

THE ROMAN AND MEDIEVAL DEFENCES AND THE LATER DEVELOPMENT, OF THE INMOST WARD, TOWER OF LONDON: EXCAVATIONS 1955–77

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SUMMARY

The course of part of the prehistoric Thames was revealed together with evidence for pre-Roman occupation. During the Flavian period river incursions ceased with the reclamation of the eastern half of the site. Subsequently, during the 2nd century, three successive buildings, the later two domestic in character, were reconstructed on the reclaimed ground. In the late 2nd or early 3rd century this occupation came to an abrupt end with the raising of the City's landward defences. Though no masonry survived, the evidence for a large contemporary internal rampart suggests the wall terminated close to the site of the present Lanthorn Tower. The enceinte was closed in the mid-late 3rd century by the construction of a defensive riverside wall. During the final years of the 4th century at least part of the riverside wall was replaced by another line of defence located slightly further to the north. This remarkably late remodelling of London's defences effectively produced a salient in the south-east corner of the circuit at a point which guarded the river approach to the city; there was evidence to suggest that it might have been reached by means of a gate to the west. Dumped against the rear of the riverside wall and contemporary with its construction was a mass of soil, clay and gravel which probably represented a raising of the ground level rather than the formation of a bank. During the Saxo-Norman period much of this material was removed from the site, but after a short space of time the ground surface was raised again. The Roman riverside defences must have influenced the layout of the early Norman castle and throughout the later medieval period were modified and repaired. North of the defences successive post-medieval redevelopments had erased nearly all trace of the important medieval palace complex—the only exception being a large foundation which may be attributed to the pre-Henry III great hall. Extensive foundations belonging to the 1777–80 Ordnance office and its refurbishment and enlargement of 1789–92 were recorded. The documentary evidence for the later building phases, together with the general development of the southern area of the Inmost Ward during the 17th–19th centuries, has been examined.

INTRODUCTION

This report contains the final results of a number of excavations that have taken place within the south-east corner of the Inmost Ward (Fig. 1). Initial investigations were carried out during 1955–6 by the Ancient Monuments branch of the then Ministry of Works, in advance of a scheme (subsequently abandoned) to construct a new Jewel House for the Royal Regalia. Work began under the supervision of John Hurst, but after initial results indicated the survival of only Roman deposits, responsibility for the investigations was transferred to Sarnia Butcher. A report prepared on this work was superseded by later investigations but

the results have been included in the present report.

Between June and December 1976, under the supervision of the present author, the Department of the Environment carried out further excavations in the area prior to the construction of the new History Gallery (opened to the public in 1978). The main excavations were concentrated 6m north of the extant curtain wall and beyond most of the earlier investigations, but two additional trenches were opened to the south in an attempt to resolve some of the uncertainties surrounding a massive wall that had been encountered during the previous work. Results indicated that the structure was

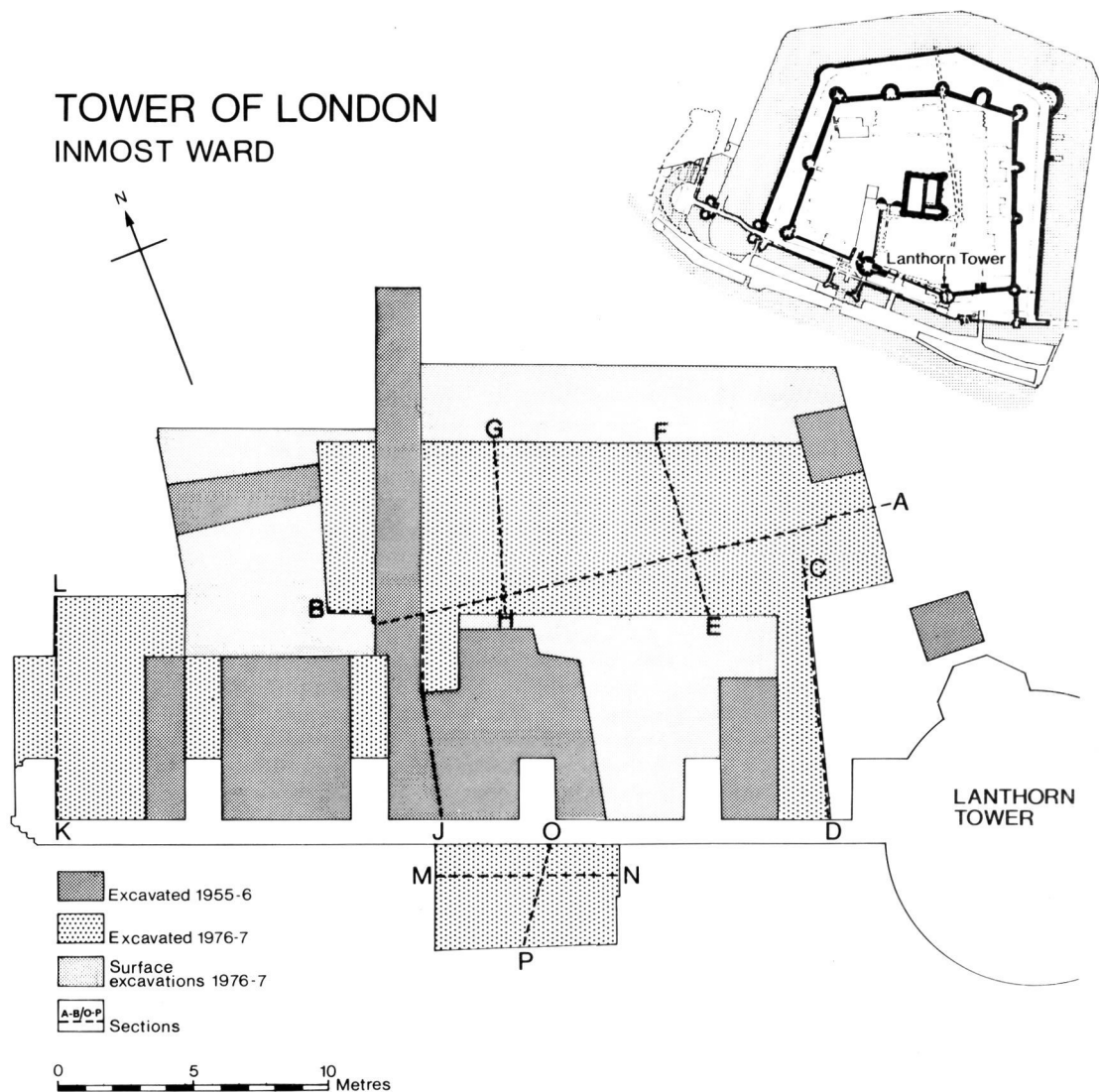


Fig. 1 Inmost Ward 1955-77: Site plan showing areas of excavation and position of sections.

in fact part of a very late 4th-century riverside defensive wall (Parnell, 1977). The remains were deemed important enough to have the History Gallery constructed further to the north than had originally been intended, in order to afford the wall a permanent display.

The remaining unexamined parts of the wall, within the planned display area, were excavated between February and

April 1977. During the following months a watching brief was maintained as work on the gallery began. Disturbances were on the whole shallow and confined to strips of ground separating the earlier excavations; information obtained from these observations is principally concerned with the post-medieval history of the site.

The final investigation sought to

explain a curious re-entrant in the line of the river wall on the west side of the Lanthorn Tower. A small-scale excavation was therefore carried out in Water Lane, on the south side of the curtain, during a six week period beginning in late October 1977 (Fig. 1). This revealed a second, and earlier, wall now identified as being contemporary with other sections of the Roman riverside defence recorded elsewhere along the city waterfront (Parnell 1978).

I. EXCAVATIONS

A. THE GEOLOGY OF THE SITE

The greater part of the site overlies the buried course of the prehistoric and early Roman river Thames. The undisturbed natural is Eocene London clay which in places is sealed by sterile orange-coloured gravel up to 50cm thick. The natural forms a slope running roughly east to west along the length of the site. In the north-east corner, where much of the deep excavation

was concentrated, prehistoric river action has eroded the bank which, at this point, is most pronounced with an angle of up to 45° (Fig. 2, Plate 1). From the top of the slope, at some 2.50m OD, the natural rises gradually northwards to the edge of the gravel terrace on which the White Tower stands, at about 9.00m OD. From the bottom of the slope at 1.00m OD, the natural extends southwards in a relatively level fashion, but 4.50m north of the standing curtain wall, is found descending again at 45° (Fig. 2). This second fall probably represents the buried Thames channel.

B. THE ARCHAEOLOGY OF THE SITE

1. METHODOLOGY

Generally speaking the depth and preservation of the archaeological deposits were determined by two principal factors: the presence of part of the 1777-80 Ordnance office, which had destroyed much of the late Roman and all of the post-Roman deposits on the eastern half of the site, and a post 1888 concrete surface which had removed the stratification of the western half down to Saxo-Norman levels. Only on the south

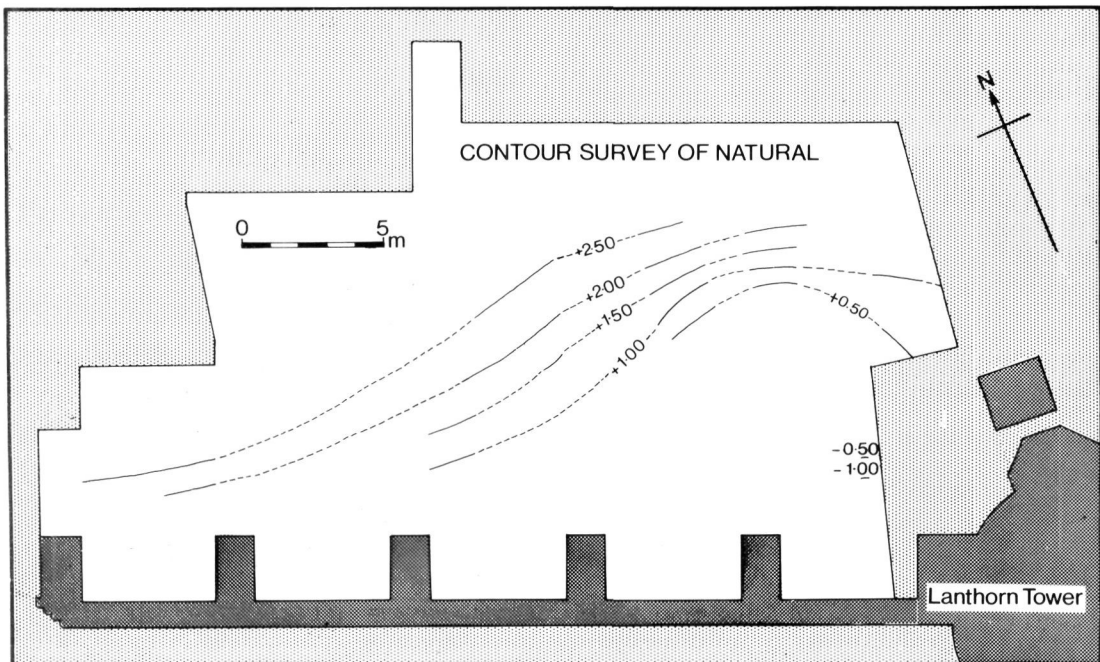


Fig. 2 Inmost Ward 1955-77: Contour survey of London Clay.



Plate 1 Inmost Ward 1976: Prehistoric river bank revealed in north-east corner of excavations (2m scale).

side of the standing curtain did later medieval strata survive.

During 1955–6 and again in 1976–7 methods of excavation were to a large extent governed by the deposition of the numerous, and substantial, 18th and 19th-century Ordnance walls which traversed much of the site (Fig. 3). A system was thus established whereby after the walls had been excavated down to their foundations, trenches were laid out in the available intervening spaces. Apart from the area around the later Roman riverside wall few of the foundations were disturbed. A notable exception was on the west side of the Lanthorn Tower where the need to interpret the internal bank of the Roman landward wall was judged important enough to have some of the masonry removed.

During the preparation of this report all excavated contexts have been categorised and renumbered. For brevity, each layer, or layers, representing a single phase is prefaced L; walls and cut features (e.g. ditches and pits) are prefaced W and F respectively.

2. PHASING

The history of the site has been arranged into the following sequence:

PREHISTORIC

- I. River silting.
- II. Iron Age activity.

ROMAN

- III. First century.
 - (a) River silting and occupation.
 - (b) Reclamation.
- IV. Second century.
 - (a) Timber foundations.
 - (b) First timber-framed building.
 - (c) Second timber-framed building.
- V. Late second/early third century. City landward defences.
- VI. Mid-late third century. First riverside defensive wall.
- VII. Late fourth century.
 - (a) Dumping.
 - (b) Second riverside defensive wall.
- VIII. Sub Roman.

MEDIEVAL

- IX. Saxo-Norman. Terracing.
- X. Late eleventh-thirteenth centuries. Alterations to Roman riverside defensive walls and early medieval 'palace' foundations.
- XI. Later medieval. Alterations and additions to Roman riverside defensive walls.

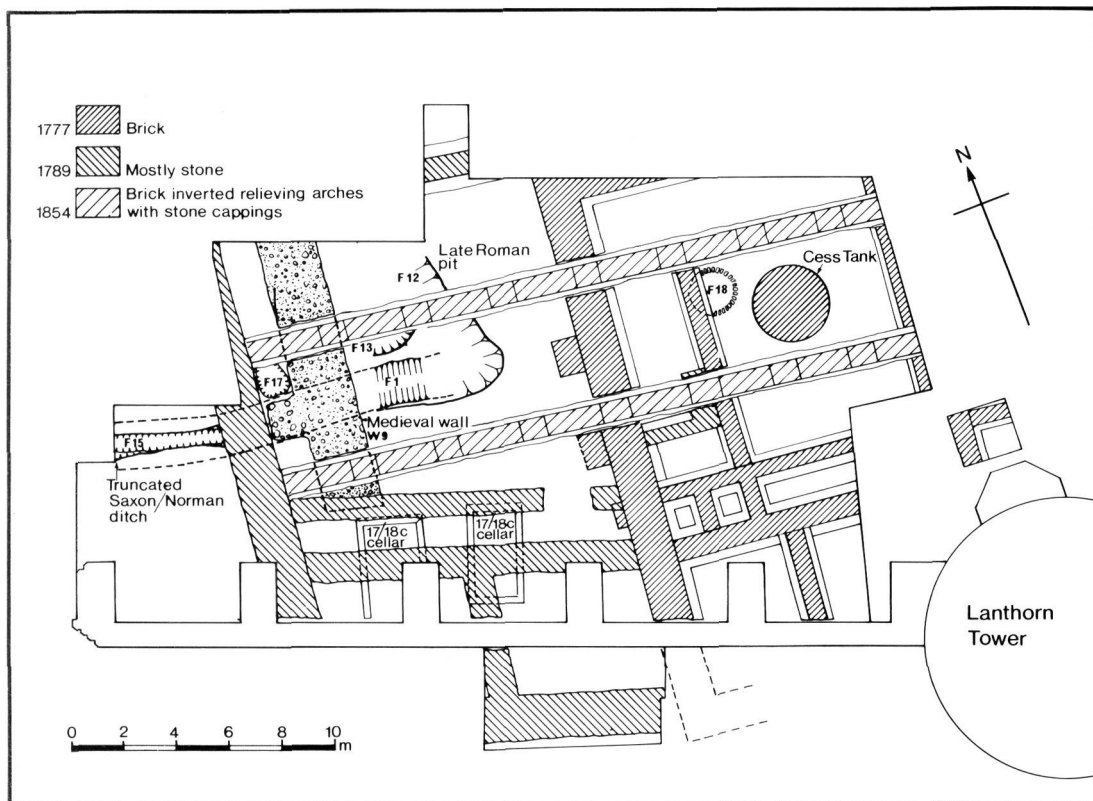


Fig. 3 Inmost Ward 1955–77: General plan of excavated features.

POST MEDIEVAL

- XII. (a) Pre-1777 features.
 (b) 1777–80 Ordnance office foundations.
 (c) 1789–92 Ordnance office foundations.
 (d) 1854 Ordnance office alterations.

PREHISTORIC:

PHASE I. RIVER SILTING

During the prehistoric period the rising river deposited fine grey sand and gravel over the natural clay (Plate 1). The silts appeared to have accumulated without any obvious interruptions and rose to a height of 1.50m OD (Fig. 5 L1). A small quantity of coarse pottery and flints, probably dating to the Iron Age, was recovered from the tops of the deposits in the north-east corner of the site at between 1.30m and 1.50m OD. Much of the material was abraded and had probably entered the river over a period of time (p. 51).

PHASE II. IRON AGE ACTIVITY

After the silting had reached its maximum the river evidently retreated to the south leaving the area dry. A large pit was then excavated in the north-east corner of the site (Fig. 4 F1). This lay partly beneath the deep foundations of an 18th-century Ordnance wall and could not therefore be fully exposed; the excavated part measured 1.50m × 2.00m, with a depth of 1.45m. The sand and gravel infill contained pottery and flints similar to the earlier assemblage from the underlying river silts (pp. 48–50).

Cutting through the southern edge of the backfilled pit was a shallow grave containing the skeleton of a young male between 13 and 16 years of age (p. 51). The body was arranged in a semi-flexed position with legs partly drawn up and pushed on one side (Fig. 4, Plate 2). The arms were outstretched with the hands originally having rested on the pelvis. The grave pit, which had been cut from a height of 1.50m OD, was only 30cm deep, barely adequate in fact to

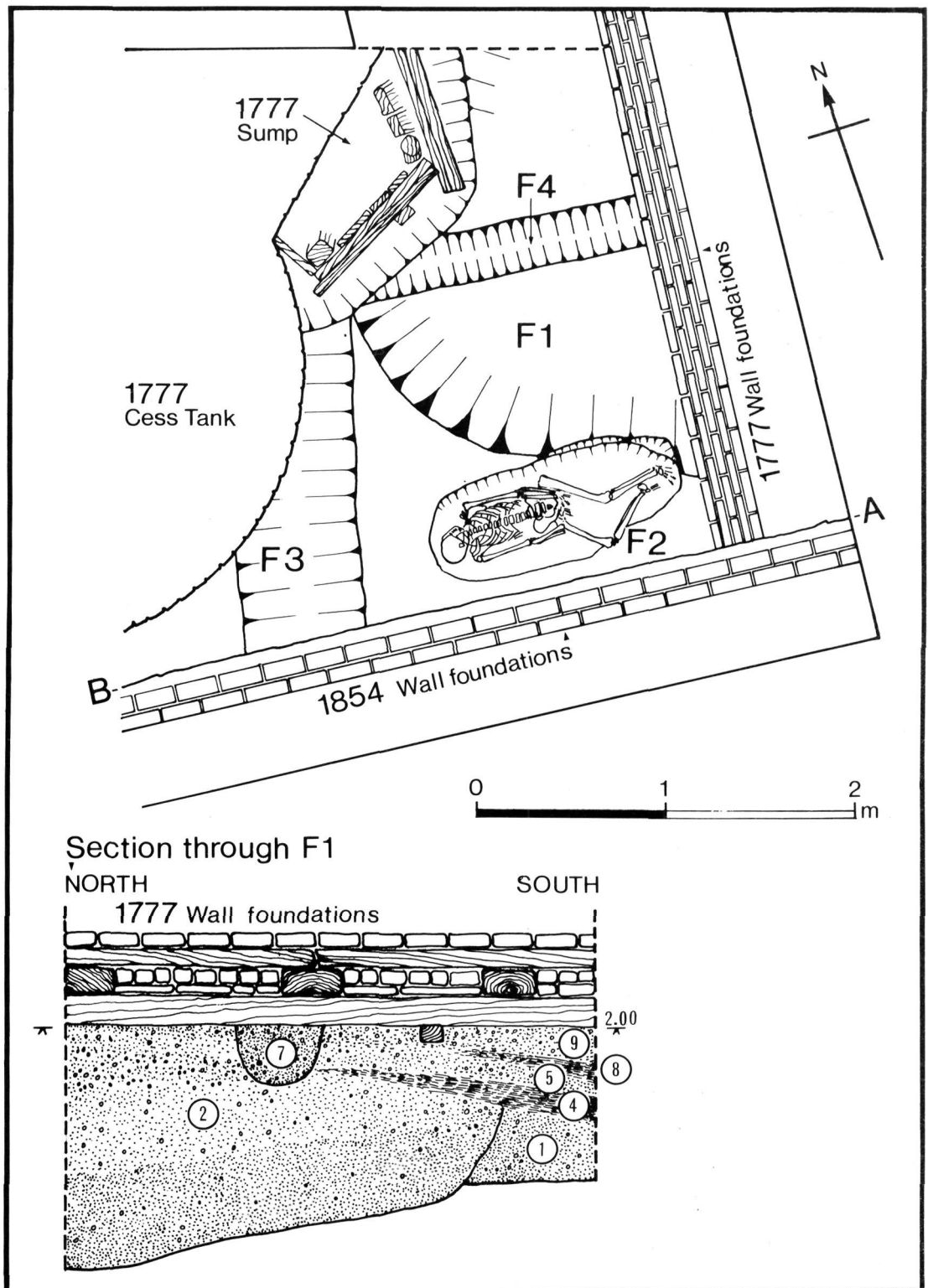


Fig. 4 Inmost Ward 1955-77: Plan of north-east corner of excavations showing Iron Age and early Roman features.

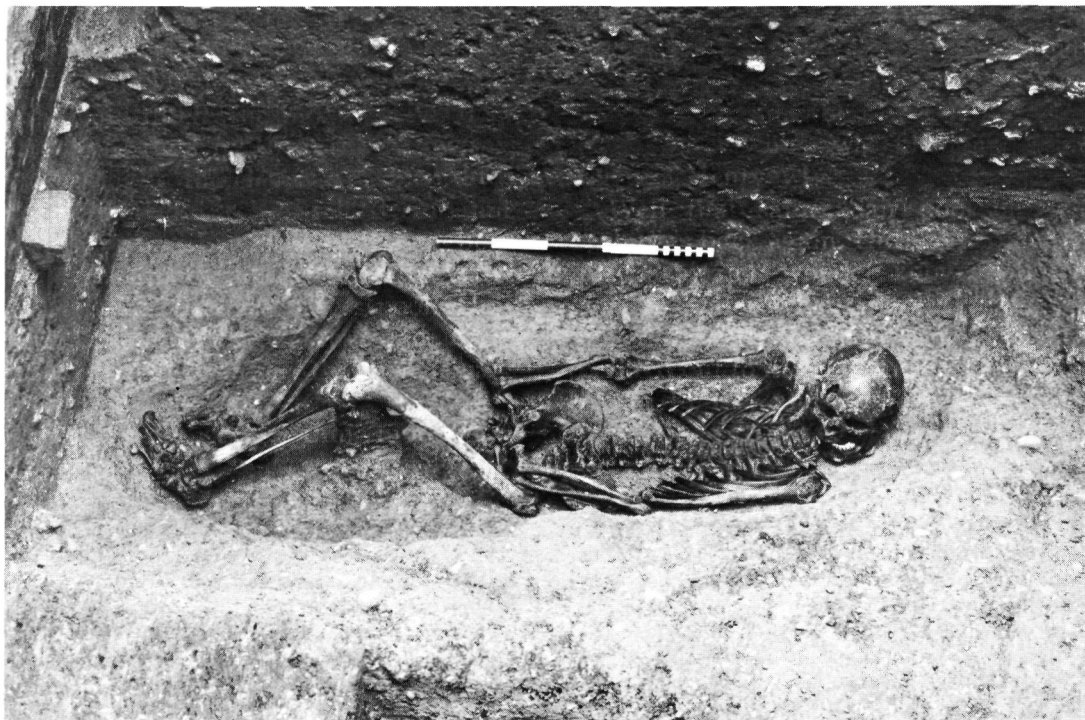


Plate 2 Inmost Ward 1976: Late Iron Age burial (50cm scale).

accommodate the body. A ring and a flint flake were found among the finger bones; unfortunately neither proved to be significant—the flint was Mesolithic in character, and therefore probably derived from the underlying river silts, while the ring exhibited no diagnostic characteristics. Radio carbon analysis of the bone indicates a date of AD 70 ± 70 years¹. Given the nature of the burial and the sequence of early Roman deposits which sealed it, a late Iron Age date seems likely.

ROMAN:

PHASE IIIa. FIRST CENTURY— RIVER SILTING AND OCCUPATION

Following the burial, the area might have experienced river erosion, as the south sides of both the grave and underlying pit showed signs of abrasion. The eastern half of the site then attracted considerable vegetation, with the area presumably representing a marsh along the margins of the river (Fig. 6 L4).

Later the river again inundated the site and deposited a layer of fine sand and gravel up to a height of 1.70m OD (Fig. 5 L5). The only item recovered from this layer was part of a human

leg bone. The incursion marked the last deposition of river silts on the site and in its wake came a resumption of activity in the north-east corner. This was represented by a small V-shaped ditch (F3) aligned north-south and a U-shaped gully (F4) running east-west; the relationship between the two had been destroyed by a post-medieval intrusion (Fig. 4). The gully was very regular and might have held a timber; the ditch was probably a drainage feature. 1st-century pottery recovered from these features represents the earliest stratified Roman material from the excavations. Further west, two pits cut into the edge of the clay bank, might also have belonged to this phase (Fig. 7 F5 & 6).

PHASE IIIb. FIRST CENTURY— RECLAMATION

Activity on the site, which might have been interrupted by further river erosion, was replaced by another phase of marsh environment evidenced by a second peat horizon (Figs 6 & 7 L8). This was sealed on the eastern half of the site by deliberate dumping which sloped from at least 2.20m OD towards the north (Figs 7 L9 and 10) to 1.40m OD towards the south (Fig. 12 L15); the fall was probably not intentional, but

the result of compression and consolidation over a period of time. It seems reasonable to suppose that the dumping was accompanied by the construction of some form of revetment or waterfront nearer to the river and beyond the limits of the excavations. Samian recovered from the sand and gravel dumps suggests a date in the late Flavian period.

PHASE IVa. SECOND CENTURY— TIMBER FOUNDATIONS

Inserted into the dumped deposits was a number of oak timbers which presumably acted as foundations for a structure, or structures, laid out over the reclaimed ground (Fig. 8). These were evidently associated with a thin, hard gravel surface (Figs. 6 & 7 L14). The timbers varied considerably in size. Some had been driven-in as piles, others were planted in pits; there was evidence for additions. One notable arrangement comprised a group of four substantial piles that had been driven into the pit until their tops were flush with the floor of the pit. Onto the piles was placed a large section of tree packed firmly into position with clay and gravel (Fig. 8 F7). Such an arrangement suggests that at least some of the timbers were intended to carry a

substantial load, though no other evidence for any superstructure survived.

Three timbers were selected for dendrochronological analysis. Two contained their full complement of sapwood (one from F7 another from F8) and results indicate that they had evidently been felled together in the winter of AD 126–7 (p. 148).

PHASE IVb. SECOND CENTURY— FIRST TIMBER-FRAMED BUILDING

During the succeeding phase occupation of the eastern part of the site, as represented by the timber foundations and gravel surface, was superseded by a timber-framed building resting on chalk sleeper walls with puddled clay floors often containing crushed chalk (Fig. 9, Phase 1). Though only the western limit of the building was exposed, it had clearly been a sizeable structure—the excavated parts measuring 15.50m east-west and 13m north-south. A corridor some 2.10m wide, its east wall marked partly by a robber trench, had evidently existed along the west side of the building. The plan of the building together with its associated painted wall plaster, sometimes of good quality, though with limited schemes, indicates that the building was

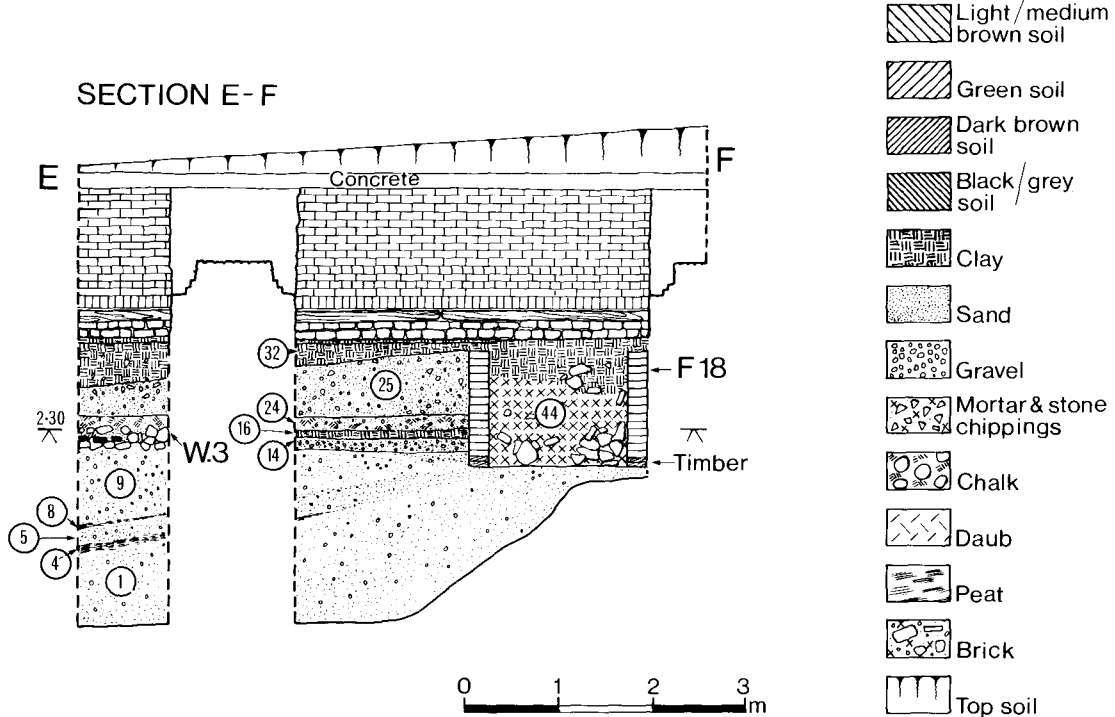
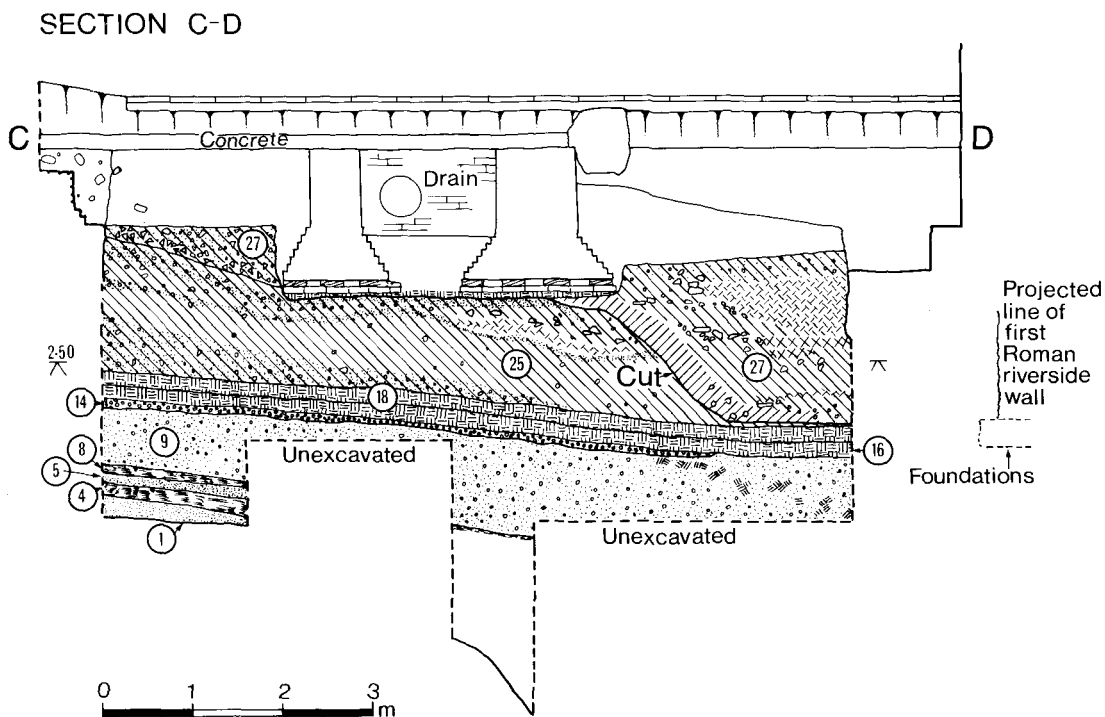


Fig. 5 Inmost Ward 1955–77: Section E–F.



of a residential nature; some repainting was evident². The destruction of the building was clearly defined by a continuous ash layer overlying the floors. Samian from the debris suggests a fire date in the early part of the period AD 160-95.

To the west of the building a thin gravel surface, showing traces of burning, suggests an associated yard. The gravel (L21) sealed some 40cm of fine grey/green sand with gravel inclusions (Fig. 7 L20). The appearance of this material was not dissimilar to the pre-Flavian river-laid silts to the east, though rising to a height of 2.70m OD, river deposition can presumably be ruled out³. Its presence, therefore, can presumably be attributed to either dumping (possibly in a very wet condition) or silting in still water. The latter might help to explain similar deposits overlying the gravel yard which evidently represent the history of this part of the site from the late 2nd century to the end of the 4th century (Fig. 7 L22).

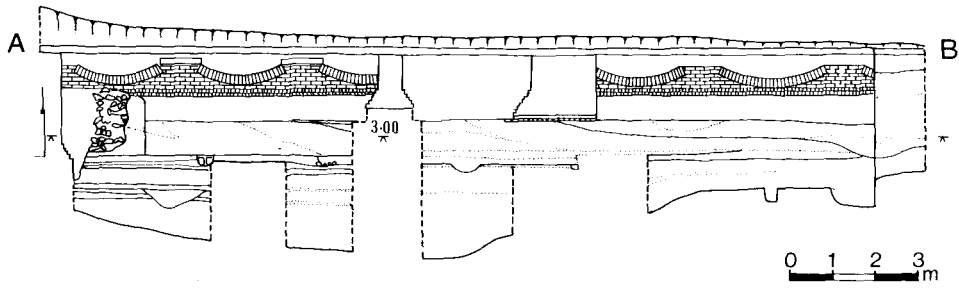
PHASE IVc. SECOND CENTURY— SECOND TIMBER-FRAMED BUILDING

Immediately after fire had destroyed the

building on the eastern half of the site a new structure was erected over its remains. The second building occupied the same north-south alignment, but lay some 5.30m further to the east (Fig. 9, Phase 2). A corridor some 2.60m wide was again incorporated along the west side, beyond which was an exterior gravelled road or yard (Fig. 7 L19). The composition of the building was much the same as its predecessor, though the sleeper for the west wall was somewhat wider and supported a row of tile fragments, which probably provided additional support for a timber base plate (Fig. 9, Plate 3). The upstanding walls were evidently composed of plastered clay.

