

Palaeoecology Research Services

Assessment of biological remains from excavations at St Andrewgate, York (site code: 1995.89)

by

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Summary

Ten sediment samples and fifteen boxes of hand-collected bone recovered from excavations of deposits of medieval and post-medieval date at St Andrewgate, York, in 1995 were submitted to PRS for an assessment of their bioarchaeological potential in March 2002.

*Plant and invertebrate remains were usually rather sparse in these deposits, overall, though some of the earlier layers had good preservation by anoxic waterlogging and there was also some well-preserved charred plant material other than charcoal. The assemblages recovered from some of the deposits gave indications of several different sources for the remains including possible textile working (Context 1542), 'stable manure' (Context 1528), and food waste (Context 1257). In addition, Context 1419 gave a single large seed which was apparently of thorn-apple (*Datura*) which, if confirmed, would be a very early and unusual record. Eggs of intestinal parasitic nematodes were seen in the 'squash' of sediment from Context 1528 indicating a faecal component to this deposit but were too poorly preserved to be of any additional interpretative value.*

*The extremely well-preserved bone indicated a range of craft and commercial activities perhaps including tanning, bone working, and butchery. Domestic refuse, indicated by the presence of chicken, goose and fish remains was also present. The fish remains were, on the whole, well preserved and mainly included the remains of herring, eel, *Gadidae* and *Pleuronectidae*.*

An attempt should be made to revisit and/or examine more material of at least the samples from Contexts 1344, 1419, 1528 and 1542 (and any others with similar lithology not included in this assessment) with a view to making a proper record of the plant and invertebrate remains. The vertebrate assemblage deserves full investigation, in the context of studies of site utilisation and zonation of activities within medieval and post-medieval York.

KEYWORDS: ST ANDREWGATE; YORK; ASSESSMENT; MEDIEVAL; POST-MEDIEVAL; MID 12TH TO 18TH CENTURY; PLANT REMAINS; CHARRED PLANT REMAINS; INVERTEBRATE REMAINS; INTESTINAL PARASITIC NEMATODE EGGS; VERTEBRATE REMAINS; 'STABLE MANURE'; ?TEXTILE WORKING; TANNING; BONE WORKING

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Introduction

An archaeological excavation was carried out by York Archaeological Trust at St Andrewgate, York (NGR SE 6050 5190), between 11 September and 3 November 1995.

A total of 59 sediment samples ('GBA'/'BS'/'SPOT' *sensu* Dobney *et al.* 1992), representing 52 contexts, and 15 boxes of hand-collected bone were recovered from the deposits. Ten of the samples (9 GBAs and one SPOT) and all of the hand-collected bone were submitted to PRS for an assessment of their bioarchaeological potential in March and April 2002.

The deposits were assigned to 12 phases and analysis of the recovered pottery gave dates to these as follows:

- Phase 1 – mid 12th century
- Phase 2 – later 12th century
- Phase 3 – early 13th century
- Phase 4 – mid to late 13th century
- Phase 5 – early 14th century
- Phase 6 – 14th century
- Phase 7 – later 14th to early 15th century
- Phase 8 – mid 15th century
- Phase 9 – late 15th to early 16th century
- Phase 10 – late 16th to early 17th century
- Phase 11 – 17th to 18th century
- Phase 12 – 18th century

Methods

The submitted sediment samples ('GBA'/'SPOT' *sensu* Dobney *et al.* 1992) were inspected in the laboratory and their lithologies were recorded, using a standard *pro forma*, prior to processing, following the procedures of Kenward *et al.* (1980; 1986), for

recovery of plant and invertebrate macrofossils.

The flots, washovers and residues resulting from processing were examined for plant and invertebrate macrofossils. The residues were examined for larger plant macrofossils and other biological and artefactual remains. Vertebrate and shell remains were sorted from the residues and the quoted approximate volumes of the residues do not include these components.

Insect preservation was recorded using the scale of Kenward and Large (1998).

Concretions recovered from the residues from six of the samples and raw sediment from Context 1528 (Sample 5056) were examined for the eggs of intestinal parasitic nematodes and other microfossils using the 'squash' technique of Dainton (1992).

In total, 185 deposits from the site produced hand-collected bone. For the assessment, material from 21 deposits was examined in detail, while a further five assemblages were scanned. Bone recovered from the samples was also recorded.

Data for the vertebrate remains were recorded electronically directly into a series of tables using a purpose-built input system and *Paradox* software. For each context (or sample) subjective records were made of the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). Additionally, where more than ten fragments were present, semi-quantitative information was recorded concerning fragment size, dog gnawing, burning, butchery and fresh breakage.

Where possible, fragments were identified to species or species group, using the reference collection at the EAU. Fragments not identifiable to species were grouped into categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal (assumed to be caprovid, pig or small cervid), unidentified fish, unidentified bird, and completely unidentifiable

Brief notes on preservation and species representation were made for the scanned material.

