather than against that type of profile.

Nevertheless, even though better standards of carving are observable elsewhere, and though some of the motifs may be described as debased when compared with their Mediterranean originals or the best western provincial work, the collection remains notable both for its range and, in the case of several which appear to be unique, its inventiveness. Standing back from the Arch, on which most of them appear, and without the close scrutiny which they have received here but can have been given by few of the contemporary men-in-the-street who saw them, the overall effect to which they contributed must have been impressive.

8. TECHNIQUES OF CONSTRUCTION AND MASONRY

The tops of most and the bottoms of some of the blocks have holes cut in them for a variety of purposes connected with the construction of the monuments of which they formed part. The holes are of four types: rectangular lewis-holes, wider at the bottom than the top and placed in the middle of the upper surfaces, for lifting tackle; square pry-holes; cramp-holes in the form of a dovetail; and bar cramp-holes, rectangular with a deeper square socket at the end; both types of cramp were used for joining two blocks of stone together.

The occurrence of these holes has occasionally been mentioned in the above descriptions, where it has been of significance for the interpretation of the function of the block on which they were cut. They also appear on the drawn upper surfaces of the stones. Their incidence is summarised in tabular form (Fig. 98). The dimensions of the dove-tail cramp-holes have been

CONSTRUCTION HOLES

Block	Dovetail Cramps No.	I/C*	Bar top	Cramps bottom	Lewis Hole	Prye Hole
1			2	1	+	—
2	1	I	0	1	—	—
3	2	II	0		+	—
4	2	II	0		+	—
5	4	IIII	0	1	—	—
6	1	I	0		+	—
7	2	C	0		+	—
8	3	C?	0	1	+	+
9			0			
10	2	II	0		+	—
11	2	II	0		+	+
12	2	II	0	0	+	+
13	2	CC	0	0	+	+
14	2	II			+	+
15	1	?	0	0	+	
16	1	?	0		—	
17					+	
18	2	II	0		+	+
19	2	II	0		—	
20	2	II	0	1		—
21	1	C	0	1		
22						
23	1	I	0	0	—	+
24	1	I	0	1	+	+
25	1	I			+	
26	1		0	1	—	—
27	1		0		—	
28	1	I	2		+	—
29	0					
30	0		0	1	+	
31	2	II	0	1	+	—
32	1	I	0	1	+	—
33	0		0		+	
34	0		0		—	—
35	1	I			+	+
36	2		0	1	—	
37	1			1	+	+
38	1				+	+
39	2		0		+	
40	0		0	1	—	—

*Straight-sided cramp-holes are indicated by the symbol I, curved-sided by C. Where there is no symbol, the hole was too damaged to tell.

NOTE: Only presences or definite absences are detailed here. Blank entries indicate that damage to the stone prevented certainty.

Fig. 98. Roman Riverside Wall: Construction holes in the carved blocks.

plotted in two further tables (Figs. 99 and 100). It had been hoped that analysis of variations in the size of the cramp-holes might have enabled the work of different gangs of masons to be identified. Although this hope cannot be said to have been fulfilled, a number of conclusions can be drawn from the information.

Almost all the complete stones had lewis-holes. These varied in length between 80 and 100mm, and in width between 20 and 25mm. The variations do not correlate with the groups into which the material falls.

Some of the stones in the second and third groups of the Arch (the niched figures and the attic busts), one of the two cornices with acanthus decoration (No. 35) and Nos. 37 and 38 had small holes 30-40mm square and 40-70mm deep. In a column such holes carried dowels of wood or metal to peg the column together during construction until it was held fast by the weight of masonry above. That can hardly have been the case here where none of the blocks, and in particular No. 23, which sat on top of No. 24, had corresponding holes in the bottom. They were probably pry-holes, for the insertion of the tip of a crowbar used to lever the blocks into position.

The dove-tail cramp holes are either curved or, more commonly, straight-sided. The curved-sided ones appear only among the group of the niched figures from the Monumental Arch (Nos. 7-22), and here perhaps one may see the preference of an individual craftsman. The lengths of the holes as they appear on the stone (Fig. 99) range from 100 to 185mm and, with the exception of a larger group of ten which are 150mm long, are evenly distributed within that range. One can infer that the cramps showed little uniformity of size, though it should be remembered that in many cases rather more of the complete cramp-hole

Length (mm)	ARCH			SCREEN	OTHERS	Total number
	Archway	Pilasters	Frieze			
190						0
185	5					1
180						0
175		7, 8, 12, 19				4
170		13	24		37	3
165	4	21	26			3
160	5	11, 14				3
155		10		31		2
150	2, 3, 4, 5	7, 10, 13, 15, 18, 20				10
145			23		36	2
140	3, 5	8, 19		32		5
135		14	27	31		3
130		12		31	36, 39	4
125		18, 20				2
120		11	25			2
115						0
110	6				35	2
105						0
100					39	1

NOTE: The length plotted is that between the widest and narrowest points of complete cramp-holes.

Fig. 99. Roman Riverside Wall: Lengths of dove-tail crampholes in the carved blocks.

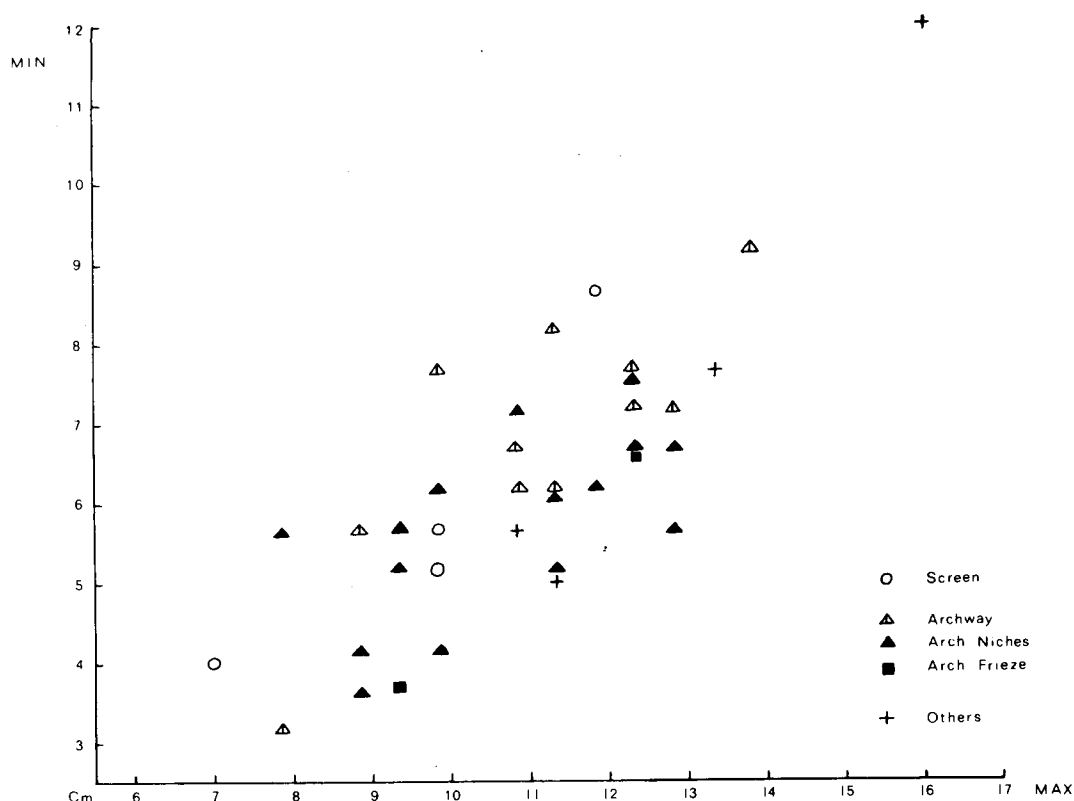


Fig. 100. Roman Riverside Wall: Widths of dove-tail crampholes in the carved blocks at their widest and narrowest points.

may have been cut on one block than on its neighbour. The widths at the widest and narrowest points of the holes have also been plotted (Fig. 100). The linear clustering makes the obvious point that the wider a hole was at one end, the wider it tended to be at the other, i.e. that there was little variation in the shape of the cramp, whatever its size. It also shows that the work of those who built the Screen of Gods cannot be distinguished on this ground from that on the Monumental Arch; the Screen's cramp-holes are scattered throughout the range. Those of the archway, however, do tend to be broader than the rest, as well as being deeper, suggesting that stronger ties were used.

The presence of the bar-cramps presents something of a problem. With the exceptions of No. 28, where they tied the engaged columns or pilasters to the end of the screen, and No. 1, where they were probably needed on a stone at a high point of the archway, they invariably appear on the underside of the stones. If they were all secondary, and derived from the re-use of the blocks in the Riverside Wall, it seems a remarkable coincidence that the stones should all have been used upside-down. Nor, except in the case of No. 37, where the hole is in the front of the stone, are they other than at the back or sides. It would be at variance with what we know of Roman building practice to argue that the courses were tied at both top and bottom, though the practical difficulty of lowering stones with prepared holes down on top of the upturned cramps without displacing or damaging them could be overcome with care.

One cannot quite see, however, why such a course should have been either desirable or effective.

The course heights of both monuments vary between 0.23 and 0.40m below attic level on the Arch, and between 0.31 and 0.46m on the Screen. The voussoirs of the Arch are of varying dimensions, not a uniformly cut set. They differ also from one another in the treatment of the wider ends, which were cut at various angles to tie in with the adjoining courses, the adjacent stones of which often carried the outer bands of the ornament. Clearly, the decorative carving on the Arch was all executed after it had been constructed, and other features indicate that almost all the detailed work was done with the blocks built into position. The irregularity of the coursing suggests that the blocks were being dressed to shape as they were required in the construction, and had previously only been roughed out, and not precisely cut to uniform heights. The discrepancies in the widths of the different pilasters and niches also indicates that these features were not laid out until construction was well advanced; the relatively shallow relief of the ornament, not requiring the removal of large quantities of stone, supports this suggestion.

