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**An assessment of biological remains from further excavations at
Merchant Adventurers' Hall, York (site code: 1995.1)**

by

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Summary

Biological remains from deposits of 11/12th to 17/18th century date encountered during excavations on land immediately adjacent to the Merchant Adventurers' Hall in Piccadilly were found to be very well preserved, particularly those from a richly organic deposit dated to the 14th century underlying a well-made cobbled surface.

The remains point to the presence of evidence for primary dumping of waste including debris from textile working, bone working, some domestic food waste and perhaps also material from stables and domestic dwellings.

Deposits of this date with such good preservation of biological remains by anoxic waterlogging have rather rarely been investigated in York and the material from this site offers an excellent opportunity to study a variety of aspect of later medieval life in the city. It is strongly recommended that, in the event that further excavation is undertaken, a systematic programme of sampling and recovery is implemented since large amounts of very valuable bioarchaeological information will undoubtedly be obtained. In any event, the material to hand is worth further, more detailed, investigation.

Keywords: MERCHANT ADVENTURERS' HALL; YORK; MEDIEVAL; POST-MEDIEVAL; PLANT REMAINS; PARASITE EGGS; INSECT REMAINS; MOLLUSCS; BONE

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Introduction

Further excavations at Merchant Adventurers' Hall, York in 1996 by York Archaeological Trust revealed a series of deposits of 11/12th to 17/18th century date in two trenches. All of the excavated samples sent to the EAU for examination were from Trench 3. Samples of sediment and some hand-collected bone from these deposits, together with samples from four boreholes, have been examined to assess their bioarchaeological potential.

Methods

Eleven samples of sediment (six 'GBAs', four 'BSs' and one 'SPOT' *sensu* Dobney *et al.* 1992), 31 borehole samples (in bags) and four one-metre long sections of sediment from a 'continuous' borehole (from borehole 1) were submitted. All of the samples were inspected in the laboratory and a description of their lithologies recorded using a standard *pro forma*. Subsamples of 1 kg were taken from each of the GBA samples for extraction of macrofossil remains, following procedures of Kenward *et al.* (1980; 1986). The bulk samples were sieved to 500 :m to recover bone, larger plant macrofossils and artefacts. A washover sieve, also of 500 :m, was employed to separate the lighter organic fraction from the bulk residues.

Plant macrofossils were examined from the residues, flots and washovers resulting from processing the 1 kg subsamples, and the flots and washovers were examined for invertebrate remains. All of the GBA samples were also examined for the eggs of parasitic nematodes using the 'squash' method of Dainton (1992).

Plant remains and other components from the bulk-sieved samples were examined briefly, and bone from these samples also recorded, as detailed below.

Three standard-sized boxes (31 x 31 x 22 cm) of bones recovered by hand-collection were examined.

Results

The sediment samples

Borehole samples

The borehole samples were examined primarily to assess the quality of organic preservation in the deposits encountered and also, in some cases, to provide a guide to the processes involved in their formation. The lithological descriptions are presented as Appendix 1.

Good preservation of organic remains was evident in many of the deposits.

The following specific questions were asked by the excavator concerning deposits encountered in the boreholes. It must be emphasised that conclusions based on small amounts of sediment are necessarily tentative.

Depositional questions for borehole 2:

In what conditions were the deposits from Contexts 5207-5209 formed?

These appear to be 'natural' river silts containing organic material (they have a humic/herbaceous detritus component).

In what conditions were the earliest deposits formed (Context 5210-5212)?

Contexts 5210 and 5211 appear to be natural river/pond silts. Context 5212 was not provided for examination.

Depositional questions for borehole 3:

Is there evidence for 14th Century dumping from Context 5308?

The presence of marine mollusc remains in this deposit may be indicative of dumping, although no other component of the deposit supports this.

In what conditions was Context 5312 formed?

This appears to be a 'natural' river/pond silt with some herbaceous detritus present (including apple endocarp, presumably from food waste).