Results

Sediment samples

The results are presented in context number order by phase. Archaeological information, provided by the excavator, is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample numbers.

PHASE 3: EARLY 13TH CENTURY

Context 1542 [mixed organic dumps above wicker fencing which had collapsed eastwards down a slope] Sample 5060/T (4 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 2 litres including areas with modern contaminant moss and algae)

Moist, dark grey-brown, brittle to crumbly, slightly clay silt with fine and coarse herbaceous detritus and areas of amorphous organic sediment. Fragments of mortar/plaster, brick/tile, wood and bone were present in the sample.

The material comprising the residue and 'heavy' and 'light' washovers for this subsample had a volume of about 950 cm³ and can be considered a moderate to large amount. The heavy washover of about 300 cm³ consisted of rather granular woody detritus (wood and bark) and charcoal; amongst these were some half-achenes and achene fragments of hemp (*Cannabis sativa* L.), and a few charred grains, including sprouted barley (*Hordeum*), the grain in rather good condition, other than being sometimes somewhat shrivelled. There was also some charred herbaceous plant material which might be reed/cereal straw culm, as well as some

saw-sedge (*Cladium mariscus* (L.) Pohl), and some of the charred material bore a soot-like spotting/varnishing thought perhaps to indicate soot-blackened thatch (though this hypothesis has not yet been tested). The uncharred fruits and seeds in this and the 'light' washover of about 275 cm³ of woody and herbaceous detritus were rather variable in their state of preservation: some were well preserved, others quite poor (perhaps indicating a mixture of material when deposited). The more abundant propagules were mainly weeds of various kind, including some rather typical of nutrient-rich waste places like dung-heaps; there were also moderate numbers of seeds of weld, *Reseda luteola* L., perhaps a weed, but also widely used in the past for its yellow dye. The presence of flax (*Linum usitatissimum* L.) seeds (and the hemp achenes mentioned above) might perhaps point to some textile working in the vicinity. Amongst the taxa recorded in trace amounts, there was certainly a wide range of plants which might have originated in various kinds of litter or perhaps even turves, including some remains from peatland/heathland, and meadows and pastures. The mixture of remains is entirely typical of urban occupation deposits, with a variety of remains in which weeds of various kinds predominated.

The flot was rich in invertebrate remains, particularly beetles. Preservation was variable, from good to rather poor (E 2.5-3.5, mode 3.0 distinct; F 2.0-3.5, mode 2.5 weak). There was a distinct colour change in most remains, with a trend to dirty yellow-brown (range 2-3, mode 2) and general decolouration. Most of the beetles were species associated with decaying matter, ranging from drier material (e.g. *Lathridius minutus* group and ?*Crataraea suturalis* (Mannerheim)) to foul matter (e.g. *Cercyon haemorrhoidalis* (Fabricius), *Gyrohypnus fracticornis* (Müller) and *Aphodius* spp.). There was probably a house fauna community, several components of which were present (including *L. minutus* group and *C. suturalis* mentioned above, and the human flea *Pulex irritans* Linnaeus). There were indications of local open-air habitats, e.g. from the nettle feeding *Cidnorhinus quadrimaculatus* (Linnaeus) and the ground beetle *Bembidion harpaloides* Serville). A notable group was some aquatics, with traces of *Daphnia* and a second kind of cladoceran, and at least four kinds of water beetle. These may conceivably have arrived via animal dung, having been accidentally taken in by beasts while drinking.

The 'squash' performed on small lumps of concretion sorted from the residue was mostly inorganic material with a little organic detritus. No eggs of intestinal parasitic nematodes were seen.

The residue of about 375 cm³ consisted of pale 'ashy' sand and charcoal from which a few charred woody remains, five small fragments of ?marine shell and two of eggshell, and a moderate-sized size assemblage of

well-preserved vertebrate remains was recovered. Cattle, caprovid and pig bones were identified, along with a small assemblage of fish (15 fragments). Herring (*Clupea harengus* L.), Pleuronectidae (flatfish), haddock (*Melanogrammus aeglefinus* (L.)) and other Gadidae were all represented, mainly by vertebrae. Several burnt fragments were noted.

The invertebrate remains should be recorded (perhaps using a further subsample, probably requiring all of the remaining material, to bring numbers up a little), in order to reconstruct local conditions and to trace the origins of the materials represented by the botanical record.

PHASE 4: MID TO LATE 13TH CENTURY

Context 1528 [backfill and use deposits of a cess pit]
Sample 5056/T (3 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 4 litres)

Moist, mid to dark grey-brown, layered, brittle, fibrous and compressed, very slightly sandy fine and coarse herbaceous detritus and amorphous organic sediment with some silt. Small fragments of eggshell were present and 'straw' was abundant in the sample.

