Plant remains from Moorgate and Finsbury (XSP10 and XRZ10)

91 to 109 Moorgate, in the City of London, EC2 (XSP10) and Finsbury Circus gardens (XRZ10)

Anne Davis

August 2015

1 Period **2.1** (early Roman)

1.1. Open Area 2

Three samples from channel fills [29]{14} and {15} and [31]{12} on XRZ10 produced generally similar assemblages of waterlogged plant remains. These included relatively few remains of the aquatic and wetland plants that might be expected from channel deposits, although all three produced quite high numbers of seeds from blinks (*Montia fontana*), a species not seen in other samples from these sites and typical of places wet in winter but subject to seasonal drying. Seeds of celery-leaved crowfoot (*Ranunculus sceleratus*), and occcasional aquatic invertebrates in the form of cladoceran ephippia (waterflea eggs) and cladoceran (caddis fly) larval cases, were each seen in two of the three samples and reinforce the picture of a seasonally water-filled channel.

The largest numbers of identified taxa, however, came from dry-ground plants of disturbed (including cultivated) habitats and grassy places. Seeds of hawkbit (*Leontodon autumnalis/hispidus*), self-heal (*Prunella vulgaris*), lesser stitchwort (*Stellaria graminea*), buttercups (*Ranunculus acris/repens/bulbosus*) and wild grasses (Poaceae) suggest the presence of managed meadows or pastures, and cultivation may be indicated by weeds such as parsley piert (*Aphanes arvensis*) and fumitory (*Fumaria officinalis*). The latter is perhaps supported by the presence of four glume bases from spelt wheat (*Triticum spelta*) in [29]{15}, possibly from a crop growing nearby. These interpretations correspond well with that from the insect remains in [29]{15}, which also suggest 'open ground, perhaps including grassland used as grazing land, and possibly human activity'. Virtually no botanical evidence of waste dispsal was recovered from the channel samples, with the exception of a single grape (*Vitis vinifera*) pip in [31]{12}.

Samples from a channel fill at BDC03, a little to the north, gave a picture of a much wetter environment at this period with a more permanently water-filled channel, with muddy or marshy margins, likely on that site (Davis in prep).

2. Period 2.2 (AD 120–160)

1.1 Open area 3

Plant assemblages were analysed from three XSP10 samples: [96]{22}, from silt thought to be formed from flooding, [149]{32} from a fill of a truncated ?quarry pit and [110]{24} from the upper fills of ditch [114]. Sample {24} produced a large organic flot, containing much plant epidermis and other vegetative tissue while the other samples produced only small flots. Seeds from the three samples were generally similar however, with all characterised by abundant remains from aquatic and wetland environments, comprising almost 40% of the identified taxa, with a smaller range of plants from disturbed, mainly waste ground habitats. The most abundant wetland remains in all three samples were seeds of crowfoots (*Ranunculus subgen. Batrachium*), water-plantain (*Alisma* sp.), sedges (*Carex* spp.) and celery-leaved crowfoot (*Ranunculus sceleratus*), with fool's watercress (*Apium nodiflorum*) and golden dock (*Rumex maritimus*) occurring in two of the three samples. These plants may grow either in shallow water or in adjacent marshy or muddy areas. Seeds of pondweed (*Potamogeton* sp) in sample {24} and stonewort oogonia (*Chara* sp.) in {22} and {24} represent fully aquatic plants which grow submerged or floating in bodies of water.

The majority of the dry-ground plants taxa were from plants requiring high soil nitrogen levels, such as red/glaucous goosefoot (*Chenopodium rubrum/glaucum*), common chickweed (*Stellaria media*) and stinging nettle (*Urtica dioica*). No evidence of cultivated plants was seen among the waterlogged plant remains, but an assemblage of charred crop-processing waste was found in [149]{32}. This was composed mainly of cereal chaff from spelt wheat (*Triticum spelta*), including spikelet forks, glume bases and unidentifiable wheat glume fragments. The assemblage included only a very small number of cereal grains, and relatively few weed seeds, most of them from large-seeded brome grass (*Bromus* sp.).

The conclusions to be drawn from these assemblages are that the area was substantially wetter than that represented by the XRZ10 samples from period 2.1, with some still or slow-flowing water present, at least in ditch [114], as well as marshy or muddy ground. There was still very little evidence of human activity in the form of dumping, although the crop-processing waste from pit [153] indicates either domestic or agricultural activity in the area.

