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**Assessment of biological remains from Blanket Row,
Hull (sitecode: BWH98)**

by

Cluny Johnstone, Frances Large, Deborah Jaques, Darren Worthy, Allan Hall,
John Carrott and Harry Kenward

Summary

One hundred and nineteen sediment samples (from fifty-six contexts), six boxes of hand-collected shell, 28 boxes of hand-collected bone, and one 'spot' sample, from excavations of deposits of 14th century to modern date at Blanket Row, Hull, were submitted for an assessment of their bioarchaeological potential.

The content of plant and invertebrate macrofossils in the samples examined ranged from a few grains of undiagnostic charcoal at one extreme to abundant and extremely well-preserved suites of remains at the other. The richer assemblages showed considerable potential for determining the nature of the material contributing to the deposits, and to some extent for reconstructing local environment, and should be recorded in more detail. The four samples which showed good preservation of delicate organic material should be submitted to detailed analysis of their plant and insect remains. The samples which were not examined during assessment should be inspected and those which, on the basis of their context type and lithology, are judged likely to yield useful assemblages should be processed, and any plant and insect remains recorded in detail if appropriate. An attempt should be made to identify the rush seeds from some of the samples in which these were the only plant remains.

The shell assemblages recovered from deposits of late medieval to early post-medieval date (dominated by oyster shell) were large enough and sufficiently well-preserved to be of interpretative value. The bias of the recovered shell towards edible taxa, together with the percentage of shells showing evidence of having been opened using tools, strongly suggests that this assemblage derives almost exclusively from human food waste. The oyster remains show some potential for further study.

Deposits from Blanket Row yielded moderately large assemblages of bone, the largest, and most useful, bodies of material being of late medieval and early post-medieval date. The later post-medieval material (16th - 18th century) would prove useful if a slightly tighter dating framework could be achieved. Age-at-death data should be recorded for the main domesticates from the late medieval and early post-medieval periods to explore possible evidence for a shift towards intensification of agricultural practices involving urban meat supply and dairying. Biometrical data for the major domesticates should be recorded to further investigate possible late medieval/early post-medieval evidence for early livestock improvement associated with the 'agricultural revolution'. Additional sediment samples should be processed to recover smaller vertebrate remains, in particular fish bones.

KEYWORDS: BLANKET ROW; HULL; LATE MEDIEVAL TO EARLY MODERN; ASSESSMENT; PLANT REMAINS; CHARRED PLANT REMAINS; INSECT REMAINS; SHELLFISH; VERTEBRATE REMAINS; STABLE MANURE; LIVESTOCK IMPROVEMENT

Authors' address:

Palaeoecology Research Services
Environmental Archaeology Unit
Department of Biology
University of York
P. O. Box 373
York YO10 5YW

Prepared for:

Northern Archaeological Associates
15 Redwell Court
Harmire Road
Barnard Castle
County Durham DL12 8PN

Telephone: (01904) 433846/434475/434487

Fax: (01904) 433850

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Introduction

An archaeological excavation was carried out by Northern Archaeological Associates at Blanket Row, Hull (NGR TA 099 283), from 15 June to 7 August 1998. One hundred and nineteen sediment samples ('GBA' and 'BS' *sensu* Dobney *et al.* 1992) from fifty-six contexts, six boxes (each of approximately 16.5 litres) of hand-collected shell, 28 boxes (of approximately 16.5 litres each) of hand-collected bone, and one 'SPOT' sample (*sensu* Dobney *et al. op. cit.*) were recovered from deposits of 14th century to modern date. This material was submitted to the EAU for evaluation of its bioarchaeological potential.

A Victorian sewer divides the site in two, the north side having seven identified phases of occupation, and the south side nine. Table 1 shows details of the dates and phases, and of the relationship between the different phases from the two areas. With a view to a more simplified approach, the contexts have been combined into six groups by periods (also summarised in Table 1) defined as follows:

Late medieval (Phases 1-3, north and Phases 1-5, south). *Late medieval/early post-medieval* (Phases 5/6, south). *Early post-medieval* (Phase 4, north and Phase 6, south) *Post-medieval* (Phase 5, north and Phase 7, south). *Late post-medieval* (Phase 6, north and Phase 8, south). *Early modern* (Phase 7, north and Phase 9, south).

Methods

Sediment samples

All of the sediment samples were inspected in the laboratory. Descriptions of the lithologies of those samples of particular archaeological or bioarchaeological interest were recorded using a standard *pro forma*. Twenty-two samples were selected for processing following the procedures of Kenward *et al.* (1980; 1986). The spot sample from Context 2538 (Sample 783) was examined.

Table 2 shows a list of the samples selected for assessment and notes on their treatment.

Hand-collected shell

Six boxes of hand-collected shell (representing material from 251 contexts, four of which were unstratified or unphased) were submitted. Brief notes were made on the preservational condition of the shell and the remains identified to species where possible.

For oyster (*Ostrea edulis* L.) shell additional notes were made regarding: numbers of left and right valves; evidence of having being opened using a knife or similar implement; measurability of the valves; damage from other marine biota (polychaet worms and dog whelks); encrustation by barnacles.

Vertebrate remains

Initially, the material in all the boxes was rapidly scanned and each context assigned a priority score on a scale from 0 to 4. Numbers of measurable bones, mandibles with teeth *in situ*, and isolated teeth were also counted. The scale was as follows:

- 0 Not worth recording, very small quantity, mostly unidentifiable and/or poor preservation.
- 1 Relatively small quantity, few interesting or 'A' bones (Dobney *et al.* forthcoming), and/or poor preservation.
- 2 Few interesting or 'A' bones, and/or poor preservation but worth recording as part of a context group.
- 3 Some interesting and 'A' bones and reasonable overall preservation.
- 4 Many interesting and 'A' bones and reasonable or good overall preservation.

For the purposes of this assessment, material from all contexts scoring 3 and 4, representing a range of periods and context types, was recorded as detailed below. This selection also included six of the sixteen contexts targeted by the excavators. The remainder contained insufficient material for any interpretation or comment to be made.

Data were recorded electronically directly into a series of tables using a purpose-built input system and *Paradox* software. Subjective records were made of the state of preservation, colour of the fragments, and the appearance of broken surfaces ('angularity'). In addition, semi-quantitative records were made of fragment size, and of

burning, butchery, fresh breakage and dog gnawing.

Where possible, fragments were identified to species or species group, using the reference collection at the Environmental Archaeology Unit, University of York. Fragments not identified to species were grouped into categories: large mammal (assumed to be cattle, horse or large cervid), medium-sized mammal 1 (assumed to be caprovid, pig or small cervid), medium-sized mammal 2 (from an animal of dog/cat/hare-size) and unidentified.

Records were made for each species, consisting of the total number of fragments, the number of each anatomical element present, along with the numbers of 'A' bones i.e. mandibles and isolated teeth (of use in providing ageing or sexing information), measurable fragments, and unfused and juvenile fragments. In addition to fragment counts, total weights were recorded for all identifiable species and unidentified categories.

Similar records were made for the vertebrate remains recovered from bulk-sieved residues. Fragments were identified to species or species group and the unidentified fragments grouped as above. Weights were noted for each identified species and the unidentified material.

Results

Sediment samples

The results are presented in phase then context number order by period (three and four digit context numbers are from deposits north and south of the Victorian sewer respectively). Archaeological information and/or archaeological questions to be

addressed (provided by the excavator) are given in square brackets.

Late medieval

Phase 1

Context 382 [Layer]

Sample 113 (2 kg GBA - washover)

Moist, varicoloured (from light yellow-brown to mid to dark grey), crumbly (working soft and slightly sticky), slightly clay silt with a little ?slag, charcoal and ?eggshell.

The washover was mostly of charcoal and cinder (to 20 mm) with moderate numbers of rush (*Juncus*) seeds. There was some plant detritus and a few charred cereal grains. The only insects noted were two fly puparia; there were several earthworm egg capsules and two damaged snail shells.

The moderate-sized residue of about 500 cm³ was mostly sand and undisaggregated silt clasts, with moderate amounts of mortar (to 30 mm) and traces of brick/tile, ?daub, pottery, oyster shell, mammal and fish bone and coal.

Context 390 [Fill of gully 394]

Sample 117 (2 kg GBA - washover)

Moist, light grey-brown to mid to dark grey, crumbly, silty clay with very small stones (2 to 6 mm) and charcoal present.

The smallish residue of about 400 cm³ was of ashy/mortary sand with some brick/tile and traces of bone, cinders, fish bone, chalk and oyster shell; the large washover was of charcoal to 20 mm, with traces of uncharred wood, snails (a single *Pupilla muscorum* (L.) and fragments of two other unidentified land snails), coal, earthworm egg capsules, a single charred ?bread wheat (*Triticum* cf. *aestivo-compactum*) grain, and traces of ?mud rush (*Juncus* cf. *gerardi* L.) seeds. The presence of *Heterodera*-type cysts and earthworm egg capsules in small numbers perhaps suggests that the deposits included soil, or that a soil had developed on it at some stage.

Context 413 [Fill of pit 414]

Sample 118 (2 kg GBA - paraffin flotation)

Moist, moderately heterogeneous, mid brown to mid grey brown, soft (working plastic), slightly clay silt with localised patches of black humic material.

