AML Report 4004

Site No 568

NEW PALACE YARD: THE PLANT REMAINS FROM A PEAT/CLAY PROFILE EXCAVATED IN THE OLD COURSE OF THE RIVER TYBURN, LONDON.

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Introduction

The pollen samples were collected by Dr S. Limbrey during the excavation, and submitted to J. Greig for pollen analysis. Standard methods were used, although some of the samples had dried so hard that considerable force had to be used to break them up so that the chemicals could do their work. Pollen preservation was not very good at the top of the profile, hence the low counts. The pollen counting was done in 1975-7, and were checked in 1984 by locating the grains recorded as of dubious identity. Further traverses were scanned on all slides to see if any taxa had been missed.

The pollen diagram

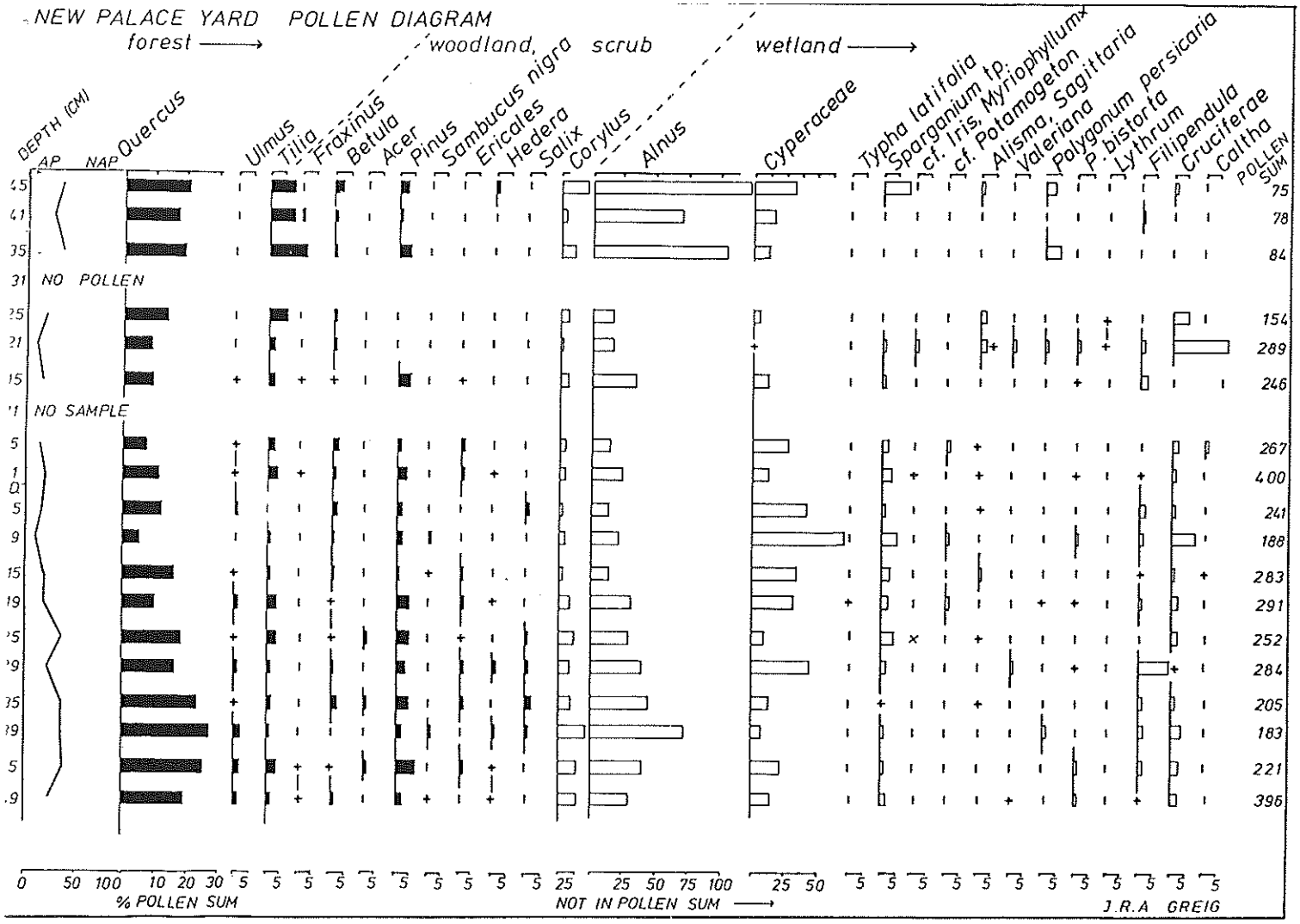
The pollen diagram is in two parts, setting out the results in approximate ecological groups representing more or less distinct kinds of vegetation. The first part shows tree, woodland and wetland vegetation, the second shows grassland, arable, and herb and spore records representing various habitats. Within these vegetational groups the pollen types are listed in reverse taxonomic order (Clapham, Tutin & Warburg 1981), which combines botanical logic with a neat layout. The pollen percentages used are calculated from the pollen sum of each sample. The sum used is the total land pollen (except Corylus), and the pollen records that form part of the sum are drawn in black. Wetland plant and spore records, not in the pollen sum, are drawn in white. The samples are given in depths in cm. relative to ordnance datum, which is the system used for recording the sediments at this site.

