EXCAVATIONS AT QUEEN STREET, CITY OF LONDON, 1953 and 1960, AND ROMAN TIMBER-LINED WELLS IN LONDON

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SUMMARY

Excavations at Aldermary House and the Bank of London and South America, Queen Street, revealed a number of wells and pits of all periods. Most important among these were the Roman wells which throw valuable light on sources of domestic water, and some knowledge of contemporary geology and hydrology. An examination of the techniques of construction of these wells, and their chronology, shows a gradual development and sophistication in the use of timber lining. This is particularly evident in the use of corner bracing, and in the more effective combination of joints. The dates of barrel-lined wells have implications in determining the period during which wine was imported in barrels. Because of the waterlogged conditions in these wells, leather, wood and organic finds survived in an exceptionally fine state of preservation.

1. INTRODUCTION

The purpose of this paper is twofold; firstly to present the results of two investigations by the Guildhall Museum,[1] and secondly to reconsider the evidence for the timber-lined wells of London, over half of which were found on these Queen Street sites.

In 1953–54 the laying of the foundations of the new Bank of London and South America building (now Lloyds Bank International), 40–66 Queen Victoria Street (TQ 3250 8106), necessitated site watching and salvage excavation which was carried out by Mr Ivor Nöel Hume of the then Guildhall Museum. In 1960, Mr Nöel Hume's successor, Mrs Eve Harris undertook observations across the street at Aldermary House (TQ 3249 8106), 61–62 Queen Street (Fig. 1). The difficulties faced by the archaeological staff of the Guildhall Museum in these years were manifold, and have recently been described by Mr Nöel Hume.[2] There was a lack of both money and manpower for archaeological work, and staff had to spread their efforts over several sites simultaneously. These problems were further exacerbated by the fact that all site investigations were salvage operations, undertaken during the course of redevelopment.

Both Queen Street sites were excavated by the contractors down to the level of the natural subsoil, so that the overlying archaeological strata were almost totally removed. Despite this, many features were recorded, mainly wells and pits, which cut into the natural layers. Given the constraints mentioned above it was obviously impossible to make a thorough examination of the whole site. The following limitations on the available evidence should be borne in mind.

1. The site plans (Figs. 5 and 6) are by no means full reflections of the total evidence for occupation from the sites and show only the features cut into natural layers. The need for the archaeologists to divide their time between many building developments, and the limited time available meant that not all, even of these features, were fully recorded. This was particularly true of the eastern end of the Bank of London and South America site as, when this was being developed, Mr Nöel

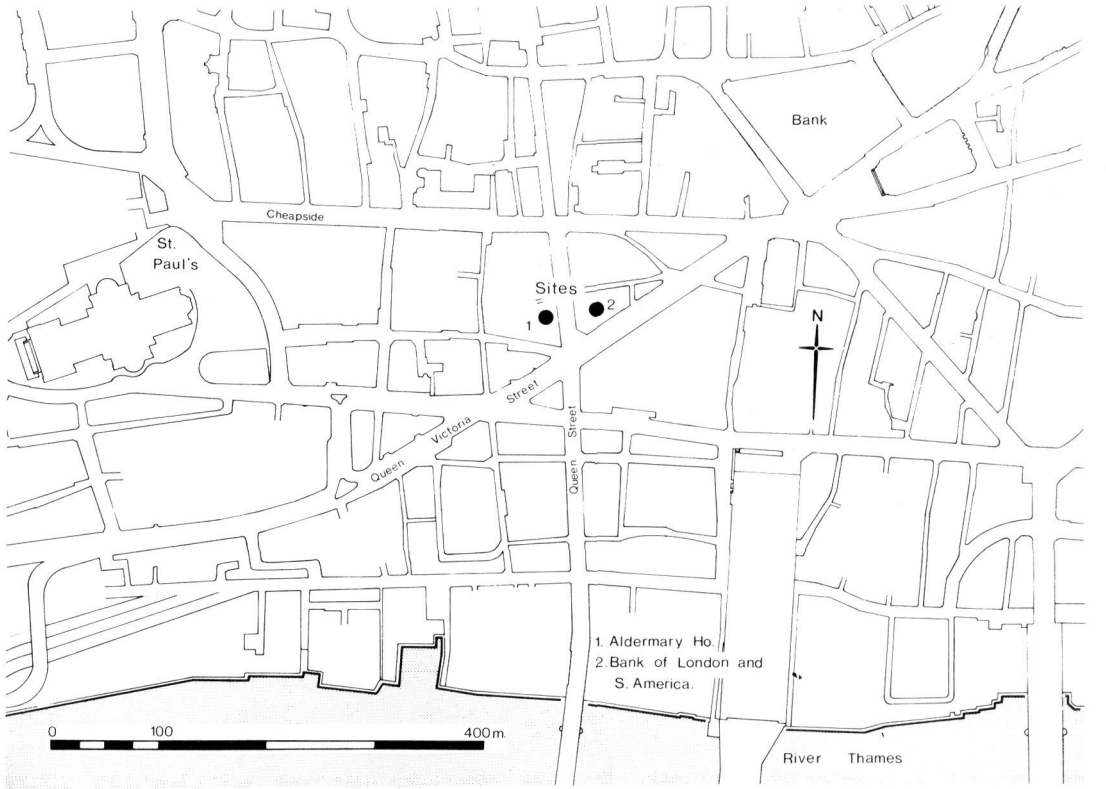


Fig. 1. Queen Street 1953 & 1960: Site location map.

Hume's efforts had to be concentrated at Bucklersbury House.

2. The second limitation concerns dating, and is of vital importance in interpretation. All dates have been derived from the study of the pottery recovered (see introductions to finds and pottery reports below. For dating see Figs. 22, 23, 27, 42). No dating evidence was recovered from the construction layers of features, and consequently all dates relate to their filling. Most fills were removed as single homogeneous waterlogged deposits and, as a result, finds from the earliest and latest layers were intermixed. Thus the earliest pottery might be from the primary fill, but might also be residual. This means that in most cases dates quoted represent the maximum period during which a feature might have been open. Basic guidelines can, however, be laid down. The lack of pre-Roman material in those features filled during the earlier Roman period indicates that they were not constructed or dug before *c.* AD 43. Within the early group of wells the consistent absence of pottery post-dating *c.* AD 150 may be taken to indicate that the group had been completely filled by *c.* AD 150. However, greater difficulties arise with the dating of the later wells, the fills of which are likely to contain large quantities of material of a residual nature. Where the internal stratification of a feature was distinguished in excavation, this is specified.

The following format has been adopted for this report. After a discussion of the geology of the sites the features are described in a series of tables, supplemented where necessary by additional discussion in the text. Tabulation is particularly useful here as it shows graphically the amount of data recorded compared with what was unavoidably lost. All

tables are based on more detailed information which is stored in the archaeological site archive at the Department of Urban Archaeology of the Museum of London. The discussion of the sites in relation to other contemporary features in the vicinity is included after the description of the archaeological evidence for each period. This report is followed by an analysis of the timber linings of the wells at Queen Street and elsewhere in London, and the paper concludes with a report on the finds from Queen Street.

II. THE GEOLOGY OF THE SITES

The underlying geology is of special importance for two reasons, in evaluating the nature of the ground surface on which the earliest Roman activity took place, and in suggesting an explanation for the large number of wells found on these sites. The geology of London comprises thick river gravels overlying London Clay and capped in turn by a layer of brickearth. This has already been considered more generally,[3] and a map showing the levels of the natural surface, so far as it is known, has recently been published.[4] The Queen Street sites lie on the plateau or terrace of the westernmost of the two 'hills' on which the Roman city developed. On the top of this hill, brickearth reaches a thickness of 1–2m.[5] About 50m to the east of the site lay the Walbrook stream, which had eroded through the natural deposits, while to the north-east lay a tributary of the Walbrook. The spot levels in Fig. 2a show the recorded top of the natural ground surface in the Queen Street area. It is clear from this that the ground sloped eastwards from the hill into the valley of the Walbrook and its tributaries. Though comparatively thick at the top of the hill, the brickearth became progressively less so on the hill slope towards the Walbrook valley, until at Watling Court[6] a maximum of 150mm was recorded. No brickearth at all was observed at Well Court[7] and Aldermary House. The top of the brickearth on the Bank of London and South America site was recorded at 8.20m O.D. but its thickness is unknown; it may merely have been a residual lens overlying the gravel as it sloped into the stream valleys to the east and north. Thus the ground surface on the Queen Street site would appear to have been of gravel overlain by thin deposits of brickearth with a gentle slope downwards to the east.

The reason for the exceptionally high number of wells on the sites is a more complex question relating to the underlying geology, and is explained by a study of borehole records and observations from deep commercial excavations, and also from Roman and later wells. The impermeable London Clay causes a reservoir of ground water to form in the gravels above. Fig. 2b is a section through part of the City showing the natural layers revealed in boreholes at Watling Court, Aldermary House (see also Fig. 3) and trial excavations at Bucklersbury House, together with archaeological observations at the Bank of London and South America. From a level of 5.03m O.D. under Cannon Street[8] the London Clay slopes upwards to *c.*7.00m O.D. at Watling Court. There is then a steep drop to 0.35m O.D. at the western limit of the Aldermary House site, before the London Clay rises to 5.23m O.D. in the centre of the site, a gradient of 1:2. Though it slopes down sharply to the south east at Aldermary House (Fig. 4) the London Clay was observed at a level of approximately 4.10m O.D. at the Bank of London and South America, indicating the continuation eastwards of the high ridge which starts in the middle of the Aldermary House site. At Bucklersbury House, the level of the top of the London Clay was established at between −1.82 and −6.09m O.D. representing a steep drop from Queen Street. Thus the Queen

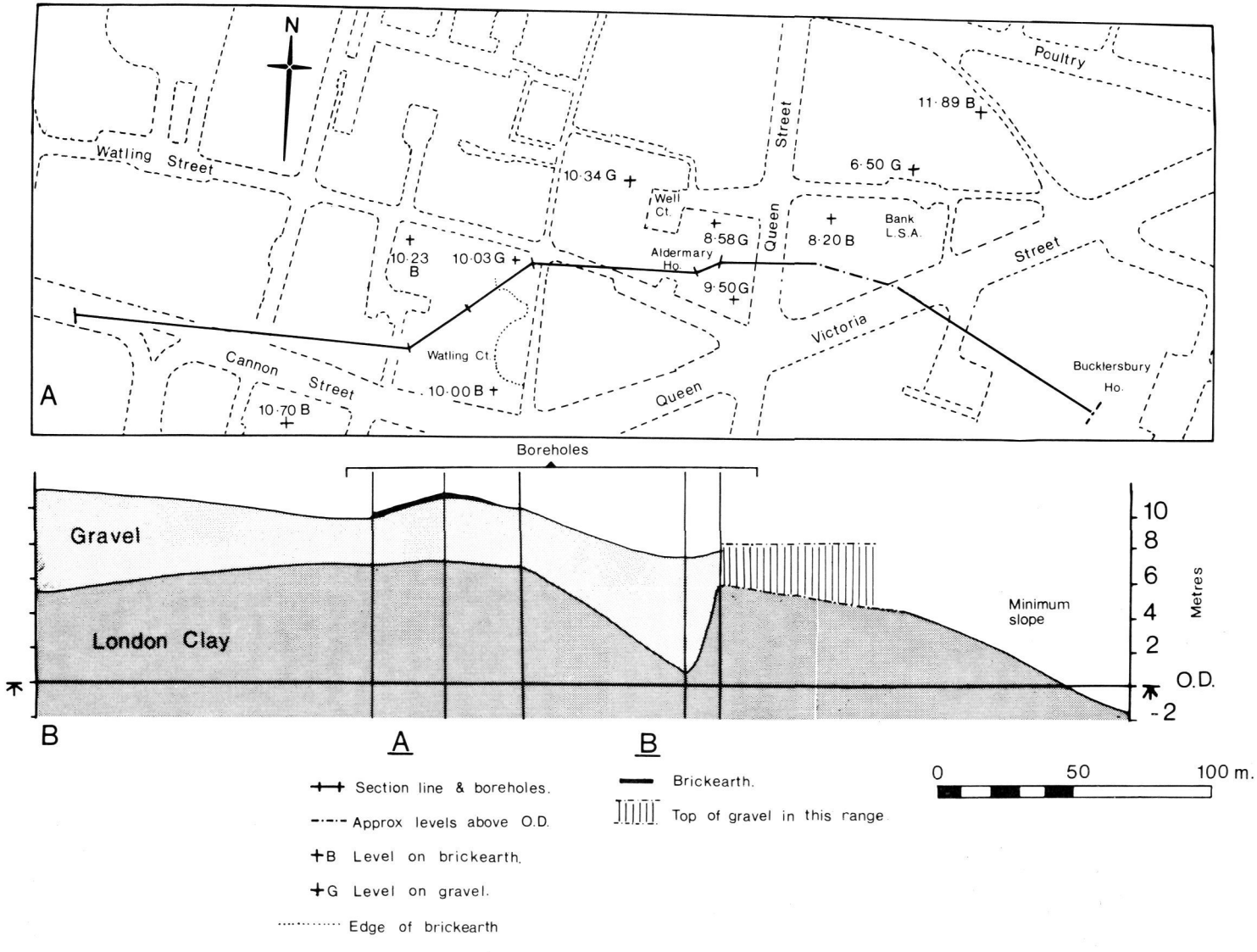


Fig. 2. Queen Street 1953 & 1960: Reconstructed section through the geology of the area.

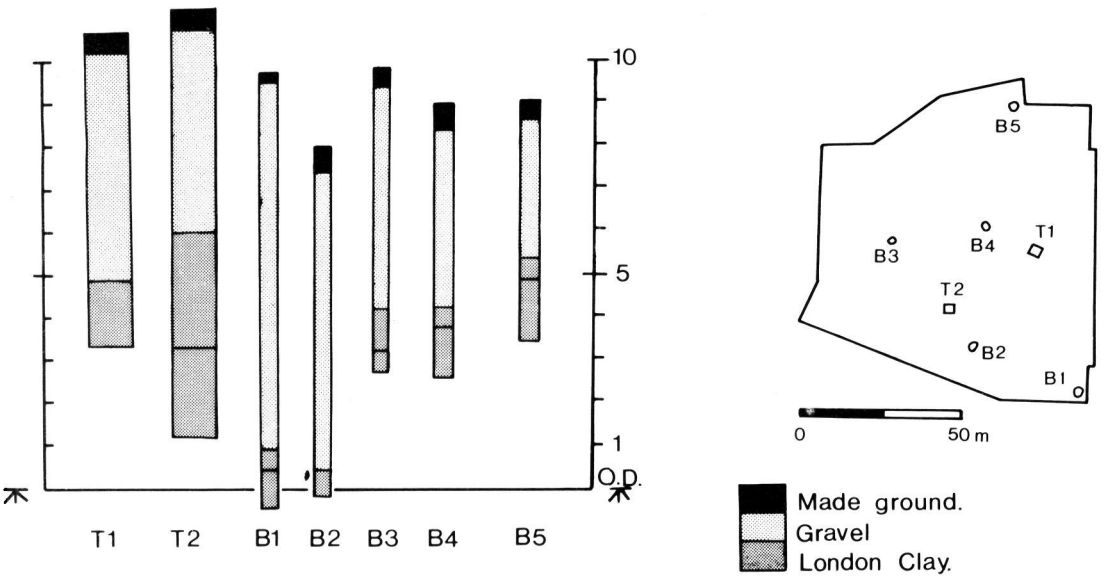


Fig. 3. Queen Street 1953 & 1960: Borehole sections at Aldermary House.

Street sites are situated in an area where the London Clay is substantially higher than at any nearby point, and this would cause the water table in the overlying gravels to be similarly high. The gravels were less thick at Queen Street than on sites to the west; at Watling Court they lay at 10.02–10.34m O.D. and at Aldermary House, between 8.50m and 9.50m O.D. At the Bank of London and South America the top of gravel lay between approximately 6.16m and 8.27m O.D. and the downward slope of the gravel surface to the east indicated by these levels appears to have continued into the valley of the Walbrook.

It therefore seems that there were two distinct geological advantages to the siting of wells on the Queen Street sites: the high level of the top of London Clay relative to the immediate area, and the fact that the gravels were 0.50–1.00m less thick than at Watling Court and further to the west. These two factors would cause a locally high water table, and conditions in which it would not be necessary to dig deep wells in order to reach the water. It is noteworthy that only two of the Roman wells at Aldermary House lay to the west of the dip in London Clay which occurred in the middle of that site, the rest were concentrated to the east (compare Figs. 4 and 6). Furthermore, a well such as Well 22 (Fig. 11) could be dug through the gravel cap into London Clay such that water springing from the gravel would fill the deep hole and provide a substantial quantity of clear water at all times, while the lower part of this well would also not need to be lined beyond the point where it penetrated the London Clay. Well 22 was, however, exceptional, and it appears that in general it was the high water table rather than the advantage gained by digging into clay, that was being exploited at Queen Street.

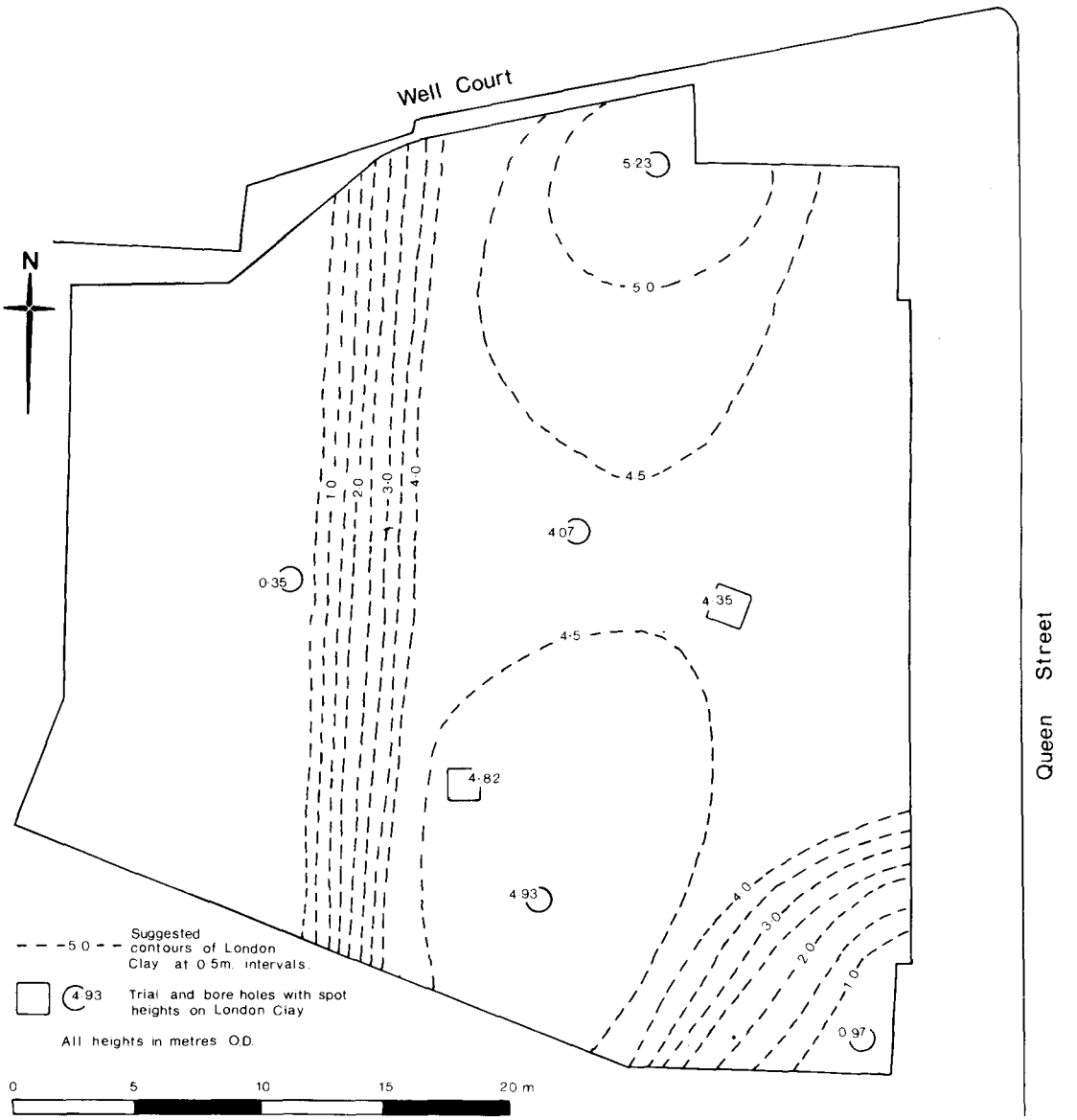


Fig. 4. Queen Street 1953 & 1960: Aldermary House borehole plan and reconstructed contours of London Clay.

III. CHRONOLOGICAL ANALYSIS OF FEATURES

In the following analysis the features from both Aldermary House and the Bank of London and South America are included in a single numerical sequence shown in Figs. 5, 6 and 7. The basic information on the features are tabulated in Figs. 9, 10, 14, 15, and 17. The Roman features are grouped according to date,

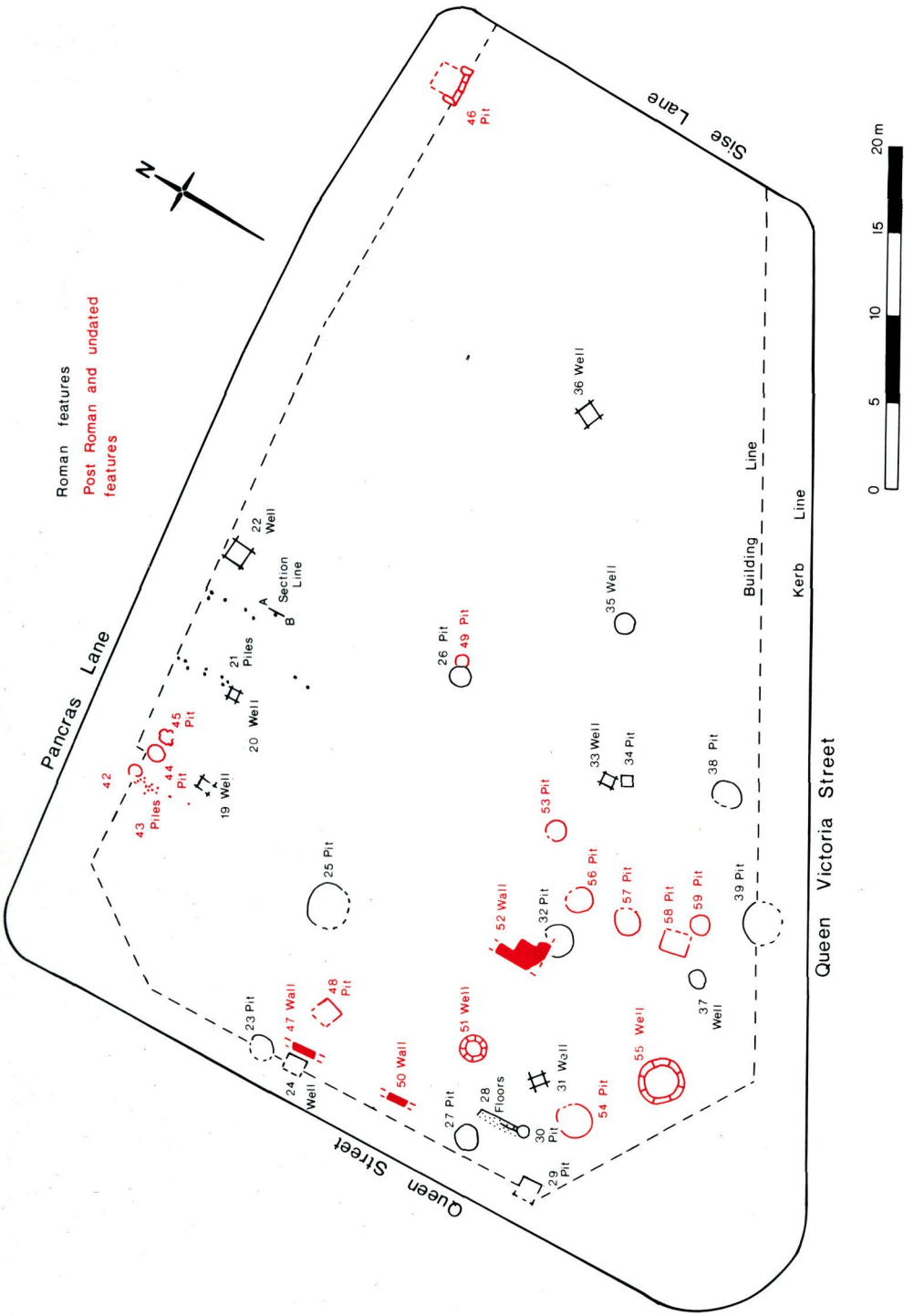


Fig. 5. Queen Street 1953 & 1960: Site plan: Bank of London and South America.

and whether they are wells or pits. A summary of date is given in tabular form in Fig. 22. Any additional information necessary has been included in the text which follows.

A. 1st–2nd CENTURIES

1. FEATURES OVERLYING NATURAL

Feature 21. Timber piles (Pl.1) placed in two parallel lines 3.13m apart. The context

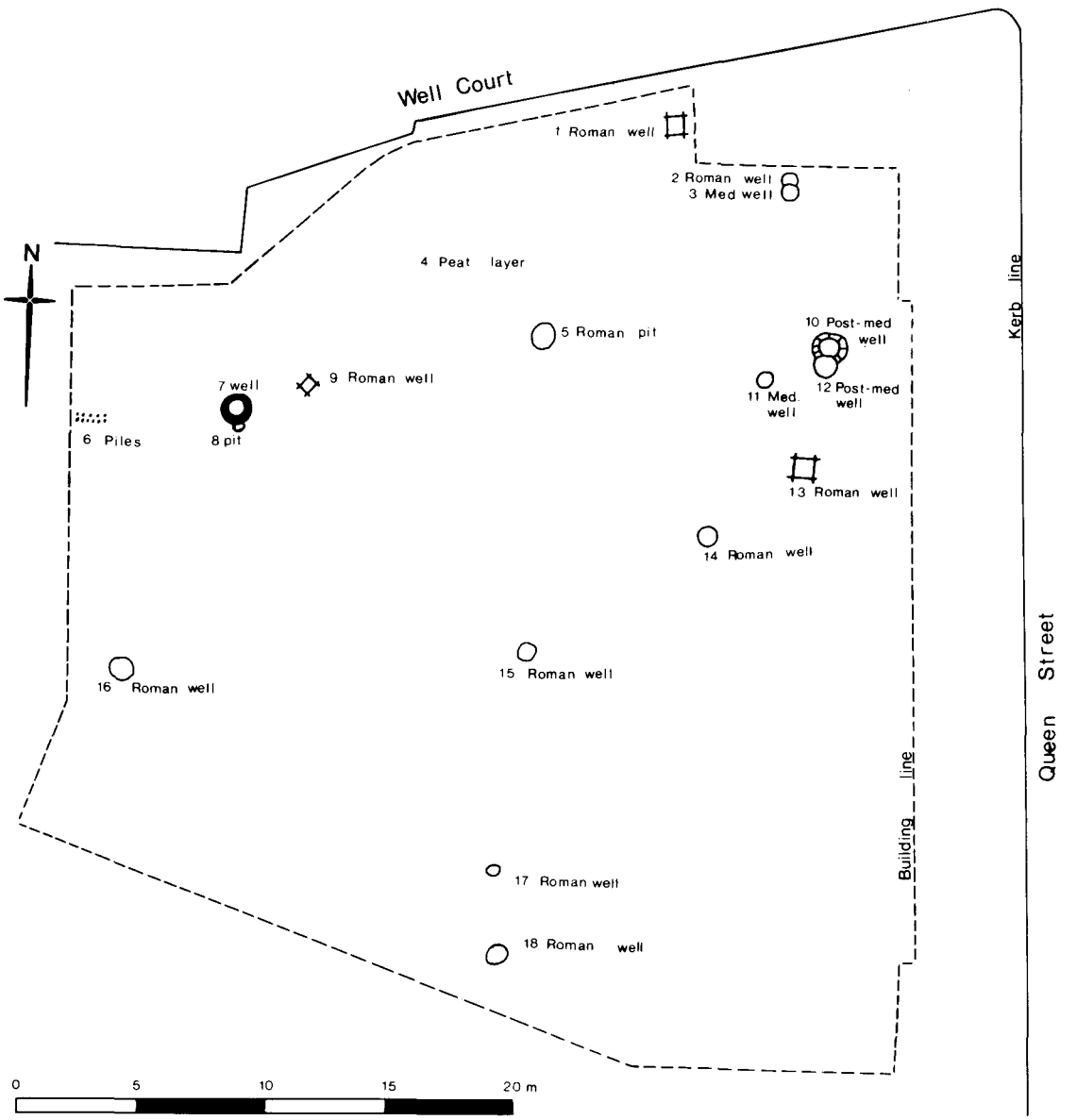


Fig. 6. Queen Street 1953 & 1960: Site plan: Aldermary House.

of one of these pits is shown in section (Figs. 5 and 8). Pit 40 (12 in section) was filled at the same time as the piles were set up. This was demonstrated by the redeposited brick-earth, Layer 11, which was laid down in a continuous layer filling Pit 40 and packing the post pit (0). It is possible that Pit 41 (No. 14 on section) was filled at the same time as it is filled with similar material at the same level. Above these fills, clay layers 9, and 10, appear to have been laid down while the pile remained *in situ*. Perhaps these layers represent the footings, or collapse, of clay walls forming part of a building supported by the timber posts. If so this would suggest a 1st–2nd-century date, the period when most of the dated clay-founded buildings in London were erected.[10] The only stratigraphic dating evidence was pottery of Roman date from Layer 6 (Fig. 22).

Plate 1. Queen Street, 1953 & 1960: Timber piles, Feature 21.

2. WELLS

1st–2nd-century wells are summarised in Fig. 9. Additional information is given below:

Well 22. A section through this well is shown in Fig. 11.[11] Layers 5 and 6 contained two finds of interest, a ladder (No. 84) and a wooden dipper) No. 92). Layer 4 was an organic deposit rich in finds, and was dated not later than the Flavian period (Figs. 22 and 23). The ladder and dipper could be associated with the use of the well, for maintenance and for the extraction of water. As finds in Layer 4 have no such connection it is likely that this was the first deposition of rubbish into the well after it had fallen out of use. The clay deposits below can be interpreted as silt. Above Layer 4 two organic layers (2 and 4) alternated with clay deposits (1 and 3). There are two possible interpretations for this. Either continued silting represented by the clay levels was interrupted by occasional rubbish dumping, or a series of dumps of different types were deposited. The former may be the more likely as the preservation of the timber lining of the well was presumably due to the continued presence of water which could have been the agency by which further silting took place. Finds from layers above 4 dated from the 1st–3rd century (Figs. 22 and 23) suggesting a long period of silting or back-filling.

The human skull in Layer 2 does not, as has been suggested[12] appear to have been pushed into the heavy clayey silt of the well with the timber that lay above it, as this would have caused greater fragmentation of the dentition.[13] It is more likely that the timber was dropped subsequently, breaking the top of the skull (see Appendix p. 75). The timbers from the upper frames of the well rested in its top filling.

3. PITS

Pits are summarised in Fig. 10.

4. GENERAL DISCUSSION

A more coherent picture of the Queen Street area in this period can be estab-

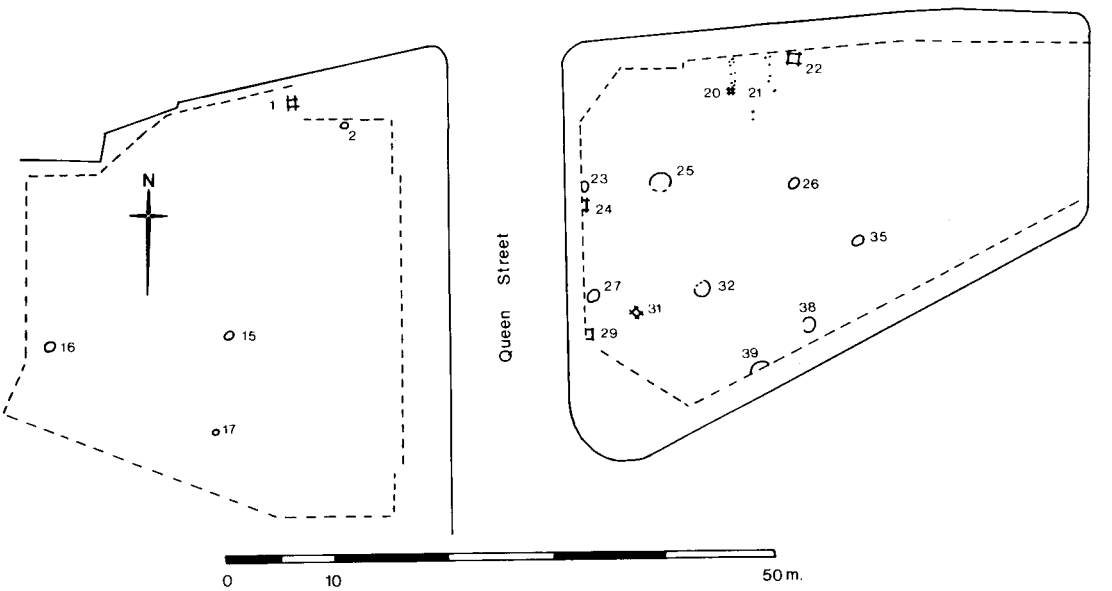
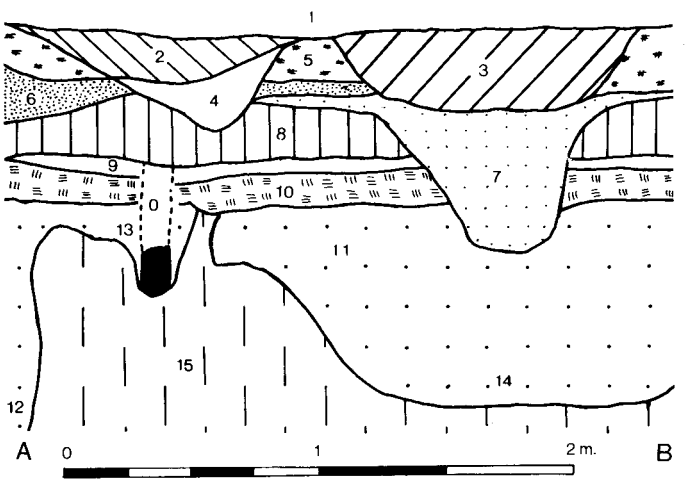


Fig. 7. Queen Street 1953 & 1960: Dated 1st–2nd-century features.