The flot was very large and mostly composed of woody plant detritus. Invertebrates were moderately abundant and included abundant mites. Over 40 beetle taxa were recorded, representing a range of habitats. Species suggesting dung and other foul matter predominated; there were numerous dung beetles *Aphodius granarius* (Linnaeus), a single individual of a second *Aphodius*, several *Anotylus complanatus* (Erichson) and *Gyrophypus fracticornis* (Müller), and single individuals of a range of other taxa which probably co-existed with these. There was a little house fauna (e.g. two each of *Lathridius minutus* group and *Mycetaea hirta* (Marsham), and singletons of some other beetles and the human flea *Pulex irritans* Linnaeus). These components, taken together, perhaps point to the presence of stable manure. However, there were no grains pests and the plant feeders may have had a local origin (probably as short-travelled background fauna) rather than representing cut vegetation, since various beetles which may have exploited disturbed urban open areas were recorded. (A specimen of the seven-spot ladybird *Coccinella septempunctata* Linnaeus was noteworthy among these.) There may have been water *in situ* since, in addition to traces of aquatic and waterside beetles, there were a few *Daphnia ephippia* (water flea resting eggs). However, this component may have been brought in water for livestock. The balance may be tipped in favour of water at the point of deposition by three adult bibionid flies; these very commonly become trapped on water surfaces. A single *Tipnus unicolor* (Piller and Mitterpacher) was recorded (see under Sample 110, Context 2539).

There was a rather small residue of about 350 cm³ of which about 70% by volume was woody detritus including some worked wood fragments (to 40 mm) and some ?peat fragments (to 10 mm), with a little sand, pottery and brick/tile. The seeds present were rather well-preserved though not very abundant and included rather a broad mixture of taxa (typical of urban archaeological deposits). Remains of plants likely to have been used for some purpose included a stone of cherry (*Prunus* Section *Cerasus*) and capsule fragments of flax (*Linum usitatissimum* L.).

The tentatively identified charred heather root/twig fragments, *Sphagnum imbricatum* Horsch. ex Russ. leaves and perhaps one or two other taxa point to the presence of a peatland component (e.g. from imported peat or turves used as litter).

With these remains were at least nine well-preserved achenes of the milk thistle, *Silybum marianum* (L.) Gaertner, a plant probably introduced in the medieval period as a herb for medicinal purposes (it is still in use). Remains of *S. marianum* have been recorded from ?medieval deposits at Skeldergate, York (A. R. Hall, unpublished data) and from a single 12th century dump at 16-22 Coppergate, York (*ibid.*) but it does not appear to have been recorded from elsewhere in Britain as a fossil. It is possible that the plant was an escape from cultivation at the present site.

Examination of the fauna of a 5 kg subsample would undoubtedly allow clarification of the interpretation of this interesting group of remains.

Context 2538 [Organic layer]

Sample 105 (2 kg GBA - paraffin flotation)

Moist, slightly pink grey-brown, plastic, slightly silty clay with medium-sized stones (20 to 60 mm) present.

The flot consisted mainly of plant detritus, some woody, and insect remains were rather numerous. There were further insect remains in the residue from flotation. The insect assemblage seems likely to have originated in stable manure. There were several grain weevils (*Sitophilus granarius* (Linnaeus)) and a range of species which may have lived in rather foul decaying matter (notably two *Carpelimus pusillus* group, and *Oxytelus sculptus* Gravenhorst, *Cercyon atricapillus* (Marsham), *C. terminatus* (Marsham) and *C. unipunctatus* (Linnaeus), all as single individuals). There was a weak house fauna component, including two human fleas, *Pulex irritans* (the latter emerging as rather typical of ancient stable manure assemblages, Kenward *et al.* 1998). A further group of remains regarded as typical of stable manure, having originated in hay, was represented by several, *Sitona* sp., and single individuals of two *Apion* species; both genera include predominantly species found on clovers, vetches and their relatives and particularly likely to be imported in cut vegetation. An anomalous element was *Platystethus nitens*

(Sahlberg), which was abundant (it was also present in modest numbers in Sample 110 from Context 2539). This tiny staphylinid beetle is generally found in organic-rich mud, but it may have found suitable conditions at the point of deposition if conditions were wet. A larger subsample of this material would permit clearer characterisation of the conditions under which it formed, and of the materials contributing to it.

There was a smallish residue of about 300 cm³ of which about 70-80% by volume was wood fragments, some perhaps from wood-working (there were some wood 'chips'), with straw-like detritus, perhaps from stable manure. Seeds were not very abundant, though preservation was generally quite good: they were a mixture of plants from grassland, wetland and various weed communities (with a possible peatland component as in the sample from Context 413 from the same archaeological phase).

Context 2539 [Fill of refuse pit 2542]

Sample 110 (2 kg GBA - paraffin flotation)

Moist, dark brown to black, soft, fine and coarse herbaceous detritus intercolated with brown and grey silt.

The flot was mainly plant detritus, some woody and including some twig fragments. There were modest numbers of insects, a few mites, and a spider. The beetles included grain pests (two *Sitophilus granarius*), house fauna (notably several *Lathridius minutus* group, two *Xylodromus concinnus* (Marsham) and a *Cryptophagus scutellatus* Newman), decomposers as a group typical of rather foul, open textured, matter (eg. two *Cercyon unipunctatus* and one *Oxytelus sculptus* Gravenhorst), and weevils likely to have been brought in hay (three *Sitona* sp.). There was also a flea, not identified to species but probably the human flea *P. irritans*. Some oospores of stonewort, *Chara* sp., may well have been imported in water for livestock or arrived in their dung. As in Sample 105 from Context 2538, *Platystethus nitens* was rather abundant (recorded as 'several'). Conceivably it too came in water.

A specimen of the spider beetle *Tipnus unicolor* was found; the fossils record suggests that it was typical of Roman and post-Normal Conquest buildings.

The modest-sized residue of about 350 cm³ was mainly of organic detritus—both woody and herbaceous. There were, in places, clasts of compressed herbaceous material with a distinctly ‘strawy’ character and some rachis fragments of a cereal which may represent chaff from grain processing or, perhaps more likely, remains of ears in straw.

Many of the plant and insect taxa recorded were typical of the kinds regularly recorded by the authors from deposits thought to contain stable manure (a variety of grassland and weed taxa in a matrix rich in strawy debris together with characteristic invertebrates e.g. grain pests (Kenward and Hall 1997)).

Phase 2

Context 298 [Fill of pit 299]

Sample 95 (2 kg GBA - paraffin flotation)

Moist, mid to dark grey-brown with a slight olive cast, brittle (working crumbly, and sticky when wet), moderately gritty, clay silt. Very small to medium-sized stones (2 to 60 mm), ?mortar/plaster, brick/tile and charcoal were present in the sample.

The small flot consisted mainly of charcoal and/or cinder (to 10 mm), with some ?peat (to 10 mm), modern woody root fragments, a charred grass caryopsis, and a single charred oat grain. The only invertebrates recorded were two *Daphnia* ephippia (water flea resting eggs), suggesting that water capable of supporting these creatures was incorporated, and several soil nematode (*Heterodera*-type) cysts.

The rather large residue of about 500 cm³ was mainly of sand and cinder (to 30 mm), with fragments of cockle (*Cerastoderma edule* (L.)) and mussel (*Mytilus edulis* L.) shell, chalk gravel, brick/tile, mortar, limestone and coal. Some large mammal bone (to 130 mm) and a few fish bones were also noted.

Phase 3

Context 103 [Layer]

Sample 9 (2 kg GBA - paraffin flotation)

Almost dry, dark brown, crumbly, ?humic silt. Marine mollusc shell was abundant, coal common, and brick/tile and modern rootlets and woody roots were present in the sample.

A large flot was recovered, consisting of charcoal, cinder, fine coal or coal exudates, woody plant roots and some rootlets. No invertebrates were found.

A large residue of about 1 litre in volume was obtained, in which the major components were coal (to 40 mm) and cinders (to 25 mm), with some sand and moderate amounts of cockle shells. Oyster shell was present in trace amounts, with mammal bone, and brick/tile. Plant remains were not recovered. A small number of fish vertebrae and skull fragments were recovered. Species represented included eel (*Anguilla anguilla* (L.)), ?conger eel (*Conger conger* (L.)), herring (*Clupea harengus* L.) and gadid.

Context 230 [Layer]

Sample 60 (2 kg GBA - paraffin flotation)

Just moist, mid brown to dark grey brown, crumbly and layered (at a mm-scale), ashy silt with some burnt soil, charcoal and rotted shell present.

The smallish flot comprised charcoal and coal (to 10 mm). There were no invertebrates.

The moderate-sized residue of about 500 cm³ consisted of about 50% by volume of coal fragments (to 15 mm) with sand and traces of brick/tile, fish bone, marine mollusc shell, with a mammal tooth.

Context 251 [Layer]

Sample 68 (2 kg GBA - paraffin flotation)

Just moist, mid brown to dark grey brown, crumbly and layered (at a mm-scale), ashy silt with some burnt soil, charcoal and rotted shell present.

The flot was small, containing charcoal and cinder (to 12 mm), coal and coal exudates, and a few fragments of plant detritus. No invertebrates could be found.

There was a moderate-sized residue of about 600 cm³ of which the bulk consisted of cinders and sand, with traces of coal, bone, mussel shell and brick/tile. Some of the bone was burnt, and a single fish otolith (‘ear bone’) was recorded. Other fish fragments

included the remains of herring, eel, pleuronectid and gadid. An amphibian vertebra was also noted.