There was a very large residue of about 1700 cm³, mainly coarse and fine herbaceous detritus with some wood fragments and sand; amongst these was one large concretion (up to 90 mm in maximum dimension) which consisted of coarse herb material. It did not appear to have formed from human faeces but may have originated in a deposit of stable manure, for bracken, straw, wood chips were present in the rest of the sample. Preservation was generally not extremely good (presumably there had been some decay after deposition), though some remains were well-preserved; all the material was rather compressed. The tally of uncharred plant remains was consistent with an origin in straw perhaps with some tares (there were, unusually, uncharred small vetch (*Vicia*) seeds), supporting a likely interpretation of stable manure. There were several unusual or unidentified but distinctive remains, likely to be interpretatively important, whose identification should be pursued.

The moderately large flot consisted mainly of coarse plant debris, but included appreciable numbers of invertebrates. Preservation was good (E 2.0.3.0, mode 2.5 distinct; F 1.5-2.5, mode 2.0 distinct). A single mineralised fly larva was recovered from the residue. Beetles were fairly abundant, with a strong component of species likely to have co-existed in somewhat foul but fairly open-textured material; an origin in stable manure (as postulated on the basis of the plant remains) is a distinct possibility. This interpretation is supported

by the presence of at least one incompletely expanded individual of an *Apion* weevil, a likely source of which would be hay. Two grain weevils, *Sitophilus granarius* (Linnaeus), were noted, as was the spider beetle *Tipnus unicolor* (Piller and Mitterpacher); both are typical of the post-Conquest period.

The 'squash' sample was mostly of organic detritus with a little inorganic material. Phytoliths, diatoms, and fungal spores were all seen as well as two eggs of *Trichuris* and two of ?*Ascaris*. Both of the *Trichuris* eggs were rather distorted and lacked polar plugs. The eggs indicated the presence of faecal material as a component of this deposit.

The invertebrate assemblage (together with remains from a further subsample) should be recorded in detail to provide information about the origin of the material in the pit and to gather data for synthesis concerning a rather poorly represented period in York. The flots will require meticulous searching in order to recover all the fossils, including any lice or other difficult remains, which may be obscured by plant debris.

PHASE 5: EARLY 14TH CENTURY

Context 1257 [dump]

Sample 5028/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 3 litres)

Moist, mid grey-brown to mid to dark grey, crumbly (working soft), slightly sandy clay silt (more clay in places). Fragments of mortar, ?brick/tile, charcoal, mammal bone and fish bone were present in the sample.

There was a large residue of about 1000 cm³ of sand, charcoal (to 10 mm), cinder (to 15 mm), with some mortar and brick/tile (both to 10 mm), two small fragments of ?marine shell, bone, and quite a lot of ?faecal concretions in small (<5 mm) fragments. A small subsample disaggregated in dilute hydrochloric acid gave many plant hairs, plus ?cereal pollen, fungal spores, and traces of plant tissue but no obvious cereal 'bran'. That food remains had been present is likely, however, given the presence of at least one fig (*Ficus carica* L.) seed and mineralised material of a *Prunus* seed. The small washover of about 25 cm³ was of fine charcoal and 'char' (presumably from burning of charcoal or coal). Only traces of invertebrate cuticle were observed in the small flot.

The 'squash' performed on small lumps of concretion sorted from the residue was mostly inorganic material with a little organic detritus. No eggs of intestinal parasitic nematodes were seen.

The vertebrate remains recovered from this deposit were quite battered in appearance, with ?faecal concretions coating a couple of the fragments. A number of burnt fragments were noted, these were small and very fragmented. At least 75% of the fragments were less than 20 mm in maximum dimension, whilst the largest fragment was 110 mm. Most of the remains represented mammals, although few could be identified to species. Birds were represented by a few fowl and goose (*Anser* sp.) fragments, whilst the small fish assemblage included Cyprinidae, perhaps ?roach (cf. *Rutilus rutilus* (L.)) or ?tench (cf. *Tinca tinca* (L.)), herring (*Clupea harengus* L.) and Gadidae.

PHASE 7: LATER 14TH TO EARLY 15TH CENTURY

Context 1344 [floors]

Sample 5036/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 3 litres)

Moist, mid to dark grey-brown, brittle and compressed and layered (working soft), sandy clay silt with some fragments of coal and charcoal present.

The very small washover of about 25 cm³ of organic debris was mainly woody fragments with some charred debris. The material was rather decayed and reddened. The moderate-sized residue of about 875 cm³ was of coal (to 50 mm) and sand with some cinder (15 mm), grit, many small fragments of marine shell (including mussel, *Mytilus edulis* L.) and several of eggshell, a little bone, and very decayed concretions or concreted sediment (to 20 mm), not apparently faecal.

The small flot contained quite a few very decayed seeds of long prickly-headed poppy (*Papaver argemone* L.) and toad rush (*Juncus bufonius* L.) and some other seeds, mostly rather decayed; none was especially informative in interpretation, though the poppy and rush seeds are regularly recorded in urban deposits with poor preservation such as floor layers. The flot also contained small numbers of insect fragments, all of which were poorly preserved, showing a strong trend to orange-yellow colouration (E 4.5; F 2.5-5.0, mode 3.5; trend to orange-yellow 3-4, mode 3). Beetles present included *Tipnus unicolor*, *Sitophilus granarius*, and *Oryzaephilus* sp., though it seems likely that other taxa had completely decayed.

