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**Assessment of biological remains from BHS store, Feasegate, York
(site code YORYM1998.2)**

by

John Carrott, Paul Hughes, Deborah Jaques, Cluny Johnstone,
Harry Kenward and Darren Worthy

Summary

Samples of sediment and a small assemblage of hand-collected bone, recovered from excavations within the BHS store in Feasegate, York, have been assessed for their potential in post-excavation analysis.

The plant and insect remains were well-preserved and, together, would provide a useful reconstruction of conditions, and to an extent activity, at the site. Further investigations of the diatoms may give additional information about deposit formation.

Whilst the Roman vertebrate assemblage was very limited, the early medieval material shows some potential for both zooarchaeological and archaeological interpretation. This group consisted mainly of domestic and primary butchery refuse, with a small amount of waste from craft activities. The moderately large assemblage of fish remains recovered from this site is of interest as other small excavations in the same area have produced very little fish.

It is recommended that further analysis be undertaken on all the material from this site as it will, when combined with evidence from nearby excavations in Davygate, provide a picture of this previously poorly represented area.

KEYWORDS: BHS STORE; YORK; ASSESSMENT; ROMAN; EARLY MEDIEVAL; PLANT REMAINS; INVERTEBRATE REMAINS; DIATOMS; BEETLES; VERTEBRATE REMAINS; FISH REMAINS

Author's address:

Palaeoecology Research Services
Environmental Archaeology Unit
University of York
Heslington
York YO1 5DD

Prepared for:

York Archaeological Trust
Cromwell House
13 Ogleforth
York YO1 2JG

Telephone: (01904) 433846/434475/434487
Fax: (01904) 433850

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Introduction

An archaeological excavation was carried out by York Archaeological Trust within the BHS store, York, in January 1998. Two trenches were excavated to a depth of 1.36 metres. Trench 1 was located next to the entrance to the store in Feasegate, whilst Trench 2 was adjacent to the north-west boundary of the store. The Roman fortress wall was encountered within Trench 1, with 10th-13th century deposits against the external face of the wall. Deposits from Trench 2 were dated to the 11th-13th centuries, with features mainly confined to pits and layers.

A total of thirty 'environmental' samples (20 GBAs, 9 BSs and one spot sample, *sensu* Dobney *et al.* 1992) and 5 boxes of hand-collected animal bone from these deposits were submitted for assessment of their bioarchaeological potential.

Methods

Sediment samples

All the sediment samples were inspected in the laboratory and on the basis of this inspection and information supplied by the excavator 10 of them were chosen for further work. A description of the lithology of all samples was recorded using a standard *pro forma*. Subsamples were taken from the seven 'GBA' samples selected for further work, for extraction of macrofossil remains, whilst three samples were bulk-sieved (to 500 µm) following procedures of Kenward *et al.* (1980; 1986).

Plant macrofossils were examined from the residues, washovers and flots resulting from processing, and the flots were examined for invertebrate remains.

Six of the samples were examined for microfossils using the 'squash' technique of Dainton (1992).

Table 1 shows a list of samples and notes on their treatment.

Vertebrate remains

Vertebrate remains were recovered from a total of 71 deposits (five boxes of approximately 20 litres each). For the purposes of this assessment, material from 46 contexts (approximately 4.5 boxes) was chosen and recorded in detail. These contexts were selected to represent a range of periods, or on the basis of number of fragments (i.e. more than six fragments) Material from the remaining deposits was briefly scanned.

The vertebrate assemblage was recorded electronically directly into a series of tables using a graphical input system and *Paradox* software. Briefly, semi-subjective data were recorded for each context regarding the state of preservation, colour and appearance of broken surfaces ('angularity'). In addition, semi-quantitative records were made concerning the size of the fragments, dog gnawing, butchery, fresh breakage and burning.

Identification was carried out using the reference collections of the Environmental

Archaeology Unit. Records were made for each species within each of the selected contexts, which consisted of the total number of fragments, the number of each anatomical element present, along with the numbers of 'A' bones i.e. mandibular teeth and mandibles for age at death analysis, measurable fragments, and the number of unfused and juvenile fragments (Dobney *et al.* forthcoming).

Fragments not identifiable to species were grouped into categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid) and bird. In addition to counts of fragments, weights of identifiable species and unidentified categories were recorded.

Results

Sediment samples

Context 1002 [Fill of gully - E13th C]
Sample 1 (description only)

Just moist, mid grey, crumbly to unconsolidated (working soft and slightly sticky), clay silt, with mm-scale lumps of off-white and light grey brown clay. Some 'lumps' of sediment rather jumbled with a mix of minor components and the main matrix. Very small (2-6 mm) and small (6-20 mm) stones, rotten mortar, brick/tile, charcoal, very rotten wood and bird bone were present in this sample.

Sample 2 (description only)

As Sample 1.

Context 1007 [Fill of pit - E13th C]
Small find 32

This spot find appeared to be a mineralised concretion, which was layered and slightly calcareous. No parasite eggs were present, which suggested that the layer was unlikely to include large amounts of human faecal

material. However, it could have formed by mineralisation of faeces of livestock.

Context 1007 [Fill of pit - E13th C]
Sample 3 (description only)

Moist, very dark grey brown black, crumbly (working soft), clay silt, with white mineral flecks and lumps. Very small (2-6 mm), small (6-20 mm) and large (>60 mm) stones, leather, charcoal, rotten wood, twigs, large mammal and fish bone were present in this sample.

Sample 4 (description only)

Same as Sample 3.

Context 1008 [Fill of pit]
Sample 5 (description only)

Moist, black and light grey, crumbly, mostly ash with poorly preserved wood.

The sample was too small for further action to be worthwhile at this stage.

Context 1025 [Fill of pit - E13th C]
Sample 6 (description only)

Just moist, mid brown to mid grey brown, crumbly to unconsolidated (working soft), clay silt, with abundant white mineral flecks. Very small (2-6 mm) stones and wood present.

