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**An assessment of biological remains from excavations at land north of the junction of Foredyke and River Hull, Kingswood, Kingston upon Hull (site code: FOR97)**

by

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**Summary**

*Eighty-three sediment samples, twenty boxes of hand-collected bone, two boxes of hand-collected shell and a single 'spot' sample, from deposits of Romano-British to post-medieval date, from deposits excavated at land north of the junction of Foredyke and River Hull, Kingswood, Kingston upon Hull, were submitted for an assessment of their potential for bioarchaeological analysis.*

*A 11th-13th century ditchfill gave a range of plants and invertebrates indicating rough ground with some taller herb vegetation, There was also a component of insects which originated in a building, presumably by dumping or via the outflow of an early garderobe.*

*The lower fill of a 14th-16th century garderobe contained food plants, some indication of waste ground vegetation, and lumps of fen peat. There were numerous mud rush, *Juncus gerardi*, fruits, perhaps from floor debris since 'house fauna' insects were abundant, but conceivably indicating flooding by brackish water. Other wetland biota were also present. The restricted nature of the house fauna suggested a building of good quality, fairly clean but a little damp. Eggs of parasitic worms were noted. The upper fill produced many of these elements.*

*A sample from the garderobe outflow produced food plants, aquatic and damp ground taxa, and a tall perennial herb assemblage indicating conditions nearby. House fauna was present.*

*An ash spread of 14th-16th century date was effectively barren of ancient biological remains, while a pit fill in an 'industrial building' yielded a few charred plant remains, including peas and beans. Another ash spread in this building gave rush seeds, perhaps from floor covering, but little else.*

*Vertebrate remains were not abundant, but included food debris and wild species.*

*Shellfish remains were thinly dispersed and often fragmentary.*

*This kind of material is not commonly encountered at rural sites and further analysis should be undertaken to provide information about the present site and data for future synthesis.*

**Keywords:** FOREDYKE; KINGSWOOD; KINGSTON UPON HULL; ASSESSMENT; MEDIEVAL; POST-MEDIEVAL; GARDEROBE; PLANT REMAINS; CHARRED PLANT REMAINS; PEAT; PHYTOLITHS; INVERTEBRATE REMAINS; DIATOMS; OSTRACODS; INTESTINAL PARASITE EGGS; *TRICHURIS*; INSECTS; FLY PUPARIA; SHELLFISH; TERRESTRIAL/FRESHWATER SNAILS; EGG SHELL; SHELL; BONE; MINERALISED REMAINS

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## **An assessment of biological remains from excavations at land north of the junction of Foredyke and River Hull, Kingswood, Kingston upon Hull (site code: FOR97)**

### **Introduction**

Excavations at Foredyke, Kingswood, Kingston upon Hull (NGR TA 8392 3960) undertaken in late 1997 by Humber Archaeology Partnership, revealed deposits of Romano-British to modern date which were extensively sampled. Eighty-three samples of sediment, twenty boxes of hand-collected bone, two boxes of hand-collected shell and a single spot sample from these deposits have been examined in various ways to evaluate their bioarchaeological potential.

Four phases of occupation have been identified (by the excavator) as listed below:

- Phase 1 - Romano-British
- Phase 2 - Medieval (11th - 13th centuries)
- Phase 3 - Late medieval - early post-medieval (14th - 16th centuries)
- Phase 4 - Post-medieval (17th century)

#### *Sediment samples*

All of the samples were examined in the laboratory to determine their gross nature and a selection chosen for closer inspection.

#### *Shell*

Shell (mostly shellfish) was recovered from a total of 105 contexts (2 boxes each of approximately 16.5 l). All of the phased material was scanned and identified where possible.

#### *Vertebrate remains*

Vertebrate material was recovered from a total of 233 contexts (20 boxes each of approximately 16.5 l). For the purposes of this assessment, material from 23 of these contexts (approximately 1/4 of the assemblage) was chosen mainly on the basis of number of fragments recovered (most contexts containing more than 50) and to provide a representative sample of all periods and feature types, based on information supplied by the excavator. Table 1 shows the proportion of material assessed from each phase.

### **Methods**

#### *Sediment samples*

Eighty-three samples of sediment (37 'GBAs' and 46 'BSs' *sensu* Dobney *et al.* 1992) were submitted (all from Trench 2). The samples were inspected in the laboratory and a description of their lithologies recorded using a standard *pro forma*. Subsamples of 1-2 kg were taken from six of the samples, and three samples were bulk sieved (to 500 µm), for extraction of macrofossil remains, following procedures of Kenward *et al.* (1980; 1986). The 'spot' sample, together with subsamples from two other samples (treat as 'spot' samples), were examined.

Two samples (31 and 33), from garderobe fills, were examined for the eggs of intestinal parasitic nematodes using the 'squash' method of Dainton (1992).

Plant macrofossils were examined from the residues, flots and washovers resulting from processing, and the flots and washovers were examined for invertebrate remains. The residues were sorted for bone, shell, larger plant macrofossils and artefacts. Artefacts were removed from the residues to be returned to the excavator.

### Shell

The shell assemblage was rapidly recorded. Notes were made on the state of preservation of the material. One group of unstratified material, seven of unknown phase and two listed as modern have not been recorded.

### Vertebrate remains

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

Identification was carried out using the reference collections of the Environmental Archaeology Unit. Records were made for each species within each of the selected contexts; which consisted of the total number of fragments, the number of each anatomical element present, along with the numbers of 'A' bones (Dobney *et al.* forthcoming) i.e. mandibular teeth and mandibles, measurable fragments, and unfused or juvenile bones.

Fragments not identifiable 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 (assumed to be dog, cat, hare or similar sized animal). In addition to counts of fragments, weights of identifiable species and unidentified categories were also recorded.

## Results

### *The sediment samples*

The results of the investigations are presented in context number order by phase with information provided by the excavator in brackets.

#### Phase 1 - Roman

**Context 171** [Ditch fill]  
Samples 35 and 37

These samples were examined and thought unlikely to yield useful quantities of biological remains. No further analysis was performed on the samples.

#### Phase 2 - medieval (11th to 13th century)

**Context 801** [Ditch fill]  
Sample 86 (2 kg paraffin flotation)

This sample was a mid orange-red very slightly sandy silt, described as a ditch fill and containing very rotted snail shell fragments, humified wood and charcoal. The deposit had a crumbly soft texture, turning sticky when wet. A 2 kg subsample produced a small flot amounting to c. 5% of the moderate-sized residue. The residue was processed for a washover with all of the available material passing into the stack of sieves.

