Excavations at 211 Long Lane, Southwark Part 1: prehistoric Neckinger-side environment in Southwark and its implication for prehistoric communities

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Prehistoric river foreshore locations can provide important information about changing river courses, river hydrology, the location and extent of foreshore, and island-edge environments. The sediments accumulating and preserved in these locations provide evidence of the development and changes in precise local habitats which form the basis for comprehending potential and actual community exploitation of these riverside environments.[1] Examination of deposits such as peat and alluvium on the northern edge of the Bermondsey eyot at 211 Long Lane, Southwark (Fig. 1) by Wessex Archaeology provided the opportunity to define the topography and geoarchaeology, and examine issues of human settlement patterns and exploitation. This discussion of the peat and floodplain deposits forms Part I of the results of these excavations; the Romano-British and later archaeology is discussed in Part II.[2]

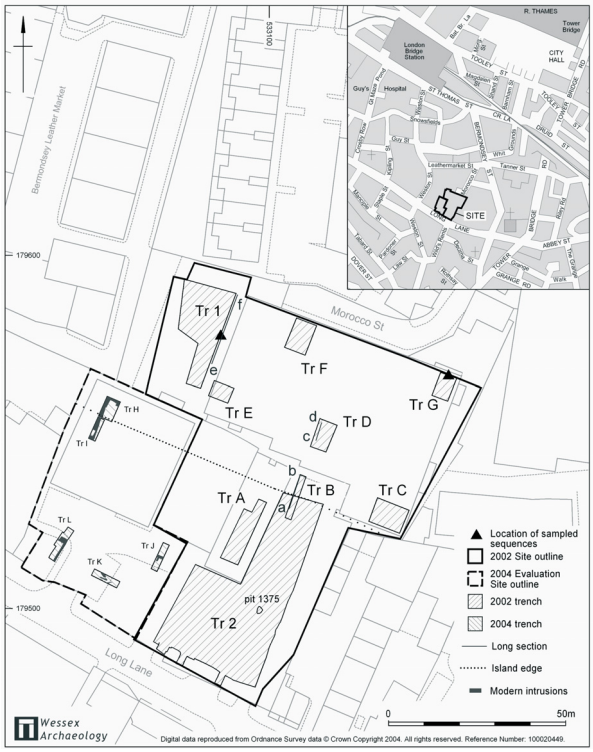

Fig. 1: location plan including excavated trenches, location of island edge and pit 1375

The site is about 800m south of the current course of the Thames (Fig. 2) and excavation straddled the northern edge of the Bermondsey eyot (at Long Lane currently at *c.* 3.2m OD) and the Neckinger floodplain (Morocco Street) which is almost one metre lower at *c.* 2.3m OD. An evaluation undertaken immediately to the west of the site at 193–197 Long Lane in October 2004 (Fig. 1) showed similar sequences to those observed in the main investigations.[2]

Geology and paleogeography

The basic palaeo-topography of Southwark and Bermondsey has been established as comprising a series of sand and gravel eyots surrounded by mudflats and dissected by channels and tributaries of the Thames.[3] The Neckinger River seems to have been a braided channel creating a number of fragmentary eyots (Fig. 2), rather than a true tributary of the Thames.[4]

Superficial geology of the Bermondsey eyot at Long Lane is fluvial sands and gravels of the Kempton Park Terrace/Shepperton Gravels deposited during the late Devensian episode, and underlain by London Clay. Episodes of Holocene transgression and regression of the Thames have lead to complexes of alluvial silts and clays interspersed with episodes of local peat formation,[5] especially in riverside and island-edge locations.