The 'squash' performed on small lumps of concretion sorted from the residue was approximately half inorganic material and half organic detritus. A few pollen grains and phytoliths were noted but no eggs of intestinal parasitic nematodes were seen.

Vertebrate material from this sample was extremely well preserved, with many fragments being coloured green as a result of copper alloy staining. All fragments were less than 15 mm in largest dimension and most were unidentified fish spines or finrays. The identifiable fish fragments included herring (*Clupea harengus* L.), eel (*Anguilla anguilla* (L.)), flatfish (?plaice, cf. *Pleuronectes platessa* L.) and Gadidae. A small amount of unidentified mammal (including small mammal incisor and metapodial) and bird fragments were also present.

Context 1368 [build-up of material on workshop floor]
Sample 5039/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 6 litres)

Just moist, dark grey-brown, unconsolidated to crumbly/indurated, ashy, slightly sandy slightly clay silt. Stones (20 to 60+ mm), slag, mortar/plaster, iron rich concretions, ?coal, cinder and bone were present in the sample.

The tiny flot consisted of some minute fragments of 'char', whilst the very small washover of about 25 cm³ included charred and uncharred detritus, nearly all under 1 mm, and mainly tiny metallic beads and vesicular metallic silvery cinder-like material; there were a few poorly preserved seeds or seed fragments and a single charred bread/club wheat (*Triticum 'aestivo-compactum'*) grain. No invertebrate remains were seen in the small flot.

The 'squash' performed on small lumps of concretion sorted from the residue was approximately half inorganic material and half organic detritus. A few phytoliths were noted but no eggs of intestinal parasitic nematodes were seen.

The very large residue of about 1900 cm³ was mainly coarse metallic slag (to 60 mm) and other mineral material, including coal and sand with a few fragments of shell (including one individual of *Discus rotundatus* (Müller)) and some bone. A small and rather heavily fragmented assemblage of bone was recovered from this sample. Most fragments were unidentified and less than 50 mm in maximum dimension. Several fish vertebrae were identified as herring (*Clupea harengus* L.) and Gadidae.

Context 1388 [several floor layers removed as one context]

Sample 5046/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 3 litres)

Just moist, mid brown to mid to dark grey-brown, brittle and layered to crumbly, ?ashy, slightly sandy clay silt (to silty clay). Coal, rotted charcoal, fish bone and some areas of modern contaminant algae were present in the sample.

The tiny flot, which appeared to be devoid of invertebrate remains, contained a few elder (*Sambucus nigra* L.) seeds, traces of fine charred material and one fish ?otic bulla; the small washover of about 65 cm³ was of fine charred material (mainly charcoal), with coal and traces of uncharred material.

The large residue of about 900 cm³ of sand, coal and cinder (the last two up to 10 and 15 mm, respectively), with some concreted sediment (to 15 mm), small (<5 mm) brick/tile fragments, small fragments of marine shell (including mussel), and bone. A small fragment of concretion treated with dilute acid revealed that it might have been somewhat ashy in character and the pursuit of the source of this material may be worth making.

The 'squash' performed on small lumps of concretion sorted from the residue was approximately half inorganic material and half organic detritus. Some phytoliths were noted but no eggs of intestinal parasitic nematodes were seen.

This sample produced a well-preserved assemblage of bone, of which fish formed the largest component. Most of the fragments were small (less than 15mm in dimension) and quite variable in colour. Identified fish remains included herring (*Clupea harengus* L.), eel (*Anguilla anguilla* (L.)), Gadidae, Pleuronectidae (flatfish) and ray (*Raja* sp.), with several vertebrae which were tentatively identified as Cyprinidae. Few mammal and bird remains were present.

Context 1419 [floors]

Sample 5047/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 3 litres)

Just moist, dark grey-brown, unconsolidated to crumbly (working soft then more or less plastic), ?ashy, slightly sandy silty clay with some small lumps of red/orange indurated clay.

This subsample yielded a large residue of about 800 cm³ of cinder (to 25 mm), charcoal (to 15 mm), grit and sand, with some brick/tile (to 25 mm), bone, and coal (to 15 mm). There were a few fragments of dark grey material which seemed to be charred herbaceous detritus in rather dense lumps; this may have been burnt residue from peat, though if so it was not in the form usually encountered by AH. The tiny flot contained a few elder seeds, and some 'char', with a single large seed which was certainly from a plant within the

nightshade/henbane family (Solanaceae) apparently thorn-apple (*Datura*); if so, this is a very early and unusual record and the material needs to be checked (and further sediment processed in an attempt to obtain further specimens). Other seeds were mostly poorly preserved, often fragmentary and were typical of the taxa found in these kinds of deposits. Only traces of invertebrate cuticle were present in the flot. The small washover of about 65 cm³ was of charcoal, coal and cinder; there were perhaps charred heather basal-twig/root fragments and rare charred moss stems, which elsewhere have been interpreted as possible evidence for burnt turves.