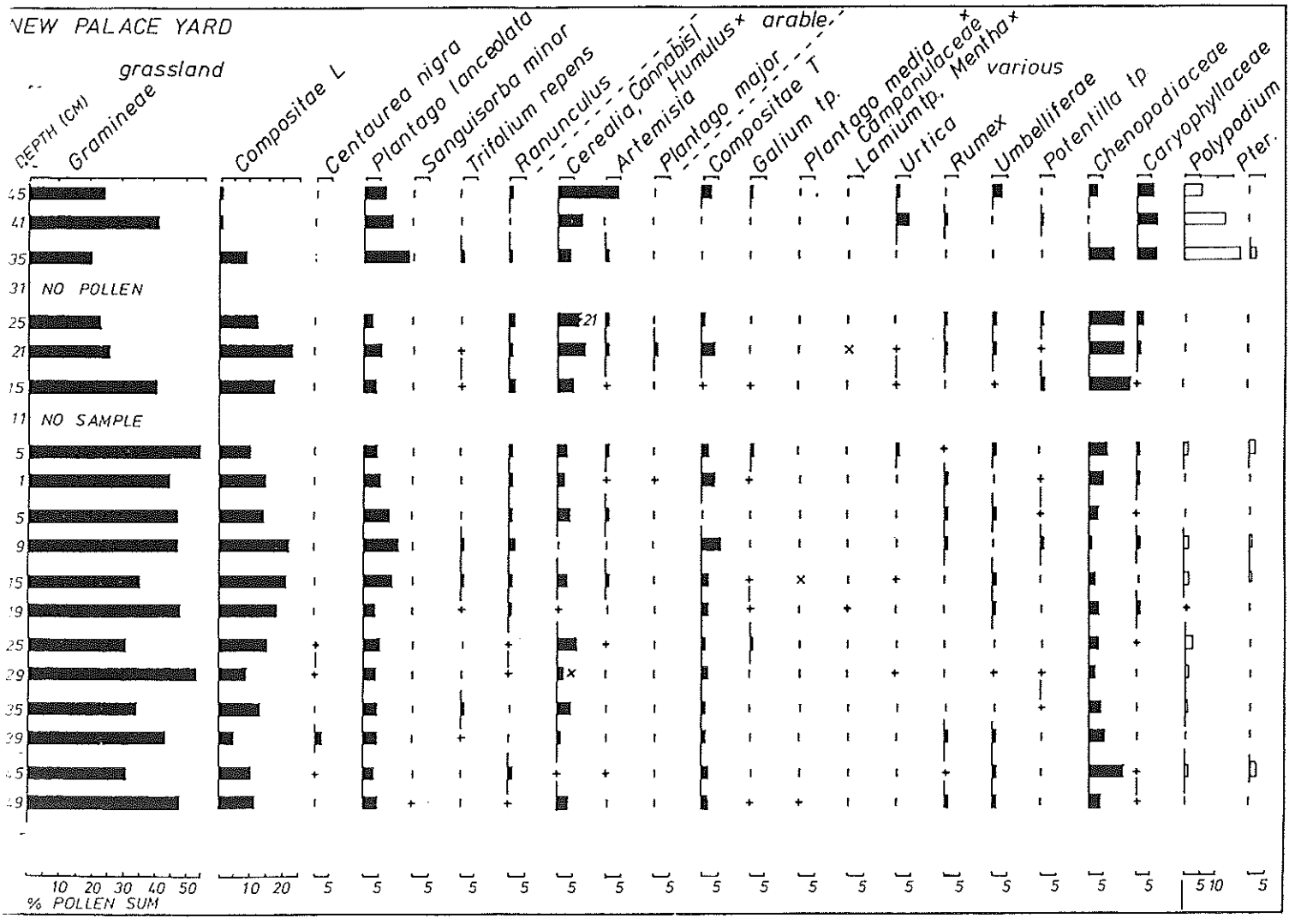
Results

The pollen diagram has one basic pollen assemblage zone, although there is a slight increase in representation of some aquatic taxa between -19 and +5. It is best interpreted with reference to the macrofossil results obtained by Arthur and Paradine, as these provide valuable additional information.

FOREST

Quercus (oak), Ulmus (elm) and Tilia (lime) are considered as forest trees because they were the main constituents of the fully developed Atlantic forest. The importance of their pollen in a diagram such as this may be some indication of the amount of forest remaining in the area at this time, although of course they could also have grown in managed forest, regenerated woodland and in hedgerows. The fact that there is around 20% of the pollen from the forest trees (compared with 95% for a pollen site set in the wildwood, like Hampstead Heath (Greig, in press) shows that the area was not greatly afforested, hardly surprising for lowlands during the Iron Age. However, results from occupation sites of this


NEW PALACE YARD POLLEN DIAGRAM
forest
woodland, scrub
wetland
DEPTH (CM)
AP
NAP
Quercus
Ulmus
Tilia
Fraxinus
Betula
Acer
Pinus
Sambucus nigra
Ericales
Hedera
Salix
Corylus
Alnus
Cyperaceae
Typha latifolia
Sparganium tp.
cf. Iris, Myriophyllum
cf. Potamogeton
Alisma, Sagittaria
Valeriana
Polygonum persicaria
P. bistorta
Lythrum
Filipendula
Cruciferae
Caltha
POLLEN SUM
45
41
35
31 NO POLLEN
25
21
15
11 NO SAMPLE
5
1
0
5
9
15
19
25
29
35
39
5
9
75
78
84
154
289
246
267
400
241
188
283
291
252
284
205
183
221
396
0 50 100 10 20 30 5 5 5 5 5 5 5 5 5 5 25 25 50 75 100 25 50 5 5 5 5 5 5 5 5 5 5 5 5
% POLLEN SUM
NOT IN POLLEN SUM
J.R.A GREIG