This mix of wet and dry-ground plants is similar to that found from channel fills, ditches and flood deposits of the same period at ENS03 and BDC03 (Davis, in prep), but with more evidence of dumping from those sites. While there were evidently flood-prone water-filled channels in the 2nd century, dry ground seems also to have been present nearby.

3. Period 2.3 (late Roman?)

1.2 Open area 4

In a sample from flood deposit [142]{31} seeds of wetland plants showed an increase to almost 50% of the identified taxa. Many of these seeds were particularly abundant, with those of golden dock (*Rumex maritimus*), crowfoots (*Ranunculus* subgen. *Batrachium*), and celery-leaved crowfoot (*Ranunculus sceleratus*) particularly numerous. These, and others found in smaller numbers, can live in shallow water, at the edges of ponds, ditches and streams, or in marshy ground, and seeds of pondweed (*Potamogeton* sp.) and duckweed (*Lemna* sp.), as well as stonewort (*Chara* sp.) oogonia confirm the presence of areas of standing or flowing water.

As in the samples from the previous period seeds of red/glaucous goosefoot (*Chenopodium rubrum/glaucum*) were abundant, but other dry-ground species were limited to small seed numbers of a limited range of cultivated and/or waste ground taxa, with a single fig (*Ficus carica*) seed and a little charcoal the only indications of human activity.

If this sample is representative of the area it would seem that the wetland had increased significantly by this period, with areas of dry ground, and hence human activity, more limited.

4. Period 3 (post-Roman)

4.1. Open Area 5

Two samples, [45]{14} and [13]{6}, were analysed from marsh deposits on XSP10 and one, [15]{6}, from XRZ10. All three sample flots were dominated by large amounts of vegetative material, most apparently epidermis from plant roots and stems. Sample {14} also contained a large amount of moss. As in the sample from period 2.3 all the seed assemblages were dominated by aquatic and wetland plants, and although they had much in common there were some differences in the species recovered from each sample, presumably related to the precise location from which they were taken. Of the aquatic plants all samples included seeds of pondweed (*Potamogeton* sp.) and crowfoots (*Ranunculus* subgen. *Batrachium*), while [45]{14} had very many seeds of water star-wort (*Callitriche* sp.). All these are plants rooted under water with submerged or floating leaves. Sample [15]{6} from XRZ10 was the only sample to contain seeds of soft hornwort (*Ceratophyllum submersum*), horned pond-weed (*Zannichellia palustris*) and duckweed (*Lemna* sp.), a combination which is characteristic of the *Ceratophylletum submersi* plant community (Rodwell 1995, 43). This is typical of the vegetation found in sluggish, often stagnant pools and ditches.

All three samples also contained a wide variety of plants which live in or beside shallow water and on marshy ground, including several from the *Bidention tripartitate* community which grow on mud left where water recedes in summer (Ellenberg 1988, 612). These plants require nitrogen-rich soil such as that formed from manuring or other organic dumping, suggesting that the area may have been receiving run-off from arable land or pastures. Abundant evidence of the aquatic nature of the site at this time was also seen in invertebrate remains from the samples. Freshwater molluscs from [13]{6} and [15]{6} indicated the presence of still or slow-flowing water (A.Pipe *pers comm*), and insects from [15]{6} were also characteristic of very wet conditions, with aquatic beetles and a water boatman (Corixidae) accounting for about half of the assemblage. All three samples also contained fragments of larval cases from caddis flies (Trichoptera) and resting eggs of water fleas (Cladoceran ephippia), both aquatic insects.

As in the period 2.3 sample, dry ground plants were rare in all three samples, and no trace was seen of foods or other cultivated plants, apart from occasional blackberry (*Rubus* cf. *fruticosus*) seeds, which are almost certainly from wild plants.

All three samples indicate that the increasing wetness seen in period 2.3 continued into this period, resulting in an inhospitable area of marshland with pools and/or slow-moving streams of possibly stagnant water. It is likely that some the higher areas dried out in summer, leaving vegetation-covered mud banks. There is no biological evidence for human activities on the marsh at this time, though it is likely that areas immediately upstream were used for agriculture or grazing.

Medieval marsh deposits from ENS03 and BDC03 contained a very similar range of aquatic and wetland plants, though parts of this area were evidently more accessible, with charred and waterlogged food remains recovered from a pit and refuse dump on ENS03.

