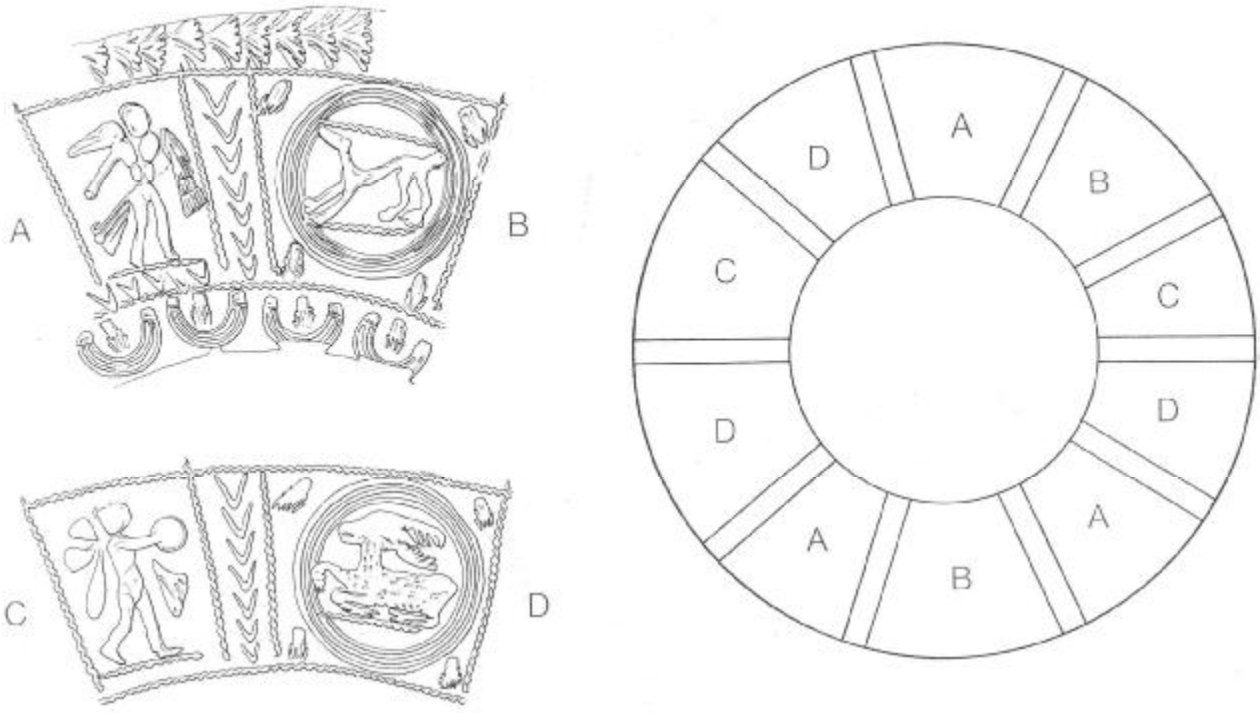

Fig. 1: Samian Drag. 37 from Montans. Scale 1 : 2. (The plan illustrates the arrangement of the panels on the complete vessel).

Drawn by Nick Griffiths.

An assemblage of Roman ceramics from London

PAUL TYERS

AMONGST THE MANY tonnes of Roman pottery excavated from the City of London over the centuries a very large number of different forms and types of vessels are represented. Many are of extremely common and well-known varieties, which do not generate any further comment, except when found in particularly significant and well-dated deposits. Occasional items are interesting and important in their own right, irrespective of their archaeological context, but it is relatively rare for a number of unusual or uncommon vessel-types to be found together and in circumstances which shed some light on their chronology and function. This article describes some of the pottery from one such discovery and comments on the wider significance of the assemblage[1].

Excavations between May and July 1982 at 28-32 Bishopsgate (TQ 3310 8124), in the north-east sector of the Roman city, revealed an occupation sequence of the first and second centuries A.D.[2]

The site was crossed by an early road, aligned north-south and substantial clay and timber build-

1. I should like to thank all those who have contributed reports and other information to this paper, often at quite short notice, particularly Dr Grace Simpson, Miss Brenda Dickenson, Dr Philip Armitage, Melvyn Card and Dr John Evans, Joanna Bird, Geoff Marsh, David Peacock, Paul Arthur. Paul Sealy and Francis Grew examined the samian, amphorae and other finds, and some of their comments are incorporated in the text. The illustrations are by Nick Griffiths and Barbara Davies.