Prehistoric activity in the vicinity (Fig. 2)

Isolated Mesolithic finds occur, largely near the edge of the eyots such as at Butler's Wharf,[6] Three Oak Lane[7] and Marlborough Grove.[8] Diagnostic and major finds of Neolithic activity are rare in central London,[9] and the record in the northern Southwark and Bermondsey areas is largely of sporadic and isolated finds, often flints,[10] such as the finds at Hopton Street ,[11] and on the Bermondsey eyot at Alscot Road and Bermondsey Abbey (Fig. 2). Wooden structures and 'platforms' are present on the edge of the Bermondsey eyot at the Bricklayers Arms, while more conclusive evidence of more 'permanent', rather than transitory, activity occurs on the Horselydown eyot from Three Oak Lane where Grooved Ware was recovered.[12]

From the Bronze Age onwards there is evidence of settlement and occupation on the higher ground, at sites in Alscot Road, Bermondsey Abbey, 170 Grange Road and further afield at Hopton Street, while trackways such as that at Bramcote Grove link the eyots and the main land. By the Iron Age, small-scale settlements with pits, postholes and ditches are evident on the Horsleydown eyot (271–283 Tooley Street) and on the Bermondsey eyot (71 Grange Road, Abbey Street/Neckinger and the Cherry Garden Pier), with other sites to the west at Hopton Street and to the east at Platform Wharf (Rotherhithe eyot).

Prehistoric activity at Long Lane

Excavations at Long Lane revealed only one prehistoric feature; a heavily truncated pit (1375) of uncertain function (Fig. 1), containing a single sherd of Iron Age pottery with a sandy fabric, and one sheep/goat bone. Unlike later pits, which surrounded and cut it, this feature was largely devoid of artefacts, suggesting that the prehistoric date may not be misplaced. In keeping with excavations in the rest of the area, a few residual fragments of Late Bronze Age/Early Iron Age pottery were recovered from sandy foreshore and floodplain deposits in trench 1.

Excavated evidence of the geotopography and the Neckinger floodplain

The southern area of the excavation (trench 2) was higher and contained an array of agricultural activity and industrial evidence from the Romano-British to the post-medieval period,[13] cut into gravel at about 1.1m OD. This occupation area is sharply divided from the Neckinger floodplain by an acute break in slope on the northern edge of the island.

This break in slope in the gravel marks the northern edge of the eyot (Fig. 3) and was sectioned in trench B. The weathered gravel edge

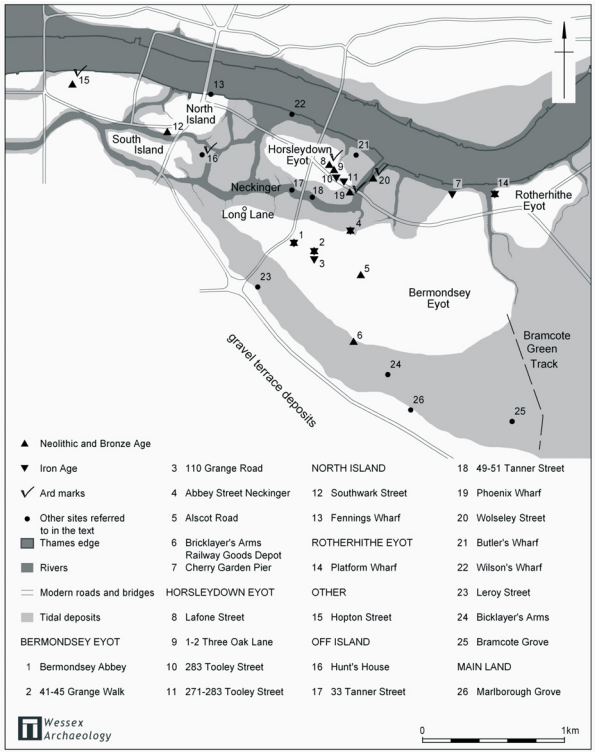

Fig. 2: the geotopography of Bermondsey Eyot, Horselydown eyot, Rotherhithe Eyot, North island and South island (after Proctor and Bishop 2002; Heard 1996)

