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An assessment of biological remains from excavations at the former Davygate Centre, York (site code: 97.125)

by

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Summary

Three sediment samples and five boxes of bone from excavations of 11th and 12th century deposits at the former Davygate Centre, York, have been investigated for their archaeological significance. All three deposits examined for plant and invertebrate macrofossils produced useful evidence; one seems to have been a burned dump of organic waste, another to include hay-like material, and another to be rich in stable manure but perhaps to contain other waste. This material is all of considerable interest and a detailed record should be made. The bone assemblage was of limited significance but included a discrete dump of what may have been hornworking or tanner's waste, and dumps of largely primary butchery waste. Combined with data from the nearby British Gas site, the bone represents a potentially useful resource and should be recorded fully. If threatened the deposits should be properly excavated and sampled with provision for an appropriate programme of post-excavation analysis.

Keywords: FORMER DAVYGATE CENTRE; YORK; MEDIEVAL; POST-MEDIEVAL; ASSESSMENT; PLANT REMAINS; CHARRED PLANT REMAINS; INVERTEBRATE REMAINS; INSECTS; BONE

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Introduction

Excavations on the site of the former Davygate Centre, undertaken in late 1997, revealed organic-rich deposits close to the walls of the Roman fortress.

Pottery spot dates and stratigraphic information provided by the excavator suggest that the deposits considered here date from the 11th century through to the early 13th century.

Sediment samples

Four sediment samples were submitted from three contexts containing organic silts or charred organic remains (Table 1). Three samples were selected for general biological analysis (Sample 1 from Context 25008, Sample 2, Context 25038, and Sample 3, Context 26006), to represent each context. Sample 1 was described by the excavator as representing a possible dump of organic material. Sample 2 was from a dump of ?charred material, while Sample 3 was taken from an organic backfill of a ?well. No further action was taken with Sample 4 from Context 26006. Vouchers of unprocessed sediment have been retained from individual samples.

Vertebrate remains

A total of five boxes (each box approximately 20 litres) of hand-collected animal bone was recovered from Trenches 25, 26 and 29. Table 6 shows the number of contexts and amount of bone recovered from each of the date categories.

Methods

Sediment samples

The samples of sediment ('GBAs' *sensu* Dobney *et al.* 1992) were inspected in the laboratory and a description of their lithologies recorded using a standard *pro forma*. Subsamples of 1 or 2 kg were taken from each of the three analysed samples for extraction of macrofossil remains, following procedures of Kenward *et al.* (1980; 1986).

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.

Invertebrates were recorded in the flots, at the 'rapid scan' level of Kenward (1992).

All three of the samples processed for macrofossil and invertebrate analyses were examined for the eggs of intestinal parasitic nematodes and other microfossils using the 'squash' method of Dainton (1992).

Vertebrate remains

Material from all bone-bearing contexts was recorded; subjective records were made of preservation, angularity (i.e. the nature of the broken surfaces) and colour, whilst quantities and identifications were noted where appropriate. Additionally, semi-quantitative information was recorded for each context concerning fragment size, dog

gnawing, burning, butchery and fresh breaks. Other fragments (classified as 'unidentified' in Tables 7-11) were, where possible, grouped into categories: large mammal (assumed to be horse, cow or large cervid), medium-sized mammal (assumed to be sheep, pig or small cervid) and bird. As well as counts of fragments, total weights were recorded for all identifiable and unidentifiable categories.

Results

The sediment samples

The results of the investigations are presented in date order with information provided by the excavator in brackets. A complete list of the species of invertebrates recorded is given in Table 2. Main statistics for the assemblages of adult beetles and bugs are presented in Table 3, and species lists for invertebrate macrofossils sample-by sample in Table 4.

Context 25038 [11/12th century dump of ?burnt material]
Sample 2 (2 kg paraffin flotation and microfossil 'squash')

A moist slightly clayey, sandy silt, varying in colour from light grey to mid grey-brown. The deposit had a soft cumbly texture and contained stones to 60 mm, ash and mammal bones.

Processing of a 2 kg subsample produced a flot, washover and residue. The small flot contained frequent relatively large wheat/rye bran fragments; however, the whole cereal grains present were barley (*Hordeum* sp.) and oats (*Avena sativa* L.). All of the complete grains were charred and accompanied by numerous pieces of fine herbaceous material, probably representing chaff. Rare (tentatively-identified) examples of the cornfield poppy (*Papaver* cf. *argemone* L.) were noted with a limited range of disturbed ground and grassland plants which included *Urtica dioica* L., *Atriplex* sp., *Reseda luteola* L., *Rumex acetosella* L. and *Plantago major* L . The upper saltmarsh species *Juncus gerardii* Lois. was noted as frequent and rare sedge nutlets were also found. The presence of *J. gerardii* could be a result of the importation of hay from upper saltmarsh meadows, or may even have arrived in the guts of animals (probably horses) fed in such places. Saltmarsh plants are not uncommonly noted in urban deposits, probably for these reasons (Kenward and Hall 1997).