2. The site was supervised by Christopher Evans and the excavation was funded by the Standard Chartered Bank. The analysis of the pottery was undertaken by Gill Dunn (the finds assistant), Barbara Davies and the author. A description of the methods employed can be found in P. Tyers & A. Vince, 'Computing the DUA pottery', *London Archaeol* 4 (ll) (Summer 1983) 299-304. Throughout this paper 'Eve' refers to the estimated vessel equivalent count. A brief interim report on the site is contained in *Popular Archaeol*, December 1983.

ings were constructed in the later first century A.D. After their demolition the site was sealed by a brick-earth dump. A substantial pit, possibly originally a quarry pit, was excavated in the eastern part of the site. The pit was irregular in shape, up to 3m (10ft) deep and 2.5-3m (8-10ft) wide, and it is the material from this pit that forms the basis of the study presented here.

The most immediate and remarkable feature of the group from the pit is its size — over 120 kg (265 lbs) in total. A single assemblage of these dimensions is an unusual find in any circumstances[3]. Moreover, closer examination indicates that a large number of the sherds are from almost complete or 'semi-complete' vessels, suggesting that much of the assemblage was dumped in one operation and may have been in contemporary use. This point will be returned to again below.

Most of the common fabrics of the second century are well represented. White ware flagons, bowls and mortaria from the Verulamium region kilns are very common, as are jars and bowls from the Highgate Wood and Black-Burnished 2 industries[4]. In the absence of closely dateable coins[5], the final date of the group is largely dependent on the samian, which includes nine stamps. There are a number of Flavian-Trajanic products of La Graufesenque (Drag. 18, 27 & 33) and several Central Gaulish vessels, including decorated bowls, from the kilns at Les Martres-de-Veyre (*c.* A.D. 100-130) and Lezoux. Amongst the Central Gaulish wares there is an almost complete example of a Walters type 81 bowl and a sherd from the rare Drag. 37R. The former is a type little known before the Antonine period, although our example is early in the series.

The stamps confirm this general picture (see Appendix 1). Four are the marks of Flavian-Trajanic potters of La Graufesenque, and there are two stamps each from the Central Gaulish factories of Les Martres-de-Veyre and Lezoux. The latter are dated *c.* A.D. 125-140/5.

The most interesting samian vessel is an almost complete decorated bowl of Drag. 37 form from the kilns at Montans, the last South Gaulish industry to be exporting to Britain in any quantity. Dr Grace Simpson has kindly contributed the following note on this bowl.

A Montans bowl from Bishopsgate
by Dr Grace Simpson

Montans is between Toulouse and Albi, beside the River Tarn, which is wide at that point. The large samian bowl of form Drag. 37 was reconstructed in the Museum of London from many fragments. Now it is almost complete.

The ten alternating panels and medallions show only four figure types. The animals have not been recorded previously, the other two are reduced copies of earlier South Gaulish types.

The illustration (Fig. 1) shows the fine detail on the winged figure (smaller than 0.704), the slim-bodied hound with head raised as though howling, the cymbal player (smaller than 0.369) and the resting stag with large eye and open mouth. The slip is thin and red-coloured. The fabric is gritty and pale brown. Such a late style belongs to the Hadrianic and very early Antonine period, not later than A.D. 150.

Taken together, the samian evidence points to *c.* A.D. 140-150 for the deposition of the group — a date which does not contradict that of the coarse wares but has interesting implications for the associated amphorae, to which we now turn.

Amphorae in Roman London and the significance of the Bishopsgate assemblage

Amphorae from a wide variety of sources are common finds on early Roman sites in the City of London. The earliest deposits on waterfront sites such as Pudding Lane are in some cases composed almost entirely of amphora sherds — undoubtedly the archaeological traces of a considerable trade in these vessels, or more precisely their contents, during the first century A.D. Contemporary 'domestic' assemblages from the city usually include less amphorae than the waterfront groups but they still

3. Although the circumstances of recovery were not ideal, and the feature was not completely excavated, the pottery assemblage seems remarkably uncontaminated.

4. A complete catalogue of the pottery from the pit and an appraisal of the other finds from the site is contained in a DUA level III archive report, held in the Museum of London.

5. There is a single coin from the pit (context 140); Jenny Hall, Assistant Keeper in the Department of Prehistoric and Roman Antiquities, Museum of London, kindly contributes the following note:

> The copper alloy coin, although in a worn and corroded condition, would seem to be an *as* of Trajan. On the obverse only a small part of the legend remains but may be deciphered as TRAIAN with laureate head, right. The reverse probably shows Victory advancing left, holding a shield. The condition of the reverse makes it difficult to make a positive identification but this particular type can be more closely dated to A.D. 98-102.