Context 1043 [Dump - 11th/12th C]
Sample 7 (description only)

Moist, mid to dark grey brown to dark grey, crumbly to unconsolidated (working soft), slightly sandy, clay silt, with white mineral flecks and coating on stones. Very small (2-6 mm), small (6-20 mm) and medium (20 - 60 mm) stones, brick/tile, pot, rotten wood and bird bone were present in this sample. The sample in the tub was contaminated by modern mould growth on the surface.

Sample 8 (description only)

Same as Sample 7.

Context 1069 [Fill of pit - 11th/12th C]
Sample 9 (2kg GBA)

Moist, dark grey brown, crumbly, slightly sandy slightly clay silt, with abundant white mineral flecks. Very decayed, orange (oxidised) wood fragments, together with pottery and large mammal bone were present in this sample.

Strongly decayed wood fragments (to 40 mm) were very frequent in the moderate-sized washover (which formed 15% by volume of the original sample). Pieces of charcoal (to 10 mm) were noted as 'frequent' and fragments of dicotyledon leaves were also present. A range of weed taxa indicative of waysides/wasteland and disturbed/cultivated ground was identified, including oraches (*Atriplex* sp(p)), fat-hen (*Chenopodium album* L.), small nettle (*Urtica urens* L.), stinging nettle (*U. dioica* L.), hemlock (*Conium maculatum* L.), knotgrass (*P. aviculare* agg.), pale persicaria (*Polygonum lapathifolium* L.), fool's parsley (*Aethusa cynapium* L.), corn marigold (*Chrysanthemum segetum* L.), long prickly-headed poppy (*Papaver argemone* L.), dead-nettle (*Lamium* Sect. *Lamiopsis*) and thorn-wax (*Bupleurum rotundifolium* L.). The sample also contained significant numbers of *Chenopodium* Sect. *Pseudoblitum* seeds, indicative of highly organic substrates such as rubbish tips or manure heaps. The presence of some grassland species such as blinks (*Montia fontana* ssp. *chondrosperma* (Fenzl) Walters) and a range of small grass seeds may represent the hay component of manure, or turf. In common with many urban archaeological deposits, the sample contained a range of wetland types, including sedges (*Carex* sp(p)) nutlets, lesser spearwort (*Ranunculus flammula* L.) achenes, common spike-rush (*Eleocharis palustris* s.l.) nutlets, toad rush (*Juncus bufonius* L.) seeds, and willow (*Salix* sp(p)) bud-scales. Possible food remains were represented by a single charred barley (*Hordeum* sp(p)) grain and a single raspberry (*Rubus idaeus* L.) seed.

The moderate-sized residue was dominated by coarse quartz sand and contained occasional rounded pebbles (to 22 mm), oolitic limestone fragments (to 40 mm), pottery shards (to 70 mm), brick/tile (to 20 mm), fish bones, mineralised wood fragments, and charcoal (to 17 mm).

The rather small flot included a large proportion of insect remains in an excellent state of preservation. There were assorted species associated with a range of decaying-matter habitats (although with rather little evidence of foul matter). Some 'outdoor' taxa were

present, as were various species found in dead wood and under loose bark. The implications of this group were not obvious, although the fauna from a larger subsample (perhaps 5 kg) would probably be more clearly interpretable.

The microfossil 'squash' was mostly inorganic with some organic detritus. No eggs of intestinal parasites were seen.

The bone comprised single gadid and eel (*Anguilla anguilla* (L.)) vertebrae, three other fish fragments (together weighing 2.3 g) and three unidentifiable mammal fragments (weighing 8.2 g).

Context 1070 [Fill of pit - 12th/13th C]
Sample 10 (description only)

Just moist, mid to dark grey brown, crumbly (working soft), clay silt, with white mineral flecks and orange patches from oxidised rotted organic matter (possibly rootlets). Oolitic limestone (to 90 mm), large stones (>60 mm), pot, rotten wood and marine molluscs were present in this sample.

Context 1079 [Dump - 11th/12th C]
Sample 11 (description only)

Just moist, light brown and mid brown, crumbly to unconsolidated, clay silt, possibly ashy, with white mineral flecks. All classes of stones (2- >60 mm), pot, charcoal and large mammal bone fragments were present.

Context 1079 [Fill of pot <28>]
(Spot sample - included bag (650 g) of sediment, and separate bags of bone, fruit stones, charcoal and lumps of ?faecal concretions)

Just moist, light brown and mid brown, unconsolidated, clay silt, possibly ashy, with white mineral flecks.

The sediment within the pot appears to reflect the surrounding matrix. Concretions recovered from within the pot were examined by microfossil 'squash'. No parasite eggs were seen but, subjectively, they seem to be faecal in nature—the absence of parasite eggs does not rule out this possibility but, almost certainly, implies that it is not human in origin.

The bones recovered from inside the pot included single amphibian, pig and goose bones, five fish, three bird and 12 unidentified fragments.

Context 1085 [Layer/floor - 11th C]
Sample 12 (description only)

Same as Sample 13 but more jumbled and with orange veining (possibly oxidised rootlets).

Sample 13 (BS whole sample 32 kg)

Moist, mid brown to mid grey brown, crumbly (working soft and sticky), clay silt. Oolitic limestone, very small (2-6 mm), small (6-20 mm) and medium sized (20-60 mm) stones, mortar/plaster, ?rotten brick/tile, charcoal and large mammal bone were present.

An extremely small wash over was recovered, which contained mostly sand, with a small number of weed seeds indicative of disturbed ground.

The large residue (approx 10 litres, partly sorted) consisted chiefly of stones, mortar, and dried clay lumps. Brick/tile, pottery and glass were present. Charcoal was abundant (to 15 mm), charred grain, nutshell, large and small mammal bone, bird bone, fish bone and shellfish were also present.