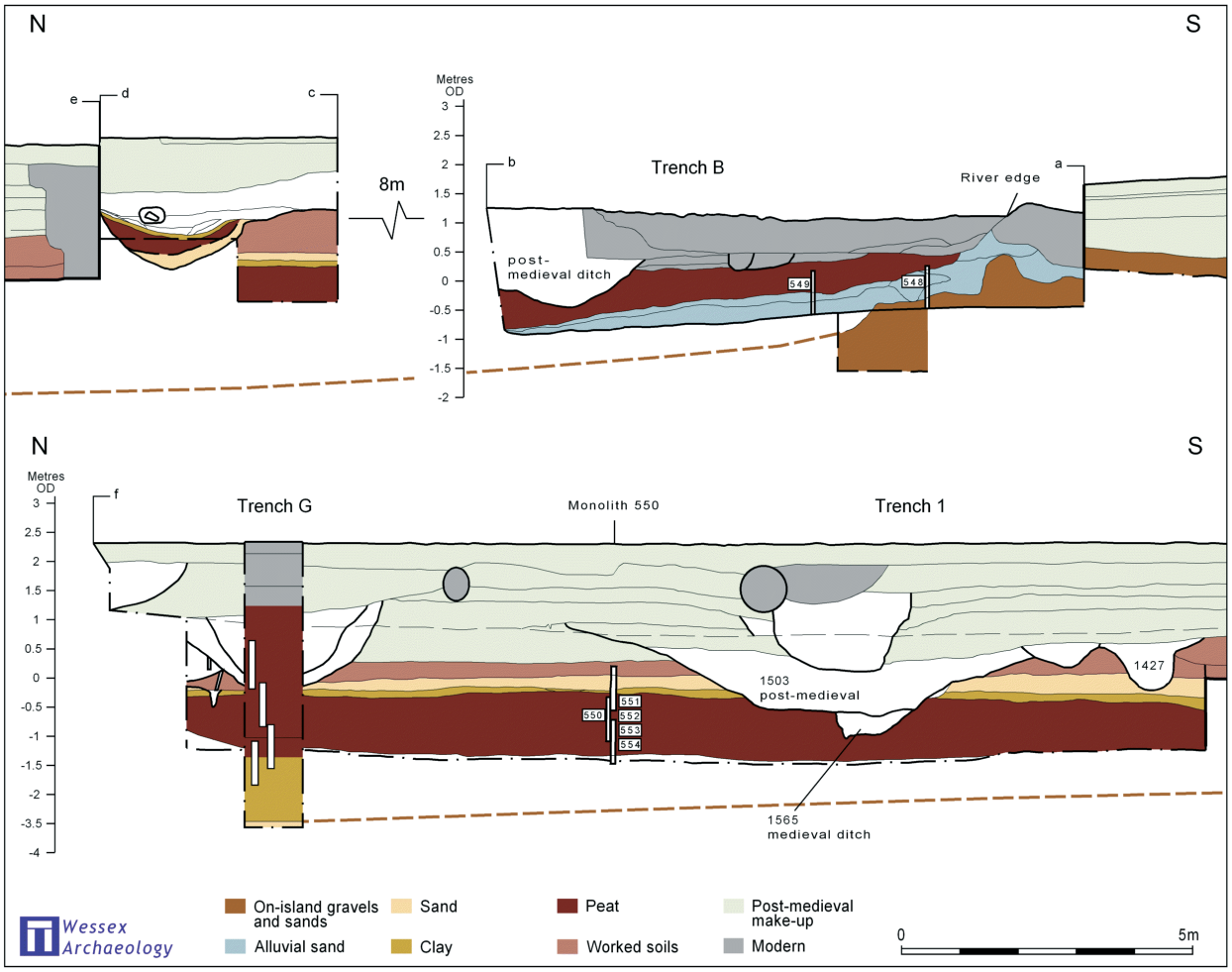

Fig. 3: schematic section of site from Trench Ba to Trench 1(f) via Trench D(d-c)

had been cut almost vertical by the scouring of a former coarse of the Neckinger. The initial deposits against this cut of were loose sands overlain by fine, well-sorted, clean fluvial sand representing flowing water of the Neckinger itself. These sands were washed from the gravel eyots upstream in either the Late Glacial period, as at Butler's Wharf,[14] or in the early Holocene. The very clean sand represents the formation of a highly localised and ephemeral sand bank or bar near the rivers edge. This was overlain by humic silt loam and humic sand loam representing overbank flood deposits and the migration of the Neckinger channel northwards leaving open mudflats, reeds and alder carr. The deposits at this location (trench B) contained physical evidence (pseudomorphs) of rooting, and small water-logged roots and twigs of alder, suggesting the stabilisation of the mudflat by vegetation along the lower edge of the eyot.