BOP82: The amphorae

Misc.	—	3288 g	—	9.07 %g
Dressel 20	—	5200 g	—	14.35 %g
Cam. 186	—	3220 g	—	8.88 %g
Cam. 189	0.02 Eve	9 g	1.21 %Eve	0.02 %g
Koan type	—	1500 g	—	4.14 %g
North African	0.47 Eve	3520 g	28.48 %Eve	9.71 %g
Pelichet 47	—	3664 g	—	10.11 %g
Rhodian	1.16 Eve	15845 g	70.30 %Eve	43.72 %g
TOTALS	1.65 Eve	36246 g		

BOP82: The amphorae (Weight)

Misc.	3288 g	———					
Dressel 20	5200 g	———					
Cam. 186	3220 g	———					
Cam. 189	9 g	-					
Koan type	1500 g	——					
North African	3520 g	———					
Pelichet 47	3664 g	———					
Rhodian	15845 g	———————					
		0%	20%	40%	60%	80%	100%
TOTALS	1.65 Eve	36246 g					

Table 1: The quantities of different amphora types in the Bishopsgate pit.

tend to form a higher proportion of the total pottery than is normal for other sites in the South-East.[6]

The range of amphora types in circulation in London varies in successive periods, but prior to the discovery of the Bishopsgate pit the pattern of London's amphora trade seemed relatively clear. Cylindrical amphorae such as the Italian Koan-style wine amphora and the Spanish fish-sauce or 'garum' amphorae of the Camulodunum 186 series seemed to be predominantly first century types, whilst on the majority of sites the globular Spanish olive oil amphora of Dressel type 20 was the commonest variety, at least in terms of weight, from c. A.D. 100.

By the end of that century or the beginning of the third a wider range of types was once again in circulation. The groups of amphorae from New Fresh Wharf and St Magnus include numbers of the Spanish Dressel 20 type, but they are joined by a range of vessels probably from the Eastern Mediterranean and North Africa, and such types appear sporadically in groups of third and fourth century date. However, as a proportion of all pottery, amphorae are considerably less common in domestic London deposits after c. A.D. 200 or 250 than before[7]. This partly reflects London's decline in status as an international port, but it has been widely recognised throughout Britain that imported pottery of all types is relatively rare in the later Roman period[8].

The Bishopsgate amphora group is anomalous in several respects. Dressel 20 sherds are rare, forming only *c.* 15% of all the amphora by weight (see Table 1), a clear contrast with the pattern from most other second century groups in London where globular Spanish amphorae are the commonest type.

Nearly half of the assemblage are sherds from perhaps four vessels of the 'Rhodian'/Camulodunum 184 type, two of which are almost complete (Fig. 2, 1 & 2). There are three of the distinctive 'peaked' handles of the Rhodian style, two of which are attached to a complete neck and shoulder. Peacock's discussion of the Rhodian type published in 1977[9] identified six fabric-groups, only two of

6. See Tyers & Vince *op. cit.*, Fig. 5. Comparative data is available from Chelmsford, where amongst 113 kg of first and second century pottery catalogue from town sites less than 1% are amphora sherds (Information from Chris Going, who also comments that similar percentages are found on other rural sites in Essex, such as Dunmow and Wickford).

7. The amphorae from Chalk (Kent) illustrate the range of types circulating in the South-East during the later Roman period (D.P.S. Peacock, 'Late Roman Amphorae from Chalk, near Gravesend, Kent', in J. Dore & K. T. Greene (eds.) *Roman Pottery Studies in Britain and Beyond* BAR **S30** (1977), 295-300) but these only form a very small proportion of all pottery of this date recovered from London.

8. M. G. Fulford, 'Pottery and Britain's Foreign Trade in the Later Roman period, in D. P. S. Peacock (ed.) *Pottery and Early Commerce* (1977) 35-84.

9. D. P. S. Peacock, 'Roman Amphorae: Typology, fabric and origin' in *Methodes classiques et methodes formelles dans l'etudes des amphores*, Collection de L'Ecole Francaise de Rome, 32 (1977), 266-270.