PHASE V. LATE SECOND-EARLY THIRD CENTURY LANDWARD DEFENCES

Around AD 200 the building occupying the east end of the site was dismantled to make way for the city landward defence⁴. Masons' debris associated with the wall's construction lay directly over the floor of the building and beneath the wall's internal rampart. Apart from some clay and flint foundations 2m north of the Lanthorn Tower nothing of the wall itself



SECTION A-B

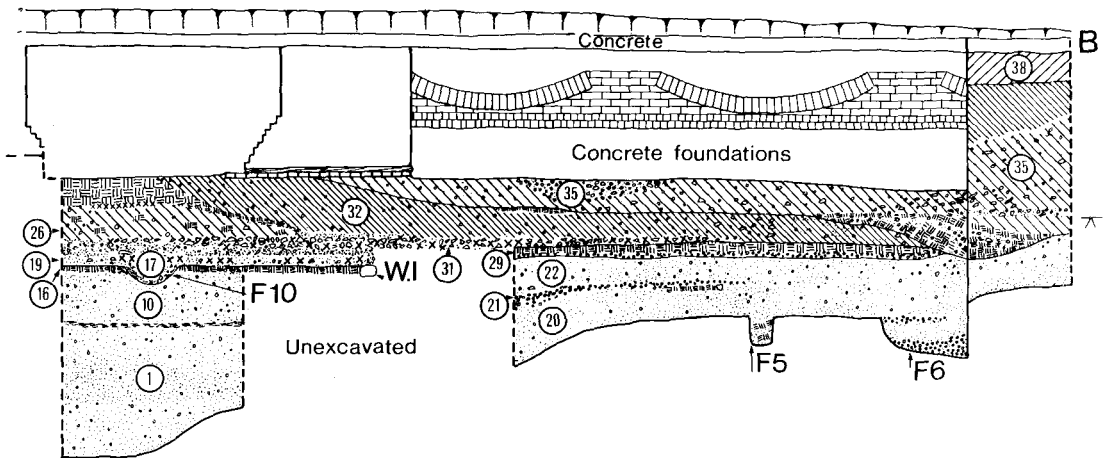
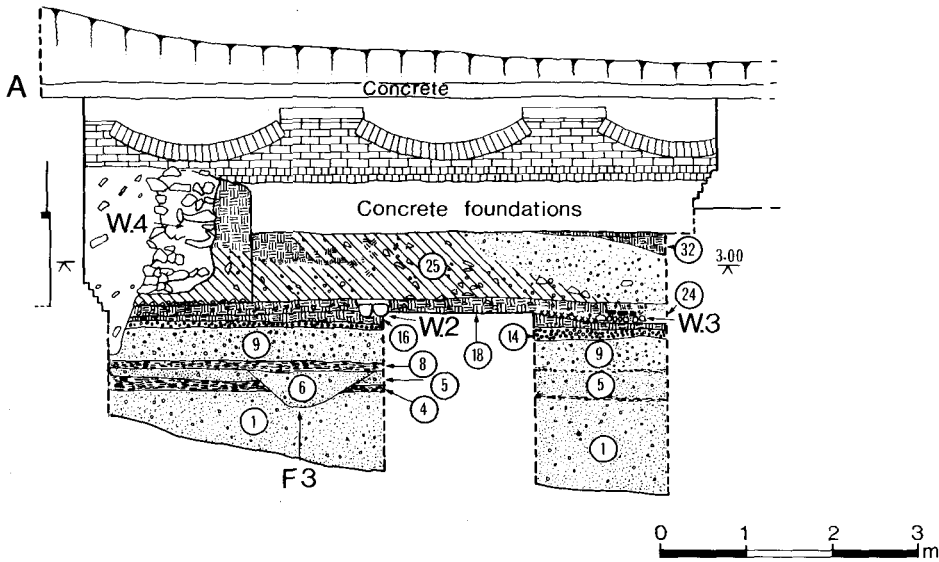


Fig. 7 Inmost Ward 1955-77: Section A-B.

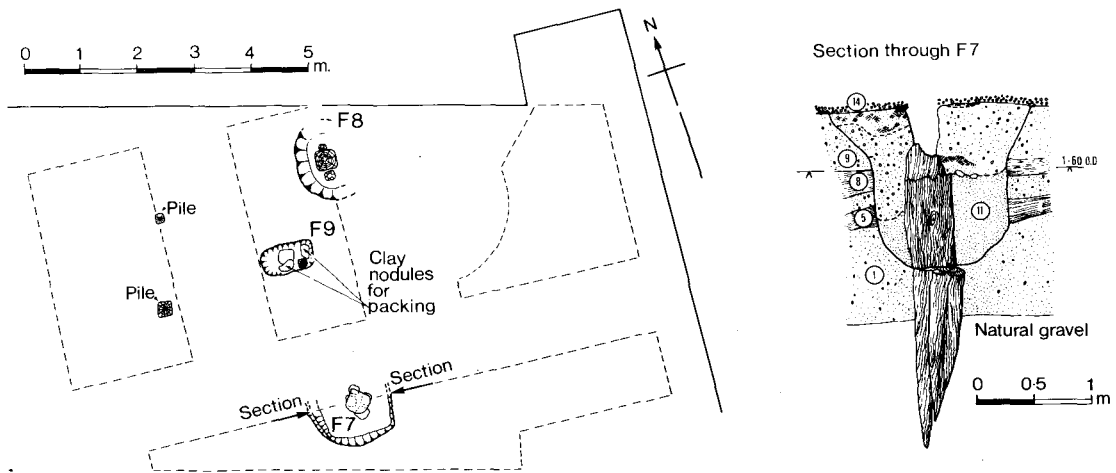


Fig. 8 Inmost ward 1955-77: Plan of 2nd-century timber piles.

survived, its course being occupied by a massive brick wall which formed the east side of a court within the principal office of the Board of Ordnance, built between 1777 and 1780 (Fig. 3). To the rear of the projection of the city wall, however, sections of the internal bank remained standing to a height of 1.50m. Within the area of excavation the bank was clearly tapering, and though the southern extent had been cut away, possibly by a construction trench for the first

riverside wall (Fig. 6), the angle of the remainder indicated that it ended close to the present Lanthorn Tower.

The most northerly section revealed the bank extending some 7m behind the line of the wall before its tail was obscured by an unexcavated balk (Fig. 7, L25). The bank did not reappear 1.60m to the west and its width, therefore, could not have been more than 8.60m. However, as previously stated, the rampart was already

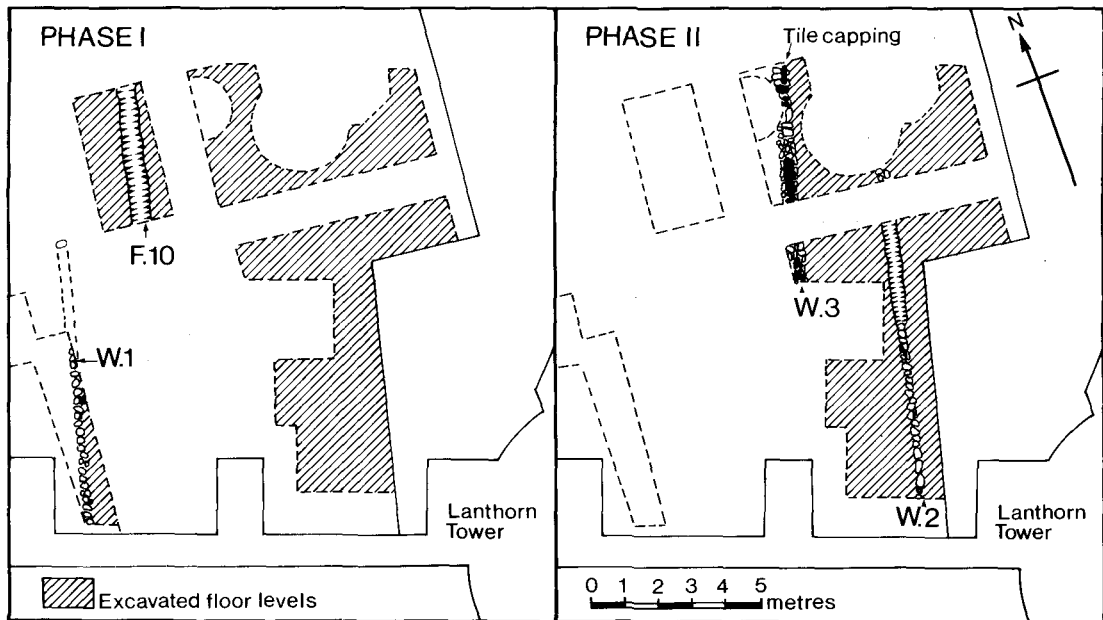


Fig. 9 Inmost Ward 1955-77: Plan of phase I & II 2nd-century timber-framed buildings.



Plate 3 Inmost Ward 1976: Western sleeper wall of phase II second-century timber-framed building viewed from south (50cm scale).

beginning to diminish at this point and a complete profile might only be anticipated further to the north.

The bank was composed of a variety of deposits, most, if not all of them, probably derived from the excavation of the wall and its ditch. These included dumps of redeposited London clay, river silts and earth. The latter contained much refuse, including painted wall plaster, tesserae, tile, mortar, flint, ragstone, chalk and shell. Within the southern end of the bank were two lenses of crushed tile/brick and daub which contained an interesting assemblage of 2nd-century glass (pp. 68–72). Analysis has shown that much of this was in fact production waste (pp. 72–3). Since there would be little benefit in conveying material for the bank over anything other than a short distance, it might be supposed that the collection derived from a local industry.

West of the bank occurred a gravel surface. In the narrow confines of the trench where it was excavated the metallurgy could only be traced to

a width of 2.10m. The eastern limit, i.e. that corresponding with the tail of the bank, must have been located within a standing bank. The western limit was subsequently extended by 1.60m during a watching brief (Fig. 6). Again the actual edge was not seen, though presumably it could not have been more than another 1.60m to the west, or it would have been detected by excavation. In summary, therefore, the overall width of the road could not have exceeded about 5.50m.

Let into the bank, 5.60m north of the Lantern Tower, was an extremely hard piece of trench-poured masonry which, though it could not be positively dated, was of Roman appearance. Composed of ragstone in a dark yellow mortar, it was 1.20m wide, survived to a depth of 1.50m and extended some 2m behind the line of the wall (Fig. 7 W4). Its dimensions, and the fact that it was located just south of the transition from firm London clay to relatively soft river silts, suggests that it might have functioned as a buttress.

PHASE VI. MID-LATE THIRD CENTURY—FIRST RIVERSIDE DEFENSIVE WALL

No further evidence for activity on the site was recorded until the building of a substantial riverside wall during the 3rd century. At 2.00m OD the base of the structure was well above the contemporary river level, its function, therefore, was clearly not that of an embankment⁵.

A small section of the wall was examined on the south side of the Victorian curtain (Fig. 11 W5). The western extent, together with the south face, had been destroyed during the 13th century (see below) while the eastern limit lay beneath successive phases of medieval masonry (Plate 4). What remained, however, provided some idea of the wall's considerable size and the manner of its construction.

The foundations of the wall were substantial. Firstly, rows of timber piles, comprised of sections of small oaks squared down to between 12 × 18cm and 40 × 46cm, were driven-in to the underlying silts. Over and between the tops of the timbers was a 30cm thick layer of rammed chalk which provided a stable bed for the main body of the wall. The raft was at least 2.80m wide; the southern edge extended beyond the limits of the excavation.

The upstanding masonry survived to a height of 1.20m and a width of 1.60m. The north face comprised eight neat courses of squared ragstone, the joints being pointed with a fine mortar. The core of the wall comprised a solid

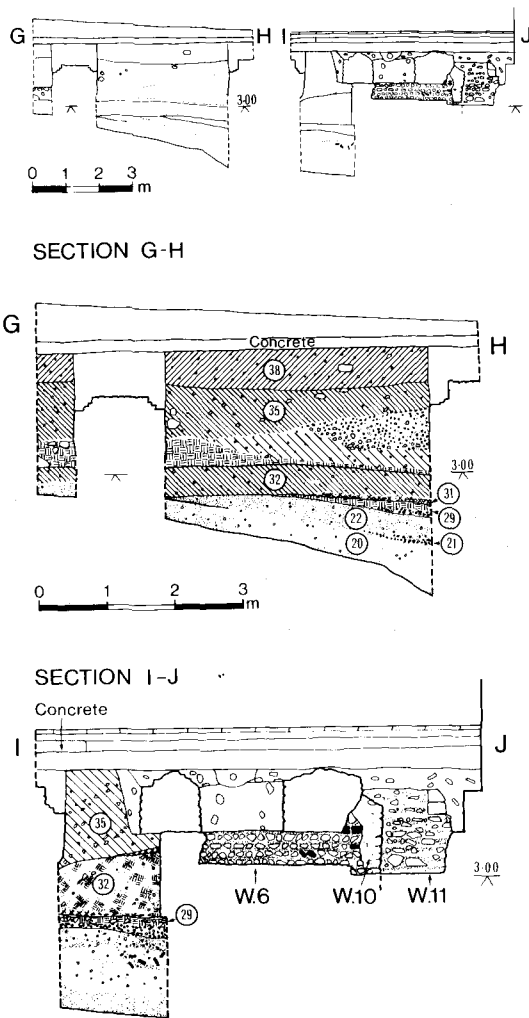


Fig. 10 Sections G-H and I-J.

mass of mortar and ragstone resting on several large irregular ragstone blocks pitched into the chalk raft (Fig. 2). Evidently the core had been raised in the normal manner, with a stone and mortar mix being applied in layers.

Analysis of the mortar has shown that it consisted primarily of sand and gravel, but in addition contained up to 10% brick/tile fragments which gave the material a distinctive pinkish colour. The presence of this inclusion indicates a deliberate attempt to produce, here, as elsewhere, a pozzolonic system in a damp context where the 'normal' mix would not have set satisfactorily⁶.

A simple projection of the wall would take its

line to a position just south of the excavations on the west side of the Lanthorn Tower, an area where the earlier landwall's internal bank was also directed. It was significant, therefore, that just north of this point the end of the bank was found to have been completely cut away (Fig. 6). The bottom of the cut corresponded with the base of the river wall while two masons' working surfaces, one on the floor of the cut, the other at a height of 90cm in the backfill, indicate construction work immediately to the south. The trench had evidently been open long enough to allow a considerable amount of silt to accumulate within it. Pottery from the deliberate infill above was largely of 2nd and early 3rd-century date, but included a few sherds probably dating to the late 3rd century (pp. 55-8).

As no stratigraphical link could be obtained between the river wall on the south side of the Victorian curtain and the excavations to the north, the principal dating evidence for the wall comes from a dendrochronological study of the oak piles employed in its foundations. Only one of the samples could be crossmatched with timbers recovered beneath a section of the Roman riverside wall at Baynards Castle, towards the western end of the city, and none from those associated with another length of wall excavated at New Fresh Wharf, a short distance downstream of London Bridge (Fig. 16). By comparing tree-ring sequences with a recently constructed Southwark chronology, however, much better results were obtained—the relative dates from the three sites showing that the timbers were probably contemporary. Allowing about 15-30 years for missing sapwood, the latest sample from the Tower indicates a felling date of AD 255-70 for the wall timbers (p. 40).

PHASE VIIa. LATE FOURTH CENTURY—DUMPING

At the west end of the site, dumped deposits of compact sandy soil, containing late 4th-century pottery, seem to represent the only available evidence for activity before the construction of the second Roman riverside wall (Fig. 13 L28). Similar deposits, evidently dating to the last decade of the 4th century and probably representing a levelling of the ground surface behind the 3rd-century riverside wall, were recorded 12m further to the west during subsequent excavations in 1979 (Parnell 1979, 70).

PHASE VIIb. LATE FOURTH CENTURY—SECOND RIVERSIDE DEFENSIVE WALL

The second wall lay 4m north of the earlier

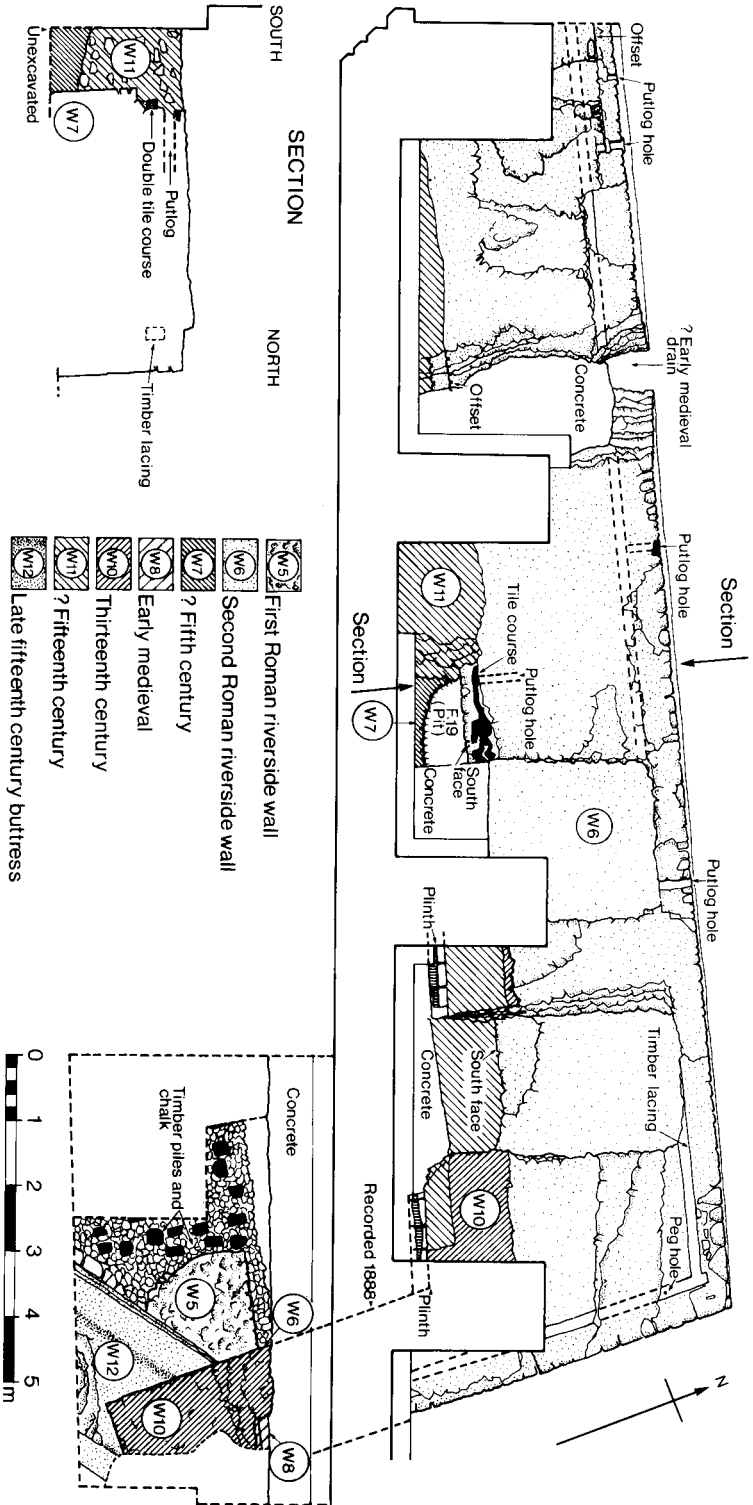


Fig. 11 Inmost Ward 1955-77: Plan and section of Roman riverside walls and medieval additions.

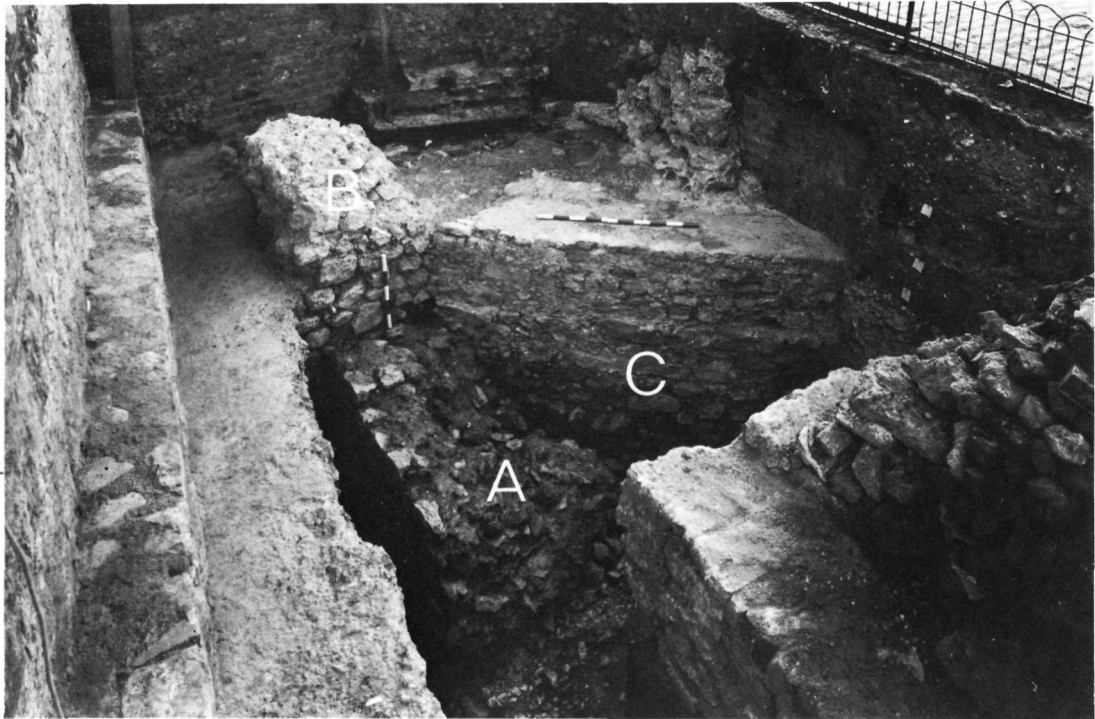


Plate 4 Water Lane 1977: Excavations viewed from west. A – 3rd-century riverside wall, B – 13th-century curtain wall and C – 15th-century buttress (50cm scale).

structure and occupied the same south-east to north-west alignment. Some 14.50m west of the landward wall it turned abruptly south at 105° to rest against the inner (north) face of the earlier wall (Fig. 11 W6, Plate 5).

The main stretch of the excavated wall, some 21m in length, lay on the north side of the standing curtain. The presence of the 19th-century masonry and earlier medieval additions, greatly hindered examination of the wall's south face, nevertheless it was possible to establish the width of the structure at three separate points as being 3.20m (i.e. 11 standard Roman feet). At a height of 1.50m offsets in the north and south faces effectively reduced the width of the masonry to *c.* 2.70m. At its maximum the core of the wall stood to a height of 2.15m; the north and south faces stood 1.90m and 1.80m respectively. Along the north face, the base of the wall rose only 20cm from 2.54m OD in the west, the difference being run out in the lowest course of masonry. By comparison the southern continuation declined some 70cm over its short length, in order to reach the same level as the base of the earlier river wall.

Compared to the thickness of the masonry the

foundations of the wall appeared slight. Rammed gravel, probably laid over a levelled ground surface, was applied first, followed by a mixture of flints and ragstone, with a few pieces of chalk and tile, puddled in clay (Figs. 10 & 13 L29). The combined layers were recorded to a depth of 50cm, though often they were much less. The clay probably derived from an enormous pit located 4m north of the wall (Fig. 3 F12). This feature could not be fully excavated but measured 6m east-west and was in excess of 2m deep. The primary fill of lumps of clay was sealed by a mass of black silty clays containing much organic waste. The pit appears to have been a stagnant pool during building operations and only completely infilled when work on the wall had been completed.

With a stable clay bed prepared work on the main body of the wall began. The method of construction differed from the earlier wall. Onto a layer of mortar the builders positioned their rows of exterior facing stones. Once the mortar was dry enough to walk upon, the area between them was packed with a layer of core rubble comprised largely of ragstone, but including some pieces of chalk, tile and even lumps of *opus*

signinum. Another layer of mortar was then applied and the process repeated. Invariably the thick bands of mortar failed to penetrate between the core stones, thereby leaving numerous air spaces and giving the centre of the wall a honeycombed appearance (Plate 6).

The north face of the wall revealed up to fourteen courses of squared ragstone supplemented with pieces of Purbeck marble, Bathstone, Hassock sandstone, chalk, tufa, brick and tile; the wide joints between the rows were pointed with a fine mortar (Plate 10)⁷. Some of the stone was reused, as was particularly evident in the corner of the wall where several large architectural pieces were employed as quoins (Plate 7). The lowest block exhibited a chiseled groove on its east face, a mark clearly indicating where the mason abandoned his attempt to fashion an angle. It is interesting to note that the large blocks in the corner had been bedded in a fine lime mix, as opposed to the dark yellow, very gravelly, mortar used elsewhere. Presumably the former was intended to prevent the large architectural stones from riding up. Without dismantling the masonry the form and origins of the carved blocks remains uncertain. However,

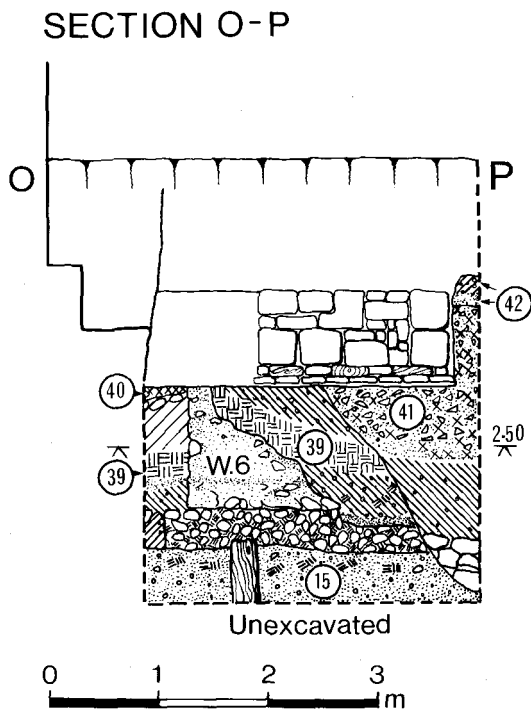


Fig. 12 Inmost Ward 1955-77: Section O-P.

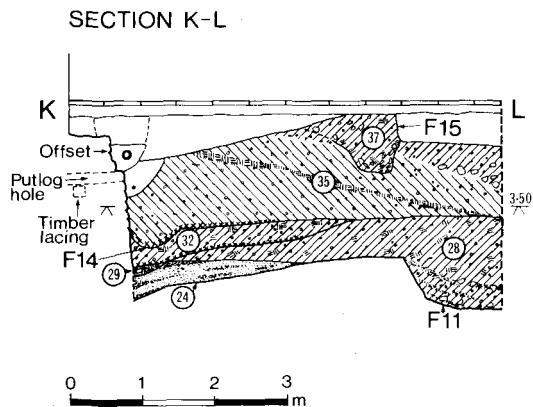


Fig. 13 Inmost Ward 1955-77: Section K-L.

two loose fragments, one a piece of imbricated column shaft, the other part of a possible funerary cornice moulding, are thought to have derived from the wall and thus indicate the possible source of some of the building material (pp. 67-68).

The south face of the wall could only be viewed to its full depth in one very restricted area, where a post-medieval (?) inspection pit had cut away part of a late medieval thickening. Once again the face revealed neat courses of squared ragstone, but at a height of 1.10m occurred a double tile course, remnants of which were also recorded 4m further to the east. The tiles were evidently reused and appeared to extend between 46cm and 60cm into the face of the wall.

Running through the core of the wall, at the level of the ninth course and between 40cm and 56cm from the north face, had been a horizontal line of timbers (Fig. 11). Although long since decayed the positions of the timbers were precisely marked by 16cm square cavities (Plate 8). The beams had been laid onto one of the mortar beds while it was in a fluid state and then after core rubble had been packed around them, remaining interstices were grouted with a fine lime mix; the impression of graining left on the surface of the mortar suggests a hard wood was employed. 4.60m west of the corner, traces of a 16cm square timber, much disturbed by post-medieval activity, were found at right-angles to the east-west beams (Fig. 11). In length this 'cross' piece could not have been more than 1.40m, possibly much less. Its north end did not pass through the face of the wall so the timber could not have been associated with external

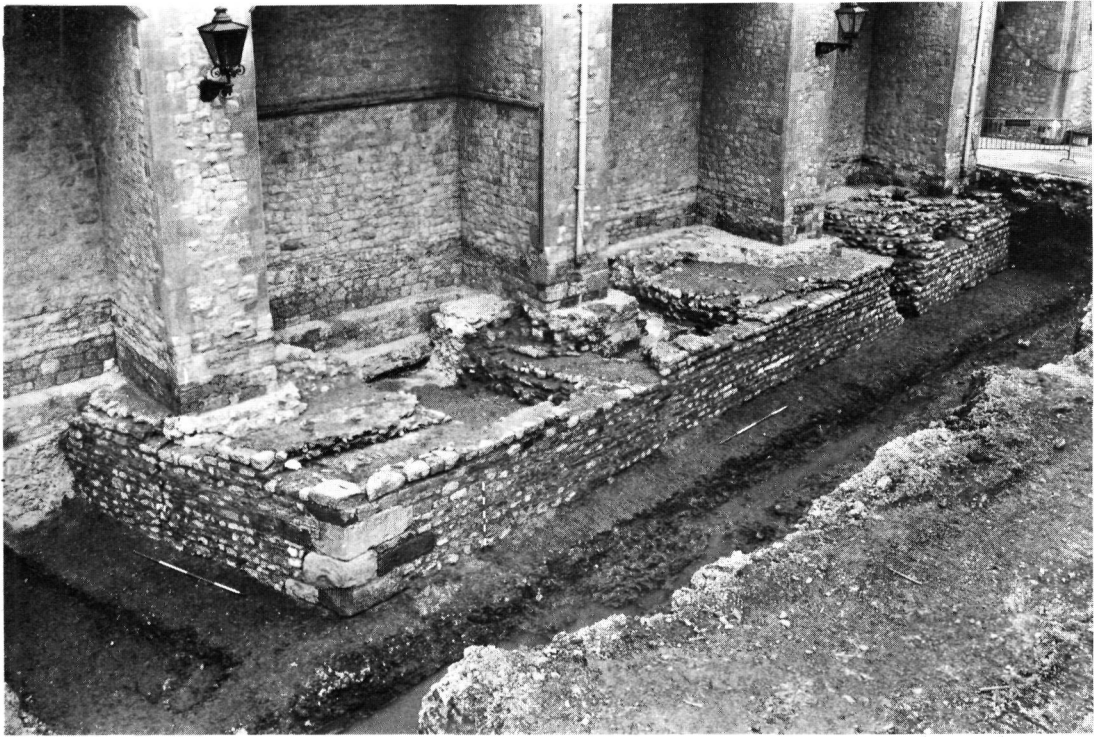


Plate 5 Inmost Ward 1977: General view of late 4th-century riverside wall from north-east (1 and 2m scales).

scaffolding. Perhaps it is best interpreted as bracing along the line of the main east-west beams.

The use of intramural timbering in a Roman context is well attested at some of the Saxon shore forts such as Pevensey and Richborough (Cunliffe 1975, 14–5). Their prime function was to stabilise the wall during construction and help prevent possible slumping. They could also act as anchorage for external shuttering. Clearly the

latter was not employed at the Tower. No lacing was found along the south face of the wall, but at a compatible level to that in the north face occurred the double tile course. A possible explanation for this arrangement might be that both tiles and timbers were intended to level and stabilise the wall close to where the offsets marked a narrowing of the masonry. Alternatively, or in addition, the timbers along the north face might have provided anchorage for external scaffolding. A row of putlog holes, which coincided with the offset in the north face, was in fact located immediately above the level of the timbers and it seems reasonable to suppose that the 10–12cm square putlog beams were fastened to them (Figs. 11 & 13). A careful examination of the ground surface north of the wall failed to reveal any post holes that might have been associated with vertical scantling and it seems reasonable to assume, therefore, that the scaffolding was cantilevered. A single putlog hole observed in the south face indicates the use of scaffolding here at a similar level (Fig. 1).

One of the most curious aspects of the wall was its relationship with the earlier riverside

Section M–N

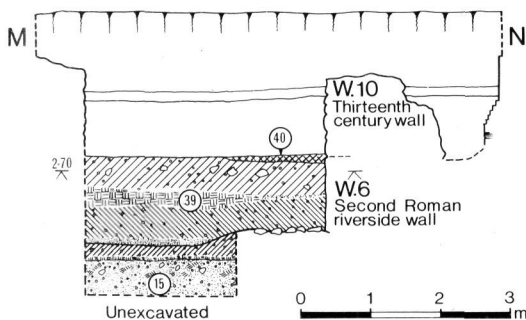


Fig. 14 Inmost Ward 1955–77: Section M–N.



Plate 6 Inmost Ward 1977: Core of late 4th-century riverside wall revealed by removal of lining of post-medieval brick cellar. South face of wall and later medieval addition far left (1m scale).

defence. A small section of the west face of the southern extension was exposed at the point where it butted against the earlier wall (Fig. 1, Plate 9). It stood 1m high and comprised seven familiar neatly pointed courses of squared ragstone. Although a very limited working area permitted only the most restricted examination, it was apparent that the alignment was similar to the opposing east face, as recorded further to the north. A simple projection of the east face would indicate that the extension was only some 1.80m wide at this point.

To the north, where the extension merged with the main body of the east-west wall, a 1.20m section of corework standing proud of the wall face suggested that some form of projection had existed within the outside angle (Fig. 11). At some stage during the medieval period this had been cut back and refaced (see below). The medieval fabric, which continued to reflect a change in the wall alignment, was not removed and it was therefore not possible to ascertain whether the original plan of the feature survived at a lower level.