5. Period 4 (late medieval)

5.1. Open Area 6

A clear reduction in both the range of species and the numbers of seeds from aquatic and wetland plants was seen in two samples, [14]{7} and {8} from a XRZ10 marsh deposit. While low numbers of these plants indicate the continuing presence of water in ditches or pools, and of seasonally wet areas, a big increase in the range of dry-ground taxa suggests that much of the area had been successfully drained by this time. Despite coming from the same context the two samples showed very different emphases in their botanical components. Sample {7} contained large numbers of seeds from disturbed ground habitats, including cultivated and waste ground, a smaller number from grassland plants and occasional seeds from a number of foods and other cultivated plants, including fig (*Ficus carica*), beet (*Beta vulgaris*), black mustard (*Brassica nigra*), hemp (*Cannabis sativa*) and, more unusually, a seed of *Allium* sp. (onion, leek, garlic etc). These remains, together with finds of leather, clinker, fish bone and marine molluscs indicate that this part of [14] contained a strong element of domestic dumping as well as seeds from the local environment, a conclusion also drawn from the insect assemblage.

Sample {8} was dominated by compressed layers of plant stems, apparently including cereal straw, and seeds of meadow/pasture plants such as hawkbit (*Leontodon autumnalis/hispidus*), yellow-rattle (*Rhinanthus sp.*), self-heal (*Prunella vulgaris*), meadow-sweet (*Filipendula ulmaria*), ox-eye daisy (cf. *Leucanthemum vulgare*) and wild grasses (Poaceae). Seeds of characteristic arable weeds including shepherd's needle (*Scandix pectin-veneris*), corncockle (*Agrostemma githago*), cornflower (*Centaurea* cf. *cyanus*), common hemp-nettle (*Galeopsis tetrahit*) and stinking chamomile (*Anthemis cotula*) were also present, as were caryopses of cereals or large grasses. This combination, and also the presence of animal hair in the sample, strongly suggests that it consists largely of stable refuse, including manure from grazing or hay-fed livestock as well as straw for bedding. Very little sign of domestic dumping was seen in sample {8}, with only one fig (*Ficus carica*) seed and very occasional coriander (*Coriandrum sativum*), though some leather offcuts were seen.

Deposit [14], therefore, seems to have received various sorts of dumped material, as well as a large assemblage of wild plant remains representing the local environment.

A further sample, from ditch fill [139]{30} on XSP10, was seen at assessment and recorded seeds came almost entirely from waste and other disturbed-ground habitats, with very few wetland plants. Occasional cereal caryopses, seeds of fig (*Ficus carica*), grape (*Vitis vinifera*), hemp (*Cannabis sativa*) and beet (*Beta vulgaris*) fruits indicate very limited dumping of waste from a variety of domestic activities.

2 Discussion/conclusions

Samples from the early Roman period 1 indicated an open environment, probably used for grazing and agriculture, but with little sign of direct human activity, and with the OA2 channel likely to have contained water only seasonally. A definite increase in wetness was seen in OA3 samples from the 2nd century AD (period 2.2), which appeared to indicate the presence of marshy ground and water-filled ditches. This had increased further by the late Roman period (2.3) (though only one sample was analysed from this period), and continued during the medieval period 3, with an increase in remains of plants rooted under water and a decrease in dry-ground taxa. The first significant signs that drainage of the area had been successful occurred in period 4, where signs of human activity in the form of dumping were seen again.

Unfortunately the samples from the two parts of the site were not evenly distributed between periods, with almost all the XRZ10 samples from the early Roman and postmedieval periods and all the XSP10 samples from the later Roman and medieval phases. It is difficult to know, therefore, whether perceived differences in plant assemblages are related to chronological changes or to locational differences, particularly as these groupings also correspond to the periods most likely to have seen change in water levels. If the site differences are ignored however the plant assemblages appear to paint a clear picture of gradually increasing wetness from the 2nd century AD until the medieval period, with subsequent drainage and increased use of the area during the post-medieval period.

