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

by

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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-exavcation analysis.

The plant and invertebrate 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 Ovengate, 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

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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 Kentward et al. (1980, 1986).

Plants 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 caprid or 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 - E1/5th C]
Sample 1 (description only)

Just moist, mid grey, crumbly to unconsolidated (working soft and slightly sticky), clay silt, with mm-scale heaps 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 (6-25 mm) stones, rotten mortar, brick/dile, charcoal. Very rotten wood and hard bone were present in this sample.

Sample 2 (description only)

As Sample 1.

Context 1007 [Fill of pit - E1/3rd C]
Small find 32

This spot find appeared to be a mineralised concentration which was layered and slightly calcareous. No articulated bones were present, which suggested that the layer was unlikely to include large quantities of human faecal material. However, it could have been made by mineralisation of faeces of livestock.

Context 1007 [Fill of pit - E1/3rd 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 - E1/3rd C]
Sample 6 (description only)

Just moist, mid brown, 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 - I/12th C]
Sample 7 (description only)

Moist, light 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/dile, 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)

Most, dark grey brown, crumbly, slightly sandy, slightly clay silts, with abundant white mineral flecks. Very decayed, orange (reduced) 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 moderately-sized whorls (which formed 15% by volume of the original sample). Pieces of charcoal (to 20 mm) were noted as 'frequent' and fragments of decaying leaves were also present. A range of weed and indicator of waysides/wasteland and disturbed/ cultivated ground was identified, including orchis (Orchis spp.), fabaceae (Chenopodium album L.), small nettle (Cotula sicken L.), stinging nettle (Urtica l.), hemlock (Conium maculatum L.), saxifrage (P. officinale ssp.), yew plant (P. p. ssp.), Food plant shrub (Ulex europaeus L.), corn marigold (Chrysanthemum segetum L.), long prickly-headed poppy (Papaver argemone L.), dead-nettle (Lamium ssp. Lamiosp.), and thistle (Hibiscus esculentus L.). The sample also contained significant numbers of Chenopodium Sect. Pseudolaimium species, indicative of highly organic substrates such as rubbing tips or manure heaps. The presence of setose grassland species such as blinks (Androsaena graminea) and chard (Daucus carota) and a range of small grass seeds may represent the hay component of manure or turf. In common with many urban geotechnical deposits, the sample contained a range of wetland types, including sedges (Carex spp.), reeds, lesser sparrow-wort (Ranunculus flammula L.)asion, common spike-rush (Eleocharis palustris L.) mats, toad rush (Juncus biflorus L.) seeds, and willow (Salix spp.) bud scales. Possible food remains were represented by a single charred barley (Hordeum sp.). grain and a single raspberry (Rubus ssp.) seed.

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

The rather small size included a large proportion of insect remains in an excellent state of preservation. There were two large species associated with a range of decaying-matter habitats (although with rather little evidence of fossil matter). Some 'outdoor' taxa were present, as were various species found in dead wood and tinder 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 'sphagnum' was mostly inorganic with some organic detritus. No eggs of intestinal parasites were seen.

The bone comprised simple galiés and sea (Trigonia argo or Linnaea angustis L.) vertebrae, three other fish fragments (together weighing 2.1 g) and three inedible identifiable 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 rootlets and organic matter (possibly rootlets). Oolitic limestone (to 90 mm), large stones (>60 mm), pol. 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 silty, possibly ash, with white mineral flecks. All classes of stones (2-60 mm), pot, charcoal and large mammal bone fragments were present.

Context 1078 [Fill of pot - 280 C]
(Sample 1 - included bag (650 g) of sediment, and separate bags of bone, iron stones, charred and lamps, of 'faecal concretions')

Just moist, light brown and mid brown, unconsolidated, clay silt, possibly ash, 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 'sphagnum'. No parasitic eggs were seen but subjectively they seem to be faecal in nature - the absence of parasitic eggs does not rule out this possibility but, almost certainly, implies that it is not blenorrhoea in origin.
The bones recovered from inside the pot included small antelaphidian 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 mixed and with orange veins (possibly oxidised roots).
Sample 13 (BS whole sample 32 kg)
Most, mid brown to mid grey brown, crumbly (working soft and sticky), clay silty. Oolitic limestone, very small (2-6 mm), small (6-20 mm) and medium sized (20-60 mm) stones, mortar/pisolithic. Brown brick-like, charcoal and large mammal bone were present.
An extremely small wad over was recovered, which contained mostly sand, with a small number of water seeds indicative of disturbed ground.
The large residue (approx 10 litres, partly sorted) consisted chiefly of stones, mortar, and dired clay lumps. Brick-like, pottery and glass were present. Charcoal was abundant (to 15 mm), charred grain, nutshell, large and small mammal bone, bird bone, horse bone and shellfish were also present.
A considerable quantity of bone was recovered, including mammal, bird and fish remains. The identified mammal fragments (weighting 275 g) included cattle, pig, sheep/goat, cat (*Felis c. domesticus*), wild boar (*Sus sp*), and goose (*Anser sp*). The numerous unidentified mammal fragments weighted 25 g. The bird remains (weighting 4.5 g) included 13 jackdaws (cf. *Corvus monedula* L.), 12 jackdaws (cf. *Aves sp*.) and 1 chicken (*Gallus f. domesticus*). The fish remains (weighting 12.8 g) included 10 eels (cf. *Anguilla vulgaris* (L.)), haddocks (cf. *Melanogrammus aeglefinus* (L.)), 1 eel (cf. *Anguilla anguilla* (L.)), bering (cf. *Charys argenteus* (L.)), 1 cod (cf. *Gadus morhua* L.), 1 eel and 1 gadil fragments.