The sample gave a moderate-sized assemblage of bone, which, unlike the material from Contexts 1344 and 1388, included a component of larger fragments (to 70 mm). The smaller fragments (approximately 75% of the assemblage) were all less than 20 mm. A few burnt bones were noted. Mammals were represented by caprovid and pig remains, with a few teeth identified as rat (*Rattus* sp.). A number of chicken bones were also identified. Fish remains were quite numerous, the bulk of which were herring (*Clupea harengus* L.), whilst other species present included Pleuronectidae (flatfish), ray (*Raja* sp.), Gadidae, haddock (*Melanogrammus aeglefinus* (L.)) and possible freshwater species (Cyprinidae).

PHASE 9: LATE 15TH TO EARLY 16TH CENTURY

Context 1150 [use and/or backfilling with domestic waste of a cess pit]

Sample 5012/SPT (SPOT sample)

This sample consisted of several lumps of concretion to about 130 mm in maximum dimension. A small subsample disaggregated in dilute acid proved to be slightly calcareous and contained a little very decayed cereal 'bran' but no eggs of intestinal parasitic nematode worms were seen. The material should be checked, however, by means of a further subsample, since the material was very similar to faecal concretions observed repeatedly in urban archaeological deposits over many years.

Context 1224 [at least five layers of trampled floor]

Sample 5030/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 4 litres)

Just moist, mid brown to mid grey-brown, layered and compressed to crumbly, ?ashy, slightly sandy silt with mm-thickness buff lenses within layered lumps and patches of light brown sand. Mortar/plaster, charcoal and fish bone were present in the sample.

There was a moderately large residue of about 1000 cm³ of sand, grit, and cinders (to 30 mm), with some coal and brick/tile (both to 10 mm), bone, and traces of very decayed oyster (*Ostrea edulis* L., including one indeterminate side valve fragment) and mussel shell fragments. The only plant material seen in the small washover, apart from a little charcoal, was a seed of chickweed, *Stellaria media* (L.) Vill., of no interpretative value; the small flot included traces of what may have been invertebrate cuticle.

The 'squash' performed on small lumps of concretion sorted from the residue was mostly inorganic material with a little organic detritus. No eggs of intestinal parasitic nematodes were seen.

Vertebrate remains from this sample were well preserved and most were less than 10 mm in dimension. The largest fragments (to 40 mm) were mainly unidentified mammal and bird remains, whilst the bulk of the assemblage consisted of fish bones. The fish present all represented small individuals and included herring, eel, gadid (some ?haddock), ?plaice (cf. *Pleuronectes platessa* L.) and thornback ray (*Raja clavata* L.). Some vertebrae appeared 'squashed' which may be evidence of ingestion may also be damage caused by trampling.

PHASE 10: LATE 16TH TO EARLY 17TH CENTURY

Context 1035 [deposit contained debris from the use of a hearth]

Sample 5001/T (5 kg sieved to 300 microns with paraffin flotation and washover; remaining sediment 3 litres)

Just moist, mid to dark grey-brown, unconsolidated, slightly sandy slightly clay silt. Fragments of rotted mortar and rotted ?charcoal were present in the sample.

The very small washover of about 35 cm³ consisted of charred material, mainly fine 'char' and some cinder-like material; the moderately large residue of about 1000 cm³ was largely cinder (to 20 mm), and grit, with some brick/tile (to 10 mm), coal (to 35 mm), bone, a few shell fragments (including marine shell, eggshell and land snail remains), and sand. The only plant remains, other than a little charcoal, were traces of birch (*Betula*) fruits and elder seeds.

This sample yielded a small assemblage of rather battered vertebrate fragments, of which approximately 50% had been burnt. All were less than 25 mm in greatest dimension and of variable colour. Pig, caprovid and goose remains were identified, whilst the fish included herring, eel and haddock vertebrae.

Only a few scraps of decayed invertebrate cuticle were noted in the small flot.

Hand-collected vertebrate remains

The assessment of the vertebrate remains from St Andrewgate, York concentrated on material from Phases 5 to 9—features and finds from this chronological period (early 14th century through to early 16th century) were the focus of the excavators' report. Additionally, some material from Phases 3, 4 and 10 was briefly recorded, whilst no material from Phases 11 and 12 was examined. Some of the material, particularly that from Phases 3 and 4, remained unwashed.

The recorded assemblage amounted to 1993 fragments, from 21 contexts mainly representing dump/build-up deposits and ditch and pit fills. Little hand-collected material was recovered from the floor deposits. Details of the range of species, number of fragments, measurable bones and mandibles with teeth *in situ* can be found in Tables 1 and 2.

