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**An assessment of biological remains from excavations at
St Saviourgate, York (site code: 1995.434)**

by

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Summary

One hundred and two sediment samples, four 'spot find' samples, one box of hand-collected shell, and fourteen crates and two boxes of hand-collected bone from excavations of early Roman to modern deposits in St Saviourgate, York, have been investigated for their archaeological significance

Most of the processed samples yielded rich assemblages of well-preserved biological remains, with considerable potential in reconstructing conditions and activity at the site. There were hints of woodworking. If correctly dated the 4th century material would be unique in York north-east of the Ouse. The Anglo-Scandinavian material is of exceptional value as a link in reconstruction of functional zonation from central York to its periphery. The post-medieval material represents a period poorly known in the city. The insect assemblages present a range of faces, some unusual, and deserve particular attention. Eggs of intestinal parasites were frequent and their identity should be confirmed by measurement and statistical analysis.

The oysters included some assemblages large enough for meaningful analysis of selection and likely sources.

The extremely well-preserved bone indicated a range of craft and commercial activities perhaps including tanning, horn working, skinning, and butchery. It deserves full investigation, again in the context of studies of site utilisation and zonation of activities within York.

It is strongly recommended that a large-scale, intensive study of the bioarchaeological remains from this site should be carried out and taken to publication; the implications concerning zonation should be discussed in an international journal paper.

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Introduction

Excavations at St Saviourgate, York (NGR SE 606 519), undertaken in late 1997 by MAP Archaeological Consultancy Ltd., revealed deposits of early Roman to modern date in three trenches. One hundred and two samples of sediment, four 'spot find' samples, one box of hand-collected shell (of approximately 20 litres), and fourteen crates (each of approximately 40 litres) and two boxes (each of approximately 20 litres) of hand-collected bone from these deposits have been examined to assess their bioarchaeological potential.

Methods

Sediment samples

One hundred and two samples of sediment ('GBAs' and 'BSs' *sensu* Dobney *et al.* 1992) were submitted. The samples were inspected in the laboratory and a description of the lithologies of those selected for assessment recorded using a standard *pro forma* (four samples were described but not examined further because of project time constraints). Subsamples of 1 or 2 kg were taken from 31 of the samples and three other samples were bulk sieved (to 500 µm), for extraction of macrofossil remains, 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.

Twenty of the samples were examined for microfossils using the 'squash' technique of Dainton (1992). This technique was originally developed for detection of the eggs of intestinal parasitic nematodes but has proved more generally useful to quickly to assess a wide range of microfossils.

Table 1 shows the quantity of each sample processed and which techniques were employed.

Spot find samples

Four spot samples of putative coprolites were submitted. These were visually inspected and examined using the 'squash' technique of Dainton (*op. cit.*).

Shell

Shell (almost all oyster) was recovered from a total of 47 contexts (1 box of approximately 20 litres). All of the phased material was scanned and identified where possible. For the oyster valves, subjective notes were made on preservation, numbers of left and right valves, encrustation by other marine invertebrates and whether the valves showed damage consistent with their having been opened with a knife.

Table 2 shows the number of contexts recorded or scanned by context and by date.

Hand-collected vertebrate remains

Material from 44 of the 182 bone-bearing contexts was selected (on the basis of information supplied by the excavator) to represent the range of periods and context types present. For these assemblages, subjective records were made of preservation, angularity (i.e. the nature of the broken surfaces) and colour, whilst quantities and identifications were noted where appropriate. Additionally, semi-quantitative information was recorded for each context concerning fragment size, dog gnawing, burning, butchery and fresh breaks. Other fragments, where possible, grouped into categories: large mammal (assumed to be horse, cow or large cervid), medium-sized mammal (assumed to be sheep, pig or small cervid) and bird. As well as counts of fragments, total weights were recorded for all identifiable and unidentifiable categories.

The remaining material (with the exception of 79 fragments from contexts described as modern or undated), was scanned and a record made of the number of fragments, mandibles with teeth *in situ*, and measurable bones.

Table 4 shows the number of contexts recorded or scanned by trench and by date.

Results

Sediment samples

The results of the investigations are presented by trench then phase then context number order, with information provided by the excavator in brackets. Notes on the small amounts of bone recovered from the GBA and bulk residues are included in the sample-by-sample results below.

Trench 1 [12th to 16th century deposits]

Context 1120 [12th/13th century - dump]

Sample 34 (1 kg GBA, 'squash')

Moist, dark grey brown, slightly crumbly (working plastic), moderately humic slightly sandy clay silt. Wood fragments, brick/tile, mammal bone and small stones (6 to 20 mm) were present in the sample.

Approximately a third of the moderate-sized flot was invertebrate remains. Fly puparia were abundant. The beetles were a mixed group, with no taxa represented by more than one to a few individuals. Decomposers were well-represented, but ranged from species typically found in buildings (*Tipnus unicolor* (Piller and Mitterpacher)) to those associated with foul matter (*Platystethus arenarius* (Fourcroy)). There were two water beetles, both migratory taxa (*Helophorus* sp. and *Colymbetes fuscus* (Linnaeus)), and some plant-feeders often associated with weeds (eg. *Chaetocnema concinna* (Marsham)). Grain pests were present (*Oryzaephilus surinamensis* (Linnaeus), *Sitophilus granarius* (Linnaeus)).

Small wood fragments (to 5 mm) were frequent in the moderate-sized washover (20% of the original sample). A range of weed taxa indicative of disturbed/cultivated ground and waysides or wasteland were present including oraches (*Atriplex* sp(p).), fat-hen (*Chenopodium album* L.), small nettle (*Urtica urens* L.) sheep's sorrel (*Rumex acetosella* agg.), *Brassica* sp(p)., nipplewort

(*Lapsana communis* L.), pale persicaria (*Polygonum lapathifolium* L.), corncockle (*Agrostemma githago* L.), burdock (*Arctium* sp(p).) and hemlock (*Conium maculatum* L.). Wetland taxa were represented by celery-leaved crowfoot (*Ranunculus sceleratus* L.), typical of muddy ditches, and wild celery (*Apium graveolens* L.), which may be found in similar environments.

Wood fragments and wood chips (to 50 mm) dominated the small residue (10% of the sample) which also contained occasional pieces of brick/tile (to 65 mm), oolitic limestone fragments to (30 mm), rare mortar (to 10 mm), a single shard of green-glazed pottery and a moderate quantity of coarse quartz sand. Other components of the residue included further examples of the weed seeds described in the washover, plus seeds of elder (*Sambucus nigra* L.), chickweed (*Stellaria media* (L.) Vill.) and fig (*Ficus carica* L.). Infrequent pieces of apple (*Malus sylvestris* Mill.) endocarp were also recorded.

The microfossil 'squash' was mostly organic detritus with a little inorganic material. A few fungal spores and hyphae and phytoliths, many diatoms (>3 forms) and eight *Trichuris* (whipworm) eggs were noted. The eggs were mostly rather poorly preserved and not measurable.

This sample contained a restricted range of occupation waste. The wood chips may represent waste from the manufacture of wooden structures or from wood turning. There were fewer plant species indicative of foul material than were found in the Anglo-Scandinavian pit fill contexts from Trench 3 (see below); nevertheless, the sample contained traces of food remains which could have originated from faecal material. The presence of the *Trichuris* eggs reinforces the suggestion that this deposit contained faecal material. While the implications of the group of insect remains are not clear, the most likely origin would be in an external layer receiving 'background fauna' and an input of insects in dumped material. A 3 kg subsample would provide a more clearly interpretable group of insect remains, and it would be of value in synthesis to record such material.

Context 1149 [12th/13th century - brushwood on cobbles]

Sample 59

Mostly brushwood (?wattle) in a matrix of dark, grey brown, crumbly, very humic very sandy silt.

No further analysis was undertaken for this sample.

Context 1156 [early 13th century - dump]
Sample 60 (1 kg GBA, 'squash')

Moist, dark grey (and, locally, dark brown), crumbly and plastic working sticky), slightly sandy clay silt with a large component of woody detritus and amorphous organic sediment. Medium-sized stones (20 to 60 mm), flecks of brick/tile and wood were present in the sample.

The flot was rather large but half of it was invertebrate remains. The insect assemblage was rather unusual. Pupae of a nematoceran fly were abundant. Beetles were of mixed ecological origins.

The large washover (40% of the sample) contained a macrofossil assemblage very close to the one described for Context 1120. Wood chips and fragments dominated the sample, accompanied by weed seeds from cultivated and disturbed ground habitats. Fig seeds were more commonly encountered and limited quantities of wheat/rye 'bran' were also noted. The sample contained additional wetland taxa including the moss *Sphagnum imbricatum* Russ. Occasional, well-preserved branches of the moss *Homalothecium sericeum* (Hedw.) Br. Eur./*lutescens* (Hedw.) Robins. were also present.

The residue contained a moderate quantity of coarse sand, further wood chips to 30 mm, occasional brick/tile, a single oyster shell, rounded pebbles to 18 mm, angular limestone fragments to 20 mm, and infrequent pieces of eggshell.

The microfossil 'squash' was mostly organic detritus with some inorganic content. A few phytoliths, some diatoms (>2 forms) and ten *Trichuris* eggs were noted. The last were mostly pale and some were distorted—approximately half of the eggs were measurable.

This seems to have been a mixed assemblage of dumped occupation waste and woodworking rubbish containing some faecal matter. There was a subjective impression (from the invertebrate remains) that the deposit formed where there was water, or at least waterlogged ground (the aquatics may have been imported in moss, however). A larger subsample should be investigated both to clarify interpretation and to provide data for synthesis.

Context 1125 [late 14th century - pit fill in 1127]
Sample 37 (2 kg GBA)

Moist, dark grey brown, crumbly (working slightly plastic), slightly (to moderately) humic slightly sandy silt. Large pieces of limestone (>60 mm) were common and brick/tile and mineralised wood fragments were present in the sample.

The flot was of moderate size and included a small mixed group of insect remains, probably interpretable were a large subsample to be processed. There were several aquatic taxa (water beetles: *Coelostoma orbiculare* (Fabricius), *Helophorus* sp., and water fleas: Cladocera sp.), and these gave an impression of deposition in water. Aquatics may just possibly have originated in water brought to the site, or in moss, however (see below). The grain pests *Sitophilus granarius* and *Oryzaephilus* sp., were noted, as was the spider beetle *Tipnus unicolor*.

In common with the previous two contexts the washover was dominated by wood fragments and chips (to 15 mm). A slightly larger range of weed taxa was identified; however, the majority of plants could be classified as cultivated/disturbed ground or waste ground/wayside species. Significantly larger numbers of *Chenopodium* Sect. *Pseudoblitum* seeds were noted, possibly indicating a more highly organic rubbish/manure component. The sample was particularly notable for the number of wetland species, which included both fen and poor fen types including bog bean (*Menyanthes trifoliata* L.), columbine (*Aquilegia vulgaris* L.), sedges (*Carex* sp(p).), celery-leaved crowfoot (*Ranunculus sceleratus*), greater spearwort (*Ranunculus lingua* L.) and the leaves of two bog mosses: *Sphagnum* Sect. *Acutifolia* and *Sphagnum imbricatum*. Most of these species were probably imported with peat. Fen peat clasts (to 8 mm) were occasionally noted in the sample. The *Aquilegia* may, of course, represent a species grown for ornament in the vicinity.

The moderate-sized residue, principally composed of coarse sand, contained a limited range of food waste including oyster shell fragments, fish scales, eggshell and small fish bones. All of these components were infrequent. Angular stones (to 17 mm), oolitic limestone (to 12 mm), mortar and brick/tile fragments (to 20 mm) were all recorded as common. Mineralised twigs (to 40 mm), unmineralised twigs (to 50 mm), a single green-glazed pottery shard and coal (to 15 mm) were also found.

Context 1126 [14th century - lower pit fill in 1127]
Sample 40 (2 kg GBA)

Moist, dark grey brown, crumbly, moderately humic sandy silt. Mortar/plaster, brick/tile, coal, mammal bone, woody roots and oyster (*Ostrea edulis* L.) shell were present in the sample.

The flot was of moderate size but half was contributed by invertebrate remains. Beetles most likely to be found together in foul matter were rather numerous, and fly larvae and pupae were abundant. There was a single grain weevil, *Sitophilus granarius*.

Although the washover from this sample contained a large number of wood fragments (to 30 mm) few were recognisably worked. This may have been a function of preservation since the average fragment size was significantly lower than the equivalent values observed from Contexts 1120, 1125 and 1156. Small pieces of bark were noted as common. A range of weed taxa indicative of cultivated/disturbed ground and waysides/waste ground were recorded. This assemblage was very close to the one recorded from Context 1125 but contained a greater diversity of arable field types, including fragments of corncockle. The range of food materials was restricted to rare fragments of wheat/rye 'bran', apple endocarp and cherry (*Prunus* Sect. *Cerasus*) stones. Fewer seeds of nitrophile species from the genus *Chenopodium* were noted than for Contexts 1120 and 1156.

In common with the previous three contexts, the residue was dominated by coarse sand, with a mixed assemblage of inorganic occupation waste that included coal (to 30 mm), charcoal (to 5 mm), mortar and brick/tile (to 40 mm). Other components included oyster shell and occasional degraded twigs (to 38 mm).

Material of this date is poorly represented in York and the insect remains from a large subsample should be recorded both for site interpretation and for synthesis.

Context 1088 [15th century - pit fill in 1091]
Sample 23 (1 kg GBA)

Moist, dark grey brown, crumbly (working slightly plastic), humic very sandy silt. Twigs were common and rotted mortar/plaster, brick/tile, cinder, mammal bone and eggshell were present in the sample.