Context 273 [Fill of pit 274]
Sample 77 (2 kg GBA - paraffin flotation)

Just moist, mid gingery grey-brown, crumbly, ashy silt with some shell fragments.

The small flot was mostly charcoal, with charred seeds and cereal grains and a little waterlogged plant detritus including modern root fragments. There appeared to be no ancient invertebrates present, those noted (three ants and a ?*Stegobium paniculatum* (Linnaeus)) appearing to be modern contaminants.

The small residue of about 250 cm³ was mostly sand, with traces of gravel, coal, mortar, brick/tile, mortar, bone and cockle shell fragments.

Context 348 [Fill of privy 349]
Sample 88 (2 kg GBA - paraffin flotation)

Moist, mid to dark greyish brown with a slightly olive cast (locally more grey or more brown), crumbly (working plastic), slightly stony silty clay with brick/tile fragments and flecks of ?mortar present.

A very small flot was recovered, consisting of charcoal and cinder (to 10 mm), a trace of charred seed, an elder (*Sambucus nigra* L.) seed, and four fly puparia (the last being orange-yellow in colour and thus having endured poor preservational conditions). No other invertebrates were present.

The smallish residue of about 450 cm³ consisted largely of glassy concretions (to 20 mm) and sand, with traces of cinders, bird and fish bone, coal, brick/tile and mortar.

The small amount of bone (23 fragments, weighing 1.3 g) recovered from the residue, included a wader tibiotarsus (similar in size and morphology to a jack snipe - *Limnocyptes minimus* Brünnich), an ?amphibian pectoral girdle fragment and a juvenile small mammal tibia. Single herring (*Clupea harengus* L.) and ?cyprinid vertebrae were also recovered, together with 12 unidentified fish and 6 unidentified mammal fragments.

Context 2280 [Floor silts]
Sample 34 (2 kg GBA - paraffin flotation)

Just moist, dark grey-brown, crumbly and slightly layered, ?ashy silt. Flecks of brick/tile, charcoal and very rotted shell were present in the sample.

The flot was dominated by charcoal and cinder (to 15 mm), with some waterlogged plant detritus including traces of seeds of mud rush (*Juncus gerardi*). No invertebrates could be found.

The moderate-sized residue of about 300 cm³ was about 50% by volume coal and cinder, the rest sand and grit, with traces of brick/tile and mussel shell, modern root fragments.

Context 2376 [Floor silts]
Samples 49 and 51 (17 kg BS)

Just moist, dark brown to dark grey-brown, crumbly and layered (at mm-scale), ashy silt with mortar and brick/tile present. Sample 49 had more mortar and a large piece of chalk present.

The rather small residue was almost entirely of mineral fragments, mainly brick/tile and sand with traces of bone, chalk, cinders, coal, fish bone, unidentified marine shell, and mortar with some modern root fragments.

The residue yielded 545 vertebrate fragments, plus numerous unidentified fish remains (weighing 46.5 g). The preservation of the vertebrate remains was described as good, with the colour of the mammal bone fragments being fawn and the fish ginger. The angularity was described as slightly variable, with most fragments being 'spiky', although some mammal fragments were more 'battered' in appearance. Green staining was noted on a few bones and a few burnt fragments were also present. A single caprovid tooth (0.2 g) was the only identified mammal fragment. The unidentified material consisted of two bird vertebrae, seven burnt fragments and 229 mammal fragments (34.8 g). Fish remains (11.7g) were more numerous and included 103 pleuronectid, 152 herring (*Clupea harengus* L.), ten eel (*Anguilla anguilla* (L.)), eight ?cyprinid, five ?gadid, six ?grey mullet (Mugilidae) vertebrae. Other fish vertebrae and skull fragments were noted (but not identified), along with abundant spine and rib fragments.

Sample 50 (2 kg GBA - paraffin flotation)

Just moist, dark brown to dark grey-brown, crumbly and layered (at mm-scale), ashy silt with mortar and brick/tile present.

The flot was mainly charcoal and cinder (to 20 mm), with some waterlogged plant detritus and a few elder (*Sambucus nigra*) seeds. Single individuals of three beetle taxa and several soil nematode (*Heterodera*-type) cysts. were also noted.

The smallish residue of about 350 cm³ consisted mainly of sand and cinder, with traces of coal, brick/tile, and fish bone.

Phase 4 (only the area south of the Victorian sewer has phase 4 late medieval deposits)

Context 2316 [Road deposit]
Samples 62 and 63 (16 kg BS)

Just moist, very heterogeneous, mid grey-brown, crumbly (working plastic), silty clay. Small and medium-sized stones (6 to 60 mm), pot and marine mollusc shell were present, mammal bone was common, and brick/tile fragments were abundant in the sample

There was about 10 litres of residue consisting mainly of brick/tile (to 50 mm) with some bone (to 60 mm) and sand, four periwinkles (*Littorina littorea* (L.)) and traces of mussel, oyster and cockle shell, cinders, coal, and gravel.

The residue yielded 52 vertebrate fragments identified to species or species group (weighing 152.5 g), together with numerous unidentified fish, bird and mammal remains (weighing 255.2 g). The preservation of the vertebrate remains was variable (mostly fair), with colour (mostly light brown, few dark brown and ginger) and angularity (appearance of broken surfaces, some spiky, some battered) also variable. The identified mammal remains included caprovids (11 fragments), cow (6), pig (2), and cat (1). A single bird bone was identified as goose (*Anser* sp.), with 22 unidentified bird fragments. Fish remains included 13 gadid, three pleuronectid, one eel (*Anguilla anguilla* (L.)) and three herring

(*Clupea harengus* L.) vertebrae. Eleven other fish vertebrae were recovered, together with numerous unidentified fish fragments.

Context 2537 [Organic layer]
Sample 108 (2 kg GBA - paraffin flotation)

Just moist, dark grey-brown, stiff (working plastic, and sticky when wet), clay silt.

There were only small numbers of insects in the flot, which consisted mainly of plant detritus. Earthworm egg capsules were rather numerous, as were mites. The beetles were species typical of urban occupation sites, but there were too few to allow any reconstruction of conditions as the deposit formed. It is unlikely that a subsample of less than 10 kg would improve matters.

On first inspection there was a rather small residue of about 275 cm³, mostly undisaggregated silt. In view of this the sample was subjected to steeping in dilute sodium pyrophosphate solution for a few days, after which it was re-sieved; the residue now consisted of about 200 cm³ of silt clasts and herbaceous detritus with traces of bark, wood, coal, pottery, charcoal, brick/tile, mortar, and chalk. Almost no identifiable plant remains were recorded amongst the herbaceous detritus.

Phase 5 (only the area south of the Victorian sewer has phase 5 late medieval deposits)

Context 2353 [Floor silts]
Sample 11 (2 kg GBA - paraffin flotation)

Moist, mid to dark brown, crumbly and layered (in places) to unconsolidated (working soft), sandy clay silt with patches of light brown ?rotted mortar, and white patches of ?mineral deposition. Very small stones (2 to 6 mm) and fish bone were present in the sample.

Devoid of invertebrates, the small flot contained a few fragments of plant detritus and moderate numbers of rush seeds, probably *Juncus gerardi* (mud rush), but was mostly charcoal and cinder.

The smallish residue of about 400 cm³ was composed mainly of sand, cinders and coal with some other occupation debris (brick/tile, fish bone, mortar). The

fish bone included a salmonid vertebra which had been chopped transversely.

Context 2354 [Floor silts]
Sample 18 (2 kg GBA - paraffin flotation)

Moist, mid brown, layered and compressed to brittle and crumbly, slightly silty ash. Cinder, charcoal and very rotted shell were present in the sample.

The flot - which was small - consisted of charcoal and cinder (to 10 mm), with some plant detritus; there were no invertebrates.

The rather small residue of about 400 cm³ consisted mainly of sand, cinders and coal, with coal and cinder fragments making up the bulk of the small flot. No plant remains were recorded, though traces of bone (including fish and bird bone) and mussel shell were present. The fish remains included a rather crushed pleuronectid vertebra and a small quantity of tiny vertebrae, tentatively identified as smelt (cf. *Osmerus eperlanus* (L.)).

Late medieval/early post-medieval

Phase 5/6

Context 2338 [Floor silts]
Sample 23 (2 kg GBA - paraffin flotation)

Moist, dark grey-brown, layered (on mm-scale) and crumbly (working slightly plastic), clay silt with flecks of charcoal, rotted mammal bone and rotted shell present.

Consisting mostly of charcoal (to 6 mm), and with a trace of slag, the small flot contained only one invertebrate - leg fragments of a poorly preserved *Trox scaber*.

There was a moderate-sized residue of about 275 cm³ of which the largest components (about 30% by volume) were coal (to 25 mm) and sand, with mussel shell, brick/tile, and cinders. Approximately 35-40 fish bone fragments were recovered, including herring and gadid vertebrae.

Post-medieval

Phase 5

Context 136 [Fill of cess pit 111]
Sample 4 (1 kg GBA - paraffin flotation)

Moist, slightly heterogeneous, dark grey brown to dark brown, crumbly (working plastic locally), slightly stony humic silt with small patches of light brown gritty clay. Charcoal, mortar, wood fragments and mammal bone were present in the sample.

