

**Assessment of biological remains from
excavations at Carmelite Street, York**

(YAT/Yorkshire Museum site code 1991.9)

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Summary

A series of samples from boreholes and trial trenches was examined for their content of animal and plant remains, together with several 'spot' finds of organic material. Most of the samples contained rich biota indicative of dumping of occupation refuse into a body of fresh water...

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A series of 24 samples was submitted for examination or identification of biological remains. Of these, seven were 'spot' finds, the remainder 'general biological analysis' (GBA) samples. The latter group were all examined in the laboratory and a 'test' (Kenward *et al.* 1986) subsample (usually of 2 or 3 kg) processed following the methods of Kenward *et al.* (1980). The flots resulting from paraffin flotation were examined briefly for plant remains and more thoroughly for invertebrates, whilst the residues were examined for plant macrofossils and their content of other materials. In several cases, a few kilogrammes of sediment remaining after removal of a 'voucher' were sieved to 1 mm to examine the nature of the sediment further and to retrieve small artefacts.

The samples are discussed in context number order, the boreholes being considered first. To facilitate recording in the EAU the borehole samples have been assigned a context number derived from the borehole number (thus 9002 is the 'context' number for Borehole 2). Comments or questions from the excavator are given in brackets following the context number.

Boreholes

Borehole 1, Context 9001 [thick organic silt above natural; probably the same deposit as samples 002 and 003, q.v.; thought to be medieval alluvium filling the 'King's Fishpool']

Sample 003 (5.40-5.90 m AOD): mid-dark grey to grey-brown, moist, slightly heterogeneous crumbly silt with patches of somewhat yellowish or greyish sandier material and some more humic, siltier parts, a few stones 6-20 mm, nutshell and wood fragments. The sediment had the appearance of having been deposited by turbulent running water, as in a river.

The 2 kg 'test' subsample gave a very small flot with a few worn seeds of plants typical of urban occupation deposits. The insect assemblage consisted of small numbers of poorly preserved typical urban decomposers.

The residue was approximately 50% sand with small stones and brick/tile fragments to 15 mm and 50% organic detritus, including bark fragments to 15 mm; the range of identifiable plant macrofossils included plants of arable land and waste places as well as some hazel nutshell, some of the material appearing rather eroded. These remains are consistent with deposition of urban occupation debris, probably reworked from the original site of disposal.

Borehole 2, Context 9002 [as sample 003, above]

Sample 001 (approx. 5.75–6.25 m AOD): mid-dark grey-brown, moist, stiff to slightly plastic, slightly heterogeneous silty sand with a few stones 2–6 mm and traces of charcoal, and occasional patches of mid yellowish-brown silty sand.

The 3 kg 'test' subsample processed gave a small flot with few identifiable plant remains; the three taxa noted might all have originated in occupation debris. Insect preservation was poor and the few remains present were typical of urban deposits.

The residue mostly comprised sand with a little brick/tile and some stones to 15 mm and a large fragment of mammal bone (to 40 mm). About one-third of the residue by volume was charcoal (up to 30 mm, though mostly much smaller) with some very decayed woody and herbaceous detritus. The identifiable plant macrofossils were all from taxa of waste ground or arable land or disturbed aquatic-marginal habitats and are not inconsistent with disposal of occupation waste into a body of water.

Sample 002 (approx. 5.25–5.75 m AOD, immediately above 001): mid-dark grey-brown, moist, stiff and crumbly and slightly plastic humic silt with lighter and darker patches including occasional patches of pale grey sand, and locally a black smear (?from charcoal).

A 2 kg subsample was processed. The tiny flot included identifiable plant macrofossils of no interpretative value—all might be found in urban occupation deposits. The few, poorly preserved, insects included a single aquatic and a few decomposers. The rather small residue was approximately 50% by volume of sand with some stones up to 35 mm and 50% very degraded woody detritus with a little charcoal and some bark fragments to 25 mm. The assemblage of plant remains included a single half-pod fragment of woad (*Isatis tinctoria* L.), a dyeplant much used in the medieval period, together with a range of taxa typical of occupation deposits (cf. the tentatively identified madder root discussed below, sample 015).