With the exception of material from a single context (1127), most bones were well-preserved, with very few fragments described as eroded or battered in appearance. Vertebrate remains from Context 1127 were recorded as being of fair preservation, but angularity (i.e. the nature of the broken surfaces) and colour were both described as being variable. Colour of most other fragments was fawn or brown, with little variation within contexts. Material from the two earlier deposits (1482 and 1542) was generally slightly darker brown, with some mottling which may be attributable to waterlogging. A number of the deposits produced several bones which were stained green to varying degrees. This colouration is caused by close proximity to copper alloy objects. Concretions attached to some of the fragments from Context 1150 (Phase 9) appeared to be faecal in origin (though no parasite eggs were seen in the 'SPOT' sample), supporting the interpretation of this deposit as the fill of a cess pit.

Few of the bones showed evidence of fresh breakage and dog gnawing, and little fragmentation appeared to have occurred. Evidence of butchery was quite extensive and indicated similar butchery practices throughout the represented periods. These included the splitting of cattle long-bones (radii and metapodials in particular) and the longitudinal chopping of both large and medium-sized vertebrae. Evidence from both the cattle and caprovid remains suggesting brain removal, by splitting the skull sagittally, was noted from Contexts 1228 (Phase 8), 1189 and 1228 (Phase 9). Horn removal was also evident from these skulls and from another caprovid skull from Context 1294 (Phase 6). Also worthy of comment was a chicken skull which had been split in half,

in much the same way as the mammal skulls. Gidney (2000) noted this same practise from a site in Leicester and suggested that this may be for the removal of the brain, possibly for consumption.

The range and frequency of identified species for all the separate chronological groups is shown in Table 2. From this it can be seen that the remains of cattle and caprovids were most common throughout, with pig bones also represented. Juvenile cattle were more frequently recorded from Phase 8 onwards, a trend which has been noted from other early post-medieval assemblages recovered from the city (Jaques *et al.* 2000a, Jaques *et al.* 2001).

Chicken and goose remains, present in most phases, increased in frequency in the later period (Phases 8 and 9). A part skeleton of a cat was recovered from Context 1174 (Phase 9), with additional fragments, probably from the same individual, identified from Context 1150. Wild species were represented by single elements of hare (*Lepus* sp.) from Contexts 1542 (phase 3), 1312 (phase 5) and 1174 (Phase 9) and a roe deer (*Capreolus capreolus* (L.)) radius from Context 1281 (Phase 9). Additionally, a rather battered antler fragment was recovered from Context 1236 (Phase 8); this could not be identified to species. Several wild birds were identified, including swan (*Cygnus* sp.) from Context 1347, juvenile heron (*Ardea cinerea* L.) and jackdaw (*Corvus monedula* L.), both from Context 1222.

Fish remains from the hand-collected assemblage were quite scarce, and were mainly recovered from Phases 8 and 9. Gadid remains, including ling (*Molva molva* (L.)) and haddock (*Melanogrammus aeglefinus* (L.)) were identified from Contexts 1312 (Phase 5), 1279 (Phase 8), 1174, 1189 and 1209 (phase 9) and 1076 (Phase 10). All fragments represented individuals of over 50 cm in length. Additionally, a single fragment from Context 1279 was tentatively identified as bream (*Abramis abrama* (L.)), whilst Context 1265 (scanned assemblage from Phase 7) produced a thornback ray dermal denticle.

Preliminary observations of the presence of different skeletal elements for the main domesticates show no clear patterns. A range of elements was recorded for cattle and caprovids from all phases, including both meat-bearing and non-meat-bearing bones. It is apparent, however, that material from the later deposits (Phases 8 and 9) does seem to contain a higher proportion of metapodials and phalanges for both species, and for cattle, mandible fragments are also more prevalent. Patterns of disposal are more likely to be identified through the more detailed analysis of the remains from deposits associated with particular features or dumping episodes. An initial examination of a few selected deposits from Phase 8 shows that the

material from a cess pit (Contexts 1222 and 1228) has, as one might expect, a greater component of domestic/household refuse, than the assemblage from fills (Contexts 1229, 1275 and 1279) of ditch 1286. The latter, with its large component of metapodials, appears to have been a convenient place for dumping refuse from initial carcass preparation and from specialist activities such as tanning and bone working. Domestic rubbish within the cess pit is indicated by the presence of a higher frequency of meat-bearing elements and of bird bones.

Bone working was almost certainly being undertaken somewhere in the vicinity. Several deposits (Contexts 1257, 1312 and 1347; 1228 and 1229; 1189 and 1209 from Phases 5, 8, and 9 respectively) produced bone fragments that appeared to be either blanks or waste from this activity. Indirect evidence came from cattle metacarpal fragments (recovered from Contexts 1228, 1229, 1240, 1275 and 1347) which had been sawn across the bone just below the proximal articulation. The remaining shaft had then presumably been taken elsewhere for manufacture into tools or pins. In addition, worked antler was identified from Contexts 1265 (scanned assemblage from Phase 7) and 1236 (Phase 8).