The preliminary dressing of the stones was done with a heavy mason's point, and the backs of most of those which were decorated on only one side were left without further attention, showing the characteristic furrows where the tool has been driven across the stone, or had the ridges removed by an adze (Plate 54). Where the sides had to fit closely with the blocks next to them, more care had to be taken. In the case of the Screen of Gods, the whole of each side was chiselled (Plate 55, No. 28), except in No. 31, where the preliminary point-work had taken too much out of the centre of the side. In the case of the Monumental Arch it was normal for the sides to be hollowed out, usually with an adze, though in Nos. 5, 13 and 26 the marks of the point may be seen. There was close fitting at the front edge only, where a vertical strip 100-200mm wide was carefully dressed with a drove (broad chisel). This classical technique of anathyrosis is observable in Nos. 5, 6, 7, 10, 13, 15, 18, 21, 23 and 26 of the Arch and on Nos. 35, 36, 38 and 39 of the stones not attributed to either monument, which might thus, on the basis of this technical feature, be associated with the Arch.

The tops and bottoms were dressed flat, but not always quite so smooth as the sides. Here also the Screen of Gods exhibits a difference in technique, with clear marks of the drove on top. Few of the stones from the Arch showed any clear toolmarks on top. The joints were close, and it is unlikely that mortar was used except as a thin film to assist the sliding of one block into position over another, and to even up slight irregularities.

Most of the carved decoration must have been executed with the point and the chisel. The toolmarks on the panels which flanked the niches of the Screen of Gods have been mentioned, but in general all marks must have been removed from visible surfaces by abrasion. On the backs of the niches and on the plain mouldings the marks of a rasp, used as part of the finishing process, confirm this. Traces of colouring have also been noted on a number of pieces (Nos. 10, 20, 23, 25, 27, 29 and 35). There is no evidence for the use of the claw-chisel or of the drill on any stone in the collection, except for an apparent drill-hole in an upper curl on each side of the head of the goddess on No. 23.

The geological report by Mr. F. G. Dimes on the samples taken from 33 of the blocks found during the summer of 1975 identifies two distinct groups of stone, both of them from the Lincolnshire Limestone formation. The first group, containing seven examples, was

present only among the stones from the Arch, which numbered 23 of the 33 sampled. These stones were not concentrated at any one point of the monument. One cannot identify any selection of this type of stone as against the other for the carving of particular features, nor point to the arrival of a load of the first group of stone and its incorporation into the monument at a certain stage in its construction. If, as Dimes suggests, the original sources of the two groups might be different (Weldon and Barnack), the supplies had been combined by the time that the Arch was being built. The first group does present a finer texture to the eye on close inspection, having an appreciably smaller quantity of comminuted fossil material: but, as the even quality in the carving of comparable detail shows, this difference did not make one type of stone technically preferable to the other.

9. THE RE-USE OF THE STONES

Once the reconstructions of the monuments from which the stones had come had been proposed, it was of some interest to compare the location of individual stones in the monuments with their spacing in the Riverside Wall. It was possible that this might throw light on the way in which the monuments had been demolished, and offer confirmation of the associations of different groups of stones.

During the excavations and observations eight Areas were designated (see Fig. 3). In some cases it was possible to record the precise order in which the individual stones appeared. In others, where observations of the contractors' work were being made, time and working conditions meant that a number of stones was extracted as a group, and their relative positions in each group could not be ascertained. Nevertheless, the areas of observation were sufficiently discrete for this less detailed information still to be valuable.

The stones came from three of the eight Areas: II, V and VIII. One important distinction may be made immediately: no re-used stonework was employed in that part of the Wall which had timber-piled foundations (Areas I and VI). The implications of this so far as they concern the construction of the Wall have been dealt with by Charles Hill in the first part of this report.¹⁰⁸ The information is not merely negative. The Wall survived in those Areas to a sufficient height for stones to have been found, had they been employed in a similar manner to that used elsewhere on the site. The demolition of the Wall was carefully watched and no stones were discovered at any point.

This carries a further implication. The wall seen by Roach Smith¹⁰⁹ appears to have been of identical construction, with piled foundation and a chalk raft, to that observed in this sector of the site. The sector lies between the length of Wall which contained the stones which are the subject of this report, and Roach Smith's stretch, where he also observed large carved stones. The intervening sector in which no stone blocks were used suggests that those seen by Roach Smith, which no longer survive, came from different sources than the monuments considered above. One might also suggest that as the two stretches of Wall, although having different foundations, were almost certainly contemporary, the buildings demolished to furnish material for the western sector were more likely to have stood some way to the west than to the east of the site, and that if other stones from the monuments are still to be found, it is to the west, under the Mermaid Theatre, that they are to be expected.

Proceeding westwards from the Areas just considered, one observes that the stones found in Areas V and II form one sequence. They were used in the rear face of the Wall, apparently as an offset course, at a height of about five metres above the bottom of the foundations. In

these Areas the sequence of stones was recorded as they were uncovered. This was as follows (starting at the east):

<i>Number</i>	<i>Monument</i>	<i>Identification</i>
24	Arch	Frieze, with Apollo
8	Arch	Hercules' pedestal
—	—	Altar
2	Arch	Voussoir
34	—	Mother Goddesses
—	—	Altar
17	Arch	Staff of unidentified deity
12	Arch	Minerva's helmet
38	—	Chamfered block
5	Arch	Voussoir
22	Arch	Guilloche moulding below frieze
4	Arch	Voussoir
—	—	Undecorated block (not published)
9	Arch	Pedestal of unidentified deity

Areas III and VII did not produce any re-used material. It is by no means impossible, however, that the Wall at these points could have contained such blocks, either in the front face (which was eroded away) or at the rear. Had they been used high up in the rear face, as they were in Areas II and V, they would not have survived; had they been used lower down (as in Area VIII) they would not have been visible in the part of the Wall that was uncovered in Area III, though they were not re-used in this manner in Area VII.

Area VIII produced two groups of stones. Group A was extracted by the contractors without leisure for detailed recording. The use of the stones, and their position relative to a double tile course which is a feature of the Wall in this Area, were observed, however, to be identical to those of group B. The latter were recorded in more detail. The blocks were used in the rear face of the Wall, as part of the foundations. At the north end there was only one course of stones, elsewhere there were two or three courses superimposed. A double course of tiles was laid a little higher up the Wall, which survived to a maximum height of 1.90m in this stretch. It is not therefore possible to say whether blocks were also used as an offset course higher up the Wall, as in Areas II and V, or in the front face, which had been eroded away. The stones in these groups were as follows:

GROUP A

Arch	3, 6 (archway) 10, 11, 13, 15, 18, 20, 21 (parts of niched figures, including torso of Hercules, waist of Minerva, head of Abundantia in roundel, and the guilloche course) 23, 25 (frieze — head of Venus, Cupid)
Screen	28, 29, 30, 31, 32, 33 (<i>i.e.</i> all the surviving pieces)
Others	35 (cornice), 40 (chamfered block)

GROUP B

Arch	7 (pedestal of niched figure), 14, 16 (shoulder and club of Hercules) 26, 27 (busts from frieze)
Others	36 (cornice), 39 (chamfered block).

The following points may be made:

1. Stones from the Arch appeared throughout the length of the Wall, other than in that part of it with timber pile foundations.

CONCORDANCE

Block No. *Fig. No.* *Plate No.*

THE ARCH

1	58	18, 19
2	59	20, 21
3	60	—
4	61	—
5	62	22, 23
6	63	—
7	64	24
8	65	—
9	66	25
10 }	67	26, 34
11 }		
12	68	27
13	69	28
14	70	29, 30
15	71	31, 32, 33
16	72	34
17	73	35
18	74	—
19	75	36
20	76	—
21	77	—
22	78	—
23	79	37
24	80	38
25	81	39, 40
26	82	41
27	83	42

THE SCREEN

28	86, 87	43, 44, 45, 55
29	88	46, 47
30	88	—
31	89	48
32	90	49
33	91	—

MISCELLANEOUS

34	93	50, 51, 52
35	94	53
36	95	—
37	96	—
38	—	—
39	—	—
40	—	—

2. Stones from the Screen were found only in Group A in Area VIII. Their absence from Group B and from Areas II and V suggests that all the stones from the Screen were brought to the site and incorporated into the Wall together. That the stones came from all parts of the monument implies that those now preserved had been taken by the Wall builders from the entire set, available for them to use, rather than that only parts of it had been carted to the site. Had the latter been the case one would have expected a selection in favour of stones all from one end or all from adjacent courses to be apparent. The other stones were therefore probably built into those parts of the Wall adjoining Group A which no longer survived at the time of excavation.

3. Of the stones not assignable with certainty to either monument, four were found close together at the west end of Area V, namely 34 (the Mother Goddesses), the altars, and 37, the block with the moulded panels which may have been a statue base. This suggests that they may all have been brought in together from the same religious precinct. The cornices (35, 36) and the chamfered blocks (38, 39, 40) were interspersed among the stones from the Arch along the whole length of the Wall, and are thus not unlikely to have come from the same monument.

4. The distribution of the stones from the Arch does not fall into any pattern which suggests the order in which it was demolished. Those from Areas II and V include stones from top and bottom and from both ends and both sides, as well as the voussoirs of the archway. The same is true of those from Groups A and B in Area VIII. The activities of demolition of the Arch and construction of the Wall must have been carried out in such a way that stones from different parts of the Arch became thoroughly mixed up. Presumably many cartloads were brought to the building site and stockpiled, and stones from those heaps were taken and incorporated into the Wall where required. There is nothing to suggest that the site of the Arch was close enough to that of the Wall for the stones from the parts being demolished to be taken directly to where they were immediately required for building: their distribution is much too haphazard.