The washover contained frequent charred barley and oat grains, fragments of hazel nut shell (*Corylus avellana* L.), egg shell, elder seeds (*Sambucus nigra* L.), *Brassica* sp. L., *Eleocharis palustris* L. and *Atriplex* sp.. Further, very frequent, charred herbaceous remains were recovered, some of which could be identified as oat spikelets, with unidentified rachis fragments, and confirming the presence of chaff in the sample. A few of the oat grains showed signs of having started to germinate, indicating that the grain had become damp before it was charred.

The moderate-sized residue (c. 25% of the original sample) was principally composed of coarse sand, angular oolitic limestone fragments, sandstone pebbles and pieces of orange baked earth. A few washed rounded pebbles were noted. Further charred *Hordeum* sp. and *Avena sativa*. grains were located, accompanied by charcoal to 5 mm and small pieces of egg shell to 2 mm.

No invertebrate remains (other than tentatively-identified scraps of cuticle) were present in the flot or washover.

The microfossil 'squash' was approximately three quarters inorganic material and one quarter organic detritus with many fungal spores and two structures which may have been degraded *Trichuris* eggs. These last, if they were indeed eggs, were extremely poorly preserved and were only very tentatively identified.

A single rat (*Rattus* sp.) femur and two herring (*Clupea harengus* L.) vertebrae were recovered, together with an additional three fish fragments which could not be identified to species or species group.

This deposits indeed appeared to have consisted of dumped material of various kinds, some of which had been burned *in situ*. Future analysis would clarify the nature of the contributory materials.

Context 25008 [Early 13th century, possible dump of organic material]
Sample 1 (1 kg paraffin flotation and microfossil 'squash')

A moist very dark brown humic sample containing some patches of light to mid brown, very slightly sandy clay silt with fine herbaceous detritus throughout. The deposit was brittle and crumbly in texture with distinct layering in some places. Stones to 6 mm, and rotted wood, were visible during the initial visual inspection. A subsample worked to a sticky consistency (rubbing brown).

A 1 kg subsample was processed, sieving to 300 microns, to provide a flot, washover and residue.

The very small flot (<1% of the total volume of the sample) was principally composed of fine herbaceous detritus, including many small fragments of monocotyledon stem and epidermis. A small proportion of the herbaceous detritus was charred and charcoal proper was also noted. The flot contained a range of tall herb species typical of disturbed ground, way sides/wasteland or arable fields, including wild turnip (*Brassica rapa* L.), stinging nettle (*Urtica dioica*), weld (*Reseda luteola* L.), stinking chamomile (*Anthemis cotula* L.), oraches (*Atriplex* sp.), corn marigold (*Chrysanthemum segetum* L.), redshank (*Polygonum persicaria* L.) and pale persicaria (*Polygonum lapathifolium* L.). The latter two species in this list may occur in damp habitats. Other species present, in the sample and indicative of damp conditions included yellow cress (*Barbarea* sp.) sedges (*Carex* sp.) and rushes (*Juncus* sp.). Several of the remaining species encountered in the flot, including sheep's sorrel (*Rumex acetosella* L.) daisy (*Bellis perennis* L.) and Hawkbit (*Leontodon* sp.), are typical of grassland habitats. The presence of these species with an abundance of monocotyledon detritus and frequent remains of legume petals suggests quite strongly that the sample contained hay.

Analysis of the moderate-sized washover (25% of the original sample) revealed abundant remains of relatively poorly preserved monocotyldeon remains and further legume flower fragments (calyces), charcoal and sedge nutlets, supporting the conclusions drawn from examination of the flot.

The small coarse residue contained rare angular fragments of oolitic limestone, rare pieces of orange baked earth, poorly preserved wood fragments and a moderate amount of coarse sand.

Few invertebrates were recovered from the flot and their preservation was poor. Those which were present gave no clear impression of ecological conditions. It is possible that a very large subsample would provide an interpretable assemblage. Subjectively it seemed possible that this fauna may have formed in an area of active decay outdoors (in a midden, perhaps, although there seemed to be no in-situ decomposer fauna).

The microfossil 'squash' was mostly organic detritus with a little inorganic material. Many phytoliths (resembling those of grasses) were noted, but no eggs of intestinal parasitic nematodes were seen.

Overall, then, this appears to have been a dump of organic matter, which included hay-like material but with little evidence of an insect fauna typical of stable manure, which is considered to be the commonest source of hay plants in occupation site deposits (Kenward and Hall 1997). There was no evidence of an origin within a domestic building, either - in particular, there was no 'house fauna' (as defined by Kenward and Hall 1995, 662-667), and no substantial component of food plants.

Context 26006 [Early 13th century, organic backfill in ?well]
Sample 3 (1 kg paraffin flotation)

A very dark brown crumbly humic silt with both fine and coarse herbaceous detritus, mortar, fish bone, wood and twigs.

