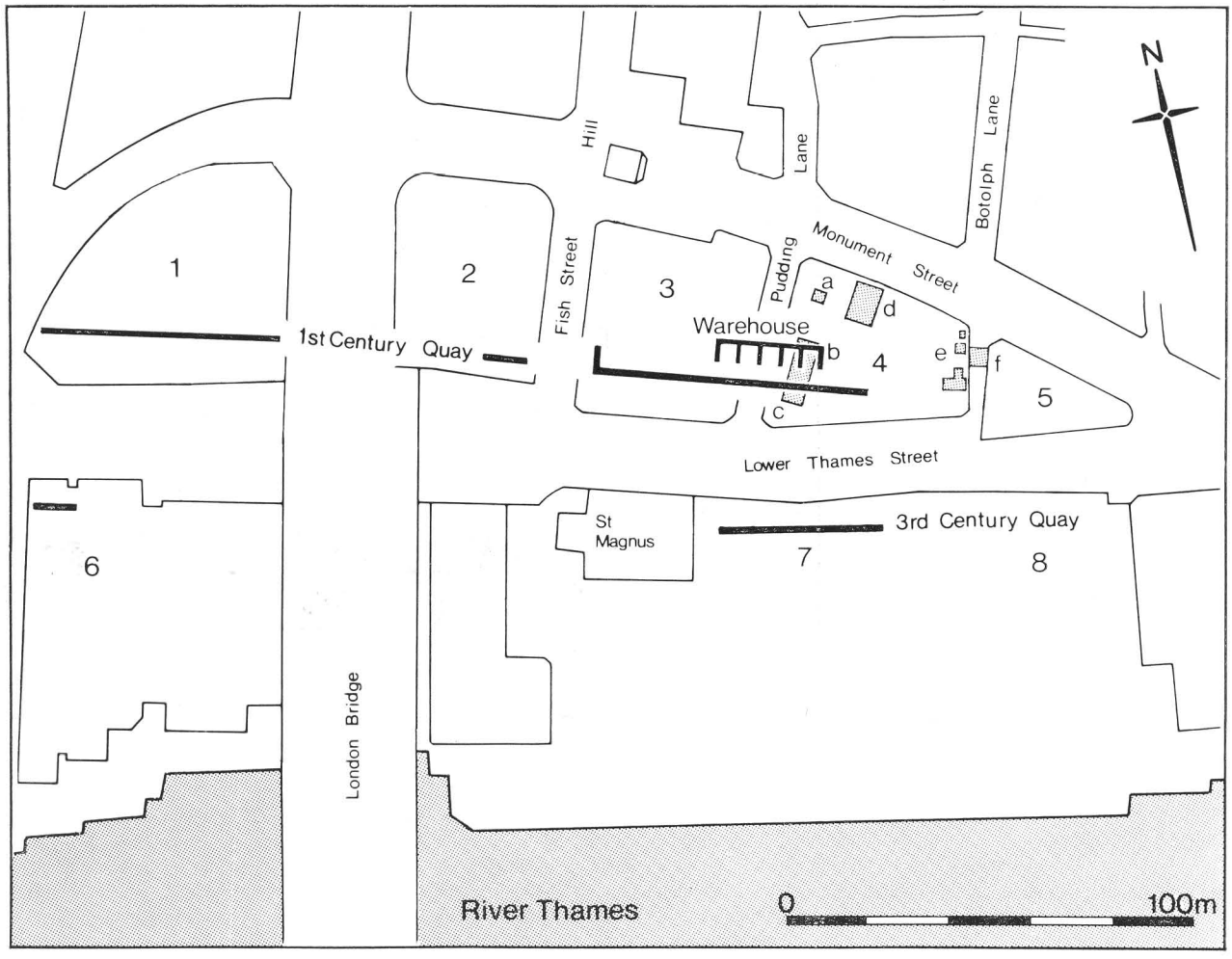

Fig. 1: Plan to show location of Roman waterfront sites. (1) Miles Lane. (2) Regis House. (3) Pudding Lane. (4) PENINSULAR HOUSE. (5) Billingsgate Buildings. (6) Seal House. (7) New Fresh Wharf. (8) Billingsgate Lorry Park.

The Sauce of the Thames

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IN RECENT YEARS much attention has been paid to the development of the Roman waterfront in London. Sites on both sides of Lower Thames Street have revealed the evidence of at least two phases of massive timber quay (see Fig. 1), and related harbour-side buildings. This paper reviews the evidence from Area A on the Peninsular House site for a waterfront fish processing plant active from the mid-second to the ? early fourth century.