Depositional questions for borehole 4:

In what conditions was Context 5417 formed?

This appears to be a 'natural' humic river/pond silt.

In what conditions was Context 5420 formed—is it a river silt or a pond silt?

This deposit appears to have formed as a river silt.

Comparison of deposits from boreholes 1 and 4:

How do Contexts 5105-5110 (borehole 1) and Contexts 5408-5411 (borehole 4) compare?

All of the deposits 5105-5108 (borehole 1) and 5408-5411 (borehole 4) contain material indicative of dumping (brick/tile, mortar, mammal bone, cinder and charcoal). This suggests that the 14th century riverbank extended as far towards the modern river as the location of borehole 4.

GBA, BS and SPOT samples

The results of the investigations are presented in context number order, with information provided by the excavator in brackets. Artefacts were removed from the residues to be returned to the excavator.

Context 3022 [17/18th century levelling/dump]

Sample 032 (GBA)

Moist, dark grey, crumbly (working plastic), very sandy clay. Mortar and brick/tile were abundant and medium-sized pieces of oolitic limestone (20 to 60 mm), charcoal and marine mollusc shell fragments were present.

The flot was vanishingly small and contained a single elderberry (*Sambucus*) seed and a specimen of the burrowing snail *Cecilioides acicula*. The small residue consisted mainly of sand, mortar, and brick/tile with traces of marine shell, bone, charcoal and cinder. The deposit evidently formed by dumping of

building debris.

The microfossil 'squash' was mostly inorganic with some organic material and a few phytoliths. No parasite eggs were seen.

Sample 054 (SPOT)

Almost dry, mid grey brown (dark when wet), crumbly to unconsolidated (when wet), silty sand with brick/tile present and abundant land snails.

The sample could not be processed to recover the land snails as they were too fragile. The two forms evident in the sample were *Helix* sp. and *Cepaea/Arianta* sp.

Context 3034 [14th century levelling/dump (top)]

Moist, dark greyish brown, crumbly to soft (working slightly plastic), humic sandy silt (with local admixture of grey clay). Medium-sized and large stones (20+ mm), brick/tile, pot and wood debris were present in the samples.

Sample 038 (GBA)

The flot contained a small assemblage of invertebrate remains including many fly puparia. The general character of the assemblage suggested the dumping of urban rubbish. Grain pests were noted. Aquatic insects were present in small numbers but they do not indicate large scale flooding of these deposits. The presence of several statoblasts of the bryozoan (*Cristatella* sp.) indicates at least some influence of the river, and good water quality upstream.

The rather small washover from the residue was about 75% by volume organic detritus, mainly woody and herbaceous detritus. The wood fragments were generally quite well preserved, being pale in colour and soft to firm in texture. The residue comprised sand and gravel with a little brick/tile, bone and charcoal. The identifiable plant remains included seeds of a small range of arable and waste ground weeds, with some elderberry

(*Sambucus nigra*), the concentration of 'seeds' being rather low.

The microfossil 'squash' was mostly organic, including a few phytoliths, with some inorganic material. Six variably preserved *Trichuris* eggs were also noted indicating the presence of faecal matter.

Sample 039 (BS - 29 kg)

The washover consisted of about 1 litre of very decayed wood (including twigs) to 30 mm maximum dimension, much of which was very buoyant and gave the appearance of having been desiccated at some point in the past. The preservation of the wood was also notably variable, some fragments having fungal perithecia on their surface; the implication of this is either that decay has taken place after burial or, more likely, that the deposit includes wood fragments already rather well rotted prior to incorporation into the deposit. Identifiable seeds and fruits were, as with the test subsample, a limited range of arable and waste ground weeds, with elderberry.