Nor can anything be inferred from this evidence about the order of demolition, nor whether the Wall was being constructed from west to east or vice versa. One might, however, infer that the Arch was still largely intact, rather than partially in ruins, at the time its stones were required for the Wall. Had many of the upper stones fallen, they had not been removed for use elsewhere or cleared out of the way, as might have been expected. Furthermore, certain stones found in association in the Wall, such as Nos. 6, 10, 11, 21 and 23, all from the upper part of one end of the Arch (Area VIII, Group A) or 2, 4 and 5, from the archway (Area V) were formerly close enough together in the Arch to suggest that they were removed from it together, and deliberately. Similarly, the relatively unweathered condition of the stones, particularly on those faces that were concealed within the monument, or the Wall, implies that they had not been lying fallen and exposed to the elements for any appreciable time.

(c) THE FOUR MOTHER GODDESSES FROM THE ROMAN RIVERSIDE WALL:
COMMENTS ON THE DRESS

BY J. P. WILD

Following Mr. T. Blagg, the figures are referred to from left to right by the letters A-D (Block 34, Plate 50, Fig. 93).

All four women wear an ankle-length *bodice* which falls in ample folds around their feet. It might have long sleeves; but in each case most of the upper part of it is concealed beneath other clothing. Over the bodice is worn an *overtunic* which hangs in a slightly different way on each figure. Figure B probably shows it to best advantage; there is a suggestion that it has full, short sleeves. Another possible interpretation of this garment, which covers the knees of all the figures, is that it is a rectangular cloak draped over the knee to carry the offerings which the figures hold in their laps; but to interpret it as an overtunic is on balance more satisfactory. Each figure has a rectangular *towel* (*mappa*) draped either over the left shoulder (C) or arm (A, D) or knee (B, C, D). Figure B has on her head what is almost certainly a loose-fitting *bonnet*, while the other ladies leave their coiffure visible.

Apart from the bonnet, the clothing shown by the sculptor on this relief is so lacking in features that it can be readily paralleled in both provincial and metropolitan fashion.¹¹⁰ But the same could be said of virtually all representations of deities in Roman Britain. There is nothing to compare with the local costume worn by Nehalennia or the Ubian *matronae* of the Rhineland.¹¹¹ Nevertheless, the bonnet of figure B indicates that the artist may have had these Rhenish traditions in mind. I know of no other definite representation of a bonnet in Roman Britain; but it can be paralleled in the 1st century funerary art of the Rhineland and on the later reliefs depicting the Mother Goddesses of that region. The bonnet was clearly an item of pre-Roman and early Roman fashion, which put up a stout resistance to the vogue for copying the hairstyles of the imperial court.

In many cases in the Rhineland a distinction is made on the same relief between figures with and without a bonnet.¹¹² Various interpretations have been advanced for this; but the figure(s) in a bonnet usually seems to be the senior member of the group. The same contrast can perhaps be seen on a matronal relief from Cirencester. With hindsight, the right-hand figure may now be seen to be wearing a bonnet.¹¹³

(d) A NOTE ON THE ANVIL AND TONGS SHOWN ON THE VULCAN RELIEF FROM LONDON

BY W. H. MANNING

(Block 32, Plate 49, Fig. 90)

Although a hammer, tongs and anvil are the normal attributes of both Vulcan and his celtic counterpart,¹¹⁴ the form of anvil shown in this relief is sufficiently exceptional to deserve some comment. The commonest form of anvil used in the Roman period, and the form which usually appears in the paintings and the sculpture of the period, was basically a rectangular iron block which splayed out slightly from its base to the working face. In use, it either stood on or in the anvil block, which will usually have taken the form of a solid block of wood, as in this relief. Those which rested on the block commonly had a dished base which effectively formed four small feet, one at each corner. It is a type which has been found in large numbers at Pompeii and which was probably in common use throughout the Mediterranean world at this time. The alternative form has a longer, tapering stem which was set in the anvil block, and this is the type normally found in Britain, while other examples are known from both France and Germany. A list of examples is given in the discussion of an anvil found at Hasholme, East Riding of Yorkshire.¹¹⁵ It is this type of anvil which appears in the two existing reliefs from Britain showing the smith and his tools; the funerary monument from York,¹¹⁶ and the pottery appliqué from Corbridge.¹¹⁷

The London relief differs markedly from these, and from the majority of Continental reliefs, in showing a much rarer variety of anvil and one more closely akin that used by the modern blacksmith. It has a strong, tapering stem which is placed in the anvil block. The anvil head is set at a marked angle to the stem, and consists of two parts, a conical beak (seen facing the smith in the relief) opposed by a flat, wedge-shaped working face. This form of anvil is extremely rare in archaeological contexts, and only one dated example is known from Britain, that found in 1890 in a hoard of ironwork at Silchester, Hants., and probably deposited in the second half of the 4th century A.D.¹¹⁸ Another example is known from a hoard of ironwork found at Heidenburg in Germany.¹¹⁹ It is noticeable that the Silchester anvil (although not apparently that from Heidenburg) also has its stem set at an angle to the face, as in the relief. The appearance of an anvil of this form on a scene which can be dated to the late 2nd or early 3rd century A.D. is of considerable interest, for it indicates that this form of anvil was in use at least a century and a half before the first actual example appears in the archaeological record.

If the anvil was unusual the tongs were clearly not. Although only a fragment remains it is sufficient to show that they had had bowed jaws ending in elongated, parallel gripping faces; the commonest of all long types, and the form which usually appears in ancient sculpture.

(e) THE INSCRIBED ALTARS

BY MARK HASSALL

The two inscribed altars are noteworthy additions to the finds of epigraphic material so far made in the City; the second, with its mention of a previously unattested governor or acting governor being particularly important. Like the architectural fragments with which they were found they had been cut from coarse oolitic Lincolnshire Limestone (Petrological Report, p. 199). When recovered, both inscriptions were partially covered with a lime incrustation which, though soft, made both cleaning and subsequent interpretation difficult since it was both physically and chemically similar to the surface of the stone beneath. Nevertheless, the readings as now established are relatively secure.¹²⁰

1. Lower two thirds of an altar 0.5m wide by 0.93m high by 0.34m deep (Pl. 56). The text,¹²¹ which is somewhat crudely cut without word divisions, was inscribed between setting out lines scored across the die. It reads:

1 . . .] M
 . . .] VETVS
 TATECONLABSVM
 AQVILINVS AVG.
 5 LIBETMERCATOR
 ETAVDAXETGRÆC.
 RESTITVER

In line 1 several restorations are possible: among them

- (a) D.I.M. for *D(eo) I(nvicto) M(ithrae)*, "to the unconquered God Mithras," or
- (b) M.D.M. for *M(atri) D(eum) M(agnae)*, "to the great mother of the gods", the title given to the goddess Cybele, or
- (c) I.O.M. for *I(ovi) O(ptimo) M(aximo)*, "to Jupiter best and greatest". The last is much the most frequently found.

However, it should be noted that there is a diagonal chisel cut preceding the M which, if it is not due to accidental damage, could be part of a leaf stop (it is too shallow to be the second stroke of the letter

A), occupying the centre of the line. If this were correct it would imply that there were only two letters on this, the first surviving line, one on each side of the stop, the first word of the formula being written out in full in the preceding line as:

(d) [I] [DEO] M (e) [D] [MATRI] M (f) [O] [IOVI] M or (g) [D] [ISIDI] M

Of the four (d) and (e) would be more usual than (f), while (g), for *Isidi deae magnae*, though hard to parallel, would fit in well with the second inscription discussed below. Since the presence of the leaf stop is on the whole doubtful, we have preferred restoration (c) here.

In line 2 a masculine or neuter noun in the accusative agreeing with the phrase *vetustate conlabsum* that follows, and the object of the verb *restituerunt* in the last line, is needed. While there are several possibilities, the word *templum* would fit both the required sense and the space available.

With words and names abbreviated on the stone duly expanded and restorations included, the text now reads:

*I(ovi) O(ptimo)] M(aximo) | [templum] vetus|[t]ate conlabsum | Aquilinus Aug(usti) | lib(ertus)
et Mercator | et Audax et Graec(us) | restituerunt).*

‘Aquilinus the emperor’s freedman and Mercator and Audax and Graecus restored this temple which had fallen down through old age for (or to) Jupiter best and greatest’

The spelling *conlabsum* in line 3 for *collapsum* can be paralleled by an inscription from Netherby (RIB 979). In both cases, the uncontracted *nl* and the incorrect *b* for *p* may be ‘hypercorrections’ on the part of someone anxious that colloquial pronunciations should not be reflected in his spelling.

The real interest of the inscription, however, lies in its mention of an imperial freedmen. The imperial bureaucracy made extensive use of slaves, and the ablest of these were regularly rewarded by grants of freedom, often while still remaining in the imperial service. Despite their servile origin, they might be men of wealth and influence, their past experience making them particularly effective in the world of commerce. The presence of imperial freedman elsewhere in the province is occasionally attested, for example, from near Bath (RIB 179) and at York (RIB 643), although perhaps surprisingly none has previously been recorded from Roman London. Aquilinus can probably be regarded as representative of a class of man that will have been met with not uncommonly in the provincial capital. Here he is named first of three associates, perhaps junior business partners or colleagues in the imperial service, in the restoration of a shrine or temple. That the text of the inscription was set out on an altar is itself slightly unusual, such ‘building records’ normally being inscribed on the architrave of the building being built or rebuilt, or on a plaque set into the wall often above the doorway. However, where, as here, the building in question was dedicated to a deity, the ‘building inscription’ could, quite appropriately, be inscribed upon an altar (compare, for example, the inscription also on an altar recording the rebuilding of a temple at Rudchester, RIB 1396).