During the winter of 1979/80 archaeological excavations were undertaken before the redevelopment of Peninsular House, and generously funded by Vitiglade Ltd and Verronworth Ltd. The site was bounded by Pudding Lane to the west, by Botolph Lane to the east, and by Lower Thames Street to the south. A series of small trenches was opened up adjacent to the two lanes in order to cast light on the development of the street grid and the buildings within it (see Fig. 1). The excavation in Areas E and F by and under Botolph Lane produced evidence for a middle to Late Saxon origin for the lane and its associated buildings[1]. The excavations along the west

side in Areas A, B and C, parallel to Pudding Lane produced evidence of large Roman masonry buildings laid out behind a first century timber quay[2], many medieval pits and the cellar of a building destroyed in the Great Fire of 1666.

The results of the excavations in Area A may be summarised as follows; a Roman ragstone wall 600 mm (2ft) thick and at least 3.60m (11ft) high when still standing (part of it collapsed into Area A in antiquity), formed the northern limit of excavation. The wall was plastered on its north but not its south face and is therefore interpreted as the south wall of a ? domestic building which lay to the north. South of this wall a series of compacted gravel and rubble surfaces was laid over the natural (river) gravels. Contemporary with each surface was an open timber drain *c.* 500mm (2ft) wide and 200 mm (8ins) deep aligned east-west across the area. The provisional date given to pottery from these layers suggests that neither the surfaces nor the masonry building to the north were established before c AD 150. A coin of Tacitus (275-6) lying beneath the fourth drain suggests that the area was still in use in the late 3rd century, while provisional dating of pottery derived from the 1.0m (3ft 3in) thick dump of rubble and silt which sealed these features suggests that the change in function which this dump represents occurred in the early 4th century.

Overlying the third drain and a contemporary joist and plank floor, both probably in use in the early to mid 3rd century, was an 80mm (3in) thick deposit of silt, small bones and large amphora sherds (Fig. 2). 2.5 kg (5½lb) of this were sampled and then sieved (the smallest mesh used was 250 microns). The residue weighed 650g (23oz) and was composed entirely of small fish bones. The quantity of these made total identification impractical so sub-samples of set weight (5, 10, and 20g) were analysed. The species represented were herring (*Clupea harengus*), and sprat (*Sprattus sprattus*), forming 84 per cent and 16 per cent of the sample respectively (based on the maximum numbers in the 20g sample). A few other species were also present; a young bass (*Dicentrarchus labrax*) was identified from a premaxilla and a few vertebrae; a young flatfish probably flounder (*Platichthys flesus*) represented by two vertebrae; and sandeel, probably the greater sandeel (*Hyperoplus lanceolatus*) were identified from operculae and a few vertebrae. Herrings and sprats were represented in large numbers by all parts of the skeleton, indicating the presence of whole fish. By calculating the line of regression, based on the number of dentaries (lower jaws) it was estimated that in a sample of 1kg (2.2lb) between 3500-6000 herrings and 800-1500 sprats would be present[3].

None of the herrings was larger than a reference specimen of 83mm (3¼in) in total length, suggesting that these were all young fish. Both young herrings and sprats are usually found in inshore waters[4]. Indeed all of these fish in their immature stages could be found in the Thames Estuary and as such probably represent a local catch. The composition is typical of 'whitebait' a traditional fishery of the Thames Estuary[5]. Whitebait is almost totally composed of young herring and sprats, herrings dominating the catch in June and July with the occasional inclusion of other young fish. From the dominance of herrings it can be suggested that this was an early summer catch.

There is little direct evidence for the nets used for this type of fishing in the Roman period. Fig. 3 shows a representation of the harbour in Alexandria on a North African ceramic lamp. In this scene a man casts a small hand held net into the water while the second man fishes by line from a boat. The colonnaded warehouses of the port form the background to the scene. In the 19th century the upstream whitebait net was fished from a boat moored in the tideway and the net was lowered over the side. The net had a relatively small mouth, about three feet square, and was very long with a fine mesh especially at the bag end. In the late 19th century a dragnet was used for whitebaiting in the lower Thames[7].

The sherds found in the deposit were derived from a CAM 186 amphora of between 100-150 AD[8].

1. G. Milne. "Saxon Botolph Lane". *London Archaeol.* **3,** no 16 (1980), 423-30.
2. N Bateman and G Milne "Roman Waterfront Devement near London Bridge". In preparation for *London Archaeologist.*
3. Minimum and maximum number of individuals in each sub-sample size:

In 5g	Herrings	min 12	max 24
	Sprats	1	2
In 10g	Herrings	min 31	max 59
	Sprats	2	3
In 20g	Herrings	min 67	max 118
	Sprats	13	23

Using these counts the line of regression was calculated (by least squares method) and based upon these calculations the numbers of fish in various volumes of deposit was estimated. For further details see Ancient Monuments Laboratory Report number 3686 kept at Fortress House, 23 Savile Row, London W1.