A subsample of 1 kg was processed, producing a large flot, a washover and a moderate-sized residue. The flot contained a range of herb species indicative of disturbed waste ground similar to those listed in Context 25008 (*Atriplex* sp., *Polygonum persicaria*, *Polygonum lapathifolium*, *Reseda luteola*, *Urtica dioica*, *Anthemis cotula* and *Chrysanthemum segetum*) plus further taxa from a similar habitat (Thistle, *Cirsium/Carduus*; hemp nettle, *Galeopsis* subgenus *Galeopsis*; hemlock, *Conium maculatum* L.; henbane, *Hyoscyamus niger* L.; small nettle, *Urtica Urens* L.; and knot grass, *Polygonum aviculare* agg.. Several of the taxa listed above occur in arable field habitats. Other typical arable field species in the sample included shepherd's needle (*Scandix pecten-veneris* L.) and corncockle (*Agrostemma githago* L.). The flot also contained lower growing grassland species such as tormentil (*Potentilla erecta* L.), creeping cinquefoil (*Potentilla reptans* L.), creeping buttercup (*Ranunculus repens* L.), bulbous buttercup (*R. bulbosus* L.), *Cerastium*

sp., *Bellis perennis* L., small grass seeds and small legume calyces. Coupled with the presence of numerous fragments of monocotyledon detritus this latter group of macrofossils is surely indicative of hay. Several of the grassland species present prefer relatively dry calcareous grassland. A few taxa indicative of damper conditions were also noted, including marsh marigold (*Caltha palustris* L.), rushes, (*Juncus bufonius* L. and *J. articulatus* L./*acutiflorus* Hottm.) and *Carex* sp.

The sample produced a large washover amounting to c. 40 % of the original subsample volume. Wood fragments to 5 cm were very frequent and were classified into worked wood chips and rounded twigs. Rare charcoal pieces to 5 mm were noted. The majority of the remaining macrofossil components were fine herbaceous detritus, including some waterlogged chaff and rachis, dicotyledon leaf and stem fragments and occasional moss stems of the species *Neckera complanata* Hedw. and *Antitrichia curtipendula* Hedw. These are common mosses of archaeological sites. The washover contained a limited range of food remains including pieces of pea pod (*Pisum sativum* L.), *Corylus avellana* nut fragments and apple endocarp (core). Frequent fragments of *Agrostemma githago* were also present and probably originated from milled flour. Although the sample contained a limited quantity of food remains there is little evidence to suggest that the deposit contained cess. A small fragment of leather (<10 mm) was also noted.

The small residue (< 5 % of the original subsample) contained frequent angular to semi rounded oolitic limestone pebbles to 30 mm, rare brick/tile fragments to 1.5 cm, twigs to 2.5 cm and a shard of glazed pottery to 5 cm. Further occasional broken *Corylus avellana* shells were also encountered. Other components in the residue included both the seeds and pod fragments of flax (*Linum usitatissimum* L.), further apple endocarp, pea pod remains, egg shell and rye/barley rachis. The remaining seed types were hogweed (*Heracleum sphondylium* L.), yarrow (*Achillea millefolium* L.) and water-pepper (*Polygonum hydropiper* L.), The latter is found in dirty ditches. Small pieces of bog myrtle (*Myrica gale* L.) and the moss species *Hylocomium splendens* Hedw. were also present both of which are found in relatively acidic peaty or heath habitats. The presence of these species may represent the importation of peat.

Insect remains were rather abundant and preservation excellent. The predominant species would be expected to occur together in foul but somewhat open-textured decaying organic matter, such as stable manure; indeed this would be regarded as a 'classic' stable manure group of the kind discussed by Kenward and Hall (1997). This is true even to the presence of weevils likely to have been cut in hay, one of them being a freshly-emerged *Apion*, which is most likely have been carried to the deposits. However, the absence of grain pests is notable in a deposit of this late date. A single sheep ked (*Melophagus ovinus*) puparium was noted, most likely to have originated from wool cleaning, although just conceivably from sheep kept temporarily on the site. It is strongly advised that the invertebrates from a large subsample should be recorded in detail for future synthesis.

The microfossil 'squash' was mostly organic detritus with some inorganic material. Some fungal spores and other spores/pollen grains were noted. No eggs of intestinal parasitic nematodes were seen.

In summary, then, this deposit undoubtedly included a large proportion of stable manure rich in hay plants and with a very characteristic insect fauna. Some other components, such as the wood chips (and possibly peat) may have been stable litter, but other kinds of rubbish - possibly including human food waste - may have been mixed with it.

Sample 4 (NFA)
Description as for sample 3

Vertebrate remains

The range of identified species recovered from the excavations is shown in Tables 7-11, together with total number of fragments, numbers of measurable bones and numbers of mandibles with teeth *in situ*.

9/10th Century (including ?9/10th Century)

Two deposits produced material of this date, although one (Context 25053) yielded only two fragments. Vertebrate remains from Context 26020 were reasonably well-preserved, with most of the fragments recorded as 'spiky' (i.e. showing sharp broken edges), whilst a small proportion were battered and very rounded in appearance (always less than 10% of the total assemblage). The nature of this material suggests that there may have been a small element of redeposition.

The remains showed heavy and systematic butchery, particularly noticeable being the longitudinal splitting of cattle long bones (especially metapodials). Additionally, a small number of cattle vertebrae had been chopped sagitally, indicative of the splitting of carcasses into sides. On the whole, the material was rather fragmentary, partly the result of the extensive butchery.

Cattle and caprovids were the most well represented species (Table 7), whilst other species present included horse, pig and chicken.

The range of cattle elements present, dominated by distal limb elements (e.g. metapodials, carpals, tarsals and phalanges), suggest that this material represented mainly primary butchery waste.