The floodplain sequence

The gravel on the floodplain immediately north of the eyot has been recorded at –0.33m OD (trench B) and two trenches at the northern limit of the site (trench 1 and trench G) revealed nearly 4m of floodplain sediment. Basal sand (presumably over gravel) was reached in only one trench. The Holocene floodplain sediments were massive alluvial clays overlain by peats and then humic clays, all of which represent mudflat, floodplain and overbank deposits.

Although the two sequences are in similar topographic locations, trench G revealed *c.* 3.8m of floodplain sediment with sand at its base at *c.* –2.5m OD, but only 1.8m was exposed in trench 1

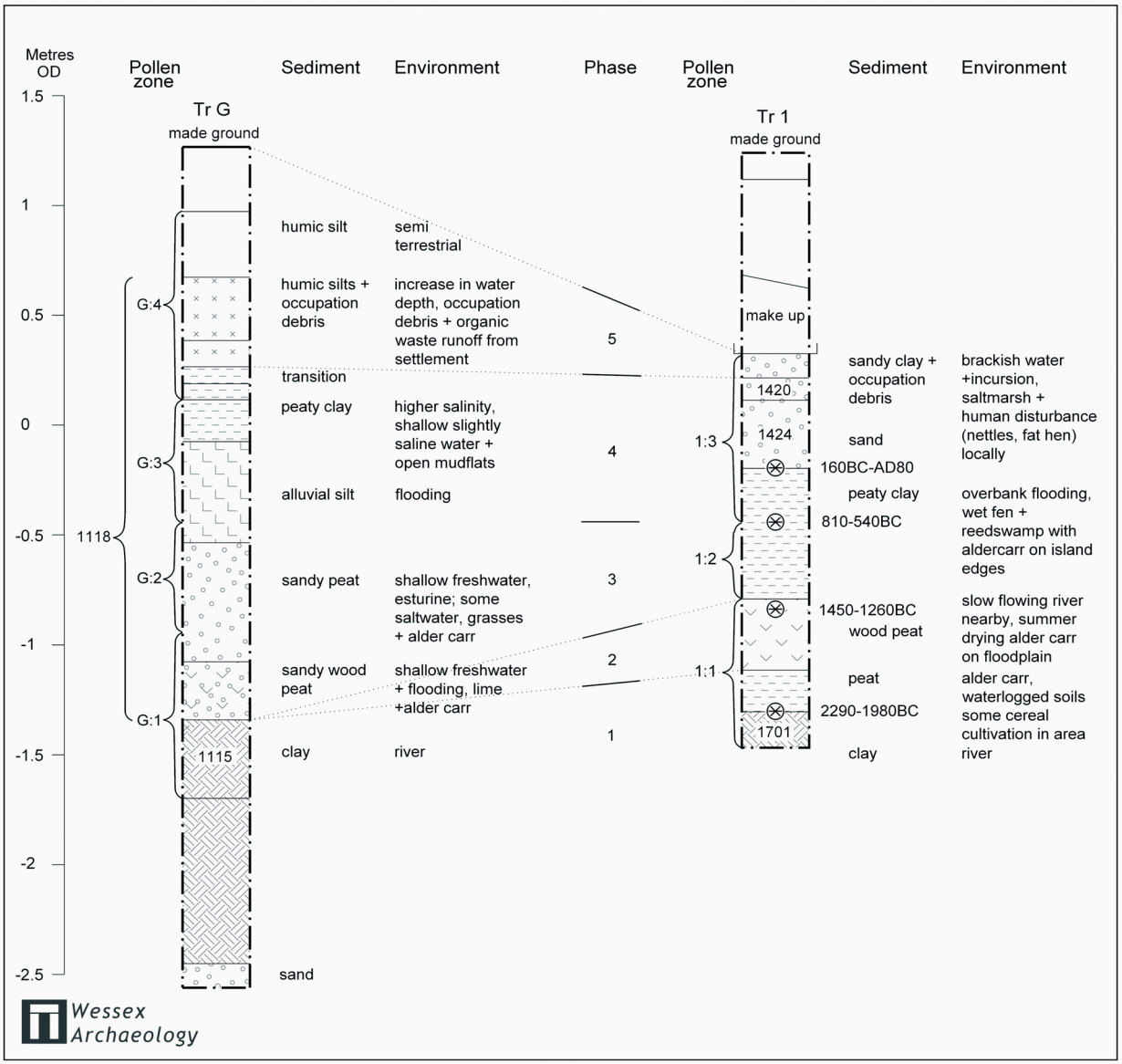

Fig. 4: relationship between monoliths from Trenches 1 and G

and this was not bottomed. These two sequences can clearly be related both sedimentologically and through pollen biostratigraphy (see below and Fig. 4), however, the lower deposits throughout the eastern sequence (Trench G) consistently contained more sand than those in Trench 1, while the upper deposits were more fine-grained. This, and its location, indicate that Trench G was further out in the floodplain and nearer the Neckinger itself, than Trench 1, which explains minor differences within both the sediment sequences and the pollen record of the two sequences.

Both sequences were sampled in overlapping monoliths and assessed for palaeo-environmental data[15]; pollen,[16] diatoms[17] and foraminifera.[18] Assessment and sediment records enabled the direct correlation of the two sequences. Foraminifera were not present in either and diatoms only survived in Trench G. More detailed analysis of pollen[19] and waterlogged plant remains[20] were conducted, and four radiocarbon determinations obtained from the shorter sequence covering the longer time period in