4. A Wheeler. *Key to the Fishes of Northern Europe.* Warne (1978) 67.
5. A Wheeler. *The Tidal Thames.* Routledge and Kegan Paul. (1979) 70.
6. *Ibid* 71.
7. *Ibid* 73, 74.
8. Kindly identified by Beth Richardson.

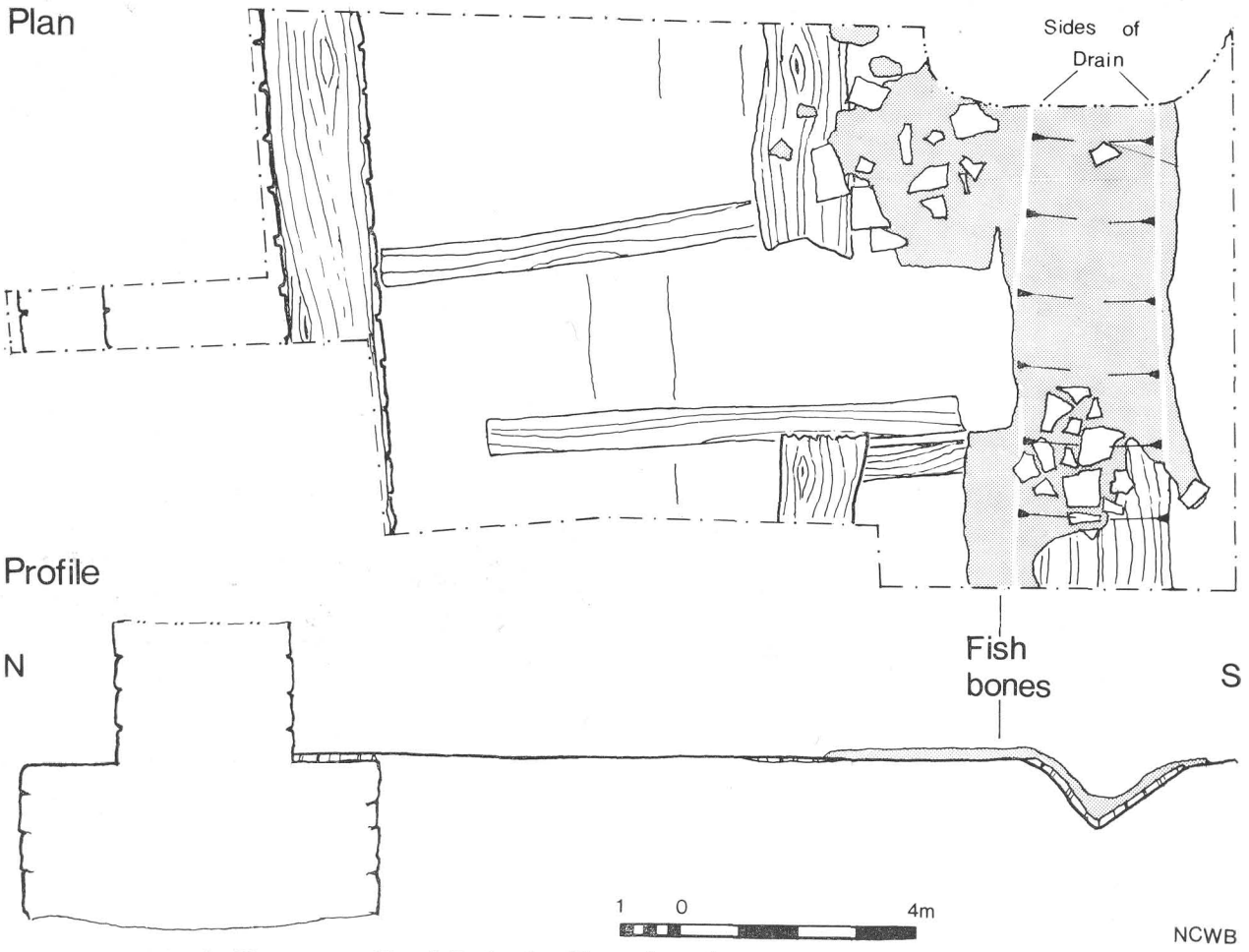

Fig. 2: Plan and profile of Peninsular House Area A showing third century timber floor and drain overlain by the fish deposit and broken amphora sherds.

These were manufactured in South Spain and used for the export of *garum or liquamen,* the strong fish sauce produced in the same area. Only one amphora was represented although since the sherds and the fish bones extended beyond the limit of excavation it was not complete.