A range of ten tall herb and rough ground species was noted in the flot (*Urtica dioica* L. (stinging nettle), *Carex* sp. (sedge), *Rumex* sp. (docks), *Stellaria media* (L.) Vill. (chickweed), *Atriplex* sp. (oraches), *Brassica* sp., *Conium maculatum* L. (hemlock), *Ranunculus sardous* Crantz (hairy buttercup), *Alliaria petiolata* (Bieb.) Cavara and Grande (garlic mustard), and *Reseda luteola* L. (dyer's rocket). This assemblage was accompanied

by *Salix* sp. (willows) fruits. The plant types present were typical of a nitrophile river bank or damp wayside habitat, tolerant to repeated flooding.

The insects from the flot fell into several groups: foul fauna (*Aphodius* dung beetles and some fly puparia); waterside (*Notaris acridulus* (Linnaeus), *Dryops* sp. *Cyphon* sp. and Saldidae sp.); aquatic (*Ochthebius* sp., Hydroptorinae sp. Corixidae sp. *Helophorus* spp.—ostracods were also present); house fauna (*Anobium* sp, *Lathridius minutus* group, *Mycetaea hirta* (Marshall), *Corticaria* sp. and *Blaps* sp., the last represented by a larval abdominal apex); outdoor ground dwellers (*Notiophilus* sp., *Pterostichus* sp., *Dyschirius* sp. and *Carabus* sp.); and plant feeders (Elateridae sp., *Chaetocnema concinna* (Marshall) and *Auchenorhyncha* sp.). These support the interpretation based on the plant macrofossils. The presence of a number of house fauna taxa in the assemblage may indicate that effluent from the garderobe reached this part of the ditch system either through drainage or dumping. This interpretation is supported by some of the plant components identified in the washover. In addition to the six insect groups outlined above, the flot contained a fragment of honey bee (*Apis mellifera* Linnaeus tarsal segment), and *Trechus micros* (Herbst), a subterranean species that lives in dark damp places such as drains. This taxon could be post-depositional.

Analysis of the washover produced further examples of all of the plant species noted above plus a number of interesting additional macrofossil components. Nodules of fen peat were noted, similar to those found in the garderobe fill discussed below, accompanied by wheat/rye bran and a single endocarp fragment from an apple. The latter is probably food waste but could conceivably have originated from a wild apple. Numerous worked wood chips were found in the coarsest fraction and probably represent dumping of domestic/industrial waste. *Cannabis sativa* L. (hemp) seeds were found in sufficient numbers to suggest that the ditch may have been used for hemp retting.

Two eel (*Anguilla anguilla* (L.)) vertebrae were recovered from the wet residue.

The biological remains from this sample are diverse and deserve to be studied further using larger subsamples in order to clarify their implications.

### Phase 3 - late medieval (14th to 16th century)

Samples 26, 31, 33 and 67 are associated with the garderobe feature—the first three being fills of the

garderobe itself and the last a fill of the outflow from the garderobe.

**Context 84** [Coal and ash spread from area north of the 'industrial building']

Sample 20 (2 kg washover and 26 kg bulk sieved)

A sample of ash of variable colour, ranging from orange to grey brown, with a crumbly texture containing clasts (to 100 mm) which disintegrated readily. A 2 kg subsample was processed to produce a moderate sized washover principally composed of disaggregated ash with frequent charcoal fragments. The sample also contained traces of well preserved herbaceous rootlets and shell fragments of the burrowing snail *Cecilioides acicula* (Müller). Both of these components are likely to be postdepositional and intrusive to the deposit.

The moderately large ashy residue from this 2 kg sample was examined wet and contained frequent fragments of charcoal to (1.5 mm). No further identifiable plant remains were noted.

The small bulk washover was mostly modern rootlets with some charcoal and small lumps of baked/burnt sediment (to 1 mm).

The medium-sized bulk residue was mostly undisaggregated lumps of baked/burnt sediment (to 40 mm) with coal and sand and a little stone, pot, bone and a few *C. acicula*. The bone component comprised a single caprovid scapula fragment, 18 unidentifiable mammal bone fragments and ten unidentifiable fish bones (weighing 7.4 g in total).

**Context 391** [upper garderobe fill]

Sample 31 (2 kg washover and 4 kg bulk sieved)

This sample consisted of a light to medium grey brown crumbly ( $\pm$  plastic) deposit containing eggshell, rare faecal concretions and rotted mortar. A 2 kg subsample was gently disaggregated and processed to provide a wet residue and washover.

The small washover, representing c. 5% of the volume of the residue, yielded numerous mud rush, *Juncus gerardi* Loisel., fruits. This may represent floor waste deposited as rubbish. It is interesting to note that this rush is usually a saltmarsh species though it does tolerate relatively fresh conditions. If the rush is local in origin it may indicate the presence of some marine influence in the adjacent river channel. Only a limited number of other fruits and seeds were noted, but these included fig (*Ficus carica* L.).

Insect remains were fairly abundant in the flot but strongly decayed to an orange colour and often fragmentary and difficult to recognise. Species present included *Bruchus* sp. (single head), some species of which are bean weevils, and which may have passed through the gut of a human since this sample is a faecal association. The woodworm, *Anobium punctatum* (Degeer) and abundant *Tipnus unicolor* (Piller and Mitterpacher) were present. This restricted beetle fauna is reminiscent of ones seen elsewhere such as at Coffee Yard (Robertson *et al.* 1989) and Swinegate, York (Carrott *et al.* 1994a). There is a possibility that the abundance of *Tipnus unicolor* is the result of differential preservation of a species resilient to decay. Even so it still seems highly likely that the fauna was originally strongly synanthropic and from a good quality, or at least, a fairly clean building that was slightly damp in places.

The bulk washover was composed of ash, coarse sand, charcoal and poorly preserved herbaceous detritus, which was probably deposited in the garderobe as rubbish.

The moderate-sized residue from bulk sieving contained further coal, a significant quantity of ash, sand and faecal concretion. Frequent mineralised fly puparia were also present though no more plant remains were recovered. The absence of bone was notable.

The microfossil 'squash' was mostly inorganic but with appreciable amounts of organic detritus, some phytoliths, a few diatoms and two poorly preserved whipworm eggs (*Trichuris*, a gut parasite of mammals including humans). These last were pale and distorted and both were missing their polar plugs. If typical of eggs in the deposit, they did not auger well for identification to species using measurements.

It would be worth recording a larger subsample from this context to confirm the impression gained from this preliminary analysis and to provide data for synthesis.

#### **Context 394** [lower garderobe fill]

Preliminary visual examination of samples 26 and 33 suggested that they differed, at least in their physical characteristics, and so subsamples of each were processed.