Trench 1. Diatoms were only analysed at crude intervals from Trench G.[21]

OD	*material*	*result no*	δC^{13} ‰
	result BP	*cal date 2 sigma*	
-0.20m	*peat*	NZA-18427	-28.55
	2030±40	160BC–AD80	
-0.49m	alder twig	NZA-19187	-27.48
	2571±35	810–540BC	
-0.84m	alder root wood	NZA-19188	-28.15
	3119±35	1450–1260BC	
-1.29m	*peat*	NZA-18428	-27.86
	3754±45	2290–1980BC	

The excavated sequences shown in Figs 3 and 4 can be summarised chronologically. Over the basal riverine sands the first floodplain deposits are massive fluvial clays the top of which seem to occur at a consistent height of *c.* -1.3m aOD. Towards the eyot, wood peat started to form in Early Bronze Age (2290–1980 cal BC)[22] and developed until 1450–1260 cal BC.[23] This was succeeded by humic peaty clays and silts across the floodplain in the Late Bronze Age and Early Iron Age (810–540 cal BC),[24] being predominantly sandier in Trench G, nearer the river. Evidence of fluvial incursions can be seen with silts and sands occurring from the Late Iron Age and early Romano-British period (160BC – AD50),[25] which equates with the onset of occupation of the eyot at this location.[26]

Down by the riverside; life and the environment on the eyot edge

The archaeological record and environmental analyses now allow comment on the nature of the changing riverside environments, eyots' habitats and prehistoric activity in the vicinity. For simplicity this is summarised and discussed in the five dated time periods ([1] to [5]) which relate to both defined stratigraphic and pollen assemblage zone boundaries (Fig. 4). Given the close proximity of the two sequences examined, both have similar characteristics; however, the minor local differences in the topography and proximity to the river are also apparent in both the sediments and pollen spectra.