The residue of about 3 litres was mainly of sand and wood (to about 40 mm), with brick/tile, mortar, pot, coal, cinder, charcoal, slag, wood, twig fragments, leather, marine and land mollusc shell, bone (including fish bone), a little hazel nutshell and a few *Prunus* fruitstones. Other plants present as 'seeds' were hemp (*Cannabis*) and oats (*Avena* sp.).

Context 3042 [14th century levelling/dump (upper part)]

Moist, dark grey brown, crumbly to soft (working slightly plastic), humic sandy silt with some herbaceous detritus. Charcoal, mammal bone and flecks of rotted marine mollusc were present in the samples.

Sample 040 (GBA)

The modest-sized flot consisted chiefly of insect remains, mostly fragments of pupae and larvae. The beetle assemblage was similar in

character to that from Context 3034, Sample 38.

The moderately large washover from the residue consisted of about 80% by volume of organic detritus, mostly wood and herbaceous fragments with a little charcoal. The residue was of charcoal, with a little sand, gravel and brick/tile. Identifiable remains included weld (*Reseda luteola*) and some weed taxa, but there were also moderate numbers of leaves of the peat-forming moss *Sphagnum imbricatum*, a species regularly recorded from riverside deposits in the King's Pool area. Preservation of plant remains was generally good.

The microfossil 'squash' was mostly organic with a little inorganic material. A few phytoliths, some fungal hyphae and a single very well preserved *Trichuris* egg were noted.

Sample 043 (BS - 33 kg)

There was a very small washover of woody and herbaceous detritus from this sample, but a residue of about 10 litres most of which consisted of woody and herbaceous fragments, the former up to 150 mm in maximum dimension (identified as oak), though mostly no more than a few tens of millimetres. There were small amount of stone, brick/tile, charcoal, bone and sand. Amongst the identifiable plant remains were considerable numbers of weld seeds but rather few other taxa. Conspicuous amongst the herbaceous debris were small root fragments and especially fine woody roots (with characteristic bark tissue), the largest only 1-2 mm in diameter. Large numbers of fly puparia (mostly Sepsidae) and adult beetles were also present. The beetle assemblage indicates rotting organic matter and the fly puparia strongly suggest that this may be dung.

Context 3050 [14th century levelling/dump (lower part)]

Moist, dark grey brown, crumbly to soft (working slightly plastic), humic sandy silt. medium-sized stones (20 to 60 mm), brick/tile, ash, charcoal, fish bone and eggshell were present in the sample.

Sample 045 (GBA)

The tiny flot contained some plant detritus, seeds and a very small poorly preserved insect assemblage suggestive of stable manure.

About 50% of the small residue consisted of woody detritus and charcoal, mostly in the <2 mm fraction. The remainder was sand and gravel, with brick/tile and further charcoal. There appeared also to be some charred and uncharred fragments of peat.

The microfossil 'squash' was mostly organic with some inorganic material. A few fungal spores and hyphae, pollen grains/spores, diatoms and many phytoliths were noted. No parasite eggs were seen.

Context 3051 [14th century levelling/dump (bottom part)]

Moist, dark grey brown, crumbly to soft (working plastic), very humic sandy silt. Brick/tile, very decayed wood, nutshell and grape pips were present in the samples.

Sample 049 (GBA)

The moderate flot was almost entirely insect remains including many pupae, beetle larvae and mites. The beetle assemblage was characteristic of stable manure—the presence of newly emerged individuals of *Apion* sp. and an *Omalium* sp. is especially supportive of this interpretation.

The rather large residue consisted mainly of wood fragments up to about 60 mm (including one ?worked fragment), together with moderate amounts of herbaceous detritus and of wheat/rye 'bran'. Also noted were leather fragments, 'straw' nodes, apple (*Malus*) endocarp (core) and some lumps of *Sphagnum* peat to 25 mm. There was a little sand and gravel.

The microfossil 'squash' was mostly organic with a little inorganic material. A few phytoliths and fungal hyphae and six poorly preserved *Trichuris* eggs were noted.