The flot was quite large but insects were fairly abundant and well- to excellently-preserved. A wide range of beetles was present, but most might have co-existed in material resembling stable manure. Grain beetles were common ('several' each of *Oryzaephilus surinamensis* and *Sitophilus granarius*, and ?*Palorus ratzeburgi* (Wissmann)). The spider beetle *Tipnus unicolor* was represented by at least three individuals, and other 'house fauna' taxa were present.

No single plant macrofossil type dominated the small, heterogenous washover (<1% of the sample). A diversity of weed seeds of cultivated/disturbed ground were noted. These were accompanied by a number of macrofossils indicative of hay or stable manure including monocotyledon stem fragments, legume petals and seeds from a range of grasses (*Danthonia decumbens* (L.) DC. plus others). If the grassy material was hay/manure it was probably dumped and quickly covered over since few plant species indicative of manure heaps were present in the sample. The washover contained a limited range of food species including, seeds of fig and strawberry (*Fragaria vesca* L.) and occasional wheat/rye 'bran' fragments (accompanied by corncockle and other cornfield weeds). This probably represents a trace of faecal material.

Cinders and charcoal (to 40 mm) dominated the large residue (50% of the sample) which also contained eleven bones (mostly cattle and caprovid rib and vertebra fragments with a single chicken humerus and two fish (gadid) vertebrae), frequent pieces of eggshell and a single charred wheat/barley grain. Willow (*Salix* sp(p).) and elder twigs were noted, accompanied by moderate quantities of quartz sand, mortar and brick/tile (to 95 mm).

This sample probably represented the dumping of hearth waste along with some food materials, hay/manure and general occupation debris. On balance, the invertebrate remains suggest that it probably included stable manure. The sheep ked *Melophagus ovinus* (Linnaeus) was represented by at least one individual (probably more). While this may have come from sheep on the site, an origin via wool cleaning is more probable, suggesting the presence of domestic debris. There are few records of insect assemblages of the 15th century from York and a full analysis should be made of remains from a larger subsample, to confirm the nature of the deposits and to provide data for synthesis.

Context 1090 [15th century - pit fill in 1091]
Sample 24 (2 kg GBA)

Moist, dark grey brown, crumbly (working plastic and locally hints of mineralisation—brittle and ?indurated), sandy clay silt. Small stones (6 to 20 mm), brick/tile, wood (some mineralised), mammal bone and land snails (*Cepaea/Arianta* sp.) were present in the sample.

The large flot consisted mainly of plant debris, but insect remains were abundant. House fauna was well represented, and included ‘several’ *Tipnus unicolor*, *Lathridius minutus* group and *Cryptophagus* sp., and other taxa such as *Xylodromus concinnus* and *Mycetaea hirta*. This component seems to have been introduced in debris from within a building but there was no evidence of a stable manure component. There were also ‘outdoor’ forms (e.g. ground beetles). Grain pests were represented by *Oryzaephilus* sp. and *Sitophilus granarius*. Subjectively, this is a rather typical later medieval/post-medieval group of a kind poorly represented in York. Full analysis will both help to define site conditions (or the source of the material) and be of importance in synthesis.

The range of macrofossils noted from this sample was broadly the same as for Context 1088 with the exception that the sample contained a greater proportion of wood chips and significantly more fen species. Food materials included, cherry stones, small quantities of wheat/rye bran, eggshell, a goose (*Anser* sp.) phalanx and fig seeds. Four unidentified mammal bone fragments were also noted. The residue contained a mix of inorganic occupation debris, traces of food remains and further weed seeds indicative of cultivated/disturbed ground and waste/wayside habitats.

Context 1053 [16th century - pit fill in 1063]
Sample 13 (2 kg GBA, ‘squash’)

Moist, mid to dark grey brown (locally more brown where the humic content was higher), crumbly, humic sandy silt. Rotted mortar/plaster, brick/tile, wood and twigs (?wattle) were present in the sample. A large, lath-like piece of wood was removed from the sample as it was mouldy.

The flot was of moderate size and composed mainly of insect remains, whose preservation ranged from rather poor (yellowed) to very good. Local decay in-ground appeared likely in view of the presence of post-depositional invaders (*Coprophilus striatulus* (Fabricius), *Trechus micros*

(Herbst)). The deposit was foul and exposed for some time before being sealed, for beetles associated with wet rotting matter were quite abundant (including several *Cercyon unipunctatus* (Linnaeus)) and there was an element likely to have accidentally fallen into the pit fill (ground beetles, weed-feeding plant-feeders). While the plant remains and parasite eggs clearly show the presence of a human faecal component, stable manure may also have been present. There were grain pests (*Sitophilus granarius*, *Oryzaephilus* sp.), and *Tipnus unicolor* was noted.

The moderately large washover (40% of the sample) was dominated by wheat/rye ‘bran’ and contained frequent faecal concretions. Other food remains included fig seeds, leek epidermis, apple endocarp, strawberry seeds, blackberry seeds, a single *Vaccinium* (probably bilberry, *V. myrtillus* L.) seed and eggshell membrane. The faecal material was accompanied by numerous fragments of corncockle and cornflower seeds, indicative of milled flour plus a significant assemblage of other cornfield weed taxa. Fewer weed taxa typical of tall waste/wayside habitats were recorded from the sample by comparison with previous contexts and the range of wetland types was very restricted.

The moderate-sized washover (20% of the sample) contained oolitic limestone fragments (to 20 mm), a moderate quantity of coarse sand and occasional pieces of oyster shell.

The microfossil ‘squash’ was mostly organic detritus with a little inorganic material. Some fungal spores and phytoliths, a few diatoms, and 22 *Trichuris* eggs were noted. The eggs were rather variably preserved (from poor to very good preservation) but approximately half were measurable.

The sample clearly contained faecal material plus a limited amount of dumped inorganic occupation waste. The invertebrate remains are of very high priority for full investigation through a large subsample, both for site interpretation and for synthesis (since there is almost no material of 16th century date recorded from York).

Context 1059 [16th century - pit fill in 1063]
Sample 15 (1 kg GBA, ‘squash’)

Moist, dark brown, crumbly and slightly layered (locally slightly concreted and brittle—concretions just beginning to form), amorphous organic sediment with some fine herbaceous detritus.

Brick/tile, wood, apple (*Malus sylvestris*) endocarp and beetles were visible in the sample.

The flot was rather large but contained fairly abundant insect remains in a good state of preservation. The insect assemblage was a little unusual, including a range of decomposers from rather dry and also from foul habitats; the deposit seems to have been exposed for some time to allow the invasion of two *Aphodius* species and other foul-matter taxa.

The moderately large washover (30% of the original sample) was almost completely dominated by wheat/rye bran. The remainder of the assemblage was virtually identical to the one described from Context 1053 with the exception that the present sample contained slightly more charcoal and some 'char' (amorphous charred material). Occasional clumps of mineralised Ericaceae leaves were noted, a few of which were identified as cross-leaved heath (*Erica tetralix* L.). These remains probably represent the dumping of floor covering or other occupation waste.

Two fragments of bird bone were recovered from the residue, one of which was tentatively identified as chicken.

The microfossil 'squash' was mostly organic detritus with a little inorganic material. Nineteen *Trichuris* and four *Ascaris* eggs, mostly well-preserved and measurable, were noted.

The sample is undoubtedly from a cess pit deposit. Insects from a large subsample should be recorded, to confirm the degree of exposure of this clearly foul deposit and to provide data for synthesis from a poorly-represented period. A proper record of the food (and other) plants present should be made.

Context 1064 [16th century - pit fill in 1057]
Sample 17 (1 kg GBA, 'squash')

Moist, dark brown, crumbly and slightly layered (concretions forming within larger lump), amorphous organic sediment with some fine herbaceous detritus. Apple endocarp was visible in the sample.

A large flot was recovered, yet 50-70% of it was invertebrate, mainly insect, remains. Preservation was extremely good. Fly wings and fragments of fly pupae were abundant, and there was a moderate-sized assemblage of beetles. Although various habitats were represented, indicators of foul matter, perhaps not entirely saturated at times,

predominated, with *Omalium ?rivulare* (Paykull) and *Oxytelus sculptus* Gravenhorst noted as the most abundant. *Sitophilus granarius* was present.

This sample was composed of abundant wheat/rye 'bran' fragments, numerous pieces of apple endocarp, occasional flax seeds/pod fragments and a range of weed taxa indicative of arable fields. The assemblage was very similar to that from Context 1053 with a greater number of wetland species (though all were poorly represented).

The residue contained a single leather fragment (to 120 mm), eggshell membrane, occasional pieces of brick/tile and a significant quantity of faecal concretions.

The microfossil 'squash' was mostly organic detritus with a little inorganic material. Some fungal spores and hyphae, twenty-eight *Trichuris* eggs and three *Ascaris* eggs were noted. Approximately half of the *Trichuris* eggs and all of the *Ascaris* eggs were measurable.

The sample is clearly from a cess pit deposit with a very limited amount of other occupation waste. From the invertebrate remains, it appears that this foul pit fill was exposed for some time.

Context 1066 [16th century - basal pit fill in 1057]
Sample 20 (2 kg GBA)

Moist, dark grey brown, crumbly (working slightly plastic), moderately humic sandy clay silt. Flecks of brick/tile, coal shale, mineralised twigs and mammal bone were present in the sample. The small flot contained a few beetles and several puparia.

Wheat/rye 'bran', accompanied by numerous corncockle fragments, dominated the relatively large washover (40% of the original sample). Other food types included apple endocarp, sloe (*Prunus spinosa* L.) stones, fig seeds and rare pieces of leek (*Allium porrum* L.) epidermis. The remainder of the washover was composed of a heterogeneous assemblage of weed seeds from fen, disturbed/cultivated ground, nitrogen-rich habitats and wayside/wasteland habitats. Both wood chips and wood fragments were frequent, flax (*Linum usitatissimum* L.) capsule fragments were infrequent, and the seeds of weld (*Reseda luteola* L.) were very common. The residue contained further sloe stones, plum stones, whole apple pips, a single juvenile chicken radius and three bones from the fore legs of a cat (probably from the part skeleton noted in the hand-collected assemblage).

A limited range of inorganic occupation waste including coal (to 15 mm) and a moderate quantity of quartz sand was also noted.

An interpretable invertebrate assemblage would probably be recovered using a larger subsample, were there a good reason.

Trench 2 [10th to 15th century deposits]

Context 2130 [10th century - dump]

Sample 124 (Description only)

Moist, very dark grey brown, crumbly (working slightly plastic), moderately humic slightly sandy clay silt. Twigs were common and wood ?apple endocarp and ?eggshell membrane were present in the sample.

No further analysis of this sample was undertaken because of project time constraints.

Context 2066 [10th/11th century - dump]

Sample 82 (1 kg GBA, 'squash')

Moist, dark brown, crumbly, amorphous organic sediment with fine and coarse herbaceous detritus. Wood, fine twigs, 'straw', ?bark, oyster shell and invertebrates (?ked, *Melophagus ovinus*) were present in the sample.

There was an ecologically mixed group of insect remains in the moderate-sized flot, with indications of foul matter and deposition in the open.

Unworked wood fragments and wood chips dominated a large washover (50% of the sample) which also contained a diverse assemblage of cultivated ground, waste ground and wayside weed taxa. Scrolls of bark (to 15 mm) were noted in small numbers. Most of the weed types recorded in Contexts 3034 to 3109 (Anglo-Scandinavian pit fill contexts from Trench 3) were also recorded in the present sample. *Atriplex* sp(p). and *Chenopodium* Sect. *Pseudoblitum* were abundant and *C. album* was recorded as frequent. The washover contained several food components, including apple endocarp, seeds of the culinary herb summer savory (*Satureja hortensis* L.), a limited amount of wheat/rye bran, rare fruit stones of both sloe and plum (*Prunus domestica* ssp. *insititia* (L.) C. K. Schneider) and whole apple pips. Wetland species were restricted to sedge nutlets, common spike rush (*Eleocharis palustris* s.l.) seeds and rare leaves of *Sphagnum* Sect. *Acutifolia*.

The inorganic fraction of the residue was composed of a limited quantity of coarse sand gritstone (to 35 mm) and a single oyster shell. Further small wood chips and small mineralised twigs were noted in addition to a selection of weed seeds similar to those found in the washover.

The microfossil 'squash' was mostly organic detritus with a trace of inorganic material. A few fungal spores and hyphae, many phytoliths, some diatoms and four *Trichuris* eggs (fairly well-preserved and probably measurable) were noted.

The plant assemblage recovered from this sample was a typical mix of waste from wood-working and weed seeds from disturbed environments and dumped faecal material. A larger subsample would produce an interpretable assemblage of invertebrate remains, which would be of value in synthesis.

Context 2117 [10th/11th century - dump]

Sample 116 (Description only)

Moist, very dark greyish brown, crumbly (working slightly plastic), moderately to very humic slightly sandy slightly clay silt with some coarse herbaceous detritus (including straw/reed nodes). Roots (not modern contaminant), wood, twigs, mammal and fish bone, and ?brick/tile/pot were present in the sample.

No further analysis of this sample was undertaken because of project time constraints.

Context 2119 [11th century - pit fill in 2121]

Sample 119 (Description only)

Moist, very dark, slightly grey brown, crumbly (working plastic), moderately humic slightly sandy slightly clay silt. Bark, wood (some wood chips and other ?worked wood), ?heather (*Calluna vulgaris* (L.) Hull) and mammal bone were present in the sample.

No further analysis was undertaken on this sample because of project time constraints.