A considerable quantity of bone was recovered, including mammal, bird and fish remains. The identified mammal fragments (weighing 273 g) included cattle, pig, sheep/goat, cat (*Felis f. domestic*), canid, vole/mouse (microtine/murine), and mouse (*Mus* sp.). The numerous unidentified mammal fragments weighed 325 g. The bird remains (weighing 4.4 g) included ?jackdaw (cf. *Corvus monedula* L.), ?duck (cf. *Anas* sp.) and chicken (*Gallus f. domestic*) fragments. The fish remains (weighing 12.8 g) included ?ling (cf. *Molva molva* (L.)), haddock (*Melanogrammus aeglefinus* (L.)), eel (*Anguilla anguilla* (L.)), herring (*Clupea harengus* L.), ?cod (cf. *Gadus morhua* L.), cyprinid and gadid fragments.

Context 1087 [Dump - 11th/12th C]
Sample 14 (2kg GBA)

Moist, dark grey, crumbly (working plastic), slightly sandy, clay silt with abundant white mineral flecks, orange veining (oxidation) and patches of light greyish brown clay silt. Small (2-60 mm) and large (>60 mm)

stones, very decayed wood and marine mollusc fragments were present in this sample.

The very small washover (<1% of the original sample) contained a more restricted range of weed taxa compared with the washover from Context 1069. The main group of species present was indicative of disturbed/cultivated ground. Wetland taxa included sedges and bulrush (*Scirpus lacustris* s.l.). Other components of the washover included occasional charcoal fragments (to 3 mm), unidentified amorphous charred material, small bark fragments (to 7 mm), degraded wood fragments (to 5 mm) and a small quantity of monocotyledonous plant detritus.

The moderately large residue (30% of the original sample) was mainly composed of coarse sand and charcoal (to 10 mm). Other constituents of the residue included occasional pieces of brick/tile, grey pottery shards, oolitic limestone (to 30 mm) and fish scales. Stone fragments (to 40 mm) were recorded as 'frequent'. Further remains of weed taxa, similar to those encountered in the washover, were also noted.

Only a few insects were present in the flot, and their preservation was moderate to poor. A trace of decomposers was noted, with rare outdoor forms (the latter including a terrestrial *Helophorus* sp. and a click beetle larva). The implications of this fauna were not clear, but a subsample of 6 kg or so might provide an interpretable group.

The bone comprised single cattle and pig fragments, two sheep/goat fragments and 24 unidentified mammal fragments (together weighing 88.8 g). A single chicken fragment and three unidentified bird fragments (together weighing 0.6 g) were noted. In addition a gadid (possibly cod (cf. *Gadus morhua* L.)) vertebra and four other fish fragments were recorded (weighing 4.2 g).

Context 2007 [Fill of depression - 12th/13th C]
Sample 200 (2kg GBA)

Moist, dark greyish brown, crumbly (working slightly plastic), moderately humic, sandy, clay silt, with woody and herbaceous detritus and white mineral flecks. Pot (to 30 mm) fragments, wood (?chips) and twigs were present in this sample.

Wood chips (to 60 mm) dominated the moderately large washover (40% of the original sample). All other macrofossils were poorly represented though the assemblage contained a relatively wide range of

disturbed/cultivated ground weed taxa and a few species indicative of manure heaps, grassland, wayside and fen habitats. Food species were represented by a single charred barley grain and rare hazel nutshell fragments.

The main constituents of the residue (15% of the original sample) were coarse quartz sand and small degraded wood fragments (to 20 mm); occasional pieces of oolitic limestone (to 40 mm), charcoal (to 5 mm) and mineralised twigs (to 15 mm) were also recorded. Possible food materials included bone fragments (to 40 mm) small pieces of eggshell, charred barley grains, and further small pieces of hazel nutshell.

The flot was quite large, but consisted mostly of insect remains. Preservation was superb, and some extremely delicate remains had survived, including wings and an entire (but clearly ancient) aphid. The insect assemblage appeared to be very diverse in its ecological origins. Aquatics and waterside species were rather common; they seemed to be too numerous to have originated in background fauna unless from very close by. Subjectively, there were more dung beetles (*Aphodius* spp. and *Geotrupes* sp.) than might occur in background fauna, too. There were some plant feeders which may have been imported in hay (unless there was grassland at the site), and some unusual remains may have belonged in this category. This deposit may have included stable manure (hence dung and hay) and have lain in the open for some time before burial. A subsample of 3-4 kg would provide an excellent assemblage which should (with plant remains) clarify the origin of the layer as well as having its own intrinsic interest as a sample of fauna of the period.

The microfossil 'squash' was approximately half organic detritus and half inorganic material. Many diatoms (>3 forms) were noted. No eggs of intestinal parasites were seen.

This sample represents a mixed occupation deposit containing rubble, food waste and possibly small quantities of fen peat. The peat could have been used as flooring material (in a stable, perhaps?) or fuel. Although there are limited numbers of seeds belonging to taxa that grow on organic rubbish and manure heaps, there is only limited evidence to suggest that the sample contained an appreciable quantity of manure.

Context 2018 [Layer/dump - 12th C]
Sample 201 (description only)

Same as Sample 202 (see below) but also with eggshell and fish bone present.

Sample 202 (1 tub of 3 described, BS whole sample)

Moist, dark brown (internally dark grey brown), brittle (working soft, rubs brown), clay silt, with occasional small lenses of pale grey and buff clay and white mineral flecks. Very small (2-6 mm) and medium sized (20-60 mm) stones, mortar flecks, brick/tile, pottery, waterlogged wood, twigs, ?rotten nutshell and ?insect fragments were present.

No washover was recovered from this sample.

The large residue (approx 10 litres, partly sorted) consisted chiefly of sand and stones. Brick/tile, pottery, slag, coal, leather and metal (?gold wire) were present. Wood fragments in various stages of decay (to 6 cm) and charcoal were abundant. Twigs (including *Prunus* sp.), charred grain (wheat/barley and oats), nutshell (hazel), large and small mammal bone, amphibian bone, bird bone, fish bone, insect fragments, fly puparia, eggshell and shellfish (oyster) were also noted.