A total of 16 measurable fragments and three mandibles with teeth were noted from material from this phase.

10/11th Century (including ?10/11th Century)

Most of the material was recovered from four deposits in Trench 26 (Contexts 26018, 26021, 26022 and 26026) described by the excavator as domestic refuse dumped against the Roman fortress wall. The fifth context (25044 from Trench 25) produced only four fragments. Overall the vertebrate remains from the four main contexts were well preserved, and very similar in character to bones from Context 26020 (9/10th Century). Most fragments were 'spiky', but all five deposits contained a small number of fragments which were rather rounded, whilst a few contained some battered and eroded bones. Again, this appears to imply the inclusion of redeposited or residual material.

Cattle remains predominated and showed extensive evidence of butchery, including metapodials, humeri and radii which had been longitudinally split. Remains of caprovids were less well represented and less systematically butchered. Although a range of elements was present in the assemblages for both species, it was clear that the cattle remains were composed of more non-meat bearing bones, such as maxilla and mandible fragments, teeth and distal limb elements, whilst meat-bearing fragments (such as humeri and radii) were more common amongst the caprovid remains. It seems likely that these remains represent both initial carcass preparation and the secondary 'boning-out' of carcasses.

Evidence for the presence of a possible wild boar was provided by a single humerus fragment (Context 26021). This bone appeared larger than other pig remains recovered from sites of a similar date and was of an equivalent size to the wild boar humeri in the EAU modern comparative collection.

Bird remains were not numerous but the identified species were noteworthy. They included single fragments of crane (*Grus* sp.), ?whooper swan (cf. *Cygnus cygnus* L.) and ?sparrowhawk (cf. *Accipiter nisus* L. (Contexts 26021, 26026 and 26022 respectively). Documentary evidence (Allison 1985) suggests that both crane and swan were favoured for feasts, whilst evidence for hawking, an activity usually associated with nobility, may be provided by the presence of the sparrowhawk. These fragments, combined with the ?wild boar humerus (the result perhaps of some hunting expedition), may tentatively hint at high status occupation.

Other species present included dog and cat and two unidentified fish fragments.

Material from this period produced 33 measurable bones and 2 mandibles with teeth.

11th Century (including ?11th Century)

Fifty-four fragments, 15 of which were identifiable, were recovered from nine contexts, all from Trench 25. Preservation was mostly recorded as 'fair', and most fragments had sharp broken surfaces. Damage characteristic of cat gnawing was noted on the single goose bone from Context 25049. Although butchery was not in evidence on a large scale, a few cattle long bones had been split in a similar fashion to that noted for the earlier periods.

Species present included cattle, caprovid, pig, cat and goose. Only four measurable fragments and a single mandible were recorded.

11/12th Century (including 12th Century)

A total of 23 contexts yielded bone, but most (16) contained less than ten fragments per context. Although much of the material was recovered from Trench 25, a single context (29003) from Trench 29 produced almost a quarter (61) of the total number of fragments. Preservation varied but was, on the whole, reasonably good. Little variation of colour was apparent within contexts and most fragments were gingery brown, brown or dark brown. Angularity (i.e.

the nature of the broken surfaces) was mostly recorded as 'spiky', although eight contexts contained some fragments which were either battered or rounded in appearance.

Butchery was noted but appeared to be less extensive than that recorded from earlier periods, with the exception of material from Context 29003. The assemblage from this deposit was composed mainly of cattle fragments, with almost half of these being cattle horncores. All the horncores showed evidence of removal from the skull. A few had been chopped through the base of the core, but most had been removed with a varying proportion of the adjacent frontal and parietal bones.

Material from the remaining contexts also included cattle fragments, in addition to caprovid, pig and chicken remains.

Two fragments were recovered from Contexts 25036 and 25041 were identified as cervid cranial fragments from two large individuals. Both had the pedicle and the very base of the antler remaining, with evidence, in the form of chop marks, for the removal of the rest of the antler and cranium. These fragments were rather different in character to other bones from the site, in that they were very rounded and extremely heavy, possibly suggesting that mineralisation had taken place. It is almost certain that these fragments are residual and may be Roman in date or perhaps even earlier (the high degree of apparent mineralisation may suggest a prehistoric date).

Evidence of a pathological condition was noted on two of the cattle cranial fragments from Context 29003. This consisted of perforations in the nuchal region of the occipital bone. A number of possible clinical factors (congenital, infectious, parasitic, neoplastic and direct pressure through yoking) have been proposed as the most likely aetiology of this condition. These factors have been most recently discussed by Brothwell *et. al.* (1996) and on the basis of their brief survey, it would appear that parasites, tumours, and infection can be ruled out as causal factors. Although it could not be clearly established, they suggest that the cause is more likely to be congenital in origin. This phenomenon has been noted from a number of sites ranging in date from Roman (Dobney *et al* 1996) to post-medieval (Carrott *et al* 1997a).

Early 13th Century

A very small assemblage, amounting to 19 identified and 39 unidentified fragments, was recovered from four deposits. Preservation overall was fair, although (as with the earlier material) some contexts contained bones that were battered in appearance with rounded, broken surfaces.