Sample 048 (BS - 26 kg)

This small washover of about 0.25 litres consisted mostly of very fragmentary but rather well preserved wood with some twig fragments, herbaceous detritus and moderate amounts of 'bran'. Notable amongst the identifiable remains were extremely well preserved receptacular bracts of fuller's teasel (*Dipsacus sativus*), together with similarly pristine fruits of *Dipsacus* (probably also the cultivated species) and capsule fragments of flax (*Linum usitatissimum*) the largest of which comprised three joined segments. Together with a range of other taxa probably representing food waste, arable weed communities, and perhaps also grassland, there were some freshwater snails. Many of the plant fragments exhibited iron sulphide deposition, probably indicative of sediment formation under water in low-oxygen environment.

The residue of about 5 litres was rich in a variety of components, especially pottery, slag, brick/tile, sand and wood (up to 100 mm), with twigs, stone, mortar, coal, metal objects, mollusc shell, charcoal, fly puparia, leather, hazel nutshell, *Prunus* fruitstones and other seeds. Amongst the last of these, grape, hemp, oats, wheat, and barley were all preserved as charred, mineralised or 'waterlogged' remains. There was evidently some faecal material, in the form of small (<15 mm) concretions; these may have been secondary.

Context 3059 [12th-14th century build up]

Moist, dark grey brown, crumbly to soft (working slightly plastic), humic very sandy silt. Brick/tile, pot, ?coal and twigs were present in the samples.

Sample 052 (GBA)

The small flot was mostly invertebrate remains including fly and beetle larvae, pupae, mites and a single human flea (*Pulex irritans*). Again, the adult beetles were strongly indicative of stable manure. A smaller component of the assemblage consisted of

beetles associated with damp/waterside conditions.

The moderately large residue was about 20% by volume sand with a little gravel and brick/tile. For the organic component, the >2 mm fraction consisted largely of wood, bark and twigs with some herbaceous detritus, the <2 mm fraction being largely of herbaceous material. There were indications of the possible source of some of the woody material from leaf epidermis fragments of holly (*Ilex*) and buds-scales of willow (*Salix*) and oak (*Quercus*). There were modest numbers of fruits and seeds, including arable and waste ground weeds, including a very well preserved specimen of pot-marigold (*Calendula officinalis*), a species rather rarely recorded from urban medieval deposits. Leaves or shoots of three mosses (*Sphagnum*, *Hypnum* cf. *cupressiforme* and *Leucobryum glaucum*) were recorded, a suite perhaps originating in peat. The identifiable remains varied somewhat in their state of preservation, some appearing very fresh, others somewhat abraded.

The microfossil 'squash' was mostly organic with some inorganic material. Two *Trichuris* eggs (poorly preserved) and a few phytoliths were noted.

Sample 053 (BS - 10 kg)

The residue was examined and found to be substantially the same as that from the GBA sample (detailed above). Consequently, this residue was not recorded further.

Vertebrate remains

Three standard boxes (31 x 31 x 22 cm) of hand-collected animal bone were recovered from excavations at the Merchant Adventurers' Hall.

Of the thirty-three contexts which produced bones, six were excluded from further examination because of their modern date. Nine of the remainder were dated to the 17/18th centuries, seventeen to the 14th century, and one to the 11th/12th centuries.

All the hand-collected bone, with the exception of the modern material, was examined, and records made of preservation, quantity and the taxa present where appropriate.

11/12th century deposits

The single context produced very few hand-collected bone fragments which included the remains of cattle and sheep. Of interest, however, was the presence of a sheep horn-core which had been chopped through at the base.

14th century deposits

(i) Hand-collected material

Most of the material was brown to dark brown (Contexts 3059, 3052, 3055 showed some slight colour variation, being either mottled or fawn in appearance). Preservation was good to excellent, with broken surfaces mostly spiky, indicating little or no reworking. However, Context 3050 contained a single unidentified human bone fragment which may indicate the presence of some reworked material. All the remains showed obvious characteristics of preservation under conditions of anoxic waterlogging.