The flot consisted mostly of woody plant detritus. A few tens (MNI) of beetles were present, together with a range of other insects, a snail, and some mites. The beetles were ecologically rather mixed, indicating a predominance of decaying plant matter (*Lathridius minutus* group, with several individuals, and *Anotylus complanatus*, with at least three, were the most numerous). The only other abundant beetle was the woodworm, *Anobium punctatum* (Degeer), of which there were several, probably from nearby structural timbers. There were also numerous fly puparia, doubtless of species exploiting decaying matter. A larger subsample of this deposit would undoubtedly provide an insect assemblage which would permit at least limited reconstruction of conditions at the point of deposition, or identification of the deposited material. Two grain weevils, *Sitophilus granarius*, were noted.

The rather large residue (of about 800 cm³) consisted largely of decayed wood and herbaceous detritus and other organic material (about 70% by volume): the woody fragments were small and had something of the appearance of debris from woodworking rather than the decay of larger fragments. The herbaceous material had the appearance of grassy stems, perhaps straw and/or hay. A few of the identifiable plant taxa recorded were consistent with either of these two materials, and there were traces of two plants which may have been utilised in food preparation: dill (cf. *Anethum graveolens* L.) and opium poppy (*Papaver somniferum* L.). The mineral component of the residue was largely sand and grit, whilst the large flot was of 'grassy' herbaceous detritus.

Hand-collected shell

Hand-collected shell was recovered from 251 contexts (150 from north of the Victorian sewer, four

of which were unstratified or unphased, and 101 from south of the sewer). Preservation was highly variable (ranging from very poor to very good) but predominantly good. All of the material was assessed and the taxa identified as closely as possible.

Tables 3 and 4 show the total numbers of contexts assessed by phase and period respectively. Tables 5 and 6 give the total number of fragments recorded by phase for the areas north and south of the sewer. Tables 7 and 8 present this information grouped by period. Table 9 gives the combined counts by period for both areas of the excavation.

The mollusca from almost all of the contexts included oyster shell. Summary information (by period) for this material is presented in Table 10.

Most of the recovered shell was of edible shellfish from deposits of late medieval, late medieval/early post-medieval or early post-medieval date. Oyster was, by far, the most commonly represented taxon with cockle fairly common (and occasionally abundant, Contexts 216, 286 and 298) in late medieval deposits from north of the Victorian sewer. Other edible marine taxa were present in small numbers, again mostly concentrated in the three earliest periods of the site.

Oyster shell was, on the whole, quite well-preserved (approximately 79% of the valves could be identified as either left or right valves). Also, 30% of the valves for which 'side' could be determined were measurable (though measurements were not taken as part of this assessment). Evidence of the oysters having been opened using a knife or similar implement (as shown by 'V'- or 'W'-shaped notches on the shell margins) was noted on 28% of the valves. There was very little evidence of damage to the valves (e.g. polychaet worm burrows, dog whelk holes) or encrustation (e.g. by barnacles) by other marine biota. Some of the valves showed signs of having grown in a cramped environment—shells were distorted and, in a few cases, pairs of valves from different individuals had become wholly or partially fused. A few of the valves (from late medieval to early post-medieval deposits, Contexts 115, 162, 171, 179, 294, 310, 350, 390, 2057, 2071 and 2358) had roughly rectangular notches (and in two cases, Contexts 171 and 179, a rectangular hole) cut into them.

The other marine invertebrates represented are, with the exception of a single limpet (*Patella vulgata* L.) and four red whelks (*Neptunea antiqua* (L.)), edible species commonly occurring off the east coast of Britain. Some of the cockle shells (which were particularly well-preserved) showed signs of having been opened by humans. Mussel remains were present in small numbers in deposits from the late medieval to early post-medieval periods but were very poorly preserved.

The recovered land snails were all *Helix aspersa* Müller (the 'garden snail'); a highly eurytopic species of no value in interpreting ecological conditions on the site, beyond indicating the availability of at least modest amounts of calcium carbonate (probably provided by the decomposing shellfish remains).

Hand-collected vertebrate remains

Vertebrate material was recovered from 324 contexts, of which eight were unstratified or as yet unphased. Material was recorded in detail from 38 contexts, 24 from Area N (north of the sewer) and 14 from Area S (south of the sewer). These 38 contexts represent 13.5 of the 28 boxes of material; 7.25 from Area N and 6.25 from Area S. Table 11 shows the total number of contexts, and the number recorded, from each phase. Tables 12-16 show the total number of fragments and weights, number of measurable bones, mandibles with teeth *in situ*, and isolated teeth for each period. Tables 17 and 18 show the numbers of fragments by phase and Table 19 presents the number of measurable fragments, mandibles and teeth from the scanned material, by period.

A total of 5,447 fragments (weighing 71.3 kg) were recorded for this assessment of which 1,893 (weighing 37.2 kg) were identified to species.

Late medieval

A total of 968 (Table 12) fragments (of which 370 were identified to species) were recorded from this period, representing 11 contexts. Late medieval deposits produced 77 measurable bones, 28 mandibles with teeth *in situ*, and 24 isolated teeth.

Preservation of the material from this period was rather variable in most cases. A few poorly preserved

fragments were noted scattered throughout the assemblage, whilst the rest were recorded as good or fair. Colour was also variable, both within and between contexts, most contexts being either shades of brown or a mixture of brown and fawn. Fragments from the road deposits (Contexts 212 and 213) were rather more 'gingery' in colour and green discolouration (typical of copper alloy staining) was noted on a few bones from Context 216. Whilst the broken surfaces of many fragments were sharp, a varying proportion within some contexts were battered in appearance. This was particularly noticeable on material from Context 212 (described as a compacted dump in the road).

Fresh breakage and dog gnawing was observed in all contexts, but few bones were affected. Evidence of butchery was mostly not extensive, with the exception of Contexts 212 and 298, where butchered fragments represented 20-50% of the assemblages. Context 298 (a pit fill) also contained a number of scorched fragments and an ashy deposit coated the surface of many other fragments. These fragments suggest that the pit may have had hot ash/cinders deposited into it as well as bone debris. The presence of cess within deposit 322 (gully fill) was indicated by faecal concretions adhering to the surface of a number of the bones.

Of the major domesticates, cattle remains predominated, followed by caprovid and pig. Thirty-seven bird bones were recovered which were mainly chicken or unidentified shaft fragments. A single duck fragment from a 'mallard-size' bird was also identified, along with three geese fragments. Fish remains included Gadidae, ?ling (cf. *Molva molva* (L.)), and ?cod (cf. *Gadus morhua* L.) bones; a few of these fragments had been chopped.

Additional species noted from the scanned material (dated to this period) included fallow deer (*Dama dama* (L.)) from Context 251, and cat (Contexts 385, 406, and 415). An equid metacarpal recovered from Context 374 was extremely small in size and may represent a donkey rather than a pony. As horse and donkey bones are morphologically very similar, detailed measurements would need to be taken to aid identification. A further 121 measurable bones, 34 mandibles with teeth and 31 isolated teeth were counted.

Late medieval/early post-medieval

The vertebrate assemblage from this period, amounting to 513 identified and 966 unidentified fragments, represents 8 contexts from the area south of the sewer only. One hundred and thirty-four measurable bones, 23 mandibles and 51 isolated teeth were recorded.

As with material from the previous period, preservation was rather variable, although most of the bones were moderately well-preserved. Some fragments were again rather battered in appearance and colour was mostly brown or light brown. Ginger/brown fragments were noted in Contexts 2312 and 2313 (road deposits). Material from a single context (2313) showed a high degree of fragmentation.

A similar range of species to those identified for the late medieval period was recorded. Common domesticates were present, with cattle and caprovid remains making up the largest proportion of the material (Table 13). Single fragments of rabbit (*Oryctolagus cuniculus* (L.)) and cat were also recovered. Large fish remains were again noted, mainly representing Salmonidae and Gadidae.

Two contexts (2132 and 2137) contained fragments exhibiting rodent gnawing amongst the scanned material from this period. A single fallow deer (*Dama dama* (L.)) phalange from Context 2132 was also noted. An additional 62 bones were measurable, and an extra 20 mandibles with teeth and 28 isolated teeth were noted.

Early post-medieval

Only material from nine of the 43 deposits dated to this period was recorded in detail. Of a total of 1582 fragments, 435 were identified to species, 84 were measurable, 20 were mandibles with teeth *in situ* and 32 were isolated teeth.

Preservation was mainly variable, with only material from three contexts (162, 179 and 188) being recorded as 'fair'. On the whole, colour did not vary within contexts, being mostly fawn or light brown. Only bones from Context 180 showed a range of colours from light to dark brown. Varying numbers of battered fragments were noted from each context, with most noted from Contexts 64, 114 and 188. Additionally, bones from Contexts 171, 180, 181 and 188 showed a high degree of fragmentation. More than 50% of all fragments recovered from Context

181 were less than 5 cm in their greatest dimension. Evidence of butchery, particularly on cattle remains, was fairly extensive, with 20 - 50% of fragments, from five of the eight contexts, being affected.

The range of identified species is shown in Table 14, from which it can be seen that caprovid and cattle remains are again most numerous. Other species present included pig, chicken and goose, with small numbers of horse, cat, rabbit and duck remains. A single tibiotarsus was tentatively identified as a ?wader (Charadriidae).