1 Modern trample.
2 Victorian trample in top of pit 64
3 Fill of pit 65 , grey clay.
4 Medieval fill of pit 64 (largely wood).
5 Clay flecked with burning.
6 Greenish gravel (Roman).
7 Gravel and sand, fill of pit 66
8 Gravel, sand and mortar.
9 Dark brown clay.
10 Grey-brown clay.
11 Reddish (redeposited) brickearth.
12 Pit 40.
13 Post-pit for 0.
14 Pit 41.
15 Dark grey clay
0 Post: part of 21.

Fig. 8. Queen Street 1953 & 1960: Section A–B (see Fig. 5).

Feature number	*Lining type*	*Description of jointing and timbers*	*Layers in fill*	*Description of fill*	*Length (metres)*	*Breadth (metres)*	*Diameter if circular (metres)*	*Depth (metres)*	*Height of base + O.D. (metres)*
2	barrels (2 survive)						0.63		
9	box-frames				0.66	0.53			
15	barrels (2 survive)						0.76		
16	barrels (2 survive)						0.84		
17	barrels (1 survives)								
18	barrels (1 survives)								
20	box-frames	Half-lap joints (Pl. 3)			0.68	0.68		1.19	6.08
22	box-frames (12 survive)	Half-lap joints (reconstruction, Fig. 19)			1.30	1.07		6.25	0.97
	bottom unlined in natural clay.		Fig. 9; No. 1 No. 2 No. 3 No. 4 No. 5 No. 6	Brown clay Organic material Grey clay Organic material Grey-brown clay Clay and stones					
24	timber-lined	Timbers vertically placed, edge-to-edge with 4 corner posts. Planking held in place with struts morticed into corner posts (Fig. 18)			0.99	0.99			6.15
31	box-frames	Half-lap joints (reconstruction, Fig. 19)					1.25		
	barrel bottom not lined	Dovetailed staves	Fill in barrel Fill above barrel	Black organic Burnt debris including stone, timber, building material, painted plaster					
33	barrel box-frames				0.58	0.49			5.24
35	barrels (2 survive)						0.93	1.68	6.39

Fig. 9. Queen Street 1953 & 1960: Description of 1st–2nd-century wells.

Plate 2. Queen Street, 1953 & 1960: Upper timbering of Well 22.

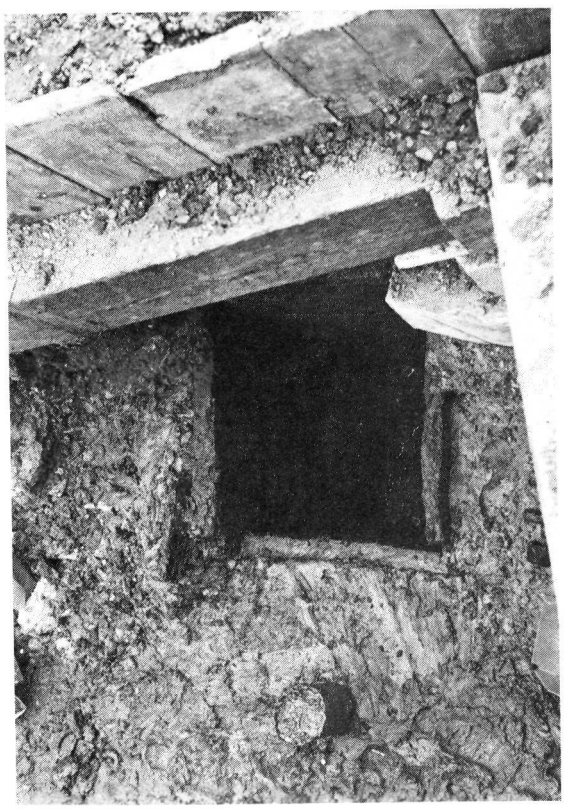


Plate 3. Queen Street, 1953 & 1960: Upper timbering of Well 20.

Plate 4. Queen Street, 1953 & 1960: West side of timbering of Well 24.

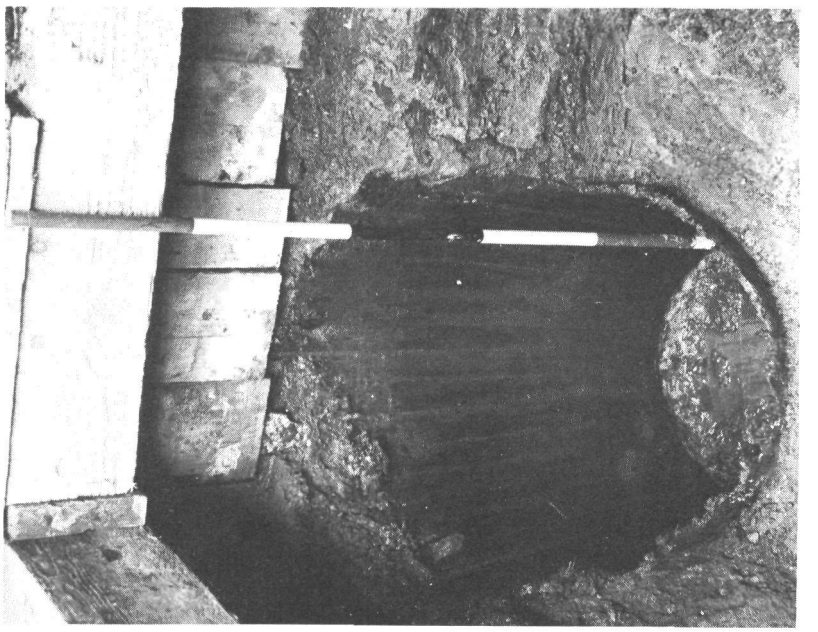


Plate 6. Queen Street, 1953 & 1960: Timbers and joints of Well 19.

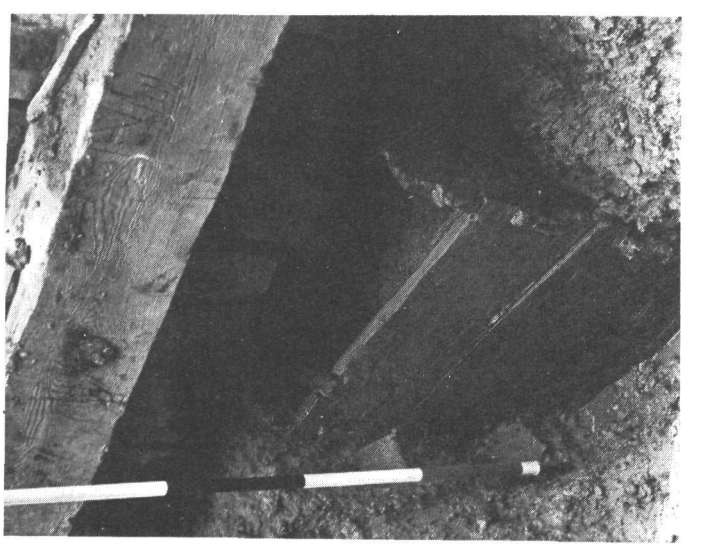


Plate 5. Queen Street, 1953 & 1960: Barrel Well 37 with staves in situ.

Feature number	*Layer in fill*	*Description of fill*	*Length (metres)*	*Breadth (metres)*	*Diameteter if circular (metres)*	*Depth (metres)*	*Height of base + O.D. (metres)*
23						1.45	
25						2.60	
26						1.14	6.16
27						1.29	5.74
29	complete fill	Silty material containing burnt daub and plaster	0.73	0.73			
38				1.52			
39	filling and sealing layer.	Burnt daub.					
40	complete fill	Redeposited brickearth Fig. 8.					
41	complete fill	Redeposited brickearth Fig. 8.			2.00+	0.75	
60							

N.B. Nos. 40–60 unplanned.

Fig. 10. Queen Street 1953 & 1960: Description of 1st–2nd-century pits.

lished by reference to other sites in the vicinity, and to Roman London as a whole. Fig. 12 shows the location of the present sites in relation to other Roman features in the area. Though this plan covers features over the whole Roman period it does illustrate the following points. Excavations at Well Court,[14] to the west of Aldermary House, revealed a north-south road, the Roman forerunner of Bow Lane. Immediately to the west of this road was found an area of intensive building development, dating from the 1st–2nd centuries. At Watling Court,[15] to the south of Well Court, more extensive indications of this development were located. On this site, buildings were closely packed, and were separated only by lanes. There was no garden or yard space and no evidence that the excavation of wells and pits had taken place. East of Bow Lane, however, on the part of Well Court adjacent to Aldermary House, there was no evidence of activity until *c.* AD 100, when only pits are recorded. Limited building did occur during the first half of the 2nd century, attested by the post and clay feature (Fig. 8), burnt daub in Pit 29 and burnt material including painted wall plaster, and lead water pipes in Well 31. This activity, however, cannot have been as intensive in scale here as that to the west of Bow Lane which left no room for the sinking of wells and pits in large numbers. This observation remains valid despite the deficiencies in the recording at Queen Street. Though it is possible that wells and pits were situated in the yards of scattered buildings, as occurred at Milk Street,[16] it would seem that the Bow Lane road may have separated two distinct zones of activity; to the west a heavily built up area, and to the east an area of well and pit-digging with only occasional buildings. Such a state of affairs has not appeared in any other Romano-British town where extensive excavation has taken place, e.g. Verulamium, or Silchester. This may be because these towns

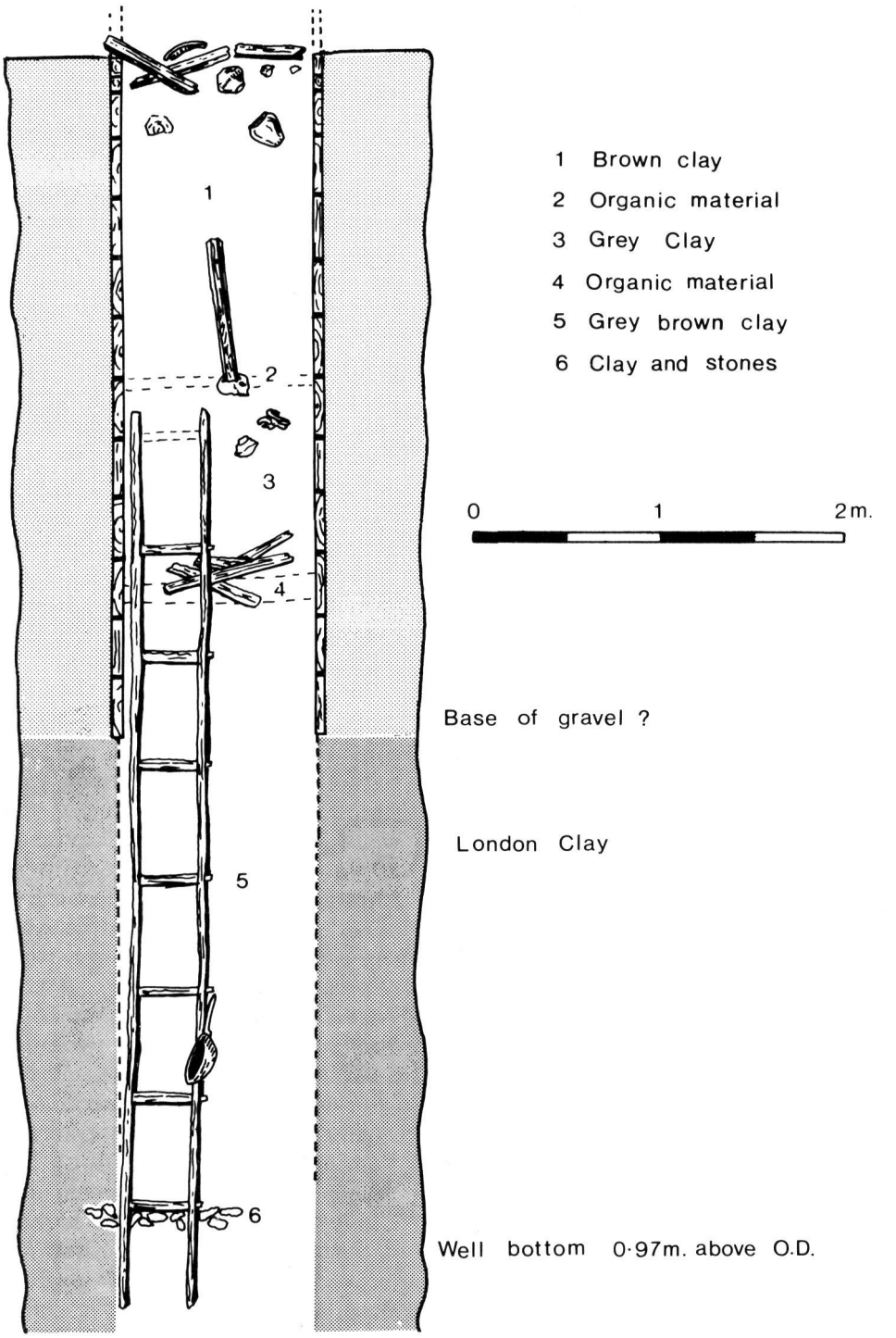


Fig. 11. Queen Street 1953 & 1960: Section through Well 22.

were served by aqueducts and this area of London at least was not.

It is clear that the concentration of wells at Queen Street, was due to the particularly advantageous geological conditions described above. A recent paper on the water supply of Roman London[17] suggested that the Queen Street wells may have been used either for industry or for public water supply. There is no evidence from the finds to support the former suggestion, and the fact that many water using industries were concentrated along the banks of the nearby Walbrook,[19] where running water was available in some quantity is probably significant. It is very likely that due to this industrial usage, and also because of rubbish disposal indicated by the large number of objects, including industrial waste found in the Walbrook, such streams would quickly have become polluted. Thus the possibility that the wells were sources of domestic fresh water appears far more likely.

This may well be the reason why wells were sunk at Queen Street despite the streams which were situated to the north, west, and east (Fig. 12). The intensive, and presumably quite heavily populated, development at Watling Court (Fig. 12) apparently had no water supply provided on site. It is probable therefore that the Queen Street wells, which would have been the nearest available source of fresh water, served the inhabitants of this adjacent development. It is likely also that the quantity of water available at Queen Street was quite considerably greater than would be required for the number of scattered buildings that appear to have occupied the small areas between the pits and the wells.

It seems reasonable to suggest that water was provided at Queen Street for the inhabitants of Watling Court at least, and possibly also for those living further afield. The idea that a public water supply was provided at Queen Street has wider implications, suggesting civic authority involvement in the development and planning of the area. If it was known that geological conditions were favourable to the extraction of water at Queen Street, the area may have been deliberately set aside for this purpose while intensive development of housing went on on adjacent plots, possibly encouraged by the existence of a ready water supply. The great depth of silt in Well 22 predating the Flavian dumps demonstrates that this policy was put into action well before the erection of the Flavian public buildings.

The wider question of the supply of water for Roman London has recently been discussed by Wacher,[20] who suggests that at least some of the water supplied to London was brought in from outside the City by aqueducts. This suggestion requires further examination.

In a previous work Wacher suggested that aqueducts were used to supply large consumers such as bath houses, with a subsidiary service for domestic properties, supplementing the water available in wells. He also points out that the presence of water pipes and sewers intended for running water should reflect the presence of an aqueduct.[21] The large water consumers in London, however, can all be related to available supplies of ground water. The bath houses at Billingsgate and Huggin Hill, together with the Palace and its large ornamental pool[22] were sited on the Thames river front, or on the spring-line between the gravel and the London Clay, while the Cheapside bath-house[23] was constructed in an area where the water table was high. Thus in none of these cases was there any need for, or indeed any evidence of, aqueduct supply. In view of the fact that running stream water was used for industry (see above), and domestic supply was catered

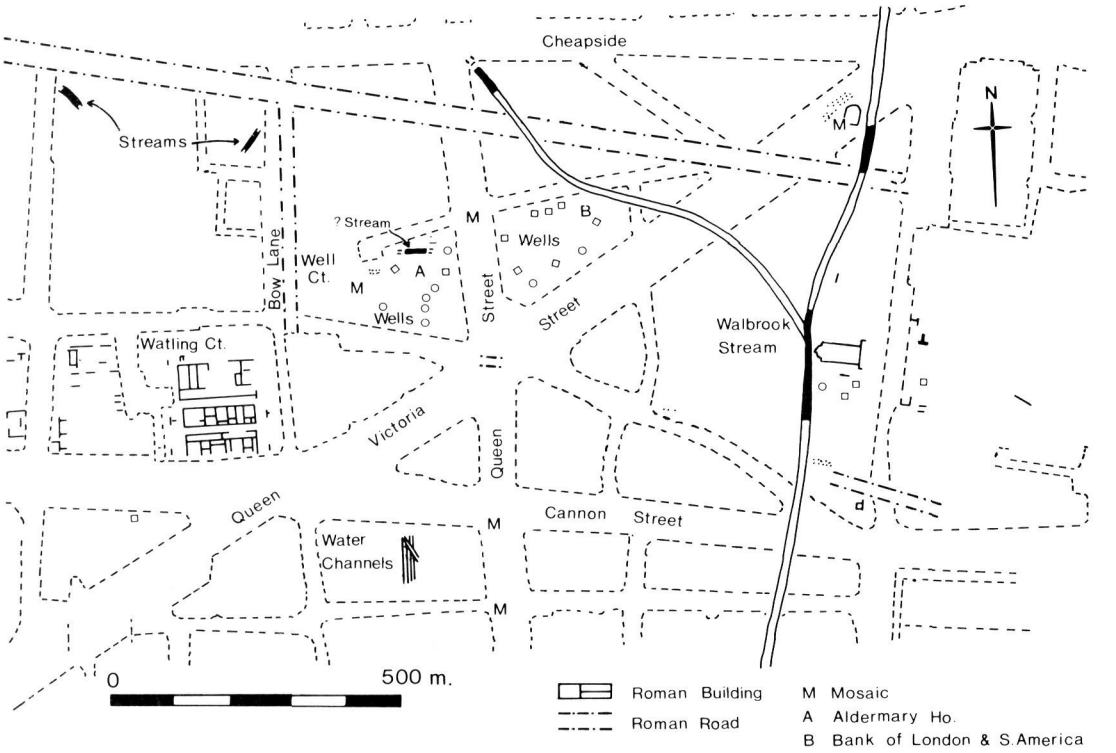


Fig. 12. Queen Street 1953 & 1960: Location of Roman features in the area of the sites.

for by the sinking of wells, it appears unlikely that aqueducts, which, as Wacher himself points out,[24] would have to be carried on a raised structure or in closed channels by pumping, would be required. Large drains such as those at Cannon Street[25] and that recently found at Pudding Lane are more likely to have been intended for draining off excess rain water, or for tapping from, or drainage of the spring line rather than for waste water from running aqueducts. Water pipes such as those found at the Bank of England[26] and on the Queen Street sites themselves, could, with the use of a pump such as that found at Silchester,[27] have channelled ground water on site, and it is at least possible that the closed water pipes at the Bank of England were used for channelling rivulets of water into the Walbrook Stream, and for draining a very damp area; such pipes were shown to have been used for this purpose at Bucklersbury House.[28]

The building developments at Watling Court and Well Court were destroyed in the Hadrianic fire of London, and the burnt daub in Pit 39, and burnt building debris in Well 31 may also be evidence of this conflagration, as the dating evidence from both features is quite consistent. Subsequent small scale buildings at Well Court and Watling Court were also destroyed by another fire in the Antonine period.[29]

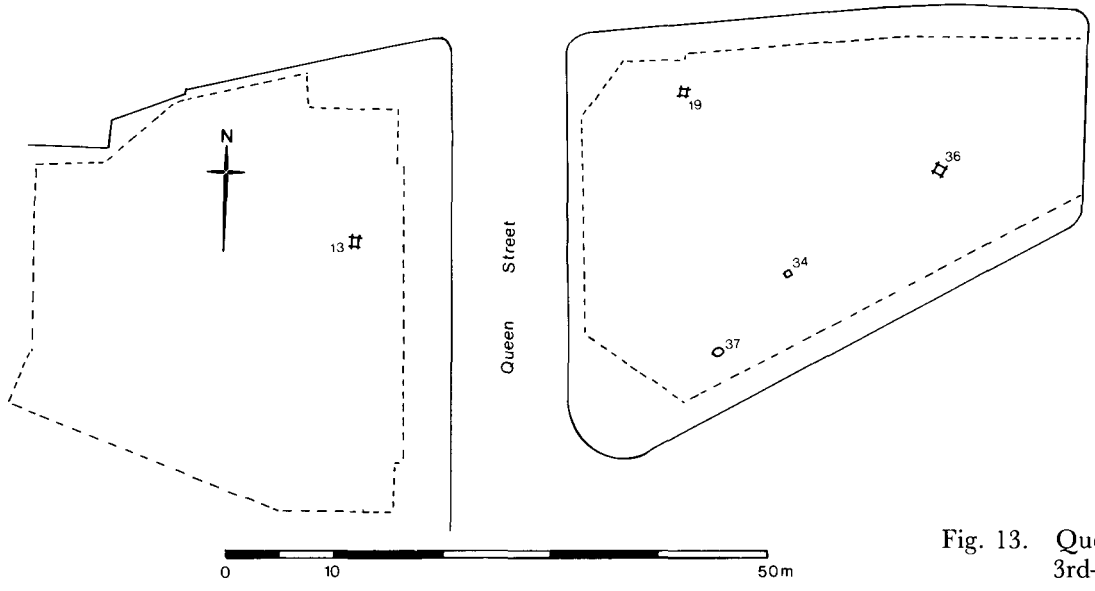


Fig. 13. Queen Street 1953 & 1960: Dated 3rd–4th-century features.

Feature number	*Lining type*	*Description of jointing and timbers*	*Layer in fill*	*Description of fill*	*Length (metres)*	*Breadth (metres)*	*Diameter if circular (metres)*	*Depth (metres)*	*Heights of base + O.D. (metres)*
13	box-frames	?Dovetailed			0.86	0.84			
19	box-frames	Top frame half-lap, other frames bridled and braced in 2 corners (reconstruction, Fig. 19).	bottom (d) (c), above (d) (b), above (c) (a), above (b)	Grey clay Black organic 'Horse dung' Black organic		0.99		0.79 1.02 0.30 2.03	5.33
36	box-frames (8 survived)	All frames fastened with bridled joints braced in two corners (reconstruction, Fig. 19)			0.68	0.53		2.44	
37	barrel (1 survived)						0.84		6.74

Fig. 14. Queen Street 1953 & 1960: Description of 3rd–4th-century wells.

B. 3rd–4th CENTURIES (Figs. 5, 6, 13)

1. WELLS

Wells of this period are described in Fig. 14.

Well 36. The lowermost timber frame in this well had slipped to the north, leaving an overhang on that side under which buckets may have caught. To rectify this, an additional board was placed beneath the overhang, and was held in place by two squared stakes driven into the bottom of the well (reconstruction: Fig. 19).

Well 37. This was the only barrel well apparently of this period (Figs. 22 and 27). The dating, however, does not rule out the possibility that, like Wells 22 and 33, this was sunk in the early Roman period, to be followed by a long sequence of back-filling.

It is feasible that the seemingly residual 1st–2nd-century finds were from the earliest fill of the feature. This is particularly likely in view of the lack of residual material in other 3rd–4th-century wells (see General Discussion, below).

2. PITS

Pits of this period are described in Fig. 15.

3. GENERAL DISCUSSION

The 3rd–4th centuries at Queen Street saw a marked decline in the number of wells and pits excavated (compare Figs. 7 and 13). At Watling Court, the Antonine fire was followed only by the build-up or deposition of dark earth,[30] while at Well Court there was no building activity after the beginning of the 3rd century, when dark earth also began to accumulate.[31] These sites thus offer no help in the interpretation of the subsequent periods at Queen Street. The decline in the numbers of features on all these sites reflect the recently postulated decline in Roman London as a whole.[32] It is certainly not the case that fewer features of later date penetrated natural due to the build-up of the ground level during the Roman period. As will be shown even post medieval wells were sunk to this level.

The fact that in the post-Roman period the area was still used for well digging shows that the decline in well numbers in the later Roman period was not the result of a change in the availability of water in the area.

The 3rd century at Queen Street is attested by the slow filling of Wells 22 and 33 and in all probability of Well 37 also. The two Wells 36 and 19, filled in the late 3rd–4th century (Figs. 22 and 27) contained very little residual pottery (compare Figs. 23 and 27). This may indicate a date of construction, as well as of filling, in that period. The almost total lack of 1st–2nd-century pottery in the fill of these features, when contrasted with Well 37, precludes their construction in the earlier period. Reinforcing this conclusion there appears, in addition, to have been 3rd–4th-century material in the packing of Well 19 (Fig. 22). The evidence, such as it is, appears to reflect a period of desertion, or at least of a lack of well digging, in the 3rd century followed by some renewal of activity in the area towards the beginning of the 4th

Feature number	*Layer in fill*	*Description of fill*	*Length (metres)*	*Breadth (metres)*	*Diameter if circular (metres)*	*Depth (metres)*	*Height of base + O.D. (metres)*
34			0.73	0.73			5.64
61	complete fill						
63		Wet and black					

N.B. Nos. 61–63 not on plan.

Fig. 15. Queen Street 1953 & 1960: Description of 3rd–4th-century pits.

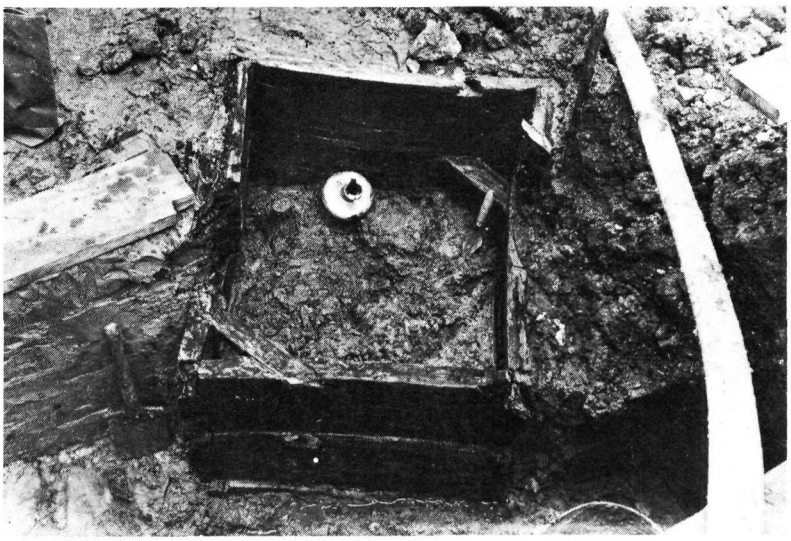


Plate 7. Queen Street, 1953 & 1960: Timbering of Well 36 from north, showing bronze jug *in situ*.

Plate 8. Queen Street, 1953 & 1960: Timbering of Well 36 from south.

Feature number	*Feature type and lining*	*Description of fill*	*Length (metres)*	*Breadth (metres)*	*Diameter if circular (metres)*	*Depth (metres)*	*Height of base + O.D. (metres)*
3	Barrel-lined well				0.76		
8	Pit				1.02		
11	Barrel-lined well				0.61		
42	Pit						6.46
44	Barrel-lined well Lower barrel fitted into base of upper (Pls. 11, 12)				1.02		
49	Pit						2.74
51	Chalk block lined well				2.67		
53	Pit				1.32		
56	Pit	Organic material			1.29		
57	Pit	Organic material					
58	Pit with board lining		1.52				
62	Pit (unplanned)						

Fig. 16. Queen Street 1953 & 1960: Description of medieval features.

century, rather than continuity throughout the Roman period.

C. OTHER ROMAN FEATURES (Figs. 5, 6)

A miscellaneous group of features could not be more closely dated than to the Roman period on pottery evidence.

Well 1. Box framed well measuring 0.76m × 0.61m at the top.

Feature 4. Ralph Merrifield describes a 'hollow filled with black peaty mud resembling a pond or stream bed, to the north of the Aldermary House site'.[33] The Roman date of this feature is dubious.

Feature 5. Circular pit, 1.20m in diameter.

Feature 6. A double row of stakes, sharpened at both ends, ran E–W. The rows were 1.45m long and 0.35m apart. Though pottery among the stakes was dated to the 3rd–4th centuries, two identical stakes were found in the 1st–2nd century Well 16.

Well 14. Barrel well 0.76m in diameter.

Feature 28. To the west of the site lay a sequence of 3 mortar floors, the lower two separated by a stratum of silt (P1.9).

Pit 30. Pit, bottomed at 8.75m O.D. which cut floors 28 (P1.9).

Pit 32. Pit filled with gravel and sand (Fig. 8 not on plan).

Pit 66. (Not on plan).

D. MEDIEVAL (Figs. 5 and 6)

The 4 wells and 8 pits of medieval date are described in Fig. 16.

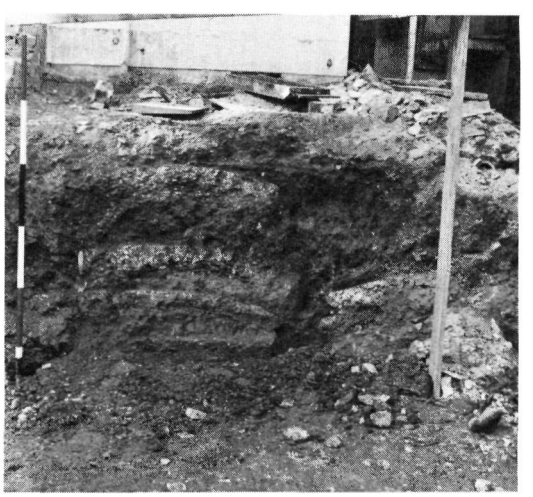


Plate 9. Queen Street, 1953 & 1960: Section through floor and pit sequence, Features 28 and 30.

Feature number	*Feature type and lining*	*Description of fill*	*Length (metres)*	*Breadth (metres)*	*Diameter if circular (metres)*	*Depth (metres)*	*Height of base + O.D. (metres)*
10	Well; lower part brick-lined, top lined with barrel containing chalk blocks				1.40		
12	Chalk-lined well				0.99		
46	Rectangular rubbish pit						
48	Pit with irregular shape		1.22				7.32
54	Cess pit lined with half-brick, 30mm thick timber ring between each 6th and 7th course				1.82		
55	Well; circular brick lining rests on wood ring below which 5-sided brick structure rests on 5-sided board structure	Fire debris			1.02		

Fig. 17. Queen Street 1953 & 1960: Description of post-medieval features.

E. POST-MEDIEVAL (Figs. 5 and 6)

The 3 pits and 3 wells of this period are described in Fig. 17.

1. POST-ROMAN GENERAL DISCUSSION

The post-Roman periods are represented only by wells, pits and loose finds. Two sherds from Aldermary House, both unstratified, were the only evidence of Saxon occupation (see Finds report, Medieval Pottery; Saxon Shelly ware). The most important aspect of these periods is the continued use of the site for water supply between the 12th and 18th centuries. It is likely that this tradition gave rise to the name Well Court for the lane to the north of Aldermary House, which is first mentioned on the Ogilby and Morgan map of 1677.[34] It is possible that the dump of burnt material in Well 55 was the result of clearance after the Great Fire of 1666.

F. UNDATED FEATURES (Figs. 5 and 6)

Well 7. Stone-lined well 1.42m in diameter. 'Roman finds' were recovered by workmen, but a Roman date is unlikely as no other stone-lined Roman wells have been found in London. The stone used was not identified.

Feature 43. N-S construction of concrete walling reinforced by or overlying, piles driven into the made ground, which produced Antonine material.

Feature 45. Pit, 0.84m × 0.86m; 0.54m deep, bottomed at 8.75m O.D.

Feature 47. Ragstone foundation turning westwards at N. end.

Feature 50. Foundation of undated tiles aligned with 47.

Feature 52. Corner of chalk wall foundation. The chalk construction may indicate a medieval date.

Feature 59. Pit 1.22m in diameter, 0.91m deep, bottomed at 7.83m O.D.

Features 64 and 65. ? Post-Roman pits defined in section only (Fig. 8; not on plan).

Plate 10. Queen Street, 1953 & 1960: Medieval stone-lined Well 51.

IV. ROMAN WELL CONSTRUCTION IN LONDON

A. BARREL WELLS

The Queen Street Barrels, as containers, are discussed fully in the Finds Report (pp. 47–9). They were of particular use in well lining both because of their shape, and their ability to withstand external pressure when placed in the well shaft. A well could easily be constructed by lowering barrels down a narrow shaft which could then be backfilled around the completed structure. Of nine barrel wells at Queen Street, eight can certainly be dated to the 1st–2nd centuries, and possibly also the ninth, Well 37 (see p. 19). Further evidence that barrel wells were commonly built during the early period comes from four others found in the city, at Lime Street,[35] the palace site,[36] Bucklersbury House,[37] and the Bank of England.[38] There is a further undated barrel well from the Bank of England.[39] It is suggested in the finds report that the absence of barrel wells later than the 2nd century may be due to the cessation of the import trade in wine at this time.

B. CORNER-POST CONSTRUCTION

This is one of the most common types of well construction used in Britain generally, so that it is remarkable that only one of the 21 Queen Street wells was of this variety.

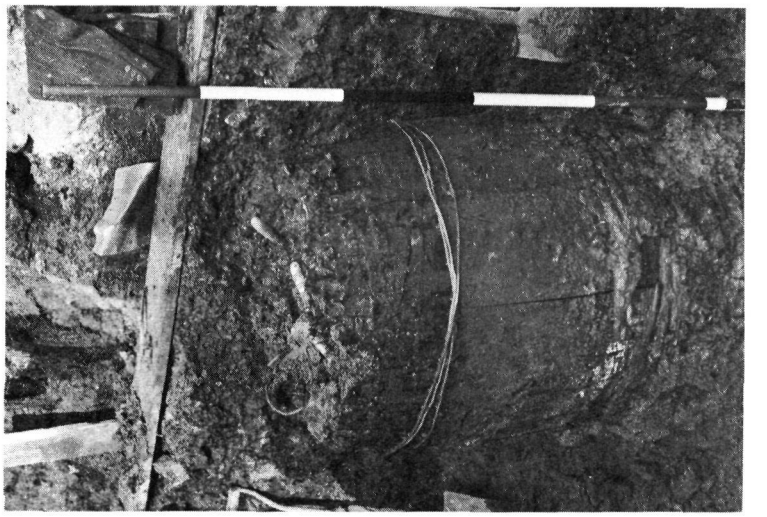


Plate 12. Queen Street, 1953 & 1960: Upper barrel of medieval Well 44.