Context 2062 [11th/12th century - dump]

Sample 77 (2 kg GBA)

Moist, dark grey brown, crumbly to brittle (working slightly plastic), humic sandy silt. Wood, daub and burnt mammal bone were present in the sample.

The flot (of moderate size) consisted primarily of plant debris. The insect remains were rather reddened, to somewhat brownish. There were outdoor forms and species favoured by foul matter, with hints of the 'oxyteline association' (Kenward and Hall 1995).

The washover from this sample was similar to that from Context 2066 in that it was dominated by wood chips and wood fragments (to 35 mm). The most abundant weed taxon was *Chenopodium* Sect. *Pseudoblitum* and several other members the genus *Chenopodium* were represented. More wetland species were recorded than for Context 2066; however, all were found at low frequencies. Cultivated and waste ground weeds were also strongly represented. Several additional taxa were noted including dead nettle (*Lamium* sp(p).), white horehound (*Marrubium vulgare* L.), prickly sow-thistle (*Sonchus asper* (L.) Hill), fumitory (*Fumaria* sp(p).) and mouse-ear chickweed (*Cerastium* sp(p).).

A moderate-sized residue (20% of the original sample) contained further wood chips (to 65 mm), several pieces of gritstone (to 50 mm), rounded pebbles (to 40 mm), a significant quantity of coarse sand, a single complete oyster valve and eight bone fragments. These last included cattle and caprovid remains and one large fish fragment which had evidently been chopped (unfortunately, it was not possible to identify this fragment to species).

A larger subsample (perhaps 4 kg) would yield an interpretable group of invertebrate remains allowing closer characterisation of the area of deposition.

Context 2036 [12th/13th century - dump]
Sample 63 (2 kg GBA, 'squash')

Just moist, mid to dark grey with abundant orange flecks, plastic and locally crumbly and indurated (through desiccation), slightly sandy clay silt. Medium-sized stones (20 to 60 mm, including limestone) were common and ?mortar/plaster and flecks of brick/tile were present in the sample.

There were very few insects in the small flot.

A very restricted range of disturbed/waste ground weed seeds were noted from the small washover (<1% of the original sample). Seeds of stinging nettle were the most frequent macrofossils. Other species present included hemlock (*Conium maculatum*) and hemp-nettle (*Galeopsis* Subgenus *Galeopsis*).

Coarse sand was the main component of the large residue (60% of the original sample). Other components included brick/tile (to 20 mm), rare bark fragments (to 10 mm), rounded pebbles (to 35 mm) and small pieces of eggshell.

The microfossil 'squash' was, approximately, half and half organic detritus and inorganic material. No parasite eggs or other microfossils were seen.

This sample is of little interpretative value. The concentrations of biological remains in the deposit are probably too low for useful groups to be recovered.

Context 2037 [12th/13th century - fill in pit 2038]
Sample 64 (1 kg GBA, 'squash')

Moist, very dark brown (showing signs of oxidation/reduction—internally strong brown tending to black externally), finely laminated, fissile (and locally brittle), amorphous organic sediment and fine and coarse herbaceous detritus.

The very large flot contained only traces of insect remains.

The highly organic, large washover produced an abundance of wheat/rye 'bran' fragments, accompanied by broken corncockle seeds, indicative of milled flour. Faecal concretions and sheets of leek (*Allium porrum*) epidermis were very common. The sample also contained apple endocarp (to 7 mm), a single herring (*Clupea harengus* L.) vertebra and raspberry (*Rubus idaeus* L.) seeds. In addition to corncockle, a number of other arable weed seeds were noted, including those of cornflower (*Centaurea cyanus* L.) and thorow-wax (*Bupleurum rotundifolium* L.). Very little inorganic material was found in the sample.

The microfossil 'squash' was organic detritus with a few phytoliths and 102 *Trichuris* eggs (mostly well-preserved and measurable).

This sample is undoubtedly a cess pit deposit with little additional occupation waste. It may have been sealed rapidly or deposited in winter, in view of the low concentration of insect remains.

Context 2042 [12th/13th century - pit fill in 2044]
Sample 66 (1 kg GBA)

Moist, varicoloured (from reddish brown to light yellowish brown to light grey), brittle to crumbly, ash with some charcoal present.

The subsample produced a small residue (10% of the original subsample) and a very small washover (<1% of the original subsample). The washover contained frequent pieces of charcoal (to 10 mm) and frequent stinging nettle seeds. The only other surviving macrofossils were badly degraded monocotyledon rootlets and traces of insect remains.

The majority of the residue was ash with a small quantity of charcoal (to 15 mm), coarse quartz sand and gritstone (to 15 mm). Brick/tile (to 40 mm) was also noted.

This sample is clearly rich in hearth waste. The lack of other macrofossil components suggest that it may have been dumped wholesale into the pit, into which nettle seeds became incorporated from stands of nettle in the vicinity.

Context 2024 [14th/15th century - dump]
Sample 62 (2 kg GBA, 'squash')

Moist, dark grey brown, crumbly (working slightly plastic), moderately humic sandy silt. Medium-sized stones (20 to 60 mm), rotted mortar/plaster, flecks of brick/tile, a trace of wood and mammal bone were present in the sample.

The trace flot contained a few insects, with no clear indication of their origin. Grain pests were present, *Sitophilus granarius*, *Oryzaephilus surinamensis* and *Cryptolestes* sp. being noted.

Fragments of monocotyledon detritus and wood chips (to 30 mm) form the majority of the moderate-sized washover (30% of the original sample). A diversity of weed seeds were noted in the sample, indicative of cultivated/disturbed ground (fool's parsley *Aethusa cynapium* L., corncockle *Agrostemma githago*, corn marigold *Chrysanthemum segetum* L., pale persicaria *Polygonum lapathifolium*, stinking mayweed *Anthemis cotula* L., weld *Reseda luteola* and *Lamium* Sect. *Lamiopsis*), waysides/waste ground (hemlock *Conium maculatum*, nipplewort *Lapsana communis* and *Carduus/Cirsium* sp(p).), manure/rubbish heaps (*Chenopodium* Sect. *Pseudoblitum*) and grassland (field scabious *Knautia arvensis* (L.) Coulter). Wetland species were represented by small quantities of *Sphagnum imbricatum* Russ. leaves, celery-leaved crowfoot (*Ranunculus sceleratus*), common spike rush (*Eleocharis palustris* s.l.), water-pepper (*Polygonum hydropiper* L.), sedge nutlets (*Carex*) and water crowfoot (*Ranunculus* Subgenus *Batrachium*). The sample also contained a single

fruit of fuller's teasel (*Dipsacus sativus* (L.) Honckeney).

The main fraction of the small residue (10% of the original sample) was coarse sand with some gritstone (to 40 mm) and occasional rounded pebbles. Charcoal (to 7 mm) and brick/tile (to 20 mm) occurred infrequently throughout the residue.

The microfossil 'squash' was mostly organic detritus with a little inorganic material. Many phytoliths and diatoms (>3 forms), a few fungal spores and eight rather variably preserved *Trichuris* eggs (approximately one third measurable) were noted.

This sample contained a heterogeneous assemblage of occupation waste. The wood chips may be waste from the construction of buildings or from wood turning. The combination of herbaceous remains, species indicative of manure/rubbish heaps, and weeds of grassland and waysides may indicate the presence of stable manure in the sample. The assemblage was also notable for the range of wetland taxa which were commonly recorded in urban occupation deposits. Some of these species are indicative of muddy ditches, others are fen or bog species which could have been imported as peat for use as fuel or floor covering. The rarity of insects is odd in view of the evidence from the plants: it *may* have been a consequence of intense biological activity in exposed material, but no partly-decayed remains were seen.

Context 2050 [14th/15th century - dump]
Sample 69 (2 kg GBA, 'squash')

Moist, very dark grey brown, soft (working plastic), humic slightly sandy clay silt. Large stones (>60 mm, including burnt shale), twigs, mammal and ?fish bone were present in the sample.

The flot was of moderate size but consisted mainly of insects and mites. There was a rich assemblage of beetles, with more aquatics than seem likely to have been present by chance—several beetle taxa and abundant water flea (*Daphnia*) resting eggs (ephippia). Whether these were of local origin or imported with wetland plants cannot be established without full analysis. Species associated with weedy vegetation included nettle feeders (among these the now southerly nettlebug *Heterogaster urticae* (Fabricius), regarded as evidence of higher-than-present-day temperatures).

The residue from this sample was dominated by wood chips and wood fragments. A wide range of weed taxa were noted that closely resemble the

assemblage encountered in Context 2024. Representatives of cultivated/disturbed ground, wayside/waste and wetland habitats were all identified. With the exception of small grass seeds (which were recorded as frequent) all other weed taxa were registered as infrequent. In common with Context 2024, the sample contained several *Chenopodium* species indicative of nitrogen-rich substrates such as manure. The wetland element of the sample had a greater bias towards fen mosses (such as *Sphagnum palustre* L. and *Scorpidium scorpioides* Hedw.) than Context 2024 and contained small fen peat clasts, ostracods, and *Daphnia* ephippia. Several fuller's teasel fruits were recorded and a small quantity of food remains were present (fish scales and a single fish spine fragment, seven fragments of cattle bone, a pig tooth, eggshell (to 4 mm), wheat/rye 'bran' and apple endocarp (to 5 mm)). None of the food remains were well represented. Part of the skull of a cat was also recorded.

The moderate-sized residue (20% of the sample) contained a piece of well-preserved leather (to 10 mm), fragments of turned wood (to 30 mm, bearing neat grooves), further frequent wood chips, rounded gritstone (to 60 mm), a single pottery shard (to 43 mm) and occasional pieces of brick/tile (to 5 mm). Food remains included cherry (*Prunus* Sect. *Cerasus*) stones, hazelnut shell fragments, eggshell fragments, small fish bones and oyster shell (to 15 mm).

The microfossil 'squash' was mostly organic detritus with some inorganic content. Some diatoms and a few phytoliths were noted. Five *Trichuris* eggs were also present, four of which were fairly well-preserved and probably measurable. The fifth egg was extremely pale and distorted.

This sample is a mixed occupation deposit containing waste from leather working, wood turning and possibly the construction of other wooden structures. Some of the food waste present may be faecal material; however, the larger bone and shell fragments are clearly dumped rubbish. The wetland component represents the importation of fen peat which could have come from the local river margin. This invertebrates are probably a mixture of background fauna and colonisers of rather foul decaying matter *in situ*, perhaps with an imported component. Grain pests and *Tipnus unicolor* were conspicuously absent, unusual in post-Conquest urban material. A larger subsample would provide a more clearly interpretable group of invertebrate remains. This material is of high priority for analysis, both to reconstruct site

conditions and to provide data for synthesis in a poorly-represented period of York's history.

Trench 3 [Early Roman to Anglo-Scandinavian deposits]

Roman contexts

Context 3080 [Early Roman - fill of linear cut 3085]

Sample 90 (2 kg GBA)

Moist, mid to dark grey brown, plastic (working crumbly), slightly humic slightly sandy silty clay. Very small and medium-sized stones (2 to 6 and 20 to 60 mm), ?mortar/plaster and vivianite were present in the sample.

Pieces of charcoal (to 10 mm) and stinging nettle (*Urtica dioica* L.) seeds were both frequent in the small flot (<1% by volume of the original sample). A limited range of waste ground/wayside species were identified (including hemlock, *Conium maculatum* and deadly nightshade, *Atropa belladonna* L.), accompanied by a number of other disturbed-ground indicators which included small nettle (*Urtica urens*), chickweed (*Stellaria media*) and *Chenopodium* Sect *Pseudoblitum*. The sample also contained unworked wood (to 10 mm), elder (*Sambucus nigra*) seeds, fish scales, orange clasts of baked mud and small grass seeds. Several fragments of corncockle (*Agrostemma githago*) were also noted, possibly indicating the presence of milled flour. The flot included no more than traces of invertebrate cuticle.

The main fraction of the moderate-sized residue was coarse quartz sand. Other constituents included rounded pebbles (to 50 mm), brick/tile (to 9 mm), a single shard of grey pottery (to 28 mm), charcoal (to 10 mm), occasional pieces of gritstone to (7 mm) and a single unworked fragment of amber (to 3 mm).

The deposit contains a typical mixed occupation assemblage, including hearth waste, building debris and a small quantity of food waste. The rarity of insect remains in a deposit containing seeds preserved by anoxic waterlogging is a little odd.

Context 3081 [?4th century - fill of pit 3112]

Sample 85 (2 kg GBA, 'squash')

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

bone and flecks of very rotted oyster shell were present in the sample.

This sample contained a similar range of common wayside and disturbed/cultivated ground weed taxa to those reported from Context 3080 with the addition of henbane (*Hyoscyamus niger* L.), fat-hen (*Chenopodium album*), dock (*Rumex* sp(p).), knotgrass, (*Polygonum aviculare* agg.), fool's parsley (*Aethusa cynapium*) and long prickly-headed poppy (*Papaver argemone* L.). The washover was principally composed of charcoal fragments (to 10 mm) accompanied by blackberry (*Rubus fruticosus* agg.), raspberry, apple (*Malus sylvestris*) endocarp, and hazel (*Corylus avellana* L.) nutshell fragments. None of these food remains was present in more than small quantities. Moderate amounts of unworked wood fragments (to 15 mm) were also noted, accompanied by earthworm egg capsules (probably indicating biological activity in the forming deposit), and the seeds of blinks (*Montia fontana* ssp. *chondrosperma* (Fenzl) Walters) and bristle club-rush (*Scirpus setaceus* L.), these last two probably representative of short damp turf. Only part of the washover was inspected for invertebrate remains. Only a few beetles were seen.