2. Altar broken diagonally in half, originally 0.60m wide by 1.22m high by 0.43m deep (Plate 57). Some of the letters still preserve traces of red colouring.¹²² The text, of which the first line had been cut on the abacus, reads:

1 IN H D D
M MARTIAN
NIVS PVLCH
ER V F LEG

5 AVGG▼PRO
 PRÆT▶TEPLM
 ISIDIS▼C . . .
 TIS VETVSTATE
 COLLABSVM
 10 RESTITVI PRÆ
 CEPIT

Lines 2 to 4 give the three names (*tria nomina*) of the dedicator, M. Martiannius Pulcher. His *nomen* (family name) Martiannius cannot be paralleled and J. R. Martindale has suggested that he bore not three, but five names: M. Mar (?) Ti Annus Pulcher.¹²³ On the whole, however, it is simpler to take the name as a mistake for Martianus with a single N, a *nomen* formed from the well-attested *cognomen* (additional given name) Martianus. The practice of forming *nomina* ending in *ius* from *cognomina* is well-attested on inscriptions from the Rhineland and Britain.

In lines 4 to 6 the exact rank and status of the dedicator also presents problems. The title *legatus Augusti* (or as here *Augustorum*) *pro praetore* is the regular one for the governor who was, technically, legate of the emperor(s) with pro-praetorian rank. Imperial legates were, without exception, senators who bore the title *Vir Clarissimus*. When this appears on inscriptions it is regularly abbreviated to the letters V.C., and this is how the two letters following Martiannius' *cognomen* Pulcher were interpreted in the original publication of the inscription. The difficulty lies, however, in taking the second letter for a C, since its angular form rather suggests an E or F (though note the angular forms of the letter G in AUGG in line 5). If the reading is in fact V.E., the normal expansion of these letters is *V(ir) E(gregius)*, a title appropriate not to senators but to equestrians. It is possible that Pulcher was really the equestrian financial official, procurator, of Britain who had taken over from the senatorial governor in the latter's absence or on his death. If this were so, the stone cutter may have omitted the letters V.A. for *vices agens* 'acting instead of' that one would expect before the title *leg. augg. pro praet.* due to their similarity to the preceding letters V.E. The third possibility, and the one preferred here, is to take the letters as V.F., standing, as Joyce Reynolds has suggested,¹²⁴ for *vices functus*, 'having served instead of', again indicating that Pulcher was deputy governor. This would avoid the necessity of assuming an error on the part of the stone cutter, although the perfect participle *functus* ought strictly to mean that Pulcher was no longer governor at the time that he gave the order for the rebuilding to begin that is recorded on the stone.¹²⁵

In line 6 the reading of the second word is not at all clear. A masculine or neuter noun in the accusative, agreeing with the phrase *vetustate collabsum* and the object of *restitui praecepit* is required. The reading TEMPL(V)M is both consistent with this and with what appears on the stone if one assumes that the first character is a ligatured TE.

Line 7: The reading ISIDIS is fairly certain although there would be room between the second I and the supposed D for an extra letter. However, some words elsewhere on the inscription do have letters generously or irregularly spaced.

Lines 7 to 8: C[. . .] TIS. Conceivably *c[um xys]tis*, 'with its porticoes', but the uncertain reading of the surviving letters makes conjecture rash.

The full text, with abbreviated words and names expanded accordingly reads:

*In b(onorem) d(omus) d(ivinae) | M(arcus) Martiannius Pulcher v(ices) f(unctus) ? leg(at)i
 Aug(ustorum) pro | praet(ore) templ(u)m Isidis C[. . .]TIS vetustate collabsum restitui
 prae | cepit.*

'In honour of the divine (i.e. imperial) house, Marcus Martiannius Pulcher, deputy (?) imperial propraetorian legate of two emperors ordered the temple of Isis . . . which had fallen down through old age, to be restored'.

A parallel for the anomalous spelling of *collabsum* with its significance has been given in discussing the first of the two altar inscriptions. Among other points of interest is the dedication, *in honorem Domus Divinae*. This formula is rarely found in Britain, though examples are known from Chichester (RIB 89) and Old Penrith (RIB 916) but it is common

in the Rhineland. Secondly there is the mention of a temple of Isis. Such a temple or shrine figures in the well-known address scratched on a flagon found across the river at Southwark: *Londinii ad fanum Isidis*, London, at the temple of Isis,¹²⁶ If the two buildings are identical, then it may have stood south of the river and outside the City proper, which may explain why it was selected for demolition when the Riverside Wall was built. On the whole, however, it is perhaps more likely that the building from which the altars came stood north of the river and in the immediate vicinity of the section of Wall in the construction of which they were re-used. But whatever the answer to this particular problem, it is the mention of a governor, hitherto unknown, that gives the inscription a special significance and it is regrettable that his exact status, whether a regular or only acting governor, is not clear. Equally uncertain is the precise period into which his tenure of office fell. It will have been under the joint rule of two emperors as is shown by the two Gs in the abbreviation of AUGG for *Augustorum duorum*, and probably in the 3rd century, since the list of governors for Britain in the 1st and 2nd centuries is almost complete, and the governors of 4th century Britain have other titles. In that case, he will have governed Britannia Superior, for at the beginning of the 3rd century Severus divided the British province into two, Britannia Superior in the south with its capital at London and Britannia Inferior in the north with its capital at York. The most likely context for his governorship would be the period A.D. 251-9 during the joint rule of Trebonianus Gallus and Valerian (251-3) or of Valerian and Gallienus (253-9). For what it is worth, the inscription then gives us a probable mid- 3rd century *terminus post quem* for the construction of London's Riverside Wall, in the building of which it was used.

To conclude, the inscriptions would appear to be similar records of rebuilding, in the one case of a temple to Jupiter, in the other a temple to Isis. As such they would have no connection with each other except in so far as they were both re-used in London's Thames-side defences. If, however, they could *both* be taken as referring to a temple to Isis (or if not Isis, some other identical deity) the two texts would appear to complement each other: in the one case, the (acting) governor is recorded as giving the order for the reconstruction of the temple which had fallen down through old age; in the second, the restoration itself is recorded under the supervision of an imperial freedman and others perhaps on the governor's staff. We have seen, however, how on the whole, it is unlikely that Isis was mentioned on the first stone. Yet even without the added interest of a connection between them, the two stones remain important individual records from Roman London.

(f) PETROLOGICAL REPORT

BY F. G. DIMES

Samples from the pieces of stonework described above were taken for identification by Mr. F. G. Dimes and Mr. M. Owen of the Geological Museum, Exhibition Road, London, S.W.7.

The specimens taken can be grouped into two distinct types:

1. Nos. 10, 11, 17, 18, 24, 25. Fine, even-grained oolitic limestone with a small amount of comminuted fossil matter. Rare complete small fossil gastropods are present.
2. Nos. 1, 2, 3, 4, 5, 6, 8, 9, 12, 13, 15, 19, 20, 21, 22, 23, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 40. A fine-grained oolith-pellet limestone with in most specimens much fragmental fossil material. Some small complete fossils, mostly gastropods, were seen. In the main, on the broken surfaces of the specimens, the ooliths had pulled out. In general the specimens are buff- to light-brown in colour. Also included in this group are the two altars discussed by Mark Hassall on p. 195.

Nos. 7, 14, 16, 26, 27, 36 and 39, discovered some months later than the others, were not sampled.

The immediate inspection of the gross characteristics suggested that the specimens are not incompatible with stone taken from the formation known as Lincolnshire Limestone.

During Inferior Oolite times (Jurassic in age) a basin of deposition ran northwards through Northamptonshire, Rutland and Lincolnshire and in this basin thick deposits were laid down. They are now seen first appearing north of Kettering and thicken rapidly northwards to reach over 100 feet between Grantham and Lincoln. Beyond Lincoln they become thinner once again and attenuate steadily towards Market Weighton. This great lens of Inferior Oolite is known as the Lincolnshire Limestone. It is by no means a homogeneous deposit either vertically or laterally.

Although the Institute of Geological Sciences recognises an 'Upper Lincolnshire Limestone' and a 'Lower Lincolnshire Limestone', this is a simplification of a much more complicated state of affairs. It is mainly from the Upper Lincolnshire Limestone that many valuable building stones have been wrought.

With the hope that any contained microfossils would indicate whether the specimens were from the Upper or the Lower Lincolnshire Limestone and an area within the outcrop of the Lincolnshire Limestone from which the blocks were taken, representative specimens were submitted to Mrs. Brenda Coleman of our Palaeontological Department.

She reports:

'Six samples were washed and examined for their microfaunal content. Two samples, 17 and 25, were barren. The remaining four samples all yielded ostracods of Lincolnshire Limestone age.

Group 1:

Sample 17 Barren.

Sample 25 Barren.

Group 2:

Sample 3 *Ammobaculites coprolithiformis*; Incertae Sedis; *Bairdia hilda*; *Cytherella fullonica*.

Sample 5 Incertae Sedis Bate 1964.

Sample 15 Ostracods and foraminifera present: *Dentalina* sp.; *A. coprolithiformis*; *Vaginulina clathrata*; *B. hilda*; *Glyptocythere* cf. *costata*; *Pleurocythere kirtlandensis*; Incertae Sedis.

Sample 28 *G.* cf. *costata*; *B. hilda*.

Incertae Sedis (Bate 1964) is a single carapace described from the uppermost part of the Millepore Oolite, Cayton Bay. *Glyptocythere* cf. *costata* has not been seen to occur lower than the highest beds of the Upper Lincolnshire Limestone as found in the Great Ponton-Ropsley area'.

No major producing quarries appear to be known in the area suggested. In an attempt to resolve the problem of a possible provenance of the specimens, a specimen from our own Collections known to be Barnack Stone and a specimen known to be Ancaster Stone (the nearest specimen locality in our Collections to the Great Ponton area) were investigated for their microfaunal content.

Mrs. Brenda Coleman reports:

'The sample of Barnack Stone yielded the richest microfauna and contained both foraminifera and ostracods. These include *Trocholina conica*, *Ammobaculites coprolithiformis*, *Dentalina oolithica* (Foraminifera), *Cytherella fullonica*, *Kinkelina triangularis*, *Glyptocythere* cf. *costata* and *Praeschuleridea subtrigona magna* (Ostracoda).