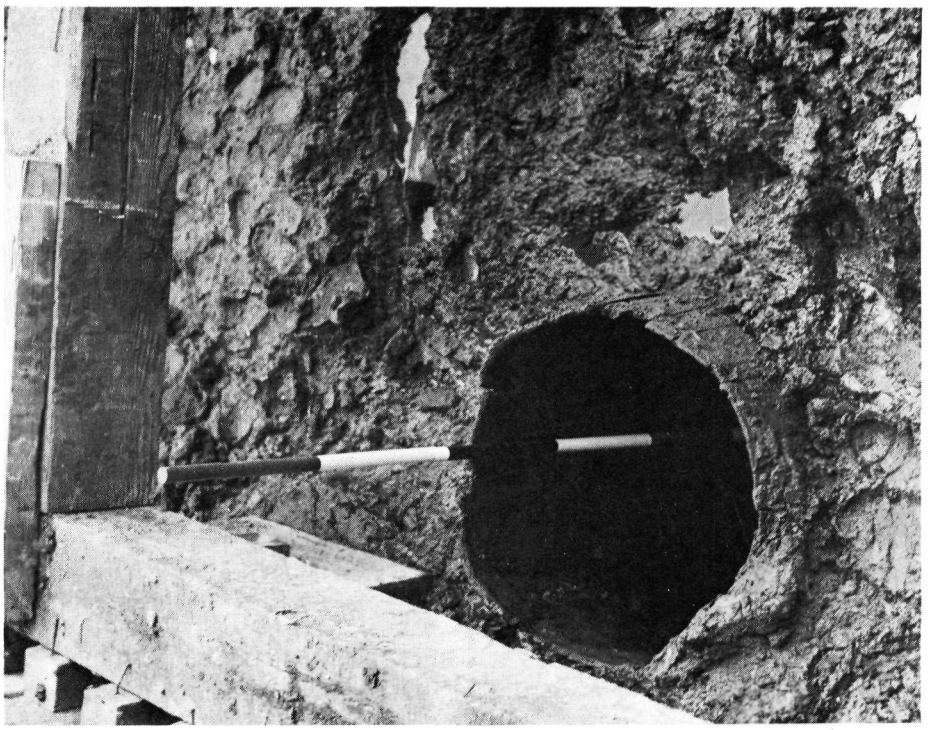


Plate 11. Queen Street, 1953 & 1960: Lower barrel of medieval Well 44.

Usually these wells were lined with unjointed horizontal planking, retained by square posts set in each corner. In London this simple construction occurs at the Cheapside baths in the 1st–2nd centuries,[40] and at Bucklersbury House in the 3rd–4th centuries.[41] One further undated example occurs at 1–5 Queen Street. Well 24 was filled in the Flavian period, and was a variation of the usual type in that it had vertical timbering which was butted against the sides of the corner posts. The planks were retained by rough-hewn horizontal struts which were let into mortices in the corner-posts (Fig. 18). Another vertically planked well, also undated, was found at Great Swan Alley,[43] where the method of retention of the planks is not recorded. At King Street,[44] a 3rd–4th century horizontally boarded well had horizontal reinforcing struts placed, like the planking, behind the corner post, and were neither jointed nor nailed into place.

Evidence fron London indicates a date range over the whole of the Roman period for corner-post wells, and this is confirmed by excavations elsewhere in Britain. There were three wells of this type at St. Thomas St., Southwark[45] dated to the 2nd–3rd centuries, while the bottom four courses of the 2nd–3rd-century well at Skeldergate, York were of corner-post construction,[46] as were two pre-Flavian wells from Colchester.[47]

A common practice in corner-post wells was to include bracing boards at intervals. These boards were laid on their sides, with the corner posts jointed into the corners of two adjacent boards. The effect of this was to form a continuous, square, hollow frame, and it is possible that these should be seen as a form of box-frame (see below). Wells of this type have been found at Scole, Norfolk,[48] and at Chigwell, Essex.[49] It would appear that this was an effective technique: all the boards in the late Saxon well from Billingsgate Build-

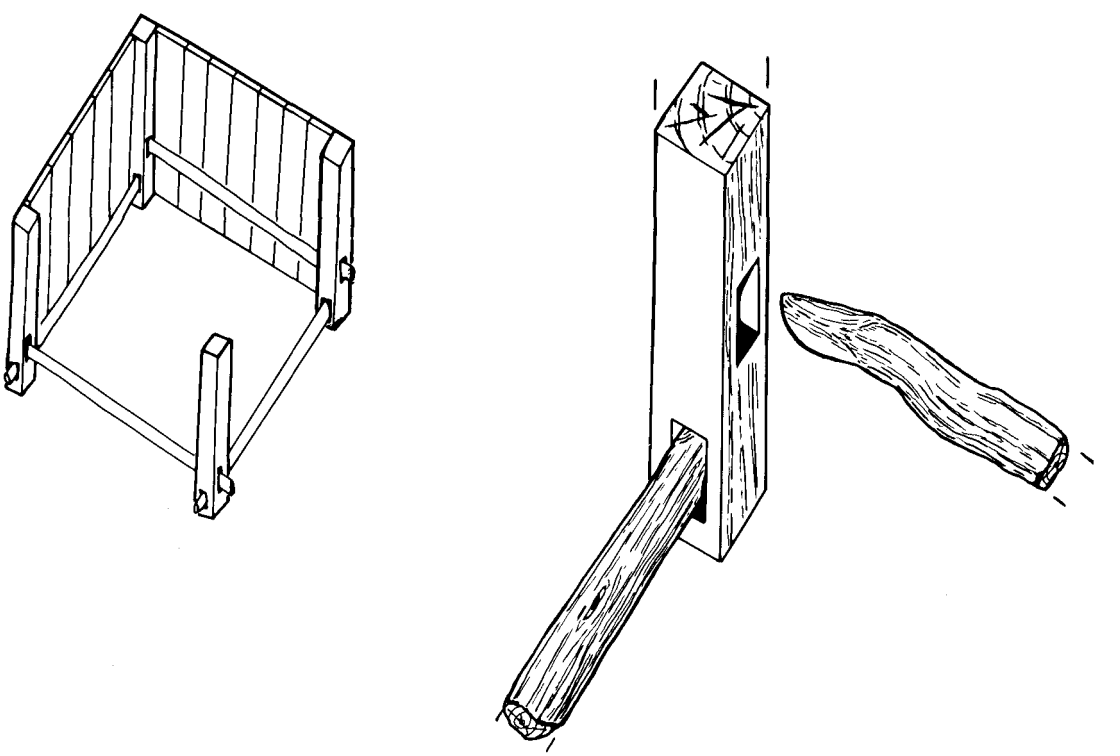


Fig. 18. Queen Street 1953 & 1960: Construction of Well 24, showing mortice and tenon joint on corner posts.

ings in London[50] were jointed round the corner-posts.

C. BOX-FRAME WELLS

This term has been adopted to describe wells of coursed timbers. Each course was independent of the others, and consisted of four boards laid on edge and jointed at the corners. There were seven examples of this type of well at Queen Street. These, like those from other parts of the City, appear to demonstrate a gradual development in timber framing techniques, although the earlier techniques remained in use throughout the Roman period.

The simplest possible form of timber box-framing is found in the well at Milk Street dated to the 1st century[51] (reconstruction, Fig. 21). This consisted of two opposite boards let into rebates made in the corners of the two other opposing planks. The structure was not nailed. At Queen Street Wells 22, 31 (reconstructions, Fig. 19) and 20, all dating from the 1st–2nd centuries (Finds Report p. 32), featured the half-lap joint (Fig. 20a) and these too were not nailed. Both the corner-post wells and those utilising rebated or half-lap joints shared a disadvantage. Unlike barrels, these unarticulated frames would not have held together when lowered down a well shaft. The method of construction must have been to build each individual box-frame *in situ* and then to pack the shaft around the timber members: this was the only way in which these frames, jointed with joints that would not hold together independently, could be kept in position.

These jointed well-frames, however, had a distinct advantage over the corner-post type, in that there was no need to waste timber on internal bracing to counter the external thrust from the packing of the well shaft. With the jointed frames the thrust was utilised to press the joints together, strengthening the resistence of the frames to external force, and thus neutralising it. This was essentially the task performed by the bracing boards in some corner-post wells.

The last dated half-lap well at Queen Street, Well 22 was out of use by the Flavian period (see above p. 16). Its construction may thus have been contemporary with that of two identically constructed wells at Colchester, which date from *c.* AD 49–61.[52] A further 1st–2nd-century well at Brampton, Norfolk, also featured halved joints.[53] Though this technique occurred at an early date, it also appears in several later wells, for example in the City at St. Swithins House, Walbrook[54] and at 33–35 Poultry,[55] as well as at Queen Street in the case of Well 19, all of which dated from the 3rd–4th century, and in the well at Chigwell, Essex dated to *c* AD 270.[56]

The next development in well construction appears to have been the use of the bridled or square dovetail joint. The appearance of this joint (Fig. 20b) seems to have been contemporary with that of the possible true dovetail in Well 13. Two out of three Queen Street wells using this joint also featured corner braces. Well 13, the unbraced, bridled well, was dated to the 4th century, but unbraced joints of this type in London appear much earlier. The earliest known well of this kind from the City with these joints is from 33–35 Poultry[57] (reconstruction, Fig. 21), where bridled frames were placed on a half-lapped base plate.

A coin of Commodus (AD 180–192) in good condition was found in the bottom of this well, suggesting a comparison with a similar well from Union Street, Southwark, dated to the late 2nd–3rd century.[58] Outside London, a bridled well at Northchurch, Herts,[59] and a dovetailed well from Great Dunmow, Essex[60] were also dated to the late 2nd–3rd century: again, neither well had corner-braces. The bridled and dovetailed joints are considerably more efficient than the half-lap for jointing wide boards. In these joints a greater surface area of the end of any one timber is presented to the side of the adjoining board, while at the same time the two units are locked together. Though this would strengthen resistance to external thrust, these frames would still need to be packed round while being assembled *in situ*.

Wells 19 and 36 at Queen Street (reconstructions Fig. 19, Pls. 6–8) combined bridled joints with corner bracing. In both these cases only two corners were braced, whereas at

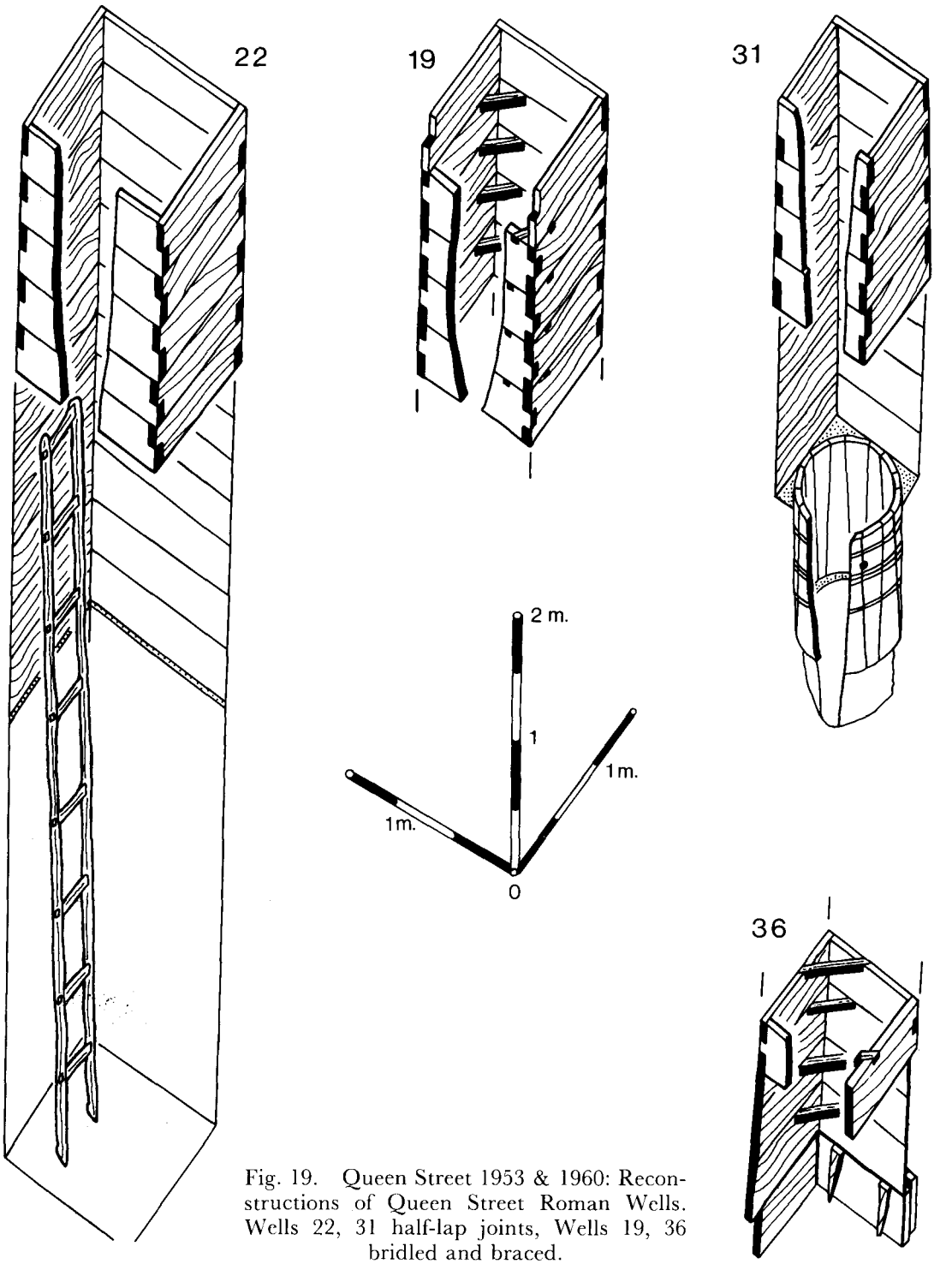


Fig. 19. Queen Street 1953 & 1960: Reconstructions of Queen Street Roman Wells. Wells 22, 31 half-lap joints, Wells 19, 36 bridled and braced.

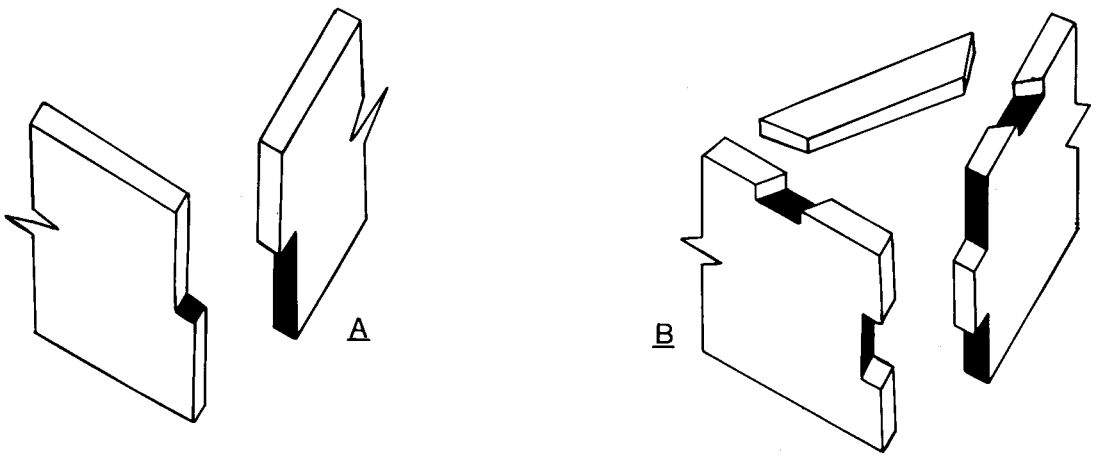
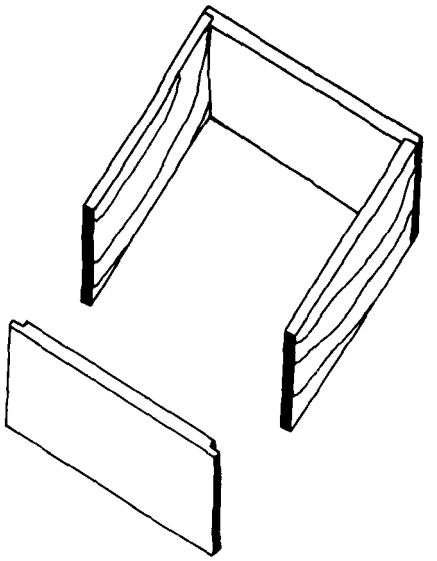


Fig. 20. Queen Street 1953 & 1960: Joisting techniques in box-frame wells: A. Half-lap joint; B. Bridled and braced joint.

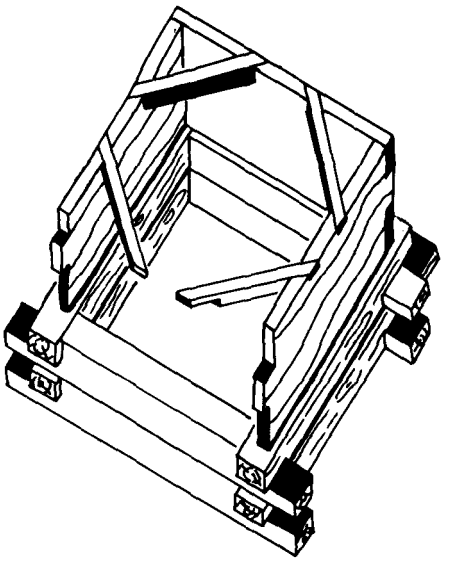
76–80 Cheapside[61] and St. Swithins House, Walbrook[62] (reconstruction, Fig. 21) braces were found in all four corners. All these wells were filled in the late 3rd–4th centuries. Most corner-braced wells in Britain, for instance at Wickford, Essex,[63] and at Skeldergate, York,[64] date to the 3rd or 4th centuries, though the Skeldergate well may have been constructed in the late 2nd century.

The Skeldergate well is the best recorded of the published box-frame wells in Britain.[65] The use of all the joints mentioned above, together with a corner-post construction at the bottom, and also the saddle joint which is considered below, suggested that by the 3rd century the Roman carpenter had a considerable range of techniques for well lining. All box-frames in the Skeldergate well were braced at each corner. The question must be asked why, when a means had been found of building strong well linings without internal bracing in the form of corner posts and frameworks (such as that in Queen Street Well 24), bracing still occurred as a feature of these wells. The excavator of the Skeldergate well suggests several explanations.[66] Firstly, the bracing could have been used as a ladder for access during construction, and subsequently for maintenance. This would certainly dispense with the need to keep a portable ladder, like that from Well 22, for this purpose. Secondly the braces may have served to strengthen the corners against lateral thrust and to provide a true right angle at the corner, thought it is doubtful that this was of primary importance. Finally, and perhaps most plausibly, it has been suggested that they were for attaching ropes with which prefabricated frames could be lowered into position.[67] Corner braces were used for strengthening in the 1st–2nd century, for example in the tank at the Cheapside Bath house.[68] Here however, they were small in proportion to the size of the tank (2.50m × 3.30m) and can only have been used for reinforcement. But if strength was a primary reason for the incorporation of corner braces in wells, they might be expected to occur in a large structure like Queen Street Well 22 (1.07m × 1.30m), where they were absent, rather than in a small well such as Well 36 (0.68m × 0.53m).

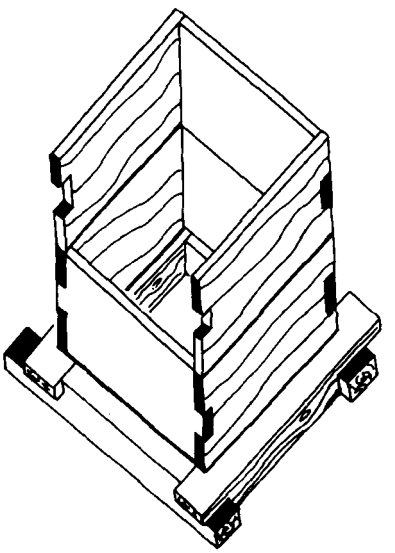
Well 36 (Fig. 19) at Queen Street demonstrates that frames prefabricated on the surface were lowered down the well shaft, as the bottom frame had become detached, and slipped to the north. This would not have occurred if the frame had been packed into place before subsequent frames were built above it. The difference between this type and the earlier half-lap type is the presence of corner-braces which should probably be seen as intended primarily to join frames firmly



Milk Street



St. Swithins House



Poultry

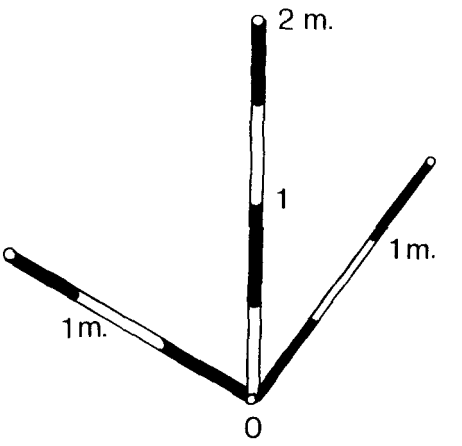


Fig. 21. Queen Street 1953 & 1960: Box-frame wells from London (*in reconstruction*).

together so that they could be lowered into a well shaft in the same way that barrels, as free-standing structures, could have been. The other explanations cited above may also have been taken into consideration but were probably secondary to the main purpose of providing an alternative to the dangerous method of constructing frames and packing them round *in situ* at the bottom of a deep, narrow shaft.

As the London wells were mainly recorded as being cut into the natural subsoil, it is difficult to suggest what form of wellhead existed, or what was the original full depth. Clearly, different types of lining were used throughout the depths of wells. In some, barrels and box-framing were combined. While within a well it is possible to identify several different types of joint, in some cases this may represent repairs or reconstruction, although this could not be assumed from the London evidence. At Skeldergate, however, the width of the well decreased at the bottom, where corner-post lining took over. The well from Lime Street in London[69] had a lining comprising one barrel placed inside the other. Above this, a square base-plate consisting of saddle-jointed beams was constructed, upon which a box-frame was placed. It is not impossible that this was the well head, although it might equally have been a change in the method of the lining, as in the case of Queen Street Well 31. It is interesting that a similar saddle jointed frame also appears in an analogous position at Chigwell, Essex.[70] Only at Skeldergate has any outer shoring been identified,[71] but it is impossible to say whether such shoring was used in London; perhaps the comparatively limited depth of most London wells rendered it unnecessary.

It is not possible to generalise about timber well construction in London because of the paucity of thoroughly examined examples, but some chronological development of techniques can perhaps be identified, although no one method gained any ascendancy. In the analysis of London timber-framed wells, the Queen Street wells must occupy a key position, as they include 21 out of around 40 known examples[72] and are by far the best recorded group.

NOTES

1. This is a report at Level IV as prescribed by the report *Principles of Publication in Rescue Archaeology* (1975) 3. Material at Archive level (Level III) is stored at the Museum of London.
2. Ivor Noël Hume 'Into the Jaws of Death Walked One' in J. Bird, H. Chapman and J. Clark (eds.) *Collectanea Londiniensia: Papers presented to Ralph Merrifield*, London Middlesex Archaeol. Soc. Special Paper 2 (1978) 7–23.
3. Peter Marsden 'Mapping the Birth of Londinium' *Geographical Magazine* (Sept. 1972) 840–46.
4. Peter Marsden *Roman London* (London 1980) 16.
5. *Op. cit.* in note 3,841.
6. WAT 78. Dept. of Urban Archaeology Archive Report: pers. comm. D. Perring.
7. WEL 79. Dept. of Urban Archaeology Archive Report: pers. comm. D. Perring.
8. W. F. Grimes *The Excavation of Roman & Medieval London* (London 1968) Fig. 13.
9. I am indebted to Mr F. Berry of the Institute of Geological Sciences for this information.
10. *Op. cit.* in note 4, 40–42.
11. Original Section drawing *op. cit.* in note 4, 64.
12. Jane Weeks 'A Roman Ladder from Queen Street, City of London' *Trans. London Middlesex Archaeol. Soc.* 29 (1978) 107.
13. Pers. Comm. Barbara West (see Appendix).
14. *Op. cit.* in note 7.
15. *Op. cit.* in note 6.
16. MLK.76. Dept. of Urban Archaeology Archive Report: Pers. comm. P. Allen.
17. J. Wacher 'The Water Supply of Londinium' in *op. cit.* in note 2, 104–8.
18. *Op. cit.* in note 8, 96.
19. *Op. cit.* in note 4, 32.
20. *Op. cit.* in note 17.
21. J. Wacher *The Towns of Roman Britain* (London 1974) 48–51.
22. *Op. cit.* in note 4, 17.
23. Peter Marsden 'Two Roman Public Baths in London' *Trans. London Middlesex Archaeol. Soc.* 27 (1976) 30.
24. *Op. cit.* in note 17, 105.
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26. *Op. cit.* in note 17, 106.
27. G. C. Boon *Silchester: The Roman Town of Calleva* (Newton Abbot 1974) 86–7.
28. *Op. cit.* in note 8, 96.
29. *Op. cit.* in note 6, 7.
30. *Op. cit.* in note 6.
31. *Op. cit.* in note 7.
32. *Op. cit.* in note 4, 110–115, 212 note 27.
33. Ralph Merrifield *The Roman City of London* (London 1965) Fig. 111.
34. Henry Harben *A Dictionary of London* (London 1918) 618.
35. *Op. cit.* in note 8, Fig. 111, and Guildhall Museum Excavation Register E.R. 49.
36. Peter Marsden 'The Excavation of a Roman Palace site in London 1961–72' *Trans. London Middlesex Archaeol. Soc.* 26 (1975) 12, Pl. 1.
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38. H. N. Page 'An Antiquarian Find' *The Old Lady of Threadneedle Street* (1926) 152–154.
39. 'Roman Britain in 1933' *J. Roman Stud.* 24 (1934) 212.
40. *Op. cit.* in note 23, 45.
41. Guildhall Museum Excavation Register, E.R. 222. *Op. cit.* in note 4, 179.
42. F. Cottrill, Unpublished notes in Museum of London.
43. Royal Commission on Historical Monuments *London 3 Roman London* (London 1928) 135.
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45. George Dennis, '1–7 St. Thomas' Street' in *Southwark Excavations 1972–74* London Middlesex Archaeol. Soc: Surrey Archaeol. Soc. Joint Publication 1 (1978) 298–302.
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50. D. Jones *Excavations at Billingsgate Buildings, Lower Thames Street, London, 1974.* London Middlesex Archaeol. Soc. Special Paper 4 (1980) 17.
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52. *Op. cit.* in note 47, 127.
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54. Unpublished photograph in Museum of London.
55. F. Cotrill, unpublished notes in Museum of London.
56. Pers. comm. P. Wilkinson, Passmore Edwards Museum.
57. *Op. cit.* in Note 54.
58. G. Marsh '8 Union Street' in *Southwark Excavations (op. cit.* in note 45) 224–226. Pers. comm. Geoff Marsh.
59. D. S. Neal 'Three Roman Buildings in the Bulbourne Valley' *Herts. Archaeol.* 4 (1974–76) 13, Fig. IX.
60. D. R. Wilson (ed.) 'Roman Britain in 1972' *Britannia* 4 (1973) 292.
61. Guildhall Museum Excavation Register E.R. 852.
62. *Op. cit.* in note 54.
63. D. R. Wilson (ed.) 'Roman Britain in 1969' *Britannia* 1 (1970) 291.
64. S. Donaghey 'Riverside Structures and a Well in Skeldergate' in M. O. H. Carver, S. Donaghey, and A. B. Sumpter *Riverside Structures and a Well in Skeldergate and Buildings in Bishophill* (York 1978) 15–27.
65. *Ibid.*, 15–27.
66. *Ibid.*, 26.
67. *Ibid.*, 25, 26.
68. *Op. cit.* in note 23, 49.
69. *Op. cit.* in note 35.
70. Pers. comm. P. Wilkinson, Passmore Edwards Museum.
71. *Op. cit.* in note 59, 18.20.
72. Apart from those wells mentioned above there are several London wells which were not fully recorded. There is one from Bucklersbury House (Guildhall Museum Excavation Register E.R. 237), a box-frame well from 71–74 Mark Lane (*op. cit.* in note 34). It is possible that the so-called Limitary deposit at the National Safe Deposit site was a well (J. G. Price, *Roman Antiquities Recently Discovered on the Site of the National Safe Deposit Company's Premises* (London 1873) 33–34). There were at least three wells other than those mentioned above at the Bank of England (*op. cit.* in note 33, 154) and more than one barrel well at Throgmorton Street *op. cit.* in note 38, 144).

THE FINDS

With contributions and notes by Philip Armitage and Barbara West, Brenda Dickinson, Chris Green, Kay Hartley, Penelope MacConnoran, Geoff Marsh, Frances Pritchard and Alan Vince.

INTRODUCTION

The finds from the Queen Street sites are housed in three collections, at the Museum of London, Lloyds Bank International, and the British Insurance Association, Aldermary House. Material from all these collections is included below.

This report is not a complete list of objects recovered from the site: finds have been subject to selective discarding during the years since their discovery, making pointless any attempt at quantification or statistical work. Some classes of material were neither collected nor kept in a systematic way. These include window glass, building materials, slag and iron nails of all periods, and environmental material of Roman date, consisting of shells of mussel, whelk and oyster, plum and cherry stones, and, in addition to the bones described in the Appendix, bones of sheep, cow, and dog. No formal environmental samples were taken, however.

In all periods the finds represent domestic debris dumped in the wells and pits. In the Roman Well 22 and the post-medieval Well 55 this dumping occurred after fires. Only in Wells 22 and 31 did the finds represent the use of a well as such, rather than its subsidiary function as a rubbish dump. In 31 there was a bucket (No. 78) and in 22 the ladder (No. 84) and the dipper (No. 92). As well deposits were chiefly random dumps, little information can be gained from their examination as groups. It is, however, possible that there was some ritual significance in the group of four animal skulls, two of which were clumsily butchered, in Well 36 (Appendix). A similar explanation may apply to the human skull in Well 22 (Appendix: Marsh and West, 1981; Neal 1976, 14).

Finds from the whole Roman period are represented, while medieval finds were predominantly 12th–15th century, and post-medieval objects were mainly 17th century in date.

The finds have been studied with particular regard to two factors—the evidence for dating in the absence of an adequate stratigraphic record, and the intrinsic interest of the objects themselves. Figure 22 gives a summary of dating evidence and its reliability. Finds were numbered and grouped according to the Excavation Register (E.R.) system then in use in the Guildhall Museum. E.R. designations are given in column 3 against their feature numbers. Most E.R. numbers are the finds groups from the fill of the feature, but where groups derive from specific layers within the fill of a feature this is stated in Column 2. The

Feature number	*Layer in feature*	*E.R. number*	*Date*	*Dating material present*	*lost*
1	Fill	608	Roman		X
2	Fill	586B	1st Century	X	
3	Fill	586A	Late 13th–14th century	X	
4	Layer	—	Roman ?		X
5	Fill	647	Roman		X
6	Fill	590	Late 3rd–4th century		X
7	Fill	589A	Nero-Vespasianic		X
8	Fill	589B	Medieval	X	
9	Fill	626	2nd half 1st century	X	
10	Fill	606	Post-medieval		X
11	Fill	643	13th century	X	
12	Fill	605	Early 18th century	X	
13	Fill	604	4th century	X	
14	Fill	644	Roman		X
15	Fill	642	Early Flavian	X	
16	Fill	645	1st–2nd century		X
17	Fill	624	Mid 1st century		X
18	Fill	612	1st century+		X
19	Packing round timbers	93A	Late 3rd–4th century		X
	Upper organic fill	93B	Late 3rd–4th century	X	
	'Horsedung' fill	93C	Late 3rd–4th century	X	
	Lower organic fill	93D	Late 3rd–4th century	X	
20	Upper filling	79	3rd century		X
	Lower filling	80	1st century–Antonine	X	
21	Seals 21	78/104	Roman		X
22	Upper filling	81alC	Post Boudican–3rd century	X	
23	Fill	95	1st–2nd century		X
24	Fill	85	Flavian	X	
25	Fill	113	1st century	X	
26	Fill	110	Early Flavian	X	
27	Fill	100	Neronian	X	
28	Fill	84	Roman		X
29	Fill	99	2nd century		X
30	Fill	—	Roman		X
31	Fill	118	Flavian-Trajan	X	
32	Fill	119	Roman		X
33	Fill	109	3rd century	X	
34	Fill	108	3rd century	X	
35	Fill	106	Nero-Vespasian	X	
36	Fill of top frame	254	4th century	X	
	Fill of frames 2–4	254A	4th century	X	
	Fill of frames 5–8	254B	4th century	X	
37	Fill	88	1st–3rd century		X
38	Fill	107	1st century		X
39	Fill	98	Hadrianic		X
40	Fill	—	—		X
41	Fill	—	—		X
42	Fill	83	15th century		X
43	Fill	90	Antonine		X
44	Material cut by 44	92A	Roman		X
	Fill	92B	15th century	X	
45	Fill	91	—		X
46	Fill	114	*c.* 1600–1630		X
47	Wall	—	—		X
48	Fill	122	Late 17th–18th century	X	
49	Fill	111	13th–14th century	X	
50	Wall	—	—		X
51	Fill	82	Late 14th century	X	
52	Wall	—	—		X
53	Fill	121	13th century	X	

Feature number	*Layer in feature*	*E.R. number*	*Date*	*Dating material present*	*lost*
54	Fill	103	17th century	X	
55	Upper filling	120	Early 17th century	X	
	Lower filling	120A	Early 17th century	X	
56	Fill	117	12th century		X
57	Fill	116	12th century		X
58	Fill	115	Late 12th–13th century	X	
59	Fill	97	—		X
60	Fill	105	2nd century		X
61	Fill	255	1st–3rd century		X
62	Fill	112	14th century	X	
63	Fill	125	3rd–4th century		X
64	—	—	—		X
65	—	—	—		X
66	—	—	—		X
—	Unstratified	595	Various	X	
—	Unstratified	596	Various	X	
—	Unstratified	599	Various	X	
—	Unstratified	602A	Various	X	
—	Unstratified	602B	Various	X	
—	Unstratified	607	Various	X	
—	Unstratified	618	Various	X	

Fig. 22. Queen Street 1953 & 1960: Dating evidence summary table.

dates attributed to the groups are based on the study of the pottery (see pottery reports, introduction to pottery reports, and Figs. 23, 27 and 42). In the final columns dating material is marked as 'lost' where it has not been available for study for this report. Here the excavator's evaluation of date has been used.

In the catalogue, each find described is given a catalogue number which is reproduced in the illustrations. Descriptions are prefaced by the E.R. group number. At the end of each description the feature number, layer (where relevant) and the date of the object as determined in Fig. 22 are given. In some cases a Museum of London Accession Number (M.O.L. Acc. No.) is given. Objects in private hands at the Bank of London and South America (now Lloyds International) are given as B.O.L.S.A. and those at the British Insurance Association as B.I.A.

INTRODUCTION TO THE POTTERY REPORTS

Pottery has been studied chiefly as a means of dating features. Tables showing the contents of groups by Common Name are given as Figs. 23, 27 and 42. The reports and comments accompanying these tables describe pieces of particular interest, or forms not previously published from London. These are also illustrated. The reports and comments give reference to other publications where full descriptions of Common Name fabrics can be found.