Material from the scanned contexts contained a few additional bird species, including swan (*Cygnus* sp.) from Context 350, a small duck species (Context 38), raven (*Corvus corax* L.) (Context 141) and ?pheasant (cf. *Phasianus colchicus* L.) (Context 326). Context 38 also produced approximately 60 fish fragments, most representing the remains of a single haddock (*Melanogrammus aeglefinus* (L.)). In total 62 measurable bones, 11 mandibles with teeth *in situ* and 27 isolated teeth were recorded.

Post-medieval

A total of 885 fragments, representing six contexts, was examined. Three hundred and sixty-six fragments were identified to species, of which 87 were measurable and 10 were mandibles with teeth.

Much of the assemblage recorded for this period was reasonably well-preserved, although most contexts contained moderate quantities of bone fragments that were battered in appearance. Cess pit 111 contained seven bone bearing contexts of which material from two (115, 121) was examined in detail. Fragments with extremely rounded edges were noted in material from Context 121, whilst some of the bones from Context 115 were very poor and eroded. The preservation and angularity of the fragments suggests that much of the material may represent a primary deposit, with some reworked material incorporated into it. The range of skeletal elements suggested a mixture of primary butchery and domestic refuse. The nature of the vertebrate remains indicates that these deposits represent infilling of the pit rather than its primary function as a cess pit.

Most other pit fills (from this period) examined were similar in nature; i.e. slightly mixed preservation and a mixture of primary butchery and domestic

refuse. The material from pit fill 2194 was slightly different being more homogeneous than many contexts, perhaps indicating this was a primary deposit. Again, the range of skeletal elements suggests Context 2194 consisted chiefly of primary butchery waste.

Colour was mainly recorded as fawn or light brown; green stained fragments were observed from Context 115. Material from two contexts (70 and 137) was very fragmented, with more than 50% of all fragments being less than 5 cm in dimension.

Mammal species present (Table 15) included the major domesticates—cattle, caprovid, pig and horse. Of the 29 dog fragments recovered, 28 represented a semi-articulated dog fore limb. The radius and ulna, which had been separated from the rest of the foot but appear to be the same individual, showed chop marks on the shaft.

The range of bird species was similar to previous periods, but additionally fragments of ?buzzard (*Buteo buteo* (L.)), wader (Charadriidae) and ?rook/crow (Corvidae) were identified. Fish were also present and included the remains of Gadidae and ling (*Molva molva* (L.)). Chopped fish vertebrae were noted from Context 121.

In addition, the scanned material included a fallow deer calcaneum from Context 2124, and a thornback ray (*Raja clavata* L.) dermal denticle was identified from Context 165. A further 31 measurable bones, 5 mandibles with teeth and 9 isolated teeth were noted.

Late post-medieval

Material from four of the 14 contexts dated to this period, was recorded in detail. This amounted to 209 identified and 324 unidentified fragments (Table 16). Fifty-seven bones were measurable, of which 16 were mandibles with teeth *in situ* and 22 were isolated teeth.

Most bones were well-preserved, with only a few battered fragments apparent. Colour was mostly recorded as variable, ranging from fawn and light brown to ginger. Butchery evidence was fairly extensive, with 20-50% of fragments from two contexts (2061 and 2063) being affected. This included a small number of chopped and split sheep crania (from Context 2016). Twenty to 50% of

fragments from Contexts 28 and 2042 were less than 5 cm in dimension.

The small assemblage produced the usual domestic mammals, with slightly more caprovid fragments than cattle (Table 16). Chicken and geese remains were also recorded. A single fragment was thought to be marine mammal bone (Context 2063) but could not be identified to species. This particular fragment had been heavily chopped.

The scanned material included eight measurable bones and four isolated teeth.

Discussion and statement of potential

Sediment samples

The content of plant and invertebrate macrofossils in the samples examined ranged from a few grains of undiagnostic charcoal at one extreme to abundant and extremely well-preserved suites of remains at the other. The richer assemblages showed considerable potential for determining the nature of the material contributing to the deposits, and to some extent for reconstructing local environment. From this brief study it appears that stable manure may well have formed a good part of the organic fraction of these more richly organic deposits. Of the 18 GBA samples examined, four (from Contexts 136, 413, 2538, 2539) are worthy of further examination, suggesting that maybe one quarter to one fifth (i.e. about twenty-six samples from twelve contexts) of the GBA samples from this site would repay analysis. Additionally, it might be valuable to pursue the identification of the rush (*Juncus*) seeds from some of the deposits in which these were almost the only plant remains present, in order to check whether they are likely to have originated in a species used for flooring rather than simply being trampled onto the site on muddy feet.

The plant and invertebrate assemblages were broadly rather similar to material of late medieval date seen at other sites in this and other British towns, although such material has not been investigated as often as would be desirable. This is a period of great change both in urban conditions and in the rate of importation of new plants (and probably insects) to the British Isles (especially so in the case of a port like Hull), so that in addition to site reconstruction there are broader issues to be addressed. In this context, it is worth noting that, reflecting the pattern seen elsewhere, these late medieval deposits have yielded only one grain pest species, the grain weevil *Sitophilus granarius*. This is surmised to be a consequence of the difficulty of removing this beetle from grain, partly as a result of its relatively large size and partly because it develops inside grains.

Shell

Only the deposits of late medieval to early post-medieval date yielded shell assemblages of sufficient size to be of value.

The bias of the recovered shell towards edible taxa, together with the percentage of shells showing evidence of having been opened using tools, strongly suggests that these assemblages derive almost exclusively from human food waste. Only the oyster remains have potential for obtaining additional information of use in site interpretation.

From current evidence, the oysters could only have been imported to the site from the Kent, Essex or Suffolk coasts or the Firth of Clyde (Winder 1992 and pers. comm.). However, Kenward (1998) has speculated that exploitation of local (but as yet unlocated) oyster beds may well have been

more widespread along the east coast of England.

The distortion and whole or partial fusion of the valves of some of the recovered oyster shell was, perhaps, indicative of overcrowding in the bed(s). The lack of epibionts and (subjectively) small average size of the oyster remains suggests a poor environment and/or over-exploitation of this resource. The purpose of the rectangular 'slots' and holes cut into some of the oyster valves is unclear.

It seems likely that all of the remains of other edible marine taxa were also derived from human food waste—the extremely small number of non-edible species having been collected accidentally. All of these taxa are common off the coast of north eastern Britain today.

The land snail remains were of no interpretative value.

Vertebrate remains

Deposits from Blanket Row yielded moderately large assemblages of bone, the largest, and most useful, bodies of material being recovered from those of late medieval and early post-medieval date. The later post-medieval material (16th - 18th century) would prove useful if a slightly tighter dating framework could be achieved.

Variability of preservation, angularity and colour was observed within material from most deposits throughout the periods represented, possibly implying the presence of some redeposited or residual bone in varying amounts. Differences in context type or phase did not generally appear to reflect differences in preservation. However, material from road deposits, levelling

deposits and 'layers', generally had a slightly higher proportion of battered and rounded fragments suggesting a higher proportion of redeposited material may be present in these contexts.

A preliminary examination of body part representation for the major domestic species was undertaken. The skeletal elements for caprovid, cattle and pig were present in proportions that reflected the whole animal. No differences were discernable between the different periods. However, when the data was viewed by context type, differences were noted. Deposits associated with the road, for example, were chiefly comprised of primary butchery waste, whilst pit fills, on the whole, showed no such clear origin of material, containing both butchery waste and domestic refuse. More detailed examination of skeletal element representation might, therefore, throw some light on specific activities being undertaken in this area.

Approximately 25% of the identified fragments were measurable and these, along with the other 'A' bones, should contribute an important dataset for zooarchaeological interpretation. The transition from late medieval to early post-medieval traditions has been identified by English Heritage (1991, 37) as a research priority. The study of assemblages of this and later periods has been, until recently, largely neglected, leaving a gap in our knowledge at an important period of agricultural intensification. Biometrical data from this assemblage will produce information regarding changes in height and general body conformation and, therefore, might provide crucial evidence of early stock improvement.

Juvenile and immature cattle fragments were noted throughout the assemblages from all periods. However, the number of juvenile individuals appeared to increase marginally

from the early post-medieval period onwards. This increase has been noted at sites of post-medieval date (Albarella and Davis 1996; Dobney *et al.* 1996) and has been interpreted as evidence of dairying, with the consequent surplus of calves for veal. During this period, the demands of a rising population in the rapidly expanding urban centres, appeared to have instigated a shift towards the production of larger carcase animals and the culling of younger animals - the beginnings of the so called 'agricultural revolution'.

The sample residues produced a moderate-sized assemblage of fish bones indicating that both freshwater and marine resources were utilised. Preservation of this material was good, particularly those fragments recovered from Context 2376 (Samples 49 and 51), demonstrating that vertebrate remains are well-preserved in certain context types at this site and show some potential for further investigations of human activity. Well-dated fish assemblages have previously been recovered from Hull, but there are few good published accounts of this material.

This assemblage of vertebrate remains shows some potential for providing useful zooarchaeological and archaeological information. However, with the possibility that redeposited/residual material is present, further work on the pottery and other finds may be necessary to address the problems of residuality and to provide a more secure dating framework. This would need to be undertaken prior to further work on the vertebrate remains.