1 Neolithic
2 Early Bronze Age – Middle Bronze Age
3 Mid/Later Bronze Age to Early Iron Age
4 Mid Iron Age to Early Romano-British
5 Early Romano-British and later

[1] During the Neolithic period the open estuarine water of the Neckinger/Thames lapped against the edge of the island depositing alluvial clays, while open oak and lime woodland grew on the sandy soils of the eyot. Further afield oak and hazel woodland was more dominant, and it was in this environment that sporadic activity occurred locally at Alscot Road and Bermondsey Abbey (Fig. 2), reflecting the wider picture within the Thames floodplain that also included track-building at Silvertown.[27] There is no evidence of local tillage or cereal cultivation during this period (Fig. 5).

[2a] By the Early Bronze Age (2290–1980 cal BC) the river level had dropped and the channel had migrated north away from the gravel edge of the eyot. Terrestrial and semi-terrestrial conditions were established around the eyot and woody peat developed slowly in the alluvial clay. The floodplain was dominated by alder carr woodland and marshes, and although wet was subject to drying out in the summer allowing the presence of willow and guelder rose. The ground was covered with sedges and other marsh/fen plants such as reed-mace water plantain and royal fern. Oak and hazel woodland with lime existed on the drier parts of the floodplain and on the islands. Small-scale sporadic cereal cultivation or crop processing occurred nearby probably on the drier soils of the eyot. Otherwise, there is little evidence of human activity, but such evidence is under-represented in the pollen spectra here because of the screening effect of the local trees.

[2b] Widespread development of floodplain alder carr communities and changes in the fen-mire habitat of the floodplain were predominantly caused by fluctuations in relative sea level in the North Sea Basin and Thames Estuary. This gave rise to changes in local hydrology with a period of lowered sea level relative to land. By the Middle Bronze Age (to 1450–1260 cal BC), subtle but significant changes in both the local environment and in the patterns of human activity in the area commenced. The Neckinger, now to the north of the excavated area , probably flowed with shallow fresh and brackish estuarine water. Pollen evidence provides unambiguous evidence of clearance both on the floodplain and within the wider landscape. Lime was felled on the drier land, probably reflecting preferential felling for