Quartz sand, ash and fine charcoal fragments (to 5 mm) formed the main part of the moderate-sized residue (25% of the original sample). A small quantity of brick/tile (to 17 mm), oolitic limestone (to 13 mm) and eggshell (to 5 mm) was recorded. Seeds of scarlet pimpernel (*Anagallis arvensis* L.), oraches (*Atriplex* sp(p).) and elder were also encountered. Thirty-two bones were recovered mostly rib, vertebra, and long bone shaft fragments from large and medium-sized mammals. A single chicken bone was identified.

The microfossil 'squash' was mostly inorganic with some organic detritus and a single poorly preserved (not measurable) *Trichuris* egg.

The assemblage probably represents waste from a hearth including a small fraction of unburnt food remains which were probably dumped separately. There would be little point in investigating the material further unless there is a specific question of interpretation to be addressed. If this deposit can be confirmed as of 4th century date, however, analysis of remains from a larger subsample should be carried out since any information about York in this period would be valuable.

Context 3083 [?4th century - fill of pit 3112]
Sample 87 (2 kg GBA, 'squash')

Moist, dark grey brown, slightly crumbly to plastic and slightly sticky, slightly humic slightly sandy silty clay. Very small and small stones (2 to 20 mm) and oyster shell were present in the sample.

The flot was large; insect remains were present but thinly distributed and poorly preserved.

Seeds of stinging nettle and small nettle were the most frequent macrofossils from a very small washover (<1% of the sample). Other constituents included a more limited version of the assemblage of cultivated ground/wayside weed seeds described for Context 3080. Small numbers of corncockle seed fragments were regularly recorded. The saltmarsh species, mud rush (*Juncus gerardi* Loisel.) was also present.

Fine charcoal fragments (to 5 mm) were frequent in the residue and food remains included a single complete oyster shell (to 75 mm), infrequent oyster shell fragments, rare fish scales and occasional pieces of eggshell (to 7 mm). The residue also contained mortar-coated brick/tile (to 75 mm), angular and rounded pebbles (to 25 mm) and a large quantity of coarse quartz sand.

The microfossil 'squash' was approximately half and half organic detritus and inorganic material. A few fungal spores and hyphae, some phytoliths and five *Trichuris* eggs were noted. The eggs were very pale and probably not measurable.

This sample contained a rather heterogeneous mix of occupation waste, including dumped building material, hearth waste and food remains, accompanied by a restricted range of common weed taxa typical of waste ground. It is possible that a useful assemblage of invertebrate remains could be recovered but there would be no point in attempting this unless a particular problem was presented. If the 4th century date is confirmed, however, then the material should be recorded through a larger subsample.

Context 3084 [?4th century - fill of pit 3071]
Sample 89 (30 kg bulk sieved)

Moist, light to mid grey brown (locally more brown and more grey), crumbly to plastic (working plastic), mix of mottled clay and slightly humic clay.

Gravel, sand and small to medium-sized stones (to 60 mm) formed the bulk of this moderate-sized residue. Small quantities of charcoal, slag, mortar/plaster, brick/tile, pot, iron nails, fragments of oyster shell, nutshell and bark were also present. Additionally, a dog coprolite (full of tiny bone fragments) was identified. The recovered bone assemblage was mostly rib, long bone shaft and vertebra fragments from a medium-sized mammal (probably caprovid) with four mouse (*Mus* sp.) bones and a single amphibian bone fragment. Traces of vivianite were common.

Context 3105 [?4th century - fill of pit 3112]
Sample 105 (1 kg GBA, 'squash')

Moist, dark greyish brown, soft (working plastic), humic slightly clay silt with faecal concretions (to 50 mm).

The small flot produced a moderate number of fairly well-preserved insect remains; there were also some poorly preserved fossils. Several spider beetles (*Ptinus* sp.) and variety of other beetles were present; a large subsample would produce an interpretable group.

The residue from this highly organic sample was mainly composed of faecal concretions, wheat/rye 'bran' and sloe (*Prunus spinosa*) stones. Raspberry seeds, apple endocarp fragments, and eggshell membrane were also frequently encountered. Much of the rest of the residue contained highly degraded wood fragments (to 10 mm) and small clasts of amorphous organic material that had not broken down fully during preparation. Small quantities of charcoal and burnt herbaceous remains were found and a limited range of common cultivated/disturbed ground weeds seeds were also present. Three rather eroded bone fragments were noted. The inorganic fraction of the sample was very small, being restricted to a few pieces of brick/tile (to 15 mm), mortar (to 10 mm), rounded pebbles (to 10 mm), glassy slag and thinly distributed quartz sand grains.

The microfossil 'squash' was mostly organic detritus with some inorganic material, phytoliths and 37 *Trichuris* eggs (one third to one half of which were measurable).

This sample undoubtedly contained faecal matter with a very small quantity of general occupation waste, which may have originated from accidental deposition. Further investigation is desirable since grain pests were absent and (subjectively) the remains had a character more in keeping with the

Anglo-Scandinavian period than the Roman; if the deposit can be confirmed as of 4th century date the biota will be of considerable importance.

Anglo-Scandinavian pit fill contexts

Context 3034 [Fill in pit 3007]
Sample 35 (2 kg GBA)

Moist, light to mid slightly greyish brown, crumbly (working slightly plastic), slightly clay sand. Small stones (6 to 20 mm) and a mammal tooth were present in the sample.

There were only traces of invertebrate remains in the rather small flot; a large subsample would probably not produce a useful quantity.

The small flot and washover (1% of the sample), contained a limited range of seeds from weed taxa indicative of rough or open ground, including stinging nettle (*Urtica dioica*), small nettle (*U. urens*), chickweed (*Stellaria media*), henbane (*Hyoscyamus niger*), oraches (*Atriplex* sp(p).) and several different *Chenopodium* species. In common with many urban occupation deposits, the sample also contained wetland macrofossils such as leaves of the mosses *Sphagnum* Sect. *Acutifolia* and *Scorpidium scorpioides*, nutlets of sedge (*Carex*) and seeds of celery-leaved crowfoot (*Ranunculus sceleratus*). This last species is common in slow-flowing muddy ditches and at pond margins. Other components of the washover included occasional charcoal fragments (to 5 mm), rare bark fragments (to 6 mm), a piece of degraded dicotyledon leaf, rare corncockle (*Agrostemma githago*) seed fragments and a limited number of monocotyledon rootlets.

The large residue (60% of the original sample) was dominated by material which probably originated in ash, with a significant component of coarse quartz sand. Several oyster shells were noted accompanied by frequent pieces of charcoal (to 10 mm), rare burnt eggshell fragments, degraded wood (to 5 mm) and small clasts of baked orange earth. Eleven fragments of burnt bone (mostly of cattle) were also recovered (these were similar in appearance to the hand-collected material discussed below). Seeds of fig-leaved goosefoot (*Chenopodium ficifolium* Sm.) and *Chenopodium* Sect. *Pseudoblitum* were also present. These *Chenopodium* species are found in nitrogen-rich environments such as organic rubbish and manure heaps.

Context 3039 [?9th century - fill in pit 3041]
Sample 41 (2 kg GBA, 'squash')

Moist, mid to dark grey brown, slightly crumbly (working sticky and plastic), slightly humic clay silt to silty clay with some light grey brown reworked clay. Very small and small stones (2 to 20 mm), charcoal and mammal bone were present in the sample.

Charcoal fragments (to 7 mm) dominated the small washover, which produced a very limited range of disturbed/waste ground weed taxa including, henbane (*Hyoscyamus niger*), small nettle (*Urtica urens*), oraches (*Atriplex* sp(p)), chickweed (*Stellaria media*), stinging nettle (*Urtica dioica*) and *Chenopodium* Sect. *Pseudoblitum*. This taxon contains species which inhabit nitrogen-rich environments such as the environs of dung heaps and drying mud at the edges of ponds and in ditches. Several wetland components were present in the sample including, sedge (*Carex*) nutlets, leaves of the fen moss *Scorpidium scorpioides* and seeds of the saltmarsh species, mud rush (*Juncus gerardi*). Occasional flax seed pod fragments and rare seeds of elder (*Sambucus nigra*) were also found. The only plant food remains, other than perhaps the flax and elder, were rare pieces of apple endocarp (core). The washover was inspected only in part for invertebrate remains; only capsules, probably of earthworms, and a few traces of cuticle were detected.

The microfossil 'squash' was essentially inorganic with a trace of organic detritus. No parasite eggs or other microfossils were seen.

The main component of the moderate-sized residue (20% of the sample) was coarse quartz sand. Rare pieces of charcoal (to 5 mm), rounded pebbles (to 30 mm), brick/tile (to 15 mm) and a single piece of gritstone (to 75 mm) were also present.

Context 3043 [Fill in pit 3007]
Sample 42 (2 kg GBA, 'squash')

Moist, dark grey brown, slightly brittle (working plastic), slightly humic slightly sandy clay silt. Small stones (6 to 20 mm), vivianite, wood and mammal bone were present in the sample.

The flot was of moderate size and contained rather few insect fossils. A suite of taxa typical of Anglo-Scandinavian York was present.

The most frequent components of the moderate-sized washover (20% of the sample) were wood

fragments, wood chips (to 100 mm) and elder seeds (*Sambucus nigra*). Seeds of a range of common weeds of open, disturbed ground were encountered including, henbane (*Hyoscyamus niger*), stinging nettle (*Urtica dioica*), small nettle (*U. urens*), chickweed (*Stellaria media*), thistles (*Carduus/Cirsium* sp(p)), dock (*Rumex* sp(p)) and shepherd's purse (*Capsella bursa-pastoris* (L.) Medic.). Species of typical of cultivated ground were represented by rare seeds of fool's parsley (*Aethusa cynapium*) and occasional fragments of corncockle (*Agrostemma githago*). Wetland taxa included sedge (*Carex*) and the moss *Scorpidium scorpioides*. Other macrofossils encountered in the washover included, frequent pieces of charcoal (to 10 mm), occasional nutshell fragments of hazel (*Corylus avellana*), rare seeds of *Chenopodium* Sect. *Pseudoblitum*, earthworm egg capsules and a single *Potentilla* sp. seed. A small piece of unworked amber (to 3 mm) was also noted and retained.

The residue (30% of the original sample) was principally composed of coarse quartz sand and charcoal (to 5 mm). Other components included rare pieces of brick/tile, eggshell, coal (to 10 mm), very degraded wood fragments (to 8 mm), further unworked amber (to 7 mm) and a single oyster shell. Twenty-six fragments of bone were recovered—twelve recorded as medium-sized mammal (probably caprovid), the rest being unidentifiable.

The microfossil 'squash' was approximately half organic detritus and half inorganic material with a few fungal spores and diatoms. No parasite eggs were seen.

A very large subsample would be needed to recover sufficient insects remains for any pressing interpretative questions to be addressed.

Context 3056 [Fill in pit 3007]
Sample 53 (2 kg GBA, 'squash')

Moist, moderately heterogeneous, dark greyish brown, crumbly (working plastic), moderately humic slightly sandy slightly clay silt with occasional smears of pinkish clay. Vivianite, wood and mammal bone were present in the sample.

The flot was rather large. Insect preservation was good; there were numerous *Aphodius* dung beetles and other species typical of foul matter.

Wood chips (to 55 mm) dominated the rather large washover from this sample. Charcoal pieces (to 10

mm) and seeds of the small nettle were also very common. A wide range of open and disturbed ground weed seeds similar to those noted in Contexts 3034 and 3043 were also noted. Other disturbed/cultivated ground weed seeds present included, knotgrass (*Polygonum aviculare* agg.), fat-hen (*Chenopodium album*), field penny-cress (*Thlaspi arvense* L.), stinking mayweed (*Anthemis cotula*) and spiny sow-thistle (*Sonchus asper*). Species indicative of waste ground and waysides included burdock (*Arctium* sp(p).), flixweed (*Descurainia sophia* (L.) Webb ex Prantl) and self-heal (*Prunella vulgaris* L.). The wetland types recorded included all of those noted from Contexts 3034 and 3043, plus toad rush (*Juncus bufonius* L.) and common tormentil (*Potentilla erecta* (L.) Räsch.), which also grows on heaths. A limited range of food remains were represented by the presence of strawberry (*Fragaria vesca*) seeds, sloe (*Prunus spinosa*) stones and hazelnut shell fragments.

The residue contained charcoal (to 10 mm), wood chips (to 50 mm), rounded pebbles (to 60 mm), and a piece of worked metal (to 8 mm), which was retained. Other components included occasional pieces of brick/tile, a small quantity of coarse sand, a charred wheat/barley grain, rare eggshell fragments, a single eel (*Anguilla anguilla* (L.)) vertebra, five fragments of cattle and pig bones, eight unidentified bone fragments and small pieces of hazel nutshell.

The microfossil 'squash' was mostly organic detritus with some inorganic material, a few phytoliths, diatoms, fungal spores and hyphae and a single *Trichuris* egg (pale and not measurable).

The insect assemblage, and other groups of similar character from the site, should be investigated fully using larger subsamples as a matter of priority.

Context 3057 [Basal fill of pit 3007]

Sample 95 (25 kg bulk sieved)

Moist, dark greyish brown, crumbly (working plastic), very humic slightly sandy clay silt. Small fragments of wood and flecks of oyster shell were present in the sample.