The enigmatic arrangement within the outer angle of the wall may have reference to the fact

that part of the earlier wall was left standing to the west of the point where the extension butted against it (Fig. 11). This effectively created a corridor between the two walls, though the western extent is not known, owing to the robbing of the earlier wall during the 13th century (see below). It is possible that the lower part of the earlier wall was utilised as a revetment, though this is not supported by the fact that the second wall exhibited signs of weathering down to its base further to the west. Another, and perhaps more plausible explanation, is that the corridor provided access to a possible gate in the later wall—an hypothesis which might account for the curious projection within its outer angle (Fig. 15). It is known that the ground level behind the second defence was raised at the time of its construction (see below), it might be suggested, therefore, that part of the earlier wall was used torevet some sort of ramp from the defences to the lower lying exterior waterfront area. Certainly the space between the two walls had contained dumping, as evidenced by the fact that the mortar pointing on both phases of masonry showed no sign of weathering; unfortunately the deposits were removed during the rob-

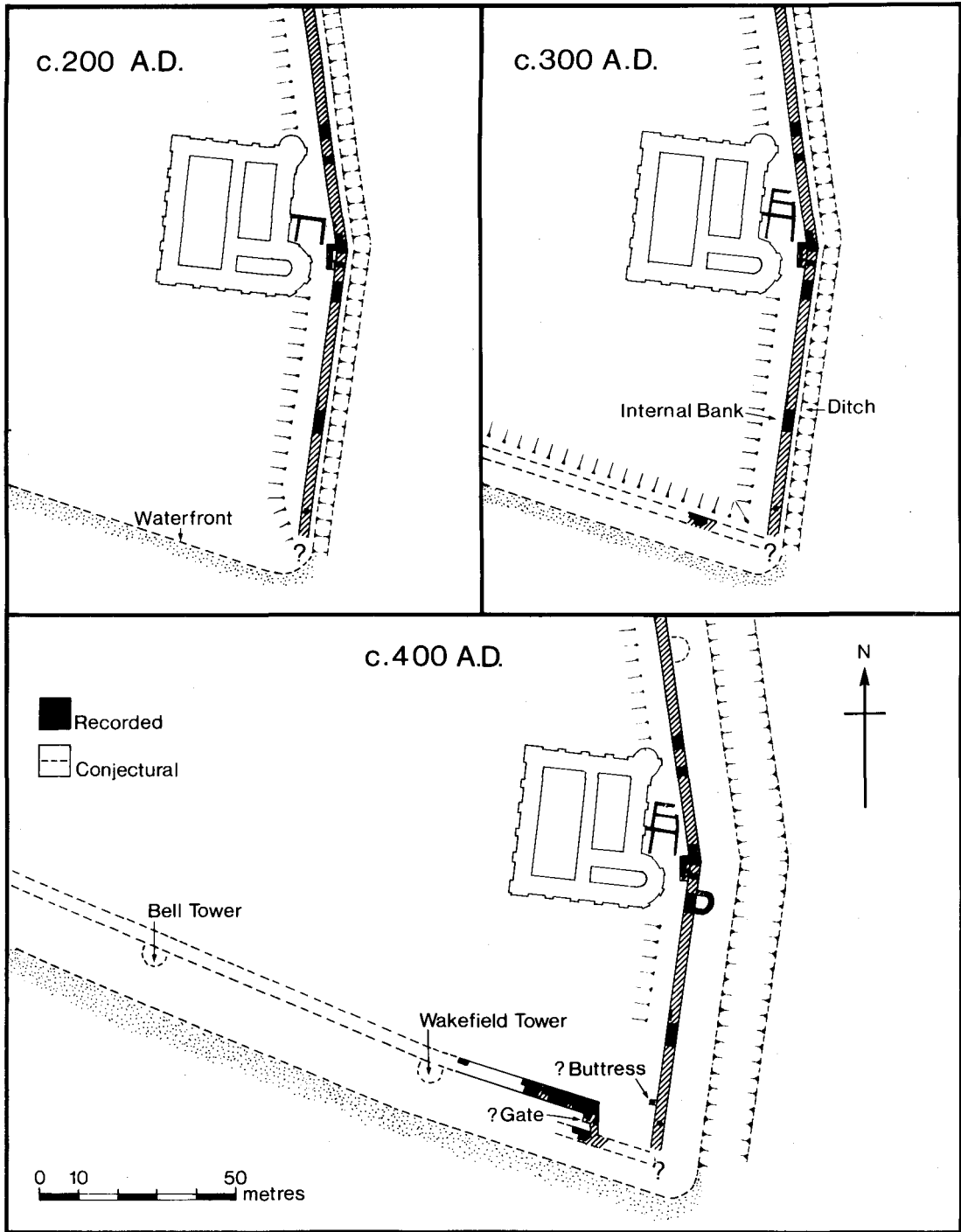


Fig. 15 Inmost Ward 1955-77: Development of Roman defences in south-east corner of city c. AD 200-400.

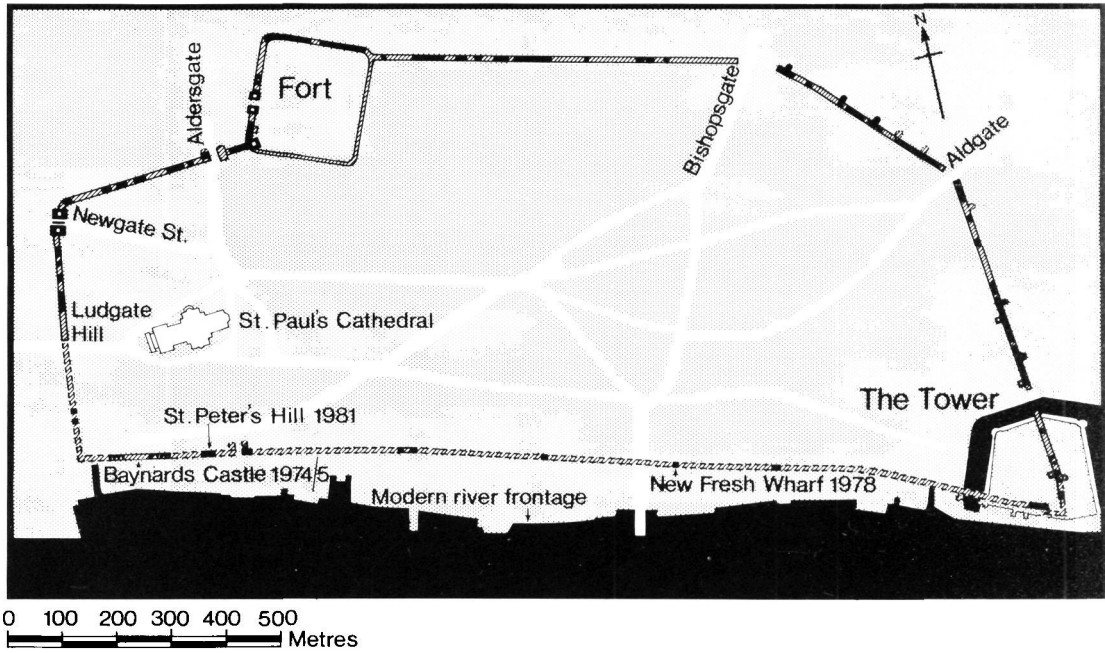


Fig. 16 Inmost Ward 1955-77: Plan of Roman city defences.



Plate 7 Inmost Ward 1977: Angle of late 4th-century riverside wall showing reuse of architectural stone (1m scale).



Plate 8 Inmost Ward 1977: Angle of late 4th-century riverside wall showing positions of internal timbers (20cm–1m scales).

bing of the earlier river wall in 13th century (see below).

Against the north face of the second wall was a mass of dumping from which the principal dating evidence for the wall was obtained (Figs. 10 & 13 L32). Two main observations support the interpretation that deposition was contemporary with the completion of the wall. Firstly, the mortar pointing on the face of the wall was in such a remarkable state of preservation that it must have been concealed immediately after application: this was clearly illustrated by the sharpness of the mason's trowel marks which included two inscribed herringbone designs (Plate 10). Secondly, no evidence of silting or intervening activity was found between the wall's construction surface and the dumping—something which might have been expected if the site had remained open for any appreciable period of time. Similarly there was no indication of delay during the construction stage, as the extensive layer of stone chippings and mortar, which represented the builders' working surface, was clearly homogeneous.

In addition to a large and comprehensive

assemblage of late 4th-century pottery, the dumping produced twenty two fully identifiable 4th-century coins. Peter Curnow adds 'these ranged through the Constantian issues of AD 321–48 [7], three *Fel Trix Reparatio* (fallen horseman) to the House of Valentinian I represented by eleven coins. The series closed with an AE 4 Victoria Augga of Valentinian II (AD 388–92). The evidence of this coin supported by the weight of the previous issues of the House of Valentinian I (AD 364–78) is undoubtedly consistent with a date for the deposition of this dumped material in the 390s'.

Owing to subsequent Saxo-Norman terracing it is not certain whether the dumping represented a bank or simply a raising of the ground surface. Against the east end of the wall the deposits survived to a depth of 1.20m, but the limited amount of weathering on the wall face above indicates that they must originally have been at least 1.90m deep. The surviving deposits were identified extending continuously 9.50m behind the wall, and were suspected another 2.50m further to the north, where similar material appeared beyond a massive 18th-

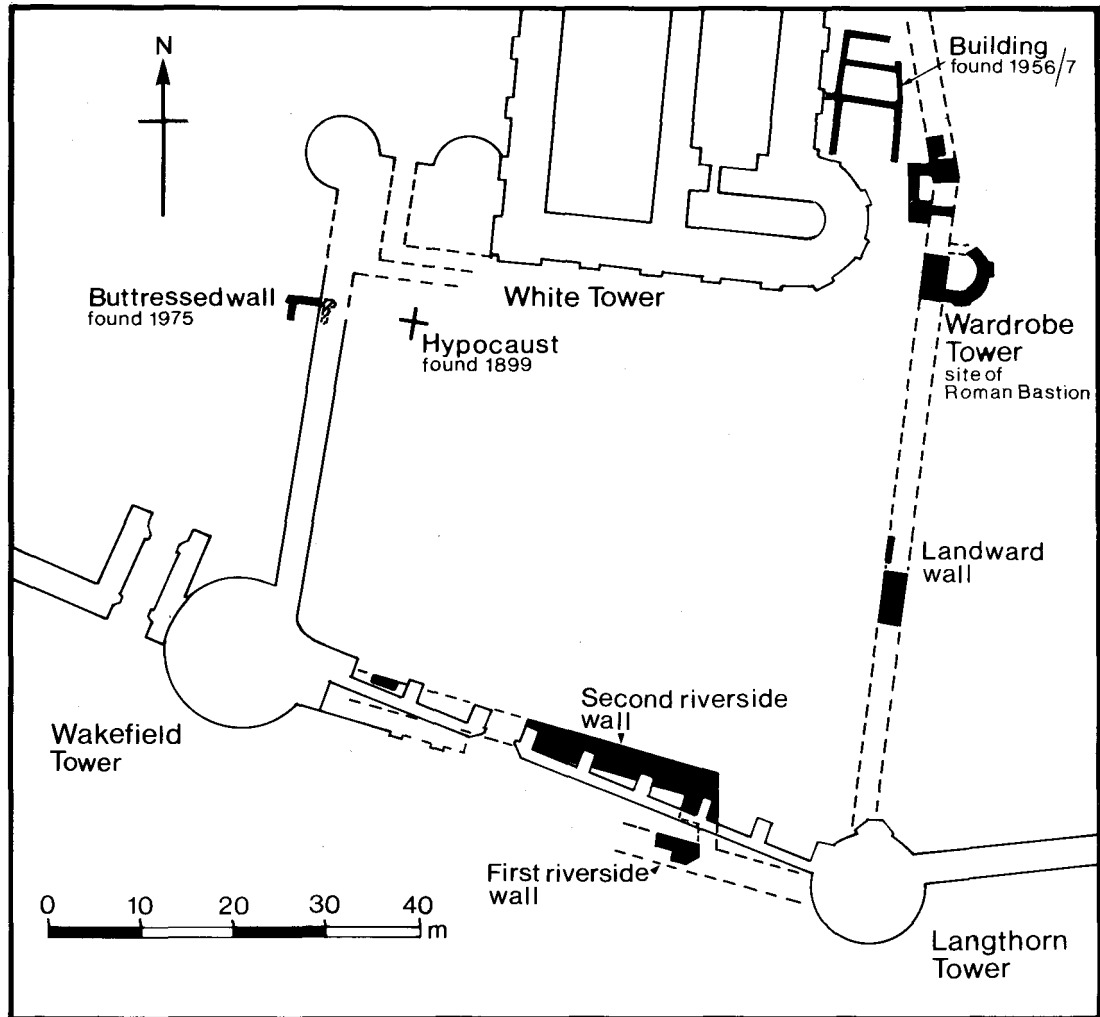


Fig. 17 Inmost Ward 1955–77: Plan of Inmost Ward showing locations of excavated Roman remains.

century wall. If these northernmost deposits do in fact represent a continuation, then overall the dumping extended at least 15m and as such would equate more easily with a general raising of the ground surface rather than the formation of a bank.

PHASE VIII. SUB-ROMAN

Little evidence for activity on the site between the 5th and middle of the 11th centuries was recorded. The bottom of a pit cut into the infilling of the late Roman clay pit was observed (Fig. 3 F13), but elsewhere north of the second river wall, Saxo-Norman and later activity had evidently removed all.

A small, but tantalising, glimpse of the situation on the south side of the later river wall was gleaned from the sides of the post-medieval (?) inspection pit cut through the late medieval thickening (Fig. 11 F.19). Here the clay foundations of the Roman wall appeared to be sealed directly by a weak mixture of sandy yellow mortar and ragstone, which included one or two pieces of *tegulae* (Fig. 11 W7). The material sealed the bottom five courses of the wall which, though showing signs of weathering, could not have been exposed for long since trowel marks were still evident in the pointing. By comparison, the coursing above was much weathered. At some stage dark soil had either accumulated



Plate 9 Water Lane 1977: Abutment of Roman riverside walls viewed from west. North (landward) face of 3rd-century wall to right, southern extension of late 4th-century wall behind ranging rod; 13th-century curtain overrides junction (1m scale).

or been dumped against the masonry and this had percolated into the open joints. Evidence of a similar situation was recorded in the top of the wall face further to the east. Unfortunately the date of the dark earth is not known, as most of it was removed when the wall was thickened in the late medieval period.

PHASE IX. SAXO-NORMAN

During the middle of the 11th century, in what might best be described as a terracing operation, the ground surface behind the second riverside wall was significantly reduced. The scarping was traced at least 15m north of the wall, the limit of the excavation. Generally speaking the new ground surface appeared reasonably level north-south, but from a point near the western end of the excavations rose approximately 1m to the east over a distance of some 17m; there were signs of a similar rise

towards the west. With regard to these slopes it is interesting to note that the lowest point coincided with a large breach in the Roman wall (Fig. 11). Gullies either side of the opening indicate that running water had collected here from east and west (Fig. 13 F14). This might suggest that the breach marked the position of an outlet in the wall, though confirmation was denied by the 19th-century curtain builders who infilled the gap with concrete while preparing their foundations.

A careful examination of the ground surface failed to reveal any features. In fact the only evidence for activity was immediately up against the river wall where a spread of mortar, with a few pieces of ragstone, extended up to 2m northwards. Analysis of the mortar has shown that it was derived from the Roman fabric, and though some might have slipped from the masonry without assistance, clearly there was sufficient to indicate human activity.

Whatever the purpose of the terracing, the limited weathering on the Roman wall face, together with the small amount of silting along its base, indicates that it was a short-lived affair. A mass of soil, clay and gravel, found up to 2m deep, was then deposited across the site (Figs. 7 & 10, 13 L35). The large quantities of predominantly late Roman pottery and at least seven 4th-century coins recovered from these layers might suggest that this was the same material that had been removed from the site shortly before (pp. 58–9).

Cut into the top of the dumping was a small east-west ditch whose course was established over a distance of at least 14.50m (Fig. 13 F15 and 16). The feature had evidently been open for only a short period before being backfilled with clay and a large amount of animal bone (p. 75). Part of a Thetford-type storage jar recovered from the fill suggests a pre-conquest date, while other shelly and sandy fabrics from both the ditch and the underlying deposits, compare favourably with pre-c. AD 1080 pottery recovered from excavations in 1963–4 on the site of the Jewel House, north of the White Tower. Dumping overlying the ditch, arbitrarily truncated by the late 19th-century concrete surface (Fig. 10 L38) produced similar wares (pp. 76–7).

PHASE X. LATE ELEVENTH— THIRTEENTH CENTURES

Perhaps the earliest structural evidence for this period was a fragment of wall built on the line of the first river defence at a height of 1.10m above the foundations (Fig. 11 W8). The



Plate 10 Inmost Ward 1977: Detail of pointing on north (landward) face of late 4th-century riverside wall showing incised herringbone design (5cm scale).

masonry was encased within later work and therefore only partly accessible. The visible section comprised a rough protruding foundation below three courses of ragstone standing to a height of only 50cm. The appearance of the masonry—a pitched course beneath two rows of roughly squared blocks, was suggestive of an early medieval date. Whether this represents a rebuilding of the river defence or simply a localised repair is not clear.



Plate 11 Inmost Ward 1976: Large medieval foundation probably associated with early 12th-century palace building.

During a subsequent phase further alterations to both Roman riverside walls were carried out. Initial work involved the excavation, and then the robbing down to its foundations, of most of the first wall that lay to the west of the later extension. This act encouraged the remains of the first wall to slump southwards, thereby opening up the junction with the extension to the north (Plate 9). Afterwards the ground level was raised again with dumps of soil and clay (Figs. 12, 14 L39) some of which contained pottery of the 13th century. The surface of the dumping was sealed by construction waste associated with a wall built upon the remains of the Roman masonry. Since there was no evidence for activity between the raising of the ground surface and the building of the wall it might be supposed that the dating of the dumping also dates the wall. The fact that the robbing of the first river wall stopped short of where it would interfere with the new masonry is further evidence for the two events being carried out in conjunction.

The new wall represented a rebuilding of the southern extension of the second Roman riverside wall that was carried onto the remains



Plate 12 Inmost Ward 1977: Later medieval addition to south face of late 4th-century riverside wall. Associated chamfered sandstone plinth can be seen in top left hand corner (20cm and 1m scales).

of the 3rd-century defence, and later medieval work, before turning eastwards at right angles (Fig. 11 W10, Plate 4). Presumably this undertaking represented a major reconstruction of part of the castle's southern curtain which, until then, had possibly retained the suggested Roman watergate.

To the north, the west face of the projection within the outer angle of the second river wall was cut back and largely rebuilt (Fig. 11 W10). Immediately to the west repairs to the face of the Roman masonry might also belong to this phase (Fig. 10, Section I–J).

In colour and composition, the mortar used in the new wall was very similar to that found in the second Roman riverside defence. The core of the medieval wall, however, revealed none of the alternating bands of stone and mortar that characterised the Roman masonry. Instead, both materials had been mixed together and poured into position *en masse*. Furthermore, the coursing

in the medieval face, composed of ragstone with a few pieces of chalk and Roman tile, was irregular, and quite different from the methodical layering of the Roman build (Plate 4).

Other than work associated with the defences, the only medieval masonry recorded was a large foundation cut into the Saxo-Norman deposits (Fig. 13 W9). This footing survived to a depth of 2.15m and a width of 2.10m. It was composed of courses of ragstone, with a few pieces of Reigate, flint, chalk and Roman tile, alternating with bands of sand and gravel. The uppermost 30cm was mortared ragstone (Plate 11). 3m to the north of where the foundation butted against the inner face of the second Roman riverside wall a feature some 1.50m wide and 1.30m deep, projected westwards. Integral with the main foundation this is perhaps best interpreted as evidence for a buttress.

The foundation must have been associated with the building of some considerable size—in all probability one of the palace buildings which occupied the Inmost Ward from at least the 12th century (see below). No dating evidence was recovered, but the construction technique is early and analogous to foundations recorded elsewhere in the city, notably from the original build of All Hallows Barking (*c.* AD 690) to the mid 13th-century and at Milk St in an excavated 12th-century building (S. Roskams and J. Schofield, 1978).

PHASE XI. LATER MEDIEVAL

During the later medieval period further alterations to the southern defences of the ward were carried out. The principal task involved a thickening of the second Roman riverside wall along the south face and a further reduction of the projection within its outside angle (Fig. 11 W11, Plate 12). The widening of the wall might have been precipitated by subsidence, as both the Roman masonry and its medieval refacing exhibited a 5° list southwards (Fig. 10). Dating evidence for this operation is lacking, though it is perhaps significant that the remains of a shallow plinth of Reigate sandstone along the south face of the addition indicates that the contemporary ground surface corresponded with the level at which a substantial buttress of presumed 15th-century date was constructed to the south.

The buttress was sited against the corner of the 13th-century curtain wall (Fig. 11 W12, Plate 4). The top of its foundation indicates that the ground surface west of the curtain had risen some 70cm since the 13th century. The massive foundation, which was not fully accessible,

appeared to be composed entirely of ragstone; it was 2.40m wide and up to least 2.80m deep and rested on the remains of the first Roman riverside wall. Of the superstructure, only three courses of hammer-dressed ragstone belonging to the east face survived; the ghost line of the west face indicates that masonry had evidently been 1.50m wide. Pottery recovered from both within and above the construction trench suggests a late 15th-century date (p. 77).

PHASE XIIa. PRE 1777 POST-MEDIEVAL FEATURES

Little evidence of the post-medieval history of the site survived the Ordnance reconstructions of 1777–92, though events are well-documented (see below). The lower fifteen courses of a second half of the 17th or early 18th-century pit were recorded within a courtyard of the 1672–3 Ordnance office and partly beneath the footings of a 1777 brick wall (Fig. 13 F17 & Plate 3). The brick built feature had a diameter of 1.50m and rested on a base plate comprised of two layers of 3.5cm thick pine planking. The bricks were neither bonded or lined and the pit could never have held water.

To the south, and cut into the second Roman river wall and later medieval addition, were the truncated remains of two small brick cellars of late 17th or 18th-century date (Fig. 3). These can probably be attributed to the residence of the Clerk of the Works (Plate 14) and were demolished in advance of the reconstruction of the Ordnance office in 1789.

PHASE XIIb. 1777–80 ORDNANCE OFFICE

In the absence of any surviving drawings of the 1777–80 building the brick foundations revealed by excavation provide the only evidence for the layout of this office prior to its reconstruction in 1789–92 (Fig. 3). By comparing the plan of the foundations with surveys of the office dating from the mid 19th-century it is possible to demonstrate that most of the 1777–80 structure was incorporated within the reconstruction of 1789–82.

To ensure maximum stability the walls were equipped with wide spreading bases which rested on frames of brick and pine (c.f. Fig. 4). One foundation, which occupied the line of the Roman landward wall, and formed the east side of an internal court, was carried down to such a considerable depth as to suggest that remains of the Roman masonry were encountered (Fig. 7). Within the court was a large cess tank fed by various drains from inside the building. Against

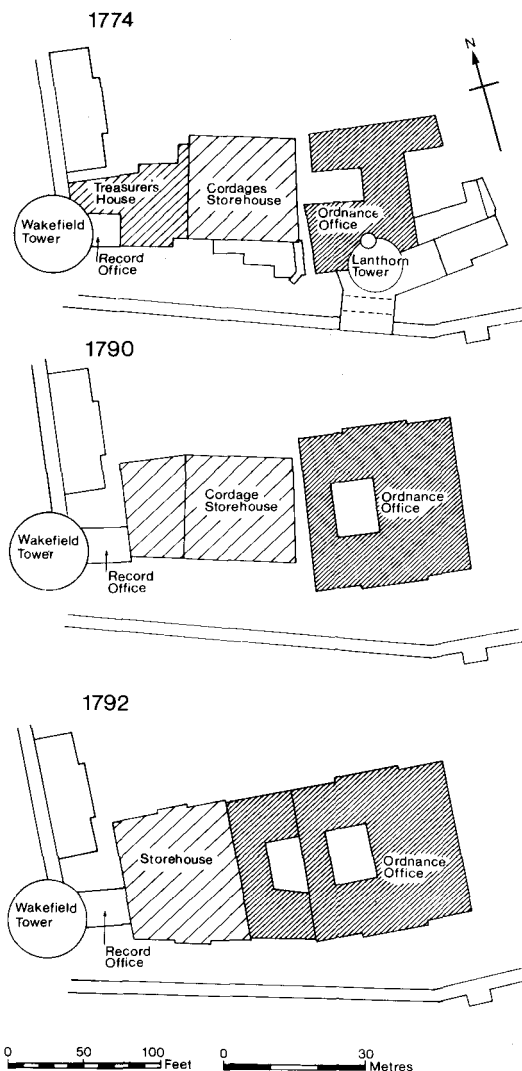


Fig. 18 Inmost Ward 1955–77: Development of Ordnance buildings along south side of Inmost Ward, 1774–1792.

the east face of the tank was a deep timber lined shaft which probably served as a sump during construction (Fig. 4). Contemporary building accounts do in fact record the use of pumps to draw water out of the foundations during building work⁸.

PHASE XII. 1789–92 ORDNANCE OFFICE

Most of the excavated foundations associated with this phase can be attributed to an extension built against the west end of the 1777–80 office (Fig. 3). The south wall of the new extension

was carried eastwards to replace the existing river elevation of the office which had been sited slightly further to the south. Within the 1777-80 building the only identified alteration was the addition of some brickwork on the west side of the internal court, where the accounts suggests a subsidiary staircase was installed. With the exception of the staircase all the foundations were composed of reused material, much of it architectural stone. Sadly, a considerable amount of masonry belonging to the Roman river defences and later medieval additions was removed when the site was levelled to receive the new extension.

PHASE XIIId. 1854 ORDNANCE OFFICE ALTERATIONS

Two parallel lines of inverted relieving arches represented a strengthening of the office in 1854 when a third storey was added (Fig. 3). The brickwork was constructed on foundations of friable concrete, with the tops of the arches capped with slabs of re-used Portland stone supporting granite blocks. The latter were bored to receive iron columns. These remains, together with the rest of the office complex, were concealed beneath a concrete surface that was laid over much of the ward following the reconstruction of the curtain wall in 1888 (see below).

NOTES

1. Harwell 2239.
2. The painted plaster was examined by Fiona Cameron. A copy of her report is lodged with the site records at the Tower of London.
3. At this level all of Roman Southwark and most of the city waterfront would have been under water c.f. H. L. Sheldon *et al* (1978), 45-7 and T. Dyson and J. Schofield (1981), 36.
4. For a more detailed account of the landward defences within the Inmost Ward and their dating evidence see G. Parnell *et al* (1982).
5. Archaeological excavations have demonstrated that by the 4th century the river level was below +0.40m OD, see C. Hill *et al* (1980), 66-7.
6. Mortar analysis was carried out by Dr Norman Davy and Dr John Evans. Copies of their reports are lodged with the site records at the Tower of London.
7. Petrological identification was carried out by John Ashurst of the Historic Buildings and Monuments Commission.
8. Public Record Office, WO51/280 p. 18 'To Mr Phillips Engine maker ... for use of a Copper Pump by him supplied for drawing water from the Foundation of the new office while laying the same in Sept 1777'.

C. DISCUSSION

PHASES I & II

Much has been written about the Thames during the prehistoric and Roman periods and river level estimates are constantly being reconsidered and refined. The evidence from the Inmost Ward suggests that the river was silting up to a height of 1.50m OD in the late Iron Age. Iron Age-early Roman river silts rising up to 1.50m OD have also been recorded in excavations against the Salt Tower in 1976, some 50m to the east (G. Parnell 1983a, 97). Together these levels compare favourably with those cited in the most recent review of the evidence for the Thames during the 1st century AD (G. Milne *et al* 1983).

A fall in the river level during the late Iron Age was followed by the first clear evidence for occupation in the form of a large pit cut by a shallow inhumation. These features appear to represent the first unequivocal evidence of Iron Age occupation so far discovered in the city, though it is doubtful whether they seriously threaten the generally accepted view that there was no pre-invasion settlement of any significance (RCHM 1928, 19-27).

PHASE III

The early Roman period was marked by fluctuations in river behaviour and on two occasions part of the site became marsh. In between these phases continuous flooding saw silts deposited up to a height of 1.70m OD before signs of occupation reappeared.

The subsequent reclamation of part of the site during the late 1st century might have been linked to a general development of the area, which included the laying out of a substantial stone building further up the hill by the south-east corner of the White Tower (G. Parnell *et al* 1982,

101–5). Though the purpose of the dumping cannot be demonstrated it is most likely to have been associated with the construction of a waterfront beyond the southern limits of the excavations. In any event, the available information is of interest because it indicates early ribbon development further downstream of the bridge than had been known. The late 1st or early 2nd-century waterfront excavated at the Custom House site some 350m to the west in 1973 was in fact the most easterly city riverside development previously recorded (T. Tatton-Brown 1974, 122).

PHASE IV

Unfortunately the timber foundations and gravel surface that superseded the late Flavian reclamation provide no clear picture of the nature of continuing occupation of this part of the site. By the middle of the 2nd century, however, the character was distinctly residential, as illustrated by the timber-framed building that fronted onto the river. The components of this building, together with its post-fire successor, include clay floors and narrow sleeper walls which are commonly paralleled elsewhere in the city and in Southwark during the 2nd century (H. L. Sheldon *et al* 1978, 30–1 & T. Dyson and J. Schofield 1981, 31–5). It is worth pointing out, however, that the size of the Tower structures is unusually large, while the use of chalk in the walls appears to represent an early use of this material in a London building context.

PHASE V

Though nothing whatsoever survived of the main body of the city landward wall the remains of its contemporary internal bank indicate that the defence terminated on, or close to, the site of the present Lanthorn Tower. Since we know now that the river defences were an innovation of

the 3rd century, this arrangement appears quite in order. Doubtless until the riverfront was closed the limit of the land wall would have been defined by a tower of some form, and a mass of inserted gravel recorded by the north-east corner of the Lanthorn Tower may in fact be associated with the foundations of such a structure (G. Parnell *et al* 1982, 92–4).

The remains of the internal bank show it to have been of considerable size. The best preserved section, though incomplete and located at a point where the bank was already beginning to narrow, indicates a width of at least 8.50m. Similar measurements have been recorded in earlier excavations near the White Tower, while more recent work on Tower Hill, north of the castle, have suggested a total width of up to 9.50m (D. Whipp 1980, 50). Such measurements however find little analogy with other sections of the bank recorded elsewhere in the city¹. Presumably the bank therefore was a variable feature, with concessions to pre-wall topography being perhaps one of the factors determining its size.

The archaeological evidence leaves little doubt that the late 2nd-century timber-framed building located west and north of the Lanthorn Tower was deliberately dismantled to make way for the city wall. This provides a sharp contrast with the situation further to the north where the substantial stone building on the east side of the White Tower is known to have been left standing against the rear of the wall (G. Parnell *et al* 1982, 100–15). Presumably the status of the stone building, or its owner, were taken into account during the planning of the defences.

One question, which it was hoped the excavations might resolve, was what factors influenced the siting of the wall. Near the south-east corner of the White Tower the wall diverges some 15° from its regular

north-south alignment, which extends continuously from Aldgate, towards the site of the Lanthorn Tower (Figs. 15). It now seems clear that the diversion was intended to take advantage of a point along the riverfront where developments during the previous 100 years or so, had created a promontory in the river. The precise location of the re-alignment was governed by the need to just clear the masonry building east of the White Tower, a diversion further to the south would have produced a more severe angle.

PHASE VI

The discovery of this wall, and the correlation of the timbers used in its foundation with those from other sections of wall at Blackfriars and New Fresh Wharf, leaves little doubt that Roman London was provided with an homogeneous and continuous riverside defence. William Fitzstephen writing in *c.* AD 1173, having described the landward defences, went on to say 'London formerly had walls and towers in the like manner on the south, but the most excellent river the Thames . . . has in a long space of time washed down, undermined and subverted the walls in that part' (J. Stow 1956, 591). The severely river-eroded walls excavated at Blackfriars and New Fresh Wharf seem to provide unequivocal confirmation of Fitzstephen's 800-year-old account. The fact that he did not mention the surviving masonry at the Tower is hardly surprising, since by the late 12th century these remains would have been regarded as part of the fabric of the castle.

The confirmation of Fitzstephen's account raises the question of where the river bastions were sited. In 1913, Sir Arthur Clapham made the attractive suggestion that the medieval towers along the line of the castle's inner south curtain (Lanthorn, Wakefield and Bell towers) originated in Roman bastions, as their

spacing is similar to those located against the landward wall (A. W. Clapham 1913, 3–5). Circumstantial evidence to support this theory has since been provided by the discovery of two early medieval ditches whose alignments appear to direct them to points along the defences where Clapham's theory would anticipate the presence of bastions. In 1963–4, excavations on the site of the Jewel House, north of the White Tower, revealed a ditch running south-west to north-east across the Parade Ground to the supposed site of the second landward bastion (B. K. Davison 1967), which Stow informs us was taken down during the reign of William the Conqueror (J. Stow 1956, 42). The second feature, on a north-south alignment, was directed towards the Wakefield Tower, the site of Clapham's proposed second river bastion (G. Parnell, 1983b). It is now clear that the Wakefield Tower occupied a position along the line of the second Roman riverside wall which, as argued below, probably represents a remodelling of the waterfront defences within the confines of the Tower. The second wall is sited a short distance to the north of the defences of *c.* AD 255–70, but there is no reason to suppose, however, that the spacing of the bastions was altered during reconstruction, as the distance between them was governed by the need to maintain effective covering fire.

The construction of the first riverside wall falls between AD 255–70, the felling dates for the timbers used in its construction, and the closing years of the 4th century when the river defences were remodelled (see below). In fact, since a great deal of fresh timber would presumably have been required for the original work, the felling dates probably reflect quite accurately the date of the wall. Historically these dates fall within a period of grave trouble for Roman Empire. For

Britain, following the usurpation by Postumus in AD 259 and the setting up of the Imperium Galliarum, this meant being served from the Central Empire for fourteen years (S. Frere 1974, 214–5). It was during the later part of this independence that the threat of sea-borne Saxon incursions first became acute and Frere points to the large number of coin-hoards that belong to the period AD 268–82 as an indication of crisis (S. Frere 1974, 220–1).

Though precise dates are still lacking, many towns in the south of England, including Canterbury, Silchester, Chichester and *Verulamium*, appear to have been equipped with stone fortifications between *c.* AD 220–80 (S. Frere 1981, 390). Moreover, a number of ‘Saxon Shore’ forts which were intended to combat a sea-borne attack, are thought to have been built in the AD 260s and 270s (B. Cunliffe 1977, 3). In this context, it may be significant that a signal station of similar date was discovered $\frac{3}{4}$ mile downstream of London at Shadwell in 1974 (T. Johnson 1975, 278–280). If as the excavator of the site suggests, Shadwell was part of a chain of Thames lookout posts to monitor military incursions, then the presence of contemporary river defences in London becomes a probability.

London’s position as a major commercial centre had evidently declined by the late 3rd century, so that the closing of the river frontage and the restrictions imposed on the wharf would have afforded a few problems, providing the wall was provided with adequate access points. The decline in activity along the wharf is strongly mirrored within the walls where large areas of the city lay empty beneath accumulating ‘dark earth’ (R. Merrifield, 1983, 140–8). During the second half of the 3rd century, however, a degree of restoration appears to have

been firmly underway. Significantly, the character of the recovery, as reflected in the type of buildings so far recorded, appears to be largely of a bureaucratic or religious nature, rather than a mercantile one (R. Merrifield, 1983, 183–92 & P. Marsden, 1980, 131–62). Perhaps, therefore, the closing of London’s riverfront should be seen as a measure to protect a city now principally concerned with administrative functions.

PHASE VIIIb

Undoubtedly the discovery of the second Roman riverside wall represents the most significant contribution that the present excavations have to offer. The numismatic evidence from dumping against the wall indicates a construction date during the last decade of the 4th century. This has been confirmed by additional dating evidence from the excavation of a second stretch of the wall in the south-west corner of the Inmost Ward in 1979 (G. Parnell, 1981). Here, deposits ante-dating the wall, produced 12 fully identifiable coins of the second half of the 4th century that terminate in an issue of the House of Theodosius I and another of Arcadius, both dated AD 388+. These two pieces effectively demonstrate that work on the wall could not have begun before AD 388 at the earliest. In fact, given the context in which the coins were found, there are good reasons for supposing that a start was made somewhat later.