Recommendations

Sediment samples

The four samples which showed good preservation of delicate organic material should be submitted to detailed analysis of their plant and insect remains in order to investigate the source of dumped material, the depositional environment, and wider aspects of site economy and environment. The samples which were not examined during assessment should be inspected and those which, on the basis of their context type and lithology, are judged likely to yield useful assemblages should be processed, and any plant and insect remains recorded in detail if appropriate. An attempt should be made to identify the rush seeds from one or two of the samples in which these were the only identifiable plant remains recorded.

Shell

Some additional information on the effects of exploitation and selection on the oyster population may be gained by measurement of the valves (where possible).

A morphological investigation of the asymmetry and fusion recorded for some of the oyster valves might provide information regarding evidence for over-crowding in oyster beds. Such information will be of use in future synthetic studies of oyster shell assemblages.

Further investigation of the cut 'slots' and holes found in some of the oyster valves from late medieval to post-medieval deposits may be warranted to determine their function/purpose.

No further work is recommended on the marine taxa other than oyster.

No further work is recommended on the land snails.

Vertebrate remains

Age-at-death data should be recorded for the main domesticates from the late medieval and early post-medieval periods to further explore possible evidence for a shift towards intensification of agricultural practices involving urban meat supply and dairying.

Biometrical data for the major domesticates should be recorded to further investigate possible late medieval/early post-medieval evidence for early livestock improvement associated with the 'agricultural revolution'.

Late medieval and early post-medieval floor silts and road deposits should be processed and sorted for the recovery of fish bone and other useful bioindicator species. A number of the samples (Contexts 103 and 251), described by the excavator as 'layers' and processed during the assessment, showed potential for yielding fish bone. Larger quantities of sediment from these samples should also be processed. It was also felt that more material from cess pit 111 should be processed to recover more fish bone and what may be 'acid etched' fragments, with a view to confirming the function of the feature. None of the drain fills were targeted for assessment by the excavators, but these fills may be rich in small bones so these samples should also be investigated. The material recovered should then be selectively recorded (depending upon size of assemblage, range of species encountered and dating framework) following an agreed zooarchaeological protocol.

Retention and disposal

All of the current material should be retained pending further analysis.

Archive

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

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Table 1. Phases and dates for Blanket Row, Hull. ('Period' represents the combined groups used for the analysis, particularly of the vertebrate and hand-collected shell remains).

Phase	Date	Period	Notes
North			
1	Mid 14th C	Late medieval	

2	Mid- late 14th C	Late medieval	
3	Late 14th/early 15th C	Late medieval	
4	Late 15th/early 16th C	Early post-medieval	Corresponds to Phase 6, south of the sewer
5	16th - 18th C	Post-medieval	Corresponds to Phase 7, south of the sewer
6	18th C	Late post-medieval	Corresponds to Phase 8, south of the sewer
7	19th/20th C	Early modern	Corresponds to Phase 9, south of the sewer
South			
1	Early or mid 14th C	Late medieval	
2	Mid 14th C	Late medieval	
3	Late 14th C	Late medieval	
4	Early 15th C	Late medieval	Road surface
5	Early 15th C	Late medieval	Building 536
6	Late 15th/early 16th C	Early post-medieval	Corresponds to Phase 4, north of the sewer
7	16th - 18th C	Post-medieval	Corresponds to Phase 5, north of the sewer
8	18th C	Late post-medieval	Corresponds to Phase 6, north of the sewer
9	19th/20th C	Early modern	Corresponds to Phase 7, north of the sewer

Table 2. List of the sediment samples assessed from Blanket Row, Hull (with notes on their treatment).

Context no.	Sample no.	Phase	Context description	Sample type	Notes
103	9	3	Layer	GBA	2 kg to 300 µm, paraffin flot
136	4	5	Cess pit 111 fill	GBA	1 kg to 300 µm, paraffin flot
230	60	3	Layer	GBA	2 kg to 300 µm, paraffin flot
251	68	3	Layer	GBA	2 kg to 300 µm, paraffin flot
273	77	3	Pit 274 fill	GBA	2 kg to 300 µm, paraffin flot
298	95	2	Pit 299 fill	GBA	2 kg to 300 µm, paraffin flot
348	88	3	Privy 349 fill	GBA	2 kg to 300 µm, paraffin flot
382	113	1	Layer	GBA	2 kg to 300 µm, wet washover, dry residue
390	117	1	Gulley 394 fill	GBA	2 kg to 300 µm, wet washover, dry residue
413	118	1	Pit 414 fill	GBA	2 kg to 300 µm, paraffin flot
2280	34	3	Floor silts	GBA	2 kg to 300 µm, paraffin flot
2316	62	4	Road deposit	BS	16 kg (with 63) to 500 µm
2316	63	4	Road deposit	BS	16 kg (with 62) to 500 µm
2338	23	5/6	Floor silts	GBA	2 kg to 300 µm, paraffin flot
2353	11	5	Floor silts	GBA	2 kg to 300 µm, paraffin flot, dry residue
2354	18	5	Floor silts	GBA	2 kg to 300 µm, paraffin flot, dry residue
2376	49	3	Floor silts	BS	9 kg to 500 µm
2376	50	3	Floor silts	GBA	2 kg to 500 µm, paraffin flot
2376	51	3	Floor silts	BS	8 kg to 500 µm
2537	108	4	Organic layer	GBA	2 kg to 500 µm, paraffin flot, soaked in Sodium pyrophosphate to disaggregate the clay.
2538	105	1	Organic layer	GBA	2 kg to 500 µm, paraffin flot
2538	783	1	Organic material	SPOT	Microscopic examination
2539	110	1	Refuse pit 2542 fill	GBA	2 kg to 500 µm, paraffin flot

Table 3. Numbers of contexts containing hand-collected shell and, of those, numbers recorded, by phase for Blanket Row, Hull.

North of the Sewer		
Phase	No. of shell bearing contexts	No. contexts recorded
1	26	26
2	13	13
3	43	43
4	38	38
5	22	22
6	3	3
7	1	1
U/S	4	0
Total	150	146

South of the Sewer		
Phase	No. of shell bearing contexts	No. contexts recorded
1	1	1
2	0	0
3	10	10
4	13	13
5	1	1
5/6	62	62
6	1	1
7	2	2
8	6	6
9	5	5
U/S	0	0
Total	101	101

Table 4. Numbers of contexts containing hand-collected shell and, of those, numbers recorded by period for Blanket Row, Hull.

Period	North of sewer	South of sewer	No. of contexts recorded	Total
Late medieval	82	25	107	107
Late medieval/early post-medieval	0	62	62	62
Early post-medieval	38	1	39	39
Post-medieval	22	2	24	24
Late post-medieval	3	6	9	9
Early modern	1	5	6	6
Unstratified/unphased	4	0	0	4

Table 5. Hand-collected shell counts by phase for the area north of the Victorian sewer at Blanket Row, Hull. Counts for bivalve taxa are minimum numbers of whole valves. Counts for other taxa are minimum numbers of individuals.

Taxon	Phase							Total
	1	2	3	4	5	6	7	
Edible crab (<i>Cancer pagurus</i> L.)	3	-	-	-	-	-	-	3
Limpet (<i>Patella vulgata</i> L.)	-	-	-	1	-	-	-	1
Periwinkle (<i>Littorina littorea</i> (L.))	-	-	-	-	1	-	-	1
Whelk (<i>Buccinum undatum</i> (L.))	33	12	2	4	-	-	-	51
Red whelk (<i>Neptunea antiqua</i> (L.))	-	-	-	1	-	-	-	1
Mussel (<i>Mytilus edulis</i> L.)	12	20	13	51	15	-	1	112
Oyster (<i>Ostrea edulis</i> L.)	485	291	363	496	122	7	2	1766
Cockle (<i>Cerastoderma edule</i> (L.))	181	255	190	48	31	-	-	705
Total (marine taxa)	714	578	568	601	169	7	3	2640
<i>Helix</i> sp.	-	-	1	22	31	1	-	55
Total	714	578	569	623	200	8	3	2695

Table 6. Hand-collected shell counts by phase for the area south of the Victorian sewer at Blanket Row, Hull. Counts for bivalve taxa are minimum numbers of whole valves. Counts for other taxa are minimum numbers of individuals. Only one context was assigned specifically to Phase 6 and one context to Phase 5—both of these contexts have been included in the counts for Phase 5/6.

Taxon	Phase								Total
	1	2	3	4	5/6	7	8	9	
Whelk (<i>Buccinum undatum</i> (L.))	-	-	-	-	-	1	-	-	1
Red whelk (<i>Neptunea antiqua</i> (L.))	-	-	-	-	2	-	1	-	3
Mussel (<i>Mytilus edulis</i> L.)	1	-	3	2	59	2	-	1	68
Oyster (<i>Ostrea edulis</i> L.)	4	-	33	40	544	37	17	38	713
Cockle (<i>Cerastoderma edule</i> (L.))	-	-	7	6	29	6	-	2	50
Total (marine taxa)	5	-	43	48	634	46	18	41	835
<i>Helix</i> sp.	-	-	5	1	4	73	-	2	85
Total	5		48	49	638	119	18	43	920

Table 7. Hand-collected shell counts by period for the area north of the Victorian sewer at Blanket Row, Hull. Counts for bivalve taxa are minimum numbers of whole valves. Counts for other taxa are minimum numbers of individuals. Numbers in brackets after the period titles refer to the phases assigned to the period.