NEW PALACE YARD
grassland
arable
various
DEPTH (CM)
Gramineae
Compositae L
Centaurea nigra
Plantago lanceolata
Sanguisorba minor
Trifolium repens
Ranunculus
Cerealia, Cannabis?
Artemisia, Humulus×
Plantago major
Compositae T
Galium tp.
Plantago media
Campanulaceae
Lamium tp., Mentha×
Urtica
Rumex
Umbelliferae
Potentilla tp
Chenopodiaceae
Caryophyllaceae
Polypodium
Pter.
45
41
35
31 NO POLLEN
25
21
15
11 NO SAMPLE
5
1
5
9
15
19
25
29
35
39
5
9
21
10 20 30 40 50 10 20 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 10 5
% POLLEN SUM

time like Fisherwick and Tattersall Thorpe have values around 5% or less forest tree pollen, so this was not a completely cleared landscape either. There is, as usual, no macrofossil evidence of forest vegetation.

WOODLAND AND SCRUB

This group includes many taxa which were present in the original wildwood, although they were relatively unimportant until forest clearance opened the forest canopy and allowed some to spread, like Fraxinus (ash) and Betula (birch). Others seem to have been encouraged by the higher nutrient levels associated with human activities, like Sambucus nigra (elder), seeds of which were also found. Seed records of ?Rubus fruticosus (possible bramble), Cornus sanguinea (dogwood) and Atropa bella-donna (deadly nightshade) add to the picture of scrub obtained from the pollen records.

HEATHLAND

The Ericales (heathers etc.) record in the pollen diagram, and possibly also that of Pinus (pine) is suggestive of heathland. This would not have grown in the wet area immediately around the site, but the sand and gravel eyots might have provided suitable habitats at no great distance. The signs are less than those found at Hampstead Heath (Greig, in press).