**Context 1087** [Dumps - 11th/12th C]
Sample 14 (250 g)
Most, dark grey brown, crumbly (working slightly plastic), moderately humid, sandy, clayey silty. With abundant white mineral flakes, 10 sheep/goat (ovulocasts) and patches of light green/yellow clay. Small (2-50 mm) and large (1-60 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 wood 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 calamus* L.). Other components of the washover included occasional charred fragments (to 1 mm), uncharred molluscs, charred material, small bark fragments (to 7 mm), degraded wood fragments (to 5 mm) and a small quantity of macrofungal cup fungus detritus.

The moderately large residue (30% of the original sample) was mainly composed of coarse sand and charcoal (to 10 mm). Other components of the residue included occasional pieces of bricklike, grey pottery shards, oolitic limestone (to 50 mm) and fish scales. Some fragments (to 40 mm) were recorded as 'frequent'. Further remains of wood taxa, similar to those encountered in the washover, were also noted.

Only a few insects were present in the flot, and their preservation was rotatory to poor. A trace of decomposers was noted, with rare outdoor forts (the latter including a terrestial *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 bones comprised small cattle and pig fragments, two sheep/goat fragments and 24 unidentified mammal fragments (together weighting 88.8 g). A single chicken fragment and three unidentified bird fragments (together weighting 0.6 g) were noted. In addition, a gadd (possibly cod (cf. *Gadus morhua* L.)) vertebra and four other fish fragments were recorded (weighting 4.2 g).

**Context 2007** [Fill of depression - 12th/13th C]
Sample 200 (2 kg GBA)
Most, dark grey brown, crumbly (working slightly plastic), moderately humid, sandy, clayey silty. With wooden and barbotaceous detritus and white mineral flakes. Not (to 50 mm) fragments, wood chips (flots) and twigs were present in this sample.
Wood chips (to 50 mm) dominated the moderately large washover (30% of the original sample). All other woodfracets were poorly represented though the assemblage contained a relatively wide range of
dirtied/cultivated ground woody taxa and a few species indicative of mature heaths, grassed, wayside and ten habitats. Food species were represented by a single charred barley grain and very hazel nutshell fragments.

The main components 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 weathered 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 site was quite large, but consisted mostly of insect remains. Preservation was superb, and some extremely delicate remains had survived, including wings and an antennae (but clearly ancient) aphid. The insect assemblage appeared to be very diverse in its ecological origins. Aquatic and freshwater species were rather common, they seemed to be too numerous to have originated in background fauna unless they were very close by. Subjectively, there were more dung beetles (C. fabulosa spp. and G. truncates sp.) than might occur in background fauna, too. There were some plant foods which may have been imported in hay (unless there was grassland at the site), and some unusual remains may have travelled in this category. This deposit may have included stable remains (hence dung and hay) and have lain in the open for some time before burial. A sub-sample 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 macroossil 'squash' was approximately half organic debris 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 faecal matter. 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 stones.

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 tot of 3 described, BS whole sample)
Moss, dark brown (internally dark grey brown), brittle (working well, ruby rough), clay grit, 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, 'potted mullusel' and hazel nutshell fragments were present.

No washout was recorded from this sample.