Fig. 23 shows pottery types (recovered from the site) representing dates of 1st century to mid 2nd-century date. Fig. 27 likewise covers the late 2nd–4th centuries, and Fig. 42 the medieval and post-medieval periods. In these tables, an 'x' marked against a group E.R. number indicates the presence of a type in that group. A number indicates the catalogue number of a fully described and illustrated sherd. Dates in the tables are those allocated to groups by Chris Green (Roman) and Alan Vince (medieval and post-medieval) on the grounds of the proportions of types and fabrics present.

Pottery reports have been prepared in accordance with the system used in the Department of Urban Archaeology (Orton 1978: see also remarks in Orton 1979a). Pottery names in italics are Common Names (Orton 1979a, 29).

1. ROMAN

(a) POTTERY

Compiled from notes and identification by Chris Green, notes on mortaria by Kay Hartley, identification of stamps on samian ware by Brenda Dickinson, and notes on the other samian ware by Geoff Marsh.

(i) 1st–2nd CENTURIES (Fig. 23)

FINEWARES

(Figs. 24 and 25).

South Gaulish Samian. Fragments of most common forms: Drag. 15/17, 18, 18R, 24/5, 27, 29, 30, 33, 36, 37. Ritt. 12 including one semi-complete from E.R. 85 (Well 24).

Brenda Dickinson makes the following comments on the stamped sherds:

CRESTIO; Die 15a on Ritt. 8 (La Graufesenque). Used frequently on forms 24 and Ritt. 8, noted at Kingsholm, Gloucester, and in Period I at Zwammerdam (*c.* AD 45–65). E.R. 603 (unstratified).

MARTI; Martialis, Die i. Incomplete 3 on Drag. 18R (La Graufesenque). Though this stamp has not previously been noted, the style of lettering indicates this potter. His stamps occur in a Claudio-Neronian group at Narbonne and on a Drag. 30 from Boudican burning at *Verulamium*. His decorated ware suggests a date *c.* AD 50–65. E.R. 603 (unstratified).

OF.MODE; Modestus, Die i, 6a on Drag. 15/17 or 18 (La Graufesenque). This particular stamp has no site dating, though his wares from Colchester, Cirencester, and Narbonne suggest a date range *c.* AD 45–65. E.R. 603 (unstratified).

OTNS; Scotnus, 5a on Drag. 15/17 or 18 (La Graufesenque). This potter is attested at Fishbourne, Waddon Hill and Narbonne. His range is *c.*AD 35–60 with this stamp in use *c.*AD 45–60. E.R. 586 (Well 2).

The above stamps of Martialis, Modestus and Scotnus are not attested at La Graufesenque, though other stamps of these potters are known there.

MOM; Mommo, Die 14a (La Graufesenque). The die in its original form was used on form Ritt. 8, but stamps from the broken die appear consistently at Flavian foundations. There is one from Aislingen *c.*AD 70–90. E.R. 618 (unstratified).

SEVERI; Severus, Die 24d on Drag. 33 (La Graufesenque). There is no date for this stamp, but Severus' range is *c.* AD 65–95. Many of his stamps occur at Domitianic foundations like Canstatt, and the main site at Corbridge. E.R. 595 (unstratified).

IV on Drag. 27g. 1st century. E.R. 108 (Pit. 34).

1. E.R. 81D (22). Complete bowl. Stamp of CRESTIO on Drag. 29. Simple design, with winding scroll ending in rosettes and stylised leaf tips above a lower zone of gadroons *c.*AD 55–75. B.O.L.S.A.
2. E.R. 607 (unstratified). Drag. 29. Upper zone has winding scroll ending in well moulded rosettes and leaf. The lower zone shows a fine vine scroll with a small bird (Oswald 2206 sim.), not dissimilar to that used by Senicio, see Knorr (1919, Taf. 76c) *c.*AD 50–65. A very close parallel is provided by the decoration on a Drag. 30 from Vindonissa stamped OF.MO see Knorr (1952, Taf. 77D). (illustrated).
3. E.R. 85 (24). Sherd in a very pale fabric. A poorly finished bowl with an upper zone showing panels of alternating arrowheads and animals, lion and deer (Oswald 1614). The lower zone has panels of latticing alternating with medallions containing an eagle (Oswald 2247 var.) and a bird (Oswald 2174). The general design indicates a date at the end of the range of the stamp FMATU; Matugenus ii, 4a, Drag. 29. The site record for this stamp includes Aislingen and Zwammerdam *c.* AD 50–70. (illustrated).
4. E.R. 607 (unstratified). Drag. 29. Upper zone has winding scroll ending in a small leaf. The lower zone also shows a winding scroll ending in a fine leaf and cigar twist *c.*AD 50–65. Extremely fine bowl with excellent silky slip.
5. E.R. 603 (unstratified). Drag. 30. A medallion containing a figure of Mercury (Oswald 517) used by Modestus *c.* AD 55–70 (illustrated).

Terra Nigra

6. E.R. 603 (unstratified). Native copy. Dark grey fabric with well rounded quartz inclusions mainly under 0.5mm diameter. Thin white internal margin below dark grey/black slip. Stamped with illiterate chequer pattern on inside base (illustrated).

Pompeiian Red Ware I

7. E.R. 108 (Well 34). See Green (1980, 303) (illustrated).

Lyons Ware

8. E.R. 100 (Pit 27). See *Ibid*, 304 (illustrated).

Ring and Dot Beakers, see Green (1978a).

London/Upchurch Types, see Green (1980, 354–65).

9. E.R. 85 (Well 24) (illustrated).

Lamp

10. E.R. 586 (Well 2). Lamp in red fabric. Possibly N. Italian *cf.* Bailey (1980, 416–18) B.I.A. (illustrated).

Miscellaneous Finewares

11. E.R. 642 (Well 15). Fineware flagon with feathered decoration. Two vessels represented. Orange-red to orange brown fabric with inclusions of quartz, white mica, ? flint and ironstone averaging 0.1mm diameter. Drab red-brown slip or wash very finely applied. Source unknown (illustrated).

Fabric type/source	*E.R. 95*	*E.R. 618*	*E.R. 100*	*E.R. 81*	*E.R. 106*	*E.R. 602B*	*E.R. 110*	*E.R. 626*	*E.R. 642*	*E.R. 81D*	*E.R. 85*	*E.R. 118*	*E.R. 603*	*E.R. 595*	*E.R. 586*	*E.R. 113*	*E.R. 589A*	*E.R. 607*	*612*	*E.R. Unstrat.*
South Gaulish samian			X	X					X	1	2	X	5			X		3, 4		
Terra Nigra													6							
Pompeian red ware I																X				
Lyons ware			8																	
Ring and dot beakers									X			X								
London/Upchurch types				X					X		9									
Lamp															10					
Miscellaneous finewares		15							11		14	13	X	12						
Rhodian amphorae									16		X									
Dressel 2/4 amphorae									X							X				
Camolodunum 185a amphorae									X											
Camolodunum 186 spp amphorae	17				X					X										
Dressel 20 amphora				X	18			19	X				21		X	X			22	20
Black micaceous amphora/jar									23											
Miscellaneous amphorae				X	X															
Group I mortaria				24					X											
Imported mortaria													X			25				
Brockley Hill/Verulamium white wares			X	X		X			X		26	X	X			X				
Hoo ware				X					27							X	28			
Black burnished II												29								
Miscellaneous flagons			X			30	X		X		X									
Hand made grog tempered wares								X	X											
Hand made grey sandy wares			32	31	X		X				X		33			X				
Wheel made grey sandy wares			34, 35, 36	39	X		X	X	40	X	38	X	X			X				
Lampholder			37								41									
Miscellaneous coarse wares										X			42							
Dates of groups	*1st–2nd century*	*Unstrat.*	*Neronian*	*Post-Boudica*	*Nero-Vespasian*	*Unstrat.*	*Early Flavian*	*Late 1st century*	*Early Flavian*	*Flavian*	*Flavian*	*Flavian-Trajan*	*Unstrat.*	*Unstrat.*	*1st century*	*1st century*	*Nero-Vespasian*	*Unstrat.*	*1st century*	*Unstrat.*

Fig. 23. Queen Street 1953 & 1960: Summary table of 1st–2nd-century pottery.

Fig. 24. Queen Street 1953 & 1960: Decorated Samian ware, Nos. 1–5, 43, and Amphora stamps Nos. 19–22, 49 (1/2).

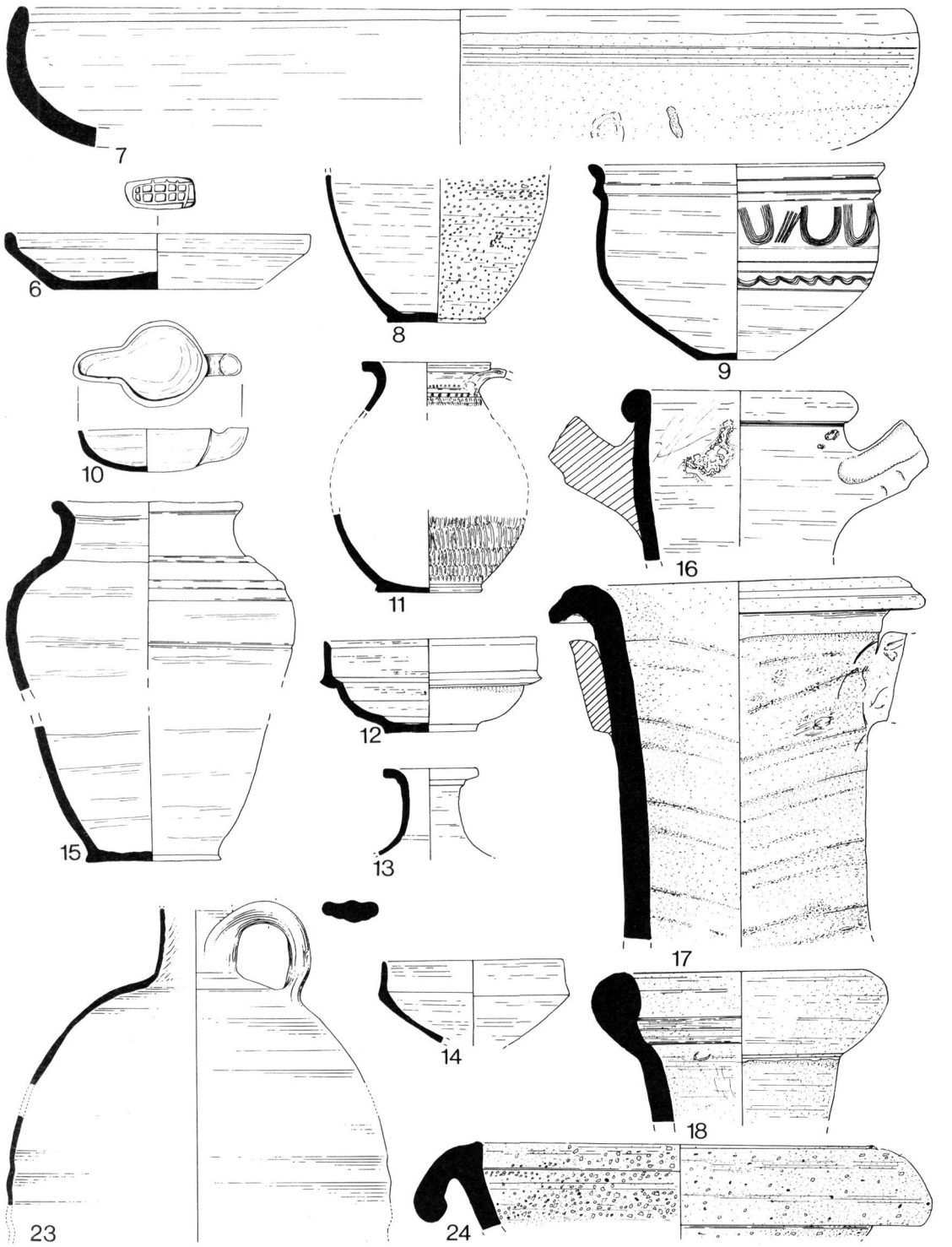

Fig. 25. Queen Street 1953 & 1960: 1st–2nd-century Roman pottery, Nos. 6–18, 23–24 (1/4). No. 6 stamp 1/2.

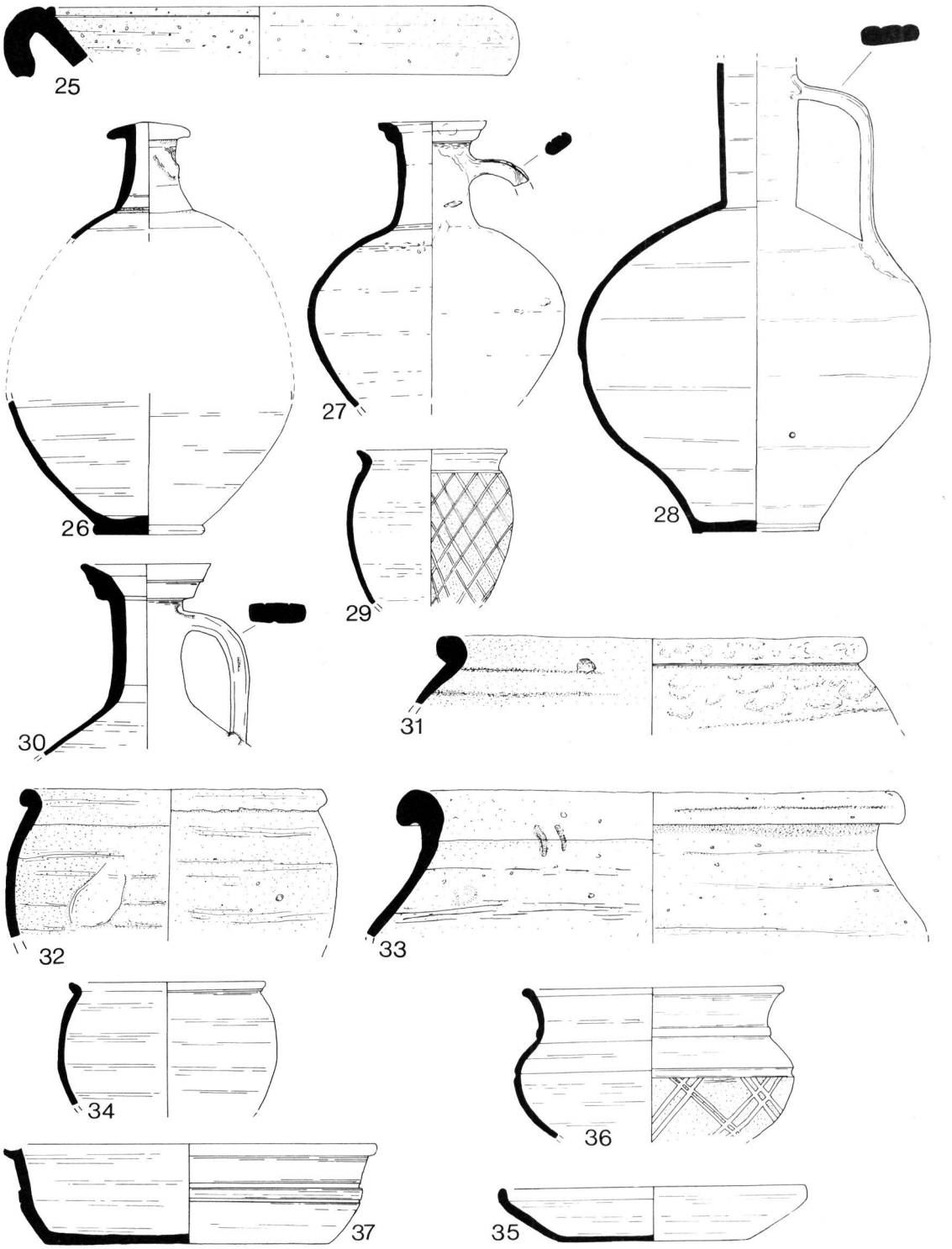

Fig. 26. Queen Street 1953 & 1960: 1st–2nd-century Roman pottery, Nos. 25–37 (1/4).

12. E.R. 595 (unstratified). Small bowl in an extremely fine light grey fabric with only silt-size white mica, and spherical limestone fragments (? micro-fossils) visible, both 0.05m diameter or less. Dark grey surfaces. Source unknown (illustrated).
13. E.R. 118 (Well 31). Vase neck. Grey fabric with ill-sorted quartz, mica, and iron ore inclusions up to 0.2mm in diameter, occasionally coarse. Inclusions up to 0.2mm in diameter, occasionally coarse. Inclusions are in a silty matrix. From E. England (illustrated).
14. E.R. 85 (Well 24). Small bowl or cup. Dark grey fabric consisting of a silty matrix with moderate inclusions of sub-angular quartz greater than 1mm diameter. The surfaces are black. Source unknown (illustrated).
15. E.R. 628 (unstratified). Belgic type cooking pot. Handmade. Dark grey fabric consisting of a silty matrix with inclusions of ill-sorted dark grey and white 'grey', charcoal fragments and organic voids, mainly above 1mm in diameter (illustrated).

AMPHORAE
(Figs. 24 and 25)

Rhodian Amphorae

16. E.R. 642 (Well 15). Peacock (1977b, 266). Fabric 1 from Rhodes (illustrated).

Dressel 2–4 amphorae, see Green (1980, 15–20).

Camulodunum 185a amphorae, see *Ibid*, 4–5.

Camulodunum 185 spp amphorae

17. E.R. 95 (Pit 23). See *ibid*, 6–11. M.O.L. Acc. No. 21184 (illustrated).

Dressel 20 amphorae, see *ibid*, 1–3.

18. E.R. 106 (Well 35). Amphora neck (illustrated).
19. E.R. 626 (Well 9). Amphora stamp CSE–PPOLY on handle (illustrated).
20. (Bank of London and South American site). Amphora stamp on handle.
SEMP:POLY C. M.O.L. Acc. No. 22251 (illustrated). Nos. 19 and 20 are similar to Callender (1965, 472), stamp of C. Semp [ronii] Polyc [liti]. These are found on many sites, chiefly on S. Spanish globular amphorae *c.* AD 50–90.
21. E.R. 603 (unstratified). Amphora stamp PO [?NTI] S (illustrated).
22. E.R. 612 (Well 18). Amphora stamp Q.C.R. This stamp is found on many sites mostly on S. Spanish globular amphorae *c.* AD 60–110, see *ibid*, 1442. B.I.A. (illustrated).

Black Micaceous Amphora/Jar

23. E.R. 642 (Well 15). A thin walled amphora or handled jar, strongly reminiscent of the well known late Roman Micaceous jar B iv (Peacock 1977a, 298) in size, form construction and fabric. The only reservations with this identification concerns the colour, which is grey with darker surfaces, rather than the usual red-brown, and the undoubtedly early (Flavian) date of these sherds are considerably earlier than the usual 3rd–4th-century examples. However a thin-section of the vessel shows the abundant inclusions of white and brown mica, a little angular quartz, and a possible/quartz/mica schist fragment, all 0.1mm or less across, which compare closely with late Roman specimens. The vessel is possibly best regarded, pending further discoveries, as an example from a similar source representing a casual arrival outside the main period of trade.

OTHER COARSEWARES
Figs. 25, 26 and 28)

Group 1 Mortaria

24. E.R. 81 (Well 22). See Hartley (1977), also Green (1980, 46–51) (illustrated).

Imported Mortarium

25. E.R. 113 (Pit 25). Off-white fabric with pink and grey core, subangular and rounded quartz fragments and iron-ore fragments up to 0.5mm diameter in a clear matrix. Beige surfaces with angular quartz and flint grits up to 1.5mm diameter applied on the wheel. Kay Hartley remarks that this is probably 1st century (illustrated).

Brockley Hill/Verulamium White wares. See Green (1980, 53–106: Forms include his 53, 54, 64, 65, 78–80.)

26. E.R. 85 (Well 24). Ring-neck flagon (illustrated).

Hoo Ware, see Green (1980, 38).

27. E.R. 642 (Well 15). Flagon (illustrated).
28. E.R. 589A (Well 7). Flagon, B.I.A. (illustrated).

B.B.2., see Green (1980, 250–7).

29. E.R. 118 (Pit 25) (illustrated).

Other Flagons

30. E.R. 602B (unstratified). Flagon is orange-buff fabric with fairly sparse inclusions largely of quartz 0.1mm–0.2mm in diameter. Source unknown; possibly pre-Flavian (illustrated).

Miscellaneous coarse hand-made greywares

31. E.R. 81 (Well 22) (illustrated).
32. E.R. 100 (Pit 27) (illustrated).
33. E.R. 603 (unstratified) (illustrated).

Miscellaneous coarse wheel-made greywares

34–37 E.R. 100 (Pit 27) (illustrated).
38. E.R. 85 (Well 24) M.O.L. Acc. No. 22782 (illustrated).
39. E.R. 81 (Well 22) B.O.L.S.A. (illustrated).
40. E.R. 642 (Well 15) (illustrated).

Lampholder

41. E.R. 85 (Well 24). Drab brown fabric distinctly streaked with white clay when seen under a lens. Moderate inclusions of sub-angular quartz up to 0.5mm diameter with some very fine iron-ore and ? fine sandstone. Mud stained surfaces, possibly imported (illustrated).

Miscellaneous Coarsewares

42. E.R. 603 (unstratified). Pinched flagon neck (illustrated).

(ii) 2nd–4th CENTURIES

FINEWARES
(Figs. 24 and 28)

Central Gaulish Samian. Fragments of forms Drag. 18/31, 31, 31R, 33, 37, 38, 45. Single sherd of W.79R from E.R. 80 (Well 20).

East Gaulish Samian. Fragments of forms Drag. 31, 32, 33, 37, 40, 43, Lud Tg. Groups included two stamps: SATURI [. . .]F; Saturio iii, 3d on Drag. 31 (Rheinzabern). Saturio is only datable by his forms which include Drag. 31R, 32 and Lud. Tb. Late 2nd–early 3rd century. E.R. 93 (Well 19).

43. E.R. 109 (B.30) COM[ITIAΛISF]; Comitialis, Die 5a (retrograde) on Drag. 31 (Rheinzabern). This stamp is noted at Holzhausen after *c.* AD 180. Comitialis' decorated ware suggests a late 2nd–early 3rd-century date *c.*AD 180–220. Decoration consists of a freestyle animal design showing lions, dogs, bears and deer (Oswald 1456, 1918, 1603, 1628, 1721 and 1732). The moulding is inferior (illustrated).

Colchester Fineware. See Green (1980, 72) Forms include a roughcast beaker.

Nene Valley Ware. See Howe, Perrin, and MacKreth (n.d. 1980). Forms include a bulbous beaker, and a Pentice beaker *cf.* Gillam (1970) 42.

44. E.R. 93 (Well 19). Pinched neck of flagon (illustrated).

'Cologne' Roughcast, see Green (1980, 316).

'Cologne' Others. Hunt beaker, see Greene (1978) 2–3, No 5).

Moselkeramik, see Greene (1978).

Hadham ware, see Harden and Green (1978).

45. E.R. 93 (Well 19). Flagon spout (illustrated).

Oxfordshire red wares, see Young (1977). Includes his form c 51, c 75, c 72–4, c 100.

46. E.R. 604 (Well 13). ? Flagon (illustrated).

Ceramique à l'Éponge, see Raimbault (1973).

Fabric type/source	*E.R. 80*	*E.R. 81 C*	*E.R. 108*	*E.R. 109*	*E.R. 93*	*E.R. 93 B/C*	*E.R. 254*	*E.R. 604*
Central Gaulish samian	X		X	X				
East Gaulish samian	X		X	43	X			
Pompeiian red ware I			7					
Colchester fineware	X							
Nene Valley ware			X		44	X	X	X
Cologne roughcast			X	X				
Cologne others	X		X		X			X
Moselkeramik					X	X	X	
Mica dusted wares	X		X	X				
Hadham ware					45			
Oxfordshire red wares					X			46
Ceramique a l'eponge						X		
Miscellaneous colour coats			X		X	X		
Dressel 2/4 amphorae			X				X	
Dressel 20 amphorae			47					
Dressel 30 amphorae	X	48		49				
Hollow foot amphorae					50			
Biv amphora/jar			X					
Miscellaneous amphorae			51					
Colchester mortaria	52							
Nene Valley mortaria						53		
Oxfordshire mortaria			X	X	X	X	X	X
Verecundus mortarium			54					
Other mortaria			55	57, 58	56			
Brockley Hill/Verulamium white wares								X
Highgate type wares					X			
Hoo ware						X		
Black burnished I	X		X	X	X			
Black burnished II				X				X
Colchester coarsewares			X		X	X		
Alice Holt ware					X		X	
Portchester 'D' ware					X			
Wheel made grey sandy wares	X	X	X	62	60	61	X	X
Hand made shell tempered wares	X							
Miscellaneous coarse wares	64			63				
Dates of groups	*1st cent.Antonine*	*Post-Boudica–3rd cent.*	*3rd cent.*	*3rd cent.*	*Late 3rd–4th cent.*	*Late 3rd–4th cent.*	*4th cent.*	*4th cent.*

Fig. 27. Queen Street 1953 & 1960: Summary table of 2nd–4th-century pottery.

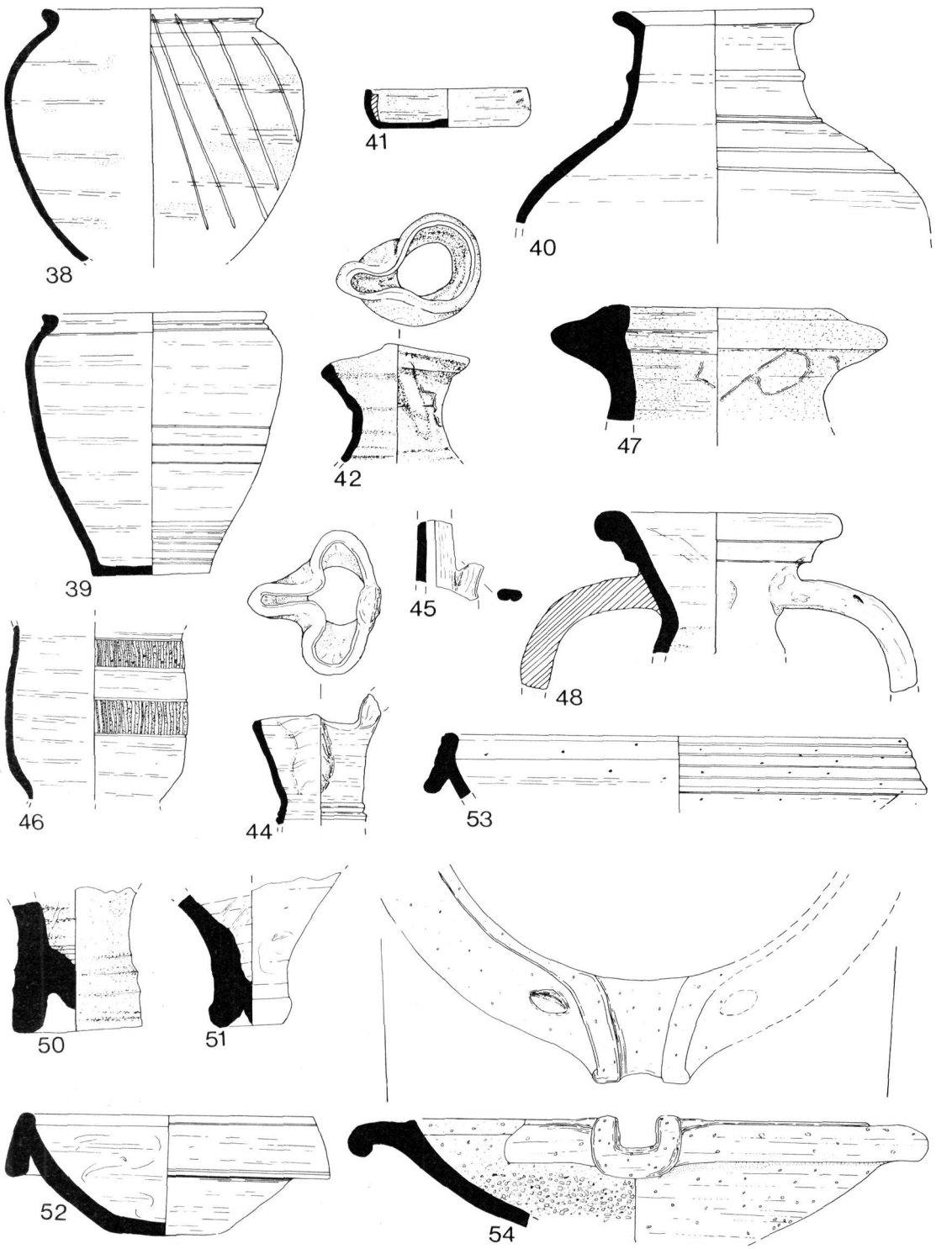

Fig. 28. Queen Street 1953 & 1960: Roman pottery; 1st–2nd century, Nos. 38–43; 2nd–4th century Nos. 44–48, 50–54 (1/4).

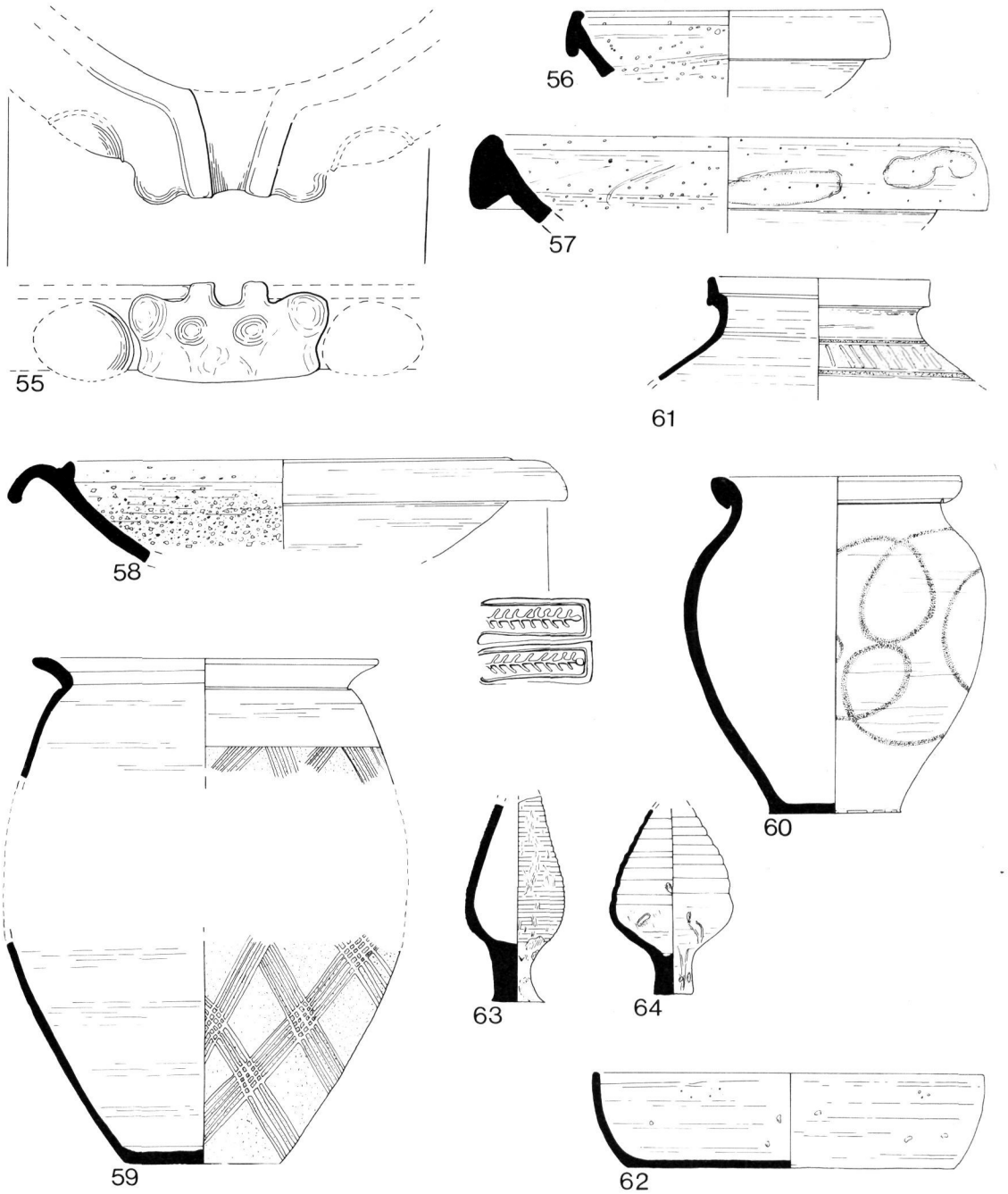

Fig. 29. Queen Street 1953 & 1960: 2nd–4th-century Roman pottery, Nos. 55–64 (1/4).

AMPHORAE
(Figs. 25 and 28)

Dressel 20 amphorae, see Green (1980, 1–3)

47. E.R. 108 (Pit 34) (illustrated). Dressel 30 amphorae, see Peacock (1977b, 264) also Green (1980, 21–28).
48. E.R. 810 (Well 22) (illustrated).
49. E.R. 109 (Well 33). Stamp on handle made with hollow tube (illustrated).

Hollow Foot Amphorae, see Peacock (1977a, 297).

50. E.R. 93 (Well 19). Amphora foot (illustrated).

Biv Amphora/jar, see *ibid*, 298.

Other Amphorae

51. E.R. 108 (Pit 34). Amphora foot. Very fine beige/red-brown fabric with abundant white mica, and a few fine quartz fragments. Surfaces beige with some brown black slip. Part of a more or less cylindrical form. 3rd–4th century. Source unknown (illustrated).

OTHER COARSEWARES
(Figs. 28 and 29)

Colchester Mortaria

52. E.R. 80 (Well 20) Mortarium (illustrated).

Nene Valley Mortaria, see Howe, Perrin and Mackreth (1980).

53. E.R. 93B/C (Well 19). Mortarium rim (illustrated).

Verecundus Mortarium

54. E.R. 108 (Pit 34). Cream fabric with pink core and orange surface patches. Abundant inclusions of mainly well-rounded quartz up to 1.5m diameter. Grits similar. Kay Hartley notes that this is from the factory of Verecundus at Soller in Lower Germany and was made *c.* AD 150–20 (illustrated). Soller mortaria were found in some quantity at New Fresh Wharf (Hartley 1977, 62).