A considerable quantity of bone was recovered from the residue including mammal, bird, amphibian and fish remains. The identified mammal remains (weighing 126 g) included cattle, pig, sheep/goat, hare (*Lepus* sp.) and red squirrel (*Sciurus vulgaris* L.). A single, burnt, cattle horn tip was recovered. The numerous unidentified mammal fragments weighed 224.6 g. The bird remains (weighing 2.4 g) included ?chicken (cf. *Gallus* f. domestic), goose (*Anser* sp.) and "wader type" fragments. The fish remains (weighing 9.7 g) included herring (*Clupea harengus* L.), eel (*Anguilla anguilla* (L.)), haddock (*Melanogrammus aeglefinus* (L.)), flatfish (pleuronectid) and gadid fragments. A single fish vertebra had a 'squashed' appearance, characteristic damage consistent with passage through the gut. Three amphibian bones were recovered (weighing 0.1 g).

Context 2019 [Slot fill - 11th/12thC]
Sample 203 (2kg GBA)

Moist, dark grey brown, crumbly (working slightly plastic), slightly humic, slightly sandy clay silt. Angular

limestone (to 150 mm), brick/tile (to 70 mm), wood and nutshell fragments were present in this sample.

The washover from this sample was very small (>1% of the original sample) and contained a limited range of disturbed/cultivated ground species including corncockle (*Agrostemma githago* L.), oraches, stinging nettle, chickweed (*Stellaria media* (L.) Vill.), knotgrass, henbane (*Hyoscyamus niger* L.), small nettle, dead nettle, 'turnip' (*Brassica rapa* L.) and common sow-thistle (*Sonchus oleraceus* L.). Occasional pieces of charcoal (to 3 mm) and wood fragments (to 5 mm) were also present.

Much of the large residue (60% of the original sample) comprised coarse quartz sand. Other common constituents included poorly preserved wood fragments (to 40 mm) and charcoal (to 7 mm). Pieces of brick/tile (to 70 mm), rounded pebbles (to 35 mm), limestone fragments (to 30 mm) and hazel (*Corylus avellana* L.) nutshell fragments were all recorded as infrequent. Further weed seeds similar to those in the assemblage noted from the washover were encountered, accompanied by occasional seeds of elder (*Sambucus nigra* L.) and rush (*Juncus* sp(p)).

The modest-sized flot yielded a rather small group of only averagely well preserved insect remains. Most were decomposers, but the character of the material which might have supported them was not clear; they may have exploited small amounts of somewhat damp decaying matter. It is not certain that even a quite large subsample would clarify the interpretation, but it would be worthwhile attempting this if a particular archaeological problem exists.

The microfossil 'squash' was approximately three parts inorganic material to one part organic detritus with a few diatoms (1 form). No eggs of intestinal parasites were seen.

Context 2026 [Dump - 11th/12th C]

Sample 204 (description only)

Moist, mid to dark grey brown, crumbly (working soft), clay silt, with abundant but scattered white mineral flecks. Very small (2 -6 mm) and medium sized (20- 60 mm) stones, micaceous sandstone rotten mortar and large mammal bone were present in this sample.

Context 2027 [Dump - 11th/12th C]

Sample 205 (description only)

Same as sample 206 but also with shellfish and white mineral flecks present.

Sample 206 (BS whole sample)

Moist, mid to dark purplish brown to mid to dark grey brown internally, brittle to crumbly (working soft), clay silt. Oolitic limestone, all classes of stones (2- >60 mm), wood and twigs were present in this sample.

The moderate washover consisted chiefly of decaying plant matter including a large quantity of decayed wood and charcoal fragments. A number of species indicative of disturbed or cultivated ground were present including dock (*Rumex acetosella* L.), poppy (*Papaver argemone* L.), small nettle (*Urtica urens* L.), oraches (*Atriplex* sp.), stinging nettle (*Urtica dioica* L.), corncockle (*Agrostemma githago* L.) and *Centaurea/lenautia* fragments. A number of fragments of *Chenopodium* Sect. *Pseudoblitum* were noted suggesting a component of manure/organic rubbish in the deposit. A few species typical of wetland habitats were also identified including celery-leaved crowfoot (*Ranunculus scleratus*), rushes (*Juncus* sp(p)), and *Daphnia* egg cases. In addition, the following species were present: elder (*Sambucus nigra* L.), chickweed (*Stellaria media*), thistle (*Cirsium/Carduus*) and *Ranunculus* sp. Earthworm egg capsules, fish scales and fly puparia were also noted.

The large residue (approx 10 litres, partly sorted) consisted chiefly of sand and stones. Brick/tile, pottery, mortar, ?slag and glass were present. Wood fragments in various stages of decay (to 10 cm) and charcoal (to 25 mm) were abundant. Twigs, charred grain (mostly barley/wheat), nutshell (hazel), large and small mammal bone, amphibian bone, bird bone, fish bone and shellfish were present.

A considerable quantity of bone was recovered from the residue including mammal, bird, fish and amphibian remains. The identified mammal fragments (weighing 81.9 g) included cattle, pig, sheep/goat, mole (*Talpa europea* L.) and rat (*Rattus* sp.). The numerous unidentified mammal fragments weighed 198.5 g. The bird remains (weighing 2.8 g) included a single chicken (*Gallus f. domestic*) fragment.

The fish remains (weighing 14.2 g) included herring (*Clupea harengus* L.), salmonid and gadid fragments. A single fish vertebra showed characteristic damage

consistent with being chewed. Three amphibian bones were recovered (weighing 0.1 g).

Context 2029 [Dump - 11th/12th C]
Sample 208 (description only)

Just moist, mid purplish brown, brittle to crumbly (working soft), slightly clay silt. Small (6- 20 mm) stones, rotten mortar, tile/pot, wood (?chips), twigs and large mammal bone were present in this sample.