The moderate-sized residue was mostly sand and gravel, with some wood and bark fragments, a little charcoal, shell and tile/brick. Scraps of leather were also noted. A small component representing food plants included fig and apple seeds, apple endocarp, blackberry pips and hazelnut shell fragments. Additionally, weeds of waste/disturbed ground were present, along with traces of moss

suggestive of fen or marsh. Small numbers of charred cereal grains and uncharred corncockle seeds were present; the latter were fragmented and may have originated in milled flour. A few invertebrate remains were noted including fly puparia, a ?ant (Formicidae) head and a few fragments of beetle (*Cercyon* sp.); these last may have been from one individual.

The bone mainly comprised cattle and caprovid fragments, probably representing butchery waste. A few amphibian and fish fragments were also identified, the latter including eel and pike (*Esox lucius* L.) vertebrae. A single pike vertebra showed characteristic damage consistent with being chewed, whilst several small unidentifiable fragments appeared to be acid etched, a consequence of passage through the gut.

Context 3069 [Fill in pit 3070]

Sample 78 (1 kg GBA, 'squash')

Moist, dark greyish brown, crumbly (working slightly plastic), slightly sandy slightly clay silt. Wood (some worked), twigs, bark and traces of vivianite were present in the sample.

The flot, of moderate size, contained a small group of insects with hints of deposition outdoors and an aquatic influence.

The washover contained frequent wood chips (to 40 mm) and frequent pieces of charcoal to (15 mm). A range of common disturbed ground weed taxa similar to the assemblages found in Contexts 3034 and 3043, were noted. The species present included seeds of *Chenopodium* Sect. *Pseudoblitum*. Further cultivated/waste ground weed species were noted including hemp-nettle (*Galeopsis* Subg. *Galeopsis*), corncockle (*Agrostemma githago*), redshank (*Polygonum persicaria* L.), pale persicaria (*P. lapathifolium*), nipplewort (*Lapsana communis*), turnip (*Brassica rapa* L.) and wild radish (*Raphanus raphanistrum* L.). Wetland species present included *Scorpidium scorpioides*, sedges (*Carex*, both charred and uncharred nutlets), and jointed rush (*Juncus articulatus* L.). Mosses present included *Hypnum* cf. *cupressiforme* Hedw., *Neckera crispa* Hedw., *Antitrichia curtipendula* (Hedw.) Brid. and *Homalothecium sericeum/lutescens*, which are all commonly found in urban occupation deposits.

The residue contained a single grey pottery shard (to 25 mm), infrequent angular stones (to 15 mm), occasional rounded pebbles and a small quantity of coarse sand. Small amounts of bark, twigs, sedge

nutlets and a single pod fragment of flax (*Linum usitatissimum*) were recorded.

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

A larger subsample (say 3-5 kg) would yield an interpretable invertebrate assemblage and might allow the origin of the aquatics (local or imported?) to be determined.

Context 3072 [Fill in pit 3070]

Sample 80 (Description only)

Jumbled mixture of dark brown humic silt with coarse woody and herbaceous detritus and sticky varicoloured (light reddish brown to light grey) clay (locally slightly sandy and stony).

No further analysis was undertaken of this sample.

Context 3094 [Fill in pit 3070]

Sample 97 (2 kg GBA)

Moist, dark grey, crumbly (working plastic and slightly sticky), slightly humic slightly sandy silty clay. Very small stones (2 to 6 mm), wood, burnt mammal bone and traces of vivianite were present in the sample.

Charcoal (to 13 mm) and the seeds of stinging nettle, small nettle, elder and oraches were the most frequent macrofossils in this rather mixed sample. Other components included a limited range of other waste/cultivated ground species similar to those described for Contexts 3034 and 3043. In addition, the sample contained rare faecal concretions, occasional wood chips (to 20 mm), a single *Triticum/Hordeum* (wheat/barley) grain, and occasional twigs (to 12 mm). In common with Contexts 3034 and 3043, the sample contained *Chenopodium* Sect. *Pseudoblitum* seeds. Food remains included blackberry seeds (*Rubus fruticosus* agg.), rare wheat/rye 'bran' and hazelnut shell fragments. Arable field weeds occurring in the sample included fragments of corncockle. Wetland/heathland plants were restricted to the moss *Scorpidium scorpioides* and common tormentil (*Potentilla erecta*). Paraffin flotation would have been useful and perhaps should be carried out to recover any insect remains present (although none were obvious on inspection of a small aliquot).

The moderate-sized residue (25% of the sample) was dominated by coarse sand with frequent pieces of charcoal (to 15 mm) and rounded pebbles (to 20 mm). Additionally, the residue contained rare pieces of brick/tile, an oyster shell, occasional angular stones, a single mineralised twig (to 40 mm), rare wood chips and bark (to 20 mm), earthworm egg capsules and fine droplets of metal/metal slag.

Sample 98 (28 kg bulk sieved)

Moist, dark grey brown, slightly crumbly (working plastic and slightly sticky), slightly humic sandy clay silt. Burnt mammal bone was present in the sample.

Much of the residue comprised sand, gravel and stones (to 65 mm), with small fragments of brick/tile, mortar/plaster, pottery and oystershell. Pieces of charcoal, wood and nutshell were also recorded from the residue. A moderate quantity of large bone was present, which included cattle, caprovid and pig fragments. Fish were represented mainly by eel, herring and pike vertebrae. A few small mammal and bird fragments were also noted.

Context 3104 [Basal fill of pit 3070]

Sample 104 (2 kg GBA, 'squash')

Moist, dark brown, crumbly (working plastic), moderately humic slightly sandy slightly clay silt. Rotted ?mortar was common and wood, burnt mammal bone, nacre, and small patches of grey/red-brown clay were present in the sample.

The rather small flot yielded a few decomposer insects and one associated with nettles.

The washover from this sample was very small (<1% of the sample) and contained a limited range of disturbed, open-ground weed seeds similar to the species listed in Contexts 3034 and 3043. Additional species encountered included several plants that are common on cultivated land, such as bladder campion (*Silene vulgaris* (Moench) Garcke) and long prickly-headed poppy (*Papaver argemone*). Fragments of corncockle were also present. The marsh and fen plants, greater spearwort (*Ranunculus lingua*) and lesser spearwort (*R. flammula* L.) were recorded. These were accompanied by sedge nutlets and columbine (*Aquilegia vulgaris*), which grows in woods and wet places on calcareous soil and fen peat but may well have been cultivated as an ornamental in the town. *Melica* sp. was the only other taxon in the

sample typical of shady hedgebanks and woods. The wayside/waste ground species cow parsley (*Anthriscus sylvestris* (L.) Hoffm.) and burdock (*Arctium* sp(p).) were also present. Probable food remains were restricted to a single dewberry (*Rubus caesius* L.) seed and apple (*Malus sylvestris*) pip.

The residue was mainly composed of coarse sand and frequent pieces of charcoal (to 15 mm). It also contained rare wood fragments (to 5 mm), rounded pebbles (to 50 mm), nine fragments of bone (representing cattle and caprovid) and rare pieces of brick/tile (to 15 mm). Further previously-mentioned wetland taxa and weed seeds were encountered, accompanied by the moss *Homalothecium sericeum/lutescens* and several apple pips. Additionally, the mud-bottomed ditch species celery-leaved crowfoot (*Ranunculus sceleratus*) was found.

The microfossil 'squash' was approximately three parts inorganic material to one part organic detritus. No parasite eggs or other microfossils were seen.

This was a heterogenous assemblage containing a wide variety of rough ground weeds that could have blown into an open pit or represent backfill by soil from adjacent surfaces. There is also evidence for dumping of general occupation debris, accompanied by a trace of faecal/food waste. A very large subsample (of, say, 5 kg) would probably provide an interpretable group. of insect remains.

Context 3108 [Lower 'cauldron' fill in pit 3007]
Sample 107 (2 kg GBA, 'squash')

Moist, very heterogeneous, sticky (working soft) pinkish brown clay to dark grey brown humic silt with wood and moss present.

The flot was large but consisted almost entirely of insect fragments. Preservation was exceptionally good (some remains appeared to be darkened, as discussed by Kenward 1983) and a wide range of insect taxa was present. Some aphids of a characteristic type were noted and may be identifiable and interpretatively useful; they appeared not to be parasitised 'mummies' (cf. Hall *et al.* 1983). There was a mixture of taxa likely to have exploited weedy waste ground and foul decomposers. The latter included numerous *Aphodius* dung beetles (mostly *A. granarius* (Linnaeus), but with other species present) and an

Onthophagus, giving an assemblage of very unusual character for the period.

The moderate-sized washover (20% of the sample) contained frequent wood chips (to 50 mm), in common with several of the previously described pit fill samples. The mix of open, waste ground and wetland taxa was also very similar to those found in Contexts 3034 and 3043, although slightly more restricted.

The small residue, amounting to 5% of the original sample, contained a small quantity of quartz sand, rare fragments of brick/tile, ten bone fragments (two amphibian bones and eight unidentified) and a single oyster shell.

The microfossil 'squash' was mostly inorganic with some organic detritus. No parasite eggs or other microfossils were seen.

A detailed investigation of this material is strongly recommended in order to attempt to determine its significance. Furthermore, an abdominal sclerite resembling *Vespula* (the common wasp) was observed and should be investigated with great care since no archaeological records of these now ubiquitous insects have been recorded (raising the possibility that they have been imported only relatively recently).

Context 3109 [Fill in pit 3007]
Sample 10801 (2 kg GBA)

Moist, heterogeneous, dark grey brown, crumbly (working plastic), humic clay silt with an admixture of pinkish grey brown clay. Mammal bone was present in the sample.

A very large flot was recovered, but about half by volume was insect remains. Many were superbly preserved, though others less so. Only part of the flot was examined; it contained a rather unusual mixture of insects including numerous *Aphodius* dung beetles (*A. granarius* and others).

Wood chips (to 20 mm) formed the main part of the moderate-sized washover (20% of the original sample). Charcoal (to 7 mm) and the seeds of elder, knotgrass and stinging nettle were all recorded as frequent. The sample contained a wide range of other cultivated/disturbed ground weed taxa similar to those recorded from most of the preceding Anglo-Scandinavian pit fill contexts. Notable additions in the present macrofossil assemblage include greater plantain (*Plantago major* L.), hairy buttercup (*Ranunculus sardous* Crantz), sow-thistle

(*Sonchus oleraceus* L.) and deadly nightshade (*Atropa bella-donna*). Similarly, the sample contained a range of wetland taxa typical of the pit fill contexts described above, plus leaf fragments of bog myrtle (*Myrica gale* L.) and the seeds of water-pepper (*Polygonum hydropiper*) and water-plantain (*Alisma* sp(p)). A single seed of the grassland species, heath grass (*Danthonia decumbens*) was also noted.

The small residue (2% of the original sample) contained a limited range of inorganic components (angular stones (to 25 mm), rounded pebbles (to 20 mm), quartz sand and brick/tile) all of which scored 'one' on the four-point scale of abundance used. Occasional wood chips (to 10 mm) and rare hazel shell fragments were also present.

The recovered assemblages should be investigated fully.

Sample 10802 (2 kg GBA, 'squash')

Moist, dark grey brown, plastic and soft (working sticky when wet), slightly humic clay silt with some pinkish brown clay. Medium-sized stones (20 to 60 mm) and rotted mortar/plaster were present in the sample.

The flot (of moderate size) consisted mostly of insect remains in an excellent state of preservation of even very delicate remains. A louse, perhaps the pig louse *Haematopinus*, was noted, and there were several large aphids which may be identifiable. The beetles were very diverse and included some taxa not regularly recorded in Anglo-Scandinavian deposits. *Aphodius* dung beetles were numerous, most being *A. granarius* but with some other species.

The washover from this sample (25% of the original sample) was very similar to the preceding Anglo-Scandinavian pit fill samples in that it was principally composed of wood chips (to 50 mm), accompanied by a relatively wide range of disturbed, cultivated and waste ground taxa and a limited suite of wetland types. The disturbed ground taxa included several species of the genus *Chenopodium*, typical of nitrogen-rich rubbish or manure heaps. In addition, the sample contained a number of grassland species (field scabious *Knautia arvensis*, blinks *Montia fontana* ssp. *chondrosperma* and hawkbit *Leontodon* sp(p)), possibly indicating the presence of hay or manure. Rare fragments of wheat/rye 'bran' and a single charred barley grain were encountered; however, no other food plants were found. Other

macrofossils in the assemblage included a single seed of common mallow (*Malva sylvestris* L.), seeds of black bindweed (*Bilderdykia convolvulus* (L.) Dumort.) and the mosses *Eurhynchium* sp(p) and *Hylocomium splendens* (Hedw.) Br. Eur.

Very few macrofossil remains were noted in the residue (2% of the original sample), which contained a small quantity of coarse sand, rounded pebbles (to 20 mm), several angular stones (to 25 mm) and occasional wood fragments (to 15 mm). The bone from this residue comprised thirteen fragments (cattle and caprovid).

The microfossil 'squash' was approximately half and half organic detritus and inorganic material with a few phytoliths and a single pale *Trichuris* egg (not measurable).

It is most important that this material should be recorded in full; the reason why the dung beetles should be concentrated in a pit is not clear. One explanation may be that heavily-colonised dung was scraped from surfaces and thrown in, although this is not very well supported by the plant remains.