Other Mortaria

55. E.R. 108 (Pit 34). Mortarium of grey-white fabric with orange-pink surfaces. Moderate to abundant inclusions of sub-angular quartz, and some iron ore 0.1–0.3mm with larger siltstone fragments. Grits lost. This is a slightly different fabric from No. 54, and, though not certainly from the Verecundus factory, is probably a German import, *c.* AD 150–200.
56. E.R. 93 (Well 19). Mortarium rim in an unusual fabric. Hard, brick red fabric with duller surfaces. Ill-sorted, abundant inclusions of sub-angular and more rounded quartz up to 0.4mm diameter with occasional iron ore. Grits of white and grey coloured flint, sub-angular, up to 3mm diameter.
This sherd is from S.E. England, and dates to *c.* AD 200+, though is more likely to belong to the 3rd–4th century (illustrated).
57. E.R. 109 (Well 33). Mortarium of white fabric with off-white surfaces, moderate to abundant inclusions of sub-angular quartz with occasional more rounded fragments of red ? schist. Inclusions ill-sorted up to 0.7mm in diameter. Grits of more-or-less rounded quartz up to 3mm diameter. This well worn sherd is a Rhineland import of *c.* AD 150–200 (illustrated).
58. E.R. 109 (Well 33). Stamped mortarium. Pale beige fabric with moderate amounts of sub-angular quartz and sparse iron ore up to 0.2mm diameter. Grits sub-angular up to 3–4mm diameter, and mainly composed of quartz or quartzite with lesser amounts of ferruginous siltstone or very fine ? sandstone, flint limestone and coarser sandstone.

Mrs K. Hartley makes the following comments:
'Dr. 34cms. The small, neat, herringbone stamps are from the same die as stamps from Fishbourne (Cunliffe 1971, 172, Fig. 82, No. 9), and from a kiln-site at Wiggonholt. A stamp from a die which differs only very slightly and which can be attributed to the same workshop is in the B.M. (provenance unknown). All of these stamps are on similar mortaria and it was his normal practice to impress his die twice close together at each side of the vessel. They were probably all made at Wiggonholt, Sussex (Evans 1974, 45–50). The rim-profiles used would best fit a date within the period A.D. 150–190.' (illustrated).

Highgate Type Ware, see Green (1980, 115–160).

B.B.1, see Farrar (1973), also Williams (1977b).

B.B.2, see above No. 29.

59. E.R. 80 (Well 20). Jar (illustrated).

Colchester Coarsewares, see Green (1980, 377–9).

Alice Holt ware, see Lyne and Jeffries (1979). Includes their forms 3B, 5B5, 6A4.

Portchester 'D' ware, see *ibid*, form 3C11.

Miscellaneous wheel made coarse grey wares

60. E.R. 93 (Well 19). Jar (illustrated).
61. E.R. 93 B1C (Well 19). Jar with black painted decoration. M.O.L. Acc. No. 21487 (illustrated).
62. E.R. 109 (Well 33). Dish, M.O.L. Acc. No. 21177 (illustrated).

Miscellaneous coarsewares

63. E.R. 80 (Well 20). Amphora stopper or unguent pot (so-called) (illustrated).
64. E.R. 109 (Well 33). Amphora stopper or unguent pot (so-called) (illustrated).

(b) GLASS
(Fig. 30)

65. E.R.10a. Pale green flagon handle consisting of 3 ribs on thin glass *cf.* Charlesworth (1972, 203). Such handles are usually from globular or bulbous flagons (Charlesworth, 1972, 202). M.O.L. Acc. No. 21469 (illustrated).
66. E.R. 109. Pale green coil base ring on thin glass body *cf.* Charlesworth (1974, Fig. 92L) M.O.L. Acc. No. 25118 (illustrated).
Nos. 65–66 from the fill of Well 33 and therefore not later than 3rd century.
67. E.R. 603 Glass stirring rod 105mm long, 7mm in diameter. Similar rods are found at all dates in the Roman period (Harden and Price 1971, 366). M.O.L. Acc. No. 25118 unstratified.

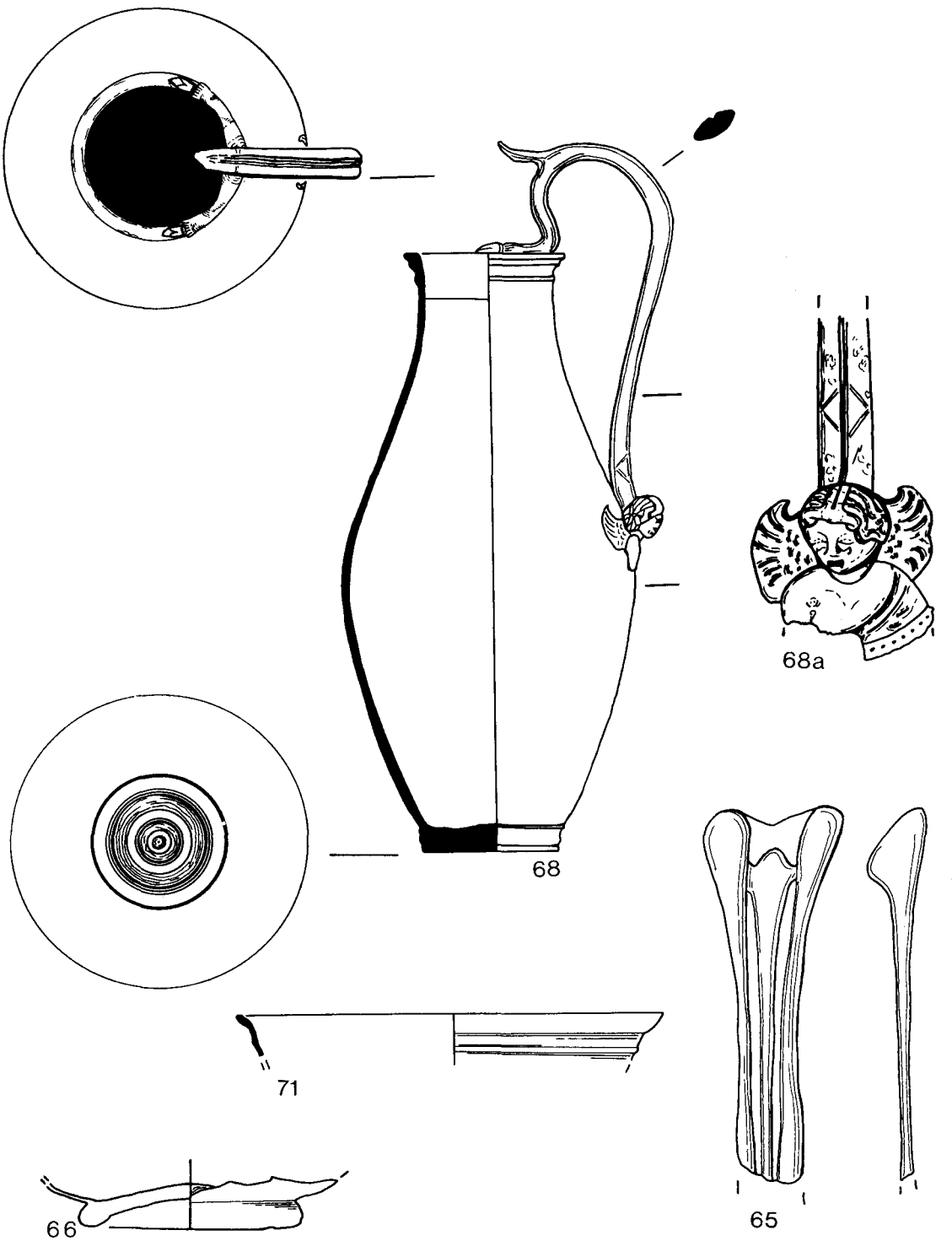

Fig. 30. Queen Street 1953 & 1960: Roman objects of glass; Nos. 65–66, and copper alloy No. 68, 71 (1/2). No. 68a 1/1.

(c) COPPER ALLOY (Figs. 30 and 31)

68. E.R. 85. Fragments and handle of jug. The footring is thick and heavy, but relieved by a series of deeply cut concentric grooves. The handle is solid cast and was attached to the rim and body by soldering. It is bowed above the mouth of the jug, and includes a thumb spur for pouring. The arms, which are attached to the rim, terminate in rounded finials. The base escutcheon is in the form of a female winged bust. The head is turned to the right, and looks down. Drapery, represented by deep grooves, sweeps over the shoulder and across the bust. The hairstyle is arranged with a parted central crest, from the sides of which the hair sweeps down to cover the ears. The hair, and feathering on the wings, are represented by shallow grooves. The treatment of the base is typical of vessels of the 1st–2nd century which were cast, and then lathe finished by turning, see Brown (1976, 35, Pl. 36) and Eggers (1966, Figs. 57–65).
The vessel is from the fill of Well 24, and could therefore be of Flavian date or earlier (illustrated). The winged female bust may be a representation of Victory. The hairstyle on the handle escutcheon appears on cameo representations of Augustus' wife Livia and his sister Octavia from Rome and the Hague respectively (Bardinelli 1970, 213–4). This may suggest an Augustan date for the vessel, which may thus have been a very early import.
69. E.R. 254. Complete jug or flagon. The base of this vessel is of similar thickness to the sides. There are few lathe marks, and the only decorative work is a rouletted band between two lines of the girth. The handle is formed of a metal strip, terminating at the base with a convex disc, and is soldered to the side of the jug. The handle is split at the top into two strips which are half twisted to present a flat face to the side of the neck. The neck and strips were then rivetted together. Fractures around the base, body, and handle were repaired by the application of lead patches.
Unlike No. 68, this jug appears to have been lathe spun (Hodges 1965, 75) using the method of manufacture employed on a jug from Grange Road, Winchester, see Toynbee (1967, 240–1). This jug, however, differs greatly from 1st and 2nd century jugs like that from Winchester, and others from Britain (Eggers, 1966), which were often Campanian imports. In particular it lacks the large, symmetrical mouth, and elaborate ornament. An undated parallel was found at Choisy-au-Bac (Oise) in Gaul (Tassinari 1975, 70, Pl. 85). From the fill of Well 36 and therefore 3rd–4th century or possibly earlier. B.O.L.S.A. (illustrated).
70. E.R. 608. Shallow lathe spun dish, with well defined lathe centre-mark and a low footring *cf.* Tassinari (1975, 48–50, Pls. 84–86). Fracturing around the base was repaired with lead. From the fill of Well 1 and therefore Roman (illustrated).
71. E.R. 589A. Rim fragments of spun bowl. From the fill of Well 7 and therefore not earlier than Neronian (illustrated).
72. E.R. 93B Instrument, see Chapman (1980a, 468) with long spoon bowl below a double moulding. The shank is plain with a probe terminal *cf.* Neal (1974, 196). From the fill of Well 19 and therefore 3rd–4th century or earlier. M.O.L. Acc. No. 24307 (illustrated).
73. E.R. 586. Instrument similar to No. 72. The shank is partly fluted with a probe terminal. Below a triple moulding is a narrow, broken projection. From the fill of Well 2 and therefore 1st century. B.I.A. (illustrated).
74. E.R. 80. Stud in the form of two serpentine pieces placed back-to-back, with outward-turning corners. Back fastening in the form of a projection of rounded section, tapering and notched towards the end. From the bottom fill of Well 20 and therefore not later than Antonine in date. M.O.L. Acc. No. 21488 (illustrated).
75. E.R. 586A. Strip of sheet metal cut in an 'L' shape, with traces of lead on the back possibly for fastening. From the fill of Well 3 and therefore 1st century (illustrated).
76. E.R. 113. Undecorated ring with rounded cruciform section. From Pit 25, and therefore 1st century (illustrated).

(d) IRON (Figs. 31, 32 and 33).

77. E.R. 81D. Slide-lock key. The handle is pierced with a circular hole. The shaft of the handle is of square section, but the corners are chamfered to an octagon near the wards. The wards consist of four rectangular prongs set in an 'L' shape, with three at right-angles to the handle. From the lower organic layer in Well 22 and therefore Flavian or earlier. B.O.L.S.A. (illustrated).
78. E.R. 118. Bucket handle of square section terminating at each end in a hook. The handle was flattened and dished at the top of the bow. When found the handle was attached to a bucket, described by the excavator as 'a single piece of wood bound round a thick base and rivetted.' From the burnt fill of Well 31 and therefore possibly as late as Hadrianic. M.O.L. Acc. No. 21181 (illustrated).
79. E.R. 254B. Tool shaped in exactly the same way as a modern builders or pointing trowel, with a spiked tang for insertion into a wooden handle made in one piece with the blade. The broken edges of the blade make it impossible to deduce the original shape. M.O.L. Acc. No. 21182 (illustrated).
80. E.R. 254B. Curved and flanged fragment of iron, possibly part of the rim of a bowl, dish or ? helmet (illustrated).
81. E.R. 254B. Single edged, triangular sectioned iron blade with broken tip and edge. The blade seems originally to have been straight backed and curved with a rivet hole at the base (illustrated).

79–81 were from the fill of Well 36 and are therefore 3rd–4th century or earlier.

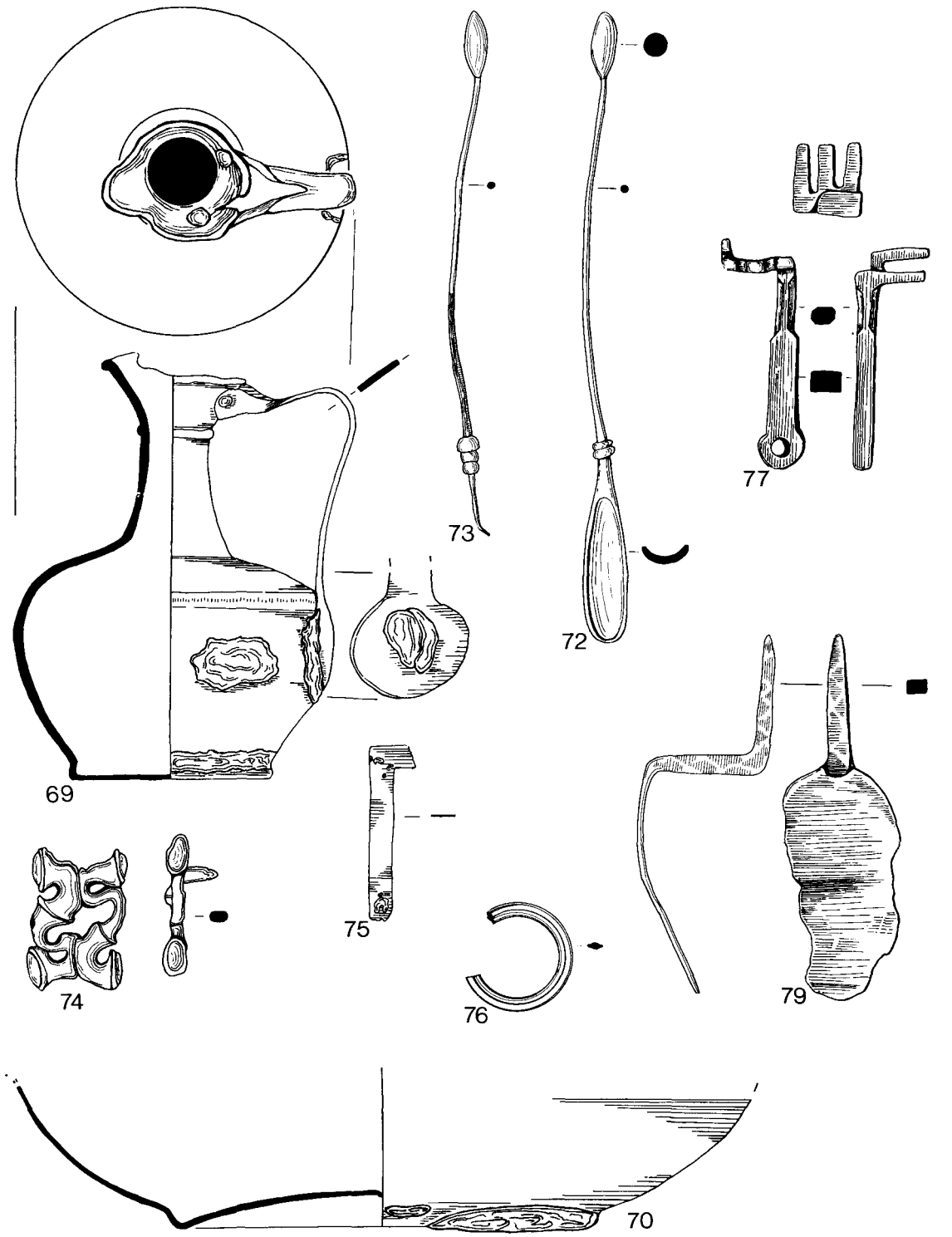

Fig. 31. Queen Street 1953 & 1960: Roman objects of copper alloy, Nos. 69–70 and iron Nos. 77, 79 (1/3). Objects of copper alloy Nos. 72–76 (2/3).

(e) LEAD
(Fig. 32)

82. Two pieces of lead water pipe, probably both from the same length. The pipe is made from sheet lead 7–10mm thick folded over to form a tube. One edge of the sheet was then folded over the other and heated or soldered to form a joint. One piece retains the thick flange formed when molten lead was applied, to join two pieces of pipe. From the fill of Well 31 and therefore possibly as late as Hadrianic in date. M.O.L. Acc. Nos. 24518–9 (illustrated).

(f) BONE
(Fig. 32)

83. E.R. 93. Pin with facetted head, showing 4 lozenge shaped and 4 hexagonal facets. Of an allied type to Crummy (1979, 161) type 4, dated *c.* AD 250–early 5th century. M.O.L. Acc. No. 24294 (illustrated).

(g) WOOD
(Figs. 32, 33 and 34)

84. E.R. 81D. Ladder 5.59m long of oak. Recently published in full in these *Transactions* (Weeks 1978). The dating given by Weeks, 1st century AD, can be further narrowed down to the Flavian period or earlier since it was found below the Flavian dump in Well 22. M.O.L. Acc. No. 21234.

BARRELS: Barrels in well linings are discussed above (p. 23). The following points were recorded on site during excavation, and the barrels themselves do not survive. Well numbers are given in brackets after the E.R. number.

85. E.R. 88 (Well 37). Barrel of 660mm top (raised) diameter, and 840mm diameter at the middle bulge (Pitch). Comprised 36 staves each 50–80mm in width and 10mm thick. The top and base grooves for the heads were 40mm from the ends of the staves. At the base two thin wood bands survived, and the top binding was willow. N. Cook identified the staves as fir (Pl. 5).
86. E.R. 106 (Well 35). 5 staves of a barrel 0.93m in top diameter.
87. E.R. 106 (Well 35). Barrel 1.22m high, with a top diameter 0.68m. Staves were of fir (identified by N. Cook) and hoops were of hazel. Three hoops survived at the top and one at the base.
88. E.R. 118 (Well 31). Barrel of unusual construction with 17 dovetailed staves. Head-grooves survived.

Nine other barrels were found:

E.R. 586 (Well 2) 1 E.R. 642 (Well 15) 1
E.R. 612 (Well 18) 2 E.R. 644 (Well 14) 2
E.R. 624 (Well 17) 1 E.R. 645 (Well 16) 2

The capacity of No. 85 can be estimated at 363.98–409.14 litres (80–90 gallons), and that of No. 87 at 490.96–545.52 litres (108–120 gallons), using the ratios of dimensions to capacity put forward by Kilby (1971, 63). These capacities are close to 15 *amphorae* (393.95 litres) and 1 *culeus* (525.30 litres) (Hultsch 1971, 704), respectively. If the barrels were made to contain a specific capacity, these were the quantities intended. A barrel from the Bank of England was estimated by Kilby as holding approximately 2 *culea* (1050.60 litres) (Kilby 1971, 100).

It is probable that the fir wood used in the barrels was silver fir *albies alba* (pers. comm. Vanessa Straker). Though this wood is not indigenous to Britain, it has been found in barrels at Silchester (Boon 1974, 86, 263–6), possibly at Peninsular House, London (pers. comm. V. Straker), and in a bucket made of reused barrel staves from York (Williams 1977a, 332). The elder Pliny (*Natural History*, cited by White 1975, 141–2) stated that a coniferous soft wood was the best type for use in coopering. It may be the case that, like at Silchester (Boon 1975, 265), only a few staves from Queen Street were examined. This is unfortunate as it is clear that often more than one wood was used in the making of a single barrel. The barrel from Harelbeke in Belgium (Vierin *et al.* 1961) had staves of both larch and silver fir. The Oberaden barrel (Hopf 1967, 214) had staves made of five different woods, and hoops of four. The majority of the staves, however were silver fir, and most of the hoops were hazel. The Silchester barrels were also made of silver fir and hazel providing a good parallel to the Queen Street vessels. The natural habitat of silver fir is high in the mountains of southern and central Europe, especially in the Alps (McGregor 1978, 33) and most of the barrels found on the Rhine and the Danube, the major riverine trade routes from the Alps, are made of similar materials (Ulbert 1959). It seems likely that the barrels were used for the transport of wine, and tartrates from the barrel from Oberaden have proved this in one case (Hopf 1967, 216), though Kilby (1971, 98) points out that the type of wood would cause wine to deteriorate. Boon (1975, 265) suggests that rough staves were sent to river ports to be made into bar-

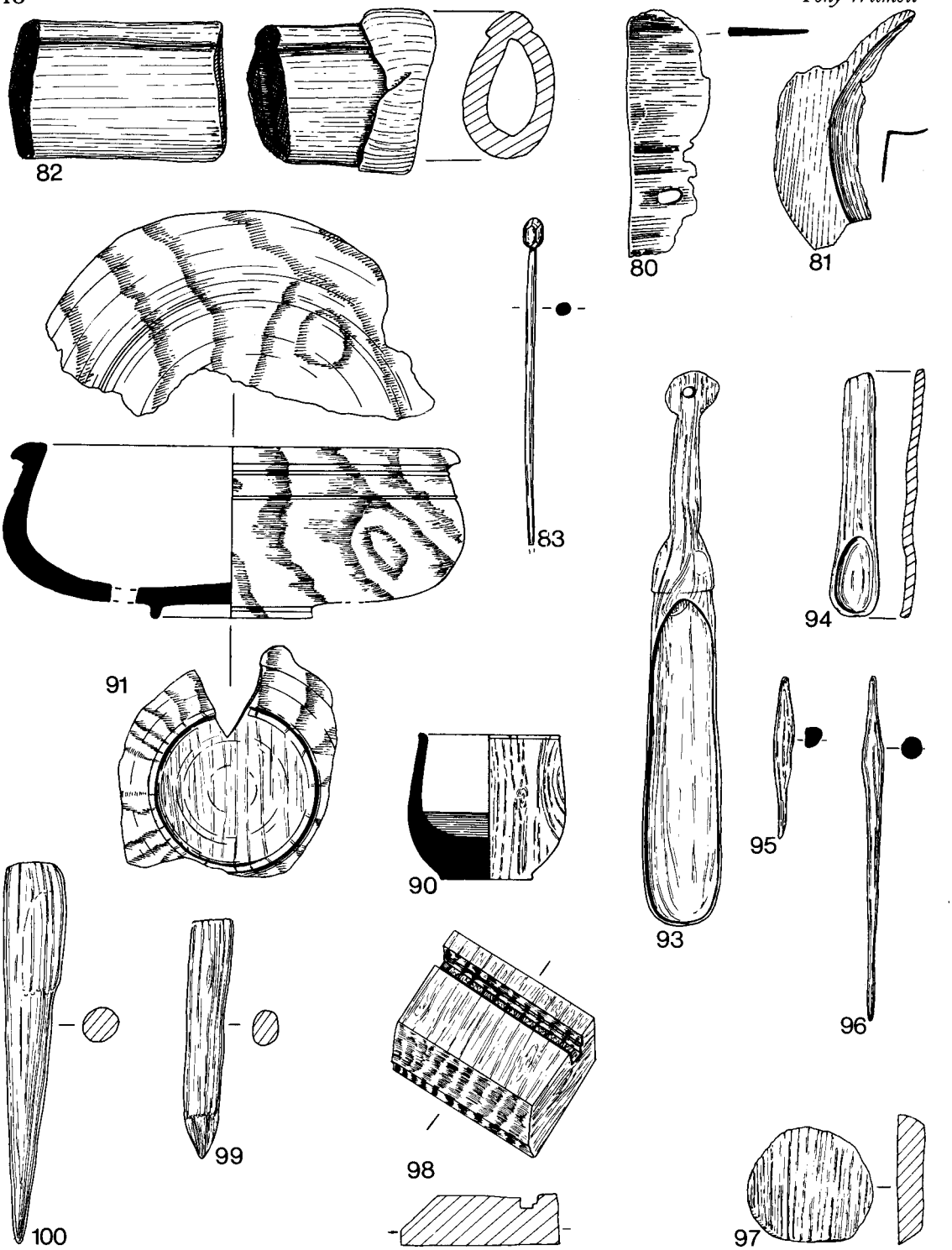

Fig. 32. Queen Street 1953 & 1960: Roman objects of iron, Nos. 80–81; lead, No. 82; and wood, Nos. 90–100 (1/3). Bone pin, No. 83 (2/3).

rels, and the discovery of iron stamps (Garbsch 1970, 108), sometimes put on the cross-peins of coopers' axes (Donnheimer 1971) have been found in such places. Most of the epigraphic evidence for the use of barrels shows them being transported by boat (Esperandieu 1907, VII No. 5833, VI Nos. 5184, 5194 and 5198: Pobe and Roubier 1961, 84) and many come from the Rhine. Some reliefs show one or two barrels mounted on wagons (Esperandieu 1907, I No. 4, IV No. 3222, VI No. 5148 etc.) Boon (1975, 266) points out that the weight of laden barrels would often exceed the maximum loads allowed on road transport. Though there are barrels but no recognisable amphorae on Trajan's Column (Boon 1975, 266) it is clear from a relief from Arlon (Esperandieu 1907, V No. 4072) that the two types of bulk containers were not mutually exclusive.

Though the direct trade route up the Rhine to the Thames is the most probable source for the barrels it may be relevant to mention the evidence for coopering in the Bordeaux region. Tombstones of coopers have been found at Bordeaux and Nantes (Esperandieu 1907, IV Nos. 1112, 1621). The Garonne was, according to Strabo, one of the major rivers from which trade embarked to Britain. This trade is also attested in inscriptions of the 1st century, and more notably in the 3rd-century inscription of M. Aurelius Lunaris (Corteault 1921, 104).

The barrels used to line wells in Queen Street all dated to the 1st–2nd centuries, and the lack of 2nd–4th-century barrels might indicate that by this time the importation of wine in barrels had ceased. The 80 barrels listed by Ulbert, which include other British examples show a similar decline in the later Roman period. All six from Britain are 1st–2nd century in date. Those from Silchester are listed as undated though Boon (1975, 264) suggests an early date for at least one of these. On the continent were 15 undated barrels, 41 of the 1st–2nd century and 11 of the late 2nd–3rd century. The decline of barrel imports in the late 2nd century coincides with the well attested decline in the numbers and range of amphorae imported to Britain generally and, though outside the scope of the present paper raises questions on the continuation of the wine trade to Britain.

89. Writing tablet: most other writing tablets from London are of the wax type (Chapman 1977, 1980b). This specimen is of wood with slightly ribbed edges and is made to carry writing in carbon ink. The tablet closely resembles examples from Chesterholm (*Vindolanda*), Northumberland (Bowman, Thomas and Wright 1974). The object is fragmentary and is preserved between two sheets of glass. Infra-red photographs of the writing on the tablet were submitted to Dr. A. K. Bowman, but unfortunately the ink writing could not be deciphered. M.O.L. Acc. No. 27734 (unstratified).
    All other wooden objects were conserved with alum. This process has caused the wood to go brittle and friable making species identification difficult. Nevertheless, the wooden objects were submitted to Vanessa Straker for identification, and her comments are incorporated below.
90. E.R. 88. Lathe-turned cup in unidentified hard wood. No centre mark is visible, but the base and lower part of the inside are scored with turning marks. The rim is beaded, and there is a shallow foot-ring. From the fill of Well 37, and therefore not later than the 3rd century. B.O.L.S.A. (illustrated).
91. E.R. 80. Lathe turned bowl in hardwood, possibly ash or maple. Deep foot-ring, beaded rim and two narrow beads are cut round the body. From the fill of Well 22 and therefore Antonine or earlier. M.O.L. Acc. No. 21671 (illustrated).
92. E.R. 81D. Lathe-turned handled bowl or dipper in unidentified wood. (See Merrifield 1965, Pl. 11B). The bowl had a stepped rim, and the centre of the base was raised. The straight handle was fixed to the bowl with a wedge-sectioned triangular rivet of iron (Fig. 33). This rivet was hammered through the side of the bowl into the end of the handle. The end of the rivet was then hammered flat against the side of the interior of the bowl. This method of fastening had caused the handle to split. From the lowest fill of Well 22, and therefore Flavian or earlier in date. B.O.L.S.A. (illustrated).
93. E.R. 81D. Scoop or spoon made from a single piece of unidentified softwood. The bowl is 155mm long and the handle is 105mm long. There is a shoulder at the top of the bowl leading into the handle, which terminates in a pierced disc. From the lower organic layer in Well 22 and therefore Flavian or earlier. M.O.L. Acc. No. 21235 (illustrated).
94. E.R. 106. Small flat spoon made from a rectangular piece of unidentified hardwood hollowed out at one end to form the bowl. From the fill of Well 35 and therefore pre-Flavian in date. M.O.L. Acc. No. 21490 (illustrated).
95. E.R. 113. Fragment of the top of a biconical spindle in unidentifiable wood. From the fill of Well 25, and therefore 1st century. M.O.L. Acc. No. 21500 (illustrated).
96. Complete spindle in unidentified hardwood. Biconical and tapering towards each end *cf.* Chapman (1980b, 671–73), and probably lathe turned. From

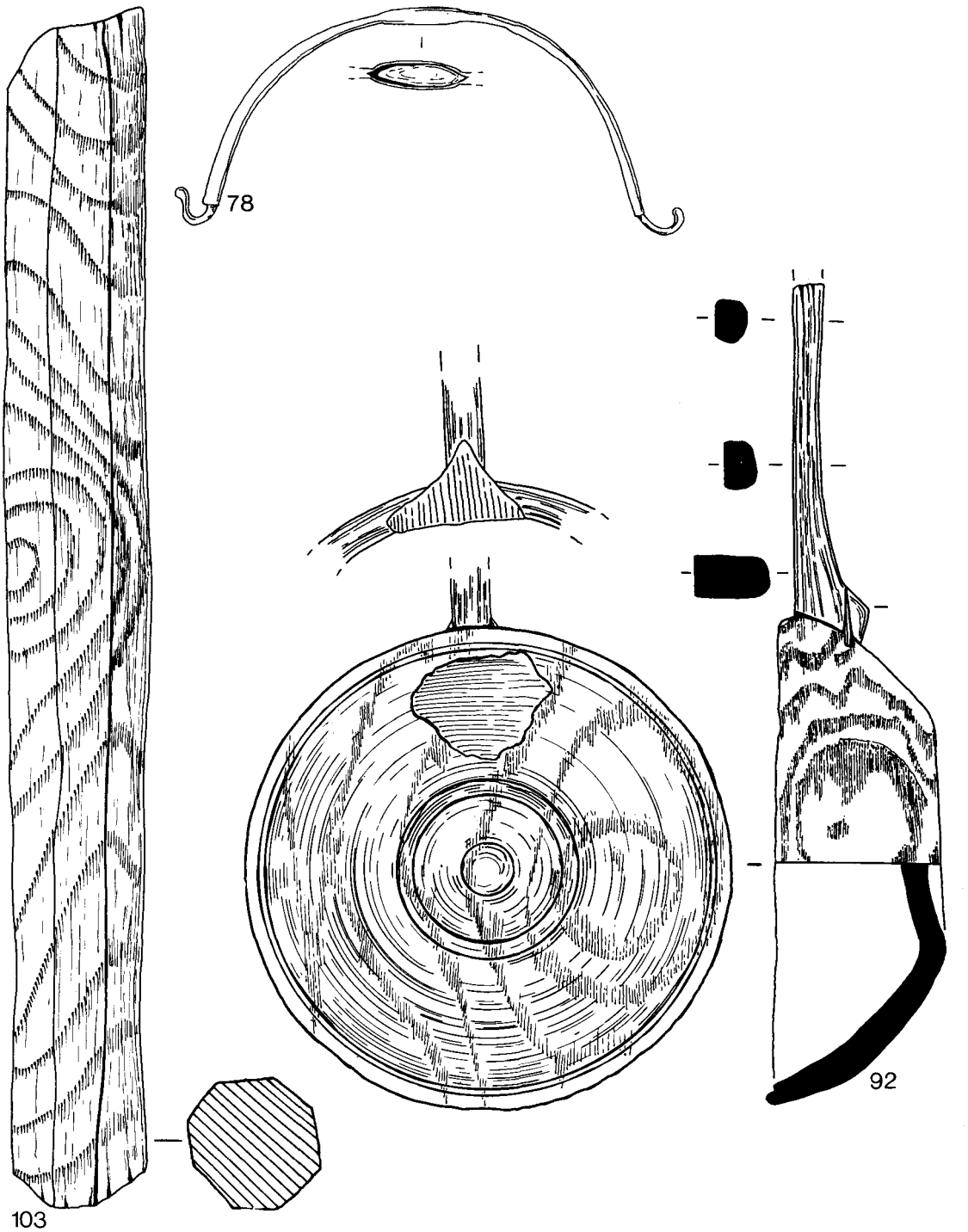

Fig. 33. Queen Street 1953 & 1960: Roman objects of iron, No. 78; and wood, Nos. 92, 103 (1/4).