Sample 26 (2 kg paraffin flotation and 28 kg bulk sieved)

The sample was a moderately humic, layered grey-brown deposit containing some silt and amorphous organic material. Occasional more humic lumps were noted within the generally brittle, crumbly matrix. A 2 kg subsample was processed, producing a flot, washover and residue all of which were examined wet.

The small flot produced a limited range of seeds including fig and strawberry (*Fragaria*) as well as tall perennial herb species such as *Conium maculatum* L., and *Brassica* sp. The moderate-sized washover contained numerous fine herbaceous rootlets and frequent seeds of the mud rush (*Juncus gerardi*). *Daphnia* ephippia were also present. The insect assemblage from the flot was very similar to that described for Sample 26 and contained the same distinctive ecological components.

The moderate-sized residue contained frequent lumps of fen peat, mortar, charcoal, ash and glassy slag. Further fig and strawberry seeds were identified and a range of aquatic and fen species including *Menyanthes trifoliata* L. (bogbean) and *Ranunculus* Subgenus *Batrachium* type; *Daphnia* was also present. The assessment suggest that the biological assemblage from this sample is similar to that described for Sample 26, although obvious pieces of faecal concretion were not observed. Sample 33 also contained mineralised ostracods which suggest at least some flooding of the garderobe pit. The presence of infrequent *Sphagnum imbricatum* var. *austinii* (bog moss) leaves and fragments of corncockle (*Agrostemma githago* L.) are also of interest (see discussion).

The small washover from the bulk subsample was mostly of modern rootlets, with a little charcoal.

The medium-sized bulk residue was mostly wood and twigs with a little stone, sand, ?brick/tile, pot, slag, cinder, mortar/plaster, charcoal, fruit stones, fen peat, bone, cockle (*Cardium* sp., two fragments), mineralised fly puparia and unidentified ?metal objects. Table 7 gives the numbers of bone fragments (by species) recovered from the partly sorted residue. Twelve of the mammal fragments were burnt. Acid etching was noted on several mammal and bird fragments and a single fish vertebra was squashed, perhaps by chewing. In total the bone fragments weighed 31.7g.

Sample 33 (1 kg paraffin flotation)

A very humic, moist, amorphous organic sediment containing fine herbaceous detritus and described as a garderobe pit fill. The deposit was dark brown

with some lighter coloured inclusions of sand/silt and had a layered, brittle texture. A subsample of 1 kg was processed and the resulting flots, washover and residue were analysed wet. The flots contained a range of fruits and seeds from wild communities and two definite food species, strawberry (*Fragaria*) and fig (*Ficus carica* L.). This rather unusual assemblage included species from wet fen/pool habitats (eg. *Menyanthes trifoliata*, *Mentha aquatica* L. (water mint) and *Phragmites australis* (Cav.) Trin. ex Steudel (common reed), and *Potamogeton* sp. (pondweeds)) and the perennial tall herb species present were in keeping with river bank or damp wayside vegetation.

The invertebrate component of the flots included numerous fly puparia and beetles degraded to an orange brown colour but with surfaces remaining in good condition. The remaining taxa fell into four distinct groups; house fauna (*Tipnus unicolor*, *Lathridius minutus* group, *Ptinus* sp., *Corticaria* sp., *Xylodromus ?concinnus*, *Atomaria* sp. and *Cryptophagus* sp.); aquatic or waterside species (*Daphnia*, *Notaris ?acridulus*, *Colymbetini* sp., *Lesteva* sp., *Ochthebius* sp., Hydroporinae sp., *Carpelimus ?elongatulus* (Erichson) and *Bembidion ?stomoides* Dejean); plant feeders (*Phyllotreta* sp., *Longitarsus* sp. and *Apion* sp.); and foul decaying matter fauna (fly puparia, *Aphodius* sp., *Omalium* sp. and *Cercyon* sp.). Thus, both the plant and insect assemblages indicate indoor waste and a wild aquatic component. The reason for the presence of this mixed assemblage may be explained by the components of the washover and the residue, reported below.

The washover contained a limited amount of faecal material (with eggs of the whipworm *Trichuris* revealed by a 'squash', and fly puparia), though a proportion of the very finely comminuted organic material may also have been faecal in origin. Other food remains present included fig seeds (*Ficus carica*) and a trace of wheat/rye bran (to 1 mm). However, the dominant fraction of the washover and the residue consisted of nodules of fen peat, containing numerous sedge rootlets (*Carex* sp.), frequent fragments of common reed epidermis (*Phragmites australis*), bog bean seeds (*Menyanthes trifoliata*), rush seeds (*Juncus* sp.) and degraded wood fragments. The peat deposit would not have developed *in situ* and therefore must represent dumping. The presence of fen peat in the sample accounts for the mixture of aquatic and faecal remains noted in the flots. The reason for the presence of the peat is discussed below.

The microfossil 'squash' was mostly organic detritus with a few phytoliths and fungal hyphae.

Six, well-preserved *Trichuris* eggs were noted. Measurements of a statistically valid number of the eggs (a minimum of thirty) might allow these to be identified to species. *Trichuris* eggs were also recorded from squashes performed on small nodules of undisaggregated organic sediment from the residue.

The material from this garderobe pit sample is interesting and rather unusual, deserving further study, particularly since the archaeological context is well understood.

**Context 589** [Pit fill in 'industrial building']  
Sample 52 (SPOT sample)

Black and red crumbly ?ash deposit with lumps of bright red ?burnt soil to 50 mm. A 0.25 kg subsample was gently disaggregated, a washover taken, and the washover and residue dried. The washover, which formed about one-eighth of the total volume of the modest-sized residue, consisted mainly of charred herbaceous material (there was no wood charcoal apart from one or two small twig fragments less than 5 mm in diameter) with a little cinder to 15 mm. The herbaceous charcoal probably included grass and cereal straw culm fragments though there were also some coarse fragments of charred stem from one or more dicotyledons. A few charred seeds were present, most conspicuously several of field bean (*Vicia faba* ssp. *minor*) and at least one fragment (testa with hilum) of pea (*Pisum sativum*). Otherwise there were only a few charred seeds of wild plants of no interpretative value. The very few fragments of whitish ?silicified plant material contained no identifiable components. The only other biological remains in the washover, apart from some modern roots, were shells of the burrowing snail *Cecilioides acicula*, no doubt another post-depositional component. The residue comprised red and grey burnt clay soil in lumps up to about 25 mm.