The large residue (approx. 10 kg, partly sorted) consisted chiefly of sand and stones, brick/tile, pottery, slag, coal, flint and metal (spindle whorl) were present. Wood fragments in various stages of decay (0-6 cm) and charcoal were abundant. Twigs (including Prunus sp.), charred grain (wheat/barley and oats), nutshell (hazelnut), large and small mammal bones, amphibian bone, bird bone, fish bone, insect fragments, byg popura, 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 (weighting 126 g) included cattle, pig, sheep/goat, hare (Lepus sp.) and red squirrel (Sciurus vulgaris L.). A single, burnt, cattle bone tip was recovered. The prominent unidentified mammal fragments weighed 224.6 g. The bird remains (weighting 2.4 g) included ?chicken (cf. Gallus L domestica), goose (Anser sp.) and 'wader type' fragments. The fish remains (weighting 9.7 g) included herring (Clupea harengus L.), eel (Anguilla anguilla L.), haddock (Melanogrammus aeglefinus L.), flatfish (pleuronectidae) and porgy fragments. A single fish vertebrae had a 'squashed' appearance, characteristic damage consistent with passage through the gill. Three amphibian bones were recovered (weighting 0.1 g).

Context 2019 [Site fill - 11th/12th C]
Sample 203 (2kg) (SEA)
Moss, dark grey brown, ephemeral (working slightly plastic), lightly organic, 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 (<10% of the original sample) and comprised a limited range of disturbed/cultivated ground species including corncockle (Agrostemma githago L.), orchases, stinging nettles, chickweed (Stellaria media (L.) Vill.), knottgrass, hemlock (Hyoscyamus niger L.), small nettle, dead nettle, turnip (Brassica rapa L.) and common sow-thistle (Vieothus oleracea 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 spp.).

The modest-sized flat yielded a rather small group of only averagely well preserved insect exuvia. Most were decomposers, but the character of the material which might have supported them was not clear; they may have explored 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 archeological problem existed.

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

Context 2027 [Dump - 17th C]
Sample 205 (description only)

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

Sample 206 (155 whole sample)

Most, mud to dark grey brown, crumbly (working soil). clay silt, with abundant but scattered white mineral flecks. Very small (2-6 mm) and medium sized (20-60 mm) stones, macerated sandstone rotted tamarisk and large mammal bone 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.), orchases (Lamiaceae sp.), stinging nettle (Urtica dioica L.), corncockle (Agrostemma githago L.) and Commonache (Anchusa officinalis L.). A number of fragments of Chenopodium Sect. Pseudoboebeum were noted suggesting a component of manure/organic rubbish in the deposit. A few species typical of wetland habitats were also identified including calery-leaved crowfoot (Ranunculus acris L.), rapes (Brassica sp.), and Dogwood (Epigaea repens). In addition, the following species were present: elder (Sambucus nigra L.), chickweed (Stellaria media), thistle (Cirsium/Cirsula) and Rumex sp. Earthworm egg capsules, fish scales and fly puparia were also noted.

The large residue (approx. 10 litres, partly scored) consisted chiefly of sand and stones. Brick tile, pottery, matter, 'slag' and glass were present. Wood fragments in various stages of decay (to 10 cm) and charcoal (to 25 mm) were abundant. Twigs, charred grass (mostly bagley/wheat), nutshell (hazel), large and small mammal bone, amphibia bones, bird bone, fish bone and shellfish were present.

A considerable quantity of bone was recovered from the residue including mammalian, bird, fish and amphibia remains. The identified mammalian fragments (weighing 8.1 g) included cattle, pig, sheep/goat/ wild (Capra bovina L.) and rat (Rattus sp.). The numerous unidentified mammalian fragments weighed 105.5 g. The bird remains (weighing 2.8 g) included a single chicken (Gallus L. domesticus) fragment.

The fish remains (weighing 5.2 g) included bream (Abramis brama L.), salmon and gadid fragments. A single fish vertebra showed characteristic damage
consistent with being chewed. Three attithesian bones were recovered (weighting 0.1 g).

Context 2020 [Dump - 11th/12th C]
Sample 208 (description only)

Just moist, mid purplish brown, brittle to crumbly (workable stiff), slightly clay silt. Small (to 20 mm) stones, even mortar, shelve, wood (chips), twigs and large animal bone were present in this sample.

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

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

Sample 209 (1 kg GDA)

Moist, dark grey brown, crumbly and slightly layered, very bruised, 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 unconsolidated included occasional pieces of dicotyledon leaf and dicotyledon stem. Several species suggestive of grassed field were encountered including selfheal (Prunella vulgaris L.), frequent small grass seeds and violaceae (Viola sp/g) seeds. Fossil concretions bearing straw impressions, and several Chenopodium species, were also noted, accompanied by a range of disturbed/cultivated ground wood species very similar to the those noted for Context 2019. Wetland taxa were restricted to grassy turf (Lythrum europaeum L.) and sedge-rich.

The moderately large residue (30% of the original sample) contained rounded pebbles (to 52 mm), fossil concretions (to 30 mm), angular stones (to 40 mm), brick/tile (to 35 mm), pieces of charcoal (to 35 mm) and ovoid/ball fragments. All of the components were infrequent.