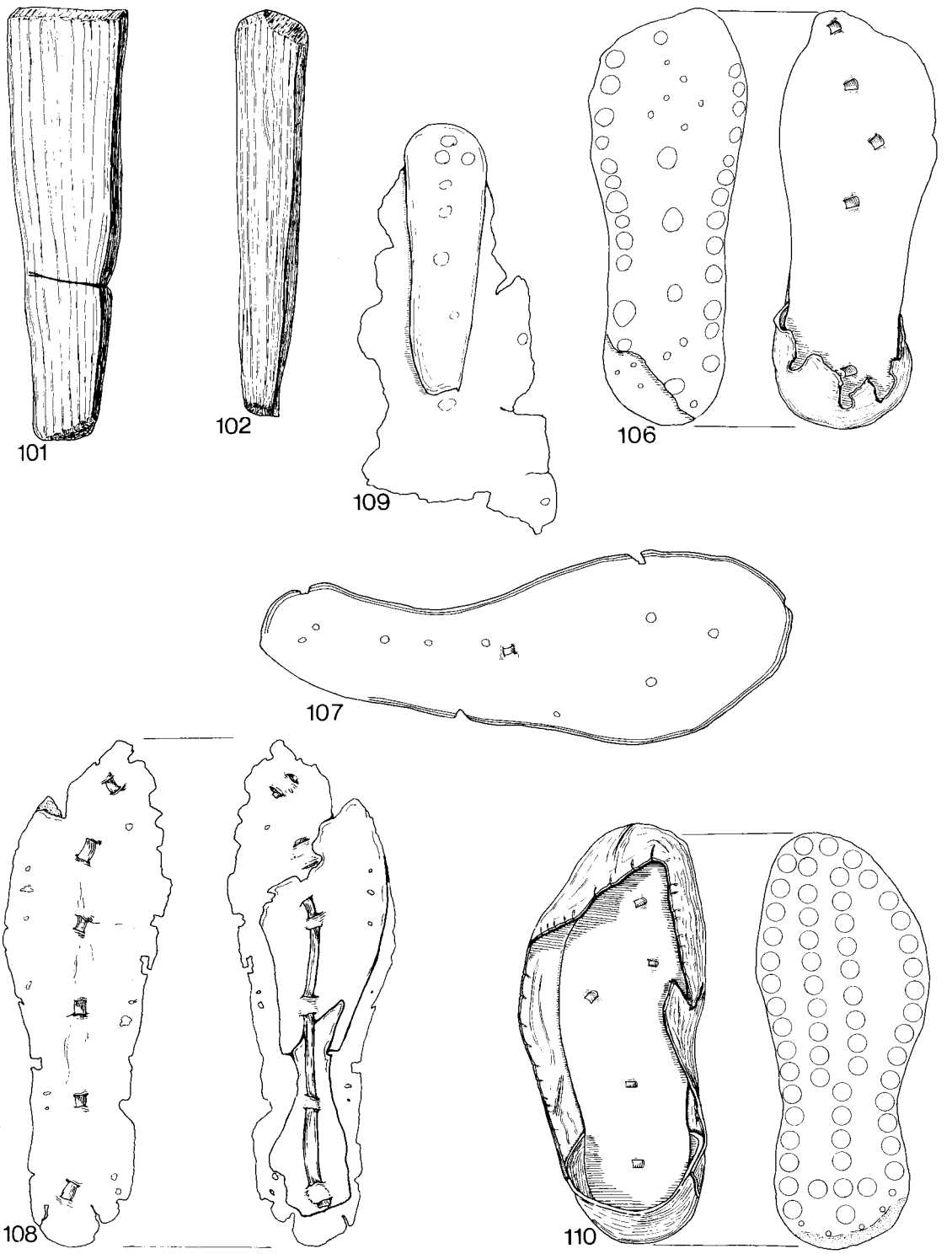

Fig. 34. Queen Street 1953 & 1960: Roman wooden objects, Nos. 101–102; and leather shoes, Nos. 106–110 (1/3).

the Bank of London and South America site, no other provenance known. B.O.L.S.A. (illustrated).

97. E.R. 109. Barrel bung, circular with bevelled sides, probably in oak. From the fill of Well 33 and therefore 3rd century or earlier. M.O.L. Acc. No. 21179 (illustrated).
98. E.R. 80. Rectangular object in oak. One edge is sharply bevelled. A deep groove is cut parallel to the bevelled edge. Though this may have formed part of a mortice and tenon joint, the function of the object is unknown. From the fill of Well 20 and therefore not later than Antonine. M.O.L. Acc. No. 19874 (illustrated).
99. E.R. 118. Knife worked peg in unidentified hardwood. From the fill of Well 31, and so probably Hadrianic or earlier. M.O.L. Acc. No. 19837 (illustrated).
100. E.R. 109. Knife worked peg or stake in hardwood (not oak). From the fill of Well 33 and so 3rd century or earlier (illustrated).
101. E.R. 93A. Oak wedge, rectangular in section. M.O.L. Acc. No. 21180 (illustrated).
102. E.R. 93A. Broad oak wedge, rectangular in section. *M.O.L. Acc. No. 21188 (illustrated).*
103. E.R. 81A. Oak beam, Octagonal in section slightly tapered and ? mitred at the thickest end. Possibly a table leg. From the upper fill layers of Well 22 and therefore in the date range post-Boudican to 3rd century. M.O.L. Acc. No. 21670 (illustrated).
104. E.R. 80. Three lengths of oak branch, stripped but not worked. Average length 400mm. They could have been ladder rungs. From the fill of Well 22 and therefore Antonine or earlier.

(h) LEATHER TRUNKS (Fig. 35)

105. E.R. 81D. Photographs (Cook 1955, 6–7; Merrifield 1965, Pls. 116–117, Marsden, 1980, 63) and a brief description (Waterer 1976 187–8) of this object have been published, but no detailed examination has yet been attempted.

Fig. 35 shows an expanded view of the trunks assembly. The basic shape, a wide 'hourglass' with the back larger in extent than the front was cut from a single piece of leather and hemmed. The hem is 5mm wide, and is stitched with a 'fell-stitch' in which the thread penetrates only part way through the thickness of the leather, so that it is not visible from the outside. This stitch does not occur in Groenman-van Waateringe's typology of Roman leather stitches (1967, 27), although in technique it is similar to his type 5/6 where, however, the thread does penetrate both sides of the leather.

The grain side of the leather was turned outwards, an arrangement which would be more comfortable to the wearer. Each corner of the original shape was reinforced on the inside with two rectangles of leather 44mm × 26mm each cut in one piece with a lace 540mm in length. The reinforcements were stitched to the corner tabs with the stitch Groenman-van Waateringe type 1b (1967, 27). The triple layers of leather thus formed on the corners were pierced with two semi-circular slots 15mm in diameter.

The method of fastening can be reconstructed since the left hip tie remains intact. Each lace was threaded through one of the opposing slots and pulled tight drawing the sides of the garment together. Each pair of laces was then doubled back and tied to the other to secure the trunks.

The trunks are well worn, with deeply defined stretch marks across the front, the pattern of which would appear to preclude a male wearer. No laces survive on the front right-hand corner, and the reinforcements on both right-hand corners had pulled away. The laces on the left side had been tied by the wearer in a 'granny' knot. Leaving an allowance of 10% for the shrinkage of the leather, an allowance used in order to estimate footwear sizes (Rhodes 1980, 102), a hip measurement of 790mm (31 in.) is produced, emphasising the likelihood that the wearer was a young woman or a girl.

From the lower organic deposit in Well 22, it was therefore of Flavian date or earlier. M.O.L. Acc. No. 21233. Reconstruction by the late John Waterer in the B.O.L.S.A. collection (illustrated).

The only similar garment to have been found also comes from London, from the probable watchtower at Shadwell, and is 3rd century in date (Johnson 1975, 279). These trunks are more ornate than those from Queen Street. They are decorated with openwork at the front, and were frilled round the legs. They tied with 3 laces at each corner, which were cut out in one piece with the garment, and which were not reinforced.

Other parallels can be found in pictorial and sculptural representations of figures wearing similar trunks, though it is not always

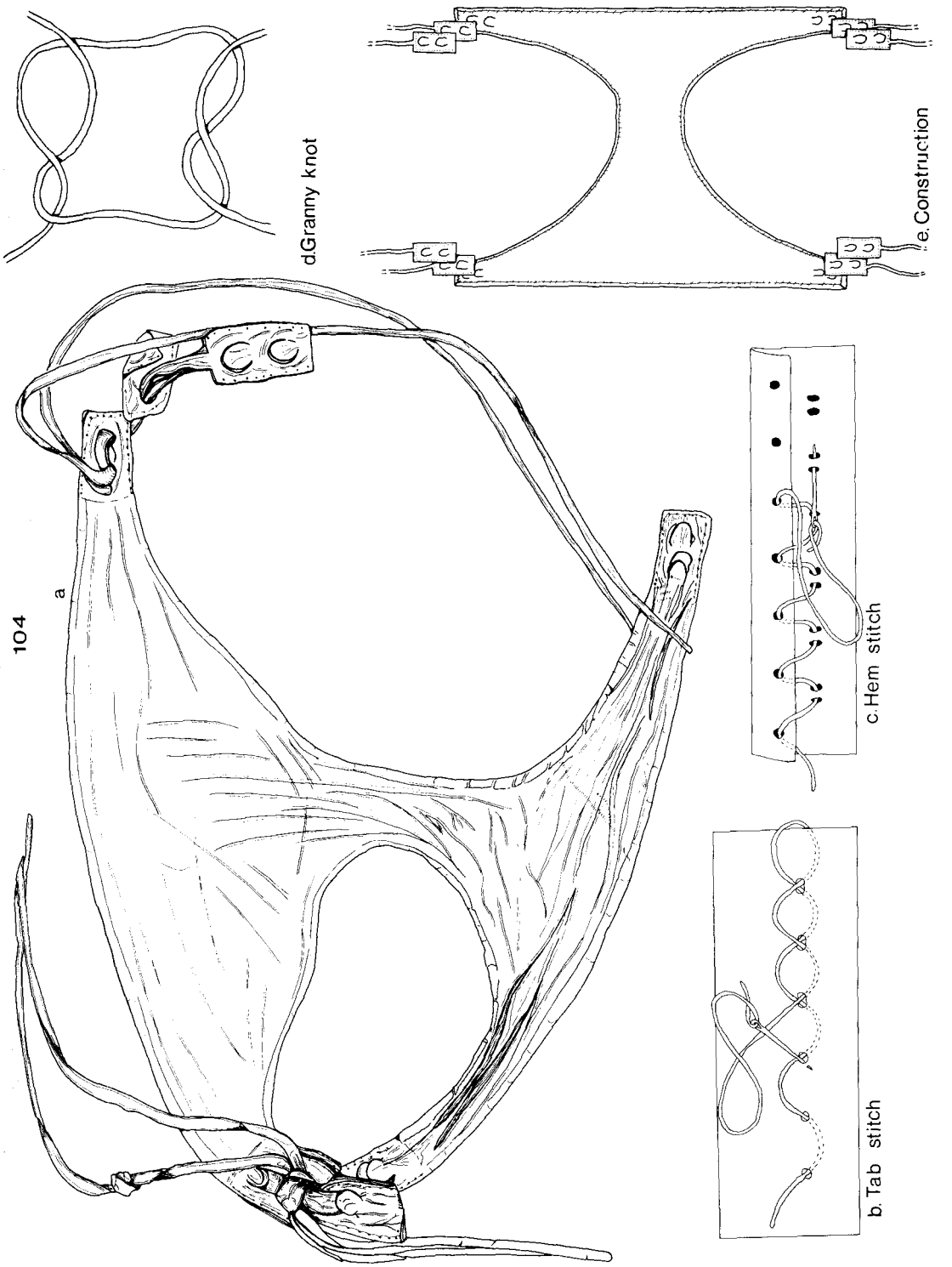

Fig. 35. Queen Street 1953 & 1960: Roman leather trunks, No. 105 (1/3).

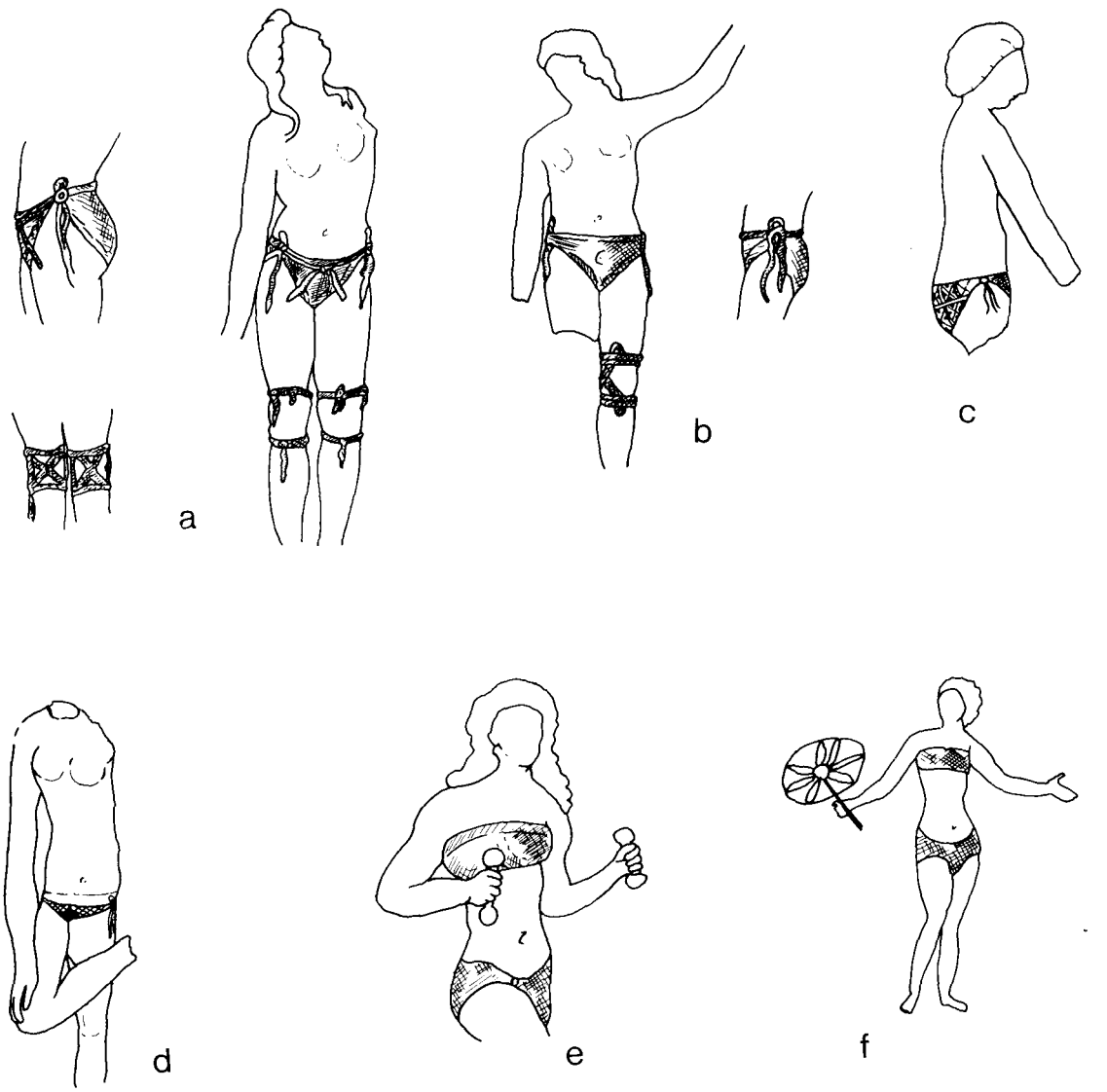

Fig. 35a. Queen Street 1953 & 1960: Roman parallels to leather trunks (a) Bronze figurine from Rennes, (b) Bronze figurine from Hamburg, (c) and (d) Terracotta figures from Dougga (e) and (f) Mosaic from Piazza Armerina. (Sketch drawings: not to scale).

possible to say of what material the trunks depicted might have been made. The mosaic in the 3rd-century villa at Piazza Armerina, Sicily (Wheeler 1964, 137, Pl. 11a) shows female figures wearing black, undecorated trunks (Fig. 35a; e,f), which might well be of leather, though other figures on the same mosaic could be wearing either embroidered cloth or painted leather trunks. The figures on this mosaic are all female acrobats or dancers.

The Queen Street trunks were of Flavian or earlier date. The only contemporary representation of trunks which may have been leather is on a marble statuette of Venus from the Villa of Julia Felix, Pompeii (Ward-Perkins and Claridge 1976, 85, No. 218). The 'bikini' type costume is gilded on to the marble figure, and it is quite possible that this was intended to represent gilded leather, fragments of which have been found in London (Waterer 1976, 192). The bikini is cut with openwork decoration representing saltires within squares closely resembling the openwork on shoes of the Roman period (Waterer 1976, Fig. 203: Rhodes 1980, Nos. 632–660) and the two halves of the costume are joined with an arrangement of cross-belts. This type of openwork garment is not confined to the 1st century A.D, since a stucco relief from the Cyclops baths at Dougga, Tunisia (pers. comm. R. Erskine) depicts trunks similar to the lower part of the costume from Pompeii (Fig. 35a; c). On this relief the trunks are picked out in clear black paint. The openwork in the trunks from Shadwell may be a variation on this type of garment. A further representation of decorated trunks from Dougga has a scaled pattern which could represent moulded, incised, or slit leather (Fig. 35a: d).

Apart from the somewhat undiagnostic depictions at Piazza Armerina, there are only two representations of undecorated trunks, on very similar bronze figures from Rennes (pers. comm. M. Berhaut, Museé des Beaux Arts, Rennes No. 6196, now lost. Merrifield 1965, Pl. 116: Fig. 35a; a) and Hamburg (pers. comm. A. Kossatz, Museum für Kunst und Gewerde, Hamburg No. 1917/362: Fig. 35a; b). The figures both represent acrobats, the Rennes figure is holding jumping weights. They are female figures with similar hairstyles, and both are wearing trunks, and kneepads fastened with some form of cross-gartering. These kneepads in themselves show that some form of athletic activity which involved a strain on the legs was being enacted. The trunks on the Rennes figure paralleled the openwork trunks from Dougga, and also one of the Piazza Armerina figures, in having side-rings as provision for fastening, whereas the scaled trunks from Dougga and also the Hamburg figure show simple knotted fastenings of the type attested at Queen Street, and probably also at Shadwell.

It will be noted that all the above representations on which trunks similar to those from Queen Street occur are of women or girls, and all except that from Pompeii show dancers or acrobats. There are other Roman depictions of dancers, acrobats, or actors showing loincloth type garments (Daremberg and Saglio 1887, 592, 6057, 6677, (1426)) but it is not possible to say what material these were made of. The term *subligaculum* meaning a type of loincloth, is used by both Cicero (*De Officiis* I, XXXV, 12a) and Juvenal (*Satires*, VI, 70) with reference to actors and female performers, though whether the Queen Street trunks should be so termed is open to speculation.

The above points would appear to indicate that the Queen Street trunks are an example of a type of garment used throughout the Roman period by female acrobats or other performers.

Hitherto the garment has usually been referred to as a 'bikini'. This however may be a misnomer. Though the representations from Piazza Armerina and Pompeii show two piece costumes, those from Dougga, Rennes and Hamburg are bare-breasted.

(j) LEATHER FOOTWEAR
by Penny MacConnoran
(Figs. 34, 36 and 37).

106. E.R. 93. Right-foot nailed shoe. 198 × 72mm. Child size 13. Bottom unit is complete and consists of insole, middle and sole. Three double thong slots occur along centre line of insole. There is a heel stiffener *in situ*. The nailing pattern is of Type A with a diamond shape in the forepart: for a list of parallels see Rhodes (1980, 107). This is the only

shoe showing clear evidence of repair. A piece of leather had been added to the worn back part of the heel; awl holes indicate that it was first held in position by stitching. When the marginal nails were driven back in, they were set slightly further inwards than usual, possibly to avoid the stitching. M.O.L. Acc. No. 21200 (illustrated).

107. E.R. 93. Right-foot nailed shoe. 243 × 89mm. Adult size 6. Insole only. Central thong slots present. Tunnel stitch holes on the flesh side indicate that the upper had been attached by means of a lasting margin. The nailing pattern is of Type B. The forepart is displaced inwards. A considerable number of excavated shoes from London (M.O.L. Acc. Nos. 3479, 14175, 14177, 79.244/144, 79.244/30, 79.244/90 and 79.244/89; Marsden 1965, Fig. 20, No. 7; Rhodes 1980, Figs. 59 and 60. No. 523) as well as a single example from York (MacGregor, 1978, Fig. 28, No. 35b) are of similar shape. None of the above examples has the circular nailing pattern that is a feature of soles of this shape from Vindonissa, which Gansser–Burckhardt (1942, 68–73) suggests are orthopaedic shoes for people suffering from a foot deformity. However, the sheer abundance of the London examples demands a more plausible explanation for the odd shape, and it may simply represent a whim of fashion. In this respect, the toe shape of 107, E.R. 93 (B12) is markedly rounded. An impressed double line runs around the edge of the insole, making this the only nailed shoe with decoration on the bottom unit. M.O.L. Acc. No. 21193 (illustrated).

108. E.R. 93. Left-foot nailed shoe. 240 × 77mm. Adult size 6. Incomplete bottom unit consists of an insole and a middle composed of two pieces of leather overlapping at the waist. A similar two-piece middle can be seen on a shoe in the Museum of London (M.O.L. Acc. No. 24823), whilst other examples are known from Zugmantel (Busch 1965, Taf. 37, No. 800) and Saalburg (Busch 1965, Taf. 11, No. 211). The central thonging survives *in situ*. The nailing pattern is of Type A. M.O.L. Acc. No. 21195 (illustrated).

109. E.R. 95. Nailed shoe 192 × 89mm. Of adult proportions but too incomplete to calculate size. Part of the sole survives as well as a tongue-shaped middle. Similar middle parts are known from London (e.g. M.O.L. Acc. No. 24771) and from Zugmantel (Busch 1965, Taf. 37, No. 804). Central thong slots are present. Due to the incompleteness of the shoe, it is difficult to determine the nailing pattern. M.O.L. Acc. No. 21194 (illustrated).

110. E.R. 93. Left-foot nailed shoe. 190 × 72mm. Child size 12. Bottom unit is complete and consists of insole, middle and sole. Central thonging survives. Heel stiffener is *in situ*. The surviving portion of upper on this shoe is of especial interest. A continuous shallow stretch of upper (average height: 16mm) runs around the bottom unit, slightly overlapping the edges of the heel stiffener. It is attached to the bottom unit by means of a lasting margin inserted between the insole and the middle. Tiny scallops have formed along the top edge which has a row of small stitch holes. Several shoes with a similar type of upper were found at Saalburg (Busch, 1965, Taf. 9, Nos. 194–196). Busch (1965, 184) suggests that uppers made of fabric which has not survived were stitched onto the leather. However a shoe of similar construction has recently been found in London (NFW 74 220/576) and this demonstrates that the top-stitched stretch of upper was used as a lining for a closed leather upper. It seems likely that the upper surviving on 110, E.R. 93 (B12) served a similar function. The shoe has a Type A nailing pattern with two straight rows in the forepart. M.O.L. Acc. No. 21192 (illustrated).

111. E.R. 93. Right-foot nailed shoe. 274 × 101mm. Of adult proportions but too incomplete to calculate size. Bottom unit consists of fragmentary remains of middle and sole. The middle is composed of three smallish regularly shaped pieces of leather intended to act as a filler between the edges of the lasting margin of the upper. Parallels for middles of this type are known from Hardknott (Charlesworth and Thornton 1973, 141 and 146, and Nos. 1 and 2). A fragment of thonging survives. Upper remains consist of part of side and back quarters with partially surviving lasting margin. There is a Type A nailing pattern with possibly four straight rows in the forepart. M.O.L. Acc. No. 21196.

112. E.R. 93. Left-foot nailed shoe. 226 × 72mm. Adult size 4. Nearly complete bottom unit consists of insole and sole. Forepart has remains of lasting margin of upper *in situ*. The nailing pattern is of Type A with an S pattern in the forepart.
Examples of this pattern are known from London (e.g. M.O.L. Acc. No. 992), while others have occurred at Zugmantel (Busch, 1965, Taf. 35, Nos 761, 763, 765, 768 and 769; Taf. 9, Nos. 194, 195, 197 and 198). The nails on this shoe are unusually small and must originally have numbered about 112. M.O.L. Acc. No. 21750.

113.A. E.R. 93. Moccasin. Length: 25mm. The surviving upper parts have elongated loops through which a thong would have passed to close the shoe over the foot. The moccasin is plain apart from decorative knobs at the base of the ankle strap. There is a seam up the back of the heel. Similar examples are known from London (e.g. M.O.L. Acc. Nos. 14129, 14154; Rhodes 1980, Fig. 69, No. 641) and from Bar Hill (Keppie 1975, Fig. 20, No. 13). M.O.L. Acc. No. 21199 (illustrated).

113B. E.R. 93. Left-foot nailed shoe. 260 × 94mm. Adult size 8. Nearly complete bottom unit consists of insole, middle and sole. Thonging survives *in situ*. The nailing pattern is of Type C and is similar to that on 114, E.R. 93, M.O.L. Acc. No. 21199B (illustrated).

114. E.R. 93. Left-foot nailed shoe. 260 × 98mm. Adult size 8. Bottom unit is incomplete and consists of insole, middle and sole. Central thonging *in situ*. Nailing pattern is of Type C and is similar to that on 113B, E.R. 93 (B12). M.O.L. Acc. No. 21197 (illustrated).

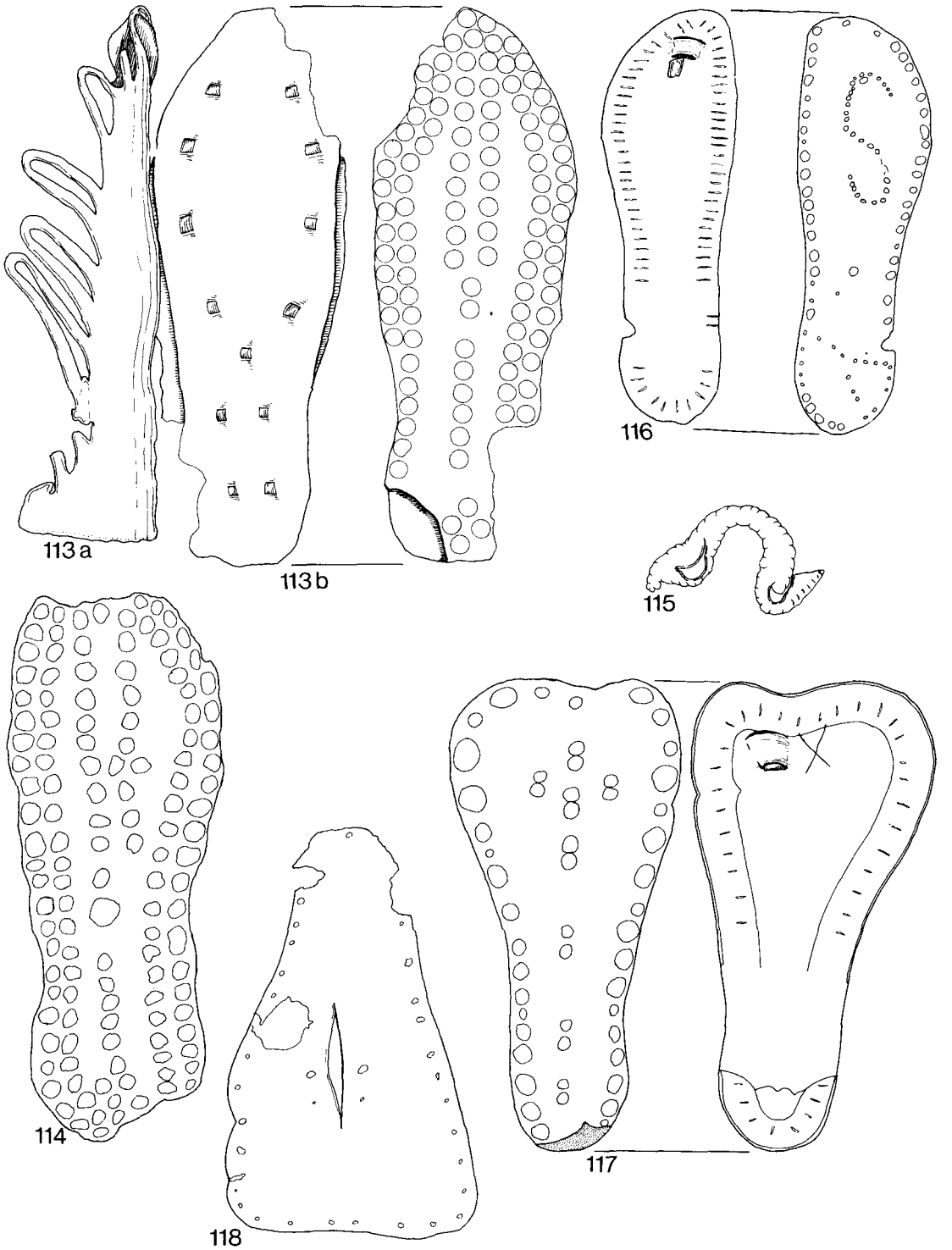

Fig. 36. Queen Street 1953 & 1960: Roman leather shoes, Nos. 113–118 (1/3).

115. E.R. 93. Part of the front fastening of an upper. Ten stitch holes run around the scalloped edges indicating that this is a reinforcement which was stitched to the inside of a latchet. A shoe from York (MacGregor 1978, Fig. 29, No. 362) shows a similar reinforcement *in situ*. Other parallels occur at Zugmantel (Busch 1965, Taf. 34, Nos. 749 and 750) and Saalburg (*Ibid.* Taf. 26, No. 535) M.O.L. Acc. No. 21197 (illustrated). Nos. 106–115 from the fill of Well 19 and therefore 3rd–4th century or possibly earlier.
116. E.R. 254B. Left-foot nailed shoe. 293 × 95mm. Adult size 12. Bottom unit incomplete and consists of insole, middle and sole. The sole-shaped middle is small and lies within the edges of the lasting margin of the upper. Similar middles are found on nailed shoes from Portchester Castle (Ambrose 1975, Figs. 132 and 133, Nos. 264 and 266). Central thonging is present. There is a small portion of the toe end of the upper *in situ*. Detached upper parts consist of the back of the quarters with heel stiffener within, also, part of the front. This latter has six tie holes down its front edge and this and the top edge had been folded inwards and stitched. The upper remains suggest that this was a close type of ankle boot, laced up the front. The upper would have been whole cut, (i.e. formed of a single piece of leather) the seam lying at the side of the quarters. Parallels are known from Bar Hill (Keppie 1975, 75 and Fig. 24, No. 44). See also Rhodes (1980, 115). The nailing pattern is of Type A. The sole has three different nailing designs. The elaborate leaf-like pattern occurs on other London specimens (M.O.L. Acc. Nos 15643, 12403, 15634) while parallels are known from Vindolanda (Metcalfe and Longmore 1975, 38 and Fig. 1). Saalburg (Busch 1965, Taf. 15, Nos. 223 and 224) and Zugmantel (*Ibid.* Taf. 34, Nos. 752 and 754). Normally the curving stem of the design lies at the waist end of the sole—the upside-down version on 116 may have been deemed necessary to provide sufficient space for the diamond pattern at the waist. From the fill of Well 36 and therefore 4th century or possibly earlier (illustrated).
117. E.R. 93. Left-foot sandal. 193 × 61mm. Child size 13. The sandal is of standard shape with gently pointed toe. Bottom unit survives complete and is formed of insole, middle and sole. Marginal thong slits are discontinued at waist. Large double thong slot in forepart to hold between toes strap. Nailing pattern is Type A with all S design in the forepart (see page 59 this paper). Nails are unusually small and must originally had numbered about ninety-five. On the insole, immediately below the toe thong slots, is a large nail. It seems most unlikely that this can be an original feature of the sandal, as it would have caused great discomfort. M.O.L. Acc. No. 21190 (illustrated).
118. E.R. 93. Right-foot sandal. 220 × 106mm. Adult size 4. This is a broad sandal with round toe and scallop for the big toe. Bottom unit complete and consists of insole and sole with a possible middle. There are the usual marginal thong slits discontinued at waist. Fragment of between toes strap survives in slot feature. The nailing pattern is of Type A with pairs of nails forming a cross shape in the forepart. Decorative markings on the insole include two impressed lines running parallel to the edge of the sole. Similar linear markings, occurring singly or in pairs are commonly found on broad toe sandals (e.g. M.O.L. Acc. Nos. 15635, 14168, 79.246/14, 25888, SM75 258/514, SM75 221/328 and SM75 221/388). Linear ornament on the seat consists of a curved and a zigzag line. The impressed X on the forepart is found on other London shoes (M.O.L. Acc. No. 25888; BM Acc. No. 1935/11-6/8; Rhodes 1981, Fig. 66, No. 631) and may represent some form of trademark. M.O.L. Acc. No. 21191 (illustrated).
119. E.R. 93. Left-foot sandal. 190 × 105mm. Adult size 4. This is a broad sandal cut straight across at the toes end, with a scallop for the big toe. It is of nailed only construction. Incomplete bottom unit consists of a middle with fragmentary sole. The deliberately cut longitudinal slit in the middle layer may be interpreted as a cut and expanded middle, examples of which are known from other excavations in London (Rhodes 1980, Fig. 66, No. 625; M.O.L. Acc. Nos. 14108, 14207 and 990). Goodfellow & Thornton (1966, 17) suggest that flexibility was the main purpose of this type of middle. Nailing pattern is of Type A, with two short rows in the forepart. M.O.L. Acc. No. 21198 (illustrated).
120. E.R. 93. Right-foot sandal. 223 × 73mm. Adult size 4. This is a standard shaped sandal with gently pointed toe. Bottom unit is complete and formed of insole, middle and sole. Usual marginal thong slits are present. Fragment of toe strap *in situ* in large double thong slot. When this sandal was examined by Ross for her M.A. thesis (1971) it appears that more substantial portions of upper were present and a construction similar to that of a sandal from Saalburg (Busch 1965, Taf. 6) was suggested. Sadly, no features remain on the sandal now to suggest such a construction. The nailing pattern is Type A with a diamond design in the forepart (see p. 59). A large nail at the inner tread of the sole appears to be a replacement. Lying slightly to the inside of centre on the insole is a single impressed line, the purpose of which is not clear. Other examples are known from London (Rhodes 1980, Fig. 66, No. 631; BM Acc. No. 1935/11-6/8) and elsewhere (Busch 1965, Taf. 6, No. 122). M.O.L. Acc. No. 21751 (illustrated).
Nos. 117–120 from the fill of Well 19 and therefore 3rd–4th century or possibly earlier.

DISCUSSION

The eleven nailed shoes, four sandals and one moccasin are of 3rd/4th-century date and all but one (116) were found in a single timber lined Well (19). The condition of the leather is poor. It had been treated with sulphonated

castor oil—an old method of conservation—and as a result it is now very brittle, its colour is extremely dark, and it has an unpleasant smell. The internal structure of some shoes whose bottom unit layers are still tightly joined by nails could not be examined for fear of damage. Shoe sizes were calculated according to the method used by Rhodes (1980, 101–102). In keeping with earlier findings (e.g. Keppie 1975, 80; Rhodes 1980, 107, 117) the sandal sizes are small, suggesting that the wearers were predominantly women or young people, whilst the heavily nailed shoes are large and indicate adult male wearers.

This small collection of late Roman footwear is of especial importance because it helps to extend the chronology of Romano-British footwear for London. It contrasts in various ways with shoes of earlier date from London (Rhodes 1980, 99–128).

NAILED SHOES

On the Queen Street shoes the central thonging was used to join an insole and separate middle together, the closed upper then being attached by means of a lasting margin. In contrast, Rhodes (*ibid.* 107) suggests that the thonging on the Billingsgate Buildings shoes served to hold a moccasin type middle in place, indicating not a closed, but an open, upper. It would also seem, in the earlier period, that shoes whose uppers were attached by a lasting margin did not tend to have a separate middle layer of central thonging (*ibid.* 109). There is a certain amount of continuity between the earlier and later nailed shoes: there is not a great deal of difference between their shapes, and there is also a continuation of the same type of nailing pattern. Ross (1971, 25) has remarked that the diamond nailing pattern occurs in the 2nd-century shoes Nos. 106, 116 and 120 confirm that the design is carried on into the 3rd/4th centuries.