Context 2032 [Dump - 11th/12thC]
Sample 207 (description only)

Same as Sample 209 (see below) but slightly purplish in colour.

Sample 209 (1kg GBA)

Moist, dark grey brown, crumbly and slightly layered, very humic, sandy clay silt, with variable fine and coarse herbaceous detritus. Partly mineralised wood fragments and fish bone were present in this sample.

The rather large washover (40% of the original sample) was dominated by monocotyledon stem and root fragments. Charcoal (to 13 mm), degraded pieces of wood, and wood chips (to 70 mm) were noted as 'frequent'. Other vegetative macrofossils included occasional pieces of dicotyledon leaf and dicotyledon stem. Several species suggestive of grassland were encountered including selfheal (*Prunella vulgaris* L.), frequent small grass seeds and violet/pansy (*Viola* sp(p).) seeds. Faecal concretions bearing straw impressions, and several *Chenopodium* species, were also noted, accompanied by a range of disturbed/cultivated ground weed species very similar to the those noted for Context 2019. Wetland taxa were restricted to gipsywort (*Lycopus europaeus* L.) and spike-rush.

The moderately large residue (30% of the original sample) contained rounded pebbles (to 42 mm), faecal concretions (to 30 mm), angular stones (to 40 mm), brick/tile (to 35 mm), pieces of charcoal (to 35 mm) and eggshell fragments. All of the components were infrequent.

About a quarter of the flot - which was of modest size - consisted of insect remains, whose preservation was less than good but which were identifiable. There were,

subjectively, hints of muddy foul matter in the open. A 3 kg subsample should provide clearer evidence.

The microfossil 'squash' was mostly organic detritus with some inorganic material. A few phytoliths (grass type) and many diatoms (4+ forms) were noted. No eggs of intestinal parasites were seen.

The mixture of grassland species, monocotyledon fragments, faecal material and nitrophilous weed species strongly suggests that the sample contained stable manure. The wood chips and degraded wood fragments could have been used as bedding for animals.

Context 2038 [Dump - 11th/12th C]
Sample 210 (description only)

Same as Sample 211(see below).

Sample 211 (2 kg GBA)

Moist, dark grey brown, crumbly, moderately humic, sandy clay silt, with white mineral flecks. Small (6-20 mm) stones, wood and nutshell fragments were present in this sample.

Wood chips (to 35 mm) dominated the moderate-sized washover (30% of the original sample). Bark (to 10 mm), monocotyledon stem fragments and monocotyledon rootlets were all recorded as infrequent. The remainder of the washover consisted of an assemblage of disturbed/cultivated ground weed species, rare poorly preserved charred wheat/barley grains and a very limited range of wetland species including sedges, bulrush and spearwort. *Chenopodium* Sect. *Pseudoblitum* and *C. murale* were both represented in the sample, indicating the presence of organic-rich rubbish or manure.

The bulk of the moderate-sized residue (30% of the original sample) was composed of coarse quartz sand. Other constituents included pebbles (to 20 mm), angular limestone fragments (to 30 mm), brick/tile (to 10 mm) and charcoal (to 35 mm).

The flot, of modest size, consisted mostly of insect remains, which were very well preserved. The presence of an appreciable proportion of aquatic, waterside and damp-ground forms was immediately obvious. Among the aquatics there were various water beetles, while the water fleas included a few *Daphnia* ephippia (resting eggs) and numerous ephippia of

another species not identified to genus. Waterside taxa included *Cyphon* sp. (usually on vegetation by water or in damp places). Among the terrestrial insects were various decomposers (including hints of a foul-matter component, but mostly rather tolerant) and outdoor forms, the latter including the nettlebug *Heterogaster urticae* (Fabricius) (probably indicating temperatures warmer than those of the present day). A larger subsample would provide a clearly interpretable group; it is important to determine the nature of aquatic habitats at this site.

The microfossil 'squash' was mostly organic detritus with some inorganic material. A few fungal spores, some phytoliths (grass type) and many diatoms (>4 forms) were noted. No eggs of intestinal parasites were seen.

Three fish fragments (0.2 g) and two unidentifiable mammal fragments (0.7 g) were recorded.

This sample contained a relatively limited occupation assemblage representing organic-rich waste possibly originating in stable manure. There was very little evidence of food remains.

Context 2040 [Dump - 11th C]
Sample 212 (description only)

Same as Sample 213 (see below).

Sample 213 (description only)

Moist, mid to dark grey, soft and sticky to crumbly (working soft and sticky), clay silt. Oolitic limestone (to 11 cm), rotten mortar and large mammal bone were present in this sample.

Context 2041 [Dump - 11th/12th C]
Sample 214 (2kg GBA)

Moist, dark grey brown, somewhat compressed, somewhat layered, slightly sandy slightly silty fine and coarse herbaceous detritus, locally more or less organic. Wood (?chips), twigs, large mammal bone and marine molluscs were present in this sample.

The moderate-sized washover (30% of the original sample) from this sample produced an assemblage very similar to that noted for Context 2032. Much of the washover comprised monocotyledon stem and rootlet fragments and wood chips (to 100 mm). The

weed taxa were dominated by *Chenopodium* Sect. *Pseudoblitum* and *C. album*. Most other types were poorly represented but included species typical of disturbed/cultivated ground, waysides/waste ground and grassland. A larger range of wetland taxa was present compared with Context 2032 (though all species were recorded as infrequent).

Coarse quartz sand formed the main component of the small residue (10% of the original sample). Other constituents included occasional oyster shell fragments, small pieces of eggshell, charcoal fragments (to 20 mm), brick/tile (to 10 mm) and wood fragments (to 10 mm). Small pieces of burnt bone (to 5 mm) were also noted.

The flot, of modest size, yielded insect remains in a good preservational condition. There were assorted decomposer taxa, with hints of a 'foul mouldering' component and species favoured by dryish conditions. Only a trace of outdoor fauna was noted. A subsample of 3-4 kg would provide an interpretable assemblage.