Most of the identifiable fraction represented the remains of the major domestic mammals, including cattle caprovids and pig. A few bird bones were also present, these being identified as chicken, goose (*Anser* sp.) and duck (*Anas* sp.). In addition, a single fallow deer (*Dama dama* L.) scapula was recorded.

Only six measurable bones and two mandibles with teeth were noted from this material.

Discussion and statement of potential

The plant and invertebrate macrofossils indicated the presence of a range of materials including hay (with evidence of saltmarsh influence and perhaps other material from calcareous grassland) and stable manure. One sample contained a group of decomposer insects very typical of manure. There was some suggestion of human food waste. A sheep ked (*Melophagus ovinus*) puparium may conceivably have come from sheep or their skins at the site or be derived from wool processing. The plant and invertebrate assemblages deserve full recording and analysis both to enhance site interpretation and to provide valuable data for future synthesis, including investigation of spatial zonation in medieval York. Larger subsamples should be employed for such recording to provide more clearly characterised assemblages and to sharpen interpretation.

Clearly the sampled deposits contained biological remains capable of providing a range of information about site usage and environment. Doubtless many other layers at

the site have considerable value in this respect and they should not be destroyed without adequate excavation and sampling.

The animal bone assemblage recovered from all periods from this site is rather small, with few deposits producing large quantities of vertebrate remains. The bulk of the material, dated to the 9/10 th and 10/11th centuries, is from dump deposits in Trench 26. These assemblages mostly comprise heavily butchered cattle fragments, predominantly representing primary butchery waste. Interestingly, 10/11th century deposits included a number of species thought to be indicators of high status occupation, although numbers of fragments are extremely limited. Small quantities of rounded fragments present in the assemblages from Trench 26 suggest the presence of some redeposited material.

Deposits from the other periods represented mostly produced insufficient fragments for detailed interpretation. However, Context 29003 (11/12th century) yielded a small and well preserved assemblage representing a discrete dump of possible hornworkers' or tanners' waste.

On its own, further analysis of this assemblage would produce only limited additional information. Most deposits contain too few fragments for useful archaeological interpretation and there are only small numbers of fragments providing age-at-death and biometrical data. However, the deposits are reasonably tightly dated and the assemblages are similar both in date and content to those from previous excavations at the British Gas site, Davygate (Carrott *et al.* 1997b). A combination of data from both sites may provide information about the economic and craft or industrial activities being undertaken in this area.

Recommendations

The invertebrate and plant macrofossil remains from larger subsamples should be recorded in detail to provide clearer identification of the deposits and an adequate record for future synthesis.

No further work on microfossils is recommended, although the phytoliths from Sample 1 represent useful material for future research.

It is recommended that a basic archive, including biometrical data, should be produced of all of the well-dated vertebrate material. Ideally, an archive of material from the excavations at the British Gas site, Davygate should also be made for comparative purposes and to enlarge the data sets to provide a wider understanding of the activities being undertaken in this area of the city. No further deposits at the site should be destroyed without full excavation and sampling and adequate provision for post-excavation analysis and publication.

Retention and disposal

The remaining sediment and monolith samples should be retained for the present pending possible future investigation.

The bone assemblage should be retained for the present.

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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The data archive for insect remains was created following the recommendation of Kenward (forthcoming) that the academic value of evaluations should be increased by providing a permanent electronic record for future synthesis. This component of the work has been funded from EAU resources in the present instance, but should be provided for in the specification in future evaluations.

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Table 1. Archaeological information for three contexts recorded for the assessment of material from the former Davygate Centre, York.

Date	Context	Description	Type of deposit
11/12th Century	25038	Possible dump of ?burnt material	moist slightly clayey sandy silt
Early 13th Century	25008	Possible dump of organic material	very humic slightly sandy clay silt with fine and coarse herbaceous detritus
Early 13th Century	26006	Organic backfill in ?well 26005=26025	moist humic deposit containing fine and coarse herbaceous detritus

Table 2 . Complete list of invertebrate taxa from Davygate, York. For explanation of codes see Table 5. Nomenclature follows Kloet and Hincks (1964-77).

Lyctocoris campestris (Fabricius)	rd-st
Trechus obtusus or *quadristriatus*	oa
Bembidion (*Philochthus*) sp.	oa
Helophorus sp.	oa-w
Cercyon analis (Paykull)	rt-sf
Cercyon atricapillus (Marsham)	rf-st
Cercyon haemorrhoidalis (Fabricius)	rf-sf
Cercyon ?pygmaeus (Illiger)	rf-st
Cercyon terminatus (Marsham)	rf-st
Cercyon sp.	u
Acritus nigricornis (Hoffmann)	rt-st
Ptenidium sp.	rt
Acrotrichis sp.	rt
Carpelimus bilineatus Stephens	rt-sf
Carpelimus fuliginosus (Gravenhorst)	st
Anotylus rugosus (Fabricius)	rt
Oxytelus sculptus Gravenhorst	rt-st
Leptacinus spp.	rt-st
Gyrohypnus fracticornis (Muller)	rt-st
Philonthus spp.	u
Staphylininae sp.	u
Tachinus sp.	u
Cilea silphoides (Linnaeus)	rt-st
Falagria or *Cordalia* sp.	rt-sf
Aleocharinae sp.	u
Aphodius sp.	ob-rf
Anobium punctatum (Degeer)	l-sf
Tipnus unicolor (Piller & Mitterpacher)	rd-st
Ptinus sp.	rd-sf
Monotoma longicollis (Gyllenhall)	rt-st
Monotoma spinicollis Aube	rt-st
Monotoma sp. indet.	rt-sf
Cryptophagus sp.	rd-sf
Lathridius minutus group	rd-st
Dienerella sp.	rd-sf
Corticaria sp.	rt-sf
Anthicus formicarius (Goeze)	rt-st
Apion sp.	oa-p
Hypera punctata (Fabricius)	oa-p
*Coleoptera sp. (larva)	u
*Acarina sp.	u
*Apoidea sp.	u
*Cladocera sp. (ephippium)	oa
*Daphnia sp. (ephippium)	oa-w
*Formicidae sp.	u
*Hymenoptera Parasitica sp.	u
*Oligochaeta sp. (egg capsule)	u
**Spalangia* sp.	u
*Diptera sp. (larva)	u
*Hemiptera sp. (nymph)	u
*Diptera sp. (puparium)	u
**Melophagus ovinus* (Linnaeus) (puparium)	u