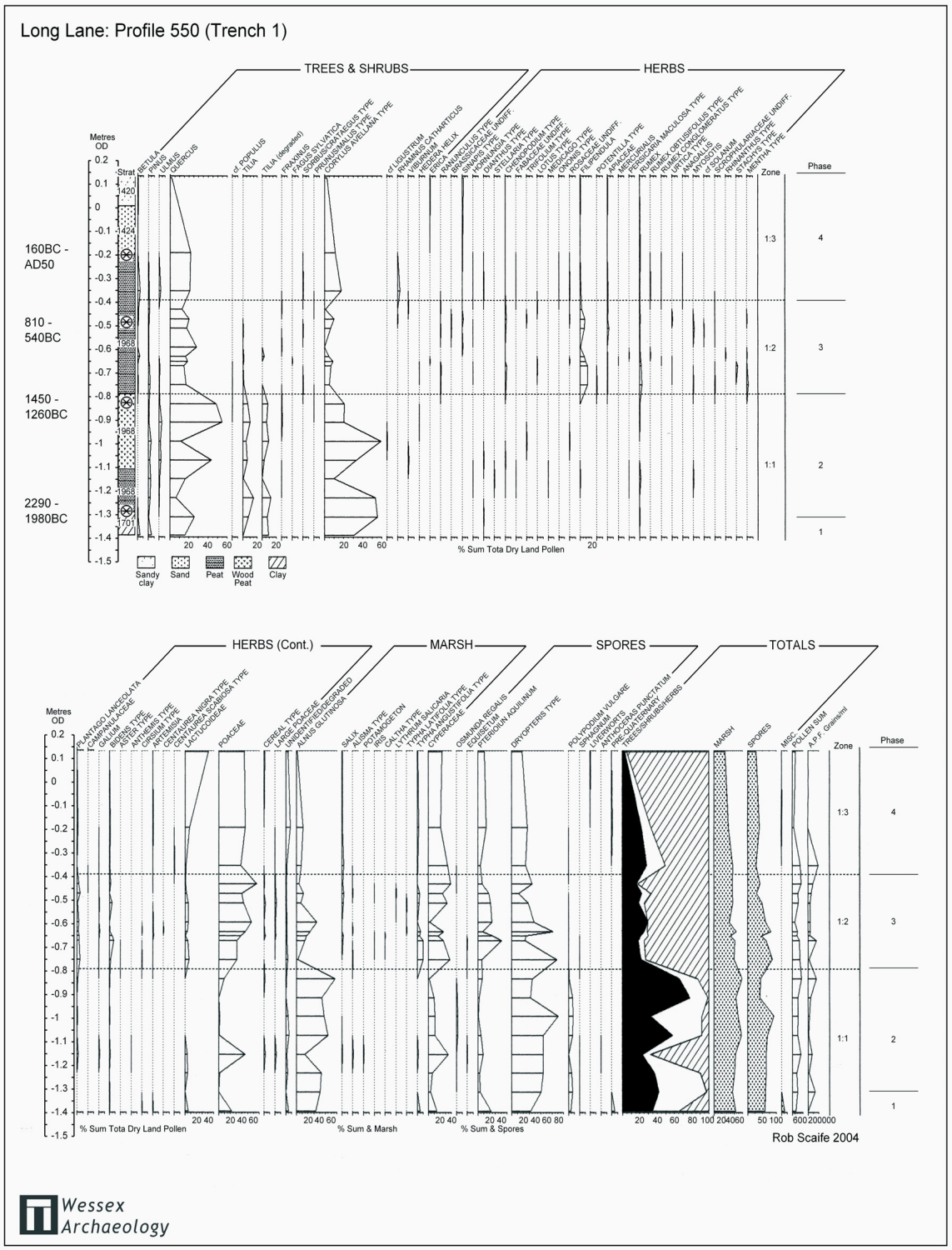

Fig. 5: pollen diagram of the dated sequence from Trench 1 (sequence 550)

its long straight trunks, and is dated here to 1450–1250 cal BC. On the floodplain too, alder carr was thinned and removed leaving open areas of herb-rich communities with grasses and nettles. The clearance on the eyots and modification of the floodplain vegetation relates to the creation of fields and arding on the eyots such as Lafone Street,[28] a transition strengthened by evidence for the expansion of cereal pollen in the later Bronze Age to Early Iron Age as seen here and the region generally.[29] However, there is no evidence of cultivation on the eyot at Long Lane. Some of the clearance may be related to expansion of the floodplain and changing local hydrology combined with more specific clearance of alder carr, making this lowland around the eyot suitable pasture for grazing cattle in the summer and autumn at least. Sloe and hazelnuts growing on the floodplain fringes might have provided food for man and livestock alike.

[3] The Middle to Late Bronze Age period was one of multifarious changes, and it appears from this and other sites that there was a complex relationship between human activity, woodland clearance, local hydrology and sedimentation as well as aspects of regionally changing sea-levels and possibly climate. Clearance in the Middle Bronze Age (see above) included removal and thinning of oak and hazel dominated woods on the eyots and on the heavier soils of the mainland fringing the Thames, and the potential establishment of pasture on the Neckinger floodplain as well as the eyot, and the establishment of fields.

Lime was cut from the woodlands, and field systems were established on the higher ground of the Bermondsey eyot, while evidence of ard cultivation marks are preserved in more peripheral locations and eyot margins where accreting sediments preserve these horizons, such as Phoenix Wharf[30] and Wolseley Street.[31] The overall level of activity is low, suggesting small-scale farming on the eyots and exploitation of the surrounding riverine habitats. Nevertheless, the establishment of fields on the eyots in the area, if not at Long Lane itself, increased runoff and led to changing floodplain conditions that were exacerbated later by changing relative sea levels. By the Early Iron Age (810–540 cal BC) alder grew locally on the floodplain edge against the eyot with more open scrub and bramble and semi-open long vegetation of thistles, docks and plants of wet open grasslands including *Glyceria* sp. on the floodplain.