The microfossil 'squash' was mostly organic detritus with some inorganic material. Some phytoliths (grass type) and a few spores/pollen grains were noted. No eggs of intestinal parasites were seen.

A single gadid vertebra (0.3 g) and five unidentified mammal fragments (6.9 g) were recorded.

This sample is a heterogeneous dump deposit containing a mix of occupation waste including food waste and probably manure.

Vertebrate remains

A total of 1170 vertebrate fragments (weighing 23.75 kg) were recovered from the 46 contexts recorded in detail, of which 408 fragments (weighing 13.36 kg) were identifiable to species or species group. Table 2 gives the numbers of fragments by species, together with the numbers of measurable and subadult bones, mandibles, loose teeth and weights. Table 3 gives the number of fragments by date.

Overall, preservation was described as good and was consistent within contexts. Colour was variable, both within and between contexts, ranging from fawn to nearly black. Angularity (appearance of broken surfaces) was mostly described as 'spiky', but a few contexts contained single rounded fragments possibly indicating a small degree of reworking.

Fragmentation was not great, less than 10 % of the fragments being less than 5 cm in any direction. Burning was only noted on material from four contexts (1085, 1087, 1095 and 2032). Both fresh breakage and dog gnawing were evident on less than 10% of fragments in most contexts. Butchery evidence was more extensive, generally 10 to 20% of fragments in each context, with up to 50 % in some contexts.

Roman vertebrate remains

Four contexts of Roman date, all from inside the fortress wall, produced a very small amount of bone. Remains from a single context (1019) were recorded in detail (Table 3). Material from the three scanned contexts contained a further eight unidentifiable fragments. This assemblage is too small to be of any interpretative value.

Medieval vertebrate remains

Vertebrate remains from a total of 45 contexts, dating to the 10th-13th centuries, were recorded in detail, material from a further 23 contexts being scanned. Mammal species present included the major domestic species (cattle, caprovid, pig and horse), minor domestic species (cat and dog), red (*Cervus elaphus* L.) and roe (*Capreolus capreolus* (L.)) deer, ?wild boar (cf. *Sus scrofa* L.), rabbit (*Oryctolagus cuniculus* (L.)) and hare (*Lepus* sp.). Bird species included goose (*Anser* sp.), duck (*Anas* sp.), chicken (*Gallus* f. domestic) and corvid. The corvid femur is of rook/crow size.

The goose bones were mainly consistent in size to the greylag (*Anser anser* (L.)) specimens in the modern comparative collection, however, this does not rule out the possibility that they might represent domestic geese. The same is true for ducks, most are mallard-sized, but the slightly larger bones could be domestic individuals.

A single tibiotarsus was morphologically similar to both the goosander (*Mergus merganser* L.) and merganser (*Mergus serrator* L.) specimens in the reference collection. However, the bone was considerably smaller in size and was tentatively identified as ?smew (cf. *Mergus albellus* L.), a smaller member of the sawbill family. This identification remains to be substantiated because there were insufficient modern comparative specimens in the EAU collection.

In addition, single crab and amphibian fragments were recovered together with 14 fish bones.

Sufficient fragments were recovered for a limited interpretation to be offered for the skeletal element representation. The cattle fragments appear to represent mainly primary butchery waste (i.e. head and lower limb fragments), with a smaller quantity of domestic refuse. Both caprovid and pig remains suggest a more equal mixture of primary butchery and domestic refuse.

Deposits from within feature 2014 (described as a circular depression) contained eight cattle horncores, (with a further ten from the cleaning layer above) suggesting a somewhat specialised deposit of hornworkers' waste. In addition, five antler fragments (probably all red deer) showed evidence of working. Evidence for the importation of antlers (probably to supply craft activities in York) is provided by a single large burr which had been shed 'naturally'.

Material from the scanned contexts appeared very similar to the rest of the assemblage. A single ulna identified as rabbit (*Oryctolagus cuniculus* (L.)) was noted in Context 1049, dated to the 10th/11th C. This fragment is of potential significance since rabbits are generally believed to have been introduced into this country by the Normans. However, even if the dating of the deposit is secure, without a C14 date it is impossible to be certain whether or not this bone is intrusive, although its preservation and general appearance showed little difference to other vertebrate remains from the deposit.

Additionally, an otter (*Lutra lutra* (L.)) metatarsal was recovered from Context 1054.

One hundred and twenty four measurable bones were recorded from the medieval deposits, together with 65 subadult fragments, 12 mandibles and eight loose teeth. A further eight measurable fragments were noted from the scanned material.

Discussion and statement of potential

Sediment samples

The insect and plant remains would, together, undoubtedly provide a useful

reconstruction of conditions, and to an extent activity, at the site, and some of the insect assemblages would be of value in their own right as a resource for synthesis. It would be desirable to attempt to determine whether there were aquatic habitats *in situ*, and if so, what they were. Further investigation of the diatoms may give additional information about deposit formation although in at least one case they may have been introduced along with dumped material (the fen peat in Sample 200, Context 2007).

The presence of material so well preserved in central York is very significant as it will, when combined with evidence from excavations in Davygate, provide a picture of this previously poorly represented area. Subjectively, conditions seem to have been different from those implied from contemporaneous deposits elsewhere in York. Perhaps the presence of the standing Roman fortress wall disrupted the pattern of dense occupation, leaving areas used for dumping in which water could pool and weedy vegetation develop. It would be necessary to analyse a larger number of assemblages in order to test this and to make objective comparison with other parts of the city.

The white flecks seen in 16 samples appear very similar to those seen in samples from Parliament Street; the latter were identified as almost pure calcium sulphate (Carrott *et al.* 1996). At both sites the buildings were constructed on concrete rafts which may possibly be the source of this mineralisation, and at both the organic-rich deposits had shrunk, leaving a void below the concrete. Such voids beneath concrete rafts suggest that the lowering of the water table (whether caused by the raft itself, or a more general phenomenon related to rainfall or drainage changes in the city) is highly detrimental to

the long term preservation of highly organic anoxically waterlogged archaeological deposits. Action should be taken to preserve such deposits, or to record them before they degrade too far.