Historically the building of the wall might relate to Stilicho, the Vandal general who held the reins of power behind the nominal Emperor Honorius in the closing years of the 4th century. Between AD 395 and 399, under Stilicho’s instructions, a final effort was made to restore order in Britain and reorganise the province’s defences (S. Frere 1974, 406–7).

This is reflected in an edict issued in AD 396, and reaffirmed in AD 408, authorising urban authorities to rebuild or repair their fortifications using, if necessary, material drawn from disused temples and other buildings (RCHM 1928, 82).

Whether or not the construction of the wall relates to the edict of AD 396, the dating evidence confirms for the first time in this country a major defensive work later than that of Count Theodosius, and as such has considerable consequences for the history of Roman Britain. The degree of organisation needed to facilitate such a large work, and the meticulous attention paid to construction techniques, are perhaps especially significant when considering the fact that the operation was undertaken in the twilight years of Roman rule.

The excavated remains of the first riverside wall at the Tower appeared structurally sound, and unless conditions had deteriorated further to the west, it might be supposed that alterations were brought about by design rather than defect. The probable intention was to transform the extreme corner of the city circuit into a salient which could only be approached by way of the narrow passage to the west. The possibility of a gate at this point was perhaps suggested by the discovery of part of an angular projection at the end of the passage (Fig. 15).

The later history of the wall along the rest of the waterfront appears also complicated. Excavations in 1974–6 at Baynards Castle, towards the western end of the City, revealed walling of two distinct constructions. The first, and that linked dendrochronologically with the earlier Tower section, comprised a 40m length of wall founded on a chalk raft supported by neat rows of oak piles driven-in to the underlying silts. The main body of the wall was carefully constructed and

accompanied by a contemporary clay bank against its inner (north) face. By comparison, the walling to the west employed no elaborate foundations, instead the masonry rested on large rag-stone blocks simply wedged into the sub-soil and natural clay (C. Hill *et al* 1980, 57–61). The excavator attributed this alteration to changes in the underlying ground surface (C. Hill *et al* 1980, 62–6). The western wall, however, differed in other respects too, and these cannot be attributed to ground conditions. There was, for example, no clear evidence for an internal bank, while the wall itself incorporated none of the tile courses found in the eastern section. Moreover, the western wall comprised numerous reused blocks of sculptured stone in its construction. Among the pieces were two altars one commemorating the rebuilding of a temple, probably Isis, by Marcus Martiannus Pulcher, governor or assistant governor of Britannia Superior and probably dated AD 251–3 or 253–9 (C. Hill *et al* 1980, 195–8). The inscription thus provides a *terminus post quem* for the construction of this particular section of wall, but in doing so the contemporaneous nature of the defences is effectively challenged, since the pillaging of temples and shrines for second-hand building material during the 3rd century must be regarded as a highly sacrilegious and improbable act². It may be assumed, therefore, that the two distinct types of construction at Baynards Castle represent different phases of build. Indeed clear evidence for two quite separate constructions was recorded in one section of wall at Baynards Castle, though it proved impossible to estimate the time scale separating them (C. Hill *et al* 1980, 38–40).

More recently the Museum of London has recorded a small section of the wall at the bottom of St Peter's Hill, to the east of Baynards Castle. Here the structure

appeared to revet a terrace on which a massive public building had been erected, possibly in the early-mid 3rd century. It is possible that this may have been the original function of the wall and that it was incorporated into the river defences at the subsequent date³. Further to the east, below Upper Thames St, Roach Smith recorded sections of the wall in 1841. Here the wall boasted the elaborate foundations of timber and chalk together with reused stone from public buildings in the main body of the wall itself (C. Roach-Smith 1859, 18–9).

One conclusion that seems to emerge from these various observations is that the river defences of AD 255–70, which might have incorporated earlier structures, were extensively repaired at some stage. The precise date might have been in the 390's when the river defences were remodelled at the Tower and when the demolition of pagan temples and other disused buildings was actively encouraged by the authorities in order to provide building material for the strengthening of urban defences.

It is tempting to relate the repair of the riverside wall with the addition of bastions to London's landward defences. These fall into two groups. The first, known as the western series have, with one exception, hollow bases of which at least one is known to be of medieval date (W. F. Grimes, 1968, 71–8). The second group, referred to as the eastern series have, with two exceptions, solid bases containing much reused sculptured and architectural stone and are almost certainly all of late Roman date (R. Merrifield 1983, 228–35). The building of the solid bastions is known to have necessitated the infilling of the city wall's original V-shaped ditch, since the towers project into its course. Excavations to the south-east of Bastion 6, near Aldgate, produced a coin of Constans AD 341–6 in the delib-

erate backfilling of the ditch (J. Maloney, 1979), while deposits resting against the face of the tower contained coins of the House of Theodosius AD 364–75 (P. Marsden, 1980, 72). It follows, therefore, that if all the solid bastions are of one phase, then the dating evidence from Bastion 6 lends weight to the suggestion first put forward by Wheeler (RCHM 1928, 82) that they form part of a late reorganisation of London's defences.

The fact that most of the bastions appear to be sited down the east side of the city only is curious. The bridge and the marshy Moorfields area on the opposing north side of the city have been cited as reasons why the regular spacing of the bastions was evidently not continued around the entire *enceinte*. While, however, these obstacles may indeed have prevented the city from being outflanked during a brief raid, they could hardly have been relied upon in the face of a determined assault.

The intention to equip the west side of the city with bastions is strongly indicated by the discovery in 1974 and 1982 of a late Roman, wide, flat-bottomed ditch in front of the city wall at Ludgate Hill (B. Hopley and J. Schofield 1977, 45 & Fig. 10, P. Rowsome 1983). Such a feature was a necessary accompaniment to the addition of bastions, since it provided an unrestricted field of fire for *ballistae* mounted on top of the towers (P. Corder, 1955, 20). There must, therefore, be a real possibility that the bastions belong to an ambitious programme of refortification that was never completed. It is perhaps significant that the two known hollow bastions that provide an exception to the eastern series are found at either end of the group. Bastion 11, located below the vestry of All Hallows Church, London Wall, contains re-used Roman stonework and was erected while the wall's original V-shaped ditch was a conspicuous feature

(R. Merrifield, 1965, 70-2). Bastion 1, nearest to the river, lies hard by the south-east corner of the White Tower where it forms the base of the early medieval Wardrobe Tower (Fig. 17). It was examined in 1879 (E. P. Loftus Brock 1882, 127-32) and again in 1962⁴ and found to contain a double course of broken Roman tiles set in a hard pink coloured mortar. The information available hardly supports the view that the two hollow bastions are of medieval date, they may, therefore, represent a hasty effort to complete the regular spacing of the solid bastions down the east side of the city in a late Roman or sub-Roman period.

The alteration of the river defences at the Tower might have been part of a much larger scheme to create some form of stronghold in the south-east corner of the city—clearly a position of strategic importance, since it guarded the river approach to the city. By the 16th century there was, in fact, a tradition that the Tower was founded on a Roman fortress (J. Stow 1956, 42) and as late as the 18th century the White Tower was still referred to as 'Caesars Tower'. If a defensive enclosure did exist it might have been expected to influence the development of the early medieval castle, and the alignments of two early ditches in relationship to the supposed sites of Roman bastions has already been commented upon (p. 29). There is no reason to suppose that these two features in themselves reflect any line of Roman fortification that cordoned off the south-east angle of the city, but they do illustrate the potential role that the Roman defences played in the formation of the Tower.

Circumstantial evidence associated with the AD 1190 Bell Tower—the most westerly of the inner curtain towers, and one of Sir Arthur Clapham's suggested river bastion sites—makes it a potentially attractive point for a landward return⁵.

The ground floor chamber of the tower occurs above a massive 18ft solid base. An excavation in the boiler room of the Queens House, a short distance to the north, revealed that the adjoining west curtain was inserted into a mass of clay to the east, the top of which occurred at about 7.50m OD. There is no doubt that this represents an artificial build up since a bore hole survey of Tower Green, immediately to the east, has shown that London clay is reached at 3.70m OD. Presumably this accumulation accounts for the abnormally high level of the ground floor of the Bell Tower and its presence here might be interpreted as part of a pre-existing bank running north along the line of the inner curtain. Of course such a feature might be associated with an earlier medieval phase, perhaps forming part of an outer bailey to the 11th-century castle. If, on the other hand, its origins are much earlier, the implications for Roman London could be considerable.

Of notable interest with regard to late Roman activity within the Tower was the discovery in 1777 of a stamped silver ingot of probable late 4th-century date. This was found, along with gold coins of Arcadius and Honorius, while 'digging the foundations of the new office for the Board or Ordnance' i.e. on, or close to, the site presently being discussed (Miles 1779). Recently three more stamped silver ingots (at least one, and probably all three, found on Tower Hill in 1898) have come to light (K. S. Painter 1981 and R. Merrifield 1983, 242-3). During the later empire officially stamped ingots were probably used for the payment of soldiers and officials and the presence of a late Treasury in London is recorded in the *Notitia Dignitatum*, a late 4th-century document with probable 5th-century additions (RCHM 1928, 7). This reference and the fact that a number of ingots

have been found either in, or close to, the Tower, might suggest the late presence of soldiers or officials in the extreme south-east corner of the city.

Finally there remains to consider what evidence there is for building activity within the hypothetical enclosure. As far as the present excavations are concerned information is sadly missing owing to the Saxo-Norman terracing of the site. The 1979 investigations to the west, however, were more fortunate insofar as part of a mortar floor, literally scraped clean by the terracing, survived to demonstrate that a building had been constructed as a probable appendage to the second riverside wall (G. Parnell 1981, 70–1). These scant remains do in fact represent the latest Roman building work as yet identified within the city.

Further north, the substantial stone building near the corner of the White Tower was refurbished in the mid 4th century, if not later, when new floors, including a tessellated pavement, were laid (G. Parnell *et al* 1982, 100–15). The main part of the structure presumably lies beneath the White Tower and it is interesting to speculate whether this relates to a channelled hypocaust and buttressed wall found near the opposing south-west corner of the keep (G. Parnell *et al* 1982, 132). If the plan of this complex could be established it might help to explain the location of the White Tower itself. The great keep seems curiously cramped against the city defences, and its alignment conforms better with the excavated parts of the Roman building rather than the city wall. In this respect it is worth pointing out that recent work at the White Tower's great counterpart—Colchester Castle—has shown that the plan of the keep, including that of the apse, was determined by the underlying Roman temple (P. J. Drury 1982, 391, fig. 36).

PHASE VIII

Sadly, owing to the Saxo-Norman terracing, little evidence of the sub-Roman history of the site survived. Mortared rubble against the south face of the wall had evidently been laid after the masonry had experienced only superficial weathering (Fig. 11 W7). The material, evidently corework, might belong to some form of platform or raft, though this, and other uncertainties, can only be resolved by further investigations.

PHASE IX

The disclosure of Saxo-Norman terracing on the north side of the second riverside wall provides an intriguing picture of the early medieval history of the site. Similar scarping has been recorded further west, near the Wakefield Tower, during excavations in 1979, and it now seems reasonable to suppose that the clearance extended across the width of the Inmost Ward, if not beyond. One possible explanation for this activity is that the site was levelled for building purposes. As no structural remains were found, however, it might be suggested that the scheme never reached fruition. In the event the clearance was of a temporary nature, with the ground level being raised again, possibly using the deposits that had been removed from the site in the first instance.

It is tempting to relate the terracing within the Inmost Ward with the evidence for a possible late Saxon defensive ditch located on the Jewel House site north of the White Tower. Here a post-Roman levelling of the area was followed by the excavation of a ditch on a north-west to south-east alignment, roughly parallel to the Roman river defences. The ditch was accompanied by the remains of a rampart to the south, which indicates that the enclosed area lay within the south-east angle of the Roman city. Shortly after being infilled the feature was cut by a

second ditch, on a south-west to north-east alignment, which almost certainly ante-dated the White Tower (begun *c.* AD 1080) and perhaps formed part of the original Norman enclosure erected during the emergency period that followed the invasion (B. K. Davison 1967).

The relationship between a potential pre-Norman defensive ditch north of the White Tower and the terracing within the Inmost Ward remains to be clarified, but the mere presence of early medieval activity provides further evidence for a continuing military presence in the south-east corner of the Roman city.

PHASE X

Little can be said about the traces of early medieval masonry that overlay the first Roman riverside wall. It should be noted, however, that the earliest documentary reference to the Tower being surrounded by a stone wall was in 1097 when work on the White Tower was probably nearing completion (H. M. Colvin 1963, 707).

Historically the partial remodelling and repair of the southern defences of the Inmost Ward during the 13th century would most readily equate with the large-scale reconstruction of the palace during the early reign of Henry III. Between *c.* AD 1220 and 1238 work within the ward included the building of the Wakefield and Lanthorn towers and the virtual reconstruction of the great hall located between them (H. M. Colvin 1963, 710–5). Given the scale of Henry III's work in this area, it seems reasonable to suppose that the curtain defences were refurbished at the same time.

Of the palace facilities within the ward, only the remains of a single foundation were found. If nothing else this isolated survival demonstrates that palace occupation was located at a level considerably higher than the south side of the ward

now appears. The footing, on a north-south alignment parallel to the Roman landward wall, had evidently formed part of the western limits of a very substantial structure. Its position does not conform with that of the Coldharbour storehouse—a building thought to have contained the carcass of Henry III's hall which occupied the site until the end of the 18th century (see below). This variance, together with the early appearance of the foundation construction, suggests that this foundation was associated with the 12th-century hall which Henry III had rebuilt.

PHASE XI

Of the later medieval additions to the curtain wall, the construction of a buttress against the re-entrant may have reference to the building of some form of tower against the Lanthorn Tower in 1501–2 (H. M. Colvin 1975, 263–4). The structure formed part of the complex of buildings which stood against the west and south sides of the tower, but about whose early history little is known (Plate 13). All these buildings, together with the buttress, were demolished in 1776 to make way for the new Ordnance office (see below).

NOTES

1. At Cooper's Row it was about 4.25m (R. Merrifield *The Roman City of London* 1965, 109 & Fig. 14) at Aldgate between about 4m (J. Maloney 'Excavations at Dukes Place: The Roman defences' *London Archaeologist* Vol. 3, No. 11, 1979, 295) and 7m (H. Chapman 'Excavations at Aldgate 1972' *Trans. London and Middlesex Arch. Soc.* Vol. 24, 1973, 10) and at King Edward Street (R. Merrifield *ibid.* gazetter entry W52, 313) and Central Criminal Court (P. Marsden 'Archaeological finds in the City of London 1966–9' *Trans London and Middlesex Arch. Soc.* Vol. 22, Part 3, 1970, 2–6) 5m.
2. I am grateful to Ralph Merrifield for discussing this matter with me.
3. Tim Williams *pers. comm.* For an interim account see *Popular Arch.* July, 1982, 26.
4. Peter Curnow *pers. comm.*
5. That the second riverside wall extended this far west is supported by the discovery in 1958 of a possible section of the earlier wall beneath Water Lane and to the south of the curtain between the Bell and Wakefield towers (i.e. the presumed line of the later river wall) see G. Parnell 1978, note 2 and Fig. 2).
6. Information kindly given by Brian Davison in advance of forthcoming publication.

II. THE DOCUMENTARY EVIDENCE

The earliest known reference to buildings within the Inmost Ward appears during the reign of Henry II when, in 1171–2, repairs to the ‘king’s apartments in the bailey’ are recorded¹. Subsequently, under the instruction of Henry III, these facilities were greatly improved when existing apartments were repaired and renovated and new buildings erected. This, together with much of the later history of the palace, is well documented and is extensively described in the *History of the King’s Works*².

Throughout the late fifteenth and sixteenth century the Tower became less and less a royal residence, largely because physical constraints prevented any major modernisation of the palace plan. Thus, when in 1532–3 Henry VIII ordered extensive repairs and alterations to the lodgings and apartments of the Inmost Ward, he became the last English monarch to attempt to renovate and improve the old medieval palace at the Tower³.

By the end of the sixteenth century much of the palace was evidently in a poor state of repair. A survey of 1597 depicts the great hall as not only ‘decay’d but roofless (Plate 13) a representation which might suggest that its demise was actively encouraged. No doubt the condition of the palace continued to deteriorate throughout the first half of the seventeenth century and much of it was gradually acquired by the various official departments operating within the Tower⁴.

Following the Restoration, control of the Inmost or ‘Coldharbour’ Ward passed almost entirely into the hands of the Office of Ordnance. Between 1666 and 1676 the Ordnance embarked upon a series of building operations which saw the ward converted into a complex of stores, offices and apartments. The course and extent

of this work has recently been described in detail elsewhere⁵ and for present purposes it will suffice to summarise only those buildings associated with the south-east corner of the ward and the area of excavation (Plate 14).

Immediately north of the Lanthorn Tower, incorporating vestiges of the palace in its build, was the principal office of the Board of Ordnance. West of the Lanthorn Tower, within the curtain re-entrant, stood a chamber block that had originally formed part of the palace complex, but which by now was integrated with the new office at first and second floor levels. The top third floor formed part of the Constable’s lodgings and this was connected to further rooms over a gate that spanned the narrow ward between the Lanthorn Tower and the outer curtain to the south. Both the Constable and the Board of Ordnance made use of the accommodation within the Lanthorn Tower at their respective levels. West of this arrangement, and separated at ground floor level by an alley, was a large storehouse whose basic construction comprised the carcass of the medieval great hall. This had been repaired during the building of the Ordnance office in 1672–3, but by 1685 needed further work on the floor⁶, walls and ceiling⁷, while new windows were punched through the back (north) wall in order to provide additional light⁸.

The Constable’s occupation of the lodgings in and around the Lanthorn Tower appears to have been brief and ownership of the property passed to the Lieutenant of the Tower. It is very doubtful whether the Lieutenant lodged there personally as he was provided with an official residence in the south-east corner of the Inner Ward (the present Queens House). Instead, at least from 1726, the Major of the Garrison appears to have been the occupant⁹, though a reference from 1756 makes it

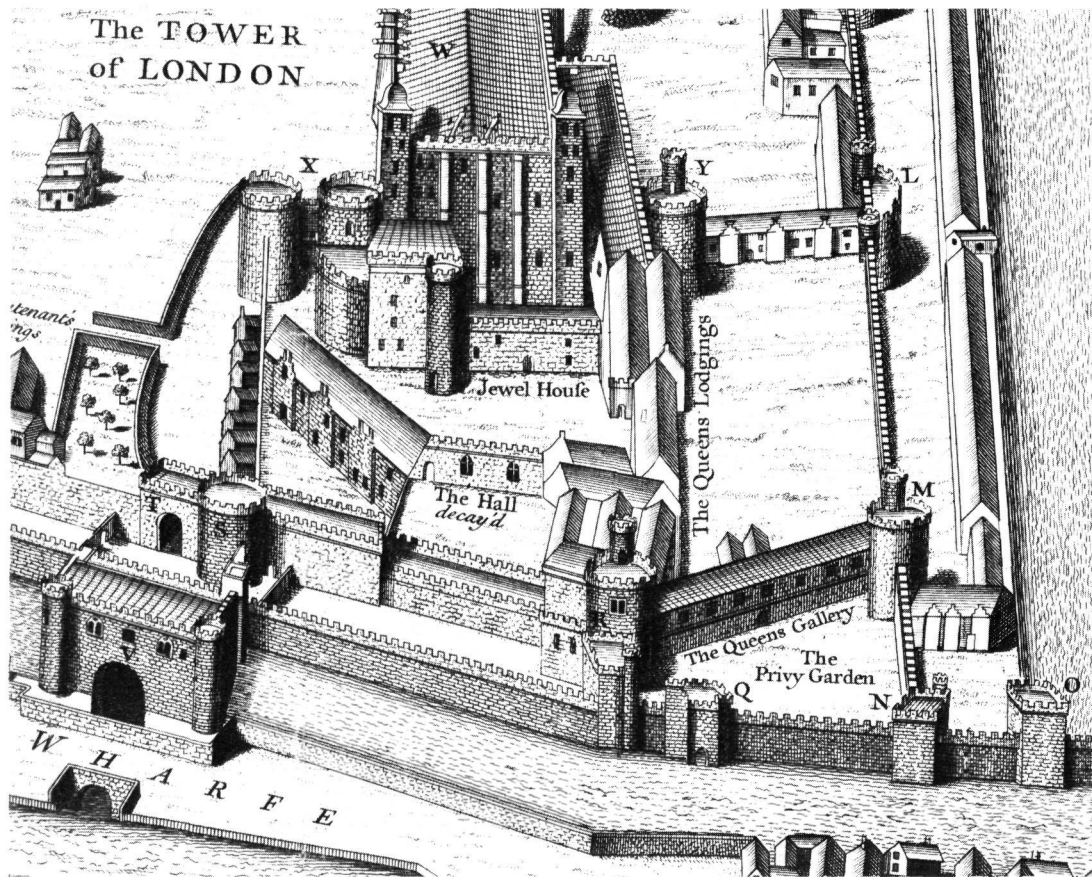


Plate 13 Part of Haiward and Gascoyne survey of 1597 showing south-east corner of Tower and palace plan.

quite clear that his superior the Lieutenant was still the owner¹⁰.

In 1741, the Office of Works, who were responsible for the maintenance of the Major's residence, ordered certain repairs to be carried out there. On 23 September however, their Clerk of Works reported that the property was 'in a much Worse Condition than he Imagined' and that 'the Ordnance had two Storeys under the said Apart, which appear to them so very ruinous, that they desire so much as belong to them may be rebuilt at their own Expense'. The Board of Works sanctioned the scheme with the proviso that the Ordnance 'agree to carry it up Initially at their own Expense to the top of the naked

Floor . . . And the Partition wall and Chimneys quite from bottom to the top'¹¹. There can be little doubt that this statement refers to that part of the Major's quarters located in the old chamber block west of the Lanthorn Tower, and not that over the gate to the south. The gate had in fact been the subject of an improvement scheme the previous year and a surviving survey of that date clearly demonstrates that all of the accommodation over it was occupied by the Major and the Lieutenant's clerk¹².

The awkward division of property in and around the Lanthorn Tower was only resolved some years later after a serious fire in 1774. The conflagration occurred

on 2 January¹³. It began in the apartments of Mr Joseph Sparrow, Clerk in Ordinary to the Ordnance, who lived immediately east of the Lanthorn Tower in part of the old Palace 'Queens Gallery' which was attached to the curtain wall between the Salt Tower and Lanthorn Tower (Plate 14). From here the blaze spread to the Lanthorn Tower and the Major's apartments. The latter was evidently now occupied by its owner—the Lieutenant, the Major having presumably taken up residence in the Queens House, where his successors lodge to this day. Some idea of the scale of the fire is provided by the number of men who attended the blaze from outside the Tower. Altogether the various fire offices and parishes sent 267 men; engines came from the Navy Office and the parishes of St Katherines, All Hallows, Barking and St Dunstan¹⁴.

The Ordnance office appears to have suffered little or no damage during the blaze¹⁵, but in order to reduce further risk the Board ordered an immediate examination of 'all the Chimnies in the Old Buildings in and adjoining the Office and report where any Timbers are improperly placed, and what Kind of Fire Grates are made use of'¹⁶. On 24 November 1775, the Board wrote to General Vernon, Lieutenant of the Tower, to 'acquaint him that the Damage done by the late fire in the Tower make it also likely necessary to rebuilt the present Office of Ordnance'. Therefore, they proposed that 'the Old [Lanthorn] Tower, which was partly occupied by him as Lieutenant of the Tower and partly intermixed with the Ordnance Buildings, being in Danger of Falling . . . it will tend to the good of His Majesty's Service if an Exchange be made betwixt the Garrison and the Ordnance

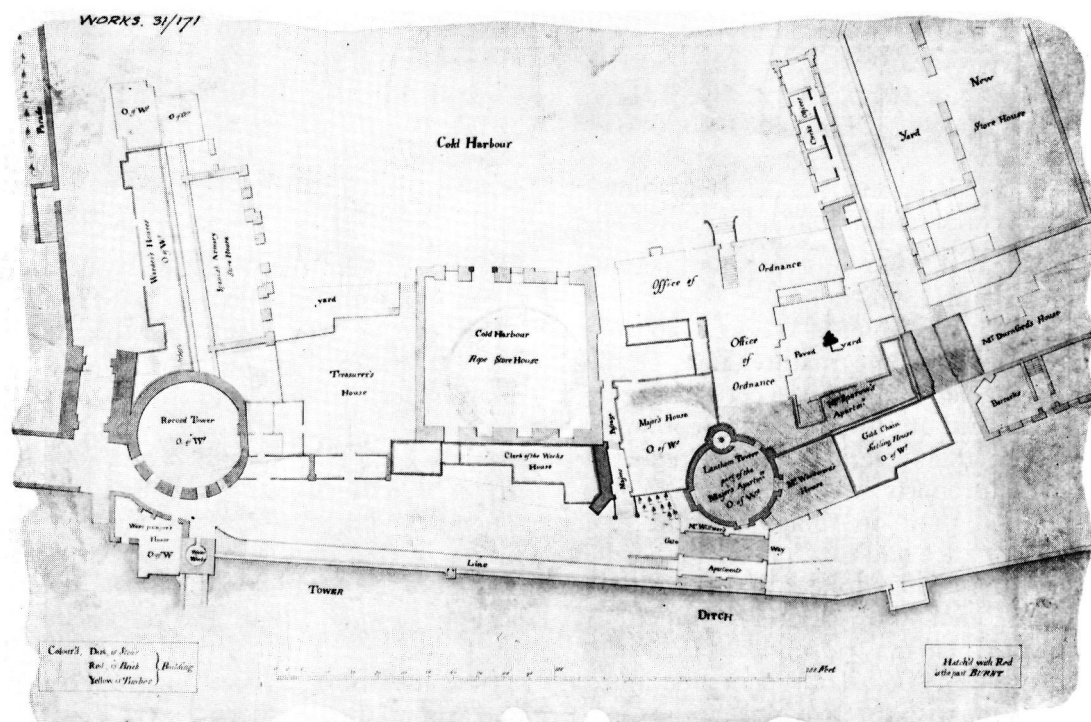


Plate 14 Ordnance plan showing extent of fire damage (hatched area) around Lanthorn Tower in January 1774.



Plate 15 Military arms of Office of Ordnance originally positioned in north front of 1777–80 office building.

by allotting to the Lt . . . the House now appropriated to the Treasurer of the Ordnance in lieu of the Apartments . . . which have been greatly damaged by fire'¹⁷. Shortly after, on 8 December, the Ordnance wrote to the Commissioners of the Board of Works to inform them 'that parliament have made provision for taking down and rebuilding the Office of Ordnance in the Tower' and that in order to expedite matters the Lieutenant had agreed to exchange his residence for that of the Treasurer¹⁸. The Treasury House, located between the old Coldharbour store and the Wakefield Tower (Fig. 18), was transferred to the Lieutenant on 3 June 1776¹⁹.

In order to obtain all the ground needed to accommodate their new office the Ordnance also sought the acquisition of the 'Golden Chain' sutling house which stood against the south side of the old Queens

Gallery 40 feet east of the Lanthorn Tower (Plate 14). This was the property of the Major of the Garrison and in return the Ordnance offered to establish him a new inn in 'part of the Old Barracks fronting the Devils Battery' i.e. a building lying to the east of his existing inn on the opposite side of a gate that passed beneath the centre of the gallery. In addition, the Ordnance sought from him a chandler's shop in the 'Old Tower' on the line opposite the Golden Chain, i.e. the upper chamber of the Cradle Tower²⁰. In response to these moves—which the Board had the power to exact—an indignant Major Collins replied that the 'House at present inhabited by him is the property of the Lieut of the Tower who has a right to possess it when he pleases' therefore he was sure that the Board would 'agree with him that a part of a Common Barracks intermixed with Common Soldiers [was]

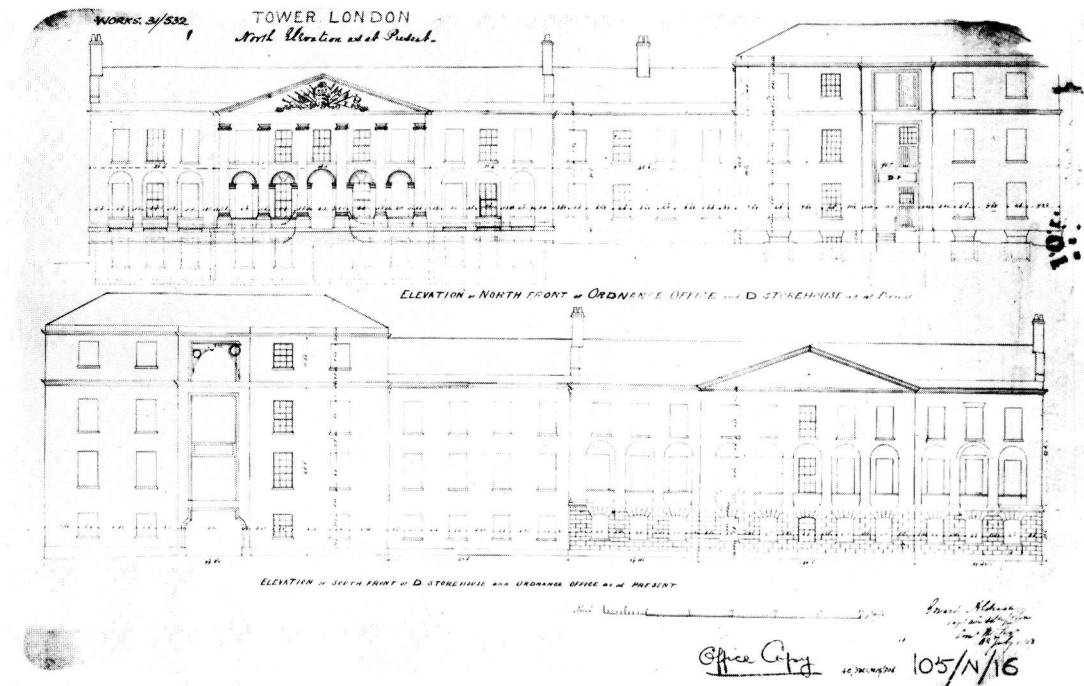


Plate 16 North and south elevations of Ordnance office and stores drawn in 1853.

an improper residence for the Major of the Garrison and his Family'²¹. Despite these objections the Board pressed ahead with their preparations and on 5 June 1776, Mr John Vidgen, their assistant Clerk of the Works at the Tower, reported that 'by pulling down the Old [Lantern] Tower a part of the Office will be laid open which would be attended with some inconveniences'. He suggested, therefore, that before any demolition took place a temporary office be established elsewhere. The proposal was agreed upon and it was ordered that a house occupied by the Surveyor General should be fitted out as a temporary office²². Although the building does not appear to have been ready to receive the office staff until January 1777²³ the dangerous state of the Lanthorn Tower demanded immediate attention, and on 19 June 1776, Mr Vidgen was able to report that 'the Old round Tower is

pulled down so low as to make it entirely safe'²⁴.

The order to proceed with 'taking down the old Buildings and Clearing the Ground for Building a New Office in the Tower' was issued on 3 December 1776²⁵. As the operation got underway the most immediate problem to arise was the disposal of large amounts of old building material and rubbish which began to accumulate on site. The situation reached a point whereby on 28 January the bricklayer reported that he could no longer continue with demolition²⁶. Evidently attempts were made to stock pile reusable material elsewhere in the fortress, for by April the Board was being informed of a mass of old timber from the site which 'greatly incumber Tower Wharf'²⁷. In fact, excluding material retained for re-use in the new building or offered for sale, nearly 11,000 cart loads of rubbish were

taken off the site between March and September 1777²⁸. Initially it had been proposed to take the rubbish onto the wharf where, in a similar operation 40 years earlier, 'Colliers and other Ships took it away for Ballast'²⁹. The scheme was never reinacted, however, since Trinity House refused Royal Navy participation while an estimate to engage alternative private shipping was deemed 'Slow and Tedious' and too expensive anyway at 3/6d per ton³⁰. In the event, therefore, it was decided to cart the rubbish a short distance outside the Tower where it could be spread over Little Tower Hill. This final decision was itself subject

to delay after the Governor of the Tower refused to allow the carts to pass over a drawbridge which had just been constructed near the south-east corner of the fortress (i.e. on the site of the extant East Drawbridge)³¹ and a hasty letter had to be despatched to his superior, the Lieutenant, asking him to 'give the necessary Orders for the Accommodation of the service since the Business is at a Stand'³².

On 21 April 1777 the Board was informed that most of the demolition had been completed and if the mason was supplied 'with a sufficient Quantity of stone the Basement Story might be got up



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Plate 17 Ordnance office and stores viewed from east end of Wharf in 1882.

this Summer'.³³ During the next three years work on the new building proceeded briskly and by August 1779 was sufficiently well advanced to enable an order to 'place the Office Arms in the Pediments . . . in the North front' to be issued³⁴. The arms are now in fact the only visible trace of the building, having survived the fire of 1788 and the subsequent heightening of the building in 1854 (see below) they were set aside during the final demolition of the office in 1882 and placed in the south wall of the New Armouries building where they have remained largely unnoticed to this day (Plate 15).

On the last day of December 1779, the assistant Clerk of the Works reported that the new office would be ready for possession in May or June of the following year³⁵. Accordingly, between January and June the carpenters were busy equipping the building with presses, bookcases and other office furniture³⁶. However, the estimated completion date appears to have been a little premature and between July and September the masons were still paving³⁷ while the bricklayers, amongst other things, were installing chimney pots³⁸. One reason for the delay appears to have been a 'misunderstanding' between the master carpenter and his team which resulted in the men walking off the site during January³⁹.