[4] The changes seen in the later Bronze Age and Early Iron Age, continued through the Iron Age and earlier Romano-British periods. Mid to Late Bronze Age woodland loss and clearance on the flood-plains lead to increased run-off from the eyots and flooding (paludification), and may, in part, relate to the increased sandiness and anthropogenic debris in the upper profiles as well as higher water tables from/during the Early Iron Age onwards. As the floodplain was increasingly subject to flooding, it became open mudflats at the river's edge (Fig. 4, Trench G). These changes in the floodplain hydrology with gradual rises in the relative sea level and increasing activity and runoff from the eyots led to the creation of a wetter, grass-sedge poor, fen which aided an expansion of grasses and reduction of alder carr. This was concomitant with changes in the Neckinger and Thames rivers. The Neckinger flowed with shallow fresh and brackish estuarine water with many emergent plants rather than open water at its edges, and 'organic-rich' water spilled over the floodplain and submerged the local vegetation under alluvial silts. Peats were inundated by sands and organic silts near the eyot and mudflats formed along the Neckinger edge. Thus, the open and thinned alder carr on the eyot edge of the floodplain developed into a wetter fen with typical reed swamp plants including grasses (Poaceae), sedges (Cyperaceae), reed mace (*Typha latifolia* and *T angustifolia*), bur reed, *Iris* and water plantain (*Alisma plantago-aquatica*). Peripheral to this was wet floodplain nearer the river with meadowsweet (*Filipendula ulmaria*), marsh marigold (*Caltha palustris*) and loosestrife (*Lythrum salicaria*). Alder and willow remained fringing the Neckinger and other tributary streams just as areas of alder carr remained further from the Long Lane site.

Similar developments during the Iron Age and Romano-British periods are seen at a number of new sites examined in the Thames floodplain of East London, for example Beckton,[32] Silvertown,[33] Rotherhithe,[34] Bermondsey,[35] other sites within London[36] and further afield at Erith.[37]

This sedimentation occurred partially as a result of, but certainly at the time of, occupation on the northern part of the eyot at Long Lane.[38] Despite wetter conditions beyond the eyot, human activity both on and off eyot is recorded by increases in herbs typical of human disturbance. However, flooding on the wet sedge fen flood-plains led to the concentration of activity on the eyot. Beyond Long Lane itself, light oak and hazel woodland and grasses was the predominant vegetation.

[5] During the Romano-British and later occupation of the eyot, the Thames and Neckinger became progressively more saline with deeper water, eventually becoming highly saline and typical of the Thames estuary we see today. The Neckinger channel was choked with sediment and occupation detritus as a result of increased run-off caused by intensification of human settlement on the eyot. In contrast with other Romano-British sites in the area,[40] the eyot and adjacent flood-plains were essentially open grassland and, despite poor pollen preservation,[39] traces of ash, lime, beech and walnut were recorded. In common with a substantial number of other London sites, however, remaining trees and woodland on drier soils consisted largely of oak and hazel with some beech and ash.[41] The floodplain surrounding the Bermondsey eyot at this stage became a wet floodplain pasture subject to overbank flooding and sediment accretion, comparable with similar environment marginal fen peats at Leroy Street.

Overview and conclusions

Excavations at this ecotonal location sampled both the dryland eyot and the edge of the Neckinger floodplain, providing evidence from Neolithic to Romano-British periods. Alder carr and sedge fen on the flood-plains and open oak and hazel dominated woodland in the Neolithic period provided a range and variety of habitats to exploit, but scarce evidence of this opportunity is seen here. Natural development of wetter flood-plains and clearance of the alder carr in the later Bronze Age provided ideal drying grazing grounds, and this was accompanied by the development of tillage of the eyot edges and sand eyot at Long Lane and the establishment of fields on a number of other sites (Fig. 2). Rising sea levels and flooding of the flood-plains from the Iron Age onwards lead to abandonment of pasture and development of long rank vegetation on the flood-plains, whilst the eyot at Long Lane became idea ground for settlement and then industrial activity in the medieval period.

Acknowledgements

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