In summary, plant remains from the Anglo-Scandinavian pit fill contexts (eleven examined) show a high degree of consistency. Almost all samples are principally composed of clearly worked wood chips which could be the debris from wood turning and/or the building of wooden structures. Most samples contained a strong component of disturbed ground and cultivated ground weed taxa including several species which favour nitrogen-rich habitats. These species probably indicate that the local environment was relatively dirty with surface deposits of foul matter such as manure. By contrast, faecal material only occurred at trace levels throughout the samples. Although fragments of corncockle, probably indicative of contaminated milled flour, were found frequently in most samples, none of the pits contained significant quantities of wheat/rye 'bran' or other commonly preserved food remains. In common with many urban archaeological deposits, the pit fills all contained assemblages of wetland plant remains which varied in detail between samples. Plant species indicative of ditch bottoms, fens and heaths were all present in small quantities, possibly reflecting the importation of materials such as peat for fuel or floor covering. Remarkable was the complete absence of any remains of plant used in dyeing. These remains were extremely common in 10th/11th century deposits at 16-22 Coppergate (Kenward and Hall 1995) and have been noted from at least some samples from

deposits dated to the Anglo-Scandinavian period from all other sites in York (Hall 1996; 1997).

The insect assemblages were varied, but some were of particular interest for their large component of dung beetles. These assemblages should be recorded in detail both to elucidate conditions on site and to provide data for synthesis. Lice and aphids deserve further investigation.

Spot find samples

All four of the spot samples submitted as coprolites were, indeed, mineralised faecal material, but had not retained the shape of the original stools. All were calcareous and at least one (from Context 1062) showed embedded fragments of bone (the coprolites from Contexts 1053 and 2025 also had embedded calcareous material which may have been bone). Three of the coprolites (from Contexts 1053, 1062 and 2025) contained *Trichuris* eggs (revealed by a 'squash') most of which were measurable though those from Contexts 1053 and 1062 were highly mineralised (the effects of mineralisation on size of eggs is unknown). It seems likely that the coprolite from Context 1171 (highly calcareous and no intestinal parasite eggs seen) is of dog faeces and that those from the other three contexts (1053, 1062 and 2025) are of faecal material of mixed origins—all three contexts are pit fills (1053 and 1062 are from the same pit) where such mixing could easily occur.

Hand-collected shell

The 46 contexts examined produced 214 identifiable marine shell fragments. Preservation was generally good. Most of the recovered shell comprised oyster (*Ostrea edulis* L.) valves (199 specimens) from deposits of Anglo-Scandinavian date—almost all (113) from the two uppermost contexts within pit 3007.

Ten of the oyster valves had balanid barnacles as epibionts and fourteen (twelve from dated contexts) showed damage by polychaetid worms (*Polydora* sp(?p)). None of the valves showed any evidence of encrustation by other marine invertebrates on their inner surface. Forty-four of the valves from dated contexts were definitely burnt (four others showed damage which may have been from burning). Seventy-two of the valves had damage characteristic of the oysters having been opened using a knife or similar implement.

Basic information by context and period/feature is given in Table 2. Additional summary information for the oyster valves is presented, by period, in Table 3.

Hand-collected vertebrate remains

The entire assemblage amounted to 3932 fragments of which 2618 (representing 44 contexts) were recorded in some detail. Much of the material was recovered from the dump deposits in Trench 2 and the Anglo-Scandinavian pit fills in Trench 3. Details of the range of species, number of fragments, measurable bones and mandibles with teeth for both the recorded and scanned material can be found in Tables 4 -13.

Trench 1

A range of deposits were revealed in Trench 1, of which 93 contexts produced bone. Of these, however, only nine contained more than 20 fragments. Material from eighteen contexts was selected for detailed recording, covering a timespan from the 12th through to the 16th century.

Preservation of the whole assemblage was good, although very small numbers of battered or rounded fragments were noted among the material from some contexts. Most deposits contained fragments which were brown, dark brown, or black in colour. Little dog gnawing was evident and fresh breakage was negligible.

Assemblages dated to the 12th and 13th centuries showed a high proportion of butchered bones (20-50% of all fragments in most cases), including split and heavily chopped cattle shaft fragments. Additionally, cattle horncores were quite numerous for this period and all had been deliberately chopped from the skull below the base of the core, thus ensuring that the whole of the horn remained intact.

Butchery appeared to be less extensive in the later periods but the material did include a small number of sheep skulls (mainly from 13th/14th century deposits) which had been chopped through the back of the cranium. Some of these clearly represented polled sheep (i.e. horn-less individuals).

12th/13th century (also incorporating material from deposits dated as late 12th/13th century)

Material from five contexts (1145, 1156, 1163, 1168, and 1172) was recorded in detail.

The range of identified species is shown in Table 5, from which it can be seen that cattle remains were the most numerous. Fragments of other common domesticates were also present, and included a few goat metapodials, one of which represented a juvenile individual. Bird and fish remains were scarce, but included fragments of goose (*Anser* sp.) and duck (*Anas* sp.), and a large gadid vertebra.

Twenty-nine of the 61 identified cattle fragments were horncores, which had been quite obviously removed from the rest of the skull. Some had been chopped through at the base of the core, whilst other fragments included part of the frontal and parietal bones. Further cattle horncores were noted within the scanned material. Clearly these fragments represent the waste from some craft activity such as horn working or tanning. In the absence of large numbers of metapodials and phalanges, it seems more likely to be the former.

The inclusion of other elements (some meat-bearing) within the assemblage suggests that refuse associated with the slaughtering and butchering of cattle was also present.

Evidence of a pathological condition was noted on two of the cattle cranial fragments from Context 1168. This consisted of perforations in the nuchal region of the occipital bone. A number of possible clinical factors (congenital, infectious, parasitic, neoplastic and direct pressure through yoking) have been proposed as the most likely aetiology of this condition. These factors have been most recently discussed by Brothwell *et al.* (1996) and, on the basis of their brief survey, it would appear that parasites, tumours, and infection can all be ruled out as causal factors. Although the cause could not be clearly established, these authors suggest that it is most likely to be congenital in origin. This phenomenon has been noted from a number of sites ranging in date from Roman (Dobney *et al.* 1996) to post-medieval (Carrott *et al.* 1997).

13th/14th century (also incorporating material from deposits dated 13th, 14th and late 14th century)

Seven small assemblages were recorded for this period (Contexts 1102, 1103, 1116, 1124, 1125, 1128 and 1144).

The usual domesticates were identified, including cattle, caprovids, pig and horse (Table 5). Additionally, one context (1144) contained eight dog bones, representing at least three individuals. A single femur showed traces of possible knife marks, which could represent evidence for

skinning. This same deposit also included the complete skull of a horse with both mandibles present. Cattle horncores were again noted, along with two goat horncores, one each from Contexts 1124 and 1144.

Wild mammals were represented by a heavily chopped red deer (*Cervus elaphus* L.) antler fragment (Context 1103) and a fallow deer (*Dama dama* (L.)) metatarsal. Fish again were represented by large individuals, one fragment of which was tentatively identified as ling (*Molva molva* (L.)).

These assemblages, as with the earlier material, suggest that waste from a number of different sources was present.

14th/15th century

Few fragments were recovered from the fifteen deposits dating to this period, none of which were recorded in detail. Preservation was mainly noted as good and many of the bones were black in colour. Material from this period is of rather limited potential.

16th century

Thirty-three deposits yielded bone, of which six (Contexts 1029, 1038, 1048, 1053, 1059, and 1066) were recorded in some detail. This group shows a similar range of species to those recovered from the earlier periods (Table 5). Although less butchery was noted, small numbers of split cattle shafts fragments were still present. The numbers of cat fragments are boosted by the presence of a part-skeleton recorded from Context 1066. A single pheasant (*Phasianus colchicus* L.) tarsometatarsus was identified from Context 1059, whilst a large gadid premaxilla was noted from Context 1053.

Trench 2

Most of the bone from this trench was recovered from a series of dump deposits, although a number of pit fills also produced material. The 13 recorded assemblages showed that these deposits were rich in extremely well-preserved bone. Some fragments had almost a greasy appearance. Although most fragments were dark brown, some variation of colour was apparent within material from individual contexts. Bone from Context 2122, however, was mainly beige. Little fragmentation appeared to have occurred, with 20-50% of the bones from some assemblages being greater than

20 cm in length. Dog gnawing was almost completely absent, whilst fresh breakage was minimal. A single human bone was identified from Context 2025. This fragment was identical in preservation and colour to the rest of the material and showed no evidence of being residual. Its inclusion in these deposits is difficult to explain.

A number of fragments from Context 2112 showed evidence of heat damage or burning. Four cattle mandibles had been burnt along the tooth row, whilst a pair of goat horncores showed extensive scorching to the anterior sides of the horncores and to the frontal bone.

Evidence of butchery was extensive and similar butchery practices were noted throughout the periods represented. These included longitudinal splitting of cattle long-bones (particularly radii) and heavily chopped vertebrae and ribs. Material from 10th/11th and 11th/12th century deposits included many cattle mandibles, most of which had been chopped through the ascending ramus. This cut would have freed the jaw from the rest of the head, facilitating the removal of the tongue. Butchery or dismemberment of horse carcasses was also hinted at by the presence of two chopped horse bones (Contexts 2004 and 2118), whilst faint traces of knife marks were observed on a cat mandible from Context 2024. The latter may represent evidence for skinning.

Perforations were observed in a cattle cranium fragment from Context 2024. This pathological condition was noted on fragments from Trench 1 deposits and has been discussed above.

10th-16th centuries

Since the well-dated assemblages from 10th to 16th century deposits were all remarkably similar, both in preservation and content, they are here discussed as a whole.

The range and frequency of identified species for all the separate chronological groups is shown in Table 8. From this it can be seen that the remains of cattle were most common throughout, with caprovid bones also present in reasonable numbers. Fragments of other species were rather scarce but included pig and horse. The assemblage from Context 2062 included four dog humeri, which represented four individuals of varying sizes, whilst the part-skeleton of a small lap-dog was recovered from Context 2024. Birds were represented by chicken and geese, the latter not noted prior to the 14th century.

Material from this trench was characterised by quantities of cattle, goat and ram horncores. All had been deliberately chopped from the main part of the skull, and whilst single cores sawn through at the base were present, a large proportion had part of the frontal bone still attached. Amongst the goat remains were six pairs of horncores with circular pieces of skull to which both cores were still joined. Few goat post-cranial elements (mainly metapodials), were identified despite careful use of comparative criteria for differentiation of sheep and goat.

Evidence for the presence of four-horned sheep was provided by half of a ram's skull (Context 2118) with one straight anterior horncore and a smaller, curved posterior core. Although uncommon, multi-horned or polycerate skulls have been found at other archaeological sites, including Flaxengate, Lincoln (O'Connor 1982). A genetic growth defect in the horn core is believed to cause this feature.

A brief examination of the occurrence of different parts of the skeleton shows a preponderance of caprovid horncores and mandibles, with few major meat-bearing elements being present. Cattle remains show a similar large proportion of horncores and mandibles, but radii, humeri and metapodials are also well represented, particularly in the 10th/11th century assemblages. Despite the numerous mandibles and horncores present, maxilla and cranial fragments from both species appear to be relatively scarce. Similar remains were observed within the scanned material, including additional cattle, goat and ram horncores.

A number of different commercial activities appear to be responsible for the remains recovered from these deposits. One of the main components seems to be waste from an industrial process such as horn-working and/or tanning, whilst the remainder of the material suggests refuse from slaughter, primary butchery and secondary carcass preparation.

16th/17th century

Only forty-six fragments were recovered from the five contexts of this date. These assemblages were merely scanned and included little material of interpretative value. Seven cattle fragments from Context 2013 represented the lower limb elements of a single individual.

Trench 3

Deposits from Trench 3 ranged in date from the early Roman period to the 11th century. Details of the number of fragments, measurable bones and mandibles with teeth for both the scanned and the recorded material are shown in Tables 11-13.

Vertebrate remains from the Roman deposits were moderately well-preserved, although angularity (the nature of the broken surfaces) was variable, with a mixture of both 'spiky', 'battered' and 'rounded' fragments (this was also apparent in the scanned fraction). Preservation of material from later deposits was mainly excellent, with most fragments having sharp broken edges. In contrast to the brown and fawn fragments recovered from the Roman deposits, later material tended to be dark brown or black in colour, although some variation was apparent within contexts.

The scanned material was similar, although bone from Contexts 3074 and 3076 was rather more variable and included small numbers of battered and rounded fragments suggesting the inclusion of some residual material.

One assemblage from Context 3034 did stand out as being quite different. Almost every bone had been burnt or showed some sign of heat damage. Whilst some fragments were white in colour, most were a pale fawny beige with a porcelain appearance. These fragments did not appear to have been subjected to direct heat (as in placed in a fire) but may have been dumped on top of a deposit of hot ashes. Additionally, many of the fragments from Context 3036 had areas where the surface of the bone had been scorched but these bones had obviously not been subjected to the same intensity of heat.

Early Roman

Limited numbers of bones were recovered from six deposits dating to this period, none of which were recorded in detail. Little material of any interpretative value was noted, with the exception of a single raven (*Corvus corax* L.) humerus fragment.

?3rd century

For this period only a very small amount of bone was recovered and only material from a single context (3044) was recorded in any detail. Table 11 shows the species present which included the usual

range of domestic mammals. This assemblage is too small to be of any interpretative value.

?4th century

Most of nine contexts which produced vertebrate remains from this period were the fills of two pits (3071 and 3112). Bone from four of these deposits (Contexts 3061, 3081, 3083 and 3084) was recorded in detail.

Totals of 53 identified and 78 unidentified fragments were recorded, most being cattle, large mammal and caprovid fragments, followed by small numbers of pig. As with the earlier Roman assemblages, the bone from this period is of rather limited value for either archaeological or zooarchaeological interpretation.

?9th century

Material from a single deposit (Context 3052), amounting to 25 identified and 55 unidentified fragments, was recorded in detail.