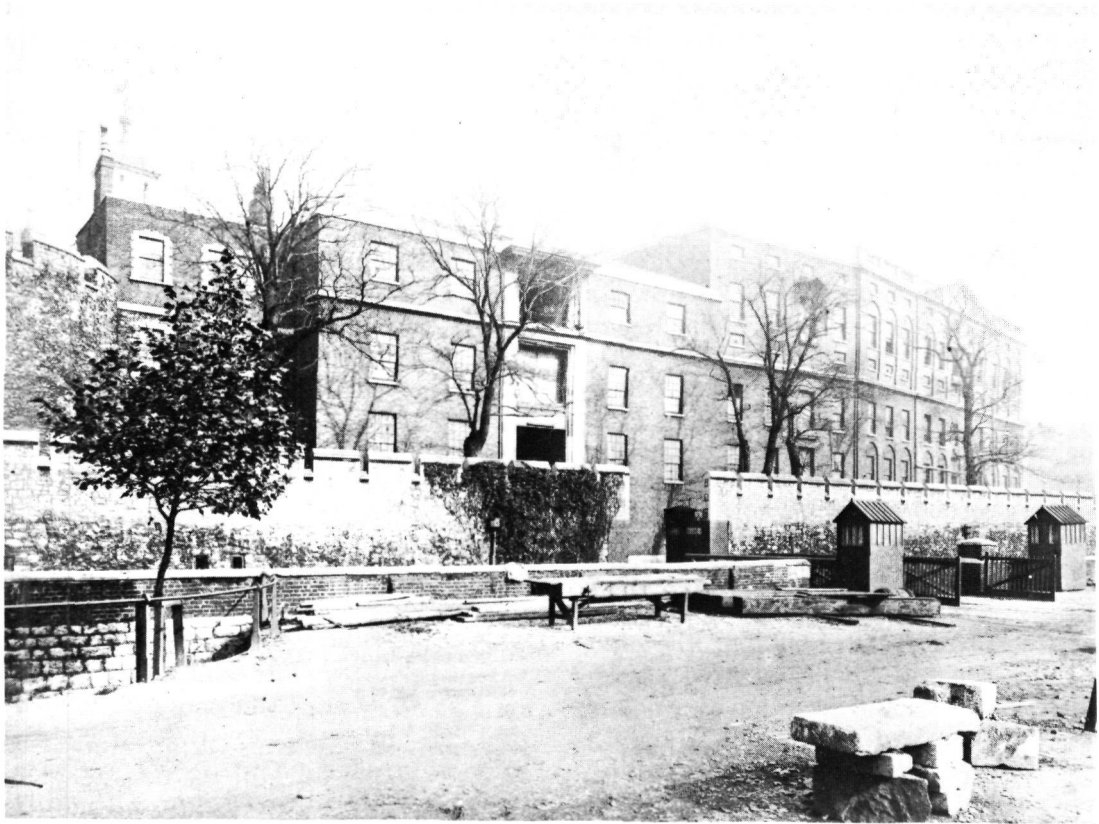
Though accounts itemising all labour and materials expended on the new building are extant⁴⁰, no contemporary drawings appear to have survived and as a consequence the plan and appearance of the office is not easily determined. The basic structure was probably some 100 feet square and comprised two storeys and basement. The walls were built of brick with elevational details picked out in gauged brickwork and stone. The principal entrance was located on the north front and was furnished with handsome portico *in antis*; almost certainly that

shown on the 1853 elevation (Plate 16).

At some stage after the construction of the office had begun, the old storehouse to the west (i.e. former medieval hall) was provided with a new extension. The first explicit reference to this is found on 18 November 1780 when the Ordnance ordered 'that the new addition to the Cordage Storehouse in Cold Harbour be covered with Plain Tyling'⁴¹. A month later a second directive authorising that '2 unstable Iron Guns be fixed at the door way of the new Building to the Cordage Warehouse' was issued⁴². The second order almost certainly relates to an estimate prepared during the previous April for 'a Pair of strong new Gates for the New Storehouse in the Tower'⁴³. The only other obvious reference to the work is by way of a plumber's account settled on 31 December 1780 for 'laying new gutters and supplying New Rain Water Pipes at the new additional Building adjoining to the Rope Storehouse in Cold Harbour'⁴⁴. Though the position of the new annex is not stated, there seems little doubt that it was against the west end of the store on ground previously occupied by the old Treasury House (Fig. 18)⁴⁵.

Only eight years after its completion the new office was seriously damaged by fire on 23 July 1788. The extent of the fire, like the earlier one of 1774, is indicated by the number of fire engines and men that came to the Tower to fight the blaze. No fewer than 13 appliances and 257 men were sent from the Royal Exchange Assurance, London Assurance, Westminster Fire Office, Phoenix Fire Office, Union Society, St Dunstons in the East, Guildhall and Navy Office. Their numbers were in turn swelled by the Ordnance's own fire fighting team together with soldiers of the garrison and a team of labourers⁴⁶.

Six days after the conflagration an Ordnance enquiry team reported on the likely



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Plate 18 View from Wharf in 1882 showing (from left to right) Wakefield Tower, Record office, 'D stores' and Ordnance office.

cause of the disaster. They found that the 'Fire originated in a Closet in the upper Storey . . . used as a Water Closet from whence it communicated to the Roof'. Whether the 'Closet was maliciously set on Fire or the Fire happened from Carelessness or Neglect' could not be established. In all probability, however, it was concluded that the fire was the result of an accident since 'no trace of any Combustible Ingredients was found in or about the Building'⁴⁷.

The 'reforming and rebuilding' of the office appears to have got underway by January 1789⁴⁸. Besides the restoration of the existing building one of the principal tasks was the construction of a new extension 20 feet to the west. To accommodate

this the old Cordage Storehouse had to be demolished, while the recently erected addition to it was retained as an appendage to the enlarged office. The archaeological evidence also indicates that the south wall of the 1777–80 building was re-sited slightly further to the north, presumably to bring the frontage in line with the new extension and thereby widening the narrow space between the office and outer curtain wall (Fig. 18). The reconstruction of the office was no less an undertaking than the work completed eight years earlier and not until December 1782, four years after work had begun, was the building nearly ready for occupation⁴⁹.

Even before the abolition of the Ord-

nance in 1855, the Board broke with a long tradition and moved their principal office away from the Tower. By 1854 the greater part of the Tower office was employed as a store and in that year was provided with an additional third floor⁵⁰. To an increasingly antiquarian-minded section of the general public this was viewed with alarm since it represented an obvious blight on the ancient fortress. For the building itself the inverted relieving arches forced through the heart of the structure (p. 27) to support the extra floor must have done much to destroy its internal plan and appearance. Externally the elegant proportions of the building were unbalanced while the portico on the north front suffered much damage with the removal of the pediment. In an act of vanity, which did little to improve the appearance of the building, the tympanum was hoisted into a new position high upon the south elevation overlooking the river (Plate 17).

Thirty years later, increasing hostility towards the former office culminated in the Board of Works pressing for the demolition of the 'storehouse which shuts out the Tower from the River'⁵¹. By now, in fact, the condition of the building was deteriorating so rapidly that the Board was able to state that it 'has now become so dilapidated in the upper stories it is no longer profitable to store goods of any baulk there'⁵². By November 1882 the materials of the main part of the building i.e. former Ordnance office, were auctioned off to a gathering of builders and other dealers, the vast amount of brick, stone, ironwork and lead fetching only the paltry sum of £1,320⁵³. Within weeks of the sale much of the site had been cleared and the Office of Works was able to begin its lamentable reconstruction of the Lanthorn Tower and adjacent curtain wall to the east. The 'D-Stores' at the west end of the building was retained for a few

years 'in order that facilities may be left for shipping purposes'⁵⁴. By September 1885, however, all its contents had been transferred elsewhere and demolition was underway. With the removal of the store and the adjacent 'Record Office' to the east (Plate 18, Fig. 18) the reconstruction of the curtain wall to the west of the Lanthorn Tower was set in motion. Work was completed in 1888.

NOTES

1. H. M. Colvin (ed) 'The Royal Castles' *The History of the Kings Works* Vol. II (1963), p. 708.
2. *Ibid.* pp. 706-79 & Vol. III (1975) pp. 266-69.
3. *Ibid.* Vol. III pp. 264-8.
4. G. Parnell 'The Tower of London: The Reconstruction of the Inmost Ward during the reign of Charles II' *Trans. London and Middlesex Arch. Soc.* Vol. 31 (1980) p. 147.
5. G. Parnell *Ibid.* pp. 147-56.
6. WO51/30 f. 138.
7. WO51.31 f. 109.
8. WO47/15 f. 121 and WO47/16 f. 29.
9. WORK 31/27.
10. WORK 6/17 f. 151.
11. WORK 4/8 entry dated 23 Sept.
12. WORK 31/158.
13. *Gentlemen's Magazine*, Monday 31 January 1774. Almost all subsequent accounts have confused this blaze with the second fire of 1788 (p. 42).
14. WO47/83 pp. 78-9.
15. *op. cit.* in note 13.
16. WO47/83 p. 11.
17. WO47/86 p. 280.
18. *Ibid.* p. 311.
19. WO47/87 p. 512.
20. *Ibid.* p. 477.
21. *Ibid.* pp. 528-9.
22. *Ibid.* pp. 480-1.
23. WO47/89 pp. 95-6.
24. WO47/87 p. 512.
25. WO47/88 p. 339.
26. WO47/89 p. 95.
27. *Ibid.* p. 461.
28. WO51/271 pp. 273 & 292. 276 p. 40. 277 p. 123. 278 p. 25.
29. WO47/89 pp. 24-5.
30. *Ibid.* pp. 63 & 96-7.
31. WO55/5 ff. 1-2, WO55 417 p. 95.
32. WO47/89 p. 161.
33. *Ibid.* p. 461.
34. WO47/94 p. 109.
35. *Ibid.* p. 409.
36. WO51/301 pp. 164-5.
37. *Ibid.* p. 125.
38. *Ibid.* p. 3-4.
39. WO47/95 p. 80.
40. WO51/266-302.
41. WO47/96 p. 915.
42. WO47/97 entry 1115.
43. WO47/95 p. 319.
44. WO51/297 p. 64.
45. The east wall of the extension together with remains of the earlier Treasury buildings were located by excavation in 1979.
46. WO47/112 pp. 129-30 & 175-6.
47. *Ibid.* pp. 110-1.
48. The building accounts for the entire operation are listed in WO52 31-61.
49. WO47/120 pp. 639-40.
50. *The Builder* Vol. 43, p. 604.
51. WORK 14/1/15 p. 7.
52. *Ibid.* p. 10.
53. *op. cit.* in note 50.
54. *op. cit.* in note 51, p. 79.

III. THE DENDROCHRONOLOGY by JENNIFER HILLAM

The oak timbers from the 1976 and 1977 excavations at the Tower of London (Parnell 1977, 1978) were examined at the DOE Dendrochronology Laboratory in 1979, and some preliminary results obtained (Hillam and Morgan 1979). Recent progress in tree-ring research (Hillam and Morgan 1981a; Sheldon and Tyers 1984) has resulted in the production of a 507-year London reference chronology for the Roman period, and this has made it possible to date the Tower timbers absolutely.

Six samples (192–4, 196–8) were taken from foundation piles of the first riverside wall (Phase VI). Piles from this wall have also been found at Baynard's Castle (Hill *et al* 1980), New Fresh Wharf and St Peter's Hill in the City of London. The samples were originally thought to date to the 4th century. The remaining three samples (199–201) came from the foundations of a structure, or structures thought from archaeological evidence to be late 1st or 2nd century in date (Phase IVa).

TREE RING ANALYSIS

The samples were reduced by sawing to thin sections. These were deep frozen and cleaned with a Stanley surform so that the individual rings were clearly visible in cross-section. The ring widths were measured on a travelling stage connected to a display panel. The timbers had between 42 and 93 annual growth rings (Fig. 21). At least 10 to 20 rings were lost from the beginning of the ring sequences because the centres of the piles were decayed at the pith. Samples 198 and 201 were rejected because they had less than 50 rings. The ring patterns of the remaining samples were represented as graphs, known as tree-ring curves, on semi-logarithmic recorder paper, which allows the curves to be compared visually by sliding one graph over another until the best fit is found.

PHASE IVa. THE SECOND CENTURY TIMBERS

Visual comparison of 199 and 200 showed that they correlated well with each other. A computer program (Baillie and Pilcher 1973), which gives an objective assessment of a tree-ring match, confirmed this result; it produced a *t*-value of 5.24. (A value greater than 3.5 indicates a match, provided the accompanying visual match is acceptable—for more details see Baillie 1982 82–5). Both timbers retained all their sapwood rings. They were felled during winter or early spring of the same year.

No precise dating was found for these timbers in 1979, but they have since been dated by comparison with City and Southwark 88. This chronology covers the period 252 BC to AD 255, and is made up from 88 timbers from Southwark and the City of London. The data for this chronology were provided by dendrochronologists at Sheffield, Southwark and Oxford, and were put together by Ian Tyers (Sheldon and Tyers 1984). The chronology dated timber 199 to AD 41–126 (*t* = 3.58), and 200 to AD 34–126 (*t* = 3.52). The two timbers were therefore felled in late AD 126 or early AD 127 (Fig. 20).

PHASE VI. THE FIRST RIVERSIDE WALL TIMBERS

Timber samples had previously been examined from sections of the wall found at Baynard's Castle (Morgan 1980) and New Fresh Wharf (Hillam and Morgan forthcoming), and relative dating obtained between the two sites. By examining the oak piles from the Tower, it was hoped to tie in a further stretch of the riverside wall.

The tree-ring sequences were compared with each other. Possible matches were found between 194, 196 and 197, but these have now been rejected. No crossdating was found with New Fresh Wharf, but 196 crossmatched with the Baynard's Castle chronology with a *t*-value of 3.51 (see Fig. 19 for relative dating).

Comparison with the new City and Southwark 88 chronology, and with its constituent chronologies, produced better results (Fig. 20). The last rings of 193, 194, 196 and 197 date to AD 238, 237, 241, and 217 respectively (192 was not dated). None of the dated samples had any sapwood except for 196, the last ring of which was the transition between heartwood and sapwood (AD 241). Allowing about 15–30 years for the missing sapwood, a felling date of AD 255–270 is obtained for the river wall timbers.

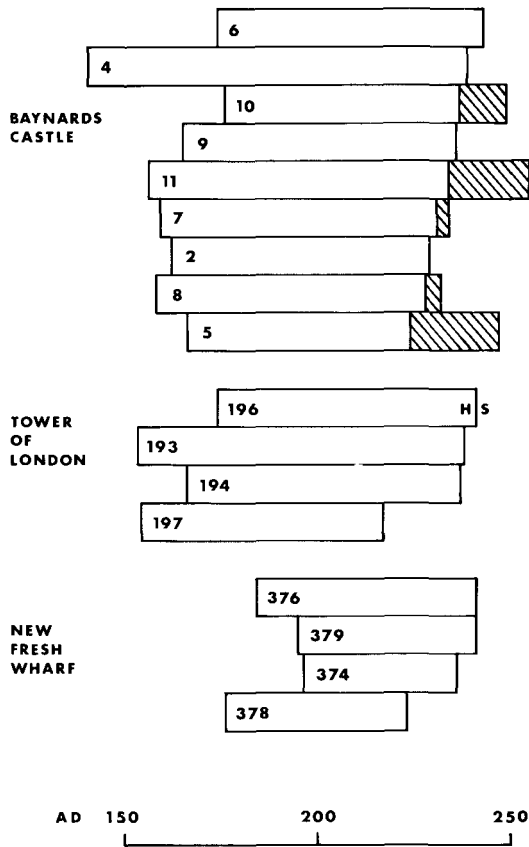


Fig. 19 Inmost Ward 1955–77: Bar diagram showing relative positions of riverside wall ring sequences from Baynards Castle, Tower of London and New Fresh Wharf. Hatching—sapwood; HS—heartwood-sapwood transition. The estimated felling date for the timbers is AD 255–70.

DISCUSSION

The riverside wall timbers come from young trees which were less than 120 years old when felled, and the quality of the crossmatching between the individual ring sequences from the Tower is very poor. This suggests that the timber resources, which produced a supply of fine timbers for the 1st and 2nd century revetments in the City (Hillam and Morgan 1981b), were diminishing, and that by the second half of the 3rd century only poor quality young trees were available.

The relative dating of the timbers from Baynard's Castle, New Fresh Wharf and the Tower of London (Fig. 19) shows that they were probably contemporary, although this does not necessarily indicate that the three stretches of wall were built simultaneously. The Tower and New Fresh Wharf timbers have outer rings which are very similar in date. The timbers may have been felled at the same time. The Baynard's Castle timbers, on

No.	Date span	H/S	Felled	t-value
199	AD 41–126	103	126/7	3.58
200	AD 34–126	107	126/7	3.52
193	AD 153–238	—	255–70	3.67
194	AD 166–237	—	255–70	4.12
196	AD 174–241	241	255–70	4.20
197	AD 154–217	—	255–70	3.60

Fig. 20 Inmost Ward 1955–77: Summary of tree ring dates.

the other hand, are more variable: the heartwood-sapwood transition of 5 BC is AD 224, whilst the outer measured heartwood ring of 6 BC is AD 243. This difference could be accounted for by varying amounts of sapwood, or alternatively the timbers may have been taken from a heterogeneous stock of timber. Riverside wall timbers from a fourth site, St Peter's Hill, will shortly be examined at Sheffield, and it is hoped that the results of that study will clarify the situation.










No.	No. of rings	Sapwood rings	Average width (mm)	Dimensions (cm)	Sketch
192	59	13	2.28	23 × 24	
193	86	—	1.53	18 × 25	
194	72	—	1.89	17 × 26	
196	68	1	1.79	18 × 26	
197	64	—	1.58	23 × 24	
198	42	—	2.40	18 × 22	
199	86	24	1.87	33 × 33	
200	93	20	2.26	36 × 40	
201	44	13	2.94	20 × 22	

Fig. 21 Inmost Ward 1955-77: Details of timbers.

IV. THE FINDS

PREHISTORIC

THE FLINT

by D. J. FIELD

A total of forty nine pieces of flint were recovered from the tops of the prehistoric river silts (Layer 1) and the fill of F1 (Layer 2), a large pit cutting through them. A single example (No. 11) derived from the fill of the late Iron Age burial (Layer 3), though its Mesolithic character indicates that inclusion was probably accidental.

Most of the pieces were in good condition with several having feather sharp edges. The raw material is mostly river pebble, though several pieces resemble Downs flint, and unrolled cortex on one suggests that some at least were carried overland from parent rock. The dominant colour is grey, though several pieces are stained through shades of amber. One or two pieces are glossed, though most retain a fresh opaque appearance, in some cases with mottled milky inclusions. No patination is evident except on the reused piece.

No discrimination appears to exist between the use of flakes and blades, both being present in roughly equal numbers, though it must be emphasised that the assemblage is too small to make any statistical analysis worthwhile. No tools in the formal sense are present, but a large number of flakes have been utilized in some way. The proportion of utilized pieces to waste is in fact so large as to suggest that the knapping site was some way distant. Significant pieces are described below.

(Figs. 22 & 23)

1. Pointed blade with signs of use of both edges at tip. (Layer 1).
2. Flake with no bulb of percussion visible. The tip has been worn to a round profile. (Layer 2).
3. Sturdy flake, possibly a core trimming. Distal end with spur or parrots beak point that has signs of utilization. Minute spalling occurs on left side of the upper edge. (Layer 2).
4. Flake with signs of wear on right dorsal face for its entire truncated length. (Layer 2).
5. Flake with attrition at the distal end of the left edge extending to the extreme tip. Spalls removed across the burin face indicate that edge being used with pressure. (Layer 2).
6. Projectile shaped blade. Left dorsal edge portrays spalling and attrition for three quarters of its length. (Layer 2).
7. Waste flake with attrition between spurs and with steep retouch along two thirds of the right edge. (Layer 2).
8. A sturdy flake, wear on right edge of dorsal face. (Layer 2).
9. Shattered flake. Left edge and base have steep retouch. (Layer 1).
10. Blade of microlithic proportions. No retouch or apparent use marks exist. (Layer 2).
11. Blade of microlithic proportions. Very finely made but with indication of use, even at 100× magnification. (Layer 3).
12. Large blade with retouch extending along both edges. (Layer 2).
13. Angular flake with attrition extending along the right edge. (Layer 1).
14. Blade with signs of wear along right concave edge. (Layer 2).
15. Thin transparent flake utilized on its left edge. (Layer 2).
16. Blade with no obvious signs of use, but with burin blow across the back right edge. (Layer 2).
17. Backed blade with spalls detached from left edge of the bulbar face. (Layer 2).
18. Blade with evidence of wear at bulbar end of right edge. (Layer 2).
19. Distal portion of snapped blade, with left edge displaying signs of wear, while the snapped end portrays severe crushing as if used as a fabricator. (Layer 2).
20. Core trimming flake. (Layer 2).
21. Core trimming flake with signs of crushing on left edge. (Layer 2).
22. Fragment of pebble with steep retouch on one edge. (Layer 2).
- 23-26. Series of waste flakes that because of their regular occurrence may have been produced for a particular purpose or as part of a particular method of knapping. The axis of impact is apparently at an angle to the striking platform, with shear waves producing a hinge fracture parallel to the platform and at right angles to previous flake scars, yet retaining force to carry through and follow the course of the adjacent arris. The result may simply be a manner of cleaning the core platform, but alternatively the spurned flake produced would make a ready usable awl. (Nos. 23 and 25-31—Layer 2, No. 24—Layer 1).

Typologically the assemblage could fit easily into any period between the Neolithic and Iron Age. The two small blades Nos. 10 and 11 would normally be considered of Mesolithic character. The association of Iron Age pottery in the same levels however makes this unlikely.

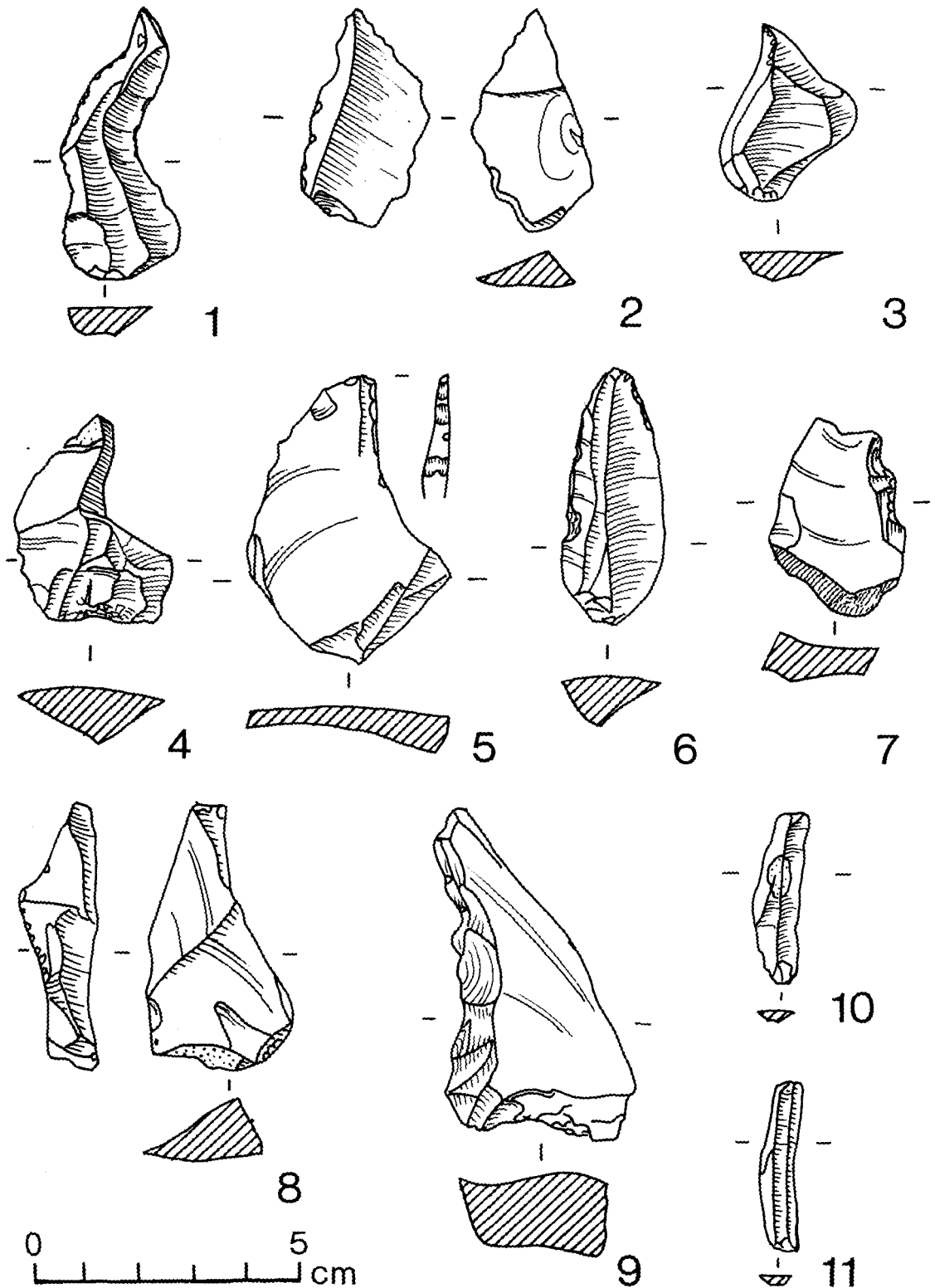


Fig. 22 In most Ward 1955-77: Prehistoric flint Nos. 1-11.

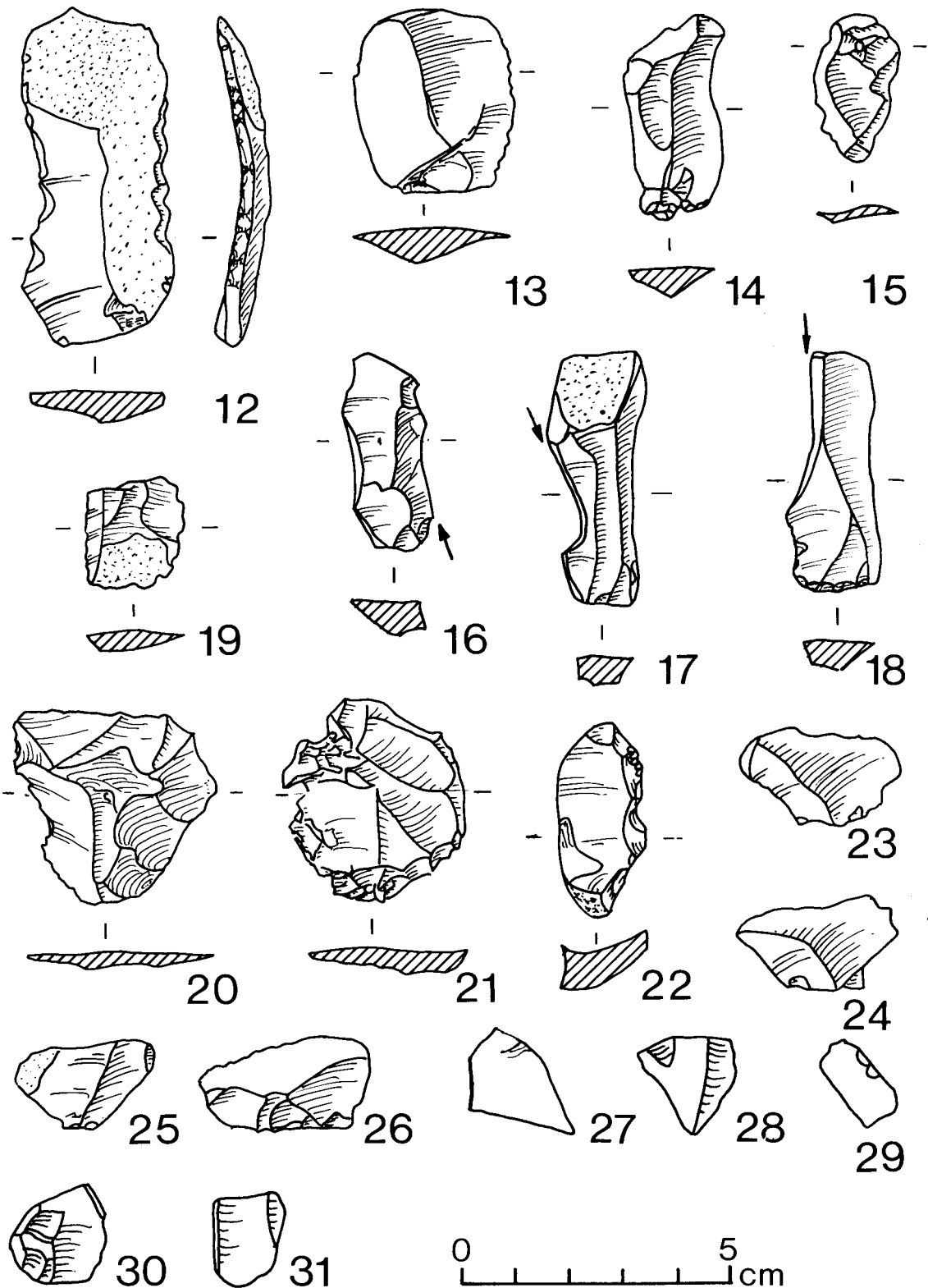


Fig. 23 Inmost Ward 1955-77: Prehistoric flint Nos. 12-31.

THE PREHISTORIC POTTERY

by D. J. FIELD

Twenty one fragments of coarse prehistoric pottery were recovered. Thirteen from the tops of the pre-Roman river silts (Layer 1) and eight from the fill of F1 (Layer 2), a large pit cut into the river deposits. Most sherds are abraded, and all but one contain sparse to medium crushed flint tempering. The core is dark grey, in some cases almost black, with brown to reddish buff exterior. Several pieces have a charred interior. Only four sherds give an indication of form. A simple upright rim, thickening towards the shoulder (Fig. 24 No. 1) from Layer 1, and a footing base (Fig. 24 No. 2) from Layer 2 are illustrated. In addition one sherd from each layer exhibited signs of a slight rounded shoulder. Dating of such an assemblage is difficult. The rim and base would fall easily within Cunliffe's Darmsden Linton group (Cunliffe 1974) which dates from the fifth to third centuries BC. The rounded shoulders are more difficult to place and may correspond to a number of PRIA groups.



Fig. 24 Inmost Ward 1955-77: Prehistoric pottery Nos. 1-2.

HUMAN BONE

by JUSTINE BAYLEY

One skeleton (Fig. 4 F2) dating to the first century, was examined *in situ* then lifted as individual bones and submitted for examination.

The bones were the remains of an immature individual aged 13-16 and almost certainly a male. A probable maximum stature of about 162cm (*c.* 5' 4") was calculated from the formulae of Trotter and Gleser (1958). This can only be a rough estimate as almost all the epiphyses were unfused.

No congenital abnormalities or pathological changes were noted. The skull was slightly cracked and warped, especially around the orbits and on the squamous part of the temporal bones.

All the third molars were present but, as one would expect in an individual of this age, unerupted. The upper left canine was also unerupted, probably because of the retention of

the corresponding milk canine which was unfortunately missing, although its socket was clearly visible. Caries were noted in two of the molars and also slight calculus deposits.

ROMAN POTTERY THE SAMIAN WARE

by JOANNA BIRD

Much of the samian pottery from the excavations came from later levels associated with the Roman city defences and subsequent Saxo-Norman activity. There were some 30 decorated bowls, including a stamped Dr 37 by Censor of Trier and 15 stamped plain vessels.

The South Gaulish wares included material associated with the 1st-century reclamation (Phase IIIb); this was mainly of pre- to early Flavian date, and several pre-Flavian plain forms were present, but none of the vessels need be earlier than *c.* AD 50. Trajanic samian from Les Martres was extremely rare, and the bulk of the samian from the site came from Lezoux and was of Hadrianic-Antonine date. Much of this pottery was mid-late Antonine date, having links with the late material from Pudding Pan Rock, both among the potters represented by stamps or decorative style and in some of the plain forms (notably the later examples of Dr 31: *c.f.* Smith 1907, Fig. opp. 279). East Gaulish wares were present in small quantities and included several unusual plain forms; both Trier and Rheinzabern were represented among the decorated bowls, with a single bowl from the earlier factory at La Madeleine.

Apart from the Gaulish samian wares, the assemblage included two other imported fine-ware sherds of interest. The fragment of wall and applied medallion from a Rhone Valley jar (Layer 32) is only the second example of this ware to be recognised from Britain (see below). The sherd from an African red-slip dish (Layer 35), though less unusual (*c.f.* Bird 1977) is sufficiently uncommon to be worthy of note.

Fig. 25 No. 13.

Fragment of jar (probably as Déchelette 1904, Vol. 2, Fig. on 236) with part of applied medallion, manufactured in the Rhône Valley. The scene on the medallion cannot be certainly identified, as only part of a body and a lock of hair survive, but it is closely similar to the figure of Scylla on Déchelette's No. 88. The dating of these vessels depends largely on certain of the inscribed medallions, which include a bust of Geta and a presentation of Armenia which probably refers to the wars of Marcus Aurelius (Déchelette's Nos 93

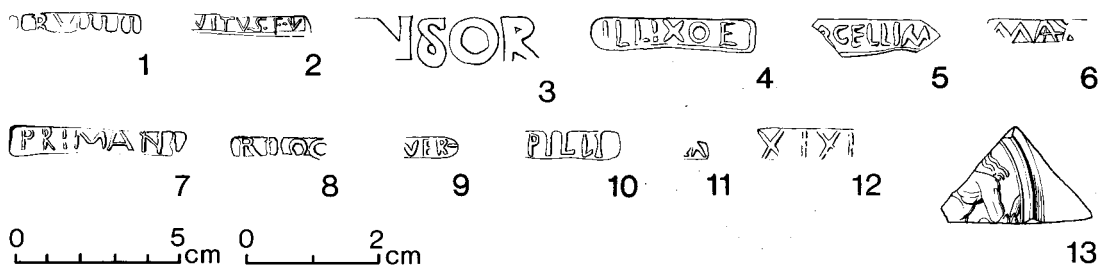


Fig. 25 Inmost Ward 1955-77: Samian Nos. 1-13.

and 96): i.e., at least Antonine to early 3rd century. Apparently the only other example of a Rhône Valley vase from Britain was found at Fishbourne (Cunliffe 1971, Vol. 2, 152, No. 4 and pl. 22b) and depicts a gladiatorial scene. (I am grateful to Dr Kevin Green for discussing the identification and date of this sherd.)

THE SAMIAN POTTERS' STAMPS by BRENDA DICKINSON

1. Albucianus, 6a, 31 [A] LBVIANI¹ Lezoux¹. Albucianus is one of the potters whose work occurs at Pudding Pan Rock, and at least seven examples of this stamp come from there. It has also been recorded at Catterick. *c.* AD 165-200. (Layer 35).
2. Avitus ii, 1a, 33 (tiny), [∧] VITVS.F.V. Les Martres de Veyre¹. He apparently only made cups and may have used one die. The significance of ... F.V is not known (it was also used at Les Martres by Dagomarus). There are eight examples of this stamp in the London Second Fire deposits. *c.* AD 100-125. (Layer 32).
3. Censor ii, 1a, 37, [CĒ]NSOR Trier¹, Haute-Yutz¹. Censor was one of the later Trier potters, and bowls with this stamp occur at the late-Antonine foundations of Holzhausen and Niederbieber. Late 2nd or early 3rd century. (Layer 35).
4. Illixo, 6a, 33, ILLIXO.E Lezoux¹. This stamp appears on forms 18/31, 18/31R and 27, but also on forms 80 and Ludowici Tx. It has been noted at Old Kilpatrick, as has another of his stamps. Illixo also made decorated bowls with decoration belonging to the early or mid-Antonine periods. *c.* AD 145-175. (Layer 35).
5. Marcellus iii, 1b, 18/31R,]RCELLIMA² Lezoux². This stamp has not been noted by us before. His forms and distribution show that Marcellus' main activity was before *c.* AD 150, but he occasionally made forms 79R and 80. A range *c.* AD 130-160 should cover the possibilities. (Layer 17).
6. Maximinus i, 9a, 31R, M X [MI] Lezoux¹. There are examples of this stamp from Bainbridge, Chesterholm, Cramond (presumably from the Severan occupation) and South Shields. *c.* AD 180-200. (Layer 27).
7. Primanus iii, 6d, 33, PRIM NI¹ Lezoux¹. Primanus' work belongs mainly to the late Antonine period. It occurs in the Wroxeter Gutter and

at forts in the Hadrian's Wall system. This particular stamp has been recorded from the Brougham cemetery and Pudding Pan Rock. *c.* AD 160-200. (Layer 35).