Evidence of butchery was recorded in the material from most contexts at a level of 10-20% (although for several contexts it was recorded at 20-50%). All contexts yielded some sheep-sized and cow-sized vertebrae which had been chopped longitudinally, indicating the splitting of carcasses into 'sides'. In addition, a horse pelvis and radius fragment showed clear evidence of butchery, whilst a cattle metacarpal and metatarsal had been sawn through their shafts, possibly indicating the presence of bone-working waste.

Major domesticates (i.e. cattle, sheep and pig) were most commonly represented in the small assemblage of hand-collected material from these 14th century deposits (Table 1). Also present were the remains of cat (*Felis* f. domestic) and dog (*Canis* f. domestic), red deer (*Cervus elaphus* L.) and fallow deer

(*Dama dama* (L.)), as well as chicken (*Gallus f. domestic*), horse (*Equus f. domestic*) and goose (*Anser* sp.).

A total of 41 'measurable' fragments were collected along with only five mandibles with teeth *in situ* and three isolated teeth.

(ii) Bulk-sieved remains

Three samples (from Contexts 3034, 3042 and 3051) produced moderate quantities of vertebrate remains. As was the case for the hand-collected material, preservation of the vast majority of the remains were good to excellent. The samples from Context 3051 yielded some very rounded fragments, but also produced some bones with obvious acid etching. Faecal concretions in this sample (one actually containing a rounded and etched bone fragment) indicate the presence of faecal material (either of human or canid origin).

The bone assemblages from three of the samples were essentially similar in terms of the range of species present and their state of preservation and they can therefore be considered as a single group. A fourth sample (from Context 3059) was very different in terms of its lithology from the other three and was wholly devoid of bone.

For the contexts yielding bone from bulk-sieved samples, large mammal fragments were mostly of cattle sheep and pig, with additional elements identified as chicken and goose. More interestingly, a single ?lapwing (*Vanellus vanellus* (L.)) distal ulna fragment was recovered from Context 3042. Several small mammal fragments were also present in Contexts 3042 and 3051 and these included three small Muridae fragments and a single rat (*Rattus* spp.) mandible.

Fish remains were present in all three samples in moderate frequencies. Species represented include, herring (*Clupea harengus* L.), eel (*Anguilla anguilla* (L.)), thornback ray (*Raja clavata* L.), mackerel (*Scomber scombrus* L.), cod (*Gadus morhua* L.) and other gadidae not identified to species. Two of the samples (from Contexts 3034 and 3051) contained fish vertebrae that showed obvious signs of

crushing, interpreted as evidence of ingestion. This appears to corroborate the evidence from the acid-etched bone fragments. A single amphibian bone was also recovered from Context 3051.

17/18th century deposits

Most of this small collection was brown or fawn in colour and, in a similar way to the material of 14th century date, was 'spiky' in appearance. Evidence for butchery was noted as being present on 10-20% of the material from each context.

This small assemblage included the remains of major domesticates, as well as numerous horse fragments (all, however representing a single cranium), chicken and goose (Table 2). Wild species included fallow deer, hare (*Lepus* sp.), and ?heron (?*Ardea cinerea* L.).

Few measurable bones and teeth were present in deposits of this date.

A single sheep metatarsal showed evidence of swelling on the proximal anterior aspect of the shaft. This took the form of a vertical ridge of highly remodelled bone positioned parallel with and medial to the position of the median extensor tendon. This condition, of unknown aetiology, has been noted on metatarsals from a number of other sites, for example from the medieval and post-medieval deposits from Selby (Carrott *et al.* 1993) and from post-medieval excavations at Walmgate, York (O'Connor 1984) and Hall Garth, Beverley (Dobney *et al.* 1994).