Borehole 3, Context 9003 [?late medieval dumps]

Sample 005 (approx. 5.40–5.50 m AOD): dark grey-brown, moist, stiff, layered, very humic silt with abundant herbaceous detritus and a few small twig fragments. A small subsample of worked leather included with this sample was passed to the YAT Finds Department.

A modest flot was obtained from the 0.75 kg subsample processed. A small group of insects was recovered, including a small and nondescript decomposer

component. There were several bug nymphs closely resembling *Craspedolepta nervosa*, a species associated with yarrow (*Achillea millefolium*) and often recorded from archaeological deposits, perhaps having been introduced in hay. There was a single human flea. The flots also contained appreciable amounts of herbaceous detritus, some probably grass or cereal straw; the identifiable macrofossils were a mixture of weeds and some probable grassland taxa. The modest-sized residue included large amounts of angular wood fragments in the >4 mm fraction, some of them certainly chips from woodworking waste; there were some small twig and bark fragments and a little charcoal plus a small component of sand. Other plant remains included some leaf fragments, probably from trees or shrubs, culm (stem) nodes of grass or cereal and some seeds and fruits of a variety of taxa, most of them probably arable weeds or grassland taxa. Although the organic content of this sample was high, the concentration of identifiable remains was low. It is likely that this was a dump of hay and straw that had not much rotted before being discarded. Certainly there was no sign that decomposer insects had been able to invade.

Sample **004** (approx. 6.40–6.90 m AOD): mid grey, moist, stiff (to plastic when handled) clay with evidence of reduction in the form of mm-scale black patches internally and a strong smell of hydrogen sulphide when treated with dilute hydrochloric acid. Some black streaks within the sediment may be reduced organic matter in fine root channels.

The 2 kg subsample gave a tiny flots with some very eroded seeds of a few taxa typical of urban occupation deposits. There were a few aquatic insects and terrestrial decomposers. The very small residue was approximately 50% sand with a few stones and some brick/tile to 10 mm, and 50% organic detritus, including woody fragments to 15 mm and a little charcoal. The few 'seeds' observed were once again from taxa regularly recorded in waterlogged urban occupation deposits.

Borehole **5**, Context **9005** [6.2 m AOD; medieval alluvium]

Sample **006**: a spot find of a fragment of coprolite, probably of dog, comprising a cone-shaped piece of dark brown, dense, concreted material, vesicular and lighter brown within, and containing small bone flakes. Maximum length 35 mm, maximum diameter at broad end 21 mm.

Borehole **006**, Context **9006** [just above natural; lowest part of 2 m-thick deposit of slightly organic silt]

Sample **008**: mid-dark grey-brown, wet, plastic silt and fine sand, with patches of paler, rather clayey sand.

The small flots from the 2 kg subsample examined contained several *Daphnia*

ephippia together with a few rather eroded plant macrofossils of taxa typical of urban occupation deposits. There was a small number of fragmentary insects, all those observed being terrestrial and representing a rather typical urban group. The residue comprised about 60% sand and gravel (up to 30 mm), with a little mussel shell and a glass fragment. Quite large amounts of wood fragments (to 30 mm) were also present, some as worked chips, and there were traces of coal and charcoal. Identifiable plant remains included hazel nutshell, charred barley (a single, very eroded grain) and a range of taxa representing a variety of habitats and likely to have been dumped with occupation material.

Context 2003 [C16th dump]

Sample 007: dark brown, moist, layered herbaceous and woody detritus with traces of wood and twig fragments and brick/tile and patches of yellow-grey sandy ash.

The 1 kg subsample examined gave a large flot, mainly of herbaceous detritus, apparently mostly of small grass/cereal 'straw' fragments; plant remains were not investigated in detail. There were abundant well-preserved insects, including a few aquatic and waterside forms, some decomposers of habitats ranging from fairly dry to rather foul, and a small component most likely to have come from in or around buildings, including *Tipnus unicolor*. The insects from this subsample offer hints for the presence of waterside vegetation, in the form of two *Cyphon* sp., although these beetles may conceivably have had an indirect origin in cut vegetation.