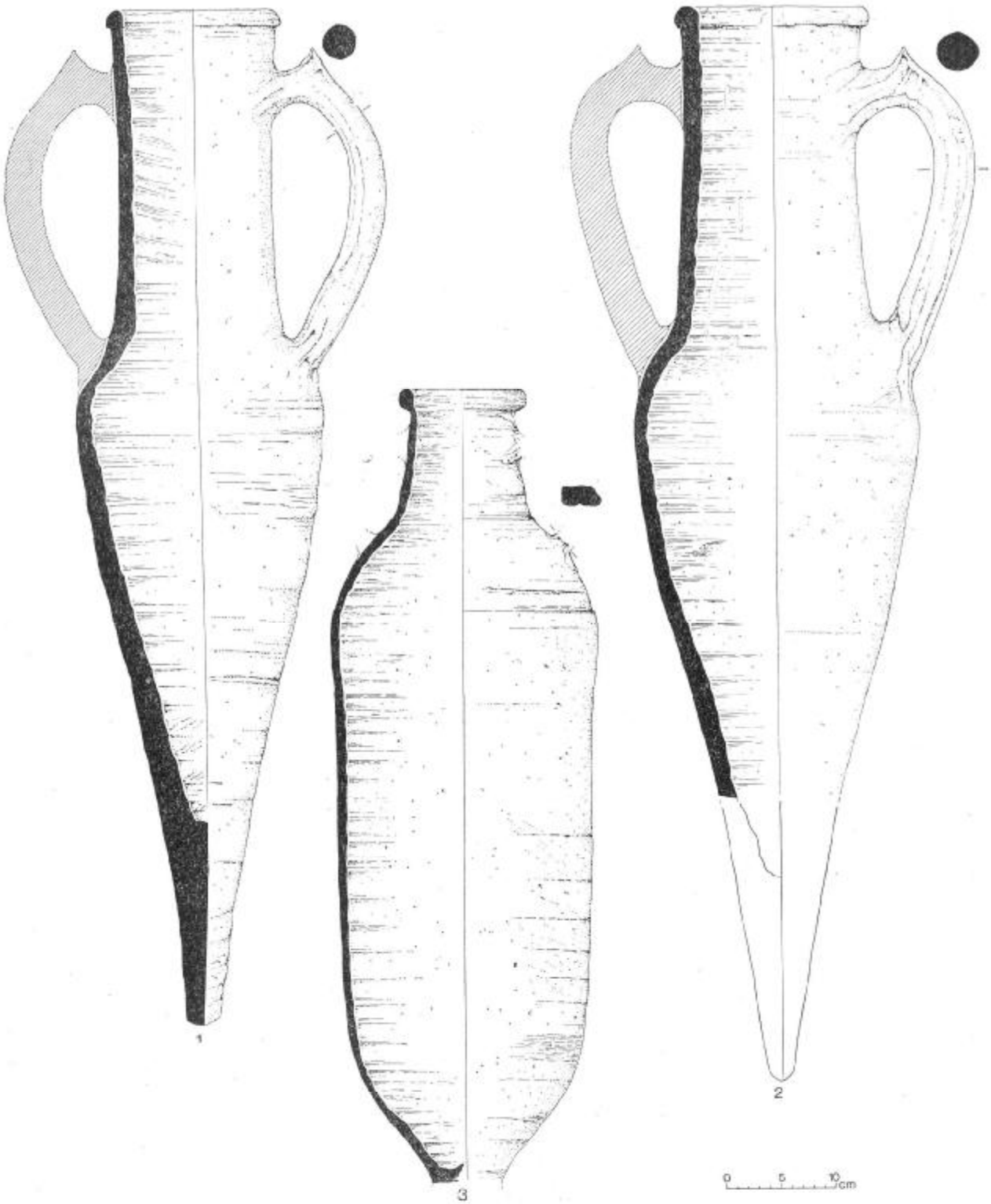

Fig 2: Rhodian-type (nos. 1-2) and North African (3) amphorae from the Bishopsgate pit. Scale 1 : 6 Drawn by Barbara Davies

which are securely products of the Isle of Rhodes itself[10]. Although the majority of Rhodians from Britain seem to date to the first century A.D., their use clearly continues into the middle years of the second.

The pit also includes substantial parts of Cam 186 type 'fish-sauce' amphorae of Spanish origin, including an example with the typical red-ironstone tempered fabric of the Cadiz region, large portions of several South Gaulish wine amphorae of the Pelichet 47/Dressel 30 type and the peg-base of a Koan-style vessel. The latter, and a small sherd of a Cam 189 'carrot' amphora, are perhaps residual first century items, but the remainder of the vessels were probably almost complete when dumped in the pit. This certainly applies to the last vessel in the group — a North African cylindrical amphora.

The vessel is almost complete (Fig.2, 3). The surviving sherds weigh *c.* 3.5kg, and in its original state the vessel probably weighed no more than 5kg. Unfortunately both handles are amongst the missing portions, but the handle-scars suggest that they may have had a vertical groove along the outer face. The cylindrical neck is finished by a small beaded rim, and there is a distinct angle and burnished zone at the shoulder. The tip of the base is also absent, but probably terminated in a simple peg foot. The fabric is brittle and thin, reddish-brown in colour (Munsell 2.5YR 5/8) and tempered with cream limestone and rounded quartz. The outer surface is covered with a yellow wash, apparently produced by immersion in salt water prior to firing[11]. An analysis of a sherd of the Bishopsgate vessel (see Appendix 2) confirms that this type originally contained olive oil.