Discussion and statement of potential

The samples assessed generally contained abundant, varied and well preserved biological material some, at least, of which appeared to be from primary dumping. The first impression is of remains typical of deposits dating to the medieval period in York, although the 14th century (to which most of the material from this site is dated) is not especially well represented in the archaeological record or from previously studied sites in the city. Thus the material is of

considerable importance, even if just as representative of its period. (For the vertebrate remains it will also provide very useful comparanda for assemblages from Beverley (Scott 1991; 1992), for example.)

At the site level, further analysis will provide insights into the way the deposits built up, including determining the influence of the River Foss. How frequent was flooding at this period? Further analysis of the remains may yield additional information concerning the nature and origins of the dumped material, and human activities and living conditions (as implied by components of the deposits)—already from the assessment there is some evidence for the presence of waste from textile and bone working, for plant and animal foods (some, at least, from faeces), for peat or peatland materials, for fishery exploitation, for the stabling of horses and for parasites afflicting humans and perhaps their domestic animals. The material will also be of considerable value in synthetic work, providing information in time and space.

In the event of further large-scale excavation, there is no doubt that important bioarchaeological information would be obtained, providing an appropriate regime of sampling and recovery was instituted.

Recommendations

The existing material should be analysed to address the questions outlined above concerning the origin and nature of the deposits and their relationship to past river regimes. This will also provide important comparative data for the post-Conquest deposits from the nearby Coppergate and ABC Cinema sites. Detailed analysis will also provide a better basis for formulating a research strategy in the event of further excavation.

Should further excavation be undertaken (and we would strongly urge that it is), extensive sampling of the deposits and detailed analysis of recovered biological remains is strongly recommended.

Retention and disposal

All the processed and unprocessed material currently in store should be retained.

Archive

All extracted fossils from the test subsamples, and the residues and flots are

currently stored in the Environmental Archaeology Unit, University of York, along with paper and electronic records pertaining to the work described here.

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Appendix 1: Borehole sample descriptions

The descriptions are presented in order of increasing depth (in metres) below current ground

Borehole 1

2.5-3.0 m (Context 5105): Moist, dark grey to dark grey brown to dark brown, soft and slightly thixotropic, silty sand with very small stones (2 to 6 mm), fragments of brick/tile and mammal bone present.

3.0-3.5 m (Context 5106-5107): Moist to wet, dark grey to dark grey brown to dark brown, soft and thixotropic, sandy silt (locally more organic and more sandy) with very small stones 92 to 6 mm) and fragments of brick/tile present.

3.5-4 m (Context 5108): Moist, dark grey brown to dark grey, crumbly to plastic, sandy silt with fragments of brick/tile, cinder and wood (at 3.5 m) and mammal bone (at 3.85 m) present. A lower sand content from 3.94-4.0 m.

4.1-4.21 m (Context 5109): Wood with some silty sand.

4.21-4.34 m (Context 5110): Moist, dark grey, crumbly, sandy silt to silty sand (especially coarse and sandy from 4.25-4.31 m) with brick/tile at 4.30-4.34 m.

4.34-4.44 m (Context 5111): Moist, very dark grey, plastic, humic clay silt (locally slightly sandy).

4.44-4.6 m (Context 5112): Crushed brick/tile and mortar.

4.6-5 m (Context 5113-5114): Moist, dark grey brown to dark grey, plastic, humic slightly clay silt with chalk/limestone fragments at 4.81-4.84 m and 4.67-4.68 m.

5-6 m (Context 5115-5118): Same as 4.6-5 m (above) with leather at 5.25 m.

6-6.2 m (Context 5119): Moist, dark grey brown, slightly brittle to plastic, slightly sandy slightly clay silt with tiny 'pellets' of brown clay. Brick/tile was common and very small stones (2 to 6 mm) present in this section.

6.2-6.4 m (Context 5120): Moist, light to mid grey to light grey brown, crumbly (working plastic), mixture of sand and sandy silt.