Overall, 235 measurable fragments and 38 mandibles with teeth *in situ* of use for providing biometrical and age-at-death data were noted.

Discussion and statement of potential

Plant and invertebrate remains were usually rather sparse in these deposits, overall, though some of the earlier layers had good preservation by anoxic waterlogging and there was also some well-preserved charred plant material other than charcoal. The assemblages recovered from some of the deposits gave indications of several different sources for the remains including possible textile working (Context 1542), 'stable manure' (Context 1528), and food waste (Context 1257). In addition, Context 1419 gave a single large seed which was apparently of thorn-apple (*Datura*) which, if confirmed, would be a very early and unusual record. Eggs of intestinal parasitic nematodes were seen in the 'squash' of sediment from Context 1528 indicating a faecal component to this deposit.

A well-preserved and tightly dated vertebrate assemblage was recovered from the deposits at

St Andrewgate. Much of the material was recovered from Phases 8 and 9, with smaller, but similar assemblages from Phases 3, 4, and 5. Very little material was produced from Phase 6 deposits, whilst the 43 deposits from Phase 7, many of which were floors and/or were associated with metal working, were also not particularly prolific. However, some of these floor deposits, once sieved, produced moderate assemblages of bone, including fish which were only sparsely represented in the hand-collected assemblage.

There appeared to be little indication of reworked or redeposited material and the scarcity of dog gnawing suggests that the remains were quickly incorporated into the deposits. As might be expected the cattle and caprovids were the dominant species throughout, with pig, chicken and goose remains becoming more numerous in the later phases (8 and 9). The hand-collected material appears to be a mix of refuse representing a range of different commercial and specialist activities, including carcass preparation, tanning and bone working. Domestic food waste was also present and was particularly noted from cess pit deposits and floors. Initial observations did not suggest any significant differences through time in the type of activities being undertaken in this area.

An analysis of vertebrate remains from several medieval sites in York undertaken by Bond and O'Connor (1999) and evidence from a number of recent assessments and evaluations (e.g. St Saviourgate, Carrott *et al.* 1995, 1998; Hungate, Jaques *et al.* 2000a; 41-9 Walmgate, Jaques *et al.* 2001) has shown that some patterning of refuse deposition is apparent within the medieval city. Further evidence provided by a detailed analysis of remains from St Andrewgate would further our knowledge concerning the use of areas of the city for different activities and for the disposal of different types of refuse.

Biometrical and age-at-death data could also be used to explore the shift during the late medieval/early post-medieval period towards

the production of larger carcass animals and the culling of younger animals, trends associated with the intensification of agricultural practices and stock improvement during this period.

The samples, in particular those from Phase 7, provided a moderate-sized assemblage of fish remains, some of which were extremely well preserved. Preliminary identifications of the species present suggests the assemblages show some similarities with those from 14th century floor deposits at Walmgate (Jaques *et al.* 2001) and from deposits at the nearby site at St Saviourgate (Carrott *et al.* 1995, 1998) and included the remains of herring, eel, gadid, flatfish and cyprinid. The detailed analysis of these assemblages would provide information, currently only hinted at, concerning the exploitation of freshwater and marine resources during this period.

Recommendations

An attempt should be made to revisit and/or examine more material of at least the samples from Contexts 1344, 1419, 1528 and 1542 (and any others with similar lithology not included in this assessment) with a view to making a proper record of the plant and invertebrate remains and resolving the identification some of the specimens whose identity could not be checked within the constraints of a project of this nature. This should permit an improved understanding of the nature of the deposits as well as providing some much needed records of plants and invertebrates for this period of York's medieval history and for a significant part of the city, currently rather poorly known. Such work will incidentally provide an opportunity to use the 'indicator group' (Kenward and Hall 1997) for stable manure in a case where identification is (on the basis of assessment) less certain than for material from some other sites.

Clearly, the vertebrate assemblage shows great potential for providing both archaeological and zooarchaeological information. Despite the recovery from York of a number of vertebrate assemblages of a similar date and nature to those discussed here (Carrott *et al.* 1995, 1998; Jaques *et al.* 2000a, 2000b; Jaques *et al.* 2001), 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. A more detailed examination of assemblages from individual features and context types may help with the interpretation and identification of some of these activities. It is recommended, therefore, that all well-dated material should be recorded in detail, including age-at-death and biometrical data for the main domesticates.

Fish remains from the samples should also be fully investigated and further sediment (where available), should be processed from the floor deposits already assessed to maximise the assemblage. It would also be worth processing samples from any additional floor deposits not seen in this assessment.

Retention and disposal

All of the current material should be retained for the present.