WETLAND

This vegetation group includes plant communities of damp ground, of banksides and the aquatic plants floating in standing or slow running water. Some of the wetland taxa can be recognised as such from the pollen records alone, while in a number of cases the macrofossil records show that at least a proportion of certain pollen records, such as Cruciferae, Umbelliferae and Caryophyllaceae, is likely to have come from wetland, as set out in table 1. Many of these plants are in the Phragmitetalia community (Ellenberg 1982), and although Phragmites was not actually identified, it is likely that at least part of the Gramineae pollen is from wetland grasses of this community. Sediment profiles like this usually show a range of plant communities in addition to the Phragmitetalia, some of wetter habitats like the true aquatics like the possible Potamogeton (pondweed) and Myriophyllum (millfoil), and those of less damp ground like Filipendula (meadowsweet) and Caltha (kingcup). This is probably the result of natural dispersal, the effects of floods and the activities of waterfowl. What is not usually seen is the hydrosere whereby a wetland community changes to a drier one, because at a certain stage the ground is no longer wet enough for the evidence to still be preserved.

NEW PALACE YARD SEED LIST by J.R.B. Arthur & P.J. Paradine, rearranged in taxonomic order, with nomenclature updated. * = fragments.

	1	2	3	4	5	11	14	15(0)	15(2)	17	18	22	24	25	26	27	29
Ranunculus repens	177	6	-	1	2	*	14	17	7	2	3	7	1	-	-	-	1
R. sceleratus	4	-	-	-	-	-	-	9	14	-	-	-	-	-	1	-	-
R. hederaceus	-	-	-	-	-	-	3	1	2	-	-	-	-	-	-	-	-
Fumaria sp.	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Brassica sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Capsella bursa-pastoris	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Nasturtium officinale	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Myosoton aquaticum	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
Chenopodium album	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Atriplex patula	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Rubus caesius	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
R.?fruticosus	-	-	2	16	2	7	*	4	*	-	7	-	7	*	*	2	-
Cornus sanguinea	-	-	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-
Apium nodiflorum	-	-	-	-	-	1	28	65	27	1	1	-	5	-	1	1	2
Polygonum aviculare	-	-	-	-	-	-	1	-	16	-	-	-	-	-	-	-	-
P. persicaria	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	-
P. hydropiper	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rumex acetosella	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Atropa bella-donna	1	1	-	-	-	-	-	-	-	-	-	-	1	-	4	-	-
Mentha aquatica	3	1	-	-	-	5	1	7	2	-	-	-	-	-	-	-	-
Stachys palustris	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Galium spp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-
Sambucus nigra	*	-	*	11	22	7	*	7	*	-	*	-	6	-	2	1	1
Dipsacus fullonum	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Cirsium arvense	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Sonchus asper	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Juncus sp.	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carex sylvatica	2	5	3	-	2	30	4	-	-	-	-	-	1	-	2	-	-
C. riparia	2	-	-	-	-	5	-	-	-	1	-	-	-	-	-	-	-
C. pendula	-	-	-	-	-	-	-	-	2	-	1	1	1	-	1	-	-
Carex sp.	-	*	*	-	-	-	4	2	-	1	-	*	-	*	-	1	-

Wetland pollen	seed record	
Alnus	-	
Cyperaceae	Carex species	
Typha latifolia tp.	-	
Sparganium tp.	-	
cf. Iris	-	
cf. Potamogeton	-	aquatic
Sagittaria	-	
Alisma	-	
Valeriana	-	
Mentha tp.	Mentha aquatica	
Polygonum persicaria tp.	-	
P. bistorta tp.	-	
Umbelliferae	Apium nodiflorum *	
Myriophyllum	-	aquatic
Lythrum	-	
Filipendula	-	
Caryophyllaceae	Myosoton aquaticum *	
Cruciferae	Nasturtium officinale *	
Ranunculus tp.	Ranunculus hederaceus *	
" "	R. sceleratus *	
Caltha tp.	-	

* = possible correlation between seeds and at least part of pollen record

TABLE 1

There is a concentration of aquatic records between samples -19 and +5 which may be a sign of more flooding or higher water levels, in which pondweed and millfoil would be favoured, together with the watercrowfoot found as a macrofossil. The molluscs