There are a number of published studies of the production and chronology of North African amphorae, but their distribution in Britain has been discussed by Peacock[12]. At the time of writing (1977) the evidence pointed to the fourth century as the period of the majority of the British examples of this class, although a vessel from Holborough in Kent 'could imply importation as early as the third century'[13]. The identification of North African cylindrical amphorae from the Roman quay at New Fresh Wharf and St Magnus (London) suggested an early third century date for the commencement of importation[14], but the Bishopsgate vessel predates these by at least half a century, and is the key find in the group.

Third century North African cylindrical amphorae, such as that from Holborough[15], have a slightly conical neck, ovate handles and vertical burnishing on the body. The latter is also a characteristic feature of fourth century vessels from the same source but the Bishopsgate vessel does *not* have the same burnishing, indicating that it is not a universal feature of the type.

The Bishopsgate amphora is a remarkable find in its own right, but doubly important because of its associations and probable date. It pulls back the beginning of North African amphora export to the northern provinces by several decades, placing it firmly in the middle of the second century. Fine red-slipped wares from North African production sites are attested from the end of the first century A.D. in Britain[16], but unlike the fine wares, amphora imports may suggest a little more than casual movements in the baggage of individual travellers.

From the broader chronological viewpoint, the association of amphora types in the Bishopsgate pit provides an effective link between imports typical of first century A.D. sites (Cam. 186, 'Rhodian' etc.) and those typical of the third century. All the relevant vessels are almost complete and there is little doubt that they were all dumped in the pit in a single operation along with many of the coarsewares. The development of amphora trade through London, and hence to the remainder of the province, should now be viewed in the light of the evidence from Bishopsgate.

10. The amphorae are in a hard, light orange-brown fabric (5YR 6/6) with an irregular fracture and there are traces of a thin white slip on the external surface. Thin-sections reveal inclusions of a basic fine grained igneous rock, plagioclase feldspars, muscovite mica, an altered rhyolite and a little quartz. The closest match amongst Peacock's types may be fabric 3, for which no source could be suggested. (This and the following petrological identifications are by Dr Alan Vince).

11. Thin-sectioning shows reaction rims around the limestone and the fabric has been heat-altered towards its edge. I am grateful to Dr D. P. S. Peacock for examining this amphora — he comments that it is probably of Central Tunisian origin.

12. Peacock, *op. cit.*, 270-2. The available continental literature on North African amphorae seems to be constantly hampered by the absence of reliable dating evidence; see, for example, *Recherches sur les amphores* romaines, Coll. de l'Ecole Franc. de Rome, 10 (1972), and references therein.

13. A vessel from Caerleon, dated A.D. 130-160, was unfortunately untraceable in 1977 and had to be excluded from any assessment of the date of the earliest imports (Peacock, *op. cit.*, 271, note 51).

14. C. Green, 'The Amphorae', in *Excavations at New Fresh Wharf*, forthcoming.

15. Peacock, *op. cit.*, Fig. 1, 6.

16. J. Bird 'African Red Slip ware in Roman Britain' in, J. Dore & K. T. Greene (eds) *op. cit.*, 269-278, particularly forms 2-9.