Most of the nailed shoes appear to be *calcei* with the upper attached to the bottom unit by a lasting margin (Charlesworth and Thornton 1973, 150; Keppie 1975, 68) and it is interesting to note that the surviving uppers indicate different designs (see Fig. 35). The heavy nailed soles of Nos. 113B and 114 suggests that these shoes were perhaps military *caligae* (Rhodes 1980, 113).

SANDALS

The sandals provide a strong contrast to those of earlier date. The broad toe sandal (Nos. 118 and 119) is introduced in the 3rd century—it is naturally absent among the earlier Billingsgate Buildings material (Rhodes 1980, Fig. 66), where the trend is very much in favour of a narrow style of sandal with all or most of the toes marked out by scallops. Many broad toe sandals have occurred in London (e.g. M.O.L. Acc. Nos. 21191, 14122, 15637, 15635, 79.246/14) and they are also known at Zugmantel (e.g. Busch 1965, Taf. 32, Nos. 722 and 727). Two of the sandals, Nos. 117 and 120, are of a more standard shape.

There is a major constructional difference between the earlier and later sandals. Earlier sandals, as represented at the Billingsgate Buildings site, have a continuous row of marginal thong slots on the same alignment as the marginal nailing, whereas the row of thong slots on the Queen Street examples is separated from the marginal nails, discontinued at the waist and is more regularly cut. Many sandals with this latter construction are known from London (e.g. M.O.L. Acc. Nos. 990, 992, 62.107/7 and 14168) while good parallels can be found from Saalburg (Busch 1965, Taf. 6) and Zugmantel (*ibid.*, Taf. 32).

The sandals are all likely to have had an upper formed of a between-toes strap and a cross-ankle strap, as the toe thong slots and waist gap in the marginal thonging suggest. A tongue-shaped piece of leather from the Royal Exchange site in London (M.O.L. Acc. No. 1014) may provide some clue to the appearance of the between-toes strap. Goodfellow and Thornton (1966, 16) suggest that the narrow end would have been attached to the pair of thong slots on the forepart of the sandal, the broader end being affixed to a cross-ankle strap. Elaborate versions of this type of upper are known from *Vindolanda* (Metcalfe and Longmore 1975, 40 and Fig.

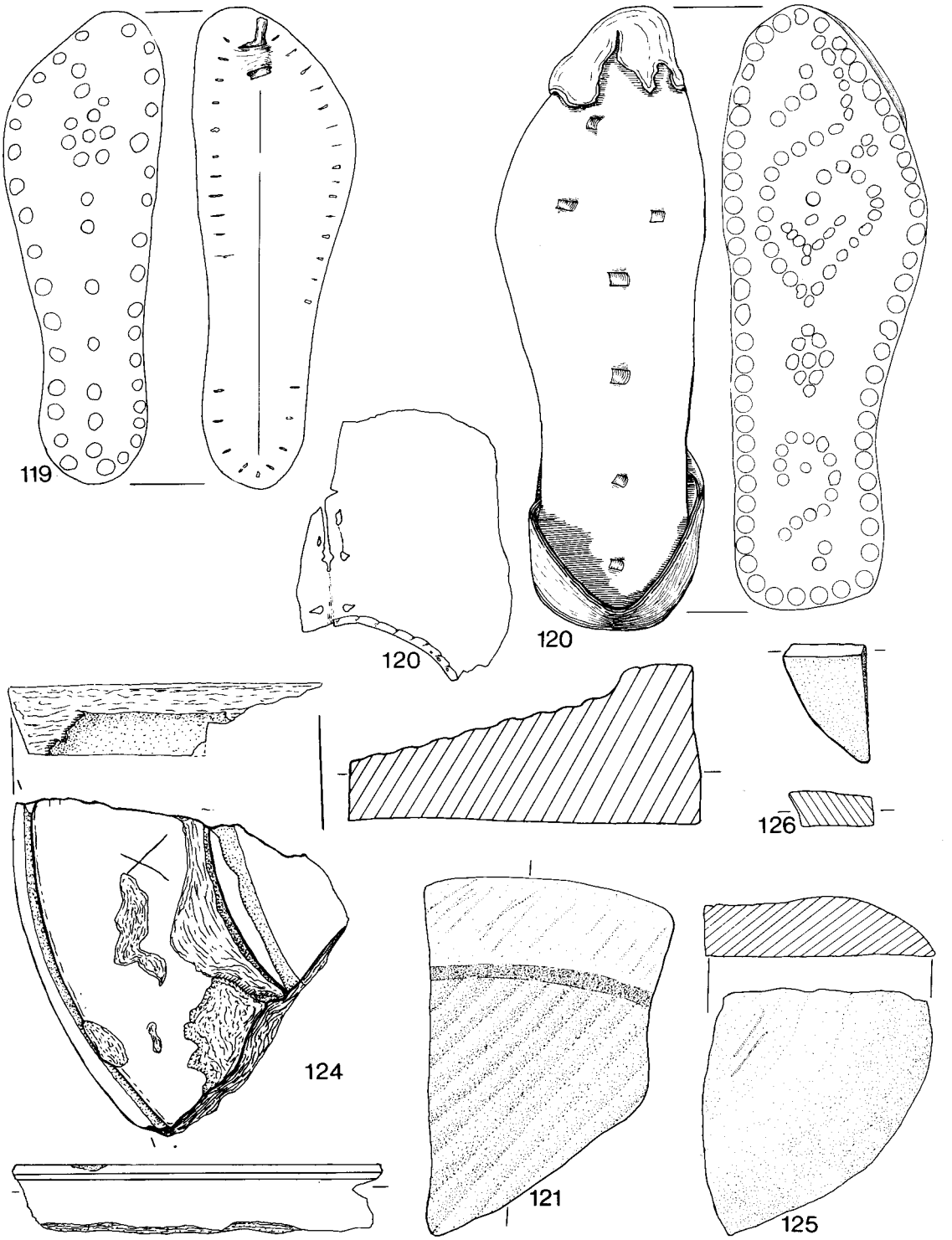

Fig. 37. Queen Street 1953 & 1960: Roman leather shoes, Nos. 119–120, and stone objects, Nos. 121–126 (1/3).

3) and from Saalburg (Busch 1965, Taf. 6, No. 122).

On both nailed shoes and sandals similar patterns of wear can be detected. Generally, the nails to the outside of the sole and those in the thread are flattish whilst those to the inside still tend to retain their conical shape. On the leather itself, the usual signs of wear at the toe-end of the sole and at the back of the heel are present in most cases.

The generally worn condition of the shoes suggests that they were cast-offs and the result of domestic dumping.

(k) STONE
(Fig. 37)

121. E.R. 626. Fragment of upper stone of a Mayen lava quern with parallel tooling on the upper and edge surfaces *cf.* Waugh and Goodburn (1972, 58) and McIlwain (1980, 132). From the fill of Well 9 and therefore second half of the 1st century or earlier. B.I.A. (illustrated).
122. E.R. 81D. Small fragment of lava, possibly from a quern. From the lower organic layer in Well 22 and therefore Flavian or earlier.
123. E.R. 109. Piece of Purbeck 'marble'. 25mm thick, smoothed flat on both sides, and broken on all edges. Probably a piece of wall cladding *cf.* Cunliffe (1971, 30). From the fill of Well 33 and therefore 3rd century or earlier.
124. E.R. 254. Fragment of table top 432mm in diameter in Kimmeridge shale. The upper surface is completely flat. The edge is 38mm thick, slopes in towards the bottom, and is decorated with two turned lines around the base. The underside is hollowed out to leave a raised rim. This rim is decorated with two turned lines towards the outer edge, and carries an 'X' graffito. The table top is not like those of one-legged side tables (Solley, 1979). It bears a close resemblance to one of similar size from Silchester. This has two mortice holes on the underside, and comes from a type of small three legged table. The legs of such tables have been found on many sites throughout Britain e.g. Frampton and Dorchester (Dorset), Caerleon (Gwent) and Rothey (Leicestershire) (Liversidge 1955, 38–47). These are often of later Roman date (*ibid.*, 46). From the fill of Well 36 and therefore 4th century or earlier. M.O.L. Acc. No. 21183 (illustrated).
125. E.R. 642. Fragment of upper stone of limestone quern, with raised edge. From the fill of Well 15 and therefore early Flavian or earlier (illustrated).
126. E.R. 81D. Fragment of hone-stone. From the Flavian dump in Well 22 and therefore Flavian or earlier (illustrated).

(i) WALL PAINTING
(Figs. 38, 39, 40 and 41).

127–164 E.R. 118 (Well 31). Most of the plaster from this context appears to have been from one wall. The material was preserved as part of a redeposited mass of fire debris, and included 13 fragments which were burnt entirely grey. The plaster was originally applied to daub walls. Fragments of daub with clear wattle or keying traces adhere to the back of it. The plaster was applied in three layers. The first was *c.*15mm thick; the second 5mm thick. Both layers were of the same quality, sandy, with large pebbles. The final layer, to which the paint was applied was a thin skin of fine white plaster 1mm thick.
The wall was divided into two panels by a white stripe 8mm wide, which appeared on eight fragments (5 illustrated; Nos. 129, 131, 132, 133 and 136). The backgrounds to the panels were in red (7.5 4/8) and black (N4).

RED PANEL
This panel (Nos. 141–158) was decorated with vertical white stems, which featured three long leaves at intervals (Nos. 148, 149 and 150). From these spring stems terminating in trefoils, which are foliated with trefoils in green (7.5 GY 5/2) paint (Nos. 146, 149, 151, 152 and 153). One set of long leaves is enclosed by a circle (No. 147). The blue (7.5B 5/2) compartment encircled by a double white line (No. 150) represents the top of a candelabrum motif, and the white projections on the outer circle on this fragment are the candles. The whole length of the vertical stem is shadowed to the left in black (Nos. 145–157). The lower part of this panel shades into grey, which is a result of fire damage. The only surviving piece of decoration on this burnt area was a curving garland of white leaves on a black band (Nos. 143 and 144).

BLACK PANEL
This panel is more completely preserved than the red (Nos. 127–138, 140). At least two, possibly three, candelabra are represented by the elliptical dark buff-brown (5YR 5/2) top plates, edged in slate blue (7.5B 7/2) with white projecting lights (Nos. 132, 134). These appear to have been included in an overall decoration of vertical and curvilinear foliage in white and green (Nos. 127–140). The long leaves on the stems of the candelabra of the red panel are repeated on the black (No. 138) as in the trefoil green leaf on the white trefoil stem-terminal (No. 139). A berry, shaded in dark green (2.5G 3/4) was also a feature of this design (No. 126). A bird is shown perching on, and surrounded by, the basic green and white foliage design (No. 138; Marsden 1980, 151). The bird is shaded in white and grey, with a slate blue tail.
The two panels are variations on the candelabrum design, a conventional motif in Roman wall decoration, based on free standing candelabra. The best

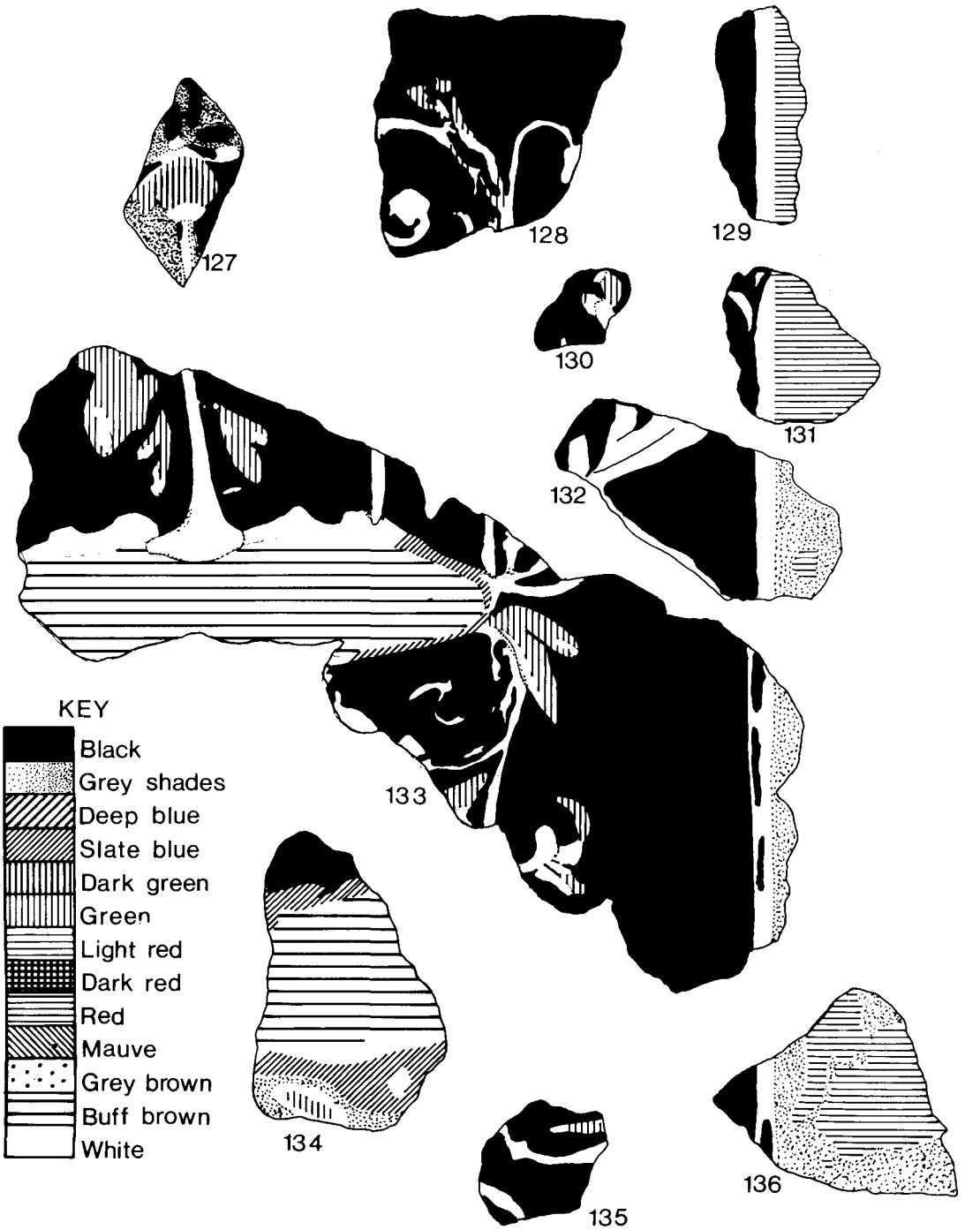

Fig. 38. Queen Street 1953 & 1960: Roman wall decoration, Nos. 127–136 (1/2).

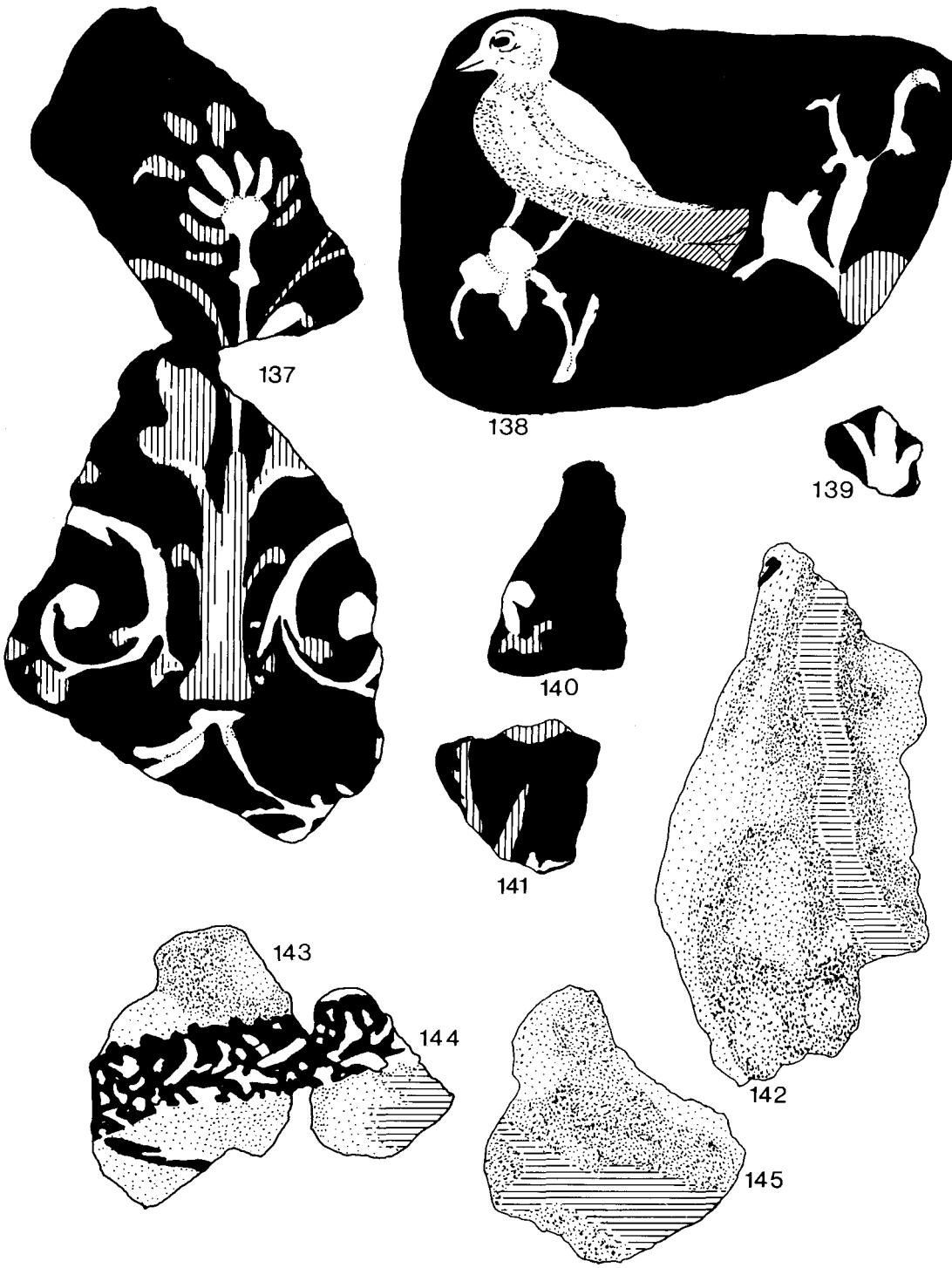

Fig. 39. Queen Street 1953 & 1960: Roman wall decoration, Nos. 137–145 (1/2).

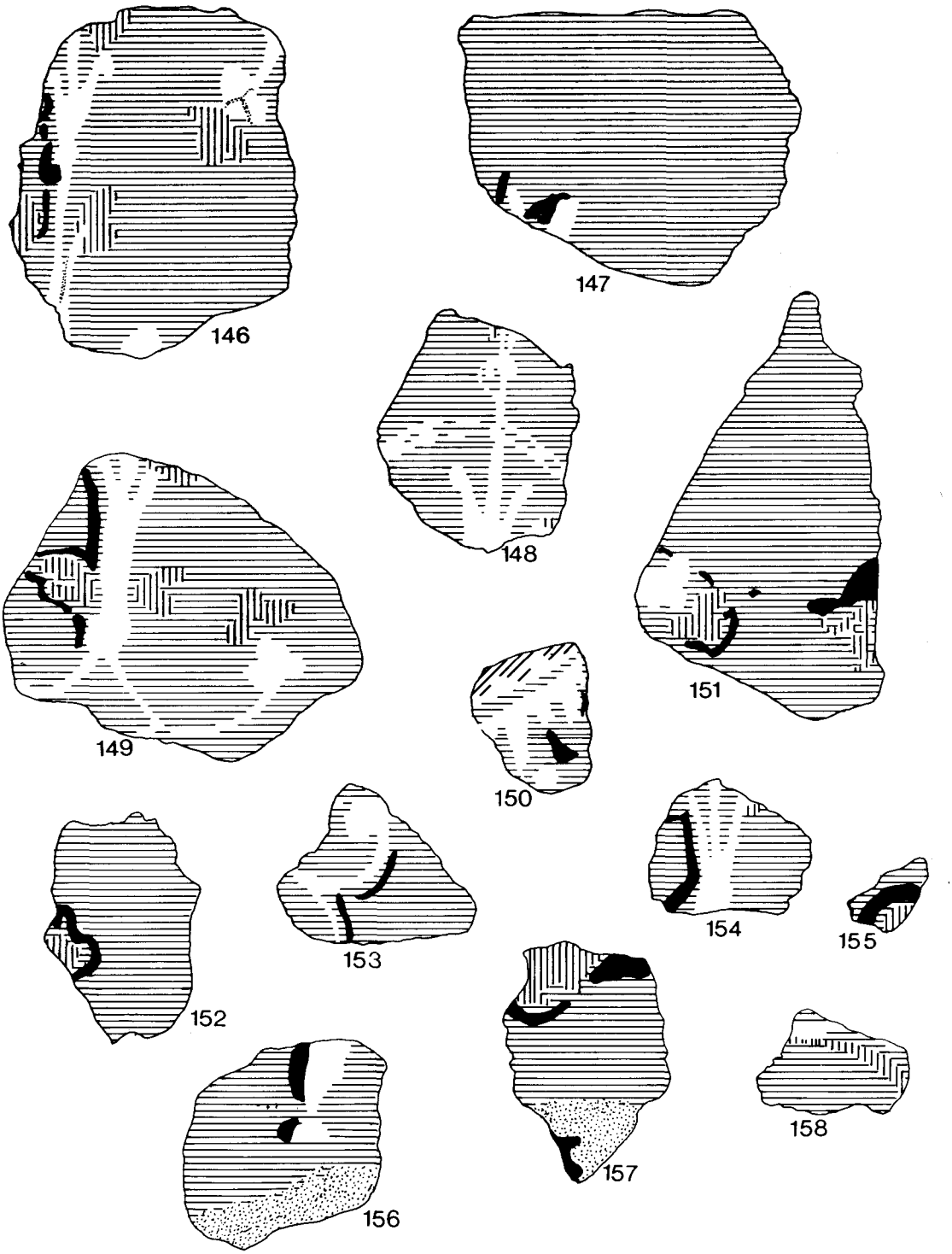

Fig. 40. Queen Street 1953 & 1960: Roman wall decoration, Nos. 146–158 (1/2).

British example of this is the 2nd-century plaster from *Verulamium* (Liversidge 1971, Pl. XXVII). It occurs among the 2nd-century plaster from Angel Court, Walbrook, in London, as do the three long leaves on the candelabra stems, and the berry on the black panel (Liversidge 1977, 543–8). The candelabra share some features with foliate strips used as panel dividers in paintings at the Ickleton and Lockleys villas. At Darenth these strips are shaded to one side, much like the red panel candelabrum stems (Liversidge 1969, 142–143). The garland pattern on the burnt part of the red panel occurs in villas at Darenth and Witcombe. It also occurs in London in 2nd-century groups at Huggin Hill (Marsden 1976, 5a). Custom House (Henig 1974, 187), and St. Swithins House, Walbrook. Interestingly in the present context, these garlands appear in swags separating candelabra in the 2nd-century *Verulamium* material, and also at Winchester (Liversidge 1971, 90, Pl. XXVIII). The bird on the black panel is of considerable interest. The 2nd-century Red Wall at *Verulamium* (Liversidge 1971) featured isolated birds on perches in the centre of panels flanked by candelabra.

The bird from Queen Street, however, is not isolated, but is included in the foliage which also appears to have formed the candelabra decoration. It must be concluded that this may be part of an inhabited scroll, similar to that in an elaborate frieze of 2nd-century date from *Verulamium*, Insula XXI (Liversidge 1971, 89, Pls. XXX–XXXII).

Four plaster fragments (Nos. 160–164) may have been figured. Only one (No. 162) has not been heavily burnt, and this may represent drapery. It is possible that these were parts of central figures in the panels described above. Colours: Grey-brown (10 YR 6/Z), dark red (7.5R 3/2), light red (5R 6/4).

The plaster was recovered from the dump of burnt material in the fill of 31. This material may have been burnt in the Hadrianic fire of London, and is dated to the Trajanic period or earlier. M.O.L. Acc. Nos. 21481 (No. 132) 21480, 21482 (No. 137), 21232 (No. 138), 21483 (No. 146), 21485 (No. 149) (illustrated).

165. E.R. 93B. 1 fragment, grey, red and mauve (5R 612). This 3rd–4th-century fragment is of a markedly different construction from the 2nd-century material (Nos. 127–164). A plaster skin 2mm thick was applied directly to a dark wall. From the fill of Well 19 and therefore 3rd–4th century or possibly earlier (illustrated).

(m) CERAMIC BUILDING MATERIAL (Fig. 41)

A very small quantity of this material was retained: tegulae, imbrices, and burnt daub were attested in all periods.

166. E.R. 80. Roller stamped box-flue tile in red fabric. Broadly similar to Lowther (1948) type 5 (illustrated). From the fill of Well 20 and therefore Antonine or earlier.
167. E.R. 80. Fragment of burnt daub with well defined wattle impressions. Provenance and date as 166 (illustrated).
168–169. E.R. 626. Fragments of burnt daub with well defined wattle impressions. From the fill of Well 9 and therefore 1st century (illustrated).

2. MEDIEVAL AND POST-MEDIEVAL

(a) POTTERY

From notes and identifications by Alan Vince. (Figs. 43 and 44)

A general explanation of the criteria employed in the analysis of medieval and post-medieval pottery can be found in the introduction to the pottery reports. The pottery is the main dating evidence for the post-Roman period. Dating and the constituents of groups are tabulated in Fig. 42.

Saxon Shelly I (Rhodes 1980a, 140)

E.R. 545, (unstratified) Sherds of sagging base bowl and cooking pot.

Early Medieval Sandyware (Orton and Miller forthcoming)

170. E.R. 112 (Pit 62). Handmade spouted pitcher. The rim and body are 45% complete, and the spout survives. Decorated with incised lattice and applied thumbed strips. Rim also has thumbed impressions. M.O.L. Acc. No. 18244 (illustrated).

E.R. 115 (Pit 58). Wheel-thrown cooking pot, heavily sooted on outside. *cf.* Thorn (1975, Fig. 21, 368).

South Herts Grey Ware (Orton 1977b, 80)

E.R. 115 (Pit 58). Handle (Orton 1977b, No. 554) and body sherds of jug.

London Type Slip Jug (Orton and Miller forthcoming)

171. E.R. 115 (Pit 58) Watering bottle lacking neck and rim. Entirely glazed in blue-green on the outside. Base pierced with nine holes in a lozenge pattern. M.O.L. Acc. No. 21176 (illustrated).
172. E.R. 111 (Pit 49). Complete handled baluster jug partly green glazed on outside. M.O.L. Acc. No. 78.170 (illustrated).

Splashglazed Ware (Orton and Miller forthcoming)

173. E.R. 115 (Pit 58) Baking tray, probably sub-rectangular or oval in original shape. Very heavily sooted inside and out (illustrated).

Kingston Ware (Orton 1977, 82)

174. E.R. 586 (Well 3) Decorated body sherd with all-over green glaze (illustrated).
175. E.R. 586 (Well 3) Mask-spout from face-mask jug. B.I.A. (illustrated).

Also from E.R. 586 (Well 3) a decorated body sherd

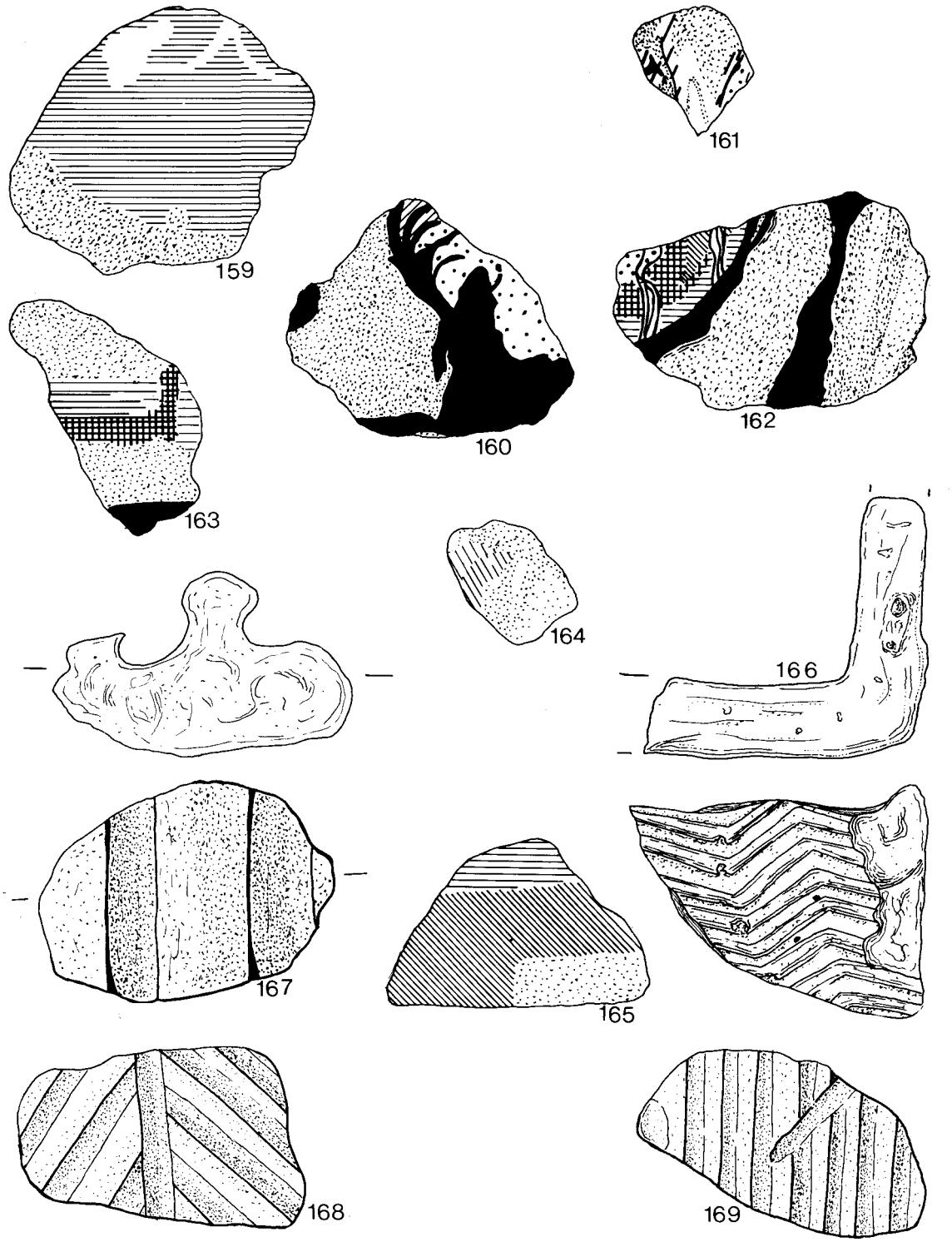

Fig. 41. Queen Street 1953 & 1960: Roman wall decoration, Nos. 159–165; flue tile, No. 166; and daub, Nos. 167–169 (1/2).

Fabric type/source	*E.R. 595*	*E.R. 112*	*E.R. 115*	*E.R. 586*	*E.R. 121*	*E.R. 643*	*E.R. 111*	*E.R. 82*	*E.R. 92B*	*E.R. 120*	*E.R. 103*	*E.R. 122*	*E.R. 606*	*E.R. 605*	*Unstrat.*
Saxon Shelly I	X														
Early medieval sandyware		170													
S. Herts greyware			X												
London slipware			171			X	172								
Splashglazed ware			173												
West Kent ware				X				X							
Kingston ware				174, 175		X									
Glazed cooking pot					176										
Normandy fineware								X							
Coarse border ware							X	X							
Dutch earthenware									177						
Guys ware										X					
Frechen stoneware										X	178, 179				
Tudor brownware										180					
Border ware										181		182			183
Post-med fine red ware										X					
Post-med. red ware										X					
Post-med. coarse red ware												X	X		
Tin-glazed ware												X			184
Westerwald stoneware												X			
Chinese porcelain												X			
Black-gazed red ware												X			
Red border ware												X			
Salt-glazed ware														185	
Date of groups	Unstrat.	12th cent.	Late 12th–13th cent.	Late 13th–14th cent.	13th cent.	13th cent.	13th–14th cent.	Late 14th cent.	15th cent.	Early 17th cent.	17th cent.	Late 17th–18th cent.	Post-Med.	Early 18th cent.	Unstrat.

Fig. 42. Queen Street 1953 & 1960: Summary table of medieval and post-medieval pottery.