Taxon	Period					Total
	Late medieval (1-3)	Early post-medieval (4)	Post-medieval (5)	Late post-medieval (6)	Early modern (7)	
Edible crab (<i>Cancer pagurus</i> L.)	3	-	-	-	-	3
Limpet (<i>Patella vulgata</i> L.)	-	1	-	-	-	1
Periwinkle (<i>Littorina littorea</i> (L.))	-	-	1	-	-	1
Whelk (<i>Buccinum undatum</i> (L.))	47	4	-	-	-	51
Red whelk (<i>Neptunea antiqua</i> (L.))	-	1	-	-	-	1
Mussel (<i>Mytilus edulis</i> L.)	45	51	15	-	1	112
Oyster (<i>Ostrea edulis</i> L.)	1139	496	122	7	2	1766
Cockle (<i>Cerastoderma edule</i> (L.))	626	48	31	-	-	705
Total (marine taxa)	1860	601	169	7	3	2640
<i>Helix</i> sp.	1	22	31	1	-	55
Total	1861	623	200	8	3	2695

Table 8. Hand-collected shell counts by period for the area south of the Victorian sewer at Blanket Row, Hull. Counts for bivalve taxa are minimum numbers of whole valves. Counts for other taxa are minimum numbers of individuals. Numbers in brackets after the period titles refer to the phases assigned to the period. The context assigned specifically to Phase 5 has been included in the total for late medieval (Phases 1 to 5) and the context from Phase 6 has been included in the counts for late medieval/early post-medieval (Phase 5/6).

Taxon	Phase					Total
	Late medieval (1-5)	Late medieval/ Early post-medieval (5/6)	Post-medieval (7)	Late post-medieval (8)	Early modern (9)	
Whelk (<i>Buccinum undatum</i> (L.))	-	-	1	-	-	1
Red whelk (<i>Neptunea antiqua</i> (L.))	-	2	-	1	-	3
Mussel (<i>Mytilus edulis</i> L.)	6	59	2	-	1	68
Oyster (<i>Ostrea edulis</i> L.)	78	543	37	17	38	713
Cockle (<i>Cerastoderma edule</i> (L.))	13	29	6	-	2	50
Total (marine taxa)	97	633	46	18	41	835
<i>Helix</i> sp.	6	4	73	-	2	85
Total	103	637	119	18	43	920

Table 9. Hand-collected shell combined counts by period for both areas at Blanket Row, Hull. Counts for bivalve taxa are minimum numbers of whole valves. Counts for other taxa are minimum numbers of individuals. For the area south of the sewer: the context assigned specifically to Phase 5 has been included in the total for late medieval (Phases 1 to 5) and the two contexts from Phase 6 have been included in the counts for late medieval/early post-medieval (Phase 5/6).

Taxon	Period						Total
	Late medieval	Late medieval/early post-medieval	Early post-medieval	Post-medieval	Late post-medieval	Early modern	
Edible crab (<i>Cancer pagurus</i> L.)	3	-	-	-	-	-	3
Limpet (<i>Patella vulgata</i> L.)	-	-	1	-	-	-	1
Periwinkle (<i>Littorina littorea</i> (L.))	-	-	-	1	-	-	1
Whelk (<i>Buccinum undatum</i> (L.))	47	-	4	1	-	-	52
Red whelk (<i>Neptunea antiqua</i> (L.))	-	2	1	-	1	-	4
Mussel (<i>Mytilus edulis</i> L.)	51	59	51	17	-	2	180
Oyster (<i>Ostrea edulis</i> L.)	1217	543	496	159	24	40	2479
Cockle (<i>Cerastoderma edule</i> (L.))	639	29	48	37	-	2	755
Total (marine taxa)	1957	633	601	215	25	44	3475
<i>Helix</i> sp.	7	4	22	104	1	2	140
Total	1964	637	623	319	26	46	3615

Table 10. Additional notes on oyster valves from Blanket Row, Hull summarised by period. A '?' before numbers indicates possible numbers (e.g. '3(?4) = definitely 3, possibly 4, whereas '?3/4' = possibly 3, possibly 4). **Key:** 'Right valves' = number of right (or upper) valves; 'Left valves' = number of left (or lower) valves; 'Indet. valves' = number of valves of indeterminate side; 'Knife marks' = number of valves showing damage characteristic of the oyster having been opened using a knife or similar implement; 'Measurable?' = estimated number of valves intact enough to be measured; 'Worm burrows' = number of valves showing damage by polychaet worms; 'Barnacles' = number of valves with barnacles; 'Dog whelk' = number of valves showing damage from dog whelk boring.

Period	Right valves	Left valves	Indet. valves	Knife marks	Measurable ?	Worm burrows	Barnacles	Dog whelk
Late medieval	462	549	206	374	346	3(?4)	1(?2)	?2
Late medieval/early post-medieval	188	209	146	149	82	?3	-	?3/4
Early post-medieval	176	189	131	93	115	3(?6)	-	?2
Post-medieval	57	74	28	58	33	2	?1	-
Late post-medieval	10	10	4	6	3	-	-	-
Early modern	23	10	7	16	12	-	-	-
Total	916	1041	522	696	591	8(?15)	1(?3)	?7/8

Table 11. Numbers of contexts containing bone and, of those, numbers recorded, by phase for Blanket Row, Hull.

North of the Sewer		
Phase	No. of bone bearing contexts	No. contexts recorded
1	33	3
2	15	3
3	49	3
4	42	9
5	24	5
6	4	1
7	1	0
Total	168	24

South of the Sewer		
Phase	No. of bone bearing contexts	No. contexts recorded
1	1	1
2	3	0
3	24	0
4	17	1
5	2	0
5/6	79	8
6	2	0
7	3	1
8	10	3
9	7	0
Total	148	14

Table 12. The recorded vertebrate remains from late medieval contexts at Blanket Row, Hull. Key: meas= measurable; mand= mandible; frags= fragments. * = The number of teeth includes only those teeth of use in providing ageing or sexing information. ** = Weight represents all categories of unidentified material.

Species		No. meas	No. unfused	No. juvenile	No. mand	*No. teeth	Total no. frags	Weight (g)
Dog	<i>Canis f. domestic</i>	-	-	-	-	-	1	3
Pig	<i>Sus f. domestic</i>	5	8	1	-	-	29	561
Cattle	<i>Bos f. domestic</i>	16	10	4	9	14	167	6,350
Sheep/goat	Caprovid	16	-	-	19	10	79	1,137
Goat	<i>Capra f. domestic</i>	1	-	-	-	-	1	40
Sheep	<i>Ovis f. domestic</i>	32	-	-	-	-	33	436
Goose	<i>Anser sp.</i>	1	-	-	-	-	3	8
Duck	<i>Anas sp.</i>	1	-	-	-	-	1	2
Chicken	<i>Gallus f. domestic</i>	5	-	1	-	-	12	17
Bird		-	-	-	-	-	21	30
?Ling	cf. <i>Molva molva</i> (L.)	-	-	-	-	-	7	6
?Cod	cf. <i>Gadus morhua</i> L.	-	-	-	-	-	3	11
Gadid	Gadidae	-	-	-	-	-	3	12
Fish		-	-	-	-	-	8	12
Crab		-	-	-	-	-	2	7
Subtotal		77	18	6	28	24	370	8,632
Large mammal		-	-	-	-	-	345	**
Medium-sized mammal 1		-	-	-	-	-	253	7,046
Subtotal		-	-	-	-	-	598	7,046
Total		77	18	6	28	24	968	15,678

Table 13. The recorded vertebrate remains from late medieval/early post-medieval contexts at Blanket Row, Hull. Key: meas= measurable; mand= mandible; frags= fragments.* = The number of teeth includes only those teeth of use in providing ageing or sexing information. ** = Weight represents all categories of unidentified material. *** = Weights of these species incorporated into weight for 'Fish'.

Species		No. meas	No. unfused	No. juvenile	No. mand	*No. teeth	Total no. frags	Weight (g)
Rabbit	<i>Oryctolagus cuniculus</i> (L.)	-	1	-	-	-	1	1
Cat	<i>Felis f. domestic</i>	-	-	-	-	-	1	2
Pig	<i>Sus f. domestic</i>	3	12	-	-	1	26	380
Cattle	<i>Bos f. domestic</i>	58	10	1	7	26	214	7,089
Sheep/goat	Caprovid	35	6	1	16	24	188	1,731
Sheep	<i>Ovis f. domestic</i>	21	-	-	-	-	27	321
Goose	<i>Anser sp.</i>	7	-	-	-	-	13	32
Duck	<i>Anas sp.</i>	-	-	-	-	-	1	1
Chicken	<i>Gallus f. domestic</i>	10	-	1	-	-	12	19
Bird		-	-	-	-	-	16	6
?Salmonid	cf. Salmonidae	-	-	-	-	-	5	***
?Ling	cf. <i>Molva molva</i> (L.)	-	-	-	-	-	1	1
?Gadid	cf. Gadidae	-	-	-	-	-	1	***
Gadid	Gadidae	-	-	-	-	-	1	2
Fish		-	-	-	-	-	5	10
Crab		-	-	-	-	-	1	1
Subtotal		134	29	3	23	51	513	9,596
Large mammal		-	-	-	-	-	256	**
Medium-sized mammal 1		-	-	-	-	-	286	9,085
Unidentified		-	-	-	-	-	424	
Subtotal		-	-	-	-	-	966	9,085
Total		134	29	3	23	51	1,479	18,681

Table 14. The recorded vertebrate remains from early post-medieval contexts at Blanket Row, Hull. Key: meas= measurable; mand= mandible; frags= fragments. * = The number of teeth includes only those teeth of use in providing ageing or sexing information. ** = Weight represents all categories of unidentified material.