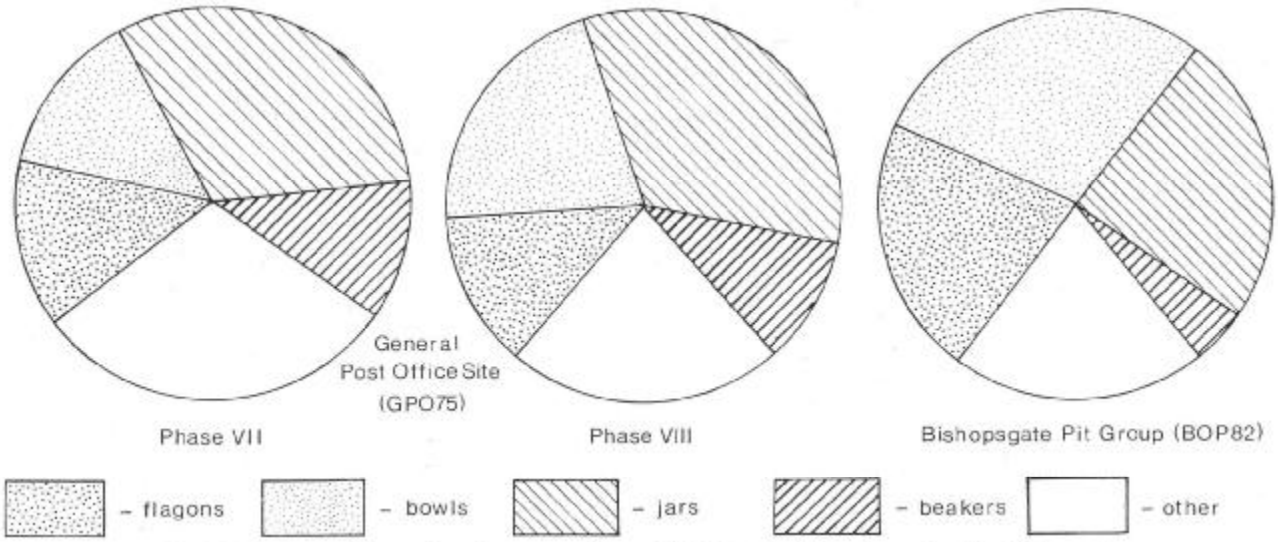

Fig. 3: Pie-charts illustrating the proportions of different pottery forms in the Bishopsgate pit compared with two phases from the General Post Office site (calculated as percentages of the total estimated vessel-equivalent count).

A functional interpretation of the Bishopsgate assemblage.

Most of London's early Roman pottery is not recovered from circumstances comparable with the Bishopsgate pit — the assemblages are usually far smaller and individual vessels far more fragmentary. Most sherds have probably been redeposited and recycled a number of times and their final archaeological context has little or no direct relationship to the original function of the vessels from which they come. Rarer groups, notably destruction and abandonment deposits such as the 'Hadrianic' fire horizons, hold out some hope of reconstructing assemblages of objects that were in contemporary usage and parts of a related system — 'systemic' contexts in Schiffer's terminology[17]. The majority of the archaeological material recovered from occupation sites is unlikely to reflect a single 'activity' as such, but rather a wide range of originally distinct activities, the debris from which have become mixed prior to the formation of the archaeological record. The main hope of disentangling these lies in the identification of 'primary' assemblages that include the debris from a more limited range of activities.

	GPO phase VII		GPO phase VIII		BOP 140/1091	
AMPHORAE	0.70 Eve	0.53 %	0.08 Eve	0.11 %	1.65 Eve	1.73 %
TS-CUPS	4.15 Eve	3.14 %	1.29 Eve	1.81 %	2.20 Eve	2.30 %
CUPs	0.32 Eve	0.24 %	0.79 Eve	1.11 %	0.00 Eve	0.00 %
TS-PLATES	3.87 Eve	2.93 %	1.43 Eve	2.01 %	2.53 Eve	2.65 %
PLATES	0.73 Eve	0.55 %	0.29 Eve	0.41 %	0.00 Eve	0.00 %
TS-BOWLS	1.48 Eve	1.12 %	2.06 Eve	2.89 %	1.05 Eve	1.10 %
BOWLS	18.18 Eve	13.77 %	15.22 Eve	21.36 %	27.88 Eve	29.18 %
TS-OTHER	2.64 Eve	2.00 %	0.95 Eve	1.33 %	0.47 Eve	0.49 %
LID	19.49 Eve	14.76 %	4.26 Eve	5.98 %	10.06 Eve	10.53 %
BEAKERS	15.68 Eve	11.87 %	7.31 Eve	10.26 %	4.04 Eve	4.23 %
JARS	41.00 Eve	31.09 %	23.68 Eve	33.23 %	23.29 Eve	24.48 %
FLAGONS	17.29 Eve	13.05 %	9.17 Eve	12.87 %	20.21 Eve	21.15 %
MORTARIA	2.76 Eve	2.09 %	2.09 Eve	2.93 %	0.98 Eve	1.03 %
MISC.	1.71 Eve	1.29 %	0.40 Eve	0.56 %	1.05 Eve	1.10 %
OTHER	2.05 Eve	1.55 %	2.25 Eve	3.16 %	0.03 Eve	0.03 %
TOTALS	132.05 Eve 133502 g		71.27 Eve 67550 g		95.54 Eve 123448 g	

Table 2: The percentages of different pottery forms in the Bishopsgate pit compared with the two phases on the General Post Office site (calculated from the estimated vessel-equivalent or eve count).