Remains of plants which grow along water-margins, on wet soils and in seasonally flooded areas were found in samples from all periods, as might be expected in this area, crossed by streams flowing into the Walbrook tributaries. In period 2.1 they were greatly outnumbered by seeds from dry land species but from period 2.2 onwards both numbers and diversity of wetland taxa increased. The second century AD (P 2.2) samples also included remains of some plant taxa found most characteristically in fully aquatic habitats, where they may be rooted in the mud or floating, submerged or on the water surface. These increased in the sample from 2.3 and were most abundant in medieval period 3. In the post-medieval period 4 samples these remains decreased to a similar level to that seen in the early Roman period. All these remains indicate a very wet environment on the site during Periods 2.3 and 3, with streams, pools and water-filled ditches dominating the landscape, and rarely drying out significantly in summer.

Many of the wetland and drier-ground plants found in the samples from all periods and features, are characteristic of highly nitrogenous environments. For example celeryleaved crowfoot (Ranunculus sceleratus), water-plantain (Alisma sp.), fine-leaved waterdropwort (*Oenanthe aquatica*), water pepper (*Persicaria hydropiper*) and golden dock (Rumex maritima) are found in more or less eutrophic conditions, in which dissolved nutrients including nitrogen have built up in the water, resulting eventually in pollution. This can come from rotting organic material of anthropogenic origin, dumped in or close to the water but can also occur naturally as a result of the accumulation of rotting leaves and other plant material. The most ubiquitous and abundant of the dryer ground species from the site, such as stinging nettle (Urtica dioica), hemlock (Conium maculatum), red/glaucous goosefoot (Chenopodium rubrum/glaucum), elder (Sambucus nigra) and white horehound (Marrubium vulgare) are also characteristic of highly nitrogenous situations, though very little direct evidence was seen in any of the Roman or medieval samples for the dumping of organic waste, such as that from sewage, industry or stabling. It is possible that areas of relatively dry waste ground and perhaps cultivated land may have been present on the better-drained parts of the site even during the later Roman and medieval periods, enabling grazing or cultivation to take place on seasonally dry areas. The resultant manuring could have caused a run-off of nutrients into the channels and ditches. There is hard evidence for these activities during the early Roman period. Many of the dry-ground plants recorded are fast-growing annuals, which complete their life cycles in only a few months, and seasonal lowering of the water-table would have also provided an opportunity for their growth in areas that may have been water-saturated in the winter months.

Although some wood fragments were seen in the majority of samples, no evidence of trees was found in the seed assemblages, apart from elder (*Sambucus nigra*) which was found in all periods and may indicate some scrubby vegetation, although elder seeds can be widely distributed in bird dung and they are ubiquitous in London samples. A single seed of holly (*Ilex aquifolium*) was found from period 4, but the site seems to have been quite open in all periods.

Evidence for grassland habitats, including managed meadows and/or pastures was found in samples from periods 2.1 and 4 in the form of seeds from hawkbit (*Leontodon autumnalis/hispidus*), sheep's sorrel (*Rumex acetosella* agg.), self-heal (*Prunella vulgaris*) and lesser stitchwort (*Stellaria graminea*), while the more ubiquitous buttercups (*Ranunculus acris/repens/bulbosus*) and wild grasses (Poaceae) were recovered from all periods.

Although the majority of the dry-ground taxa tend to be characteristic of disturbed environments, the single example of charred crop-processing waste dumped in a period 2.2 quarry pit was the only definite evidence for human activity on the site from the second century AD until the post-medieval (P4) samples, containing domestic food waste and stable refuse.

Sites downstream from Moorgate, and inside the Roman and medieval city, such as Copthall Avenue, show a similar pattern of increasingly wet conditions in the later Roman periods, (de Moulins 1990, 85-115), but the samples contained a wider range of plants than the current sites, with substantial numbers of dry-ground plants and food remains from all the Roman phases, in addition to the wetland indicators. This is likely to reflect the greater pressure for drainage and reclamation inside the Roman city.

3 Bibliography

Davis A, 2015, 'Plant remains from Finsbury Circus', in C Harward et al, *The upper Walbrook valley cemetery of Roman London*, MOLA monograph 69

Ellenberg, H, 1988, Vegetation Ecology of Central Europe, Cambridge

de Moulins, D, 1990 Environmental analysis. In C. Maloney (ed) *The archaeology of Roman London, Volume 1: The Upper Walbrook Valley in the Roman period.* CBA Research Report 69, 85-152

Rodwell, J S (ed), 1995, British plant communities Vol 4 Aquatic communities, swamps and tall-herb fens. Cambridge