The Ancaster sample yielded very few specimens, which include *G.* cf. *costata* and *Bairdia hilda*.

It was not possible, on the basis of these two samples, to determine whether the Roman building stone came from either of these two areas. *G.* cf. *costata* is probably widely distributed in the Upper Lincolnshire Limestone and is not restricted to the very top beds as was previously

thought. The presence of foraminifera in the Barnack Stone and the submitted specimens may be indicative of deposition in a common environment but their absence at Ancaster may be due to poor preservation'.

Unfortunately, the palaeontological evidence is not conclusive. However, on the basis of the evidence presented and particularly on the basis of lithology and general appearance, we consider that the specimens listed in Group 2 above are probably of *Barnack Stone*. This stone came from the village of Barnack which lies between the rivers Welland and Nene. It is known that it was quarried from at least the Roman period until the 15th century when it seems that the stone was exhausted. It was used extensively in the great Fenland abbeys and in many great and small churches.

Specimens 17 and 25, representing those specimens listed in Group 1, were barren. From close inspection and comparison with material in our Collections we are certain that they are from the Lincolnshire Limestone. We do not know of, nor have we seen, oolitic limestone of this type coming from Barnack although this does not preclude that in the past it did so.

Comparisons with material in our Collections suggest that these specimens may well be *Weldon Stone*. This stone has a long history of use dating back in records to before 1512. In the past the stone was extensively mined in old underground workings now seen along sides of the Kettering-Stamford road south-west of Weldon itself where the present quarry is situated.

(g) THE CONTRIBUTION TO OUR KNOWLEDGE OF ROMAN LONDON

BY RALPH MERRIFIELD

The contribution made by these excavations and the studies derived from them to our knowledge of Roman London is impressive, and great credit is due to the Department of Urban Archaeology of the Museum of London for its achievement. It is due particularly to the directors of the excavations, Martin Millett and Charles Hill, for successfully accomplishing a difficult task, mostly in very unpleasant conditions. This was only the beginning of the work, however, and the new light on Roman London emanated mainly from months of patient research by Charles Hill himself and by the various experts who undertook specialised studies of the finds — notably Ruth Morgan, who, in default of adequate archaeological dating evidence, combined the scientific techniques of radio-carbon analysis and dendrochronology to date the riverside wall; Mark Hassall, who read and reconstructed the worn and fragmentary inscriptions, giving us the name of a hitherto unknown governor or acting-governor of Britannia Superior; and Tom Blagg, who brilliantly reconstructed a monumental arch and an architectural screen from the blocks of stone re-used in the wall.

What then have we learnt? Not that there was a Roman riverside wall, for that was discovered more than 130 years ago by Charles Roach Smith; our new information is that this wall was not a mere embankment, but was certainly defensive and therefore, if finished, would undoubtedly have been continuous from Blackfriars to the Tower of London, except probably at the mouth of the Walbrook. Moreover its date, assumed by Wheeler to be contemporary with the eastern bastions and later than the landward wall, mainly because of the existence of re-used material in both riverside wall and bastions,¹²⁷ is now shown by modern scientific techniques to be definitely of the 4th century — 'about A.D. 330-350 in radio-carbon terms; calibrated dates would bring the wall's construction closer to A.D.

400.' (p. 93). This dating has since received remarkable confirmation in coin evidence from another stretch of riverside wall since excavated on behalf of the Department of the Environment by Mr. G. Parnell in the Tower of London. Here a deposit dumped against the inner face of the wall, apparently just after it was built, contained late 4th century coins, including one of Valentinian II dated A.D. 388-392. Anyone who saw the astonishing freshness of the mortar pointing on the face of the wall here will have no difficulty in accepting that it was protected by the dump immediately after its construction, so that it is in effect dated by the coin as probably not earlier than A.D. 388. There now seems good reason to believe, therefore, that of the three possible occasions in the 4th century cited by Charles Hill (p. 70), the building of the riverside wall can be attributed to the last — the final effort to provide for the defences of Britain organised by Stilicho between A.D. 395 and 399.¹²⁸

If the evidence from the construction of the riverside wall throws new and dramatic light on the last years of Roman rule, the re-used blocks with which it was built give us a surprisingly vivid glimpse of London in the 3rd century — a period of which we knew little beyond the fact that the city was already provided with its imposing landward wall. This might have prepared us for some magnificence, but we hardly expected such clear evidence that part of *Londinium*, in all probability the south-western part, underwent in the Antonine period or later a transformation comparable with that of the eastern part of the city under the Flavian Emperors. The demolition of the great Flavian baths on Huggin Hill in the second half of the 2nd century¹²⁹ may well have marked the beginning since it cannot be accounted for by any major redevelopment on its own site, and is therefore likely to have been clearance for an ambitious plan involving a much wider area. The terracing of the hill-side further west on Lambeth Hill over the remains of earlier buildings¹³⁰ may have been part of the same project, perhaps resumed at a later date. The pile and chalk foundations of the revetment walls are remarkably like the foundations of the riverside wall itself, where it is built on gravel, but, as Charles Hill has shown (pp. 57-61), this building technique, combining the use of timber and chalk, had a fairly long life within the later Roman period, and might have been introduced to London quite early in the 3rd century.¹³¹ We have unfortunately no dating evidence at all for this terracing, nor any indication of the buildings that stood on it. More certainly a feature of 3rd century London are the enigmatic parallel walls on the line of Knightrider Street, of which the more northerly was at least 120m (400ft.) and probably *c.* 175m (580ft.) long.¹³²

All that can be said of their date is that they were built after the gravel pits in this area had been filled in the late 1st century, and they seem to have been in existence, perhaps after rebuilding, in the late 3rd or 4th century.¹³³ The hypothetical road continuing the line of the *via praetoria* of the early 2nd century fort, which Charles Hill suggests may have run southward to a gateway where the riverside wall makes its mysterious right-angled turn to the north at the bottom of Lambeth Hill (p. 68), would in fact have crossed the line of these walls. If this road ever existed, therefore, it can only have been constructed after their demolition. This just possible, in view of the very late date of the riverside wall. In that case, it might be suspected that the Knightrider Street walls formed part of whatever was destroyed to help build the new defences in the late 4th century.

Our knowledge of Roman London in general has been built up from a study of the plans of foundations, which survive best from the earlier periods. It is ironical that the south-western part of the city, which has yielded practically no information about the foundations and lay-

out of later Roman buildings, has now given us a clearer picture of parts of their superstructure and architecture than we have of any other Roman buildings in London. These parts consist of a monumental arch and a screen, both highly decorative and including representations of deities (Figs. 84 and 85, pp. 158, 155). The arch is dated stylistically as no earlier than the late 2nd century and more probably 3rd century, possibly Severan (p. 180), and the screen even more cautiously as 2nd to 3rd century (p. 182). There is, of course, no certainty about where they stood — even approximately — in the city, but there is at least a very strong probability that such heavy blocks of stone were re-used in a section of the riverside wall fairly near to the building or buildings from which they were obtained. If so, they would have stood in the south-west corner of the city, immediately west of the Lambeth Hill terraces and the Knightrider Street walls — the area between Godliman Street and St. Andrew's Hill, where the absence of recorded Roman structures perhaps bears witness to the completeness of their destruction and removal, even to the foundations, in the late 4th century.

Tom Blagg has suggested a temple complex as a likely context for the arch (p. 179), with interesting figurative and architectural parallels from the baths-theatre-temple complex of the Ruines de Champlieu (Aisne). The screen of gods he thinks would have been appropriate either for a temple or secular building complex. The one certainty seems to be that both are from a public building or buildings of considerable architectural pretensions. Tom Blagg very properly points out that they need not have come from the same source. Nevertheless, it seems very probable that they did, given the fact that they both undoubtedly came from a building or complex that occupied a considerable area, and if it is accepted that such massive stones were unlikely to be carried far. The choice seems to lie between a religious complex and public buildings for relaxation and entertainment, such as baths, theatres or sports arenas, any of which might be decorated with figures of gods. But these alternatives are not by any means mutually exclusive, as the Ruines de Champlieu and, nearer home the temple and theatre of Verulamium show. An interesting example of an earlier date from Italy itself is the so-called Triangular Forum at Pompeii, which contained three temples — one of Isis — a palaestra, a theatre, a smaller concert-theatre (odeon) and a gladiatorial school. Religion and entertainment were in fact closely linked, and it would not be inconsistent with our present evidence to envisage the south-western corner of the city, west of Little Trinity Lane, as mainly occupied in the 3rd century by a complex of public buildings devoted to these two functions. This might explain the curious absence of any indication of a normal street grid in this area.

We have also the evidence of the sculptured stones that do not belong to the arch or screen — the two altars with inscriptions relating to the rebuilding of a temple or temples, and the relief of the four Mother-goddesses, which presumably stood in a temple or shrine of some kind. There is again no certainty, but a very strong probability, that these also came from this adjacent quarter of the city. If so, they confirm the presence of the religious element in the district, whether they stood within the precincts of the major complex or in independent temples just outside it. It might be expected that the provincial governor or acting-governor, Martianus Pulcher, would have been concerned with rebuilding a large and important temple rather than a small one, so that it must be considered rather more than a possibility that the principal deity honoured in the precinct was Isis. If Mark Hassall is correct in the interesting suggestion, based on one of his four options for the second inscription, that the

imperial freedman Aquilinus was concerned with the same rebuilding, as an agent of the provincial government (p. 196), the degree of probability is considerably increased. There is no need to be concerned about the 1st century flagon addressed to the temple of Isis in London, found on the other side of the river. It provides no certain evidence that the temple was in Southwark, and even if it were, this was almost two centuries earlier than the date of the inscription (A.D. 251-3 or 253-9, see p. 198), and a century earlier than the earliest possible date for the building of the suggested temple complex in the south-west corner of the city. A cult that was slightly disreputable and relegated to the suburb in the reign of Nero — the approximate period of the flagon — might well have been favoured with a new and important site in the city itself in Antonine or Severan times. In the latter period, particularly, the Egyptian gods seem to have reached the height of their popularity and received the greatest official support. There is in fact an interesting parallel from Rome itself of the establishment of an Iseum in a more favoured position in the early third century. Successive temples of the cult had stood in the Campus Martius, well outside the sacred enclosure of the Servian Wall, from the reign of Caligula, but a grand new Iseum was built by Caracalla about A.D. 215 on the Quirinal, in the heart of Rome, and half at least within the ritual enclosure of the ancient city.¹³⁴

There is also no need to be disturbed by the presence of at least one, and probably two shrines dedicated to other deities in close proximity to an Iseum, or by the use of the gods of the traditional pantheon to enhance the architecture of what it is suggested might be its precinct. We need only recall the diverse deities found in the Walbrook Mithraeum to realise the all-embracing nature of 3rd century syncretism, in *Londinium* as elsewhere.