8. Reogenus, 1b, 31, RIIOG[ENIM] Lezoux¹. This stamp is probably one of his later ones, since it was used on forms 31R and 79R. It appears only once on form 27, which was not uncommon in his output. It occurs at Catterick and on Hadrian's Wall, but not in Scotland, though there are many stamps there from one of his other dies. *c.* AD 155-175. (Layer 27).
9. Severus i—Pud(ens), 3a, 18, [OF.SE] VER+. The first potter of this association is clearly (from the lettering) Severus of La Graufesenque. The other is quite likely to be Pudens, though the name never goes further than PUD ... The die originally ended in ... R.P, but the P was chipped almost immediately, and subsequent impressions, which are much more common than the original, give ... R+. The site recorded is entirely Flavian, and includes Caerleon, Cardiff, Corbridge and the Nijmegen fortress. *c.* AD 70-90. (Layer 9).
10. Uxopillus, 6a, 33, [VXXO] PILLI Lezoux². Uxopillus' forms include 31, 31R, 38, 80 and Ludowici Tr. This particular stamp occurs on forms 31R and 38 and has been noted at Catterick. Another comes from the destruction deposits of the Wroxeter forum. *c.* AD 160-190. (Layer 32).
11.]M on form 18/31 or, more probably, 31, Central Gaul. Presumably Antonine. (Layer 27).
12.]X[XI on form 18/31R, Central Gaul. Almost certainly illiterate. Hadrianic or early Antonine. (Layer 32).

¹ Indicates a die found at the kiln site; ² shows that another die, but not this one, of the potter have been found at the kiln site.

THE AMPHORAE by CHRIS GREEN

Over 75kg of amphora sherds were recovered in the course of the excavations. Although they cannot in themselves do more than help to confirm the dating of contexts and phases, the

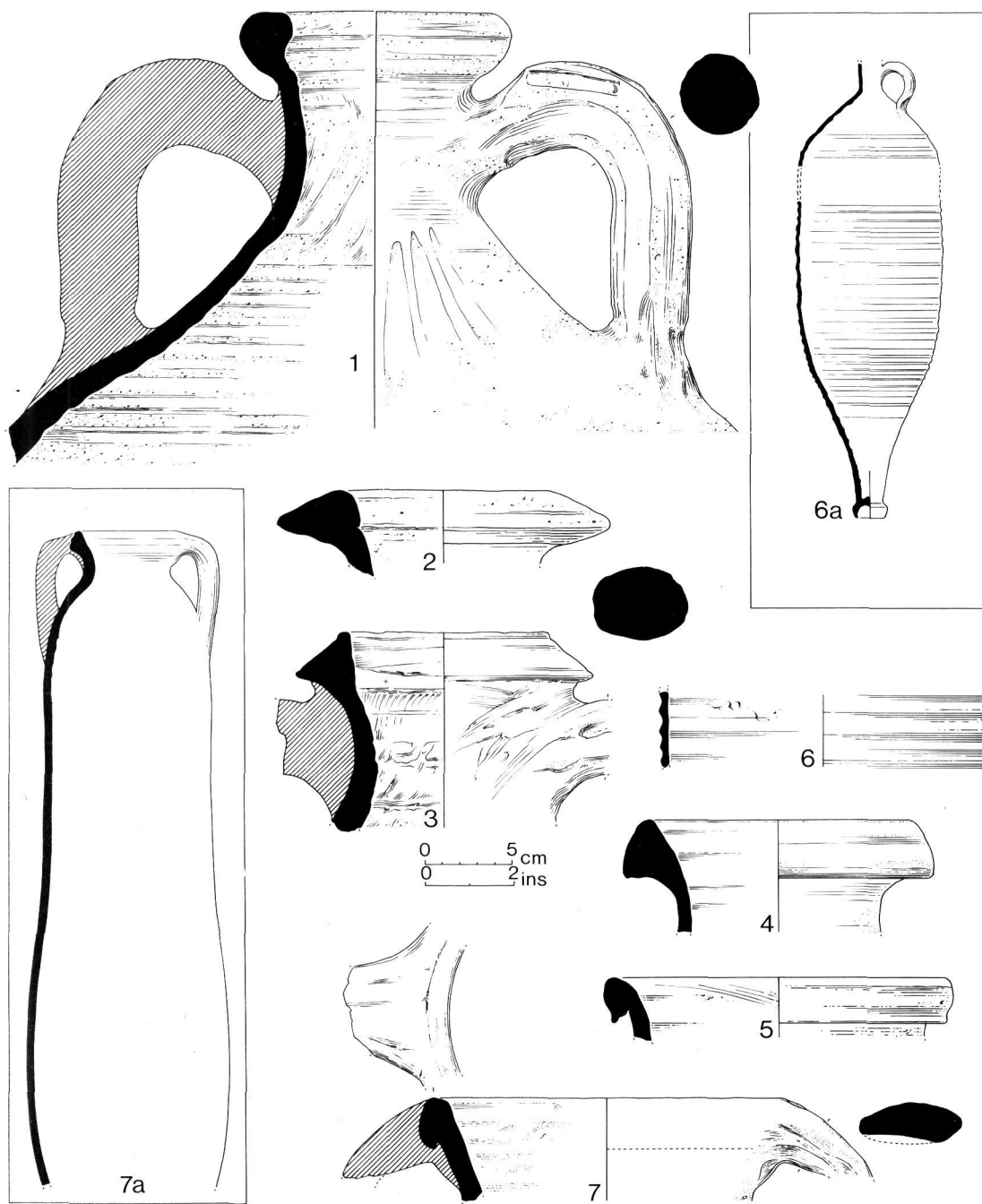


Fig. 26 Inmost Ward 1955-77: Amphorae Nos. 1-7a.



Fig. 27 Inmost Ward 1955-77: Stamped Amphorae Nos. 1-2b.

amphorae provide further useful information on the sources of commodities reaching London after *c.* AD 200, and have provided an example of a late Roman type (Almagro 50) previously unknown in Britain.

The stratigraphical distribution of the types found (excluding unidentified sherds, many of which may belong to large flagons rather than amphorae) is shown in Fig. 28.

Dressel 20 amphorae Fig. 26, 1-3; stamps Fig. 26, A1-2.

The familiar globular olive oil amphora from the Gradalquidr Valley of southern Spain, imported from pre-conquest times until the ? early 3rd century AD (see Peacock 1971). As usual in London it is represented by large quantities of sherds, mostly in residual contexts.

1, with a rounded profile, is from the reclamation deposits of phase III (context 10) and is probably Flavian in date; it bears stamp A1.

2 and 3, with angular rim profiles, are typical of later vessels, (Phase V and later) and 3 is probably associated with stamps A2a-b.

Stamp A1: Much abraded but almost certainly the CSEMPOI (die illustrated by Callender (1965) Fig. 6, No. 25 (472b)). CSEMPOI is a contraction of *C. Sempronii polystiti*, and further variants are dated by Callender to *c.* AD 50-90; this example, from Phase IV, is associated with a coin of Domitian, AD 81-96.

Stamps A2a and b: Probably from the handles of a single vessel: a. F SCIM/NIANO (Callender Fig. 16, No. 41 (1579) and b. LIVNI/M/ELISSI.P (die as Callender Fig. 9, No. 23 (879a)). There are continental examples of SCIMINIANO and IVNI MELISSI

stamps occurring on the same vessel, and it is possible that they were always used together. Callender dates them to *c.* AD 160-190, but both the present examples are from post-Roman contexts.

Dressel 30 amphorae (not illustrated). A wine amphora imported from the 1st and 2nd centuries AD, largely from the area around Marseilles (Peacock 1978). Present in most phases, but particularly common in post-Roman contexts, suggesting that importation may have been greatest in the late 2nd century and later.

Camulodunum 186 amphorae (not illustrated). See Peacock 1971. A 1st-2nd century AD type from the Mediterranean coast of Spain, associated with the transport of *garum* and similar products. Occurrences post-Phase 5 are likely to be residual.

Camulodunum 185a amphorae (not illustrated). A 1st century AD form, fairly common in London, from the same source as Dressel 20 amphorae (see Peacock 1971). Represented by residual sherds only.

Dressel 2-4 (koan) amphorae (not illustrated). Wine amphorae, normally of Italian origin, common in London in the 1st century AD (Peacock 1971). A single residual occurrence here.

African cylindrical amphorae Fig. 26; 4 and 5. Large cylindrical amphorae characterised by a red sand and limestone-tempered fabric and a distinctive knife-trimmed or vertically wiped grey or yellow surface produced by washing the vessel in brine before firing (Peacock 1977b). Undoubted sherds are present in Phases IV and VI, which, together with evidence from New Fresh Wharf (Richardson, in press) suggests importation to London on some scale by the early

	Phase							Total
	III	IV	V	VI	VIIa	VIIb	IX-XV	
Dressel 20	6.66	1.58	27.73	2.00	1.10	3.95	25.00	68.02
Dressel 30	0.03	—	0.10	0.24	0.04	0.07	5.00	5.48
Camulodunum 186	0.87	0.17	0.56	—	0.11	0.34	—	2.05
Camulodunum 185a	—	—	—	—	—	0.03	0.03	0.06
Dressel 2-4	—	—	—	—	—	—	0.09	0.09
African	—	0.04	0.03	0.18	—	0.14	1.92	2.31
Micaceous jars	—	—	—	—	—	—	0.01	0.01
Almagro 50	—	—	—	—	—	0.25	—	0.25
Palestinian	—	—	—	—	—	—	0.07	0.07
	7.56	1.79	28.42	2.42	1.25	4.78	32.12	78.34 kg

Fig. 28 Inmost Ward 1955-77: Stratigraphic occurrence of Amphora types (kg).

years of the 3rd century AD. Most of the material, however, was recovered from post-Roman deposits. It included rimsherds 4 and 5 which, although of apparently North African fabric, are not typical of the forms most commonly found in Britain.

Micaceous jars Fig. 26, 6, 6a. Post-Roman deposits produced a single sherd of highly micaceous red-brown thin-walled amphora, readily recognisable as one of the single-handled vessels of eastern Mediterranean origin described by Peacock (1977a). They occur from the 3rd century AD in south-east England, although there appear to be rare instances of earlier vessels. A 3rd century example from Bath (after Cunliffe 1970) is shown as Fig. 6a, at $\frac{1}{4}$ scale.

Almagro 50 amphora. Fig. 26, 7, 7a. The single sherd, identified by Dr D. P. S. Peacock, was recovered from a late 4th century pit (F.12) associated with the second river wall (Phase VIIb), and seems to be the only known example of the type from Britain. The most immediately distinctive feature of Almagro 50 is the tall narrow cylindrical body and the attachment of the handles flush with the top of the rim. The fabric is fine, grey-brown with beige surfaces, and without distinctive features in the hand specimen. Thin sectioning of this example does however provide some possible guides for recognition: the dark brown, almost opaque clay matrix is packed with well-sorted inclusions, c. 0.1mm, among which angular/splintered quartz predominates, but limestone fragments and very many fossil foraminiferae form some 30% of visible inclusions. Laths of muscovite mica are common, and a few fragments of feldspar and ferromagnesian minerals can be seen. Opaque inclusions (iron ore etc) are not visible.

Fig. 7a shows a near-complete specimen from Ampurias, Tarragona, Spain, after Beltran Lloris, 1970, Fig. 220. Beltran dates the form to the 3rd and 4th centuries, and gives Spain as the likely area of production (*ibid*; also Beltran 1978). A well dated 3rd century example is known from a wreck at Marseilles (Gassend 1978).

Palestinian amphorae (not illustrated). Five small sherds of rilled amphorae in red or grey fabrics with abundant inclusions of wind-polished quartz sand and limestone. These amphorae are found in Dark Age contexts in western Britain (Thomas 1959) but it is now known that they occur in 4th-early 5th century contexts in London, as was presumably the case here, although all the sherds are from post-Roman contexts.

THE OTHER ROMAN POTTERY by FIONA CAMERON

INTRODUCTION

The most important group of Roman pottery from the excavations came from material which had been dumped behind the second riverside wall at the time of its construction (Phase VIIb). It is a well-stratified group, securely dated by

numismatic evidence to the final years of the fourth century AD, and although it included a certain amount of residual material, its significance for the study of late Roman pottery in London is evident.

The pottery from the first and second-century phases (Phases III and IV) was not significant and need not be discussed here. That derived from the internal bank of the c. AD 200 landward defensive wall (Phase V) has been published in detail elsewhere (Parnell 1982) while the pottery probably associated with the construction of the first river wall (Phase VI) and subsequent dumping (Phase VIIa) is here confined to a discussion of the diagnostic pieces which help provide the dating evidence for these contexts.

PHASE VI (Layer 27)

The majority of the fine wares in this group consist of colour-coated vessels from the Nene Valley but there are some, especially from the earlier periods, which may have been produced locally or at Colchester and others which were imported from the Continent.

The Nene Valley vessels include: a beaker with a plain rim and rouletted decoration on the exterior c.f. Howe *et al* (1981) Fig. 29, No. 34 late 2nd to early 3rd century; a beaker with everted rim (c.f. Nene Valley Guide Fig. 5, No. 48), 3rd century; a beaker with a bead rim c.f. (Nene Valley Guide Fig. 5, No. 50) 3rd century. There is also a sherd from a beaker with under-slip barbotine lattice decoration probably late 3rd century and another from a beaker with curvilinear underslip barbotine decoration which is probably not later than late 3rd century (Howe *et al* 1981, 8). There are two beakers which seem from the fabric to come from the Colchester area rather than the Nene Valley and may date to the mid to late 2nd century (Anderson 1980, Fig. 13). There are several body sherds which are probably from vessels in 'Rhenish' fabrics, more precisely from Central Gaul and Trier, including one with white painted decoration on the exterior which is probably from Trier late 2nd to mid 3rd century AD. It seems that these wares were probably not being imported into Britain much after mid 3rd century (Greene 1978, 19). There is one sherd from a beaker with rough-cast decoration, a type which was actually being produced in Britain in the 2nd century but this example is probably imported and therefore from an earlier period (c.f. Green 1978, 17). There are two sherds of mica-dusted ware which may have been produced in London though not after mid 2nd

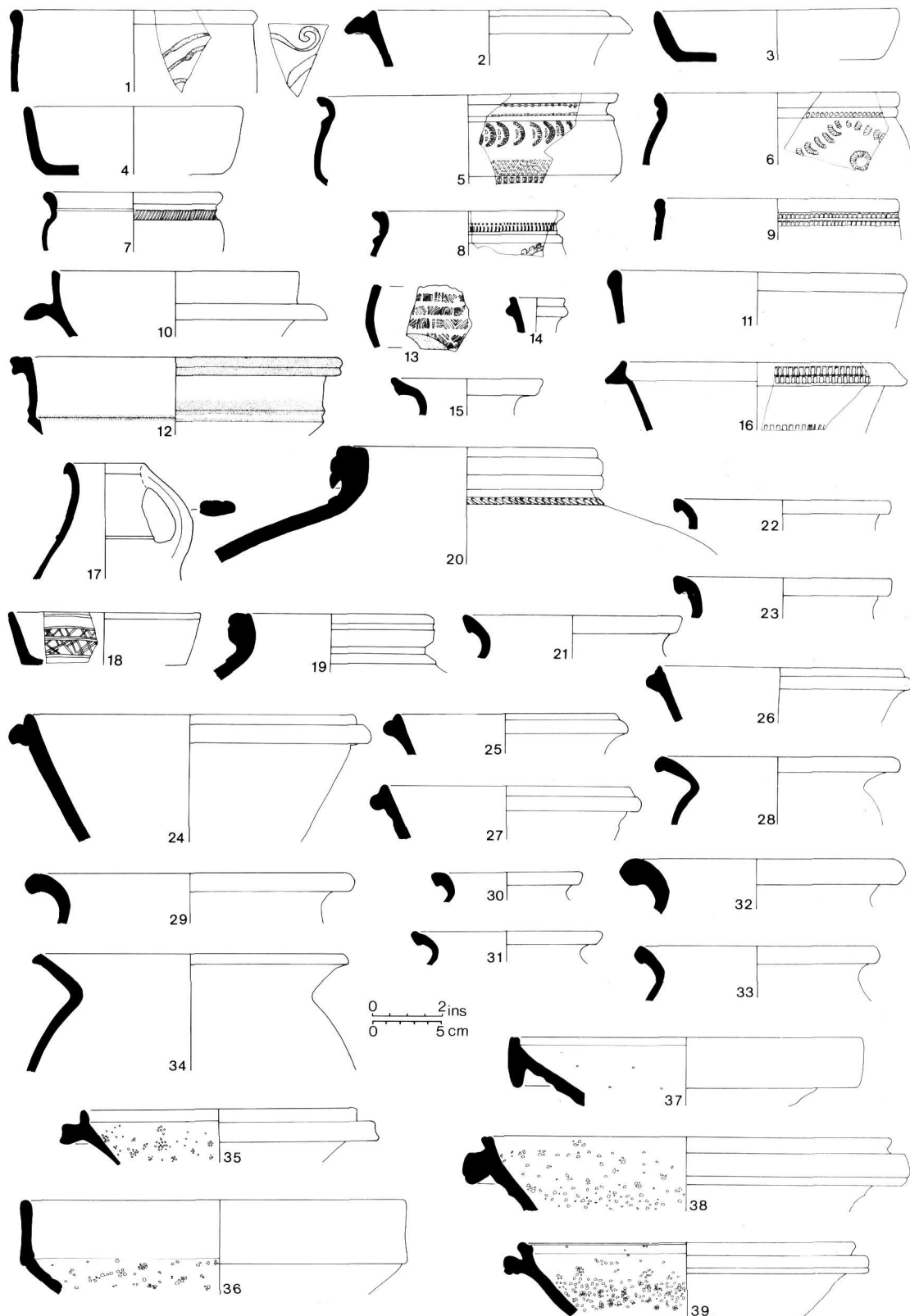


Fig. 29 Inmost Ward 1955-77: Other Roman pottery.

	No. of Sherds	Percentage	Total for Group
<i>Reduced Wares</i>			395 = 51.4%
Alice Holt	34	8.6%	
Black-burnished	3	0.8%	
Mayen	4	1.0%	
Overwey	5	1.3%	
<i>Fine Wares</i>			174 = 22.6%
Oxford	93	53.4%	
Nene Valley	33	19.0%	
? Colchester	5	2.9%	
Argonne	2	1.1%	
Other Imported	13	8.4%	
<i>Oxidised Wares</i>			180 = 2.3%
Overwey	48	26.6%	
Oxford Parchment	1	0.5%	
<i>Other Wares</i>			
Shell-gritted	4		
Mortaria	15		
			<i>Total of Group</i> 769

Fig. 30 Inmost Ward 1955-77: Pottery Quantification table.

century, and one of London ware which is probably late Flavian in date (see Southwark p. 536 for a discussion of these fabrics). Poppyhead beakers may also be included here, since they occur in both reduced and oxidised fabrics. There are several sherds of this type which occur in Southwark in the early to mid 2nd century (c.f. Southwark types III.F.4-6).

The course wares in this group occur in both oxidised and reduced fabrics though mainly the latter. Grey sandy fabrics predominate, some probably from the Alice Holt kilns, but there are also a good number of BB1 vessels. Bowls or dishes with rounded or triangular bead rims occur frequently c.f. Southwark type IV.H. which is common from the late 2nd century onwards although there are some examples similar to Southwark Nos. 1763 and 1767 which are found in second half of 3rd-century contexts. Dog-dishes are also common c.f. Southwark type IV.J of mid 2nd century onwards, but there are also variants e.g. Southwark 1345 in a 3rd-century context and Angel Court Nos 191 and 192 with a groove beneath the rim in a late 3rd to 4th-century context. There are several flanged bowls all in BB1 fabrics with parallels in Southwark Nos. 1808, 1861 and 1865 which are in second half of 3rd-century contexts, and No. 568 in a mid to later 3rd-century context. Jars with everted rims sometimes 'cavetto', usually occur in grey sandy fabrics although there is one BB1 example, and are paralleled at Angel Court

No. 152, in the late 3rd to 4th century. They are also similar to Alice Holt type 3.C c. 220-mid 4th century and Southwark No. 943 in a late 3rd to 4th-century context. There are also some small jars or beakers with short everted rims c.f. Southwark No. 1745 in a second half of 3rd-century context as well as a jar with a slight lid-seating c.f. Southwark No. 1840 of the second half of the 3rd century also. There are two vessels among the reduced wares which are probably residual, a jar of Southwark type II.G. 2 dated AD 100-150, also similar to Alice Holt type 1.28 dated AD 150-180 and another jar rim with a parallel in Southwark No. 768 in a Flavian context. There is a single BB1 tankard similar to Angel Court No. 158 of late 3rd to 4th-century date and Southwark No. 1691 of early 3rd century although Gillam (1976, Fig. 2) dates the type to mid to late 2nd century.

Among the other wares is a flagon rim in a gritty off-white fabric of Southwark type I.B.5 dated to the Hadrianic period and therefore residual. There are two unidentifiable fragments of mortaria as well as a rim sherd with a form very similar to some made at Colchester in Kiln 25 (c.f. Fig. 89, No. 13) possibly, as has been suggested for other mortaria, a 2nd century innovation, and type No. 498 of the late 2nd to 3rd century (Hull 1963, 116). It is also paralleled internally to Group 12 dated to the late 4th century. There is also a single body sherd of shell-gritted fabric.

Several of the vessels in this group are of long-lived types such as dog-dishes and bead-rimmed bowls which can go back as far as the middle of the second century, but the predominance of late 3rd century or later types, such as flanged bowls and cavetto rim jars, probably indicates that they are all contemporary. The latter variants of the dog-dishes and the tankard seem to support this conclusion. There are also several Nene Valley colour-coated types characteristic of this period, whilst the Colchester and Rhenish colour-coated vessels are probably residual. A late 3rd-century date for the group would thus seem most likely.

PHASE VIIa (Layer 28)

The majority of the fine ware sherds from this group are from the Oxford region and include a bowl of Young type C.46 dated AD 340–400, a body sherd from a vessel with white-painted decoration only common in the last quarter of the 4th century (Young 1977, 133) as well as a colour-coated mortarium. There is also a bowl in Hadham ware of late 3rd to 4th century (c.f. Orton 1977), colour-coated ware with the white overslip barbotine decoration characteristic of the later periods of production and a funnel-necked beaker with a bead-rim c.f. Nene Valley Guide Fig. 5, Nos 51 and 52, probably 4th century. Imported fine wares include a sherd of Argonne ware which is probably 4th century and a beaker rim, probably from Trier and not likely to be later than c. AD 250 (Green 1978, 19) and therefore possibly a survival in use.

There are few diagnostic sherds among the oxidised wares but they do include a large number of fragments of Overwey ware, datable to the 4th century (Lyne and Jeffries, 37).

The reduced wares consist mainly of dog-dishes as well as a BB2 pie-dish—both are long-lived types beginning c. mid 2nd century in London c.f. Southwark types IV.H. and IV.J. There is another variety of dog-dish, however, with a groove below the rim similar to Southwark No. 1368 in an early to mid 4th century-context and a flanged bowl of Alice Holt type 5.B.8 dated AD 270–420. Also probably from Alice Holt is a grey ware jar with cavetto rim covered with a whitish slip c.f. Alice Holt type 3.B. dated mid 3rd century onwards. The other grey ware jars are probably residual and include several rims of Southwark II.D. and II.C types which are usually 1st or 2nd century, as well as an unusual jar with a heavy bead rim with internal thickening similar to 1st-century forms, in a coarse, gritty pale grey fabric.

As a whole this group is clearly late 3rd to 4th century but includes a certain amount of residual material.

PHASE VIIb (Layer 30, 31 and 32)

This group has been presented as it stands, since the independent dating evidence eliminates the need for parallels, although pieces which are known to be residual have been omitted from the illustrations. Fig. 30 shows the proportions by count of the various recognizable wares which occur in this group, in relation to the total number of sherds from the whole site. It should be noted, however, that the identification of Alice Holt ware has suffered from the fact that the pottery was processed before the publication of Malcolm Lyne's corpus (Lyne and Jeffries 1979) and it is not always possible to distinguish them from the other reduced wares. It is probable, therefore, that the proportion of Alice Holt sherds is, in fact, much greater than that which is shown here. This bias is somewhat redeemed by the proportions of the much more distinctive Overwey products of the Alice Holt industry, sometimes known by Fulford's appellation of 'Porchester D' ware (Cunliffe 1975, 299). The fact that these vessels were so readily identifiable, means that the figures in this case give a much more accurate picture.

The identification of the fine wares presented no major problem, with the exception of some of the colour-coated sherds, which are not from the Nene Valley, but whose attribution to the Colchester kilns is by no means certain.

PHASE IX (Layers 35 and 38)

Although all the Roman pottery in this group is residual in its medieval context, its similarity to the pottery of Phase VIIb seems to bear out the stratigraphical evidence for the excavation and redeposition of the material in its original location. A comparison of the proportions of the wares in this group (Fig. 31) with those of Phase VIIb (Fig. 30), will serve to confirm this interpretation. It is almost certainly due to the problems of the identification of Alice Holt grey wares that the figures for the two groups of reduced wares do not relate to each other except in their overall totals and percentages for the group as a whole. In the case of the fine wares, however, where identifications are much more certain, the proportions of the various wares are strikingly similar, as is the occurrence of fine wares on the site as a whole. Although the far greater numbers of oxidised wares in Phase IX is difficult to explain, it is interesting to note that

the proportion of the Overway sherds within this category, are almost identical.

Fig. 29

1. Bowl: orange fabric with grey core, orange colour-coat with white painted decoration on exterior. Probably Nene Valley. (Layer 32).
2. Flanged bowl or dish, white fabric, red-brown colour-coat. Nene Valley. (Layer 32).
3. Dish: pale orange fabric, brown-orange colour-coat. Nene Valley. (Layer 32).
4. Dish: white fabric, brown colour-coat. Nene Valley. (Layer 32).
5. Bowl: orange fabric, red colour-coat with rouletting and rosette stamps on exterior. Oxford region c.f. Young type C75. (Layer 32).
6. Bowl: orange fabric, red colour-coat with rosette stamps on exterior. Oxford region, c.f. Young type C75. (Layer 32).
7. Bowl: orange fabric, red colour-coat with rouletting on exterior. Oxford region, c.f. Young type C77.4. (Layer 32).
8. Bowl?: orange fabric, red colour-coat with rouletting and white painted decoration on exterior. Oxford region. (Layer 32).
9. Dish or bowl: orange fabric with grey core, orange colour-coat, with rouletting on exterior. Oxford region, c.f. Young type C86. (Layer 35).
10. Bowl: imitation Drag. 38, brownish fabric with brownish colour-coat. Oxford region, c.f. Young type C51. (Layer 32).
11. Dish or bowl: sandy orange fabric with red colour-coat. ? Oxford region. (Layer 32).
12. Bowl: fine cream fabric with orange painted decoration. Oxford Parchment ware, c.f. Young type P24.3. (Layer 30).
13. Decorated sherd: orange fabric with brownish core, orange colour-coat with roller-stamped decoration on exterior. Argonne ware. (Layer 32).
14. Flagon: micaceous pink fabric with buff surfaces. (Layer 32).
15. Flagon: gritty reddish fabric, cream slip on exterior and upper part of interior. (Layer 35).
16. Dish or bowl: gritty orange-buff fabric with thin grey core and roller-stamping on top of rim. (Layer 32).
17. Flagon: sandy grey fabric, burnished on rim. Alice Holt c.f. type 8:10. (Layer 32).
18. Dish: pale grey sandy fabric, darker, burnished interior with two rows of criss-cross burnished lines. Alice Holt? (Layer 32).
19. Large storage jar: pale grey sandy fabric with burnished exterior. Alice Holt c.f. type 1A.16. (Layer 32).
20. Large storage jar: pale grey sandy fabric, darker surfaces with burnished exterior. Alice Holt c.f. type 1A.20. (Layer 30).
21. Jar: gritty buff fabric, partially reduced exterior. Overwey type. (Layer 32).
22. Jar: gritty grey fabric. Overwey type. (Layer 32).
23. Jar: gritty grey fabric. Overwey type (Layer 32).

	<i>No. of Sherds</i>	<i>Percentage</i>	<i>Total for Group</i>
<i>Reduced Wares</i>			1514 = 50.7%
Alice Holt	14	0.9%	
Black-burnished	26	1.7%	
Mayen	2	0.1%	
Overwey	13	0.8%	
<i>Fine Wares</i>			711 = 23.8%
Oxford	312	43.9%	
Nene Valley	132	18.6%	
? Colchester	24	3.4%	
Argonne	2	0.28%	
Other Imported	104	14.6%	
<i>Oxidised Wares</i>			655 = 22.0%
Overwey	162	24.7%	
<i>Other Wares</i>			
Shell-gritted	48		
Mortaria	52		
			<i>Total of Group</i> 2982

Fig. 31 Inmost Ward 1955-77: Pottery Quantification table.

24. Flanged bowl: sandy grey fabric with burnished interior, partially oxidised. (Layer 30).
25. Flanged bowl or dish: pale grey sandy fabric with dark grey burnished surfaces. (Layer 32).
26. Flanged bowl or dish: sandy fabric with finely burnished surfaces. (Layer 32).
27. Flanged bowl or dish: pale grey sandy fabric with dark grey burnished surfaces. (Layer 32).
28. Jar: Pale grey sandy fabric, burnished on exterior and inside rim. Alice Holt? (Layer 32).
29. Large jar: gritty grey fabric. (Layer 32).
30. Jar: gritty grey fabric with darker surfaces. (Layer 32).
31. Jar: gritty grey fabric. (Layer 32).
32. Large jar: coarse, gritty brownish-grey fabric. (Layer 32).
33. Jar: pale grey sandy fabric. (Layer 32).
34. Jar: sandy grey fabric with burnished surfaces. (Layer 30).
35. Mortarium: grey fabric, orange surfaces, red colour-coat, pink and white quartzite grits. Oxford region c.f. Young type C100.2. (Layer 32).
36. Mortarium: orange fabric with grey core, orange colour-coat, pink and white quartzite grits. Oxford region, c.f. Young type C98.3. (Layer 32).
37. Mortarium: gritty pale pink fabric with white surfaces, ? white quartzite grits. (Layer 32).
38. Mortarium: gritty off-white fabric with pink core, darker slip on exterior, pink and white quartzite grits. Oxford region c.f. Young type M22.18. (Layer 31).

SMALL FINDS

by HUGH CHAPMAN

(Unless otherwise stated, objects are of Roman date)

COPPER-ALLOY (Figs. 32, 33)

1. Miss Jean Macdonald writes:

Brooch, corroded and incomplete, made in one piece. The arched, D-sectioned bow has two short wings at its head, and at the other end is broken off at a point where it appears to be expanding into a moulding. The spring presumably had four coils: two remain on the left-hand side. The external chord is held down by a hook terminating slightly above the bow. The rest of the spring and the pin are missing. A longitudinal groove down the bow is presumably a remnant of decoration. Length 29mm, width across wings 5mm.

The brooch is apparently a Camulodunum Type XV (Hawkes and Hull 1947, 320, Pl. 95, Nos. 117-9). It would originally have had a long foot with catch-plate, separated from the bow by the now fragmentary moulding, and the hook over the chord would probably have been finished off with a knob.

Calmulodunum Type XV has been identified as a La Tène III (late Iron Age) form developed mainly in Germany in the later 1st century BC-early 1st century AD, the series ending in the Claudian era (AD 41-54) (Hawkes and Hall 1947, *loc. cit.*; and for the Aylesford and Swarling brooches, Stead 1976). The brooches seem rare in Britain. A typologically late example from the Sheppen site, Colchester, came from a context dated about AD 49-65 (Hawkes and Hull 1947, 56, 101, 320, No. 119). The Tower brooch appears to resemble more closely another, typologically earlier, Colchester specimen, collected during pipe laying at Sheepen Road (Hawkes and Hull 1947, 22, 320, No. 118). It is redeposited therefore in a gravel surface associated with the early second century timber foundations. (Layer 14).

2. Brooch, much corroded, pin missing; short arms formed by spring corners; bow decorated by raised ridge; catch plain and originally unperforated. Collingwood Group H, 'Dolphin' brooch. 1st-2nd century AD, redeposited therefore in pit (F12) associated with construction of second river wall. (Layer 30).
3. Brooch, pin and half of spring coil missing; short arms formed by spring covers; bow decorated by raised ridge; catch-plate plain and unperforated. Collingwood Group H, 'Dolphin' brooch. 1st-2nd century AD, redeposited therefore in 3rd century river wall construction trench. (Layer 27).
4. Fragment of finger ring (?); thin strip of metal; half of surviving length decorated with transverse incised grooves. From Saxo-Norman dumping and therefore redeposited. (Layer 35).
5. Finger ring (?); heavily corroded; thin strip of metal, surface details unclear; ends overlapped to compress to smaller diameter. From dumping contemporary with construction of second river wall. (Layer 32).
6. Fragment of bracelet; approx. 25mm of total circumference surviving; D-shaped section with beaded decoration, c.f. Clarke (1979, 307, Nos. 164 & 165, Fig. 37 and other references cited) where two late 4th-century graves at Lankhills cemetery had similar bracelets. From dumping contemporary with construction of second river wall. (Layer 32).
7. Fragment of bracelet; approx. 60mm of total circumference surviving; oval cross-section of main strip body with one stylised animal snake head terminal surviving; method of fastening not clear. From Saxo-Norman dumping. (Layer 35).