Species		No. meas	No. unfused	No. juvenile	No. mand	*No. teeth	Total no. frags	Weight (g)
Rabbit	<i>Oryctolagus cuniculus</i> (L.)	-	-	-	-	-	1	1
Cat	<i>Felis f. domestic</i>	2	2	-	1	-	7	16
Horse	<i>Equus f. domestic</i>	-	-	-	-	1	1	48
Pig	<i>Sus f. domestic</i>	3	13	-	2	1	19	503
Cattle	<i>Bos f. domestic</i>	11	9	7	1	14	155	4,616
Sheep/goat	Caprovid	18	6	1	16	16	149	1,457
Sheep	<i>Ovis f. domestic</i>	28	3	-	-	-	39	497
Goose	<i>Anser sp.</i>	6	-	-	-	-	15	47
Duck	<i>Anas sp.</i>	4	-	-	-	-	7	16
Chicken	<i>Gallus f. domestic</i>	11	-	-	-	-	19	41
?Wader	?Charadriidae	1	-	-	-	-	1	1
Bird		-	-	-	-	-	20	35
Fish		-	-	-	-	-	2	2
Subtotal		84	33	8	20	32	435	7,280
Large mammal		-	-	-	-	-	479	**
Medium-sized mammal 1		-	-	-	-	-	668	9,070
Subtotal		-	-	-	-	-	1,147	9,070
Total		84	33	8	20	32	1,582	16,350

Table 15. The recorded vertebrate remains from post-medieval contexts at Blanket Row, Hull. Key: meas= measurable; mand= mandible; frags= fragments. * = The number of teeth includes only those teeth of use in providing ageing or sexing information. ** = Weight represents all categories of unidentified material.

Species		No. meas	No. unfused	No. juvenile	No. mand	*No. teeth	Total no. frags	Weight (g)
Dog	<i>Canis f. domestic</i>	6	-	-	-	-	29	46
Horse	<i>Equus f. domestic</i>	-	1	-	-	-	3	114
Pig	<i>Sus f. domestic</i>	-	4	-	-	1	6	92
Cattle	<i>Bos f. domestic</i>	12	5	14	3	10	99	3,533
Sheep/goat	Caprovid	23	27	1	7	2	111	1,295
Sheep	<i>Ovis f. domestic</i>	34	8	-	-	-	49	702
Goose	<i>Anser sp.</i>	5	1	-	-	-	13	31
Duck	<i>Anas sp.</i>	1	-	-	-	-	1	2
Chicken	<i>Gallus f. domestic</i>	5	-	-	-	-	7	15
Wader	Charadriidae	1	-	-	-	-	1	1
?Buzzard	cf. <i>Buteo buteo</i> (L.)	-	-	-	-	-	1	1
?Corvid	Corvidae	-	-	-	-	-	1	1
Bird		-	-	-	-	-	13	14
?Ling	cf. <i>Molva molva</i> (L.)	-	-	-	-	-	3	7
Ling	<i>Molva molva</i> (L.)	-	-	-	-	-	3	9
Gadid	Gadidae	-	-	-	-	-	4	7
Fish		-	-	-	-	-	22	36
Subtotal		87	46	15	10	13	366	5,906
Large mammal		-	-	-	-	-	207	**
Medium-sized mammal 1		-	-	-	-	-	311	4,665
Medium-sized mammal 2		-	-	-	-	-	1	
Subtotal		-	-	-	-	-	519	4,665
Total		87	46	15	10	13	885	10,571

Table 16. The recorded vertebrate remains from late post-medieval contexts at Blanket Row, Hull. Key: meas= measurable; mand= mandible; frags= fragments. * = The number of teeth includes only those teeth of use in providing ageing or sexing information. ** = Weight represents all categories of unidentified material.

Species		No. meas	No. unfused	No. juvenile	No. mand	*No. teeth	Total no. frags	Weight (g)
?Marine mammal	?Cetacean	-	-	-	-	-	1	42
Pig	<i>Sus</i> f. domestic	-	3	4	2	1	9	190
Cattle	<i>Bos</i> f. domestic	18	8	4	2	2	83	4,353
Sheep/goat	Caprovid	18	4	1	12	19	83	1,027
Sheep	<i>Ovis</i> f. domestic	15	1	-	-	-	21	173
Goose	<i>Anser</i> sp.	1	-	-	-	-	3	10
Chicken	<i>Gallus</i> f. domestic	5	-	-	-	-	6	20
Bird		-	-	-	-	-	3	10
Subtotal		57	16	9	16	22	209	5,825
Large mammal		-	-	-	-	-	92	**
Medium-sized mammal 1		-	-	-	-	-	101	4,204
Unidentified		-	-	-	-	-	131	
Subtotal		-	-	-	-	-	324	4,204
Total		57	16	9	16	22	533	10,029

Table 17. Total numbers of recorded vertebrate remains by phase from contexts north of the sewer, Blanket Row, Hull.

Species		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Total
Rabbit	<i>Oryctolagus cuniculus</i> (L.)	-	-	-	1	-	-	1
Dog	<i>Canis</i> f. domestic	-	1	-	-	29	-	30
Cat	<i>Felis</i> f. domestic	-	-	-	7	-	-	7
Horse	<i>Equus</i> f. domestic	-	-	-	1	3	-	4
Pig	<i>Sus</i> f. domestic	8	14	4	19	5	2	52
Cattle	<i>Bos</i> f. domestic	40	63	41	155	59	-	358
Sheep/Goat	Caprovid	11	17	36	149	83	2	298
Goat	<i>Capra</i> f. domestic	-	1	-	-	-	-	1
Sheep	<i>Ovis</i> f. domestic	9	6	12	39	30	1	97
Goose	<i>Anser</i> sp.	-	1	2	15	9	-	27
Duck	<i>Anas</i> sp.	-	1	-	7	1	-	9
Chicken	<i>Gallus</i> f. domestic	2	1	8	19	5	2	37
?Wader	cf. Charadriidae	-	-	-	1	-	-	1
Wader	Charadriidae	-	-	-	-	1	-	1
?Buzzard	cf. <i>Buteo buteo</i>	-	-	-	-	1	-	1
?Corvid	?Corvidae	-	-	-	-	1	-	1
Bird		-	2	16	20	12	-	50
?Ling	cf. <i>Molva molva</i> (L.)	-	-	7	-	3	-	10
Ling	<i>Molva molva</i> (L.)	-	-	-	-	3	-	3
?Cod	cf. <i>Gadus morhua</i> L.	3	-	-	-	-	-	3
Gadid	Gadidae	2	1	-	-	4	-	7
Fish		4	4	-	2	22	-	32
Crab		1	1	-	-	-	-	2
Subtotal		80	113	126	435	271	7	1032
Large mammal		79	127	96	479	143	11	935
Medium sized mammal 1		55	65	107	668	258	21	1,174
Medium sized mammal 2		-	-	-	-	1	-	1
Subtotal		134	192	203	1147	402	32	2110
Total		214	305	329	1,582	673	39	3,142

No. of contexts recorded 3 3 3 9 5 1 24

Table 18. Total numbers of recorded vertebrate remains by phase from contexts south of the sewer, Blanket Row, Hull.

Species		Phase 1	Phase 4	Phase 5/6	Phase 7	Phase 8	Total
Rabbit	<i>Oryctolagus cuniculus</i> (L.)	-	-	1	-	-	1
?Marine mammal	?Cetacean	-	-	-	-	1	1
Cat	<i>Felis f. domestic</i>	-	-	1	-	-	1
Pig	<i>Sus f. domestic</i>	2	1	26	1	7	37
Cattle	<i>Bos f. domestic</i>	3	20	214	40	83	360
Sheep/Goat	Caprovid	7	8	188	28	81	312
Sheep	<i>Ovis f. domestic</i>	3	3	27	19	20	72
Goose	<i>Anser sp.</i>	-	-	13	4	3	20
Duck	<i>Anas sp.</i>	-	-	1	-	-	1
Chicken	<i>Gallus f. domestic</i>	-	1	12	2	4	19
Bird		-	3	16	1	3	23
?Salmonid	cf. Salmonidae	-	-	5	-	-	5
?Ling	cf. <i>Molva molva</i> (L.)	-	-	1	-	-	1
?Gadid	cf. Gadidae	-	-	1	-	-	1
Gadid	Gadidae	-	-	1	-	-	1
Fish		-	-	5	-	-	5
Crab		-	-	1	-	-	1
Subtotal		15	36	513	95	202	861
Large mammal		12	31	256	64	81	444
Medium sized mammal 1		7	19	286	53	80	445
Unidentified		-	-	424	-	131	555
Subtotal		19	50	966	117	292	1,444
Total		34	86	1,479	212	494	2,305
No. of contexts recorded		1	1	8	1	3	14

Table 19. The numbers of mandibles with teeth in situ, isolated teeth (providing ageing or sexing information) and measurable fragments from the scanned contexts, at Blanket Row, Hull.

Period	Measurable	Mandibles	Teeth
Late medieval	121	34	31
Late medieval/early post-medieval	62	20	28
Early post-medieval	62	11	27
Post-medieval	31	5	9
Late post-medieval	8	-	4
Early modern	12	2	7
Total	296	72	106