**Context 638** [Fill of garderobe outflow]  
Sample 67 (2 kg paraffin flotation)

A mid grey-brown sediment with a slightly sticky, crumbly texture, containing white flecks of rotted mortar and traces of twigs and wood. Two kilograms of the sample, described as a garderobe outflow fill were processed, yielding a small flots and a moderately large residue.

The flots contained food remains including a plum stone (*Prunus domestica* var. *insititia* (L.) C. K. Schneider) and strawberry and fig seeds. No bran

fragments were encountered. In addition to the food plant species, a wide range of tall perennial herb taxa were noted which may have been living in or on the banks of the outflow. Many of the species recorded presently occupy damp verge or riverbank habitats. Alternatively some of the plant remains could have been transported to the deposition site in water flowing up the ditch system from the river. Aquatic and damp ground taxa encountered in the sample include *Oenanthe aquatica* (L.) (water dropwort), *Juncus* sp., *Sphagnum* sect. *Subsecunda* and *Ranunculus* Subgenus *Batrachium*. The tall perennial herb assemblage included burdock (*Arctium* sp.), hemlock (*Conium maculatum*) stinging nettle (*Urtica dioica*), thistles (*Carduus* sp./*Cirsium* sp.), carrot (*Daucus carota* L.) and dock or sorrel (*Rumex* sp.). This wayside assemblage reflects a moderate degree of disturbance to the local vegetation though not to the extent that large areas of trampled bare ground were present adjacent to the sampling point. Other plant taxa found in the flot include *Lapsana communis* L. (nipplewort), which is indicative of cultivated ground, fragments of corncockle (*Agrostemma githago* L.), a weed of cereal crops and stinking mayweed (*Anthemis cotula* L.) which is a common archaeological weed of cornfields on heavy clay soils.

The insects from this sample were abundant and in rather good condition. Six components were recognised: house fauna (*Anobium punctatum*, *Tipnus unicolor*, *Ptinus* sp., *Cryptophagus scutellatus* Newman, *Corticaria* sp., *Atomaria* sp., *Xylodromus concinnus*, *Lathridius minutus* group); aquatic taxa (*Helophorus* spp. and *Colymbetes* sp.—*Daphnia* was also present); waterside taxa (*Lesteva* sp., *Bembidion* sp. and *Donaciinae* sp.); foul decomposers (fly puparia, *Aphodius* spp. and *Anotylus sculpturatus* group); plant feeders (*Elateridae* sp., *Longitarsus* sp. and *Cidnorhinus quadrimaculatus* (Linnaeus)); and other outdoor species (*Trechus quadristriatus* or *obtusus* and *Staphylinus* sp.). The insect assemblage thus contained strongly synanthropic and outdoor components. The records from the plants and insects appear to agree in indicating that the sampled feature contained foul domestic waste and was located outdoors in close proximity to perennial bankside and aquatic vegetation.

The residue contained a similar range of plant taxa to that found in the flot. In addition the residue contained nodules of peat to 15 mm of the same type as those found in context 394 (samples 26/T and 33/T), and numerous worked wood chips. Fifty to sixty percent of the residue was inorganic, being composed of angular oolitic limestone fragments

and concreted sediment. The concreted sediment may represent the formation of a pan rather than 'faecal concretion'.

This context deserves further study through larger subsamples.

**Context 785** [Ash spread in 'industrial building']  
Sample 81 (2 kg washover)

This grey-brown sample, contained some ash and coal within a clayey silt matrix. The deposit was soft and sticky when wet and displayed a layered structure. A 2 kg subsample was processed and produced a small washover representing less than 5% of the volume of the moderate-sized residue. The washover was composed of ash, coal and charcoal, coarse sand and a few infrequent wild weed taxa of no interpretative value. Rush seeds (*Juncus* sp.) were frequent and may represent the remains of floor covering. The only other biological remains were modern rootlets, shells of the burrowing snail *Cecilioides acicula*, and a very limited range of insects. The sample contained a complete centipede which was definitely modern, the head of a beetle larva (?modern) and earth worm egg capsules which may have been intrusive. Other beetle species present included *Megasternum obscurum* (Marsham) and *Enicmus* sp. both of which were represented by single elytra. The elytra, though oxidised, were in very good condition and may also be modern.

The residue was principally ash and coal with some fine to coarse sand, silt and occasional pieces of bright orange burnt clay. No further plant remains were record. Several *Cecilioides acicula* shells were noted.

#### Phase 4 - post medieval (17th century)

**Context 409** [Ash spread in 'industrial building']  
Sample 34 (SPOT sample)

A small sample of the finely laminated whitish compacted ash from this sample (ranging in colour from grey-brown to yellowish- and greyish-white with black charcoal flecks) was examined under the binocular microscope. No identifiable plant remains were present, though it is possible that disaggregation of a larger sample would have revealed the presence of charred and perhaps also silicified remains.

A single bird fragment, two mammal and four fish fragments (weighing 0.3g) were recovered from the

residue.

### *Shell*

The 97 contexts examined produced 458 shell fragments of greater than 20 mm in largest dimension together with very many smaller fragments. Preservation ranged from fair to very poor—some contexts contained almost complete shells (though even these were partly rotted and pitted), while others yielded only very rotted unidentifiable fragments.

Most of the recovered shell was oyster (*Ostrea edulis* L.) valves or fragments of valves from Phase 3 (late medieval-early post-medieval (14th-16th centuries)) and Phase 4 (post-medieval (17th century)). Fragment counts by phase are given in Table 9.

### *The hand-collected vertebrate remains*

Deposits from the 23 contexts examined (Table 2) contained a total of 2098 bone fragments (weighing 40.02 kg) of which 871 (weighing 26.47 kg) were identifiable to species. Overall, preservation was variable, mostly being described as a mixture of 'good' or 'fair'. The appearance of broken surfaces ('angularity') was described as 'variable', with most contexts recorded as a mixture of 'spiky', and 'battered'. Colour was more variable than the other two preservation factors. Only eight contexts could be described as 'brown' or 'dark brown', the remaining 15 containing fragments ranging in colour from fawn to brown.

Fragmentation was not great, with more than half the fragments in most contexts being between 5 and 20 cm in any one dimension. Most contexts showed limited evidence of dog gnawing and butchery. Bones from three contexts (7, 171 and 386) showed evidence of burning but only affecting less than 10 % of fragments. Fresh breakage was evident in material from all except two contexts, mostly less than 10 % of fragments were affected, but in two contexts (421 and 632) a larger proportion of the material was affected.

#### **Phase 1**

Bones from three contexts out of six were examined, representing almost all the material from this phase. Table 3 gives the number of fragments for each of the species for the hand-collected assemblage, along with the number of 'A' bones

from this phase. The 'A' bones are those that would yield information on age at death and size, should further work be carried out.