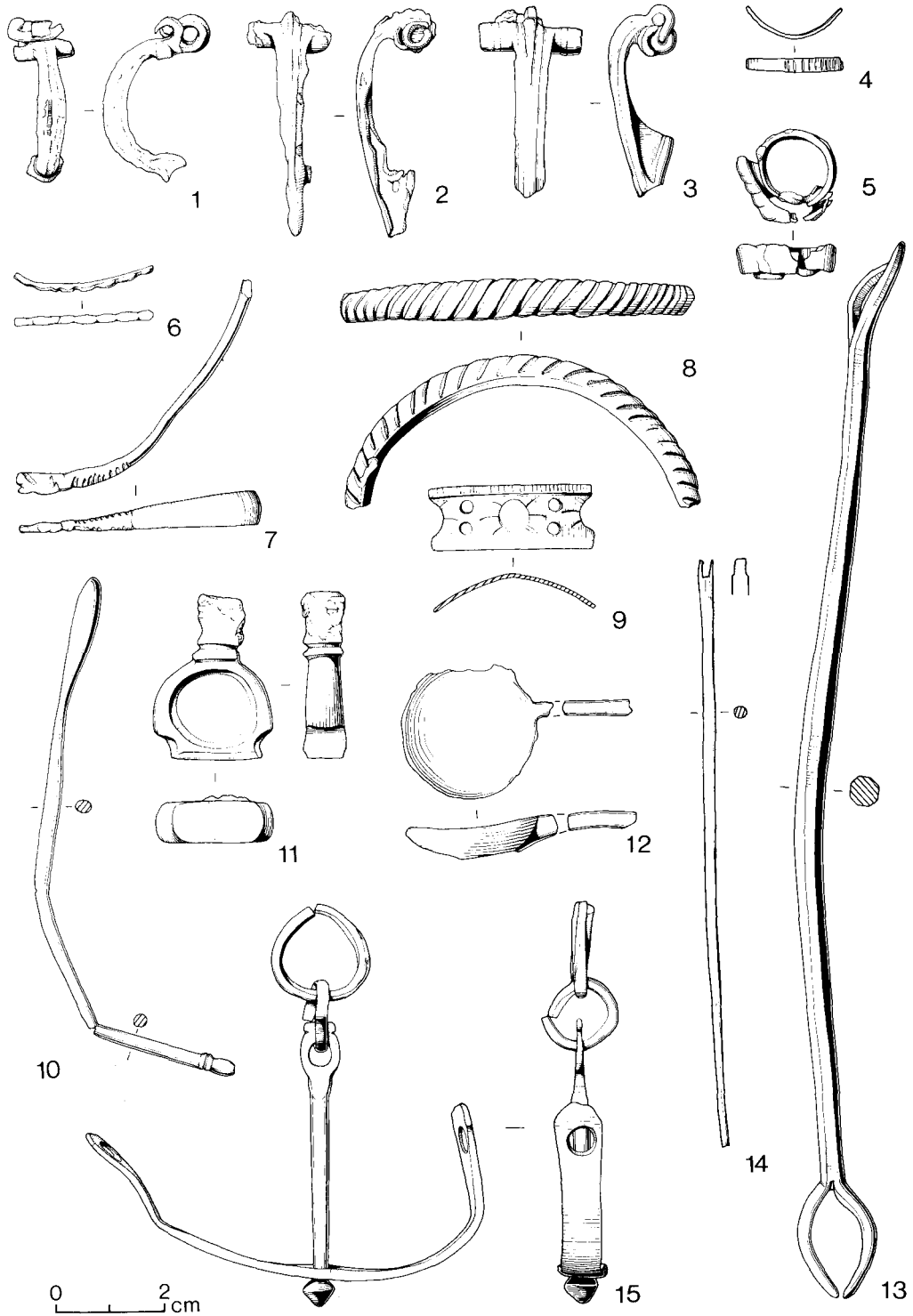


Fig. 32 Inmost Ward 1955-77: Objects of copper alloys Nos. 1-15.

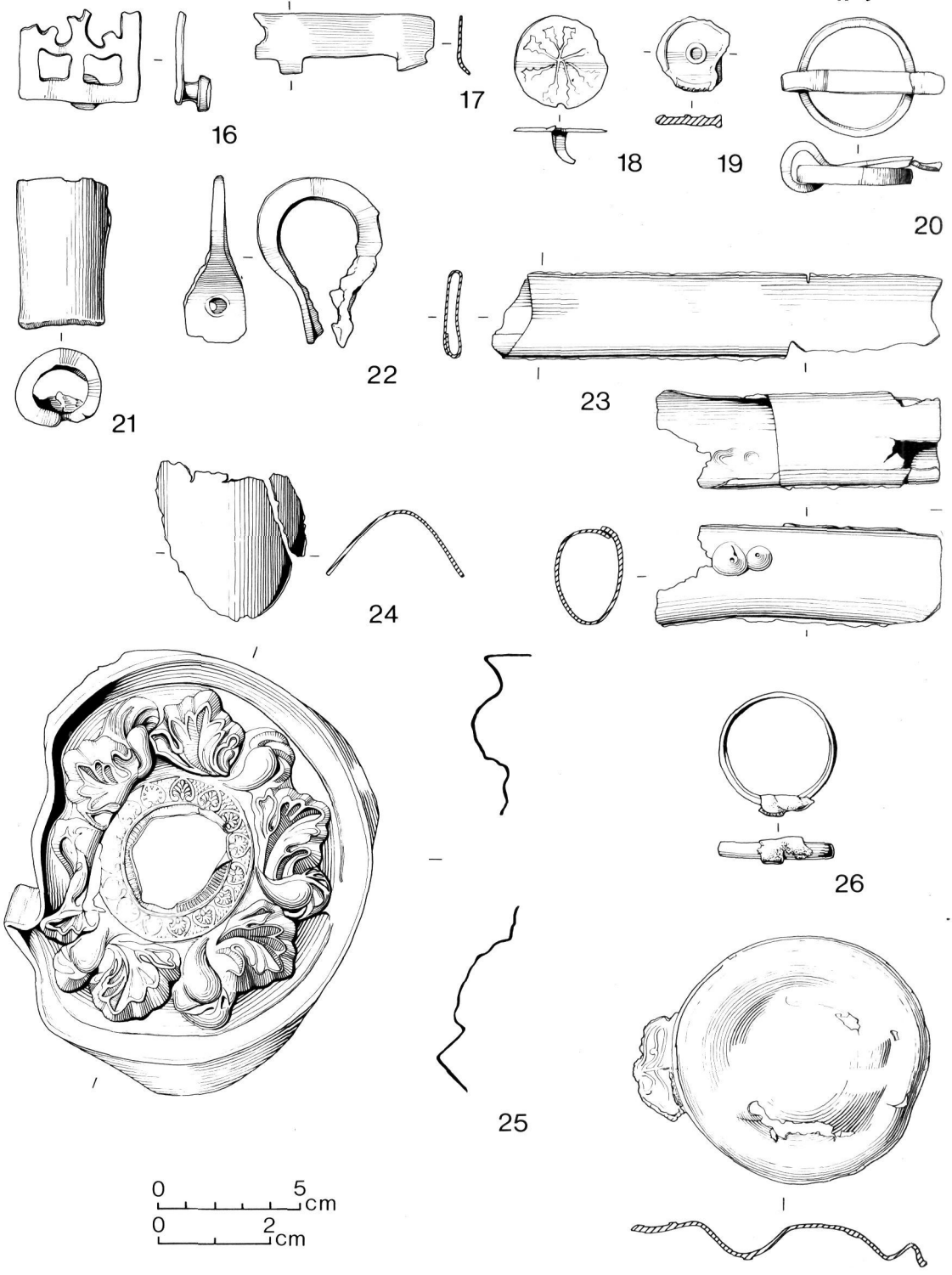


Fig. 33 Inmost Ward 1955-77: Objects of copper alloy Nos. 16-26, lead alloy No. 27.

8. Fragment of bracelet; approx. half of total circumference surviving; solid cast bracelet with incised grooves to represent cabling. From dumping contemporary with construction of second river wall. (Layer 32).
9. Fragment of strip bracelet; approx. 30mm of total circumference surviving; open-work decoration with six grooves radiating from circular punched holes with two smaller in-line holes between each main hole; five transverse grooves along with raised edges. For a bracelet with identical detail and spacing of the decoration from a late 4th-century grave at Lankhills, *v. Clarke* (1979, 306, No. 506, Fig. 37). From Saxo-Norman dumping. (Layer 35).
10. Instrument with rounded probe at one end, now bent shaft with single traverse moulding at other. This originally would have joined to a long oval bowl. A common object, often thought to be surgical, but there are so many from London and elsewhere, that their primary purpose must have been domestic, e.g. the extraction of cosmetics from unguent bottles. Probably 1st-2nd century date, redeposited in pit (F.12) associated with construction of second river wall. (Layer 30).
11. Handle of key of tumbler-lock; iron shaft; teeth missing. From internal bank of landward city wall. (Layer 25).
12. Spoon, *cochleare*, partially flattened circular bowl and short length of circular sectioned handle surviving. From internal bank of landward city wall. (Layer 25).
13. Netting needle; complete though prongs bent; faceted shaft; c.f. *Cunliffe* (1968, 105, No. 212, Pl. 47). From late Flavian reclamation levels. (Layer 9).
14. Needle. Laboratory reports that microscopic examination shows sign of gilding. From late Flavian reclamation levels. (Layer 9).
15. Strip fitting with swivel pivot and two attached chains. The main body of the fitting is bent but presumably formed a semi-circular hoop. No precise parallel for the fitting has been found and its use remains uncertain, though it may be suggested that it had a personal domestic function (perhaps as a *chatelaine*, or similar) rather than as part of a harnessing system or other apparatus requiring great strength. From dumping contemporary with construction of second river wall. (Layer 32).
16. Military belt-plate; approx. one third of openwork plate and single back fastening stud surviving; see *Griffiths* (1983, 52, No. 7) for other parallels from Britain; probably of 2nd-century date. From Saxo-Norman dumping. (Layer 35).
17. Flat strips, two projecting square lugs; fragment of buckle (?). From Saxo-Norman dumping. (Layer 35).
18. Circular stud with radiating spoked decoration on upper surface, short (now bent) shank on underside. From late Flavian reclamation levels. (Layer 9).
19. Circular stud, probably originally enamelled, raised central boss and outer notched edge. From Saxo-Norman dumping. (Layer 35).
20. Ring and attached split pin. From Saxo-Norman dumping. (Layer 35).
21. Tube, one end broken, the other flattened by force; originally circular section; ferrule? From infilling of Saxo-Norman ditch F.15. (Layer 37).
22. Semi-circular loop, with both ends flattened to form lugs and pierced with a circular hole; holding handle from toilet-set, the individual pieces of which were suspended from a rod through holes in the lugs. From Saxo-Norman dumping. (Layer 35).
23. Two lengths of thin-walled hollow tubing; perhaps sheathing; one piece flattened. From infilling of 3rd-century river wall construction trench. (Layer 27).
24. Sheet fragment, perhaps originally in tubular form. From late 4th century-dumping. (Layer 28).
25. Originally circular repoussé plaque (lid?) with down-turned rim; 18th-century date. From demolition of late 18th-century Ordnance Office.
26. Miss Jean Macdonald writes:
Copper-alloy finger-ring, a continuous circle of thin metal, tapering in width from 2.5mm to 1.0mm. The taper may be intentional, but no trace of a bezel could be detected, and the irregularity of the surface seems to be due to corrosion, not decoration. Internal dia. 19mm, external dia. 21mm.

It is difficult to put a date on this simple ring or to suggest a satisfying parallel. The normal and indigenous finger-ring type of the British Iron Age seems to have been a bronze spiral (*Bulleid* 1911, 209-17; *MacGregor* 1976, 135). Some taper in width like the Tower ring (*Gray* 1953, 209; *Wheeler* 1943, 267, No. 21, Fig. 86). A few rings made as continuous circles are known from the late Iron Age sites and some incomplete specimens may originally have been continuous. Examples have been published from the Glastonbury and Meare lake villages, but the complete specimens illustrated are thicker than the Tower ring and usually have a horizontal groove, perhaps reminiscent of the spiral-ring tradition (*Bulleid* 1911, 212-7, 227, Nos. E38, 49, 104, 120, 137, 245, 264, Pls 41, 44; *Gray* 1953, 208-12, Nos. E14, 37, 100, 106, 111, 142, 162, 164, 182). Maiden Castle has produced, in contexts dated to the first half of the 1st century AD, a fragmentary, possibly continuous, plain thin bronze ring, and plain bronze and iron rings with ends apparently butted closely together and so superficially similar to the Tower (*Wheeler* 1943, 266-7, No. 22, 278-9, Nos. 4, 9, Figs 86, 92).

Romano-British finger-rings, on the other hand, are generally complete circles, often

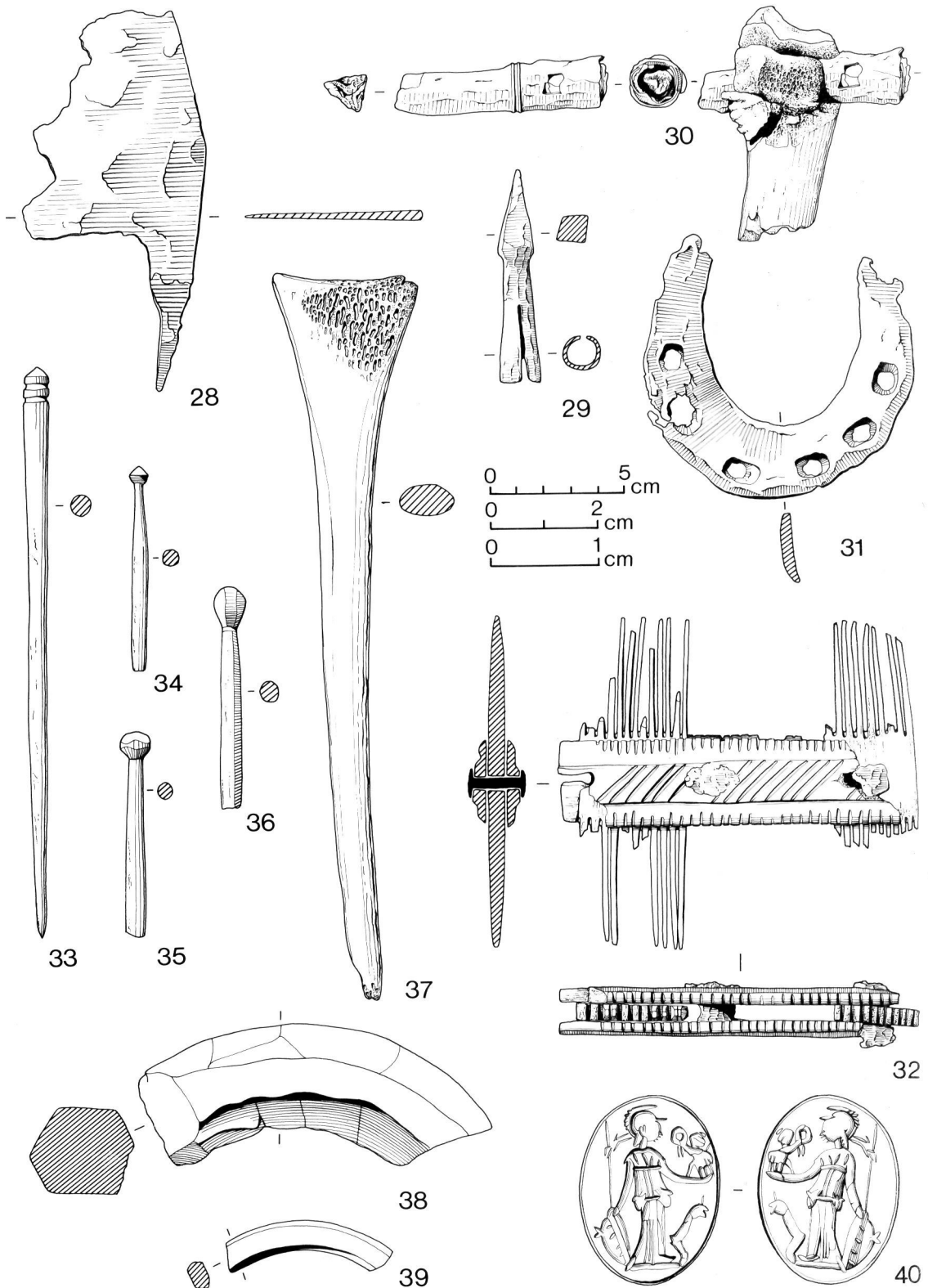


Fig. 34 Inmost Ward 1955-77: Objects of iron Nos. 28-31, bone Nos. 32-37, shale Nos. 38-39, stone No. 40.

expanded at the front to take additional decoration (British Museum 1958, 22-6, Fig. 13), and a variety of fairly plain bronze rings of Roman types is known from Roman sites in southern Britain (Down 1971, 47, Fig. 3.17 12; 1978, 302, Fig. 10.38 106; Neal 1974, 136-8, Fig. 60, 146-7, Fig. 65, Nos. 254-6, 258; Bushe-Fox 1949, 127, Nos. 99, 101, Pl. 35; Partridge 1981, 105, 260, 265, Fig. 54, No. 5). An example that looks fairly similar to the Tower ring came from a late Roman burial at Verulamium (Wheeler 1936, 136, 207, Pl. 60.5).

Unless more exact Iron Age parallels emerge, then, the Tower ring seems on balance more likely to have originated in the Roman world than in the British Iron Age tradition. Recovered from burial F.2.

LEAD-ALLOY (Fig. 33)

27. Small circular cup or dish; now flattened and misshaped, but original profile must have had a rim with thickened edge, and a shallow bowl with slight raised foot ring; two cast ear-handles (one now detached) were separately soldered to the rim opposite each other; differential corrosion of the surface of the handles has caused the decoration on their upper surfaces to become indistinct, but a foliage-based design is suggested. The main body of the vessel was cast and subsequently turned on a lathe; a central chuck mark is visible in the centre of the base. A spot test applied to the body of the vessel and one of the handles indicated the presence of lead in the body, and lead and tin for the handle. Detailed metallurgical analysis is required to establish the proportions involved and whether or not the body of the vessels consists of pure lead. If such analysis indicated an alloy of lead and tin in significant proportions, this vessel, coming as it does from a context dated to the second half of the 2nd century, would be a significant early piece in the history of the development of the Romano-British pewter industry. From the robbing of the west wall of the earlier Phase IV clay and timber building. (Layer 17).

IRON (Fig. 34)

28. Knife; approx. two thirds of the blade and tang survive; a typical common (1st-2nd century AD) shape and form with the back of the blade arched, see for example Manning (1976, 37 ff.). From late Flavian reclamation levels. (Layer 9).
29. Split socketed ballista or catapult bolt with square cross-section head, c.f. Manning (1976, 21 ff.). From late Flavian reclamation levels. (Layer 9).
30. Socketed ballista or catapult bolt with triangular cross-section head; wood remains survive within the socket; the surviving bolt pierced and lodged in part of a right tibia of a domestic ox. From dumping contemporary with the construction of the second river wall. (Layer 32). Mr Philip Armitage writes:

Distal extremity of a right tibia of domestic ox *Bos* (domestic) comprising the distal epiphysis (fused) and part of the shaft. The fusion of the distal epiphysis indicates that this animal was at least 2½ years old at the time of death, and may have been much older than this; probably a fully grown adult.

Comparison with the reference collection of cattle skeletons held by the BM(NH) reveals that the London specimen came from an animal similar in stature and build to a modern Chillingham ox (withers height about 120cm) i.e. a medium sized beast by Roman standards.

The ballista bolt entered from the rear (posterior side) just above the distal articular surface and slightly to the right of centre of the longitudinal axis of the bone i.e. towards the lateral side (- lateral malleolus). Penetration by bolt at this point is complete with the tip protruding beyond the anterior face of the shaft. Entry of the bolt 'exploded' the distal articulation which broke into five pieces.

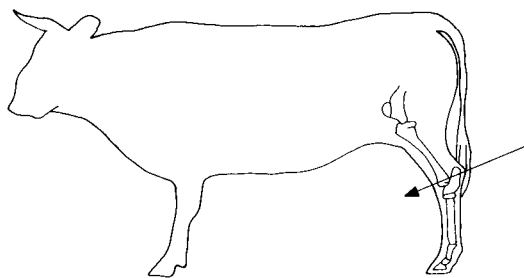


Fig. 35 Inmost Ward 1955-77: Diagram showing position of ballista bolt in hind limb of Ox.

Interpretation:

Fig. 35 shows the position and angle of entry into the right hind limb of the ? living animal or ? hanging carcase (see below). This region of the hind limb is often called the 'hock joint'.

Because the bolt was travelling from the rear when it struck the leg it must have caused damage to the calcaneum before it actually entered the tibia.

The effects of the entry of the bolt into the 'hock joint' probably included severance of the superficial flexor tendon and damage to the flexor muscle. If the injury was caused to a living animal the bolt would have effectively 'hamstrung' the beast and permanently crippled it. An alternative explanation would be that the hind limb of the ox was used for 'target practice' much in the same way that ox skulls (= heads) were used for training Roman troops in the art of spear throwing at Vindolanda. From dumping contemporary with the construction of a second river wall. (Layer 32).

31. Mr John Clark writes:

Horseshoe made from thin, broad bar, with six nailholes, equally spaced. The nailholes are countersunk, the countersinking being rectangular; in each case the hole seems to be deliberately placed towards one end of the countersunk depression. The punching of the holes has produced a slightly wavy edge to the shoe. Although from a Saxo-Norman context, this shoe differs in many respects from the 'standard' early medieval form, made of a thin, narrow bar with heavy calkins and with nailholes, in two groups of three, with slot-like countersinking (to take nails of fiddle-key form) producing a decidedly wavy outline (for example, London Museum 1940, 11-7, Fig. 37, Nos. 1-3; Godall 1982, 230, Fig. 41, Nos. 126-30). Earlier Saxon shoes seem to have been less standardised (Rahtz 1979, 267, Fig. 91, Nos. 7, 94; Cunliffe 1976, 197, Fig. 131, No. 9), but none seems quite to match the form of the present example.

Given the range of residual material present, it may be necessary to look for parallels in the Roman period, such as those from late 4th-century contexts at Maiden Castle (Wheeler 1943, 290, Pl. XXXB) or an example in the Museum of London (Acc. No. 24607, from Dowgate in a 1st-2nd century context) which has the same broad form and equal spacing at the six large nailholes. From Saxo-Norman dumping. (Layer 38).

BONE (Fig. 34)

32. Composite double-side comb; the surviving lengths of the connecting plates are held together by two iron rivets; two sections of the teeth plates remain, together with some of the individual teeth; diagonal grooves on the main sides and vertical notches on the edges decorate both connecting plates; parallels for similar bone or antler late Roman combs can be found from Colchester (Crummy 1983, 55 ff.), Lankhills Roman cemetery (Clarke 1979, 247 ff.) and Richborough (Bushe-Fox 1949, 147, No. 216). From Saxo-Norman dumping. (Layer 35).
33. Hairpin; complete, two groves below conical head, Crummy Type 2 (1983, 21). From landward city wall internal bank. (Layer 25).
34. Hairpin; conical head and length of shaft. From Saxo-Norman dumping. (Layer 35).
35. Hairpin; spherical head and length of shaft, Crummy Type 3 (1983, 21). From Saxo-Norman dumping. (Layer 25).
36. Hairpin; as No. 35 above. From Saxo-Norman dumping. (Layer 35).
37. Tool; thick crudely shaped shaft, spatulate triangular head; date of object uncertain. From modern level.

SHALE (Fig. 34)

38. Part of the circumference of an extremely crudely knife trimmed armlet. From late Flavian reclamation levels. (Layer 10).
39. Fragment of plain undecorated lathe finished

armlet. Roman from post-medieval pit F17. (Layer 43).

STONE (Fig. 34, 35)

40. Martin Henig writes:

Intaglio; Oval with flat upper surface (Henig 1974, part i, Fig. 1). 17mm × 13mm × 2mm. Material: red jasper. There are a few dark patches and a slight chip on the right side of the stone which appears to be a result of a flaw.

The device is Athena (i.e. the Roman Minerva) who is depicted standing with her body towards the front and her head turned to the left. She wears a belted peplos with overfold and a crested Attic helmet. On her extended right hand stands Nike (Victoria) who holds a wreath towards her; her left hand is lowered to support an upright shield and spear on the ground beside her. In the field, below Nike, is a rearing serpent.

It is clear that the type is that of Pheidia's masterpiece of the mid- 5th century BC, the Athena Parthenos (c.f. M. Robertson 1975, 311 ff.). To judge from the 'Varvakeion' statuette, the goddess looked straight before her and the serpent—perhaps a relic of an early Athenian snake-cult—stood between her body and the shield (A. W. Lawrence 1972, 134f. Pl. 30a). However, it is clear that from the very beginning considerable licence was used by gem-engravers in their treatment of the type. Perhaps the first intaglio to reflect the influence of the Parthenos, a cornelian scarabid from Kourion, already depicts the head in profile and transfers the serpent to the goddess's right (J. Boardman 1970, 198, 288, Pl. 486). On gems of the Roman period, where the serpent is included in the composition at all, it is usually on the shield side although an amethyst in an American collection provides an exact parallel to the type of the London gem (Richter 1971, 34, No. 94 (sard from Athens). Furtwangler 1896, 270, No. 7243 (cornelian). c.f. especially the catalogue, *Ancient Gems from the Collection of Burton Y Berry*, Indiana 1969, 28, No. 47).

Apart from the snake, the type is easy to parallel and there are examples from every part of the empire, including Britain where gems showing Minerva seem to have been especially popular with soldiers (Henig 1974, part i, 90f; part ii, 36f and Pl. viii Nos. 234-8. *Ibid.* 37, No. 245 for another type of Athena with a serpent. From elsewhere c.f. M. Gramatopol 1974, 49 and Pl. vii Nos. 131-3. and Richter 1971, 33f. Nos. 93-5).

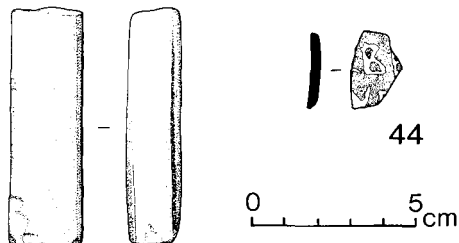
Red jasper seems only to have become a common material for intagli in the second century AD and the 'patterned' treatment of Athena's garments, her hair, crest of her helmet, rim of

the shield and above all the body of the snake are characteristically Antonine (Henig 1974, part i, 44f. discussing Sena Chiesa's 'Officina dei Diaspri Rossi'—G. Sena Chiesa, *Gemme del Museo Nazionale di Aquileia* 1966, 60. Although a cornelian and not a jasper, the style of the Minerva gem found, conveniently in a late 2nd century context at Caerleon (Henig No. 234) is broadly similar). From Saxo-Norman dumping (Layer 35).

41. Rectangular section of calcareous sandstone (?); both ends broken. From landward city wall internal bank. (Layer 25).

CERAMIC (Fig. 36)

42. Spindle whorl cut from pot base and pierced with central hole. Roman object from Saxo-Norman dumping overlying ditch F14. (Layer 38). Not illustrated.
43. Counter, roughly circular and cut from convex wall of orange-red fabric Roman vessel with internal white slip. From construction trench of 1777 Ordnance office foundations. Not illustrated.
44. Small body sherd of colour-coated Roman vessel with two line graffiti, .B.. From Saxo-Norman dumping. (Layer 35).
45. Rim sherd of colour-coated beaker with decoration *en barbotine*, with graffiti scratched below rim, VIDIC. From infilling of 3rd-century river wall construction trench. (Layer 27).



41

44

45

LEATHER (Fig. 36)

46. Mr John Thornton writes:

Shoe bottom unit: left foot, heavily nailed. Appears to consist from top to bottom of insole, two or three middle sections and sole.

Nailing: two marginal rows all round, two more rows forming a lenticular loop in the forepart and several (now missing, but holes remain) in waist and seat.

There are also traces of thonging (some still *in situ*) where the middle sections were held together before nailing.

Length: 272mm; Width (max.): 93mm.

The specimen is typical Romano-British and the nails where detached show the curvature caused when they struck the iron last used during the nailing operation. From pit F12 associated with construction of second river wall. (Layer 30).

DECORATED ARCHITECTURAL STONEWORK

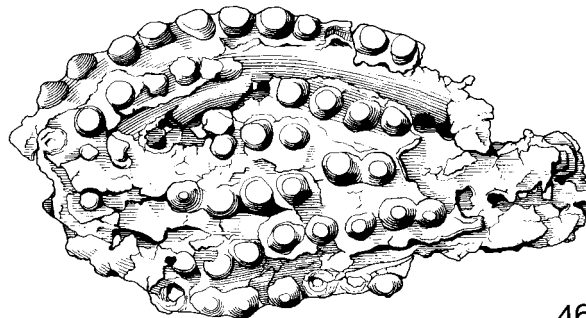
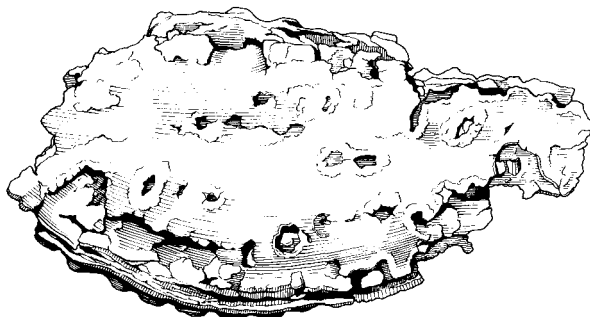
by T. F. C. BLAGG

Imbricated Column Shaft. Fig. 37

(From fill of post-medieval pit F18.)

Fragment, 0.29m wide, 0.145m deep and 0.28m high, from the top of a drum originally about 0.6m in diameter. (Bathstone.)

It is carved with shield-shaped leaves overlapping in the manner of roof-tiles or fish scales. Their surface is



46

Fig. 36 Inmost Ward 1955-77: Objects of stone No. 41, ceramic Nos. 44-45, leather No. 46.

gently concave on each side of a central ridge. The back and side from a rough right angle which, if not accidental, may have been shaped for re-use of the fragment as a building stone.

Column shafts decorated in this way are relatively uncommon in Britain: I know of sixteen other examples. In Gaul, where they are more frequent, the majority came from free-standing votive columns, usually dedicated to Jupiter (Walter 1970). Evidence for the original use of most British examples is absent. The most certain is the imbricated votive column from the temple precinct at Springhead, Kent, which was 0.52m in diameter (Blagg 1979). From London a smaller shaft, 0.24m in diameter, found built into Bastion 8, was decorated in part with a lattice and in part with imbricated leaves carved in a similar manner to those of this fragment (RCHM 1928, pl. 19). If the latter did not come from a votive column, its size suggests that it belonged to a major public building. The detail of the leaves is not diagnostic of date.

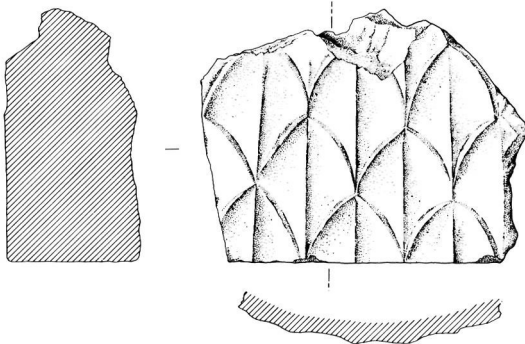


Fig. 37 Inmost Ward 1955–77: Imbricated column shaft.

Cornice Moulding. Fig. 38.

(From 18th-century demolition rubble overlying second Roman riverside wall.)

A corner piece, 0.82m long, 0.38m wide and 0.225m high, moulded on two adjacent sides, the other two broken. (Kentish ragstone.)

It is decorated with a *cyma recta* and a *cavetto* moulding separated by two fillets. The edges of the mouldings are still quite sharp, and the *cyma* and the *cavetto* have horizontal marks of a broad-bladed chisel. The fascia at the top has been more exposed to damage and weathering. The top and bottom are level and fairly smooth; there are no lewis- or cramp-holes.

The cornice came from a medium-size structure. Quite possibly this was a funerary monument, to judge from the architectural stonework re-used in the bastions; Bastion 10 produced similar, though not identical mouldings (RCHM 1928, pl. 17).

THE GLASS

by JOHN D. SHEPHERD

Three hundred and fifty-two fragments of glass were retrieved from the site, all of which can be dated to the Roman period. Of this total, two hundred and ninety four are vessel or window glass fragments—the remaining fifty eight being associated with the processing of glass and the actual manufacture of glass vessels.

Below are catalogued all the vessel and window glass fragments according to glass metal (e.g. polychrome, monochrome, colourless, naturally coloured). The incidence of the glass working waste is noted below.

THE VESSEL GLASS POLYCHROME GLASS

1. (Fig. 39 No. 1) Phase V

Fragment from the rim and flange of a wide bowl or plate. Cast, polychrome glass consisting of opaque white circlets set in a deep bluish-green background. The glass is slightly pitted and in places is covered by an off-white iridescence. Broad flange with a small overhanging lip. Early to mid 1st century.

This is the only fragment of this distinctive first century metal from the site. The form itself is similar to Harden's 'Karaniš' type (Harden 1936, 64f, 83, Nos. 166–8, pl. xii—other references *ad loc*), vessels more commonly manufactured in good colourless metals from the Flavian period until the early 2nd century—e.g. Fishbourne (Harden and Price, 1971, 332, No. 26, pl. xxvi, Fig. 138), Tongeren (Vanderhoeven 1962, 70, Fig. 194) and Conimbriga (Alarcao 1968, 19, No. 24, Fig. 1). That we have here an example in a millefiori metal would suggest that it belongs to the earliest period of the forms production.

MONOCHROME GLASS

2. (Fig. 39 No. 2) Phase V

Fragment from the rim of a bowl of plate. Blown, thin green glass. Horizontal rim with a small lip folded under. Mid to late 1st century.

3–4. (Fig. 39 No. 3) Phase V

Two fragments from the rim and side of a bowl (Isings 1957, 59f form 44a). Blown, thin green glass. Insloping rim with an out-turned lip. Mid to late 1st century.

5. (Not illustrated) Phase V

Small fragment of deep brown glass from a vessel of indeterminate form. Mid first to early 2nd century.

With so little of the body surviving of No. 2 it is very difficult to make any observations on its exact form. Nos. 3–4, however, are from a well-attested bowl form of the mid to late 1st century (cf. Czurda-Ruth 1979, 59–62, Nos. 493–496 for examples from Magdalenburg and also for references to bowls from Muralto, Koln, Pompeii, Aquileia, Richborough etc).