GRASSLAND

As already mentioned, not all of the Gramineae (grass) pollen may be representative of dry grassland, although there are enough signs of non-aquatic grassy vegetation for it to be likely that at least part of this record represents mesotrophic grassland. Centaurea nigra (knapweed), Plantago lanceolata (ribwort plantain) Sanguisorba minor (lesser burnet) and Trifolium repens (white clover) are all good indicators of grassland. Compositae (Liguliflorae) records have been regarded as indicators of grassland even though the only seed record from this group is of a weed, Sonchus (Greig 1982). The Ranunculus pollen was mainly that of the dry land buttercups, such as R. repens which appears in the seed record, although this buttercup has various habitats. Grassland usually shows up better in pollen than in seed records.

ARABLE LAND

The main sign of arable land is from the Cerealia (cereal) pollen record, which seems to be distinct from that of the rather large pollen grains of some wetland grasses. Weed pollen records are often difficult to assign to habitat precisely enough to be sure of detecting weeds of arable land. On the pollen diagram Artemisia (mugwort) and Plantago major (hoary plantain) have been put in the arable category, and some of the records listed under 'various' could also represent this group. The macrofossils do not add much further information, apart from the presence of some weeds like Fumaria (fumitory) and Capsella bursa-pastoris (shepherd's purse) which do certainly occur in arable land, although elswhere as well. Brassica (cabbage etc.) is another possible crop, and the Cannabis/Humulus pollen record might also indicate the cultivation of hemp.

Discussion

These results can be set in context when compared with those from other sites in the area. Devoy's (1979) work on the Thames Estuary provides many pollen diagrams that give a background to vegetational history, while the Hampstead Heath results (Greig in press) allow this to be compared with the higher and drier ground from which there may have been some pollen transport by the river Tyburn down to New Palace Yard. Somewhat similar profiles to New Palace Yard have been investigated at Cromwell Green (Greig, unpublished) and at Broad Sanctuary (Scaife 1982), while the general question of river channel movements has been discussed by Nunn (1983).

The wet sediments caused by transgressions of the Thames have preserved a record of the development of local alder carr (from about 8000 bp) and regional mixed lime forest in the Thames valley, with subsequent signs of human activity seen in elm declines and the appearance of cereal pollen. The New Palace Yard results match the corresponding part of these sequences well, although lacking the richness of pollen flora (Fagus, Viburnum, Euonymus, Cornus, Rhamnus)although Cornus sanguinea seeds were found at New Palace Yard.

The results from Hampstead Heath show how the forest was cleared and replaced in part by heathland and holly woods. The heathland shows up at New Palace Yard to a slight extent, but the holly, perhaps from poorer pollen dispersal, does not. There is scarcely any sign of either Ericales or Ilex pollen in the Thames Estuary pollen diagrams, perhaps because there were no suitable areas for it in the flat lower reaches of the Thames.

A slightly surprising absentee is Fagus (beech) which appears at different times at various sites, present in rather small amounts at sites like Hampstead Heath

but not found at New Palace Yard, although present at the somewhat later deposit at Cromwell Green along with Carpinus (hornbeam) and Juglans (walnut) (Greig, unpubl.). The later date of the Cromwell Green deposits is shown by the presence of Centaurea cyanus (cornflower) pollen, which seems to appear (or become common) after about 1200 AD, and walnut pollen records are likewise known from this time onwards in Britain (e.g. Colledge 1979).

Deposits found at Broad Sanctuary are still later in date, 15/16th century AD. The pollen flora (Scaife 1983) includes more crop plants both in quantity (of Cerealia pollen) and in the number of taxa, including Cannabis (hemp), Linum bienne type (probably cultivated flax) and Fagopyrum esculentum (buckwheat) and Juglans (walnut). Here, the presence of parasite ova indicated one source of the pollen to be from sewage, and a range of other rubbish is likely to have been the source of much of the pollen, only a proportion coming from the atmosphere.

Conclusions

The deposits at New Palace Yard formed in a marsh associated with the River Tyburn, where the natural environment consisted of a range of mainly wetland vegetation including alder carr. On dry land there still remained some mixed forest, and the cleared landscape had a mixture of grassland, arable land and some heath. The results fit in with the others obtained for this area.

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