Archive

All material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

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References

- Bond, J. and O'Connor, T. P. (1999). Bones from Medieval deposits at 16-22 Coppergate and other sites in York. *The Archaeology of York* **15** (5), 299-429 + Plates XVI-XIX. York: Council for British Archaeology.
- Carrott, J., Dobney, K., Hall, A., Issitt, M., Jaques, D., Kenward, H., Large, F. and Shaw, T. (1995). An evaluation of biological remains from excavations in St Saviourgate, York (site code: 1995.434). *Reports from the Environmental Archaeology Unit, York* **95/51**, 9 pp.
- Carrott, J., Hall, A., Hughes, P., Jaques, D., Johnstone, C., Kenward, H. and Worthy, D. (1998). Assessment of biological remains from excavations at St Saviourgate, York (site code 1995.434). *Reports from the Environmental Archaeology Unit, York* **98/14**, 41 pp.
- Dainton, M. (1992). A quick, semi-quantitative method for recording nematode gut parasite eggs from archaeological deposits. *Circaea, the Journal of the Association for Environmental Archaeology* **9** (for 1991), 58-63.
- Dobney, K., Hall, A. R., Kenward, H. K. and Milles, A. (1992). A working classification of sample types for environmental archaeology. *Circaea, the Journal of the Association for Environmental Archaeology* **9** (for 1991), 24-6.
- Gidney, L. (2000). Economic trends, craft specialisation and social status, pp. 170-178 in Rowley-Conwy, P. (ed.), *Animal Bones, Human Societies*. Oxford: Oxbow.
- Jaques, D., Carrott, J., Hall, A., Kenward, H., and Rowland, S. (2000a). Evaluation of biological remains from excavations in the Hungate area, York (site codes YORYM2000.1-14). *Reports from the Environmental Archaeology Unit, York* **2000/29**, 22 pp.
- Jaques, D., Hall, A., Kenward, H., Rowland, S., Wang, T. and Carrott, J. (2000b). Evaluation of biological remains from excavations at NCP car park site, Skeldergate, York (site code: YORYM1999.844). *Reports from the Environmental Archaeology Unit, York* **2000/53**, 17 pp.
- Jaques, D., Hall, A., Kenward, H., Rowland, S., and Carrott, J. (2001). Assessment of biological remains from excavations at 41-9 Walmgate, York (site code:

1999.941). *Reports from the Environmental Archaeology Unit, York* **2001/26**, 17 pp.

Kenward, H. and Hall, A. (1997). Enhancing bioarchaeological interpretation using indicator groups: stable manure as a paradigm. *Journal of Archaeological Science* **24**, 663-73.

Kenward, H. and Large, F. (1998). Recording the preservational condition of archaeological insect fossils. *Environmental Archaeology* **2**, 49-60.

Kenward, H. K., Hall, A. R. and Jones, A. K. G. (1980). A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits. *Science and Archaeology* **22**, 3-15.

Kenward, H. K., Engleman, C., Robertson, A. and Large, F. (1986). Rapid scanning of urban archaeological deposits for insect remains. *Circaea* **3**, 163-172.

Table 1. Summary information for hand-collected vertebrate remains by phase from excavations at St Andrewgate, York. Key: No. meas = number of measurable fragments; No. mands = number of mandibles with teeth in situ.

Phase	Total frags.	No. meas	No. mands	No. boxes assessed (approx.)	No. contexts assessed
3	146	22	9	1	1
4	222	16	8	1	1
5	272	27	6	1	3
6	47	5	0	0.25	1
8	508	68	1	2	6
9	701	80	12	2	7
10	95	17	2	0.25	2
Total	1991	235	38	7.5	21

Table 2. Hand-collected vertebrate remains by species and phase from excavations at St Andrewgate, York.

Species		Phase							Total
		3	4	5	6	8	9	10	
<i>Lepus</i> sp.	hare	1	0	1	0	0	1	0	3
<i>Felis</i> f. domestic	cat	0	0	0	0	0	33	0	33
cf. <i>Felis</i> f. domestic	cf. cat	0	0	1	0	0	0	0	1
<i>Equus</i> f. domestic	horse	0	2	0	1	0	1	0	4
<i>Sus</i> f. domestic	pig	10	6	15	3	18	22	5	79
Cervid	deer	0	0	0	0	1	0	0	1
<i>Capreolus capreolus</i> (L.)	roe deer	0	0	0	0	0	1	0	1
<i>Bos</i> f. domestic	cattle	24	38	36	7	53	69	11	238
Caprovid	sheep/goat	19	18	27	8	52	90	20	234
cf. <i>Ardea cinerea</i> L.	cf. heron	0	0	0	0	1	0	0	1
cf. <i>Cygnus</i> sp.	cf. swan	0	0	1	0	0	0	0	1
<i>Anser</i> sp.	goose	5	3	3	0	22	17	5	55
<i>Anas</i> sp.	duck	0	0	0	0	0	3	2	5
<i>Gallus</i> f. domestic	chicken	2	2	6	0	22	38	3	73
?Wader	cf. wader	0	0	0	0	0	0	1	1
Fish		2	0	1	0	5	19	5	32
Unidentified		83	153	181	28	336	407	43	1228
Total		146	222	272	47	508	701	95	1993