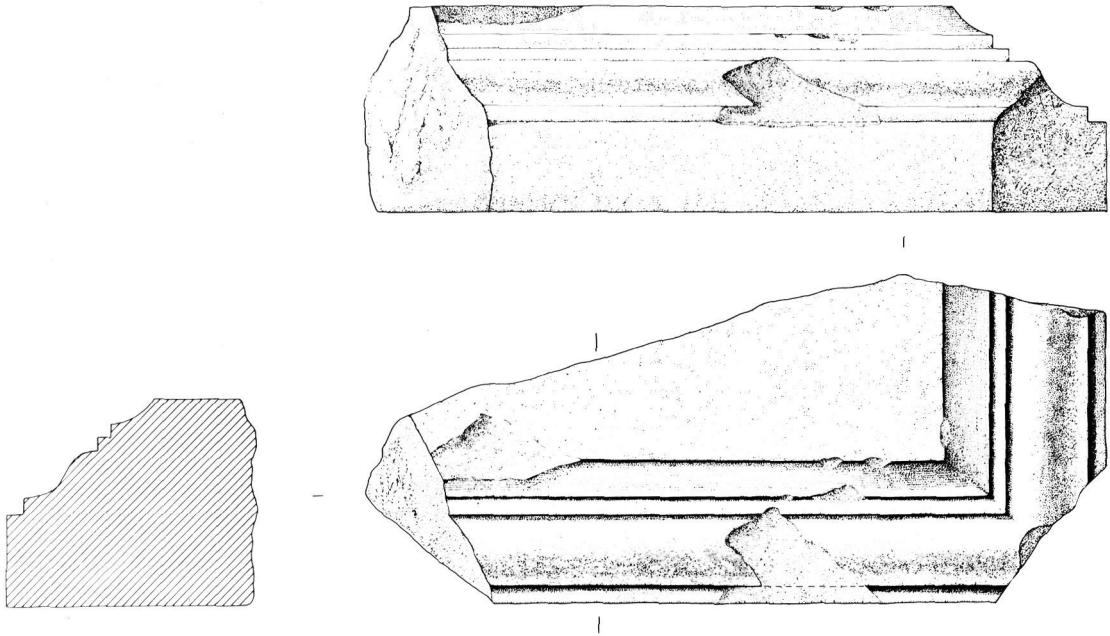


Fig. 38 Inmost Ward 1955-77: Cornice moulding.

COLOURLESS GLASS

6. (Fig. 39 No. 4) Phase V

Fragment from the foot or the shoulder of a large flask or ewer. Blown, thick colourless glass with a faint greenish tint. Decorated with a single broad horizontal wheel-cut line with a row of wheel-cut facets above of which just parts of three are extant.

7. (Fig. 39 No. 5) Phase IX

As for No. 6 but a small fragment. Decorated with circular facets.

8. (Fig. 39 No. 6) Phase VI

Fragment from the side of a bowl. Blown, colourless glass with a greenish tint. Decorated with two horizontal wheel-cut lines.

9. (Not illustrated) Phase IX

Fragment from the lower part of a bowl. Blown, thick colourless glass with a milky iridescence. Side decorated with two groups of two horizontal wheel-cut lines and a row of wide-spaced oval facets, horizontally orientated, between. Only two are extant.

10. (Fig. 39 No. 7) Phase IX

Fragment from the side of a bowl. Blown, good colourless glass with a faint greenish tint. Decorated with rows of oval wheel-cut facets with wheel-cut lines between in a hexagonal pattern.

11. (Not illustrated) Phase V

Fragment from the rim of a bowl. Blown, colourless glass, ground and polished on both surfaces. Ground, rounded rim, slightly outplayed, with a horizontal wheel-cut line below. Late 1st or 2nd century.

12. (Fig. 39 No. 8) Phase XIII

Fragment from the base of a small beaker or bowl. Blown, colourless glass. Hollow tubular base ring.

Late 1st to 3rd century.

13. (Fig. 39 No. 9) Phase V

Fragment from the base of a beaker or bowl. Blown, good colourless glass. Pushed-in base with a flattened hollow tubular base-ring. Late 1st to 3rd century.

14. (Fig. 39 No. 10) Phase IX

Fragment from the rim and side of a bowl—probably of 'Airlie' type (Isings 1957, 102, form 85b). Blown, good colourless glass. Rim thickened and fire-rounded. Late 2nd or 3rd century.

15. (Fig. 39 No. 11) Phase V

Small fragment from the rim and part of the body of a small beaker. Blown, colourless glass. Fire-rounded rim with a thin applied and marvered horizontal trail of dull blue glass below. Late 2nd or 3rd century.

16. (Not illustrated) Phase V

Fragment from the rim of a flask/bottle (Isings 1957, 120, form 102 for rim style). Blown, thick colourless glass with a slight greenish tint. Rim fire-rounded and outplayed. Applied horizontal trail of the same metal below. Late 3rd or 4th century.

17. (Not illustrated) Phase V

Fragment from the neck of a small flask or unguentarium. Blown, colourless glass with a milky surface. Neck tapers towards an outplayed rim, the lip of which is missing. 2nd or 3rd century.

18-72 (Not illustrated)

Fifty-five fragments of colourless glass, many with a milky iridescence, from the bodies of an unknown number of vessels of intermediate form.

Phase III (×2)

Phase V (×25)

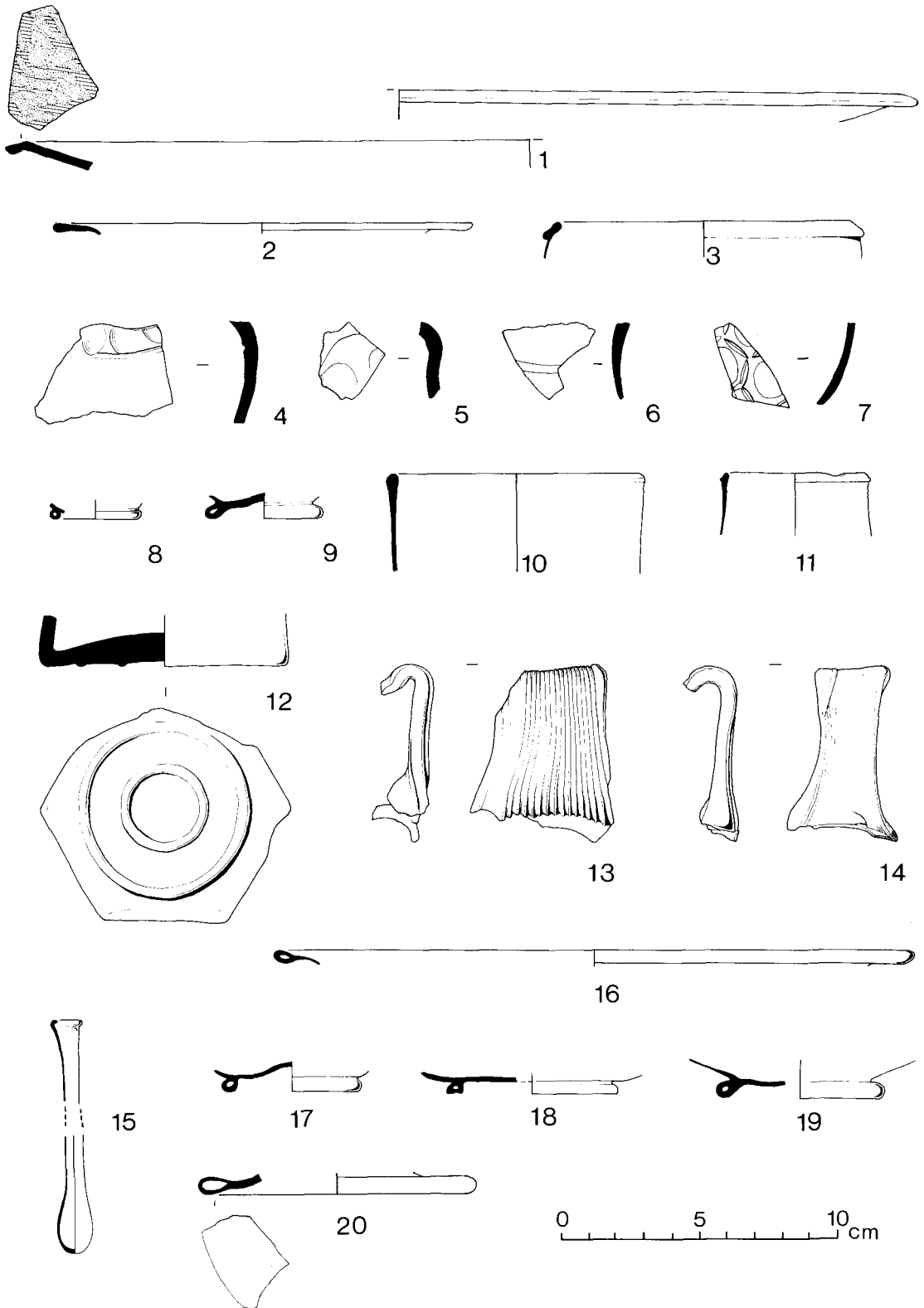


Fig. 39 Inmost Ward 1955-77: Roman glass Nos. 1-20.

Phase VI (×5)
 Phase IX (×21)
 Phase XIII (×2)

The majority of the distinctive colourless fragments come from 2nd to 3rd century wheel-cut bowls. These, usually hemispherical (Isings 1957, 113-116, form 96), bowls occur in large numbers as fragmentary finds throughout the north western provinces. Their concentration around Koln might suggest that this was the region of their manufacture. The remainder of these fragments come from the fashioned parts of simple, long-lived bowls (e.g. Nos. 12, 13). The flask/bottle rim fragment (No. 16) and the case fragment (No. 120 below) are the only fragments from the whole assemblage which might suggest some actual late supply of glass to the site rather than simple dumping. The style of this rim, with the applied trail below the lip, is distinctive of bottles from late 3rd or 4th-century repertoires.

NATURALLY COLOURED GLASS

73. (Fig. 39 No. 12) Phase V

The base of hexagonal sectioned bottle. Mould-blown, thick bluish-green glass. Base decorated in high relief, with two concentric circles. Late 1st or early 2nd century.

74. (Not illustrated) Phase V

Small fragment from the base of a bottle (e.g. Isings 1957, 63f, form 50). Mould-brown, greenish-blue glass. Base decorated with a high relief design of which just parts of two concentric circles are extant. Late 1st or 2nd century.

75. (Not illustrated) Phase XIII

As for No. 74 but the base design consists of a circle with four unconnected internal arcs of which just two are extant.

76. (Fig. 38 No. 13) Phase V

The handle from a square or hexagonal sectioned bottle. Applied to a mould-blown vessel. Thick bluish-green glass. Combed surface. Late 1st or 2nd century.

77. (Not illustrated) Phase V

Small fragment as for No. 76.

78. (Not illustrated) Phase V

Small fragment as for No. 76.

79. (Not illustrated) Phase IVc

Small fragment as for No. 76.

80. (Not illustrated) Phase V

Small fragment from the rim of a bottle (e.g. Isings 1957, 63-69, forms 50/51). Blown, thick bluish-green glass with surface decomposition. Lip folded out and flattened down. Late 1st or 2nd century.

81-108. (Not illustrated)

Twenty-eight fragments from the sides of an indeterminate number of prismatic bottles in naturally coloured glass.

Phase V (×19)

Phase VI (×5)

Phase VIIb (×1)

Phase XIII (×3)

109. (Fig. 39 No. 14) Phase V

The handle from a bulbous flask (Isings 1957, 69f, form 52). Applied to a blown vessel, thick greenish-blue glass. Plain strap hand. Late 1st or early 2nd century.

110-111. (Fig. 39 No. 15) Phase V

A small unguentarium. Blown, thin bluish-green glass. Fire-rounded lip, slightly bulbous body.

112. (Not illustrated) Phase V

Fragment from the rim and part of the neck of a trefoil-mouthed jug (Isings 1957, 74f, form 56). Blown, bluish-green glass. Fire-rounded rim. Late 1st or 2nd century.

113. (Not illustrated) Phase V

Small fragment as for No. 112 but with an infolded lip.

114. (Fig. 39 No. 16) Phase V

Small fragment from the rim of a bowl. Blown, bluish-green glass. Horizontal rim with the lip folded inwards to give a flattened hollow tubular profile. Late 1st to 3rd centuries.

115. (Not illustrated) Phase VI

Small fragment as for No. 15.

116. (Not illustrated) Phase V

Small fragment as for No. 15.

117. (Fig. 39 No. 17) Phase V

Fragment from the base of a small beaker or bowl. Blown, good quality greenish-blue glass. Pushed-in base with a hollow tubular base-ring. Late 1st to 3rd century.

118. (Fig. 39 No. 18) Phase V

As for No. 117.

119. (Fig. 39 No. 19) Phase V

As for No. 117.

120. (Fig. 39 No. 20) Phase VIIb

Fragment from the base of a flask. Blown, poor greenish colourless glass. Pushed-in base with a flared flattened hollow tubular base-ring. 3rd or 4th century.

121-282. (Not illustrated)

One hundred and sixty-two fragments of naturally coloured glass from free-blown vessels of indeterminate number and form but exclusive of mould-blown bottles (see Nos 81-108 above).

Phase IIIb (×3)

Phase IVc (×10)

Phase V (×118)

Phase VI (×7)

Phase VIIb (×6)

Phase IX (×17)

Phase XIII (×1)

283-289. (Not illustrated) Phase V

Seven fragments, as for those body fragments listed above, but all heavily distorted as a result of contact with fire.

WINDOW GLASS

290-293. (Not illustrated) Phase V, VIIb and IX

Four fragments of window glass of the blown cylinder variety. Greenish-blue. Thickness *c.* 2.5mm.

294. (Not illustrated) Phase V

A fragment of window glass of the cast matt/glossy variety. Greenish-blue. Thickness *c.* 5mm.

As one might expect, the naturally coloured

metals by far outnumber those fragments in polychrome, monochrome and colourless metals. The forms represented here are also as one might expect, bottles (Nos. 73–108), a flask (No. 109) and bowls and beakers (Nos. 73–119) the exact forms of which can not be ascertained. There are, however, also two fragments of trefoil-mouthed jugs (Nos. 112–113) which, by no means uncommon, appear to be the only vessels of any real note amongst this naturally coloured assemblage.

The bottle fragments are, in the main, from square-sectioned forms (Isings 1957, 63f, form 50). The complete base, however, is from a hexagonal example. Such bottles, though well-known, are not as common as their square-sectioned counterparts and the date for their production appears to be limited to the late 1st and very early 2nd century with an emphasis on the late 1st century (Shepherd 1982, 227f), whereas the bottle continues to be produced well into the 2nd century. The base design of this example is one of the commonest to be found on hexagonal sectioned bottles, sometimes with a small dot at the centre (this example does have such a dot but it was not intentional design, merely the traces of a compass point to mark out the concentric circles). Eight examples are known to me, all of similar size to this example but none an exact mould-link. There are five from Koln (Fremersdorf 1965/66, 31—these are not illustrated and may well have additional motifs to the designs), an unpublished fragment from Cirencester (Corinium Museum Inv. C870) and unpublished French examples from Bourges and St Medard des Pres.

The base design on the fragment (No. 75) is also of interest since such designs are not relatively common. Since the centre and the corners of the design is lacking it is not possible to tell if there was any central motif such as a circle or a point or any angle motif but designs which compare with this are known from Portugal (Alarcao 1975, 49 No. 23 and 24—Milreu and Conimbriga respectively), the lowlands (Mesch—Isings 1971, 30, No. 99) and France (Amiens, Bourges and Plessis—all unpublished—and Bois de Buis—Isings 1971, 30). Again no direct mould link exists.

Of the remaining vessels, the bowl and beaker fragments can not, sadly, be elaborated upon. As with the colourless fragments their forms were long-lived. The fragments from the jugs, however, are of particular interest. Since evidence of glass vessel manufacture exists on this site (that is, evidence of nearby

manufacture) it is possible that these fragments represent the rims of vessels that were wasted but escaped being recycled as cullet. This possibility is noted also by Isings for similar fragments from the *Canabae Legionis* at Nijmegen (Isings 1980, 303–304), where glass working is also attested. If they are, in fact, jug fragments they may be compared to those jugs dating from the early 1st century to the end of the 2nd century (Isings 1957, 74f form 56; Czurdza-Ruth 1979, 140, ff).

In conclusion, the forms represented amongst this naturally coloured group—and also for the colourless group—are well-attested, expected types but concerning Nos. 73–289 above, the large number should be noted and, also, the actual volume. Taken in association with the pot-metal waste and glass working waste of the same metal discussed below, the possibility that most of this material represents cullet, collected from the hinterland of the site and not actually delivered to the site as complete vessels is more than a possibility.

THE GLASS-WORKING WASTE by JUSTINE BAYLEY & JOHN SHEPHERD

The waste material from the *c.* AD 200 internal rampart of the city wall (Phase V) (p. 12) consists of four categories of fragments—A. Furnace fragments, B. Pot-metal, C. Droplets, and D. Cuttings and wastings. (A pellet of Egyptian blue was also found.)

FURNACE MATERIAL:

Six large fragments were recovered. This was all hearth or furnace lining, coarse sandy clay that was vitrified on one surface. This happens when siliceous material is exposed to high temperatures, especially in the presence of fuel ash. The pieces are probably parts of a glass furnace as they were found associated with the waste glass and without any evidence for metal-working or other high temperature processes. Most of the pieces are very deeply vitrified (up to 4cm from the surface is glassy) and so must come from a part of the furnace such as the fire-box that was very hot for long periods at a time. The less deeply vitrified pieces probably came from relatively cooler areas further from the fire. The colours of the slag (buff through to black and blue) are due to the presence of iron, most probably coming from the sandy clay.

POT-METAL:

Thirty-six fragments were recovered, one of which is colourless, the rest naturally coloured. These fragments, very thick and of no particular form or shape, represent the contents of crucibles or tanks which have been allowed to cool, emptied (by smashing) to be remelted, presumably along with cullet, one piece has a thick layer of well fired sandy clay adhering to one side, similar in fabric to that of the hearth lining. This presumably represents the containing in which the glass was melted or it may be part of the furnace structure on which the glass was spilt.

DROPLETS:

Twelve were recovered; all were naturally coloured. These small droplets presumably fell accidentally from crucibles, furnace openings or blow-pipes onto the glasshouse floor and were not deemed worthy of retrieval for recycling.

CUTTINGS AND WASTINGS:

Only five identifiable fragments were recovered. Others, however, may be included among those distorted by fire (Nos. 283-289) above.

These five fragments, all truncated cones, have a fire-rounded lip at the narrow end and a thicker knocked off and rough lip at the opposite end. These represent the waste material either from the blow-pipe ends of empontilled vessels or the actual waste from around the mouth of the blow-pipe itself. As mentioned above, some of Nos. 283-289 may well be clippings from lips or vessels removed in the course of their manufacture which has been discarded and escaped recycling.

Taking the collection of waste glass and vessel fragments as a whole, it would appear that what has been found is part of the debris associated with a glass-blowing workshop where vessels and/or window glass were being produced. It is unlikely that the material was brought far so the glasshouse was probably fairly local to the site, though with the river close by, long distance transport was of course possible.

There is no evidence that glass was made at the workshop that was the source of these finds, only that it was melted and blown there.

Most of the glass being worked was of the natural coloured variety but there is some evidence to suggest that colourless glass was also being worked.

These finds represent one of the best deposits indicative of the glass working and, perhaps, ves-

sel glass production during the Roman period in this country, but sadly the nature of its deposition means that the actual location of any furnace and its date cannot be precisely ascertained.

The naturally coloured vessel glass associated with this waste is, primarily, of the late 1st and 2nd centuries and, if the pot-metal and the other waste fragments can be used as an indicator for a date, the colour of their metal would suggest a late 1st to early 3rd (or even late 2nd) century date, rather than later, which agrees with the date of *c.* AD 200 for the context in which they were found. If much of the glass found in association with the waste was cullet there are further dating problems since the time span between the circulation, an ultimate breakage of a vessel and its collection, sorting, storing and eventual reuse is never constant.

Before a whole industry is built on the glass finds described above it should be remembered that the total weight of the glass waste (plus vessel sherds) was only just over one kilogram.

THE COINS.

by PETER CURNOW

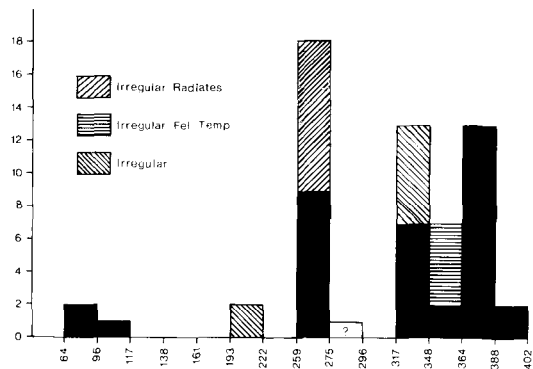


Fig. 40 Inmost Ward 1955-77: Roman coins. Total No. coins 61, coins identified 59.

THE COINS, by PETER CURNOW

No.	Obverse type	Date	Denomination	Reference (R.I.C.)	Layer
1	Vespasian	69-79	As	cf. 746	18
2	Domitian	81-96	As	354	9
3	Trajan	98-117	Dup	494	27
4	Irregular Geta	c. 200+	Irregular plated Denarius	(Obv: type of AD 200-2. Rev. Providential)	22
5	? Elagabalus	early 3 cent.	Base Denarius	—	35
6-7	Postumus	259-68	Ant	67, 85	35, 38
8	Victorinus	268-70	Ant	115	32
9	Posth. Claudius II	270	Ant	266	32
10-11	Tetricus I	270-3	Ant	cf. 100-2, 136	32, 35
12	Tetricus II	270-3	Ant	—	32
13-15	Uncertain Radiates	c. 270	AE.3 [3] (1? Carausius)	—	35
16-24	Irregular Radiates	c. 270	AE.3 [2] AE.4 [6] + minimum	—	32[2] 35[7]
25	Uncertain AE.3	—	—	—	35

No.	Reverse type	Date	Mint	Obverse type	Reference (L.R.B.C.I,II)	Layer
26	BEATA TRANQVILLITAS	321	Lyons	C II	R.I.C. VII, 150	32
27	Irregular Beata Tranquillitas	321+	cf. Trier	C I	R.I.C. VII, 303s	32
28	PROVIDENTIAE CAESS	324-30	Trier	Cs II	I 40s	Unstratified
29	GLORIA EXERCITUS (2 stds)	330-5	—	C I	—	32
30	Irregular Gloria Exercitus (2 stds)	c. 330-5+	cf. Trier	cf. Cs II	I. cf. 64	32
31	Wolf and Twins	330-7	—	U.R.	—	32
32	Irregular Wolf and Twins	330+	cf. Lyons	U.R.	cf. I, 184	38
33	Irregular Victory on Prow	c. 330+	cf. Lyons	C'opolis	cf. I, 356 etc	35
34-35	GLORIA EXERCITUS (1 std)	337-41	H of Const	Cs II	I 249	32
36	Irregular Gloria Exercitus (1 std)	35-41	Const	—	Minimum	32
37	H of Constantine—uncertain	c. 340	—	—	AE3	35
38	Irregular Vict dd Aug. nn (2 Victories)	341-8	—	Cs II	—	32
39	FELTEMP REPARATIO (th3)	353-61	—	Cs II	AE3	32
40-42	Irregular Fel Temp Reparatio (th3)	353+	—	—	AE4 [2] + Minimum	35, 32, 32
43-44	? Irregular Fel Temp Reparatio (th3)	353+	—	—	AE4 [2]	35, ?
45	VOTIS V MVLT X	361-4	—	Julian	—	35
46-48	GLORIA ROMANORVM	364-78	Rome	Vr	II 727	32
49-55	SECVRTAS REIPVBLICAE	364-78	Aquileia	VI [2]	II 996, 1032	32, 32
56-57	GLORIA NOVI SAECVLI	367-75	Lyons	G	II 345	32
58	H of Valentinian I	364-78	Arles	Vn, H of VI	II 516, 518-23	32, 32
59	VICTORIA AVGGG	388-92	Rome	G	II 726/31	36
60	SALVS REIPVBLICAE	388+	Aquileia	Vn	II 1012	32
61	Uncertain 3rd or 4th century	—	Siscia	Vn	II 1417	32
			Arles	G [2]	II 529 [2]	32
			Lyons	V II	II 389	32
			—	H of II	—	35
			—	—	—	32

Fig. 41 Inmost Ward 1955-77: Roman coins. Summary table.

THE ANIMAL BONES

by PAT NICOLAYSEN

The bones presented were found in two contexts, which were distinct both environmentally and chronologically. Both groups were examined in order to see which species were present, and for signs of any special activities. For each species, the minimum possible number of individuals present is stated; this is unlikely to be much higher in view of the small assemblage. The range of bones identified was insufficient to allow any estimation of age or sex.

PIT 12

At most, perhaps 25% of this late Roman quarry pit associated with the construction of the second Roman riverside wall was excavated, the fill being moist and stagnant—optimum conditions for the preservation of organic remains.

A total of 99 bone fragments, weighing 9.40kg, was examined. Of these, 86 (85.6%) were identifiable species; identification was uncertain for the remaining 13 fragments (14.4%), but these were all cattle size.

The bones were well preserved. No part of any animal was found in disproportionately high numbers. Butchery cuts were present on 10 of the cattle bones, including 2 scapulae, 3 humeri, 1 radius and 1 tibia. The absence of sheep bones in this context is noted.

Species present (inc. teeth)		No. of Fragments	Minimum No. of Individuals	% of Whole
Cattle	(<i>Bos</i> sp.)	59	3	59.6
Horse	(<i>Equus</i> sp.)	8	2	8.0
Pig	(<i>Sus</i> sp.)	4	1	4.0
Dog	(<i>Canis</i> fam.)	12	2	12.1
Bird	(<i>Gallus</i> sp.)	3		

DITCH 15 and 16

The second group of bones was found packed into a Saxo-Norman ditch. A total of 435 bone fragments was recovered, weighing 11.69kg. Of these, 275 (62%) were from identifiable species; identification was uncertain in a further 20 (4.3%), and there were 140 fragments (33.7%) which could be recorded as cattle-size or sheep-size.

The bones were fairly well-preserved. No part of any animal skeleton was found in disproportionately high numbers; bovine mandibles form the largest group.

Butchery marks were observed on a total of 18 bovine skull, limb and foot bones; on 4 sheep bones, and on 5 equine limb and foot bones. One sheep metatarsal had apparently been worked by man; a hole had been made in the proximal articular surface, and another in the lower posterior surface of the shaft, but the reason is unknown. The human skeletal remains consisted of the first 2 vertebrae, the atlas and axis; their presence here, in isolated from other human bones, is difficult to explain.

Species present (inc. teeth)		No. of Fragments	Minimum No. of Individuals	% of Whole
Man	(<i>Homo sapiens</i>)	2		
Cattle	(<i>Bos</i> sp.)	143	3	32.9
Sheep	(<i>Ovis</i> sp.)	84	3	19.3
Sheep/goat	(<i>Ovis</i> sp./ <i>Capra</i> sp.)	1		
Horse	(<i>Equus</i> sp.)	32	2	7.3
Pig	(<i>Sus</i> sp.)	11	2	2.5
Red deer	(<i>Cervus elaphus</i>)	1		
Bird	(<i>Gallus</i> sp.)	1		
Cattle-size fragments		55		
Sheep-size fragments		85		

MEDIEVAL

THE MEDIEVAL POTTERY

by STEPHEN NELSON

The post-Roman deposits associated with phases IX, X and XI included much residual Roman material and they presumably also present mixed later contexts as well. Although the quantity of material included in these medieval levels is small it is possible to suggest a broad dating for them.

PHASE IX

Fig. 41

The earliest phase is that concerned with the raising of the ground level behind the second Roman riverside wall. The material comes from two groups of general layers of backfilling, which were separated by the excavation of a small ditch (Fig. 3, F15 and 16). From the dumped layers there is a high percentage (some 84%) of shelly wares—fairly soft, grey fabrics with red to brown surfaces and varying amounts of shell filler. Other sherds are of soft sandy fabrics of various types. The pottery from the ditch fill (Layers 36 and 37) is significant in that there are 3 sherds from a small Thetford-type ware storage jar (No. 1); the complete side of a small hand-made cooking pot (No. 3); a thumbled rim from similar, but larger, cooking pot (No. 4) and many sherds from a sandy bowl (No. 7). From the earlier group (Layer 35) are the shelly rims (Nos 2 and 5) and the apparently wheelmade sandy rim (No. 6). The later group sealing the ditch (Layer 38) produced the shelly rims (Nos. 8 and 9), of similar fabric to No. 4, and the heavy, everted rim (No. 10). A late Saxon date is suggested by the Thetford-type ware but this may be residual, although the sherds are unabraded, and a slightly later date might be attributed to the cooking pot shapes and thumbing on rim No. 5. However pottery from the early phases (1–3) of the Jewel House excavations 1962–3 (Rednap 1983) does show vessels of similar form, especially those in Saxo-Norman sandy-shelly fabric, in contexts of the second half of the 11th century. Phase Ib also contained Thetford-type ware sherds.

(Nos 2 and 5) and the apparently wheelmade sandy rim (No. 6). The later group sealing the ditch (Layer 38) produced the shelly rims (Nos. 8 and 9), of similar fabric to No. 4, and the heavy, everted rim (No. 10). A late Saxon date is suggested by the Thetford-type ware but this may be residual, although the sherds are unabraded, and a slightly later date might be attributed to the cooking pot shapes and thumbing on rim No. 5. However pottery from the early phases (1–3) of the Jewel House excavations 1962–3 (Rednap 1983) does show vessels of similar form, especially those in Saxo-Norman sandy-shelly fabric, in contexts of the second half of the 11th century. Phase Ib also contained Thetford-type ware sherds.

1. Three large, unabraded sherds from near base of Thetford-type ware storage jar. Even dark grey fine sandy fabric with applied thumbled strip and evidence of fettling on lower inner surface. (Layer 37).
2. Two sherds from straight everted, slightly expanded rim of sparse shelly dark grey cooking pot. Slightly lumpy hand-made appearance. (Layer 35).
3. Various sherds making up complete side of small cooking pot. Fabric similar to previous sherds but slightly sandy and shelly and oxidised brown internal surface. Completely hand-made and heavily sooted on outer surface. Shape is typical of the squat medieval baggy form but very small. (Layer 37).
4. Large everted rim with outer thumbing; fabric sandy/shelly as No. 3 but a cooking pot of larger size. (Layer 36).

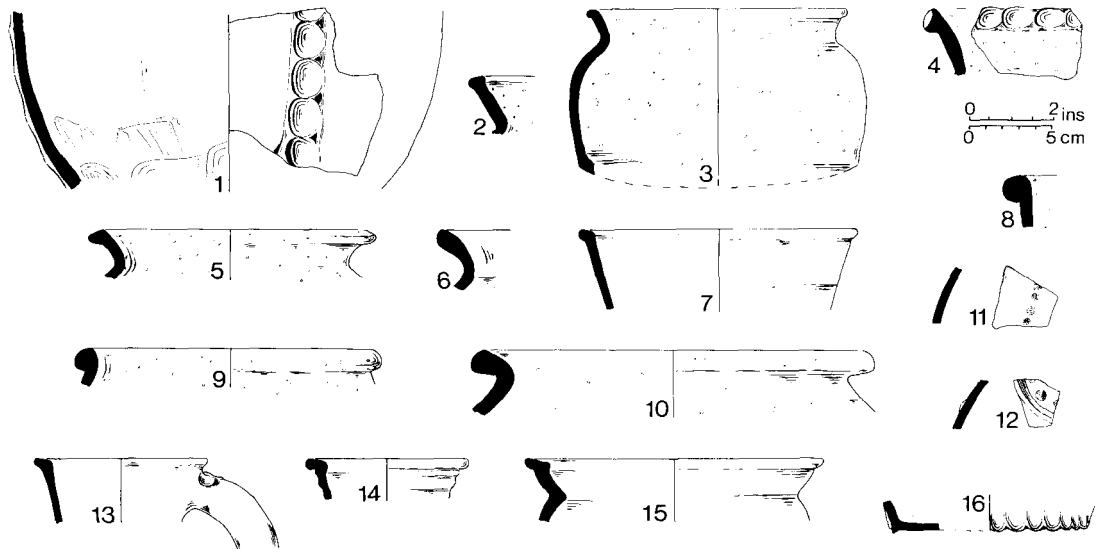


Fig. 42 Inmost Ward 1955–77: Medieval pottery Nos 1–16.

5. Simple everted squared rim sherd in even brick-red fabric, oxidised throughout—sparse shell content. (Layer 35).
6. Simple everted, very slightly expanded rim in smooth, even sandy dark grey reduced fabric with blotchy brown outer surface. Irregular profile apparently wheelmade. (Layer 35).
7. Many small sherds from fine sandy deep bowl in grey fabric with brown inner surface; hand-made. (Layer 37).
8. Rolled rim from bowl in brick-red shelly fabric similar to No. 5. (Layer 38).
9. Another in similar fabric but grey core. (Layer 38).
10. Large heavy expanded rolled rim in very fine sandy, very slightly shelly, light grey fabric with light brown outer surface. Both this and No. 6 are apparently wheelmade—fine horizontal rilling is just visible—and shape seems to be of Saxo-Norman upright cooking pot form. (Layer 38).

PHASE X

Fig. 42

The group of material associated with the robbing of the first Roman riverside wall (Layer 39) was very fragmentary and included many residual medieval shelly ware sherds but also, significantly, a high proportion of decorated, glazed jug sherds mostly Mill Green type ware (Nos. 11-13) very similar to the examples published from the nearby Wakefield Tower. The pottery there is described fully by Thorn and Moorhouse (Apted, Gilyard-Beer and Saunders 1977) and a mid to late 13th-century date demonstrated. Only two sherds of medieval Surrey White ware were recovered from the 13th-century levels associated with the tower and it is significant that only one possible sherd of this fabric occurred in the deposits associated with the robbing of the Roman river wall. There is also one very small scrap of Andenne glazed ware (unillus) in smooth, orange/buff fabric with light orange outer glaze and typical brown flecking. A much larger group of similar 13th-century material was found in 1974-5 in a sequence of defensive ditches on the north side of the Wakefield Tower (Redknap 1983). The infilling of these features was dated by documentary evidence to c. 1190-1220 and c. 1225-35.

11. Body sherd from jug in fine, sandy light grey fabric with brown surfaces, outer surface glazed and decorated with white slipped pellets and strip. (Layer 39).
12. Similar sherd with white slip circle and pellet decoration and dark green glazing. (Layer 39).
13. Jug rim and handle in fine, sandy red fabric with light grey core and traces of white slip on inner surface and green glaze on outer, applied 'ears' on handle. (Layer 39).

14. Jug rim sherd in light grey off-white sandy fabric with pale watery light yellow-green glaze on outer surface. (Layer 39).

PHASE XI

Fig. 42

From the construction trench for the late medieval angle buttress W.12 (Layer 41) and overlying deposits (Layer 42) came a small group of material comprising, as expected, residual medieval sherds including a small fragment of plain green-glazed Saintonge jug (unillus) in characteristic smooth off-white fabric with creamy inner surface. There were also 3 sherds of Surrey White Ware and a sherd from a post-medieval redware white-slip jug. The Surrey ware rim (No. 15) is a 15th century rather than 14th century type and the continuously thumbled base (No. 16) is of creamy-buff colouring more typical of the later Surrey White Wares. This latter sherd shows the rounded red quartz inclusions characteristic of the Kingston kiln products which are probably of 14th century date. The group would seem to indicate a late medieval date for the buttress construction sometime towards the end of the 15th century.

15. Angular rim sherd in coarse sandy off-white fabric showing moulded internal ledge, presumably for lid seating. Unglazed and heavily soot blackened on outer surface. (Layer 41).
16. Thumbled base of jug in creamy/buff sandy fabric, red inclusions and specks of green glaze on under side (another small sherd in same fabric, but with deep green glazing, occurred in this layer). (Layer 42).

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