The large residue contained much well-decayed wood and herbaceous detritus, with a little brick/tile, oyster shell, charcoal, cinder and limestone larger than 10 mm with a few small fragments of coal, mortar, fragments of leaves, probably from trees or shrubs, and percid (perch family) fish scales. The plant remains included rather large numbers of culm- (stem-) nodes and rachis (flower-spike) fragments, probably all from cereal straw. With these was a range of taxa, mostly weeds of arable land and waste places but with some possible indicators of grassland habitats. The finest fraction was notably rich in achenes of celery-leaved crowfoot, *Ranunculus sceleratus*, a plant likely to have been growing in trampled muddy areas by water and perhaps present in the area in which this mass of straw (and perhaps also some hay) was dumped. Another noteworthy find was of several fruits of fuller's teasel, *Dipsacus sativus*, the plant providing flower heads used for raising the nap on cloth. In this context they might only be from 'escapes from cultivation', in the absence of other evidence for textile working (but note records for woad and madder from other contexts).

The 4 kg subsample sieved to 1 mm gave a residue with quite large amounts of shellfish (including oyster, mussel and cockle), charcoal, and wood fragments, together with small amounts of sand, mammal and bird bone, brick/tile, plaster, coal, cinder, wax (?beeswax), daub, pot, and a large cobble (100 mm maximum dimension). There were also a few fragments of hazel nutshell and some 'plum' stones, one perhaps wild plum (bullace), the other clearly a cultivated type (length approx.

22 mm). In addition a small slab of about 50 x 50 x 10 mm of tufa-like material was recorded.

Sample 009: a spot find of bird eggshell, the largest fragments about 10 mm across, with several contiguous fragments giving the impression of an egg at least 60 mm long before it was flattened.

Sample 010: a spot find recorded by the excavator as 'seeds, leaves', from a layer 'high in well preserved plant material'. The sample consisted of several kg of dark grey-brown (yellowish-brown to olive within), compressed-felted, highly humic silt with abundant coarse plant detritus, a little brick/tile, freshwater snails, eggshell, coal, twig fragments, hazel nutshell and very fresh-looking bone. The surfaces of the lumps of sediment were examined for identifiable plant remains and the following were recorded: a leaf of box (*Buxus sempervirens*), frond fragments of bracken (*Pteridium aquilinum*), and stem and leaf fragments probably from monocot plants (some sedge and spike-rush fruits were also present).

A smear of sediment examined under the transmission microscope showed it to be rich in diatoms and what appeared to be filamentous green algae, the latter retaining the green colour of their chloroplasts. *Daphnia* ephippia were again present, and the overall character of the material suggests dumping of richly organic refuse, perhaps including stable/byre cleanings and garden waste, into a body of fresh water.

Sample 011: a spot find of small snail shells, tentatively identified as freshwater types (planorbids and ?*Lymnaea*) in a matrix similar to that in sample 010 (including bracken frond).

Sample 012: thought by the excavator to be faecal, this spot find comprised lumps of crumbly, blackish material which on closer inspection proved to be concentrations of 'plum' (*Prunus*) fruitstones. Those that could be measured were about 11-12 mm in length and are thus probably wild plum (bullace) rather than large sloes. Most of the stones visible at the surface bore reddish-brown 'flesh'. The matrix contained a little wheat/rye 'bran', but parasitic worm eggs were not recorded from the small subsample examined and doubt must be cast as to whether this was, in fact, faecal. An interesting observation was of a local concentration on the surface of one of the lumps of achenes of celery-leaved crowfoot (*Ranunculus sceleratus*). The oval patch of 'seeds' corresponded to the shape of the sub-conical fruiting head of this plant and it appears that the mass of *Prunus* stones, perhaps with other food waste, was deposited onto a celery-leaved crowfoot plant, embedding the achenes into its surface. As observed elsewhere in this material, celery-leaved crowfoot is likely to have been common along the riverside where disturbance and increased nitrification occurred.

Sample 014: almost black, moist, crumbly to brittle to 'crisp' charcoal with a somewhat sandy and sticky feel; charred and uncharred twig fragments present and a little brick/tile also recorded.

The rather small flot from the 2 kg subsample processed produced quite large numbers of insects. Domestic and storage habitats were represented by, for example, *Tipnus unicolor*, *Sitophilus granarius*, *Oryzaephilus surinamensis* and *Blaps* sp.; a human flea was also noted. Species associated with rather foul decomposing plant remains, of the general consistency of stable manure, were well-represented. There were a few aquatics, but no clear evidence of aquatic deposition was offered by the insects.