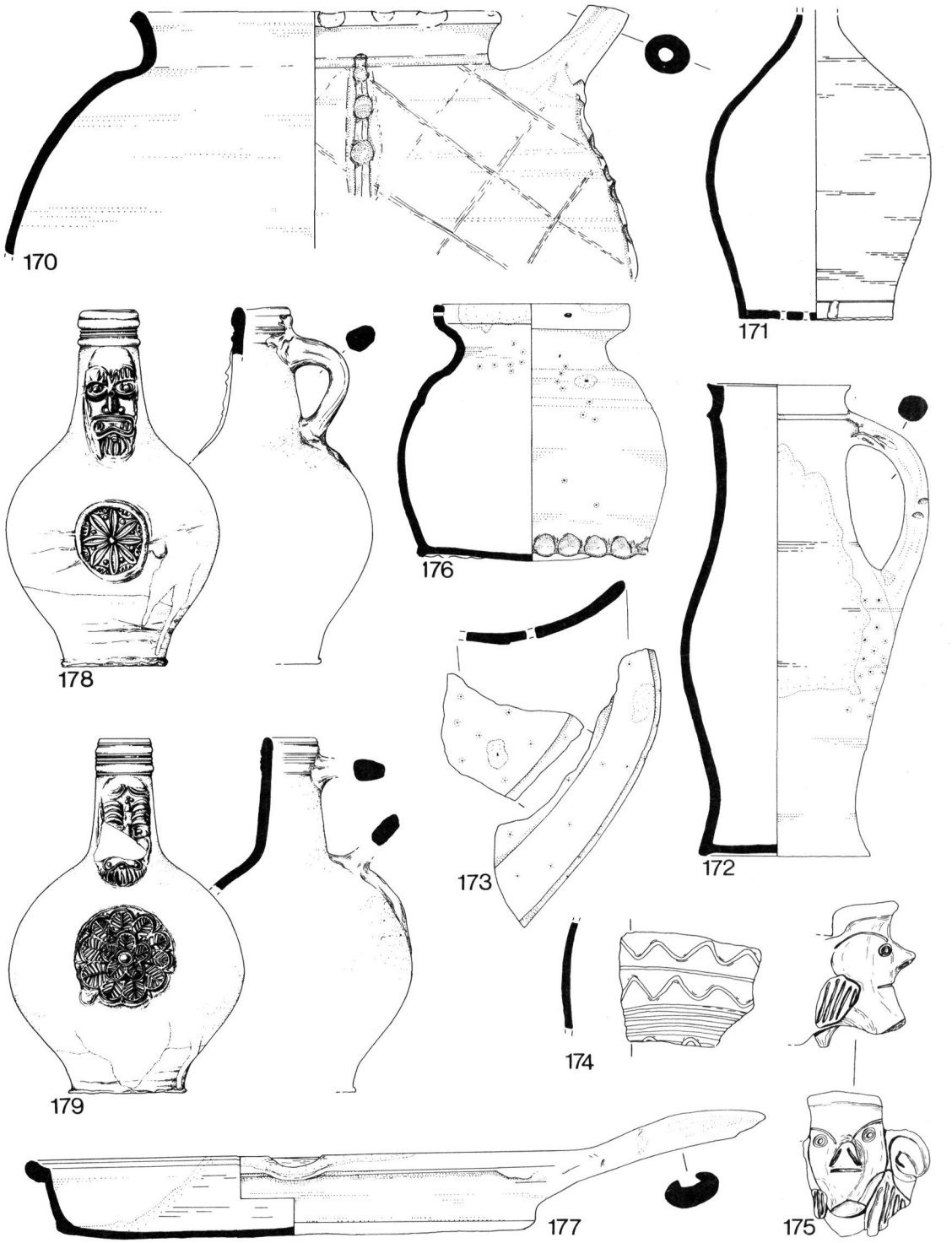

Fig. 43. Queen Street 1953 & 1960: Medieval pottery, Nos. 170–176; and post-medieval pottery, Nos. 177–179 (1/4).

where clear green glaze covers applied strips of white and dark red clay (*cf.* Orton 1979b, 30) and rim and neck of a baluster jug similar to M.O.L. Acc. No. 22775.

Glazed Cooking Pot

176. E.R. 121 (Pit 53) Complete cooking pot. Hard fabric with irregular fracture and smooth feel. Inclusions are moderate, very coarse, ill-sorted angular flint, and medium sub-angular quartz. Cream or off-white fabric (10 YR 8/1), wheel-thrown. Green glaze was applied to the inside rim. Holes, possibly for suspension, were made in the rim, and the vessel was heavily sooted on the outside. M.O.L. Acc. No. 21175 (illustrated).

Coarse Border Ware (a light sand-tempered fabric from the Farnham region of the Surrey/Hants border)
E.R. 92B (Well 44) Cooking pot, slightly sooted. Paralleled by M.O.L. Acc. No. 18402.
E.R. 92B (Well 44) Bowl with flat horizontal rim. (Orton and Pearce forthcoming, No. 16).

Post-Medieval Dutch Earthenware (Orton and Pearce forthcoming)

177. E.R. 92B (Well 44) Skillet with handle and pouring lip, red-brown glaze on inside base (illustrated).

Frechen Stoneware (Orton and Pearce forthcoming)

178–179. E.R. 103 (Pit 54) Complete Bellarmine jugs, 179 without handle and heavily burnt. M.O.L. Acc. Nos. 22176, 22177 (illustrated).

Tudor Brownware (Turner 1971, 105)

180. E.R. 120 (Well 55) Cooking pot, glazed inside in brown, and slightly sooted (illustrated).
Also from this context cooking pot *cf.* Orton and Miller (forthcoming, No. 312).

Border Ware (Holling 1971)

181. E.R. 120 (Well 55) Pipkin of Holling form E2b (illustrated).

182. E.R. 122 (Pit 48) Bowl, green glazed on inside, rim and upper surfaces (illustrated).

183. E.R. 578 (unstratified) Skillet (illustrated).

Tin-glazed Ware (Orton and Pearce forthcoming)

184. E.R. 599 (unstratified) Plate with *Wan-Li* decoration in blue on white showing a bird on a rock in a border of imitated Chinese characters. Early 17th-century product of Pickleherring Quay potteries (Noël-Hume 1977, 40). (illustrated).
E.R. 122 (Pit 48) Drug-jar base (Orton and Miller forthcoming, 302) and rim (Orton and Pearce forthcoming, No. 302).

Post-Medieval Fine Red Ware (Orton and Pearce forthcoming)
E.R. 120 (Well 55) Cooking pot (Orton and Pearce forthcoming, No. 112).

Post-Medieval Coarse Red Ware (Orton and Pearce forthcoming)
E.R. 605 (Well 12) Almost complete fire cover (Orton and Pearce forthcoming, No. 214). Bowl (Orton and Pearce forthcoming, No. 77).

Westerwald Stoneware (Orton and Pearce forthcoming)
E.R. 605 (Well 12) Body sherd of bottle decorated with cobalt and manganese.

Black Glazed Red-Ware (Orton and Pearce forthcoming)
E.R. 605 (Well 12) Cup handle.

Staffs Saltglazed White Ware (Orton and Pearce forthcoming)

185. E.R. 605 (Well 12) Small dish with foot (illustrated).

(b) OTHER FINDS

1. MEDIEVAL

(i) WOOD
(Fig. 45)

Barrels were found lining several wells. They were recorded on site as follows, and have not survived for further examination. Wood was identified by Mr N. Cook.

186. E.R. 92B. Barrel 970mm in head diameter and 1.37m high. The barrel comprised 19 staves and was bound with willow (Pl.11)

187. E.R. 92B. Barrel 940mm in head diameter and 1.07m high. Comprised 26 staves, bound with willow (Pl. 12).
Nos. 186 and 187 lined Well 44, and these were dated to the 15th century or earlier.

188. E.R. 586. Barrel, 760mm in head diameter, made of staves retained about the middle with a split wood bond. The barrel-lined Well 2 and was thus dated to the late 13th–14th century or earlier.

189. E.R. 606. Barrel 1.39m in head diameter. The barrel line Well 10 and was therefore post-medieval in date.

190. E.R. 643. Barrel 610mm in head diameter. The barrel lined Well 11, and was therefore 13th century or earlier.

The following wooden objects from group E.R. 92 were all conserved in alum, making wood identification difficult. They were however submitted to Vannessa Straker, who attempted species identification. Her comments are included below.

191. E.R. 92. Chamfered disc of unidentified hardwood. Probably a barrel bung, and possibly from one of the barrels (Nos. 187 and 188) lining the well (illustrated).

192. E.R. 92. Rounded top of object in wood, bored with two holes, one of which is broken across. Possibly part of a roof shingle (illustrated).

193. E.R. 92. Lathe-turned pedestal dish in unidentified hardwood. M.O.L. Acc. No. 21164 (illustrated).
Nos. 191–193 from the fill of Well 44 and therefore not later than the 15th century.

(ii) LEATHER
(Fig. 45)

194. E.R. 116. Complete shoe in such poor condition that any attempt at close examination would cause serious damage. The shoe is a left ankle boot of turnshoe construction (Thomas 1980, 8). The quarters are in one piece, notched at the back, and have been stitched to the vamp with a butt seam. Though no fastening survived, it appears that two wings on the

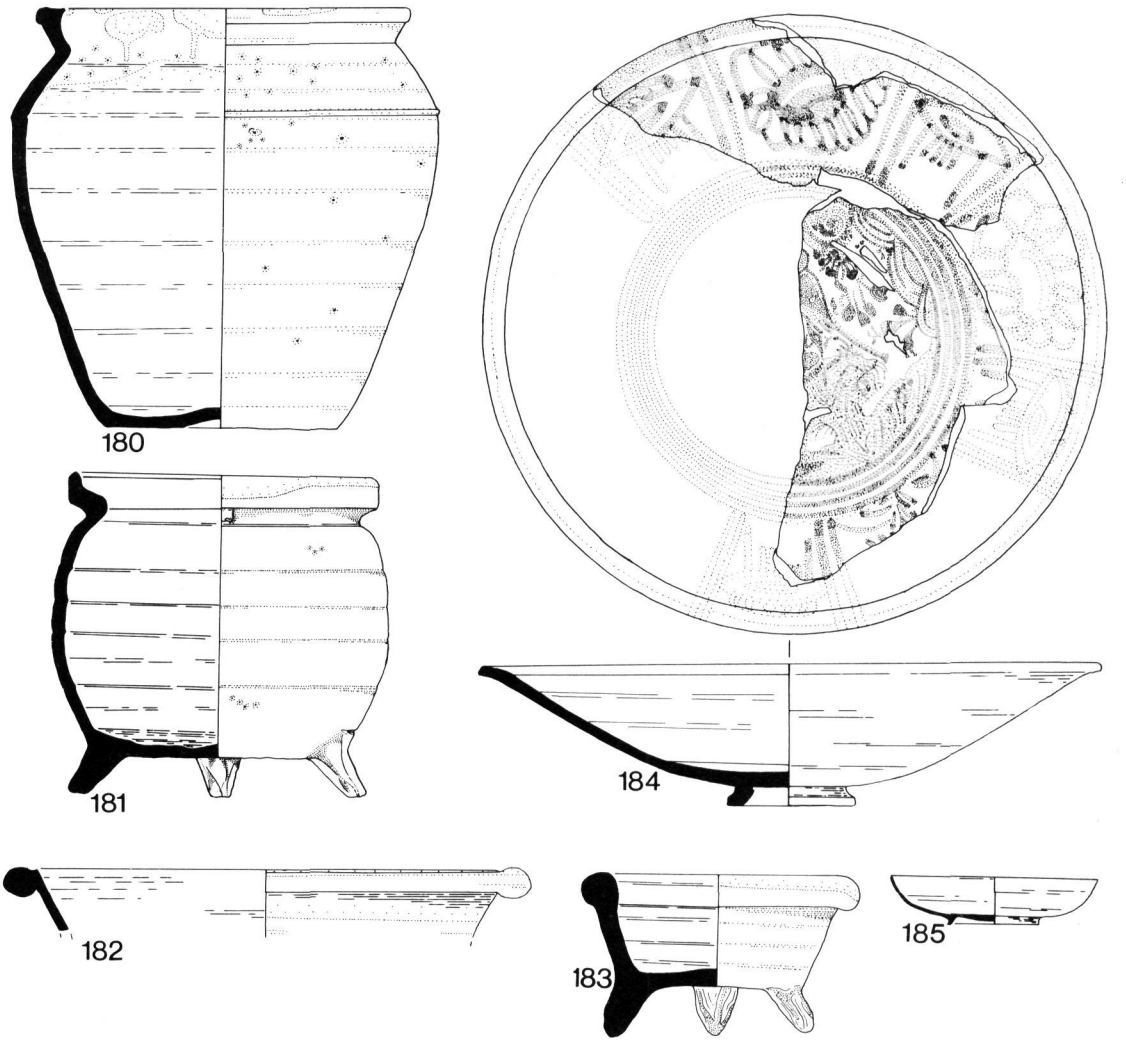

Fig. 44. Queen Street 1953 & 1960: Post-medieval pottery, Nos. 180–185 (1/4).

vamp folded over a central tongue, and were tied in position. The tongue was decorated with a series of punched circles within two incised lines. The shoe was from the fill of Pit 57 and therefore 12th century or earlier. M.O.L. Acc. No. 21749 (illustrated).

(iii) TEXTILE
by Frances Pritchard.

195. E.R. 92c. One fragment measuring *c.* 95 × 85mm with four curved edges, cut slightly across the grain of the fabric. Wool, (?) warp; fine, generalised medium, unpigmented; (?) weft: fine, unpigmented (Fig. 46). Spinning: Z, hard spun, combed yarn in one system, (?warp); S, fluffier, carded yarn in the other, (?weft). Weave: Plain, close and even. Count: 12/11 threads per 10mm. Finishing: Fulled and napped and shorn on both faces, obscuring weave. From the fill of Well 44 and therefore not later than the 15th century. This example displays certain characteristics of 14th-century woven cloth in that it exhibits a combination of carefully prepared combed and carded wool for the warp and weft, the use of mixed spinning, plain (tabby) weave and the typical finishing processes of the period associated with the manufacture of broadcloth (Carus-Wilson 1952, 379–381). The close uniformity in thread count between the piece described here and many other

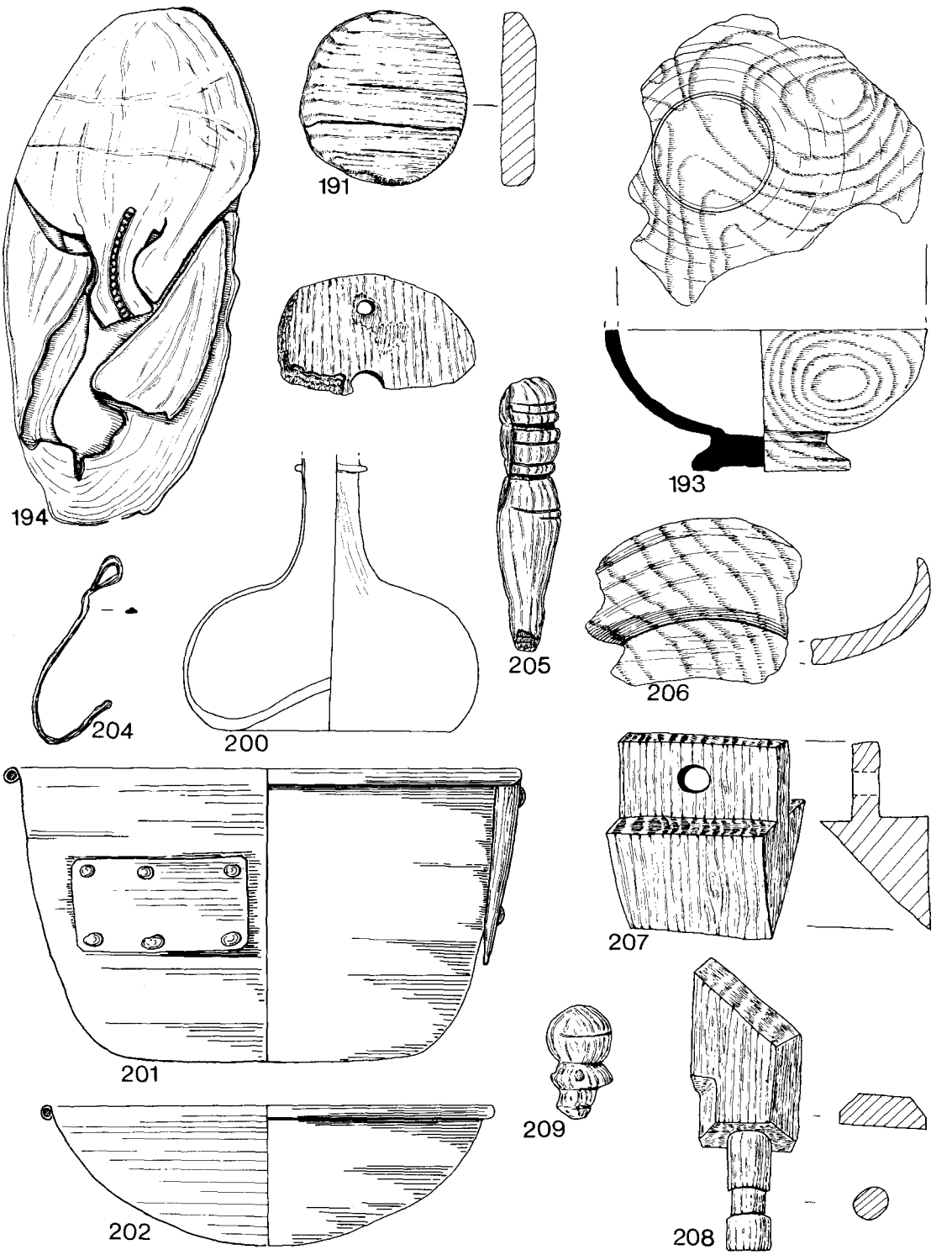

Fig. 45. Queen Street 1953 & 1960: Medieval objects of leather, No. 194; and wood, Nos. 191–193. Post medieval objects of glass, No. 200; copper alloy, Nos. 201–202; lead, No. 204; and wood, Nos. 205–209 (1/3).

System	*Fibre diameter range*	*Mode*	*Mean*	*Standard deviation*	*Standard error of mean*
?warp (Z)	14–38	25	23.58	4.66	0.47
?weft (S)	12–34, 40	22	21.47	4.93	0.49

Diameter distribution	*Natural pigmentation*	*Fleece type*
Symmetrical	—	Fine, generalised medium
Symmetrical	—	Fine

* Fibre diameter measurements were carried out on 100 fibres from the warp and weft separately using a Stogate Censor Micrometer and Automatic Data Logger at a magnification of ×100.

Fig. 46. Queen Street 1953 & 1960: Medieval textile, summary of wool fibre measurements. Measurements in microns (1 = 0.001mm).

fragments of this date found in London (Crowfoot unpublished; Pritchard forthcoming) and elsewhere in England (e.g. Crowfoot 1975, Nos. T16, T18) provides evidence that the statutory regulations governing the width of finished cloth were observed by many professional weavers. The quality and type of cloth suggests that it would have been dyed a single hue.

The fragment itself would appear to be a piece of waste material as each edge is cut and no stitches or stitch holes are present, thus reflecting the fashion for tight fitting garments which came into vogue from the early 1340s, and which necessitated a much greater quantity of fabric to be cut (Newton 1980, 3). Its lone occurrence, however, makes it unlikely that the waste fragment came from a tailor's workshop in the immediate vicinity.

(iv) CERAMIC BUILDING MATERIALS
From notes and identifications by Alan Vince)

Several *Medieval Peg Tiles* (Vince forthcoming) were retained. Floor tiles included the following.

196. E.R. 82. Penn Tile *cf.* Hohler (1942), 66. From the fill of Well 51 and therefore no later than the late 14th century.
197. E.R. 120. Penn Tile *cf.* Hohler (1942), 73. Residual in the fill of Well 55.
198. E.R. 606. A group of 7 floor tiles measuring 115mm square and 29mm thick. The tiles are moulded, with a bevelled edge and are sanded on the bottom. There are nail holes in all 4 corners. The fabric is hard, with hackly fracture and rough feel. There are abundant inclusions of sub-angular quartz, sparse limestone and iron ore, all medium sized; and sparse fine mica. The upper surface was treated with a quartz-sand tempered white slip 1mm thick, and glazed with clear, yellow glaze (2.5Y 914).
199. E.R. 606. A group of 10 floor tiles 115mm square and 22mm thick. The manufacture of these tiles is identical to No. 189, and the fabric is similar with the addition of a moderate inclusion of very coarse (10mm) sub-angular clay pellets. The upper surface was glazed with clear green-brown glaze (5Y 3/2). Nos. 189 and 190 were found in the same deposit, and may have been from the same floor. Though the fabric appears to be of English origin, the nailed corners are a Flemish technique.

The tiles were from the fill of Well 10, which also contained a little post-medieval pottery. They may therefore have been the result of a post-medieval demolition.

11. POST MEDIEVAL

(i) GLASS
(Fig. 45)

200. E.R. 585. Small wine bottle in good condition, made of dark green, almost black, glass. The neck is slightly fluted due to an accident of manufacture. Similar to a bottle from Cannon Street, dated *c.* 1700–30 (Orton 1979c, 34) Unstratified (illustrated).

(ii) COPPER ALLOY
(Fig. 45)

201. E.R. 120A. Brass pan. Lathe marks are clearly defined on the base, and the vessel appears to have been spun. The beaded rim was made by hammering the edge over and round a length of thick iron wire. An iron handle-escutcheon was attached to the vessel by means of 3 brass-headed iron rivets, the heads of which were hammered flat against the inside of the bowl. The pan was heavily smoke-blackened and had cracked on one side. The crack was repaired by rivetting a thin sheet of brass to the inside of the

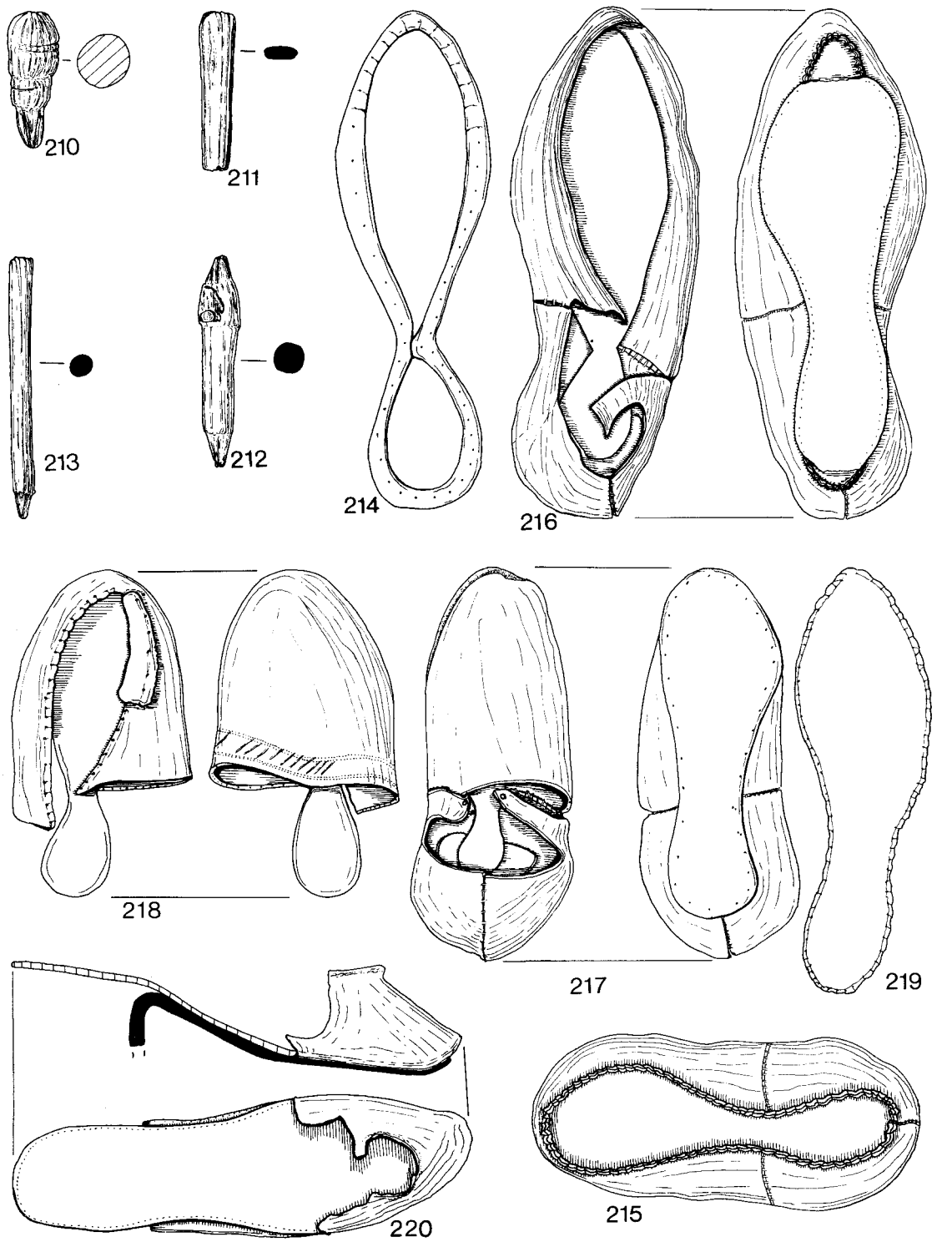

Fig. 47. Queen Street 1953 & 1960: Post-medieval wooden objects, Nos. 210–213, and leather shoes, Nos. 214–220 (1/3).

pan with brass rivets hammered flush against the inside and outside surfaces of the pan (illustrated).

202. E.R. 120. Brass dish made in the same way as No. 201. Traces of lathe working are more pronounced on this vessel, and the centre mark pierced the base (illustrated).
Vessels 201 and 202 were found together in the same context. They were also of identical manufacture. This might indicate that they formed part of a set of domestic vessels. They were both recovered from the fill of Well 55, and thus date to the early 17th century or before.
203. E.R. 120. Brass dressmakers type pins. From the fill of Well 55 and thus not later than early 17th century. M.O.L. Acc. No. 21504.

(iii) LEAD
(Fig. 45)

204. E.R. 122. Strip of window lead 160mm in length. From the fill of Pit 48 and therefore late 17th–18th century or earlier (illustrated).

(iv) WOOD
(Figs. 45, 47)

The following wooden objects were submitted to Vanessa Straker for species identification. Like the Roman and medieval wood this material was conserved with alum, and was therefore difficult to identify. All of these objects were from the fill of Well 55 and therefore early 17th century at the latest.

205. E.R. 120. Terminal in an unidentified hardwood, with turning marks in the head (illustrated).
206. E.R. 120. Fragment of shallow bowl, originally approx 200mm in diameter. Lathe turned in an unidentified hardwood. M.O.L. Acc. No. 21503 (illustrated).
207. E.R. 120. Object of triangular section with projecting bored tenon. A support or part of a pegged joint in hardwood, possibly oak or elm. M.O.L. Acc. No. 21476 (illustrated).
208. E.R. 120. Curved and chamfered piece of hardwood, rectangular in section with a lathe-turned projection. Possibly decoration for a piece of furniture. M.O.L. Acc. No. 21474 (illustrated).
209. E.R. 120. Turned bulbous terminal in a hardwood. M.O.L. Acc. No. 21502 (illustrated).
210. E.R. 120. Knife-worked bulbous bung in a hardwood (not oak), whittled to fit into the neck of a container.
211. E.R. 120. Knife-worked bung in hardwood. Sharpened at one end with a bulbous head (illustrated).
212. E.R. 120. Knife sharpened peg in ash (Fraxinus sp.) (illustrated).
213. E.R. 120. Fragment of oak peg of rectangular section (illustrated).

(v) LEATHER
(Fig. 47)

214–218. E.R. 120. Well 55 contained a group of five shoes in varying states of preservation. Though both adults' (Nos. 214, 216) and children's (Nos. 215, 217 and 218) shoes were present all were of the same construction. Vamps were made in one piece, and the quarters in two, with a back seam. The vamp was attached to the quarters by means of a butt-seam. A heel stiffener was inserted in the back. Each of the two halves of the quarters were fitted with latchet ties, which fastened over the instep. The insoles were very narrow at the waist, and had welt sewing-channels of edge-flesh seam-holes around them (No. 214) (Thornton 1973, 44). After the upper, welt and insole had been stitched together (Nos. 217, 218), the sole was stitched onto the bottom. Construction was identical to that of a shoe from St. Neots (Thornton 1974, Fig. 44). The shoes are of a flat soled brogue type (Barton 1969, 187). The style is consistent with the date of well 55 and is typical of *c.* 1600–1620 (Jafvert 1938, Pl. 2 A-C; Northampton Museum 1975, Pl. 8; Wilson 1969, 129). M.O.L. Acc. Nos. 21512, 21506, 21507, 21515, 21508 (illustrated).
219. E.R. 606A. Narrow waisted insole of welted shoe. From the fill of Well 10 and therefore early 18th century or earlier (illustrated).
220. E.R. 122. Insole, toe cap, and sole of high-heeled shoe. From the fill of Pit 48 and therefore not later than the early 18th century (illustrated).

(vi) PIPE CLAY

221. E.R. 122. Groups of pipes including one stem and five bowl sherds with Atkinson and Oswald (1969) types in the following quantities: type 15:2, type 17:2, type 20:6, type 22:19. The group is dated *c.* 1680–1720, which is consistent with the pottery date of the fill of Pit 48.
222. E.R. 602A. Interesting pair of pipes with moulded masonic devices on the bowl, and the stamped initials G.B. on the spur. The stamp is that of George Benson who made masonic pipes in Pentonville 1802–1820 (Atkinson and Oswald 1969, 200, 217). Unstratified.

REPORT ON THE MAMMALIAN REMAINS FROM TWO ROMAN WELLS QUEEN STREET 1954, LONDON (E.R. 81 and E.R. 254)

by Philip L. Armitage and Barbara A. West

(1) Human skull from E.R. 81. (Well 22) 1st/2nd century AD.

223. The human skull is complete except for the mandible, zygomatic arches and fragments of the right frontal, parietal and temporal bones. Using the methods listed by Marsh and West (1981, 90) the

skull is identified as a mesocephalic male, approximately 35 to 45 years old, in poor dental health, with considerable calculus (resulting in resorption of the alveolar bone) and hypoplasia (suggesting dietary deficiencies). In addition, several anomalies are present, such as: a rotated and underdeveloped right second premolar, unequal attrition on the left first molar, and the congenital absence of both second molars and the right third molar (confirmed by X-radiography). Post-mortem damage: at some time after the skull was deposited, a rectangular wooden stake penetrated the right parietal area (see p. 9).

(2) Animal skulls from E.R. 254. (Well 36) 3rd/4th century AD

224. Horse *Equus* (domestic)

The skull is complete except for the nasal bones and occipital region. The base of the skull has the appearance of having been chopped through obliquely just below the nuchal crest, resulting in the removal of both occipital condyles, the basilar part of the occipital bone and the paramastoid processes. The jagged edges suggest that the implement used was somewhat blunt; a well-sharpened butcher's axe or cleaver would have penetrated clean through the bone.

Dentition: Apart from a broken fragment of the left first incisor, all the incisor teeth are missing. Closure of the alveolus of the right third incisor indicates that this tooth was lost *ante mortem*. The remaining incisors, together with the right third premolar, left second premolar and left third molar, were all lost *post mortem*, possibly during excavation of the specimen. There is evidence that one other tooth, the right second premolar, was also lost *ante-mortem*.

Sex: The absence of canine teeth indicates that the skull is female: the canine is fully developed only in the male (Scott and Bray-Symons 1964, 380).

Age: Comparison with the series of horse and pony skulls of known age in the collections of the British Museum (Natural History) revealed that the animal from the Queen Street site was at least 32 years of age at the time of death, and may have been considerably older than this: the occlusal (biting) surfaces of the surviving cheekteeth (right P^4, M^1, M^2, M^3 and left P^3, P^4, M^1, M^2) are much worn. The great age of this horse is also suggested by the presence of severe periodontal disease which has resulted in exposure of the roots (recession of the alveolar bone) of the premolar teeth on both sides of the face, and was probably the cause of the shedding of the right second premolar (see Baker and Brothwell 1980, 153).

Size: Although incomplete, the surviving portion of the skull is sufficiently intact to allow measurement. These measurements, which were taken according to the method of von den Driesch (1976) are given in Fig. 48. The Queen Street skull is much larger and more robust than the other horse skulls from Roman London that we have come across so far, and this at first led us to believe that we were possibly dealing with a mule rather than a horse. However, using the criteria for distinguishing between the skulls of horses and mules found in the works of Chauveau (1879) and Osborn (1912) and by comparison with modern horses and the two mules (BM(NH) Reg. Nos. 1888.12.3.1 and 1980.414) held in the collections of the BM(NH), the London skull is identified as horse. Furthermore, reference made to the descriptions of the horse and pony skulls from the Roman fort at Newstead, Melrose, published by Ewart (1907) showed that the London skull falls within the size range of Romano-British horses (profile length: 494 to 582mm).

225. Red deer *Cervus elaphus*

The skull, identified as an adult female Red deer, is incomplete with the facial portion (splanchnocranium) missing (broken in antiquity) and the occipital region broken. Although the occipital condyles were probably removed artificially (possibly when the head was severed from the body) there is no clear evidence of chopping, and the jagged edges around the foramen magnum suggest that the

Point of measurement		*Designation as in von den Driesch (1976, 19–23)*	*Value*
Profile length		1	550.0
Basifacial axis		6	376.0
Neurocranial length		9	183.8
Facial length		10	378.9
Median palatal length		18	270.8
Length of diastema		21	111.2
Length of cheektooth row (right side)		22	160.9
Length of molar row (right side)		23	73.3
Length of premolar row (right side)		24	89.0
Max. neurocranial width		38	108.9
Min. width between supraorbital foramina		40	144.5
Max. skull width		41	213.0
Min. orbital width		42	158.7
Facial width		43	178.0
'Snout' width		45	71.0
Min. diastema width		47	65.0
Max. palatal width		48	124.9
Teeth:		Right	Left
P^3	length	—	26.5
	width	—	24.2
P^4	length	24.5	24.5
	width	23.8	24.0
M^1	length	21.0	20.4
	width	23.0	23.0
M^2	length	22.8	21.8
	width	22.6	22.1
M^3	length	27.9	—
	width	21.4	—

Fig. 48. Queen Street 1953 & 1960: Measurements (mm) of the horse skull.

Point of measurement	*Designation as in von den Driesch (1976, 35–37)*	*Roman Queen Street E.R. 254*	*Modern BM(NH) Reg. Nos 72.4296–4303*		
			N	M	Range
Length of cheektooth row (right side)	20	104.9	7	91.4	88.5–94.4
Max. neurocranial width	30	86.0	7	86.5	81.9–89.6
Max. palatal width	37	98.0	7	92.8	89.4–97.5

Key: N No. specimens
M Mean
Range Lowest and highest values recorded for variate

Fig. 49. Queen Street 1953 & 1960: Measurements (mm) of red deer hind together with those from female modern skulls from London.

Point of measurement	*Designation as in von den Driesch (1976, 47–49)*	*Value*	
		Spec. 1	*Spec. 2*
Length	1	89.0	79.0
Basal length	3	74.6	67.1
Neurocranial length	7	49.3	46.5
Facial length	9	31.8	26.6
Length of cheektooth row (right side)	12	21.4	—
Max. width of occipital condyles	19	—	20.2
Max. neurocranial width	22	40.6	41.1
Zygomatic width	23	—	57.1
Max. palatal width	26	36.6	35.4
Width at the canine alveoli	27	23.2	19.5
Height: Akrokranion—Basion	32	24.4	21.8

Fig. 50. Queen Street 1953 & 1960: Measurements (mm) of the two cat skulls.

implement used was somewhat blunt, as in the horse skull.

In Fig. 49 measurements taken from the London specimen are compared with those from the series of skulls of modern Red deer hinds from Inverness-shire, Scotland, held in the collections of the BM(NH) (BM(NH) Reg. Nos. 72.4296–72.4303). From these data, it is seen that whilst the width of the cranium in the London skull falls within the size range of the modern Red deer hinds, the toothrow is longer and the palate slightly wider than the largest in the Scottish animals.

226. Cat *Felis* (domestic)

In addition to the horse and Red deer skulls, there are two skulls of adult domestic cats from the Well (E.R. 254) at Queen Street. Measurements taken from these two specimens are given in Fig. 50.

(All the mammalian skulls from the Queen Street site are held in store at the Museum of London, where they may be examined on request).

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