Cattle remains and large mammal fragments (assumed to be mainly cattle) predominated in the assemblage, with only a few fragments of caprovid, horse and pig also being present. Butchery was not extensive but split cattle metapodials were noted in both the recorded and the scanned material. Additionally, shallow chop marks were observed on a horse phalanx from Context 3052. A single goose coracoid represents the only supplementary species present in the scanned material.

'Anglo-Scandinavian'

By far the largest assemblages from this trench were recovered from deposits dated by the excavator as 'Anglo-Scandinavian'. Fills from two large pits (3007 and 3070) produced the bulk of the material and the recorded vertebrate remains represent seven of these fills (Contexts 3006, 3043, 3057, 3069, 3090, 3093 and 3094).

A total of 860 fragments were recorded of which 282 were identified to species. The vertebrate remains were dominated by cattle and caprovid remains, although 'large mammal' fragments (assumed to be mainly cattle) significantly boost the proportion of cattle fragments (Table 11). Evidence for butchery was quite extensive and included split cattle and caprovid long bones (particularly metapodials), presumably for the

extraction of marrow. Also of note were a small number of sheep crania which not only showed evidence of horn removal but also perhaps of brain extraction, characterised by the presence of skulls split longitudinally or chopped through the back of the cranium. Also present was a pair of goat horncores with attached frontal bone showing quite clearly where they had been chopped away from the rest of the skull.

Besides a small quantity of pig bones, there were also single fragments of horse, hare (*Lepus* sp.) and red deer. Goose and chicken were noted in small amounts.

A preliminary examination of the presence of different skeletal elements of the main species from these deposits suggests that much of the material in Pit 3007 represents primary butchery waste. Although some meat-bearing bones are present for both cattle and caprovids, there appears to be a preponderance of elements, such as crania, mandibles, isolated teeth, metapodials and phalanges, usually removed during the first stages of butchery. Other elements may represent secondary carcass preparation. The recorded assemblages from pit 3070 were too small for any detailed interpretation.

Overall, the scanned material (representing 18 contexts) was similar in preservation, and range and frequency of species as that recorded in detail. Further examples of the butchery practices discussed above were also observed.

?10th/11th century

Only 34 fragments were recovered from the two deposits dated to this period. Little information can be drawn from such a small assemblage.

Discussion and statement of potential

Plant remains (with the exception of charcoal, mostly preserved by anoxic 'waterlogging') were generally abundant and well-preserved in these deposits; only a few samples (mainly the very earliest) yielded small and interpretatively very limited assemblages. The deposits tentatively dated to the late Roman period (?4th century) included some evidence for plant foods in faeces and the plant remains from some of these, if they can be dated firmly to this period, are certainly worthy of proper recording as rare sources of information for late Roman times.

The 'Anglo-Scandinavian' material is notable for its consistency in yielding assemblages of weeds with or without an admixture of wood fragments and wood chips. The latter may be worth pursuing as a source of information about the precise kind of woodworking occurring at the site at this period. Quite remarkably, none of the samples from deposits of the 10th and 11th centuries yielded any evidence for dyeplants. Remains of several such plants were present in a very high percentage of contexts from 16-22 Coppergate (Kenward and Hall 1997) and have been recorded regularly from at least some samples from almost all sites of this period in the city (Hall 1996), even those re-studied since the Coppergate material was identified (Hall 1997), so their absence here is very much contrary to expectations. Examination of a wider range of samples from deposits of this date (and in particular of deposits other than the pit fills which formed the bulk of the material assessed during this exercise) may be valuable as a check against their absence.

Wood chips were also present in some of the later deposits, and again their closer inspection may provide an insight into woodworking methods and practices and possible changes of these through time at one site. Two 14th/15th century dump deposits yielded traces of fuller's teasel fruits and present the possibility that textile working was being carried out in the vicinity. An effort should be made to examine further plant remains, and also insect ectoparasites from these contexts to check for further evidence for this craft activity.

It may also be profitable to make a proper record of the assemblages of weeds from selected Anglo-Scandinavian and later medieval samples to define more closely the kinds of habitats likely to have occurred in the vicinity of the site and to provide comparanda for analogous assemblages from nearby excavations at 6-8 Pavement (Hall *et al.* 1983) and 16-22 Coppergate (Kenward and Hall 1995).

The 16th century deposits (all pit fills) examined are notable for being composed almost entirely of what it may be supposed was human faeces. More detailed analysis of intestinal parasite eggs is required to

confirm the host and therefore the generator of the waste and a proper record of the food plants is required for comparison with other material (though there is very little tightly dated material from this century available from York so far).

One particular plant deserves special mention, columbine (*Aquilegia vulgaris*). Single well-preserved seeds were recorded from a (basal) Anglo-Scandinavian pit fill and from a late 14th century pit fill. Though both are rare records nationally, the latter is less surprising, since material of this date (and of 15th-17th century date, too) was found in fills contexts at the nearby 'Bedern Foundry' site (bioarchaeological data not fully published, but for excavation report see Richards 1993). The earlier record is important in providing temporal continuity for the presence of this plant, which may well have grown in the town primarily as an ornamental (perhaps even a medicinal herb), in the city.

The generally well-preserved microfossil remains may yield additional information. Measurement and statistical analysis of the *Trichuris* eggs would, almost certainly, allow their identification to species level and consequently the identification of their host (animal or animals). Also, a more thorough microscopic investigation of the deposits may reveal other parasite eggs of rarer species. Identification of the diatoms may provide further information on deposit formation or the importation of wetland plants and sediments.

This site has yielded a range of insect assemblages of considerable importance. They will contribute substantially to reconstructing activity and environmental conditions at the site. However, they will also be of great significance in synthesis and research; there is a distinct impression that there is a gradient from 'homely' to very foul in the fauna of Anglo-Scandinavian sites from Coppergate, through 6-8 Pavement, to St Saviourgate and then to the Layerthorpe Bridge excavations. This probably reflects the typical usage of areas—housing and craft workshops in the Coppergate-Pavement area (with leather working at the latter), perhaps activities involving livestock at St

Saviourgate, and tanning at Layerthorpe Bridge (and other sites directly fronting the Foss). Proper recording of the insects from the last two of these would permit at least a preliminary statistical investigation of zonation across this part of York.

Some of the insect assemblages have an unusual character, while preservation of some others is superb, affording the opportunity to identify aphids (*perhaps* introduced with food). The possibility that a wasp (*Vespula* sp.) is present in one deposit must be investigated in view of the apparent complete absence of records of an insect which impinges strongly on humans.

The Anglo-Scandinavian 'cauldron pit' gave some most unusual assemblages and would perhaps be a suitable subject for a stand-alone journal publication.

If the dating of the late Roman deposits can be confirmed, the insect assemblages from them would be of great importance, no similar material being known from York other than the fills of the well at Skeldergate (Hall *et al.* 1980).

The occurrence of a series of 14th-16th century deposits with preservation of insect remains is very important; material of this date has barely been investigated, particularly in York.

A full post-excavation programme of recording of these insect assemblages is of high priority; some groups require 'detailed' recording (*sensu* Kenward 1992), particularly those containing abundant dung beetles and those with aphids in an apparently identifiable condition.

Marine shell (almost entirely of oyster) was thinly distributed through forty-six contexts—mostly of Anglo-Scandinavian date (15 contexts). The presence of 'knife' marks on, and the absence of encrustation by other marine invertebrates on the inner surface of, the oyster valves indicate that they were being eaten by humans. At first sight, the concentrations seem too low (with the exception of the uppermost layers of Pit 3007—Context 3006 and Context 3034) to imply large-scale importation to the site, so that casual

utilisation might be assumed. The nearest known oyster beds are located off the Kent, Essex and Suffolk coasts or in the Clyde estuary (Winder 1992 and pers. comm.). It is possible, however, that oyster beds existed more locally (Kenward, forthcoming). Further investigation of the size of the valves and barnacles and of the *Polydora* sp(?p) burrows may help to identify the source of the oysters. The few other taxa noted all occur commonly occurring along the East coast of England today (MacMillan 1968).

The vertebrate remains recovered from these deposits clearly hold much evidence of importance in reconstructing aspects of human activity. Preservation is excellent, with little indication of residual or redeposited material. Since dog gnawing is uncommon it is likely that the remains were quickly incorporated into the deposit and were not left exposed for any length of time. The bulk of the material from all three trenches appears to be refuse from a range of different commercial activities, with little domestic food waste present (reflecting the evidence from the insects). The accumulation of cattle and caprovid horncores (recovered mainly from Trench 2 deposits) almost certainly represents waste associated with horn working and/or the tanning of hides. Small numbers of cat and dog remains, with traces of skinning marks, may also derive from the processing of animal skins. However, most of the assemblages contain an additional component of primary and secondary butchery waste which suggests that a number of related activities were being undertaken in the vicinity and that the area excavated was a common dumping ground for all.

Despite the recovery from York of a number of vertebrate assemblages of a similar date and nature to those discussed here (O'Connor 1984; Dobney and Jaques 1993; Carrott *et al.* 1994; Carrott *et al.* 1995; Carrott *et al.* 1997), most remain unpublished, leaving a large gap in our understanding of the craft and commercial activities being undertaken in the city during the medieval and early post-medieval periods.

An element of bias caused by the obviously specialised nature of some of

the bone groups may limit the scope of the research questions that can be addressed. The bulk of the material under discussion may merely represent animals chosen for a particular craft/industrial purpose (i.e. hides, horns) rather than giving a broad picture of the economic significance of each species. However, the vertebrate remains could potentially provide useful information regarding interpretation of archaeological features; evidence of possible local activities and patterns of refuse disposal; and detailed information regarding Anglo-Scandinavian, medieval and post-medieval husbandry practices (from the high proportion of mandibles with teeth and measurable bones).

Recommendations

A full-scale investigation of the plant and invertebrate macrofossils from Anglo-Scandinavian deposits should be carried out in order to reconstruct activity and living conditions at the site and to identify imported plant materials. The record created should be compared with data from 16-22 Coppergate and 6-8 Pavement and (when analysed) Layerthorpe Bridge, in order to produce a preliminary spacial analysis of this part of York in the Anglo-Scandinavian period.

Late Roman (if the dating is confirmed) and post-medieval material is of great importance, representing virtually unknown periods of York's bioarchaeological history.

In particular, a proper record should be made of the plant remains from a selection of samples representing the following types of contexts from these excavations: (i) cess pit fills (to establish the range of plant foods); (ii) Anglo-Scandinavian deposits generally (to check for the presence of dyeplants and to make records of weed assemblages); (iii) to isolate worked wood fragments from appropriate samples for analysis of woodworking techniques (analysis could be undertaken by Ian Panter, Conservation laboratory YAT); and (iv) 14th/15th century dumps (to check for evidence of textile working).

Measurement and statistical analysis of the *Trichuris* eggs should be undertaken.

Identification of the diatoms should be undertaken.

The oyster shells from the Anglo-Scandinavian deposits should be examined further. Biometrical data on both the valves themselves and on the attached barnacles should be collected. The burrows on the valves should be investigated further in an attempt to identify which species of polychaetid worm made them.

It is recommended that funding be provided for a full programme of further analysis of vertebrate remains from all well-dated deposits. Particular attention should be paid to recording skeletal element distribution and butchery practices. All relevant biometrical and age-at-death data should be collected.

Retention and disposal

All of the current material should be retained.

Archive

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

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Table 1. List of samples described and/or processed from St Saviourgate, York (95.434)

Context	Sample	Type of deposit	Notes
1053	13	16th C. pit fill in 1063	2 kg GBA, microfossil 'squash'
1059	15	16th C. pit fill in 1063	1 kg GBA, microfossil 'squash'
1064	17	16th C. pit fill in 1057	1 kg GBA, microfossil 'squash'
1066	20	16th C. basal pit fill in 1057	2 kg GBA
1088	23	15th C. pit fill in 1091	1 kg GBA
1090	24	15th C. pit fill in 1091	2 kg GBA
1120	34	12th/13th C. dump	1 kg GBA, microfossil 'squash'
1125	37	late 14th C. pit fill in 1127	2 kg GBA
1126	40	14th C. lower pit fill in 1127	2 kg GBA
1149	59	12th/13th C. brushwood on cobbles	Description only
1156	60	early 13th C. dump	1 kg GBA, microfossil 'squash'
2024	62	14th/15th C. dump	2 kg GBA, microfossil 'squash'
2036	63	12th/13th C. dump	2 kg GBA, microfossil 'squash'
2037	64	12th/13th C. pit fill in 2038	1 kg GBA, microfossil 'squash'
2042	66	12th/13th C. pit fill in 2044	1 kg GBA
2050	69	14th/15th C. dump	2 kg GBA, microfossil 'squash'
2062	77	11th/12th C. dump	2 kg GBA
2066	82	10th/11th C. dump	1 kg GBA, microfossil 'squash'
2117	116	10th/11th C. dump	Description only
2119	119	11th C. pit fill in 2121	Description only
2130	124	10th C. dump	Description only
3034	35	Anglo-Scandinavian fill in pit 3007	2 kg GBA
3039	41	?9th C. Anglo-Scandinavian fill in pit 3041	2 kg GBA, microfossil 'squash'
3043	42	Anglo-Scandinavian fill in pit 3007	2 kg GBA, microfossil 'squash'
3056	53	Anglo-Scandinavian fill in pit 3007	2 kg GBA, microfossil 'squash'
3057	95	Anglo-Scandinavian basal fill in pit 3007	25 kg bulk sieved to 500 µm
3069	78	Anglo-Scandinavian fill in pit 3070	1 kg GBA, microfossil 'squash'
3072	80	Anglo-Scandinavian fill in pit 3070	Description only
3080	90	early Roman fill of linear cut 3085	2 kg GBA
3081	85	?4th C. fill of pit 3112	2 kg GBA, microfossil 'squash'
3083	87	?4th C. fill of pit 3112	2 kg GBA, microfossil 'squash'
3084	89	?4th C. fill of pit 3071	30 kg bulk sieved to 500µm
3094	97	Anglo-Scandinavian fill in pit 3070	2 kg GBA

Context	Sample	Type of deposit	Notes
3094	98	Anglo-Scandinavian fill in pit 3070	28 kg bulk sieved to 500 μm
3104	104	Anglo-Scandinavian basal fill in pit 3070	2 kg GBA, 'squash'
3105	105	?4th C. fill of pit 3112	1 kg GBA, microfossil 'squash'
3108	107	Anglo-Scandinavian lower 'cauldron' fill in pit 3007	2 kg GBA, microfossil 'squash'
3109	10801	Anglo-Scandinavian fill in pit 3007	2 kg GBA
3109	10802	Anglo-Scandinavian fill in pit 3007	2 kg GBA, microfossil 'squash'

Table 2. Hand-collected shell from St Saviourgate, York (1995.434) by context.