Identifiable plant remains represented a variety of habitats with no particular group predominating. The very large residue included some coal (unburnt and partly burnt), cinder, charred twigs and small branches (including hazel) and burnt and unburnt bone. There were quite large amounts of irregularly-shaped wood fragments in the 2–4 mm fraction, together with charcoal and some bone and coal. Finer fractions gave rather large amounts of oak (*Quercus*) buds and bud-scales and nutlets of a spike-rush (*Eleocharis* sp.). The latter was not the species usually recorded from urban archaeological deposits (*E. palustris*), but a three-sided type, probably *E. multicaulis*. This species is found mainly on acid peat bogs and wet sandy heaths and may perhaps have arrived with cut peat or sods, with which the leaves of bog moss (*Sphagnum imbricatum*) may also have reached the site. The remaining plant taxa are likely to have originated in occupation debris or local weedy vegetation: they included box leaf fragments and perhaps also some stem fragments and single seeds of fig and strawberry.

A 3 kg subsample sieved to 1 mm was also rich in charcoal and coal but with abundant cinder, some of it in large lumps. There was also a little brick/tile and bone, and a 'plum' (probably bullace) stone.

The suite of waterlogged remains recovered from this sample was most remarkable bearing in mind its lithology. It can only have formed as a mixed dump of occupation waste rich in ashes.

Context 2007 [C16th dump]

Sample 019: a spot find of four very fresh snail (*Helix aspersa*) shells.

Context 2009 [C16th dump]

Sample 016: dark grey, moist, crumbly to brittle, slightly heterogeneous sandy silt, with patches of ash or decayed mortar, brick/tile, coal, cinder and a snail (*Cepea*) shell; quite a large component of small twig fragments and probably also of other organic matter.

A 2 kg subsample was processed as a 'test' sample. It gave a large flot rich in herbaceous detritus, the supernatant being coloured green. Grass/cereal stem fragments were present, together with tree leaf fragments and oak buds and bud-scales. A whole leaf and some fragments of box were recorded (probably accounting for the green colour of the alcohol in this flot, since box leaves preserved in waterlogged archaeological deposits often retain some pigmentation). There were abundant well-preserved invertebrates. Hundreds of *Daphnia ephippia* were estimated to be present and there were various aquatic beetles and bugs (all eurytopic species tolerating a wide range of still and sluggish water environments). There were also some freshwater (planorbid) snails. Terrestrial insects were abundant and varied, representing domestic/storage habitats (e.g. *Tipnus unicolor*, of which there were several, and *Sitophilus granarius*), decaying matter ranging from foul to fairly dry, and some 'semi-natural' habitats. A human flea (*Pulex irritans*) was also noted. Much of this fauna may have been introduced in something resembling stable manure.

The residue was very rich in identifiable plant macrofossils, with excellent preservation of these and the many freshwater snails and small numbers of bones, including those of fish and bird. The bulk of the residue comprised woody and herbaceous detritus with twigs and wood fragments to about 50 mm, and some brick/tile to 30 mm. Tree leaf fragments, probably willow and oak, were abundant, and there were many oak buds and scales and some willow buds, as well as female cone axes of alder. Occupation debris were represented by nutshell fragments of walnut and hazel nut, and there were occasional seeds of grape, and fig and cereal rachis (flower spike) fragments. A wide range of weeds of arable land and waste places was recorded. The assemblage as a whole suggests dumping of occupation refuse containing straw and some food waste into water, but with dumping occurring sporadically so that aquatic snails could become mixed into the dump. The absence of true aquatic plants suggests a lack of vegetation in the water — perhaps a function of overhanging trees (whose leaves and buds formed a considerable component of the material). Insect remains typical of weedy water were also absent, apart from a single *Tanysphyrus lemnae*, found on duckweed.

The 2 kg subsample sieved to 1 mm comprised sand and gravel with a little walnut shell, traces of box leaf and stem fragments, cockle and ?mussel shell, and a little mortar and brick/tile. An arm from a set of scales was also recovered from this sample.

Sample 017: a spot find of 'snails' in a sample rich in plant material. This sample comprised 2-3 kg of rather varicoloured, somewhat felted, slightly sandy silt with partings revealing many dark brown tree leaves, of which some, at least, were probably willow, and paler yellowish-grey ?ashy patches. There were also some well-preserved wood fragments, many freshwater (planorbid and other) snails and some straw-like herbaceous plant fragments. Twig fragments included some tentatively identified as willow. In places there was blackish, rather 'clean' silt with a little brick/tile.