6.4-6.75 m (Context 5121): Moist, light to mid grey, unconsolidated (locally working slightly plastic), gravelly sand with patches of silt. very small to medium-sized stones (2 to 60 mm), brick/tile and ?freshwater molluscs were present in this section.

6.75-7 m (Context 5122): Moist, mid to dark grey brown, crumbly (working plastic), ?slightly humic, sandy silt with traces of herbaceous detritus. Freshwater and ?marine molluscs were present in this section.

7.1-7.81 m (Context 5123-5125): Moist, light to mid grey to dark grey, plastic, silt with pale brown sand lenses from 7.44-7.67 m. The sediment was finer from 7.1-7.44 m.

7.81-8 m (Context 5126): Moist, light to mid grey brown, crumbly to unconsolidated, slightly silty sand.

Borehole 2

3.2-3.8 m (Context 5205): Moist, dark grey brown, soft to crumbly (working plastic), slightly silty slightly clay sand. Mortar was abundant and brick/tile, coal, wood and fish bone were present in the sample.

3.8-5.1 m (Context 5206): Moist, light to mid grey brown with slight mm-scale orange brown and grey mottling, firm to slightly crumbly (working plastic), clay silt with localised 'pellets' of pure clay.

5.1-5.2 m (Context 5207): Moist, mid to dark grey brown (internally blue-black in places), crumbly (working plastic), slightly sandy clay silt (locally sandier) with herbaceous detritus (including apple endocarp) and twigs.

5.2-6 m (Context 5208): Moist, sulphide rich, mid brown (black internally), crumbly (working plastic), slightly humic slightly clay silt with some herbaceous detritus and traces of vivianite.

6-6.2 m (Context 5209): Moist, mid to dark grey, crumbly (working plastic), clay silt with some

herbaceous detritus and patches of pale grey brown sand.

6.2-6.4 m (Context 5210): Moist, dark grey, crumbly (working plastic), clay silt.

6.4-6.75 m (Context 5211): Moist, mid to dark grey brown, crumbly to plastic, very stony clay sand (locally more sandy and more clay) with rotted lime and mammal bone present.

Borehole 3

2.8-3 m (Context 5308): Moist to wet, dark grey to black, crumbly (working plastic—matrix very variable in texture from plastic to very gritty), very stony (very small to medium-sized stones were common) silty sand with marine mollusc present.

4-5.1 m (Context 5312): Moist, dark grey brown to dark brown to dark grey, crumbly (working plastic), slightly clay silt with some herbaceous detritus (including apple endocarp).

5.1-6.1 m (Context 5313): Moist, mid grey brown (black internally—evidence of oxidation/reduction), crumbly (working plastic), slightly sandy slightly clay silt with some herbaceous detritus. Vivianite and wood were present in the sample.

6.3-7 m (Context 5315): Moist, dark grey, crumbly (working plastic), slightly sandy silt (with localised patches of pale grey brown sand) with some herbaceous detritus and vivianite present.

7-7.5 m (Context 5316): Moist, dark grey, crumbly (working slightly plastic), stony silty sand. Very small and small stones (2 to 20 mm) and fragments of brick/tile were present in the sample.

7.5-8 m (Context 5317): Moist, dark grey, crumbly (working plastic), sandy silt with some herbaceous detritus.

Borehole 4

2.3-3.3 m (Context 5408): Moist to wet, dark grey, soft to plastic, silty clay sand. Brick/tile was common and medium-sized stones (20 to 60 mm) and mammal bone were present in the sample.

3.3-3.5 m (Context 5409): Moist to wet, dark grey,

crumbly (working slightly plastic), very sandy silt or silty sand (?rich in ash). Charcoal was abundant and rotted mortar present in the sample.

3.5-3.7 m (Context 5410): Moist, dark grey brown, crumbly to somewhat layered, humic silty clay sand with some herbaceous detritus (locally richer in the latter). Medium-sized stones (20 to 60 mm), rotted mortar, brick/tile and twigs were present in the sample.