Table 3. *Main statistics for assemblages of adult beetles and bugs (excluding aphids and scale insects) from samples from Davygate, York. Statistics are not given for assemblages with less than 10 individuals, although all assemblages contribute to the 'Site' statistics (last column). For explanation of abbreviations, see Table 5.*

Context	**25008**	**26006**	**Whole site**
Sample	**1**	**3**	
Ext	**/T**	**/T**	
S	6	36	40
N	6	56	61
ALPHA	0	44	50
SEALPHA	0	11	12
SOB	2	4	5
PSOB	33	11	13
NOB	2	4	5
PNOB	33	7	8
ALPHAOB	0	0	0
SEALPHAOB	0	0	0
SW	0	1	1
PSW	0	3	3
NW	0	1	1
PNW	0	2	2
ALPHAW	0	0	0
SEALPHAW	0	0	0
SD	0	0	0
PSD	0	0	0
ND	0	0	0
PND	0	0	0
ALPHAD	0	0	0
SEALPHAD	0	0	0
SP	0	2	2
PSP	0	6	5
NP	0	2	2
PNP	0	4	3
ALPHAP	0	0	0
SEALPHAP	0	0	0
SM	0	0	0
PSM	0	0	0
NM	0	0	0
PNM	0	0	0
ALPHAM	0	0	0
SEALPHAM	0	0	0
SL	0	1	1
PSL	0	3	3
NL	0	1	1
PNL	0	2	2
ALPHAL	0	0	0
SEALPHAL	0	0	0
SRT	3	26	28
PSRT	50	72	70
NRT	3	45	48
PNRT	50	80	79
ALPHART	0	26	28
SEALPHART	0	7	8
SRD	2	5	7
PSRD	33	14	18
NRD	2	6	8
PNRD	33	11	13
ALPHARD	0	0	0
SEALPHARD	0	0	0
SRF	0	5	5
PSRF	0	14	13
NRF	0	10	10
PNRF	0	18	16
ALPHARF	0	0	0
SEALPHARF	0	0	0
SSA	3	24	26
PSSA	50	67	65
NSA	3	43	46
PNSA	50	77	75
ALPHASA	0	23	25
SEALPHASA	0	6	7
SSF	3	8	10
PSSF	50	22	25
NSF	3	13	16
PNSF	50	23	26
ALPHASF	0	0	0
SEALPHASF	0	0	0
SST	0	16	16
PSST	0	44	40
NST	0	30	30
PNST	0	54	49
ALPHAST	0	14	14
SEALPHAST	0	5	5
SSS	0	0	0
PSSS	0	0	0
NSS	0	0	0
PNSS	0	0	0
ALPHASS	0	0	0
SEALPHASS	0	0	0
SG	0	0	0
PSG	0	0	0
NG	0	0	0
PNG	0	0	0
ALPHAG	0	0	0
SEALPHAG	0	0	0

Table 4. Species lists in rank order for invertebrate macrofossils from samples from Davygate, York. For each sample assemblage the adult Hemiptera (bugs) and Coleoptera (beetles) are listed first, followed by the remaining invertebrates. Weight is in kilogrammes, n = minimum number of individuals; SQ = semi-quantitative (e = estimate; - = fully quantitative, m = 'many', translated as 15 individuals; s = several, translated as 6). For translation of ecological codes, see Table 5. 'null' indicates that there were no recognisable remains of macro-invertebrates, although there may have been decayed scraps unassignable to class.