Identification			No of bones	Wt (g)
MAMMAL				
Domestic	Ox	*Bos* (domesic)	128	3488.0
	Sheep/goat	*Ovis/Capra* (domestic)	44	715.2
	Pig	*Sus* (domestic)	106	1677.5
	Pig/sheep/goat		50	107.6
Wild	Roe deer	*Capreolus capreolus*	10	197.7
	Roe deer (?)		1	4.5
	Hare	*Lepus sp.*	8	3.1
Unidentified			93	352.0
BIRD				
Domestic	Domestic fowl	*Gallus gallus*	82	197.1
	Goose	*Anser anser*	4	12.8
Wild				
Unidentified			2	1.4
FISH				
	Cod	*Gadus morhua*	20	42.2
TOTAL			548	6781.1

Table 3: The animal bones.

The completeness of many of the pots in the group, and the glass vessels[18], suggests that the material in the Bishopsgate pit is in some sense a 'primary' assemblage. The proportions of pottery from different sources supplied to a particular consumer will vary through time as individual industries rise and fall in importance and the particular mixture represented in the Bishopsgate pit can be related to the sequence of supply established on other Roman sites in the City. However the function of an assemblage, if function is indeed a contributory factor to their formation, is more likely to be recoverable from a study of the proportions of different forms represented in the group.

The accompanying table and pie-charts (Table 2 & Fig. 3) illustrate the overall balance of different forms in the Bishopsgate pit and assemblages from two phases on the General Post Office (1975) site: phases VII (*c.* A.D. 100-120) and VIII (*c.* A.D. 120-150). The comparative material is from a domestic and minor industrial site in the western part of the city and the pottery, largely from occupation and construction levels, represents a cross-section of the types circulating in London in the early second century A.D.

The Bishopsgate pit assemblage is marked out by two features. The contemporary assemblage from GPO phase VIII includes similar quantities of beakers and flagons (7.3 & 9.2 eve's respectively) whilst in the Bishopsgate pit these two types are present in a ratio of *c.* 1 : 5 (4 & 20 eve's respectively) — poppy-head and colour-coated beakers are noticeably rare in the pit group. Flagons and bowls together form *c.* 50% of the Bishopsgate group, but only 27% of GPO phase VII or 34% of GPO VIII. The other types present (plates, cups, mortaria etc.) do not seem to show any clear pattern, but the individual sample sizes are very small.

Thus if we are to seek a 'functional' pattern in the pit assemblage it must explain a relative dearth of beakers, and higher proportions of bowls and flagons. We cannot, of course, distinguish between the absence of one type of pottery and the over-representation of another — we can only deal with ratios and balances.

The material does not derive from a warehouse or shop, unlike the pottery from Regis House and some of London's other waterfront sites. Many of the jars and bowls (particularly the Black-Burnished style vessels) show clear signs that they have been used for cooking — sooting and 'furring' are visible on many vessels. The low numbers of beakers in the group may suggest that the pottery does not result from activities associated with food, specifically liquid, consumption.

The amphorae are a mix of types that carried food for immediate consumption, such as wine, and oils and sauces for cooking. Amongst the coarse wares are sherds from an almost complete shell tempered jar of the 'North Kent' type and large fragments of a 'bucket' in another shell-tempered ware, possibly from South Essex. The latter, and possibly both, of these vessels may be associated with the transport of salt extracted from the Thames estuary[19]. In short, despite such remarkable fine vessels as the Montans samian bowl, the *overall* balance of the pottery shows a bias towards vessels for food preparation.

The other artefacts from the pit do not assist in any assessment of the immediate origin or function of the assemblage[20], but the animal bone may assist

17. M. B. Schiffer *Behavioural Archaeology* (1976), esp 28 ff. Despite its somewhat polemical stance, Schiffer's work is probably the clearest analysis of the processes of archaeological deposit formation and their implications for the study of artefacts.

18. John Shepherd comments that most of the glass from the pit are fragments of no more than three vessels that were probably almost complete when they were discarded.

19. For illustrations of these types see C. Green, 'Roman Pottery', in D. M. Jones *Excavations at Billingsgate Buildings, Lower Thames Street, London, 1974*, London and Middlesex Archaeological Society Special Paper No. 4 (1980), nos. 295, 299-301.

20 The other finds from the pit include a number of small objects in bone, copper and iron (pins, studs, tumbler-lock keys etc), a few fragments of decorative stonework *(opus sectile)*, large quantities of building materials, a moulded pipe-clay figurine and two lamps.

in its interpretation. A summary of the animal bones from the pit, compiled by Dr Philip Armitage, is included here as Table 3, and his comments are included below. The bones are all from food animals; domestic pets such as cats and dogs, which might be expected from 'normal' domestic refuse, are noticeably absent. The animals were all slaughtered and consumed nearby, for all parts of the skeleton including feet, skulls and bones from joints of meat, are represented.