All this argument depends ultimately, of course, on the reading of one word 'ISIDIS' in the first worn rebuilding inscription, and this Mark Hassall considers to be almost certainly correct, though with some element of doubt remaining (p. 197). Even if it is not, however, there is good reason to believe that the south-western part of *Londinium* was publicly redeveloped on a large scale in Antonine or Severan times; that important religious structures were included in it, and may well have been the dominant features of the area.

As we have seen, the initial clearance of the area probably took place in the Antonine period, but the monumental arch is considered to be no earlier than the late 2nd century, and is more likely to be Severan. If so, there seem to be two alternative possibilities; the first, that ambitious architectural embellishments were added to an already existing complex in the early third century; and the second, that whatever project led to the demolition of the Huggin Hill bath-house was not immediately put into effect, and the area remained derelict until the new project, which included the arch, was carried out. Such delays after demolition are not unknown in our own day, and the rulers of Britain in the second half of the 2nd century had more pressing matters to deal with than the improvement of *Londinium*, except probably its defences. The second alternative is perhaps the more likely. There are, however, stylistic differences between the screen and the arch, suggesting either that they were produced at different times, or were produced simultaneously by different groups of sculptors, as might have happened if there were sudden pressure to complete the task.

Most striking developments in the planning and architecture of London, throughout its history, seem to have resulted from the impact of a strong personality, and in the relevant period one name comes immediately to mind. Julia Domna accompanied her husband, Septimius Severus, to Britain in A.D. 208. She was an energetic and highly intelligent

woman who had great influence over her husband; moreover, she was deeply interested in religion and philosophy. Julia seems to have passed a considerable part of A.D. 208 and 209 in the south of Britain, almost certainly in London, and it would be rather surprising if she had not left her mark there. Her native religion was that of the Syrian Baal, but she had a great interest in all religions and was strongly influenced by the syncretic theology of her age. No-one is more likely to have befriended an oriental cult in London, and no-one was in a better position to do so. She would certainly have had no difficulty in obtaining the support of Severus, who is known to have favoured the related cult of Serapis.

The great difficulty about attributing the building of the temple itself — as distinct from the monumental arch and screen of gods — to the inspiration of Julia Domna, is that it was rebuilt as early as A.D. 251-9, if we accept Mark Hassall's suggestion that the two Augusti mentioned in the inscription must be either Trebonianus Gallus and Valerian, or Valerian and Gallienus (see p. 198). We are told that the temple was rebuilt after it had 'fallen down through old age'. Could this possibly have happened in less than half a century? Certainly not if the temple was as solid a structure as the arch and screen, which were probably still standing more than a hundred years later. There is, however, a possible explanation for a combination of jerry-building and monumental masonry in the same development at the time when Severus was in Britain. The frontier defences of northern Britain had to be repaired as a matter of urgency, and this must have made heavy demands on the skilled builders of the province. It is for this reason that a Severan date is difficult to accept for the landward city wall of London, and it seems more likely that this task had already been completed when Clodius Albinus withdrew troops from Britain. Sculptors and monumental masons, unlike builders, were not required for the urgent military work, however, so that a situation can be envisaged in which architectural embellishments built of massive carved blocks were combined with structures that were superficially impressive but either badly built or constructed of less permanent materials, perhaps partly of wood.

One other interesting and significant probability is suggested by these finds. It is that *Londinium* had its own school of sculptors who, as might be expected, received influences from elsewhere, particularly the Rhineland (see p. 182), but developed their own local styles and idiosyncracies (p. 180). The latter are particularly marked in the curious relief of four mother-goddesses; and another striking example of this local originality has recently come to light in Southwark, where a remarkable figure of a hunter-god, which cannot easily be paralleled elsewhere, has been found in a late Roman well under the cathedral. Both sculptures, though not brilliant works of art, show a high degree of professional competence, so that it is difficult to accept the idea that their aberrations are due to technical errors or to a misunderstanding of the subject.

Professor Toynbee has suggested that the sculptor may have been instructed to include a figure of the donor on the right of the mother-goddess relief, as it occurs on some continental groups, but misunderstood this, and put in another seated figure in that position. It is true that the figure of the donor is sometimes made as large as the goddesses themselves, but he or she is invariably represented as standing, whereas the fourth figure on the right in the London relief is shown seated and holding an attribute; she is in fact virtually indistinguishable from the neighbouring goddess (who, Professor Toynbee suggests, has put a welcoming hand on her shoulder) and also from the goddess on the extreme left. It seems fairly certain, therefore, that the sculptor himself intended to portray another goddess at the

right end of the group. Could he possibly have made this mistake, with or without a copy-book? Representations of the three mother-goddesses must have been a familiar sight in Roman London, so it is difficult to believe that an obviously experienced sculptor could have fallen into this error. Even if he had, would his mistake have been tolerated, not only by the donor who commissioned the relief, but also by the priestesses of the cult? For there is little doubt that the relief was kept in a protected position, presumably in a sanctuary, until it was taken for use as building material late in the 4th century.

As Tom Blagg has remarked, the second figure from the left is distinguished by her more natural attitude and by her head-covering (p. 171), and John Peter Wild thinks that she stands out as the most important of the group (p. 194). It would seem likely therefore that it is this figure that is the interloper in an otherwise conventional group of three similar goddesses in the usual hieratic posture. The hand of the third goddess on the shoulder of the fourth might, therefore, equally well be interpreted as a gesture to move along, thereby making room for this dominant intruder.

If we are looking for another goddess who might have joined the conventional triad, in accordance with the syncretic tendency of the age, the most likely identification for the figure with a baby on her lap is the Gaulish *Dea Nutrix*, who would have been very familiar to any British sculptor from the imported clay figurines that represented her. This divine mother symbol has, of course, a much wider distribution than Gaul and Britain, and could be identified by the viewer with other mother-goddesses of the Mediterranean, Nile and Asia according to taste. The advanced religious thinker of the third century would no doubt have said that they were all one, and that it did not therefore matter whether you represented the Divine Mother by three figures, or one, or four. Perhaps this is the thought underlying our strange sculpture, if it is to be interpreted wholly in religious terms. It might therefore have been acceptable to the religious establishment in *Londinium* at that time, although the ordinary worshipper, accustomed to the conventional triad, probably encountered it with some feeling of shock.

Tom Blagg does not reject the suggestion that the sculptor or his patron intended the fourth figure to "represent a human rather than a divine being" (p. 171), and merely comments that if she represents the sculptor's patron in her daily dress, "she has not accepted a subordinate position." But would any patron have dared to place herself in a position of equality with the goddesses, and if she did, would such a representation have been acceptable to the temple authorities? It would not only have been blasphemous, but also politically suicidal, since even the *Domus Divina*, apart from the mad Caligula, did not claim equality with the gods during life. Only an Empress, deified according to the proper rites after her death, could hope to take her seat as a goddess among goddesses, and no other woman is likely to have been represented as doing so. The cloth head-covering, described by Dr. Wild as a bonnet, worn by this figure alone of the four, might therefore be intended to represent the veil of a deified Empress, although it is much shorter than usual, and there is no trace of a diadem.

I have suggested elsewhere¹³⁵ that the foundress of a dynasty would be the most likely Empress to be represented as a *Dea Nutrix*, and in the third century there are only two deified Empresses in this category — Julia Domna herself, who was deified about A.D. 220 by Elagabalus, since he claimed to be the son of Caracalla, and therefore her grandson; and Julia Maesa, her sister, who was deified by her own grandson, Severus Alexander, after her

death in A.D. 225. All that can be said is that the crudely depicted face is quite unlike that of Julia Domna, who is shown on coins with small, pretty features, but is rather less unlike the longer, heavier face of Julia Maesa.

No mystery would remain if only we had an inscription, but unfortunately it was never carved on the panel that was intended for it.¹³⁶ Its absence is perhaps significant, however, and may give some support to the conjecture that the relief was originally intended to have some political significance, which it may have become expedient to suppress before the work was finished. It will be noted that both the dynasties mentioned above were short-lived and ended violently. In such circumstances an elaborate compliment intended for the late Emperor would be better forgotten, but the sculpture itself, without the political gloss, need not be wasted.