Context 2011 [C16th dump]

Sample 018: mid-dark grey, moist, buttery (sticky, slimy and plastic) humic clay, with small amounts of very well-preserved bone and wood and abundant brick/tile and freshwater snails.

The 1 kg subsample processed gave a large flot rich in freshwater snails and *Daphnia ephippia* (there were probably thousands of the latter), with some ostracods, willow fruits and a caddis larva coat covered in wood fragments rather than the more usual sand grains. The tree leaf fragments, probably willow and oak, looked very fresh and 'crisp'; there were also oak bud-scales. Aquatic insects were fairly well represented and included two *Ochthebius* sp., *Tanytarsus lemnae* and some tentatively identified Corixidae nymphs. Deposition in rather clean water appears likely. The terrestrial insects probably represent those that drowned accidentally. There was little sign of rubbish.

The residue contained quite a lot of herbaceous detritus, though the finest fraction also included much quartz sand. There were a few twig and wood fragments and a little charcoal. Freshwater snails and tree leaf fragments were conspicuous and notable in this sample were the shoots of mosses retaining much chlorophyll. A little straw-like material was recorded, together with apple endocarp ('core') and a few very fresh-looking sloe and bullace fruitstones. The smaller 'seeds' included arable weeds and several taxa that might have been growing in waterside or marsh habitats. The only true aquatic plant was duckweed, *Lemna* sp., of which there were a few seeds in the finest fraction, together with some ostracods, also pointing to deposition in a body of water.

Sample 021: sampled as 'tree root/twigs', this material comprised one unidentifiable flattened twig about 6 x 3 mm in section, a twig and a branch fragment of Pomoideae (apple/hawthorn/rowan, etc.), the former about 17 mm diameter, the other approx. 21-27 mm diameter, both with shiny bark attached, and an irregularly-shaped piece of willow (*Salix*) wood about 120 x 120 x 30 mm.

Context 2012 [late medieval dump/alluvium?]

Sample 022: mid-dark grey-brown, crumbly, somewhat earthy but locally more stiff sandy clay silt, with traces of stones 2-60 mm, charcoal and tiny patches of rotted wood.

From the 2 kg subsample examined a small flot was obtained, containing many fine rootlet fragments and some small charcoal fragments. There were abundant ostracod valves and *Daphnia ephippia* but very few insects. Subjectively, it appeared that the insects may not have decayed, but that input was very low.

The small residue mostly consisted of greyish sand with some pebbles to 30 mm. A small washover of charcoal, wood (mostly root) and fine rootlet fragments

was obtained from this. It contained a few tree leaf fragments and elderberry seeds, and traces of charred cereal grains. Also present were a single freshwater snail and some duckweed seeds, indicating an aquatic depositional environment with dumping or redeposition of occupation material.

The 6 kg subsample sieved to 1 mm was rich in gravel and stones including limestone to 120 mm and a lump of chalk. There was some brick/tile (to 60 mm) and traces of mortar/plaster and pottery.

Context 2013 [medieval gravel surface]

Sample 023: mixture of black amorphous charcoal and mid yellow-brown clay in lumps on 1 mm-10 mm scale, with traces of brick/tile.

A minute flot was obtained from the 2 kg subsample examined. It contained considerable numbers of *Daphnia* ephippia of two kinds, together with several ostracod valves, a freshwater snail and traces of insect cuticle; plant remains were limited to some elderberry seeds and a sedge nutlet.

The small residue was very like that from sample 022,, context 2012. The small washover, mostly of fine charcoal included very decayed wood, rootlet fragments, tree leaf fragments and some elderberry seeds. A few freshwater snails and oak bud-scales were also present.

A 9 kg subsample was sieved to 1 mm; the residue contained abundant gravel and stones (with rounded cobbles to 100 mm), a little oyster shell, mammal bone, brick/tile (to 110 mm), pottery, ?daub, and charcoal.

Context 2016 [backfill of an Anglo-Scandinavian (or perhaps early medieval) linear cut]

Sample 024: mid grey to grey-brown, moist to wet, plastic to sticky sandy clay silt, with a few stones 20-60 mm.