The species identified from this phase included horse (*Equus* f. domestic), cow (*Bos* f. domestic) and sheep/goat (caprovid) with cattle being the most numerous. No interpretation of the skeletal element representation was possible in view of the small number of identifiable fragments. Three mandibles and a single measurable fragment were also recorded.

The remaining small proportion of material, which was rapidly scanned, contained a further single measurable fragment.

#### **Phase 2**

Material from four contexts of fifteen was examined, representing approximately two thirds of the material from this phase. Table 4 gives the number of fragments for each of the species for the hand-collected assemblage in addition to the number of 'A' bones from this phase.

The main domestic species (pig, cattle and sheep/goat) are represented in this phase, along with a single fragment of goose (*Anser* sp.). Cattle were once again the predominant species. As with Phase 1, the assemblage of identifiable fragments was too small for any significant interpretation of skeletal element representation, but the cattle elements may indicate primary butchery waste.

Nine measurable fragments were recorded along with seven subadult bones, five mandibles and two loose teeth.

The remaining third of the material from this phase, which was rapidly scanned, appears to be very similar and contains a further two measurable fragments, two mandibles and a few teeth.

#### **Phase 3**

Bones from only thirteen contexts of 135 were examined, representing approximately one quarter of the material from this phase. In addition a single context (of seven) from phase 3/4, was examined and incorporated into Phase 3. Table 5 gives the number of fragments for each of the species for the hand-collected assemblage along with the number of 'A' bones from this phase.

As in Phase 2, the main domestic species were all represented but cattle (*Bos* f. domestic) and sheep/goat (caprovid) were present in similar



proportions. Horse (*Equus f. domestic*) and chicken (*Gallus f. domestic*) fragments were also reasonably well represented. The 'bird' fragments are also probably chicken but were too juvenile to be identified with any certainty. Other mammal species present included hare (*Lepus sp.*), dog (*Canis f. domestic*) and cat (*Felis f. domestic*), whilst birds were represented by goose (*Anser sp.*), duck (*Anas sp.*) and pigeon (Columbidae). A single fish fragment was recovered from Phase 3 deposits.

Although no measurements were taken for this assessment, the large size of the dog remains was noticeable. Of the five fragments from Phase 3, one represented a medium sized dog, but the rest were from individuals of greyhound size (or larger) and more robust. The three fragments from Phase 4 were also from individuals of similar conformation.

There were sufficient identifiable fragments from Phase 3 deposits for a pattern to emerge from the skeletal element representation (Table 7). The cattle bones appeared to represent mostly primary butchery waste, whereas the caprovid remains indicated a mixture of primary butchery and food waste. The pig fragments also indicated a similar mixture of butchery and domestic refuse.

Most of the Phase 3 vertebrate remains were recovered from the garderobe and its outflow ditch, and from the yard to the north of the industrial building. When the species and element representations were examined from these areas, the picture was similar in both areas and to the site as a whole. This suggests that little evidence can be gleaned from the vertebrate remains for any specific activities in these areas.

The remaining material from 122 (mostly small) contexts was rapidly scanned to estimate their potential. It is anticipated that the scanned material would include approximately 190 further 'A' bones.

#### Phase 4

Material from two contexts of 51 was examined, representing about one third of the material from this phase. Table 4 gives the number of fragments for each of the species for the hand-collected assemblage along with the number of 'A' bones from this phase.

As for Phases 2 and 3, the main domestic species were all represented, with cattle (*Bos f. domestic*) again predominant. Other mammal species present were water vole (*Arvicola terrestris* (L.)) and dog (*Canis f. domestic*), whilst the bird species present were goose (*Anser sp.*), duck (*Anas sp.*), chicken

(*Gallus f. domestic*) and ?moorhen (cf. *Gallinula chloropus* L.).

There were sufficient identifiable fragments for a limited interpretation of skeletal element representation. Both cattle and caprovid remains appear to indicate primary butchery waste, although the numbers are considerably smaller than those available for Phase 3.

The presence of water vole in deposits within the feature described as a drain, on a site next to the River Hull, is hardly surprising. However, since water voles burrow these may be intrusive remains. The presence of other species associated with water (?moorhen, goose and duck) may also be explained by the proximity of the site to the River.

The remaining material from 49 (mostly small) contexts was rapidly scanned to estimate their potential. It is anticipated that the scanned material would include approximately 35 further 'A' bones.

The bones recovered from the sediment samples are detailed, together with the other components of the samples, in the preceding section.

## Discussion and statement of potential

### *Sediment samples*

Isolated rural archaeological sites with well preserved waterlogged deposits are rare. Organic remains are often severely damaged or obliterated after land drainage, or were never preserved because initial conditions were unsuitable. For this reason the garderobe and ditch fills from Foredyke represent an important and interesting record of medieval rural occupation. The lower garderobe deposits were very rich in organic matter and represent a phase when the facility was in regular use. As with other garderobes the samples show that many different types of waste were deposited, including sticks, stones, rushes and ash. The latter may perhaps have been used to seal the upper surface of the fill at intervals. The identification of numerous nodules of fen peat in the garderobe is more unusual. It may represent further dumping of

household rubbish. Well humified fen peat could be used as fuel, but there is no evidence to suggest that the nodules represent partly burnt fuel from a hearth since none of the constituent herbaceous material displayed any charring. A second possibility is that the peat was used as an absorbent floor covering in a similar manner to reeds and rushes, although it might be argued that this use would not favour the preservation of sizable peat nodules.

The sample from the upper garderobe fill contained less organic material and a higher proportion of ash and other waste, possibly reflecting a period of abandonment or less frequent use as a garderobe—or even differential decay in a better-drained deposit. The continued presence of small traces of faecal material in this level could result from flooding of the pit as water backed up the drainage system from the river at intervals. This might cause lighter material, such as gut parasite eggs, to float and be redeposited on the upper surface of the fill.

All of the indoor garderobe and outdoor pit fill samples produced a mixed insect assemblage that contained both house and foul-matter fauna, and outdoor aquatic and waterside components. However, the indoor garderobe samples had a greater abundance of house/foul taxa, as might be expected. The plant recovered from the organic-rich samples displayed a similar set of mixed assemblages containing both faecal and household waste and wild aquatic/fen/bankside taxa. Similarly, domestic waste was more abundant in the indoor samples whilst wild taxa were best represented in the open ditch. The presence of aquatic and waterside beetles, ostracods, diatoms and plants in the garderobe strongly indicates that the pit was flooded by water backing up the ditch system. Whilst diatoms could have been

introduced in reed or rush material thrown into the garderobe as rubbish, or in waste water, ostracods are much more likely to have entered the pit in flood water. The flooding could have been deliberately undertaken to flush the garderobe as appeared to be the case for the reredorter at St John's Hospital, Canterbury (Carrott *et al.* 1994b). Alternatively, the flushing may have been an unintended consequence of water backing up against tidal flow in the river. The fen taxa found in the garderobe samples are clearly associated with the numerous peat nodules described previously. The peat was probably of local origin in view of evidence from Roman deposits at nearby Gibraltar Farm (Carrott *et al.* 1998).