NOTES AND REFERENCES

1. Nine samples from this and other stones which appeared to be painted or limewashed were examined by Dr. M. S. Tite and Miss Mavis Bimson of the British Museum Research Laboratory. In no case was it possible to obtain more than a small surface scraping, and observation under the microscope did not reveal any undoubted particles of pigment that could be separated for study. X-ray diffraction showed that the white material was calcite (CaCO_3) in seven cases and gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) in two. Both substances could represent white grounds from which the pigment has almost entirely been lost. It is also possible that the calcite derived from the stone itself. Some iron was found in most of the samples; red and yellow tints are probably due to iron oxides, but it is not clear whether they were deliberately added or were present accidentally.
2. We owe this suggestion to Mrs. Joanna Bird. For the beasts, cf. those on some of the Ostia mosaics, G. Becatti *Scavi de Ostia* iv (Rome n.d.) Pls. 124, 125, 158.
3. Instances of the representation in Britain include the polygonal base from Great Chesterford (British Museum, *Guide to the Antiquities of Roman Britain* (London 1964) Pl. XIX), a mosaic from Bramdean in Hampshire (*VCH Hampshire* i (London 1900) Fig. 18), and the serrated clasp from the Thames from the arms of which busts of these gods project (J. M. C. Toynbee *Art in Britain under the Romans* (Oxford 1964) 65 n. 4; British Museum, *op. cit.* Pl. XXIV).
4. For the locks of hair, cf. the mosaics from Frampton and Hinton St. Mary, Dorset: D. J. Smith in A. L. F. Rivet (ed.) *The Roman Villa in Britain* (London 1969) Pls. 3.28 and 29; J. M. C. Toynbee 'A New Roman Mosaic Pavement found in Dorset' *J. Roman Studies* 54 (1964) 10.
5. Espérandieu viii, 6282. References to Emile Espérandieu *Recueil Général des Bas Reliefs, Statues et Bustes de la Gaule Romaine* 14 vols. (Paris 1907 et seq.) are abbreviated in these footnotes to the author's surname and the volume number, citing the catalogue numbers of the relevant entry. References to the same author's *Recueil Général des Bas Reliefs, Statues et Bustes de la Germanie Romaine* (Paris 1931) are abbreviated to Espérandieu, *Germania*.
6. E.g. Espérandieu vii, 5549 from Brumath, with the god Medru (?), a beardless, helmeted, cloaked figure holding a spear; and vii, 5560 from Gunstett, also near Strasbourg, with a similar figure on an uninscribed stele. Cf. also a figure in the costume and pose of Attis among a group on an altar erected in Bordeaux by M. Aurelius Lunaris, Espérandieu ix, 6932.
7. For which see F. Benoît 'Le Symbolisme dans les Sanctuaires de la Gaule' *Coll. Latomus* 105 (1970) 81 ff.
8. E.g. Espérandieu v, 4040 (Arlon); vii, 5663 (Saverne); xiv, 8449 (S. Laurent-sur-Othain).
9. E.g. Espérandieu v, 3785 (Laon) and 4307 (Metz).
10. M. V. Taylor 'Roman Britain in 1935' *J. Roman Studies* 26 (1936) 263, Pl. XXVIII, 1-3; *RIB* 89.
11. As on a relief from Cirencester, *Britannia* 6 (1975) Pl. XXI (B) (bunched on the left shoulder).
12. Espérandieu viii, 6019 and *Germania* 98 (from Hedderheim) respectively.
13. *Royal Commission on Historical Monuments: London 3 (Roman London)* (London 1928) 43, 120, Pl. 12. Cf. also an example of comparable quality to this from Mandach, now in Speyer Museum, Espérandieu viii, 5975.
14. J. M. C. Toynbee (*op. cit.* in Note 3) Pl. XLV(A).
15. *Ibid.* 159, 179.
16. A group on a relief from Bordeaux shows Jupiter seated, right, with Ganymede naked, left, advancing towards him. An eagle with outspread wings stands between their heads. L. Valensi *Bordeaux Gallo-Romain* (Musée d'Art et d'Histoire de Chambéry, 1969) Pl. 42(a).
17. Espérandieu xiv, 8449.
18. For the use of this and other stonemason's tools, see T. F. C. Blagg 'Tools and techniques of the Roman Stonemason in Britain' *Britannia* 7 (1976) 152-172.
19. The impression of a moustache given by the photograph is misleading; it is merely part of the rendering of her contorted mouth.
20. E.g. on a Greek statuette seen in Rome (R. Herbig 'Wo die Eule sass, ist ungewiss' *Röm Mitteilungen* 66 (1959) 138-43 and Taf. 34), and on Roman coins apparently illustrating a bronze statue of Athena in Corinth mentioned by Pausanias (II, 3, 1) (F. W. Imhoof-Blumer and P. Gardner *Ancient Coins Illustrating Lost Masterpieces of Greek Art* (Chicago 1964) Pl. E, XCII and XCIII). I owe these references to Mr. Hector Williams.

21. Espérandieu viii, 5907 and 5919 (Godramstein) and *Germania* 101 (Hedderheim) — owl by left foot; *ibid.* 104, owl by right foot; *ibid.* 755 (Osterburken) — owl to lower left, but not actually on the ground. In Espérandieu viii, 6124 (Bingen) the owl appears at the bottom right on a relief from which the goddess has been excised but where other attributes of Minerva remain.
22. J. M. C. Toynbee in *Art in Roman Britain* (London 1962) Pl. 26, No. 27 shows a figure of Minerva from Sibson, Huntingdonshire, but what looks as though it could be the body of an owl by her left foot is apparently a small vase. The style of carving is closely comparable with the London relief.
23. For references, see above, Note 10; the identification as Victory is one which I hope to demonstrate in print elsewhere.
24. Espérandieu *Germania* 341 (Pforzheim).
25. F. Brommer *Der Gott Vulkan auf Provinzialrömischen Reliefs* (Cologne, Vienna 1973) 1-2, 17 and Abb. 1.
26. Cf. however, Miranda Green *The Religions of Civilian Roman Britain* (*British Archaeological Reports* 24 1976) 25, who refers to a statuette or relief from Duns Tew, Oxfordshire, in the Ashmolean Museum as 'a very native-looking Cotswold carving of the god or his equivalent as a local smith-god'.
27. Brommer (*op. cit.* in Note 25) No. 14 (Taf. 14); Espérandieu *Germania* 365.
28. Brommer *op. cit.*, Nos. 23 and 24 (Tafn. 22 and 23); Espérandieu *Germania* 411 and viii, 5988.
29. Brommer *op. cit.*, No. 43 (Taf 38).
30. *Ibid.*, No. 59; Espérandieu ix, 7247. The piece is listed by Brommer under Metz, where it is now thought to be; but neither Espérandieu nor he was able to gain access to it.
31. This probability is based on the argument for how the Screen is to be reconstructed, see p. 167.
32. Brommer (*op. cit.* in Note 25 above) in his table on p. 30 of thirty-three such reliefs in which Vulcan appears, notes the following occurrences: Hercules 16, Juno 10 (? 14), Minerva 10, Apollo 7, Mercury 6, others less than 6.
33. Espérandieu xiv, 8403. H. Koethe *Trierer Zeitschrift* 14 (1939) 239.
34. J. Klemenc *Rimske Izkopanine v Sempetru* (1961) Pls. 11-32; J. M. C. Toynbee *Death and Burial in the Roman World* (London 1971) Pl. 62.
35. Espérandieu *Germania* 419.
36. R. P. Wright and E. J. Phillips *Roman Inscribed and Sculptured Stones in Carlisle Museum* (Carlisle 1975) Pl. X.
37. E.g. the relief of three Genii Cucullati and a Mother from Daglingworth, Gloucestershire, J. M. C. Toynbee (*op. cit.* in Note 3) Pl. XLIV.
38. Espérandieu *Germania* 557. The altar bears a consular date, 29 December 230.
39. R. Merrifield, in J. T. Munby and M. Henig (eds.) *Roman Life and Art in Britain B.A.R.* 41 (1977) 383-6. For a criticism of Merrifield's interpretation of one of the figures as a deified empress, see J. M. C. Toynbee in *Current Archaeol.* 58 (1977) 350.
40. Espérandieu ix, 6640, 6643, 6644, 6645, 6651, 6652. See also A. Hondius-Crone *The Temple of Nebelennia at Domburg* (Amsterdam 1955).
41. J. P. Wild 'Clothing in the North-West Provinces of the Roman Empire' *Bonner Jahrbuch* 168 (1968) 166-240.
42. See Note 1.
43. K. M. Kenyon 'Roman Theatre at Verulamium, St. Alban's'; *Archaeologia* 84 (1934) 238; R. E. M. and T. V. Wheeler *Verulamium, a Belgic and Two Roman Cities* (Oxford 1936) 76 and 129; S. S. Frere 'Excavations at Verulamium, 1961' *Antiquaries Journal* 42 (1962) 153-159.
44. D. E. Strong in B. W. Cunliffe (ed.), *Excavations at the Roman Fort at Richborough*, 5 (Oxford 1968) 57 ff.
45. P. R. V. Marsden, personal communication.
46. S. S. Frere *Britannia* (London 1974) 278.
47. F. Noack *Triumph and Triumphbogen* (Vorträge der Bibl. Warburg, 5, 1928) Taf. 1.
48. L. Crema *L'architettura romana* (Turin 1959) 450.
49. *Ibid.* 556; Espérandieu v, 3681.
50. Espérandieu vii, 5288.
51. Espérandieu iii, 1757.
52. Espérandieu vii, 5290 and v, 4067.
53. Ch. J. Makaronas *The Arch of Galerius at Thessaloniki* (Thessaloniki 1970) Pls. 47 and 48.
54. J. Engemann *Jahrbuch für Antike und Christentum* 17 (1974) 147-8 and Pl. 10 (b).
55. Espérandieu v, 3834.
56. *Idem.* vii, 5865.
57. H. Klumbach *Der römische Skulpturfund von Hausen an der Zaber* (Stuttgart 1973).
58. M. W. Deonna *L'Art Romain en Suisse* (Geneva 1942) Pls. 51 and 53. We owe this reference to Professor Toynbee.
59. Ph. Filtzinger 'Die Jupitergigantensäule von Walheim' *Fundberichte aus Baden-Württemberg* 1 (1974) 437-482.
60. B. W. Cunliffe *Roman Bath* (Oxford 1969) 20-1 and Figs. 26 and 27.
61. R. Merrifield *The Roman City of London* (London 1965) 142.
62. D. E. Strong *Papers of the British School at Rome* 21 (1953) 120.
63. A. Boëthius and J. B. Ward-Perkins *Etruscan and Roman Architecture* (London 1970) 264.
64. H. Walter *La Colonne Ciselée dans la Gaule Romaine* (*Annales Littéraires de l'Université de Besançon*) (Paris 1970) 21.
65. Espérandieu vii, 5270.
66. Above, p. 177 and Note 49.
67. Espérandieu v, 3834; above, p. 178.
68. *Idem.* vi, 5021, 5089 and x, 7595. Cf. also xiv, 8355, a vousoir from the temple of Jupiter at Senlis.
69. *Idem.* vii, 5726.
70. H. Kähler *Die römischen Kapitelle des Rheingebiets* (Berlin 1939) 32.
71. Publication forthcoming.
72. B. W. Cunliffe (*op. cit.* in Note 60) Pls. XXIX-XXXV (Temple of Sulis Minerva), LI-LIV (Quadrant Monument).
73. *Ibid.* 29 ff. and Fig. 9.
74. Espérandieu vi, 4717.
75. *Idem.* viii, 5990.
76. F. Wagner *Corpus Signorum Imperii Romani Deutschland I.1* (Raetia and Noricum) (Bonn 1973) Nos. 13 and 18.
77. M. R. Hull *Roman Colchester* (Oxford 1958) 171 ff.
78. For the owl, Espérandieu ii, 1065 (Bordeaux); v, 4425 (Merten); viii, 5907 and 5919 (Godramstein), 6124 (Bingen); *Germania* 101, 104 (Hedderheim) and 755 (Osterburken). For the spear, xi 7751 (Alzey); examples within the area include vii, 5862