There were many ways of making *garum,* according to the species of fish available and the scale of the operation. Pliny provides many recipes for its manufacture based on small red mullet, sprats, anchovies or *any other small fish.* The Bithynians used large or small sprats, anchovies, horse mackerel or mackerel making a mixture of them all. The recipe for this states: ". . . put in an earthenware vessel which you place open in the sun for 2-3 months . . ." The best *garum,* called '*haimation*' was, he says, made from "the entrails of tunny fish and its gills, juice and blood . . . leave in a vessel for 2 months at the most"[9]. Along the south coast of Spain, the western seaboard of Morocco and the coast of Brittany the manufacture of *garum* and related fish products was undertaken on a large scale involving the use of large rectangular lined tanks for fermentation and salting[10]. But there was evidence that *garum* was also manufactured at a less 'industrial' level. Pliny provides a recipe for 'homebrew'. "Put the fish into the brine in a new earthenware pot . . . put it on good fire until it

9. Pliny in B Flower and E Rosenbaum. *The Roman Cookery Book.* Harrap London. (Reprinted 1980) 22.

10. M Ponsich and M Tarradell. *Garum et Industries Antiques de Salaisons dans la Mediteranee Occidentale.* Universite Bordeaux, Casa Velasquez Bib, Ecole Haute Etudes, Hispan. Fasc. 36, Paris (1965). And R Sanquer and P Galliou "Garum, Sel, et Salaisons en Armorique Gallo-Romaine." (1972) *Gallia* **30** 199-223.

boils — i.e. until it begins to reduce"[11]. At the end of all these processes the liquid was strained off as *garum* or *liquamen*, the solid residue (containing the bones) was known as '*hallec*' and was also sold. Pliny says that *hallec* was also specifically made — i.e. not just as a by-product of *garum* manufacture —"*from very small fish that were otherwise useless*"[13].

Since the fish found in Area A must represent a North European and probably local catch (the herring does not occur south of the Bay of Biscay), their location in and around a broken Spanish *garum* amphora cannot represent an unfortunate accident with a jar of imported unstrained *garum* or *hallec*. Since fish and pot do seem to be associated, it is suggested that the amphora(e?) once emptied of its original imported content, had been re-used to contain this local catch. It is interesting to note that this type of amphora was not made later than *c* AD 150, whereas the drain in which it was found was probably early to mid third century in date.

As has already been pointed out, the 2nd-4th century occupation of the area comprised a series of gravel surfaces and open timber drains aligned east-west. It has been argued elsewhere[13] that these may have functioned beneath an open fronted timber framed lean-to structure against the south wall of the large building to the north (see Fig. 2). The nature of the surfaces and drains precludes the interpretation of the structure as domestic but is not inconsistent with the possibility that a relatively small scale industrial process was established there. The regularity with which surfaces and drains were replaced suggests that such an industry was successful and persistent. It is proposed that the industry concerned was the manufacture of fish products, and that the deposit of bones which sealed the drain represents either whole fish pickled in brine or a provincial version of one of the *liquamen* manufacturing processes outlined above: possibly an amphora (or ? amphorae, given the quantity of fish) of locally produced *hallec*, or fish fermenting in an earthenware vessel before the *liquamen* was strained off.

Fig. 1 shows that Area A lay *c* 55m (60yds) north of the early 3rd century waterfront and only 12m (13yds) north of the warehouses which lay behind the waterfront. The area was therefore well situated for the processing of fish unloaded along the quays and very close to the warehouses where it is known that *garum* amphorae were unloaded in quantity in the 1st and early 2nd centuries[14]. It is perhaps significant that the smashed amphora in the drain was

Fig. 3: A first century Roman lamp showing a Mediterranean harbour scene with fishermen. Reproduced by kind permission of the British Museum.

a re-used *garum* amphora. There is little evidence for the import of *garum* in the third centruy and it seems likely that this deposit represents more evidence for the decline of imported luxury goods and their replacement by cheaper local commodities.

Whether or not the deposit represents whole fish pickled in brine, or fish sauce, it still remains the earliest evidence yet found for a local fishing industry based in London. This may suggest an even greater antiquity to the traditions of nearby Billingsgate market than hitherto suspected!

Acknowledgements

We would like to thank Tony Dyson and Gustav Milne (Museum of London) and Alwyne Wheeler (British Museum Natural History) for their comments and advice. Also Prince Chitwood who supervised Area A and Chrissie Milne and Richard Lea for help with the drawings.

11. Pliny in Flower and Rosenbaum. 1980 *op cit* in footnote 9, 22.
12. *Ibid*, 23.
13. Archive Report PEN 79 held by the DUA.
14. See footnote 2.