Context: 25008 Sample: 1/T ReM: RS
Weight: 1.00 E: 0.00 F: 0.00

Taxon	n	SQ	ec
Bembidion (Philochthus) sp.	1		oa
Staphylininae sp.	1		u
Ptinus sp.	1		rd-sf
Monotoma sp.	1		rt-sf
Dienerella sp.	1		rd-sf
*Hymenoptera Parasitica sp.	1		u
*Hemiptera sp. (nymph)	1		u
*Diptera sp. (puparium)	1		u

Context: 25038 Sample: 2/T ReM: RS
Weight: 2.00 E: 0.00 F: 0.00

null	0		u

Context: 26006 Sample: 3/T ReM: RS
Weight: 1.00 E: 0.00 F: 0.00

Taxon	n	SQ	ec
Cercyon analis	6	s	rt-sf
Cercyon atricapillus	6	s	rf-st
Acritus nigricornis	3		rt-st
Leptacinus sp. B	3		rt-st
Anthicus formicarius	3		rt-st
Carpelimus fuliginosus	2		st
Anotylus rugosus	2		rt
Monotoma longicollis	2		rt-st
Lathridius minutus group	2		rd-st
Lyctocoris campestris	1		rd-st
Helophorus sp.	1		oa-w
Cercyon haemorrhoidalis	1		rf-sf
Cercyon ?pygmaeus	1		rf-st
Cercyon terminatus	1		rf-st
Cercyon sp.	1		u
Ptenidium sp.	1		rt
Acrotrichis sp.	1		rt
Carpelimus bilineatus	1		rt-sf
Oxytelus sculptus	1		rt-st
Leptacinus sp. A	1		rt-st
Gyrohypnus fracticornis	1		rt-st
Philonthus sp. A	1		u
Philonthus sp. B	1		u
Tachinus sp.	1		u
Cilea silphoides	1		rt-st
Falagria or Cordalia sp.	1		rt-sf
Aleocharinae sp.	1		u
Aphodius sp.	1		ob-rf
Anobium punctatum	1		l-sf
Tipnus unicolor	1		rd-st
Monotoma spinicollis	1		rt-st
Cryptophagus sp.	1		rd-sf
Dienerella sp.	1		rd-sf
Corticaria sp.	1		rt-sf
Apion sp.	1		oa-p
Hypera punctata	1		oa-p
*Acarina sp.	100	e	u
*Diptera sp. (puparium)	30	e	u
*Coleoptera sp. (larva)	6	s	u
*Daphnia sp. (ephippium)	2		oa-w
*Apoidea sp.	1		u
*Cladocera sp. (ephippium)	1		oa
*Formicidae sp.	1		u
*Hymenoptera Parasitica sp.	1		u
*Oligochaeta sp. (egg capsule)	1		u
*Spalangia sp.	1		u
*Diptera sp. (larva)	1		u
*Melophagus ovinus (puparium)	1		u

Table 5. Abbreviations for ecological codes and statistics used for interpretation of insect remains in text and tables. Lower case codes in parentheses are those assigned to taxa and used to calculate the group values (the codes in capitals). See Table 2 for codes assigned to taxa from Davygate, York. Indivs - individuals (based on MNI); No - number. Synanthrope categories are defined by Kenward (1997).

No taxa	S
Estimated number of indivs (MNI)	N
Index of diversity (α)	alpha
Standard error of alpha	SE alpha
No 'certain' outdoor taxa (oa)	SOA
Percentage of 'certain' outdoor taxa	PSOA
No 'certain' outdoor indivs	NOA
Percentage of 'certain' outdoor indivs	PNOA
No OA and probable outdoor taxa (oa+ob)	SOB
Percentage of OB taxa	PSOB
No OB indivs	NOB
Percentage OB indivs	PNOB
Index of diversity of the OB component	alphaOB
Standard error	SEalphaOB
No aquatic taxa (w)	SW
Percentage of aquatic taxa	PSW
No aquatic indivs	NW
Percentage of W indivs	PNW
Index of diversity of the W component	alphaW
Standard error	SEalphaW
No damp ground/waterside taxa (d)	SD
Percentage D taxa	PSD
No damp D indivs	ND
Percentage of D indivs	PND
Index of diversity of the D component	alphaD
Standard error	SEalphaD
No strongly plant-associated taxa (p)	SP
Percentage of P taxa	PSP
No strongly P indivs	NP
Percentage of P indivs	PNP
Index of diversity of the P component	alphaP
Standard error	SEalphaP
No heathland/moorland taxa (m)	SM
Percentage of M taxa	PSM
No M indivs	NM
Percentage of M indivs	PNM
Index of diversity of the M component	alphaM
Standard error	SEalphaM
No wood-associated taxa (l)	SL
Percentage of L taxa	PSL
No L indivs	NL
Percentage of L indivs	PNL
Index of diversity of the L component	alphaL
Standard error	SEalphaL
No indivs of grain pests (g)	NG
Percentage of indivs of grain pests	PNG
No decomposer taxa (rt + rd + rf)	SRT
Percentage of RT taxa	PSRT
No RT indivs	NRT
Percentage of RT indivs	PNRT
Index of diversity of RT component	alpha RT
Standard error	SEalphaRT
No 'dry' decomposer taxa (rd)	SRD
Percentage of RD taxa	PSRD
No RD indivs	NRD
Percentage of RD indivs	PNRD
Index of diversity of the RD component	alphaRD
Standard error	SEalphaRD
No 'foul' decomposer taxa (rf)	SRF
Percentage of RF taxa	PSRF
No RF indivs	NRF
Percentage of RF indivs	PNRF
Index of diversity of the RF component	alphaRF
Standard error	SEalphaRF
No synanthropic taxa (sf+st_ss)	SSA
Percentage of synanthropic taxa	PSSA
No synanthropic indivs	NSA
Percentage of SA indivs	PNSA
Index of diversity of SA component	ALPHASA
Standard error	SEALPHASA
No facultatively synanthropic indivs	SSF
Percentage of SF taxa	PSSF
No SF indivs	NSF
Percentage of SF indivs	PNSF
Index of diversity of SF component	ALPHASF
Standard error	SEALPHASF
No typical synanthropic indivs	SST
Percentage of ST taxa	PSST
No ST indivs	NST
Percentage of ST indivs	PNST
Index of diversity of ST component	ALPHAST
Standard error	SEALPHAST
No strongly synanthropic taxa	SSS
Percentage of SS taxa	PSSS
No SS indivs	NSS
Percentage of SS indivs	PNSS
Index of diversity of SS component	ALPHASS
Standard error	SEALPHASS
No uncoded taxa (u)	SU
Percentage of uncoded indivs	PNU