The small flot from the 3 kg subsample examined consisted mainly of fine rootlet fragments with a few scraps of insect cuticle, freshwater snails and several elderberry seeds. The small residue was mainly composed of sand and gravel, with a few stones to 30 mm, very similar in appearance to the residue from sample 023. The small washover from it was mainly charcoal (to 10 mm), with some elderberry seeds (some charred), a charred oat grain and a little oyster shell.

The 8 kg subsample sieved to 1 mm contained many cobbles (to 10 mm), with a little oyster shell, charcoal, mammal bone, brick/tile (to 35 mm) and pottery.

Context 3005 [late C13/14th dump/surface]

Sample 013: mid-dark grey, wet, plastic to crumbly, sandy clay silt, with small numbers of stones 6-20 mm, compressed wood fragments (including possible shavings) and brick/tile.

The flot from the 2 kg subsample processed was very small and contained 'seeds' of only three taxa—stinging nettle, hemlock and elderberry, with some fine rootlet fragments and a little fine charcoal. Insect preservation was rather poor and the few remains were of common urban forms. The large residue contained abundant decayed wood fragments, many like flakes with a more or less squared outline. There was a little mammal and fish bone, charcoal, brick/tile, pot and chalk, with about 50% white sand/50% fine plant detritus in the 300 µm-1 mm fraction. There was a very low concentration of 'seeds', a single charred wheat grain being added to the list from the flot.

The same materials were noted from a 2 kg subsample sieved to 1 mm, and here appreciable amounts of vivianite were present, along with the wood 'flakes'.

The overall impression is of a dump of worked wood waste with only a very small input of other plant remains from local weedy vegetation. There is nothing to suggest dumping in water.

Context 3008 [late medieval/early post-medieval, thought to be alluvium]

Sample 015: mid-dark grey, moist, crumbly to slightly plastic sandy clay silt with traces of twig and wood fragments.

The modest flot obtained from processing a 2 kg subsample included several plant taxa of weedy vegetation suggestive of land disturbed and then neglected for at least one year. There were also some *Daphnia ephippia* and an ostracod, probably pointing to deposition in water. A large proportion of the flot consisted of insect remains with, however, a rather restricted range of species all in small numbers. Almost all were terrestrial forms from a variety of habitats. They may have been 'background fauna' or have included a small mixed invading decomposer element.

The rather large residue contained quite a lot of irregularly-shaped chunks of wood to about 70 mm with a little limestone (to 40 mm). Finer fractions included a little brick/tile and coarse sand or gravel but the plant material was mostly partly decayed wood with some charcoal and abundant fine rootlet fragments. There were also several fragments of pink-coloured woody root that are thought to be madder, *Rubia tinctorum*, presumably waste from textile dyeing, up to about 10 mm long. The <1 mm fraction was rather large and included much sand. 'Seed' concentration was low, the identifiable taxa indicating weedy waste ground or aquatic-marginal habitats, consistent with dumping by water.

The residue from a 5 kg subsample sieved to 1 mm was dominated by wood fragments, gravel and sand, with a little chalk and limestone (to 60 mm), freshwater snails and (?freshwater) mussel shell, charcoal, mammal and fish bone, pot and small brick/tile fragments.

Context 3017 [(C13th)/early C14th dump]

Sample 020: mid-dark very faintly purplish grey, moist, plastic, sticky, humic, slightly sandy clay, with traces of limestone fragments larger and smaller than 10 mm, charcoal and ash, and paler patches of ?rotted mineral material.

A 3 kg 'test' subsample was examined. The modest flot, mostly of fine rootlet fragments, included only traces of arthropod cuticle and a few elderberry seeds. The modest residue was mostly sand and gravel, with a few stones and brick/tile fragments to 30 mm, and a little mammal bone and oyster shell. From this a small washover (about 25% by volume of the total residue) was obtained. It consisted mainly of charcoal, small twig fragments and very decayed wood fragments with fine rootlets (as in the flot). There were modest numbers of elderberry and henbane (*Hyoscyamus niger*) seeds, one or two charred cereal grains, and a few weed taxa, indicating occupation but no particular kind of dumping except of charcoal. The rootlets perhaps suggest a surface with a stand of vegetation and thus sufficiently well aerated soil that preservation by waterlogging was extremely limited.

References

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