Vertebrate remains

The Roman vertebrate assemblage was so small that it has no interpretative or zooarchaeological potential.

The tightly dated early medieval deposits produced a moderate-sized, well preserved vertebrate assemblage. The material was not highly fragmented and displayed little evidence of dog gnawing, suggesting that the bones were incorporated into the deposits fairly rapidly.

Good preservation is also indicated by the presence of significant numbers of sub-adult bones, which tend to be more vulnerable to the processes of decay. However, it should be noted that a small quantity of possibly reworked material was observed in a few deposits.

The assemblage consisted chiefly of domestic and primary butchery refuse with a small quantity of craft-working refuse. The latter suggests the presence of horn and antler workers in the vicinity. Two metatarsi, one identified as otter, the other as squirrel, may indicate that pelts were also being processed nearby, however, evidence for this activity is obviously rather limited.

A third of the identifiable fragments were measurable and these should provide a useful dataset for zooarchaeological interpretation.

On its own, further analysis of this assemblage would produce only limited additional information about the deposits from which it came. However, in

combination with other small assemblages in the vicinity (Carrott *et al.* 1997; 1998), from deposits of a similar date and nature, the vertebrate remains might be able to throw some light on activities in this area during the early medieval period.

The bulk-sieved samples produced a moderate-sized assemblage of fish bones indicating that both freshwater and marine resources were being utilised. The relatively large quantity of fish bone recovered from this site is of interest as other small excavations from the same area of York (Carrott *et al.* 1997, 1998) have produced very little fish.

Recommendations

It is recommended that most of the remaining sediment samples should be processed, analysed, and reported in comparison with other sites in York. Quite large subsamples should be used to recover insect remains.

It is recommended that a basic archive, including biometrical data, should be produced of all well-dated material. The identities of the more unusual species should be checked and the biometrical data recorded. In addition, it is recommended that the rabbit bone from Context 1049 is radiocarbon dated to confirm the early date. As the potential for the recovery of a large and tightly dated fish assemblage appears high (on the basis of the remains from the samples that were bulk-sieved), all excess sediment should be processed. The data should be published in relation to those for other contemporaneous sites in York.

Retention and disposal

It is recommended that all the sediment samples and vertebrate remains are kept for the present.

Archive

All material is 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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Table 1. Samples from BHS store, Feasegate, York.

| Context no. | Sample no. | Described? | Processed? | Notes |
|-------------|------------|------------|------------|---|
| 1002 | 1 | Y | N | Recommend processed. |
| 1002 | 2 | As 1 | N | Recommend processed. |
| 1007 | 3 | Y | N | Recommend processed. |
| 1007 | 4 | As 3 | N | Recommend processed, particularly for bone |
| 1008 | 5 | Y | N | Too small for further action |
| 1025 | 6 | Y | N | No further action necessary. |
| 1043 | 7 | Y | N | Recommend processed. |
| 1043 | 8 | As 7 | N | Recommend processed. |
| 1069 | 9 | Y | GBA | 2 kg processed + microfossil 'squash' |
| 1070 | 10 | Y | N | Recommend processed, particularly for bone |
| 1079 | 11 | Y | N | fill of pot <28>, contents described |
| 1085 | 12 | As 13 | N | Recommend processed. |
| 1085 | 13 | Y | BS | 32 kg (whole sample) bulk sieved to 500 µm. |
| 1087 | 14 | Y | GBA | 2 kg processed |
| 2007 | 200 | Y | GBA | 2 kg processed + microfossil 'squash' |
| 2018 | 201 | As 202 | N | Recommend processed. |
| 2018 | 202 | Y | BS | 28 kg (whole sample) bulk sieved to 500 µm. |
| 2019 | 203 | Y | GBA | 2 kg processed + microfossil 'squash' |
| 2026 | 204 | Y | N | Recommend processed. |
| 2027 | 205 | As 206 | N | Recommend processed. |
| 2027 | 206 | Y | BS | 30 kg (whole sample) bulk sieved to 500 µm. |
| 2032 | 207 | As 209 | N | No further action necessary. |
| 2029 | 208 | Y | N | Recommend processed, particularly for bone |
| 2032 | 209 | Y | GBA | 1 kg processed + microfossil 'squash' |
| 2038 | 210 | As 211 | N | No further action necessary. |
| 2038 | 211 | Y | GBA | 2 kg processed + microfossil 'squash' |
| 2040 | 212 | As 213 | N | Recommend processed, particularly for bone |
| 2040 | 213 | Y | N | Recommend processed, particularly for bone |
| 2041 | 214 | Y | GBA | 1 kg processed + microfossil 'squash' |

Table 2. Vertebrate remains from BHS store, Feasegate, York. Number of teeth includes only those teeth of use for ageing or sexing information; juv = juvenile, neo = neonatal; *weight of all caprovid fragments i.e. sheep/goat, sheep and goat; #weight of all unidentified fragments.