The presence of faecal material, food remains and house insect fauna in the outflow clearly represents discharge from the garderobe. Similar remains in the second open ditch, (Context 801, Sample 86), which displayed evidence for retting of hemp, may have resulted from direct deposition.

The biological samples from Foredyke are notable because they contained no evidence for the presence of grain pests or whole grain. This is unusual for a medieval site with anoxic preservation. The only cereal remains found were very small bran fragments accompanied by small pieces of corncockle seeds. This suggests that any cereal production and storage was located well away from the site, which only received milled, relatively clean flour or possibly baked bread. It would be interesting to extract insects from unsieved sediments to determine whether milled fragments of grain pests are present.

The insect assemblages also lack any communities typical of manure. In fact the site appears to have been remarkably free of organic rubbish, other than the effluent

from the garderobe. The garderobe building lacks any evidence for human fleas or lice, but this may be an artifact of differential preservation. Further work to investigate this aspect of the site might be rewarding.

The occurrence of two species of flightless synanthropic beetle, the churchyard beetle (*Blaps* sp.) and spider beetle (*Tipnus unicolor*) in an isolated rural location is notable. *Blaps* sp. and *T. unicolor* are probably dependent upon humans for distant transport. The arrival of these beetles at an occupation site is a chance event. The presence of both species at Foredyke, together with a few other characteristic synanthropes, probably reflects a long period of occupation.

The vertebrate remains from the bulk residue from Sample 26 (Context 394), whilst not numerous, were of some interpretative significance. The presence of acid etching (caused by passing through the digestive tract) and a single squashed fish vertebra is indicative of faecal material (as might be expected in the fill of a garderobe). However, the larger fragments of mammal bone suggest that domestic waste was also disposed of in the pit. The presence of amphibian and small mammal remains (obviously not food waste), and the larger mammal fragments, might suggest that the feature may not have been in use as a garderobe while Context 394 was being deposited, although the small vertebrates may have strayed in through the outflow channel while the pit was still functional.

### *Shell*

Marine shell (mostly of oyster) was thinly distributed through ninety-seven phased contexts—mostly Phase 3 (62 contexts) and Phase 4 (25 contexts). At first sight, the concentrations seem too low to imply

large-scale importation to the site (one might expect at least occasional larger concentrations from dumping of food waste), so that casual utilisation might be assumed. However, the nearest known oyster beds are located off the Kent, Essex and Suffolk coasts or in the Clyde estuary (Winder 1992 and pers. comm.). If the oysters were imported to the site then it seems likely that originally larger assemblages have rotted, leaving only the relatively few remains that were recovered (the more intact remains are mostly large, robust shells—large oyster valves and whelks, and there are many unidentifiable small fragments of shell (less than 20 mm in greatest dimension) throughout the assemblage). It is possible, however, that oyster beds existed more locally (Kenward, forthcoming). The other taxa noted are all commonly occurring along the adjoining coast today (MacMillan 1968).

A very few terrestrial and ?freshwater (?planorbid) snail shells were recovered. None of these were identifiable to species and hence are of no interpretative value.

Small numbers of fragments of eggshell were recovered from five contexts—in the hand-collected material from Contexts 47, 392, 766 and 839 and as a 'spot' sample from Context 258. In addition, eggshell was seen in Context 391.

Taken in isolation the shell assemblage is of no further interpretative value but may be of use should more general, synthetic studies by region or period be undertaken in the future.

### *Hand-collected vertebrate remains*

The assemblages from Phases 1 and 2 are too small to provide further useful interpretation. However, a basic archive of this material should be made, as this would

provide useful comparative data. Further, more detailed recording and analysis of material from phases 3, 3/4 and 4 may provide limited information, primarily relating to rubbish disposal on the site. The presence of what appears to be faecal material and domestic rubbish in the garderobe and outflow ditch may show some evidence of both its primary and secondary use.

Historical sources describe a managed fishery and 'fish-house' within the general area of the excavated site. However, the few fish remains recovered are not sufficient evidence for large-scale fish exploitation, and do not indicate any activities such as fish farming or processing being undertaken at the site.

Although only limited information can be gained from the bones regarding activities on the site, there are reasonable quantities of 'A' bones from Phases 3, 3/4 and 4 which could provide a limited but significant data set. Biometrical data from these phases may add useful information with which to address the question of early improvements in livestock associated with the Agricultural Revolution.

The medieval - post-medieval transition has been highlighted by English Heritage (1991) as an area of high academic priority but little work has previously been undertaken on rural medieval and post-medieval material in this area. Several sites within the region may be of use for comparative purposes. These include Lurk Lane and Eastgate, Beverley (Scott 1991, 1992), Dominican Friary (Gilchrist 1996), Skeldergate (O'Connor 1984) and Hungate and St. Paul-in-the-Bail, Lincoln (Dobney *et al.* 1996)

## Recommendations

The material from the garderobe pit and the ditch fills at Foredyke is worthy of further study in view of the richness of the organic deposits, the degree of preservation and their location in an isolated rural setting. 'Waterlogged' occupation material from such sites is rare and sporadic.

Further work should include processing of larger samples from each of the organic-rich deposits and full biological analyses to provide species lists of insects and plant remains both to clarify site interpretation and as a resource for future synthesis. Further samples should be processed, without sieving, to search for milled beetle fragments, by applying paraffin flotation to slurried sediment as described by Kenward (1974). Main phase work should include a closer examination of the ostracod and diatom content of the garderobe and outflow fills to determine the character of the flooding regime at the site (in particular, can a saline influence be detected?). Additional contexts should be examined (including Context 748 in particular which connected the outer ditch Context 801 and the garderobe outflow). All of the remaining well-dated and provenanced samples showing any sign of organic preservation should be processed—any recovered assemblages should be analysed if they have potential to elucidate any of the project aims (as given in Steedman 1997). A more detailed study of this site has the potential to produce a valuable stand-alone study of publishable quality. This type of study is all too rarely presented.

No further work on the shell assemblage is recommended.