- and 5865 (Castel), and *Germania* 101 and 143 (Hedderheim), 341 (Pforzheim), 343 (Karlsruhe), 436 (Stocksberg) and 755 (Osterburken). 101 and 755 also have the owl at her foot.
79. Espérandieu vii, 5887 (the Mainz Jupiter column) where the shield is illustrated on p. 382; for the eagle and snakes, vi, 4921.
 80. *Op. cit.* in Note 13, Pl. 54.
 81. *E.g.* supporting one of the two busts of his ancestors carried by the well-known togate man of Augustan date in the Capitoline Museum at Rome; A. N. Zadoks-Josephus Jitta *Ancestral Portraiture in Rome* (Amsterdam 1932) Pl. 6 (a) and (b).
 82. H. Walter (*op. cit.* in Note 64) 21.
 83. H. Dragendorff and E. Krüger *Das Grabmal von Igel* (Trier 1924).
 84. *Op. cit.* in Note 13, Pls. 16, 19.
 85. J. P. Bushe-Fox *Richborough I* Report of the Research Committee of the Society of Antiquaries (Oxford 1926) 37 and Pl. X.
 86. Espérandieu xi, 7780 and ix, 6624.
 87. For examples of the original, *cf.* J. M. C. Toynbee and J. B. Ward-Perkins 'Peopled Scrolls: a Hellenistic Motif in Imperial Art' *Papers of the British School at Rome* 18 (1950) Pl. IV 3 and VII 2.
 88. Cunliffe (*op. cit.* in Note 60) No. 2.4 and Pl. LIV.
 89. J. M. C. Toynbee (*op. cit.* in Note 3) 165 and Pl. XLI.
 90. Cunliffe (*op. cit.* in Note 60) No. 2.2, Pl. LII (Quadrant Monument), and No. 1.71, those numbered 2 and 5 on the reproduction of Lysons' drawing in Pl. XLVIII.
 91. *Op. cit.* in Note 44, 57. The Facade of the Four Seasons at Bath had similar pilasters, though with five flutes; Cunliffe (*op. cit.* in Note 60) 1.34 and Pl. XXXIX.
 92. R. P. Wright and I. A. Richmond *Catalogue of the Roman Inscribed and Sculptured Stones in the Grosvenor Museum, Chester* (Chester 1955) 12-13, No. 5 and Pl. III.
 93. Cunliffe (*op. cit.* in Note 60) No. 2.1, Pl. LI.
 94. Unpublished.
 95. P. H. von Blanckenhagen *Flavische Architektur und Ihre Dekoration* (Berlin 1940) Taf. 12, Abb. 37.
 96. For an analysis of the ornament of this period, see D. E. Strong (*op. cit.* in Note 62 above) 118-151, in particular his illustrations of the cornice of the main order of the Hadrianum, Pl. XXXI (a), and the architrave of the Temple of Venus and Rome, Pl. XXXII (a).
 97. D. E. Strong (*op. cit.* in Note 44 above) 72-3 and Pls. XI (d) and XXII (g-j).
 98. *Corinium Museum, Catalogue* No. A.187. No details of provenance are recorded.
 99. Toynbee and Ward-Perkins (*op. cit.* in Note 87 above) Pls. X (1) and XXV (2).
 100. *Gallia* 32 (1974) 423 and Pl. 39.
 101. For the seams, *cf.* those on the arch from Charlottenau, Espérandieu x, 7595.
 102. Cunliffe (*op. cit.* in Note 60) Pl. XXXIV.
 103. The tombstone has recently been discussed by E. J. Phillips 'The Gravestone of M. Favonius Facilis at Colchester', *Britannia* 6 (1975) 102-5; parallels outside Britain for the decoration are cited at p. 105, n. 17.
 104. A feature employed on the lowest cyma moulding below the pediment and that of the upper cornice in the Igel monument; Dragendorff and Krüger (*op. cit.* in Note 83 above) Taf. 14-17. In Britain it is paralleled, in a slightly simpler form, on a Roman cornice re-used in the Saxon church at Brixworth; see T. F. C. Blagg 'A Decorated Roman Cornice from Brixworth, Northamptonshire' *J. Brit. Archaeol. Assoc.* 131 (1978) 110-112.
 105. Toynbee and Ward-Perkins (*op. cit.* in Note 87 above).
 106. Cunliffe (*op. cit.* in Note 60) Nos. 2.2 and 2.3 Pls. LII and LIII.
 107. Wright and Richmond (*op. cit.* in Note 92 above) Nos. 165 and 166.
 108. See above, p. 62.
 109. C. Roach Smith 'Observations on Roman Remains recently found in London' *Archaeologia* 29 (1841) 150-151.
 110. *Bonner Jahrbuch* 168 (1968) 199ff., 216ff.
 111. *Ibid.*, 210ff.
 112. *Bonner Jahrbuch* 160 (1960) 11 Nr. 2, Taf. 2, 1, 3.
 113. J. M. C. Toynbee (*op. cit.* in Note 22) Cat. No. 73, Pl. 84; *eadem* (*op. cit.* in Note 3) 172.
 114. J. Leach 'The smith God in Roman Britain' *Arch. Ael.* 40 (1962) 35-45.
 115. W. H. Manning 'An iron anvil from Hasholme, Yorks' in J. D. Hicks and J. A. Wilson 'The Romano-British kilns at Hasholme, East Riding' *East Riding Archaeologist* 2 (1975) 67-69.
 116. *Royal Commission on Historical Monuments: Eboracum* (London 1962) 128, Pl. 53, No. 96; W. H. Manning, *Catalogue of Romano-British Ironwork in the Museum of Antiquities, Newcastle upon Tyne* (Newcastle 1976) Pl. III.
 117. Leach (*op. cit.* in Note 114) Fig. 1; Manning (*op. cit.* in Note 116) Pl. IV.
 118. J. Evans 'On some iron tools and other articles formed of iron found at Silchester in the year 1890' *Archaeologia* 54 (1894) 142, Fig. 3; W. H. Manning 'Ironwork boards in Iron Age and Roman Britain' *Britannia* 3 (1972) 236.
 119. L. Lindenschmit *Die Althertümer unsere heidnischen Vorzeit* (Braunschweig 1881) Taf. 46.
 120. The inscriptions were first published in *Britannia* 7 (1976) 378-9.
 121. The following conventions have been used in printing the texts and in the expanded versions of them that follow: letters within [] are restorations, letters within () have been omitted by the stone cutter by way of abbreviation or mistake and letters within < > are superfluous. A curved superscript line above two letters shows that they have been cut as ligatures while a subscript dot indicates that the letter so marked is difficult to read. In the expanded text vertical strokes indicate line divisions. RIB = R. G. Collingwood and R. P. Wright *The Roman Inscriptions of Britain* 1 (Oxford 1965). It is cited here by item numbers.
 122. Analysis by the Research Laboratory of the British Museum showed that the colouring consisted of a calcium carbonate base with the red due possibly to some form of iron oxide. Clearly some binding agent would also have been needed.
 123. *J. Roman Studies* 66 (1976) 187.
 124. *Ibid.*
 125. Yet another possibility would be to interpret the leaf stop following the letters VE as part of an X making Pulcher an ex-governor. The V, however, would then be very difficult to explain.

126. *Op. cit.* in Note 13 above, 177; inscription No. 104, Pl. 53; *J. Roman Studies* 12 (1922) 283, No. 13.
127. *Op. cit.* in Note 13, 80ff.
128. Information kindly given by Mr. Parnell in advance of publication. Preliminary report in *London Archaeologist*, 3 (1977) 98. The subsequent discovery by Mr. Parnell of an earlier river-side wall, to the south of the wall dated by coins to the end of the 4th century, indicates that at the Tower of London a riverside wall was constructed before that date, but on pottery evidence probably after the middle of the 4th century. It might therefore be attributable to the crisis of A.D. 367, a date also within the range of error of the C14 dating of the wooden piles. It is now uncertain, therefore, to which of these phases the wall with pile and chalk foundation belongs.
129. *Trans. London Middlesex Archaeol. Soc.* 27 (1976) 22-23.
130. *Ibid.* 21 (1967) 149ff.
131. The use of chalk for footings in Londinium seems in fact to be as early as the second century. See G. Parnell, (*op. cit.* in Note 128) 97.
132. Merrifield (*op. cit.* in Note 61) Gazetteer Nos. 93-99, 100-102.
133. *Ibid.* Gazetteer Nos. 93-102.
134. F. Cumont *Oriental Religions in Roman Paganism*, (New York 1956 ed.) 84.
135. *Op. cit.* in Note 39, 385.
136. A painted inscription which might have worn off is quite unlikely in a work of this quality.

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