| Taxa | | No. measurable | No. unfused | No. juv/neo | No. mandibles | No. teeth | No. fragments | Weight (g) |
|-----------------|-----------------------------------|-------------------|----------------|----------------|------------------|--------------|------------------|---------------|
| Rabbit | <i>Oryctolagus cuniculus</i> (L.) | - | - | - | - | - | 3 | 1.6 |
| Hare | <i>Lepus</i> sp. | - | - | - | - | - | 1 | 4 |
| Dog | <i>Canis</i> f. domestic | 3 | - | - | - | - | 4 | 59 |
| Cat | <i>Felis</i> f. domestic | 2 | 4 | - | - | - | 9 | 42 |
| Horse | <i>Equus</i> f. domestic | 1 | 1 | - | - | - | 3 | 679 |
| ?Boar | cf. <i>Sus scrofa</i> L. | - | 1 | - | - | - | 1 | 36 |
| Pig | <i>Sus</i> f. domestic | 14 | 19 | 2 | 3 | 3 | 58 | 1399 |
| Red deer | <i>Cervus elaphus</i> L. | - | - | - | - | - | 1 | 175 |
| ?Red deer | cf. <i>Cervus elaphus</i> L. | - | - | - | - | - | 4 | 92 |
| Roe deer | <i>Capreolus capreolus</i> (L.) | 2 | - | - | - | - | 2 | 42 |
| Cow | <i>Bos</i> f. domestic | 32 | 18 | 7 | 2 | 5 | 158 | 9004 |
| Sh/g | Caprovid | 20 | 8 | - | 7 | - | 60 | |
| Goat | <i>Capra</i> f. domestic | 1 | - | - | - | - | 2 | *1657 |
| Sheep | <i>Ovis</i> f. domestic | 15 | - | - | - | - | 19 | |
| Goose | <i>Anser</i> sp. | 7 | - | - | - | - | 12 | 39.6 |
| Duck | <i>Anas</i> sp. | 4 | - | - | - | - | 5 | 8 |
| ?Smew | cf. <i>Mergus albellus</i> L. | 1 | - | - | - | - | 1 | 1 |
| Chicken | <i>Gallus</i> f. domestic | 22 | 2 | 1 | - | - | 30 | 72.2 |
| Corvid | Corvidae | - | - | 2 | - | - | 2 | 1 |
| Bird | | - | - | - | - | - | 17 | 31.2 |
| Crab | | - | - | - | - | - | 1 | 0.2 |
| Amphibian | | - | - | - | - | - | 1 | 0.1 |
| Fish | | - | - | - | - | - | 14 | 15.1 |
| Subtotal | | 124 | 53 | 12 | 12 | 8 | 408 | 13359 |
| Medium mammal 1 | | - | - | - | - | - | 262 | |
| Large mammal | | - | - | - | - | - | 437 | #10392 |
| Unidentified | | - | - | - | - | - | 63 | |
| Subtotal | | - | - | - | - | - | 762 | 10392 |
| Total | | 124 | 53 | 12 | 12 | 8 | 1170 | 23751 |

Table 3. Numbers of vertebrate fragments by period from BHS store, Feasegate, York.

| Taxa | | Roman | C 10/11 | C 11 | C 11/12 | C 12 | C 12/13 | C E13 | C 13 | Total |
|-----------------|-----------------------------------|----------|----------|------------|------------|------------|-----------|------------|------------|-------------|
| Rabbit | <i>Oryctolagus cuniculus</i> (L.) | - | - | - | 1 | 1 | - | 1 | - | 3 |
| Hare | <i>Lepus</i> sp. | - | - | - | 1 | - | - | - | - | 1 |
| Dog | <i>Canis</i> f. domestic | - | - | - | - | - | 3 | 1 | - | 4 |
| Cat | <i>Felis</i> f. domestic | - | - | 2 | 1 | 1 | - | 4 | 1 | 9 |
| Horse | <i>Equus</i> f. domestic | - | - | 2 | 1 | - | - | - | - | 3 |
| ?Boar | cf. <i>Sus scrofa</i> L. | - | - | - | - | 1 | - | - | - | 1 |
| Pig | <i>Sus</i> f. domestic | 1 | - | 7 | 23 | 11 | 1 | 10 | 5 | 58 |
| Red deer | <i>Cervus elaphus</i> L. | - | - | - | - | 1 | - | - | - | 1 |
| ?Red deer | cf. <i>Cervus elaphus</i> L. | - | - | 2 | 1 | - | - | - | 1 | 4 |
| Roe deer | <i>Capreolus capreolus</i> (L.) | - | - | - | 1 | 1 | - | - | - | 2 |
| Cow | <i>Bos</i> f. domestic | 1 | 1 | 37 | 46 | 27 | 5 | 11 | 30 | 158 |
| Sh/g | Caprovid | - | 1 | 5 | 25 | 10 | 1 | 9 | 9 | 60 |
| Goat | <i>Capra</i> f. domestic | - | - | 2 | - | - | - | - | - | 2 |
| Sheep | <i>Ovis</i> f. domestic | - | - | - | 8 | 4 | - | - | 7 | 19 |
| Goose | <i>Anser</i> sp. | - | - | 1 | 5 | 3 | - | 2 | 1 | 12 |
| Duck | <i>Anas</i> sp. | - | - | 1 | 1 | - | - | - | 3 | 5 |
| ?Smew | cf. <i>Mergus albellus</i> L. | - | - | - | - | - | - | 1 | - | 1 |
| Chicken | <i>Gallus</i> f. domestic | - | - | 4 | 8 | 5 | 2 | 6 | 5 | 30 |
| Corvid | Corvidae | - | - | 2 | - | - | - | - | - | 2 |
| Bird | | - | - | 5 | 9 | 3 | - | - | - | 17 |
| Crab | | - | - | - | - | 1 | - | - | - | 1 |
| Amphibian | | - | - | - | 1 | - | - | - | - | 1 |
| Fish | | - | - | 5 | 7 | - | 1 | - | 1 | 14 |
| Subtotal | | 2 | 2 | 75 | 139 | 69 | 13 | 45 | 63 | 408 |
| Medium mammal | | - | 2 | 64 | 77 | 38 | 8 | 41 | 32 | 262 |
| Large mammal | | 2 | 1 | 122 | 138 | 75 | 4 | 50 | 45 | 437 |
| Unidentified | | - | - | 17 | 34 | 8 | - | - | 4 | 63 |
| Subtotal | | 2 | 3 | 203 | 249 | 121 | 12 | 91 | 81 | 762 |
| Total | | 4 | 5 | 278 | 388 | 190 | 25 | 136 | 144 | 1170 |