For the vertebrate remains, contexts described as 'unstratified', 'site clearance' or 'modern', and those of uncertain date

require no further work. It is recommended that a basic archive should be made of all the vertebrate remains from contexts from Phases 1 and 2. Material from well-dated deposits from Phases 3, 3/4 and 4 should be recorded and analysed in detail with particular emphasis placed on recording biometry and age at death data.

### Specific project objectives

Some of the specific project objectives, as given in Steedman (*op. cit.*, 6-8), that may be addressed are as follows (numbers refer to Steedman's paragraphs):

There was no evidence for agricultural use or stock rearing, but there was evidence of tall perennial herb flora such as might develop in waste ground. (2.2.3).

The garderobe outflow may have flooded at intervals; this may have been deliberate 'flushing' (water management) or unavoidable (indicating fluctuations in the River Hull's level). (2.2.4 and 2.2.12).

The presence of the beetles *Tipnus unicolor* and *Blaps* sp. probably indicate that the buildings were 'long-lived'. There is no clear evidence to suggest the function of the buildings but information may be recovered by detailed analysis. (2.2.15).

There is no evidence for domestic use of the site. (2.2.16).

There was no evidence of the exploitation of fish on more than a casual scale. No remains of grain pests, such as might be expected in a mill of the late medieval period (on the basis of evidence of the ubiquity of grain pests elsewhere in this period (Kenward, forthcoming)), were recovered. (2.2.19 and 2.2.20).

The recovered biota provided no evidence of any craft or trade activities on site.

The presence of oysters indicated importation of food-stuffs to the site.

### Retention and disposal

All of the material should be retained in the anticipation of further study.

### Archive

All extracted fossils from the test subsamples, and the residues and flots are 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. Numbers of boxes of vertebrate material by phase from Foredyke, Kingswood, Kingston upon Hull.

<b>Phase</b>	<b>No. of boxes</b>	<b>No. of boxes assessed</b>	<b>Total number of boxes</b>
1	0.5	0.5	20
2	0.75	0.5	
3	10.25	2.75	
3/4	1	0.25	
4	3.5	1	
*Unstratified	4	-	

\* This included material described by the excavator as sub-soil / site clearance and modern material and 4 contexts for which no information was available

*Table 2. Archaeological information and phasing of contexts recorded for the assessment of material from Foredyke, Kingswood, Kingston upon Hull.*

<b>Phase</b>	<b>Context</b>	<b>Description</b>	<b>Spot date</b>	<b>Site area</b>
1	171	Fill of 422 (ditch)	3rd / 4th C	RB ditches
1	421	Fill of 422 (ditch)	2nd / E3rd C	RB ditches
1	424	Fill of 422 (ditch)	4th C	RB ditches
2	765	Fill of 767 (ditch)	14th C +	E medieval ditches
2	766	Fill of 767 (ditch)	L13th / E14th C	E medieval ditches
2	800	Fill of 792 (ditch)	L12th / E 13th C	E medieval ditches
2	801	Fill of 792 (ditch)		E medieval ditches
3	47	Floor / hard standing	M15th / 16th C	Yard N of industrial building
3	60	Occupation deposit	16th C	Yard N of industrial building
3	101	Floor / hard standing	L15th / M16th C	Yard N of industrial building
3	176	Fill of 216	L15th / M16th C	Area N of stone building
3	272	Demolition deposit	16th / 17th C	Yard N of industrial building
3	314	Demolition deposit	15th / 16th C?	Garderobe
3	371	Fill of garderobe	L15th-17th C	Garderobe
3	386	Clay platform	13th / 16th C	Yard N of industrial building
3	391	Fill of garderobe	M14th-M15th C	Garderobe
3	393	Fill of garderobe	L15th / 16th C	Garderobe
3	394	Fill of garderobe	14th / 15th C	Garderobe
3	632	Fill of 660 (garderobe ditch)	E/M14th C	Garderobe ditch
3	638	Fill of 660 (garderobe ditch)	14th C	Garderobe ditch
3/4	113	Fill of 225	L15th / 16th C	Area N of stone building
4	7	Fill of 11 (drain)	17th C	Drain across site
4	81	Silty clay spread	L15th - E17th C	Yard N of industrial building



Table 3. Number of fragments by species for Phase 1 from Foredyke, Kingswood, Kingston upon Hull.

<b>Taxa</b>		<b>No. measurable</b>	<b>No. unfused</b>	<b>No. Juv/neo</b>	<b>No. mandibles</b>	<b>No. teeth*</b>	<b>No. frags</b>	<b>Weight (g)</b>
Horse	<i>Equus f. domestic</i>	-	-	-	-	-	1	39.7
Cow	<i>Bos f. domestic</i>	1	1	-	2	-	17	1501.4
Sheep/ goat	Caprovid	-	-	-	1	-	1	43.0
<b>Subtotal</b>		<b>1</b>	<b>1</b>	<b>-</b>	<b>3</b>	<b>-</b>	<b>19</b>	<b>1584.1</b>
Large mammal		-	-	-	-	-	21	396.9
Medium mammal 1		-	-	-	-	-	17	
Unidentified		-	-	-	-	-	34	
<b>Total</b>		<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>91</b>	<b>1981.0</b>

\*Includes only those teeth of use for ageing or sexing information.

Table 4. Number of fragments by species for Phase 2 from Foredyke, Kingswood, Kingston upon Hull.

Taxa		No. measurable	No. unfused	No. Juv/neo	No. mandibles	No. teeth*	No. frags	Weight (g)
Pig	<i>Sus f. domestic</i>	-	-	-	-	-	1	15.1
Cow	<i>Bos f. domestic</i>	6	3	3	2	2	27	1523.0
Sheep/ goat	Caprovid	2	-	-	3	-	9	208.5
Goose	<i>Anser sp.</i>	1	1	-	-	-	3	25.8
<b>Subtotal</b>		<b>9</b>	<b>4</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>40</b>	<b>1772.4</b>
Large mammal		-	-	-	-	-	43	455.7
Medium mammal 1		-	-	-	-	-	5	
<b>Total</b>		<b>9</b>	<b>4</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>88</b>	<b>2228.1</b>

\*Includes only those teeth of use for ageing or sexing information.

Table 5. Number of fragments by species for Phase 3 from Foredyke, Kingswood, Kingston upon Hull.