For a sample of this size, there are rather high numbers of roe deer and chickens, and amongst the latter there is a capon (a castrated, fattened male). Most of the domestic animals are from improved stock. The cattle and sheep include individuals towards the upper limit of the Romano-British size range and amongst the pigs there are some very large examples, particularly males which may approach the size of wild boars but are perhaps more likely to have been 'intensively' reared. Some of the individuals are immature, suggesting the consumption of both veal and beef, lamb, kid and mutton, sucking pig as well as pork.

Although the diet represented by those bones was clearly of high quality, it was not particularly exotic and a very high status assemblage might be expected to include a wider variety of fish, game and wild birds. If the pottery and the bones are debris from the same function, then we have a picture of an establishment in the vicinity slaughtering and consuming a variety of high quality meats, cooked in oils and sauces from all parts of the Western Empire and accompanied by quantities of wine. The slightly anomalous elements might be the rather limited range of species, and, from the ceramic viewpoint, the relative dearth of table wares.

The size of the assemblage suggests that it is not the debris from the activities of a small household; rather it could be from the kitchens of a more substantial private dwelling or perhaps even a 'cookshop' of some type. Although we can go no further at present, it is now perhaps possible to begin to see the degree of variation between contemporary assemblages which may reflect differences in the range of activities represented. Such analyses, on a larger scale, will become an increasingly important part of future research on London's finds, drawing on a body of data almost unparalleled in range and quantity.

21. A little data on the quantities of pottery in use on some sites is available. The 'Hadrianic' fire at GPO engulfed two buildings and the pottery in the destruction of horizons amounts to *c.* 60kg/58 Eves. Although the majority of this was in use at the time of the fire, some clearly derives from earlier levels.

Appendix 1: The samian potters stamps

Amongst the samian from the pit there are nine potters stamps. Miss Brenda Dickinson of Leeds University has kindly provided the following identifications.

Arcanus die 3c, Dr18/31, Lezoux. There is no site dating for this particular die, but Arcanus' other stamps occur at forts in the Rhineland and his decorated ware is Hadrianic. His output includes 18/31R and 27. *c.* A.D. 125-140.

Carantus i die 2a, Dr27g, La Graufesenque. Carantus i's output seems to be entirely Flavian or later. Some of his stamps, though not this particular one, occur at Butzbach. *c.* A.D. 80-110.

L. Cosius Viritis die 12a, Dr18R, La Graufesenque. A stamp noted from Domitianic foundations, such as Butzbach, the Saalburg and the main site at Corbridge, but also, occasionally, on form 29. *c.* A.D. 80-110.

Donnaucus die 2a, Dr27, Les-Martres-de-Veyre. This stamps occurs in London Second fire deposits. *c.* A.D. 100-125.

Maternus ii die 2a, Dr18, La Graufesenque. The site records for this stamp includes Old Penrith, Butzbach, the Saalburg (2), Wilderspool and the main site at Corbridge (2). *c.* A.D. 80-110.

Reginus ii die 2a, Dr18/31, Les-Martres-de-Veyre. A stamp recorded from London Second fire deposits and at sites evacuated when Hadrian's Wall was built. One of his other stamps occurs in Antonine contents in Scotland. *c.* A.D. 110-130.

Secundinus iii die 5b, Dr 27, Lezoux. The die was used on both plain forms and decorated moulds. The plain ware includes forms 18/31 and 1831R and the decorated bowls are Hadrianic. The stamp occurs at the Saalburg Erdkastell (before A.D. 139). *c.* A.D. 125-145.

Illiterate Dr18/31, Central Gaulish. The fabric and glaze suggest a Hadrianic or early Antonine date.

Dr27g, South Gaulish. Early Flavian.

Appendix 2: Analysis of a sherd of a North African amphora

Mr. M. D. Card and Dr. J. Evans of the Department of Chemistry, North-East London Polytechnic, have a sherd of the amphora illustrated on Fig. 2, 3 and contributed the following report.

A small amphora sherd was ground and extracted by means of a soxhlet apparatus (effectively a chemists coffee perculator) using a series of solvents of varying polarity. The solvents were selected on the ground that they dissolve specific groups of materials from the fabric and are suitable for subsequent analysis by various chromatographic techniques.

Extraction of the amphora under discussion gave triglyceride patterns closely similar to olive oil, Examination of the hydrolysed extract (*i.e.* breaking down the complex triglyceride molecules to fatty acids) gave results in good agreement with authentic samples of olive oil.

It seems certain that the amphora was used for the transport of olive oil, and other African amphorae from York, Carthage and Poundbury examined by similar techniques have also yielded olive oil.