Context	Period/Feature	Oyster (<i>Ostrea edulis</i> L.) valves		Other shell
		Left	Right	
1010	18th/19th C.	-	-	1 cockle (<i>Cerastoderma</i> sp.) fragment
1021	16th C. in pit 1025	1	-	5 mussel (<i>Mytilus edulis</i> L.) fragments
1035	16th C.	-	-	4 mussel (<i>Mytilus edulis</i> L.) fragments
1048	16th C. in pit 1063	1	1	
1072	14th/15th C. in pit 1074	-	1	
1075	14th/15th C. in 1083	1	-	
1112	Anglo-Scand. in pit 3007	1	-	
1125	late 14th C. in pit 1127	6	1	
1133	13th/14th C. dump	-	1	
1135	structures 1249 and 1250	-	1	
1138	14th C. kiln/oven	-	1	
1139	12th/13th C.	1	-	
1155	12th/13th C. in 1157	2	-	1 burnt mussel (<i>Mytilus edulis</i> L.) valve
1156	early 13th C. dump	1	2	
1168	structures 1249 and 1250	1	-	
1172	structures 1249 and 1250	2	-	
2041	14th/15th C.	3	4	
2062	11th/12th C. dump	4	-	
2066	10th/11th C. dump	2	-	
2071	10th/11th C.	1	-	
2110	?	-	3	
2112	11th C. ?dump	1	1	
2114	?	1	-	
2117	10th/11th C. dump	-	-	4 mussel (<i>Mytilus edulis</i> L.) fragments
3005	modern	2	-	
3006	Anglo-Scand. in pit 3007	39	48	
3008	Anglo-Scand. in pit 3009	-	1	
3028	Anglo-Scand. (?9th C.) in pit 3053	1	1	
3034	Anglo-Scand. in pit 3007	15	11	
3036	Anglo-Scand. in pit 3007	5	1	

Context	Period/Feature	Oyster (<i>Ostrea edulis</i> L.) valves		Other shell
		Left	Right	
3043	Anglo-Scand. in pit 3007	1	1	
3052	Anglo-Scand. (?9th C.) in pit 3053	1	2	
3054	?4th C. Roman	2	2	
3056	Anglo-Scand. in pit 3007	-	1	
3061	?4th C. Roman in pit 3071	1	1	
3065	in pit 3066	-	1	
3067	Anglo-Scand. in pit 3070	1	-	
3068	Anglo-Scand. in pit 3070	1	-	
3069	Anglo-Scand. in pit 3070	2	-	
3076	?4th C. Roman in pit 3071	1	1	
3080	early Roman in cut 3085	-	1	
3083	?4th C. Roman in pit 3112	-	2	
3084	?4th C. Roman in pit 3071	2	-	
3090	Anglo-Scand. in pit 3070	3	-	
3093	Anglo-Scand. in pit 3007	1	-	
3094	Anglo-Scand. in pit 3070	1	1	
Total		108	91	15 (mostly fragments)

Table 3. Hand-collected oyster (*Ostrea edulis* L.) shell from St Saviourgate, York (1995.434) by period. Unbracketed figures in the 'Burnt' column are numbers of valves definitely damaged by burning; bracketed figures include valves possibly damaged by burning.

Period	Left valves	Right valves	Knife marks	Barnacles	<i>Polydora</i> sp(?p). burrows	Burnt	Total
early Roman	-	1	-	-	-	1	1
?4th C. Roman	6	6	4	-	1	9	12
Anglo-Scandinavian	72	67	64	9	8	21 (?24)	139
10th/11th C.	3	-	-	-	-	1	3
11th C.	1	1	-	-	-	-	2
11th/12th C.	4	-	-	-	1	4	4
12th/13th C.	3	-	2	-	-	2	3
early 13th C.	1	2	-	-	-	1	3
13th/14th C.	-	1	-	-	-	1	1
14th C.	6	2	-	1	-	(?1)	8
14th/15th C.	4	5	-	-	2	4	9
16th C.	2	1	2	-	-	-	3
Total	102	86	72	10	12	44(?48)	

Table 4. Number of recorded and scanned bone-bearing contexts (by trench and by date), St Saviourgate, York.

Trench	Trench 1		Trench 2		Trench 3	
	No. recorded	No. scanned	No. recorded	No. scanned	No. recorded	No. scanned
Early Roman						6
?3rd C					1	1
?4th C					4	5
?9th C					1	4
Anglo-Scandinavian					7	18
10th C			1	1		
10th/11th C			2	4		
?10th/11th C			1			2
11th C			2	2		
11th/12th C			1	1		
12th/13th C	1	9	1	3		
Late 12th/13th C	4	3				
13th C		1				
13th/14th C	4	6				
14th C	2	7				
Late 14th C	1	7				
14th/15th C		5	4	4		
15th C		10				
15th/16th C			1			
16th C	6	27				
16th/17th C				5		
Total	18	75	13	20	13	36

Table 5. Recorded vertebrate remains (hand-collected) from Trench 1, St Saviourgate, York.

Species		*C12/13	**C13/14	C16	Total
<i>Lepus</i> sp.	hare	1	-	1	2
<i>Canis</i> f. domestic	dog	1	11	1	13
<i>Felis</i> f. domestic	cat	-	2	17	19
<i>Equus</i> f. domestic	horse	2	6	2	10
<i>Sus</i> f. domestic	pig	4	8	9	21
Cervid	deer	-	-	1	1
<i>Cervus elaphus</i> L.	red deer	-	1	1	2
<i>Dama dama</i> (L.)	fallow deer	-	1	-	1
<i>Bos</i> f. domestic	cattle	61	23	13	97
<i>Capra</i> f. domestic	goat	3	2	-	5
Caprovid	sheep/goat	15	14	9	38
<i>Anser</i> sp.	goose	2	1	-	3
<i>Anas</i> sp.	duck	1	-	-	1
<i>Gallus</i> f. domestic	chicken	-	4	-	4
<i>Phasianus colchicus</i> L.	pheasant	-	-	1	1
Bird		-	1	5	6
Fish		1	2	1	4
<i>Sub-total</i>		<i>91</i>	<i>76</i>	<i>61</i>	<i>228</i>
Large mammal		55	58	30	143
Medium mammal		17	22	18	57
Unidentifiable				1	1
<i>Sub-total</i>		<i>72</i>	<i>80</i>	<i>49</i>	<i>201</i>
Total		163	156	110	429

*includes material from 12th/13th and late 12th/13th century deposits

**includes material from 13th/14th, 14th and late 14th century deposits

Table 6. Numbers of measurable fragments, mandibles with teeth and isolated teeth (the recorded vertebrate remains) from Trench 1, St Saviourgate, York. Key: meas= number of measurable bones; mand= number of mandibles with teeth in situ; teeth= number of isolated teeth.

Date	meas	mand	*teeth
12th/13th C	4	-	-
Late 12th/13th C	38	2	1
13th/14th C	22	6	-
14th C	2	1	-
Late 14th C	4	-	-
16th C	18	2	1
Total	88	11	2

*includes only those teeth of use in obtaining ageing or sexing information

Table 7. Scanned vertebrate remains from Trench 1, St Saviourgate, York. Key: id= number of identifiable fragments; unid= number of unidentifiable fragments; meas= number of measurable bones; mand= number of mandibles with teeth in situ.

Date	id	unid	meas	mand
12th/13th C	23	30	9	2
Late 12th/13th C	9	12	3	-
13th C	2	4	1	-
13th/14th C	20	21	14	-
14th C	11	24	3	-
Late 14th C	6	14	2	-
14th/15th C	1	9	-	-
15th C	24	43	5	1
16th C	75	100	21	3
Total	171	257	58	6

Table 8. Recorded vertebrate remains (hand-collected) from Trench 2, St Saviourgate, York.

Species		*C10/11	C11/12	C12/13	C14/15	C15/16	Total
<i>Canis f. domestic</i>	dog	-	7	1	14	1	23
<i>Felis f. domestic</i>	cat	-	2	-	2	2	6
<i>Equus f. domestic</i>	horse	3	-	-	4	2	9
<i>Sus f. domestic</i>	pig	9	8	3	4	3	27
<i>Bos f. domestic</i>	cattle	141	97	16	83	36	373
<i>Capra f. domestic</i>	goat	17	21	2	15	3	58
Caprovid	sheep/goat	37	19	3	33	8	100
<i>Anser sp.</i>	goose	-	-	-	12	2	14
<i>Gallus f. domestic</i>	chicken	3	1	-	9	3	16
Bird	bird	1	-	-	9	-	10
<i>Homo sapiens</i>	human	-	-	1	-	-	1
Fish	fish	-	-	-	11	-	11
<i>Sub-total</i>		<i>211</i>	<i>155</i>	<i>26</i>	<i>196</i>	<i>60</i>	<i>648</i>
Large mammal		108	89	17	83	56	353
Medium mammal		11	26	2	17	12	68
Unidentifiable		4	-	-	6	-	10
<i>Sub-total</i>		<i>123</i>	<i>115</i>	<i>19</i>	<i>106</i>	<i>68</i>	<i>431</i>
Total		334	270	45	302	128	1079

*includes material from 10th, ?10th/11th, 10th/11th and 11th century deposits

Table 9. Numbers of measurable fragments, mandibles with teeth and isolated teeth from the recorded vertebrate remains from Trench 2, St Saviourgate, York. Key: meas= number of measurable bones; mand= number of mandibles with teeth in situ; teeth= number of isolated teeth.

Date	meas	mand	*teeth
10th C	5	4	-
10th/11th C	30	10	-
?10th/11th C	11	5	-
11th C	44	28	-
11th/12th C	48	16	1
12th/13th C	10	5	1
14th/15th C	72	12	-
15th/16th C	23	3	3
Total	243	83	5

*includes only those teeth of use in obtaining ageing or sexing information

Table 10. Scanned vertebrate remains from Trench 2, St Saviourgate, York. Key: id= number of identifiable fragments; unid= number of unidentifiable fragments; meas= number of measurable bones; mand= number of mandibles with teeth in situ.

Date	id	unid	meas	mand
10th C	15	6	2	3
10th/11th C	25	35	14	1
11th C	8	10	8	-
11th/12th C	17	7	4	6
12th/13th C	8	12	1	4
14th/15th C	24	32	4	3
16th/17th C	20	26	10	1
Total	117	128	43	18

Table 11. Recorded vertebrate remains (hand-collected) from Trench 3, St Saviourgate, York.

Species		?C3	?C4	?C9	Anglo-Scand	Total
<i>Lepus</i> sp.	hare	-	-	-	1	1
<i>Canis</i> f. domestic	dog	-	1	-	-	1
<i>Equus</i> f. domestic	horse	2	-	5	1	8
<i>Sus</i> f. domestic	pig	3	7	2	19	31
<i>Cervus elaphus</i> L.	red deer	-	-	-	1	1
<i>Bos</i> f. domestic	cattle	9	23	15	165	212
<i>Capra</i> f. domestic	goat	-	-	-	1	1
Caprovid	sheep/goat	1	22	3	92	118
<i>Anser</i> sp.	goose	-	-	-	1	1
<i>Gallus</i> f. domestic	chicken	-	-	-	1	1
<i>Sub-total</i>		15	53	25	282	375
Large mammal		19	59	45	435	558
Medium mammal		5	18	9	118	150
Unidentifiable		-	1	1	25	27
<i>Sub-total</i>		24	78	55	578	735
Total		39	131	80	860	1110

Table 12. Numbers of measurable fragments, mandibles with teeth and isolated teeth from the recorded vertebrate remains from Trench 3, from St Saviourgate, York. Key: meas= number of measurable bones; mand= number of mandibles with teeth in situ; teeth= number of isolated teeth.

Date	meas	mand	*teeth
?3rd C	2	-	2
?4th C	22	7	-
?9th C	11	-	-
Anglo-Scandinavian	92	25	5
Total	127	32	7

*includes only those teeth of use in obtaining ageing or sexing information

Table 13. Scanned vertebrate remains from Trench 3, St Saviourgate, York. Key: id= number of identifiable fragments; unid= number of unidentifiable fragments; meas= number of measurable bones; mand= number of mandibles with teeth in situ.

Date	id	unid	meas	mand
Early Roman	17	20	3	-
?3rd C	10	24	1	-
?4th C	9	32	5	1
?9th C	36	69	13	2
Anglo-Scandinavian	121	190	47	11
?10th/11th C	16	18	8	1
Total	209	353	77	15