Taxa		No. measurable	No. unfused	No. Juv/neo	No. mandibles	No. teeth*	No. frags	Weight (g)
Hare	<i>Lepus</i> sp.	1	-	-	-	-	2	4.5
Dog	<i>Canis</i> f. domestic	2	-	-	1	-	5	168.3
Cat	<i>Felis</i> f. domestic	2	-	-	-	-	2	9.8
Horse	<i>Equus</i> f. domestic	17	1	-	-	5	52	3888.6
Pig	<i>Sus</i> f. domestic	2	-	24	9	1	78	1753.6
Cow	<i>Bos</i> f. domestic	46	14	5	11	11	234	10697.3
Sheep/ goat	Caprovid	48	7	3	32	30	233	3283.7
Goose	<i>Anser</i> sp.	3	-	-	-	-	10	29.9
Duck	<i>Anas</i> sp.	3	-	-	-	-	3	4.9
Chicken	<i>Gallus</i> f. domestic	24	-	-	-	-	33	88.8
Pigeon	Columbidae	1	-	-	-	-	1	0.3
Bird		-	-	7	-	-	11	6.2
Fish		-	-	-	-	-	1	0.1
<b>Subtotal</b>		<b>149</b>	<b>22</b>	<b>39</b>	<b>53</b>	<b>47</b>	<b>665</b>	<b>19936.0</b>
Large mammal		-	-	-	-	-	427	10718.5
Medium mammal 1		-	-	-	-	-	429	
Unidentified		-	-	-	-	-	25	
<b>Total</b>		<b>149</b>	<b>22</b>	<b>39</b>	<b>53</b>	<b>47</b>	<b>1546</b>	<b>30654.5</b>

\*Includes only those teeth of use for ageing or sexing information.

Table 6. Number of fragments by species for Phase 4 from Foredyke, Kingswood, Kingston upon Hull.

Taxa		No. measurable	No. unfused	No. Juv/neo	No. mandibles	No. teeth*	No. frags	Weight (g)
Water vole	<i>Arvicola terrestris</i> (L.)	-	-	-	1	-	1	0.4
Dog	<i>Canis</i> f. domestic	1	-	-	1	-	3	105.9
Horse	<i>Equus</i> f. domestic	-	-	-	-	1	4	43.0
Pig	<i>Sus</i> f. domestic	-	2	1	-	-	9	132.7
Cow	<i>Bos</i> f. domestic	4	6	9	1	7	67	2351.3
Sheep/ goat	Caprovid	3	-	2	9	12	50	515.1
Goose	<i>Anser</i> sp.	-	-	-	-	-	2	1.2
Duck	<i>Anas</i> sp.	1	-	-	-	-	1	4.9
Chicken	<i>Gallus</i> f. domestic	4	-	-	-	-	5	18.4
?Moorhen	cf. <i>Gallinula chloropus</i> L.	1	-	-	-	-	1	0.8
Bird		-	-	-	-	-	4	2.1
<b>Subtotal</b>		<b>14</b>	<b>8</b>	<b>12</b>	<b>12</b>	<b>20</b>	<b>147</b>	<b>3175.8</b>
Large mammal		-	-	-	-	-	83	1982.2
Medium mammal 1		-	-	-	-	-	118	
Medium mammal 2		-	-	-	-	-	2	
Unidentified		-	-	-	-	-	23	
<b>Total</b>		<b>14</b>	<b>8</b>	<b>12</b>	<b>12</b>	<b>20</b>	<b>373</b>	<b>5158.0</b>

\*Includes only those teeth of use for ageing or sexing information.

Table 7. The vertebrate remains from Context 394 Sample 34/BS from Foredyke, Kingswood, Kingston upon Hull.

<b>Taxa</b>		<b>No. frags</b>	<b>Notes</b>
Eel	<i>Anguilla anguilla</i> (L.)	2	vertebrae
Thornback ray	<i>Raja clavata</i> L.	1	dermal denticle
Fish		16	1 ?Gadid supracleithrum, rest unidentified spines
Amphibians		22	
Chicken	<i>Gallus f. domestic</i>	5	1 vertebra, 4 phalanges - 2 acid etched
Passerine		2	humerus and carpometacarpus
Corvid	cf. <i>Garrulus glandarius</i> (L.)	1	carpometacarpus possibly Jay
Bird		13	
Mouse	Murine	1	femur
Rat	<i>Rattus</i> sp.	1	metapodial
Shrew	<i>Sorex</i> sp.	2	mandibles
Vole/mouse	Microtine/Murine	8	3 incisors, 1 femur, 2 tibia, 1 pelvis, 1 metapodial
Mammal		31	12 burnt, mostly unidentifiable
<b>Total</b>		<b>105</b>	

Table 8. The element representation for the major domestic species from Phase 3 from Foredyke, Kingswood, Kingston upon Hull. (Key: HC - horncore, Cran - cranium, Max - maxilla, Mand - mandible, Teeth - includes maxillary and mandibular teeth, Scap - scapula, Hum - humerus, Rad - radius, Pel - pelvis, Fem - femur, Tib - tibia, Calc - calcaneum, Astr - astragalus, M/c - metacarpal, M/t - metatarsal, M/p - metapodial, Phals - phalanges, C/T - carpals and tarsals).

	Head elements					Major and minor meat-bearing elements							Distal limb elements						
Taxa	HC	Cran	Max	Mand	Teeth	Scap	Hum	Rad	Ulna	Pelv	Fem	Tib	Calc	Astr	M/c	M/t	M/p	Phals	C/T
Cow	2	-	4	27	57	2	8	7	5	7	6	3	4	3	20	24	4	49	2
Sh/g	7	4	4	42	62	3	14	22	1	7	5	16	3	2	16	14	-	11	-
Pig		5	5	12	11	5	3	4	2	6	4	10	-	1	-	-	6	1	-
Horse			1	2	20	3	1	2			2		1	4	2	2	4	7	1

Table 9. Hand collected shell (not including eggshell) by phase from Foredyke, Kingswood, Kingston upon Hull (Note that all counts are of fragments > 20 mm in largest dimension, not minimum numbers of individuals; figures in brackets beneath the phase headings are the number of contexts examined from that phase.)

	Phase 2 (4)	Phase 2/3 (1)	Phase 3 (62)	Phase 3/4 (5)	Phase 4 (25)	Total (97)
Oyster ( <i>Ostrea edulis</i> L.)	2	6	277	14	109	408
Mussel ( <i>Mytilus edulis</i> L.)	-	-	16	-	-	16
Cockle ( <i>Cardium</i> sp.)	-	-	6	-	5	11
Whelk ( <i>Buccinum undatum</i> L.)	1	-	3	-	-	4
Unidentified marine shellfish	12	-	3	-	3	18
?Planorbid	3	-	-	-	-	3
<i>Cepaea/Arianta</i> sp.	1	-	3	-	-	4
Total	19	6	308	14	117	464