Table 6. Numbers of bone-bearing contexts, weight of bone and boxes of bones by date from Davygate, York.

Date	Number of contexts	Weight (g)	Number of boxes
9/10thC	1	4927	0.5
?9/10thC	1		
10/11thC	1	12482	1.5
?10/11thC	4		
11thC	7	858	0.25
?11th	2		
11/12thC	22	7270	2.5
12thC	1		
E13thC	4	961	0.25

Table 7. Hand-collected vertebrate remains from 9 to 10th century deposits from Davygate, York. Key: No. frags = total number of fragments; No. meas = number of measurable fragments; No. mand = number of mandibles with teeth in situ.

Species		**No. frags**	**No. meas**	**No. mand**
Equus f. domestic	horse	4	1	0
Sus f. domestic	pig	10	5	1
Bos f. domestic	cow	40	3	0
Caprovid	sheep/goat	21	6	2
Gallus f. domestic	fowl	2	1	0
Sub-total		*77*	*16*	*3*
Unidentified bird		1	0	0
Unidentified		162	0	0
Sub-total		*163*	*0*	*0*
Total		**246**	**16**	**3**

Table 8. Hand-collected vertebrate remains from 10 to 11th century deposits from Davygate, York. Key: No. frags = total number of fragments; No. meas = number of measurable fragments; No. mand = number of mandibles with teeth in situ.

Species		**No. frags**	**No. meas**	**No. mand**
Canis f. domestic	dog	1	1	-
Felis f. domestic	cat	2	1	-
Equus f. domestic	horse	3	1	-
Sus f. domestic	pig	11	1	-
Bos f. domestic	cow	90	16	1
Capra f. domestic	goat	2	1	-
Caprovid	sheep/goat	25	11	1
cf. *Cygnus cygnus* (L.)	?whooper swan	1	-	-
cf. *Accipiter nisus* (L.)	?sparrowhawk	1	1	-
Grus sp.	crane	1	-	-
Sub-total		*137*	*33*	*2*
Unidentified fish		2	-	-
Unidentified		299	-	-
Sub-total		*301*	-	-
Total		**438**	**33**	**2**

Table 9. Hand-collected vertebrate remains from 11th century deposits from Davygate, York. Key: No. frags = total number of fragments; No. meas = number of measurable fragments; No. mand = number of mandibles with teeth in situ.

Species		**No. frags**	**No. meas**	**No. mand**
Felis f. domestic	cat	1	1	-
Sus f. domestic	pig	5	-	1
Bos f. domestic	cow	6	1	-
Caprovid	sheep/goat	2	2	-
Anser sp.	goose	1	-	-
Sub-total		*15*	*4*	*1*
Unidentified		39	-	-
Sub-total		*39*	-	-
Total		**54**	**4**	**1**

Table 10. Hand-collected vertebrate remains from 11 to 12th century deposits from Davygate, York. Key: No. frags = total number of fragments; No. meas = number of measurable fragments; No. mand = number of mandibles with teeth in situ.

Species		**No. frags**	**No. meas**	**No. mand**
Canis f. domestic	dog	3	2	-
Equus f. domestic	horse	1	1	-
Sus f. domestic	pig	13	3	1
Cervid	deer	2	-	-
Bos f. domestic	cow	50	17	2
Caprovid	sheep/goat	12	5	1
Anser sp.	goose	1	-	-
Gallus f. domestic	fowl	11	6	-
Sub-total		*93*	*34*	*4*
Unidentified fish		1	-	-
Unidentified		161	-	-
Sub-total		*162*	-	-
Total		**255**	**34**	**4**

Table 11. Hand-collected vertebrate remains from early 13th century deposits from Davygate, York. Key: No. frags = total number of fragments; No. meas = number of measurable fragments; No. mand = number of mandibles with teeth in situ.

Species		**No. frags**	**No. meas**	**No. mand**
Sus f. domestic	pig	6	1	-
Dama dama (L.)	fallow deer	1	1	-
Bos f. domestic	cow	4	-	1
Caprovid	sheep/goat	3	2	1
Anser sp.	goose	2	-	-
Anas sp.	duck	1	1	-
Gallus f. domestic	fowl	2	1	-
Sub-total		*19*	*6*	*2*
Unidentified bird		5	-	-
Unidentified		34	-	-
Sub-total		*39*	-	-
Total		**58**	**6**	**2**