3.8-4.0 m (Context 5411): Moist, very dark grey, crumbly (working slightly plastic), slightly silty sand. Rotted mortar was abundant and twigs were present in the sample.

4-4.35 m (Context 5412): Moist to wet, dark grey (locally grey or slightly brown), crumbly (working somewhat plastic), silty clay sand. Very small stones (2 to 6 mm), brick/tile, wood (oak), twigs, mammal bone and fish bone were present in the sample.

4.37-4.6 m (Context 5413-5418): Moist, dark greyish brown (internally black in localised patches), soft and crumbly (working plastic), humic slightly clay silt with some herbaceous detritus and twigs present.

4.65-4.9 m (Context 5419): Moist, dark grey brown (internally blue-black), crumbly (working plastic), sulphide rich, slightly clay silt with ostracods present.

4.9-6.0 m (Context 5420): Just moist, mid to dark grey brown (internally blue-black), crumbly to brittle (working plastic), slightly clay silt. Vivianite was present in the sample.

6.0-6.2 m (Context 5421): Moist, dark grey, soft and crumbly (working plastic), slightly clay silt with patches of rusty colouration in 'drying cracks'. Brick/tile was present in the sample.

6.2-6.6 m (Context 5422): Moist, mid to dark grey, crumbly (working plastic), locally slightly sandy, slightly clay silt.

6.6-6.8 m (Context 5423): Moist, mid to dark grey, crumbly working plastic, slightly clay silt.

6.8-7.1 m (Context 5424-5427): Moist, mid to dark grey, unconsolidated, very stony coarse sand with traces of clay.

Table 1. Hand-collected vertebrate remains from 14th century deposits; *— includes only those teeth of use for ageing or sexing information.

Taxon		No. fragments	No. measurable	No. mandibles	*No. isolated teeth	Weight (g)
<i>Canis</i> f. domestic	dog	4	4	1	-	193
<i>Felis</i> f. domestic	cat	9	7	-	-	25
<i>Equus</i> f. domestic	horse	4	3	-	-	1131
<i>Sus</i> f. domestic	pig	12	1	1	-	430
<i>Cervus elaphus</i> L.	red deer	1	1	-	-	199
<i>Dama dama</i> (L.)	fallow deer	1	1	-	-	77
<i>Bos</i> f. domestic	cattle	36	13	-	2	2283
Caprinae	sheep/ goat	23	8	3	1	495
<i>Anser</i> sp.	goose	5	1	-	-	19.5
cf. <i>Anser</i> sp.	?goose	2	-	-	-	4.5
<i>Gallus</i> f. domestic	chicken	4	2	-	-	24
Fish		1	-	-	-	14
Sub-total		102	41	5	3	4895
Unidentified		171	-	-	-	2918
Sub-total		171	-	-	-	2918
Total		273	41	5	3	7813

Table 2. Hand-collected vertebrate remains from 17/18th century deposits; *—30 fragments represent a single horse cranium.

Taxon		No. fragments	No. measurable	No. mandibles	Weight (g)
<i>Lepus</i> sp.	hare	1	-	-	7
<i>Equus</i> f. domestic	horse	30*	-	-	1050
<i>Sus</i> f. domestic	pig	4	-	-	77
<i>Dama dama</i> (L.)	fallow deer	1	1	-	83
<i>Bos</i> f. domestic	cattle	12	3	-	784
Caprinae	sheep/ goat	7	4	2	216
cf. <i>Ardea cinerea</i> L.	?heron	1	-	-	2
<i>Anser</i> sp.	goose	1	-	-	6
cf. <i>Gallus</i> f. domestic	?chicken	2	-	-	3
Sub-total		59	8	2	2228
Unidentified		39	-	-	442
Sub-total		39	-	-	442
Total		98	8	2	2670