About a quarter of the flora - which was of modest size - consisted of grass remains, whose preservation was less than good but which was identifiable. There were, subjectively, hints of mainly foul matter in the open. A 3 kg subsample should provide clearer evidence.

The macrofossil ‘squash’ was mostly organic detritus with some inorganic material. A few physoliths (grass type) and many diatoms (4+mm) were noted. No eggs of intestinal parasites were seen.

The mixture of grassland species, monocotyledon fragments, fossil 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 2028 [Dump - 11th/12th C]
Sample 210 (description only)

Same as Sample 211 (see below).

Sample 211 (2 kg GDA)

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) distinguished 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 wood species, rare poorly preserved charcoal wheat/barley grains and a very limited range of wetland species including sedges, sedge and sparrowwort. Chenopodium Succ. Paeoellipticum and C. maruale 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 20 mm), brick/tile (to 10 mm) and charcoal (to 35 mm).

The flot, of modest size, consisted mostly of wood remains, which were very well preserved. The presence of a appreciable proportion of aquatic/watermug and drain-ground forms was immediately obvious. Among the aquatics there were variegated water betoks, while the water fleas included a few Daphnia sp (resting egg) and nummularia sp (of
another species not identified to genus. Waterside taxa included Cephalotheca sp. (usually on vegetation by water or in damp places). Among the terrestrial insects were various decomposers (including larvae of a four-mother component, but mostly rather tolerant) and outdoor forms, the latter including the netting bug (Heteropteran oriscatae 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 sagittal habitats at this site.

The microfossil "squid" was mostly organic detritus with some inorganic material. A few fungal spores, some phytooliths (grass type) and many diatoms ("A") 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 manners. There was very little evidence of food remains.

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

Sedilic in Sample 213 (see below).

Sample 213 (description only)

Moist, mud 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 (2 kg GRA)

Moist, dark grey brown, somewhat compressed, somewhat layered, slightly sandy slightly silt fine and coarse herbaceous detritus, locally more or less organic. Wood (chips), twigs, large mammal bone and mineral 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 wood taxa were dominated by Cheiroglossa Seest, Peucedanum 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 waterfowl taxa was present compared with Context 2032 (though all species were recorded as infrequent).

Cosmic quartz sand formed the loam component of the small residue (50% of the original sample). Other constituents included occasional oyster shell fragments, small pieces of eggshell, charcoal fragments (to 20 mm), brick (to 10 mm) and wood fragments (to 10 mm). Small pieces of burnt bone (to 5 mm) were also noted.

The foot, of marshy size, yielded insect remains in a good preservational condition. There were insect decomposer taxa, with hints of a "food mangling" component and species favoured by dryish conditions. Only a trace of outdoor faunas was noted. A subsample of 3-4 kg would provide an interpretable assemblage.

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

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

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

**Vertebrate remains**

A total of 170 vertebrate fragments (weighting 23.75 kg) were recovered from the 46 contexts recorded in detail, of which 408 fragments (weighting 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 very 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. Bivariate analysis, noted on material from four contexts (1085, 1087, 1095 and 2022), both fresh breakage and dot gnawing were evident on less than 10% of fragments in most contexts. Butchery evidence was quite evident, 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 (1095) were recorded in detail (Table 3). Material from the three scanned contexts contained a further eight undistinguishable fragments. This assemblage is too small to be of any interpretive 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, capravid, pig and horse), minor domestic species (dog and red deer, Capreolus capreolus L.) and rabbit (Oryctolagus cuniculus L.) and hare (Lepus sp.). Bird species included goose (Anser sp.), duck (Anas sp.), chicken (Gallus L. domesticus) and corvid. The corvid femur is of rock/corn size.

The goose heads 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 greylag (Anser anser L.) and merganser (Mergus merganser L.) specimens in the reference collection. However, the bone was considerably smaller in size and was tentatively identified as acaena (cf. Mergus acaena L.), a smaller member of the merganser family. This identification remains to 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 capravid 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 workmen’s waste. In addition, five antler fragments (probably all red deer) showed evidence of work. Evidence for the importation of antlers (probably to supply craft activities) is unlikely is provided by a single large boar 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 deposits.

Additionally, an oter (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 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 pelt 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.

Acknowledgements

We are grateful to York Archaeological Trust for providing the material and the archaeological information.

References


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| <strong>Unidentified</strong>   | -              | -            | -           | -             | -         | 63            |            |
| <strong>Subtotal</strong>       | -              | -            | -           | -             | -         | 762           | *10392     |
| <strong>Total</strong>          | <strong>124</strong>        | <strong>53</strong>       | <strong>12</strong>      | <strong>12</strong>        | <strong>8</strong>     | <strong>1170</strong>      | <strong>23751</strong>  |</p>
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