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Technical Report: Plant and invertebrate remains from Anglo-Scandinavian deposits at 2 Clifford Street, York (site code 99.256)

by Allan Hall and Harry Kenward

Summary

Plant and invertebrate macrofossils were investigated from five dump deposits of Anglo-Scandinavian date at 2 Clifford Street, York. The samples yielded rather small assemblages of remains which were substantially similar to those seen in other deposits of this date from the city, though with a marked component of charred cereal grains and chaff which have not generally been recorded in quantity at sites in the heart of York, but which are more characteristic of sites in the Walmgate area.

Keywords: YORK; 2 CLIFFORD STREET; ANGLO-SCANDINAVIAN; OCCUPATION DEPOSITS; DUMPS; PLANT REMAINS; INVERTEBRATE REMAINS; PIT FILLS; DYEPLANTS; FOODPLANTS

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Introduction

Excavations within F. W. Ward Florists at 2 Clifford Street were undertaken in March and April 1999 by York Archaeological Trust under the direction of Mark Johnson. Excavation (in a pit 0.9 x 0.6 m and reaching a depth of 0.9 m) revealed some Anglo-Scandinavian occupation deposits lying immediately beneath 19th century cellars (and overlying Roman deposits), summarised by Johnson (1999) thus:

'Phase 3 deposits were composed of partially preserved Anglo-Scandinavian wattle fences aligned parallel and at 90 degrees to King Street. These were sealed by a series of dumped, slightly organic deposits of Phase 4. Further indications of fence-lines (Phase 5), again parallel and at 90 degrees to King Street (medieval Cargate) were observed cutting the Phase 4 deposits. The latest archaeological deposits preserved at the site were of further dumped domestic refuse of Anglo-Scandinavian date.'

It is a group of five samples from the Anglo-Scandinavian levels with which this report is concerned, the work being carried out to provide additional data for a synthesis of evidence for Anglo-Scandinavian plant and animal remains from York.

Practical methods

Following a laboratory description of lithology of all five samples selected for investigation, using a *pro forma*, subsamples of 1-2 kg were processed according to the methods of Kenward *et al.* (1980; 1986), the residues being stored wet prior to examination. Plant remains (and other components of the residues and flots) were recorded using direct input to a PC (using an input form and *Paradox* software).
Abundance of all constituents (in relation to the original size of the subsample) was recorded using a four-point scale from 1 (one or a few individuals or fragments or a small component of the matrix) to 4 (abundant remains or a major component of the matrix). For investigation of the composition of the plant assemblages, 'abundance-indicator values' (AIVs) were calculated; these combine the measure of abundance with a score for the degree to which a taxon may represent one or more of a series of ecological and 'use' groups (Tables 4-5).

Insects were identified by comparison with modern reference material and using the standard works. Adult beetles and bugs, other than aphids and scale insects, were recorded fully quantitatively and a minimum number of individuals estimated on the basis of the fragments present. Other invertebrate macrofossils were recorded semi-quantitatively using the scale described by Kenward *et al.* (1986) and Kenward (1992), estimates being made for extremely abundant taxa. Recording of the macro-invertebrates was essentially 'detailed' in the sense of Kenward (1992): many of the identifications were pushed further than is normal under 'scan' recording. Recording of the state of preservation of invertebrates followed Kenward and Large (1998), making use of the sheet illustrated in their fig. 2.

Insect remains recovered from the residues during recording of plant remains were included in the record, although there were hardly ever any taxa additional to those from the flots and, indeed, rarely any additional individuals. Fossils from residue tended to be larger or denser than those in the flot.

Data pertaining to invertebrate remains were transferred from a paper record to computer databases (using *Paradox* software) for analysis and long-term storage.

Interpretative methods

The interpretative methods employed in this study were essentially the same as those used in work on a variety of sites by Hall, Kenward and co-workers.

For the plant remains, interpretation is facilitated by the use of 'abundance-indicator values' (AIVs), calculated from the abundance scores and a score for the indicator value of each taxon within a series of ecological, use, and other groups (for details, see Hall and Kenward 1990).

For the insect remains, interpretation rests primarily on a number of 'main statistics' of whole assemblages of adult beetles and bugs, and on the recognition of ecologically-related groups of species (see Kenward 1978, with modifications outlined by, for example, Kenward 1982; 1988; Hall and Kenward 1990; and Kenward and Hall 1995). The main statistics used include: (a) a measure of species-richness (or diversity), α of Fisher *et al*. (1943), for the whole assemblage and for components of it; and (b) proportions of 'outdoor' species (OB, calculated from taxa coded oa and ob), aquatics (W, w), waterside species (D, d), phytophages (plant-feeders) (P, p), species associated with dead wood (L, l), moorland/heathland taxa (M, m), and decomposers (species associated with decomposing matter of some kind). Decomposers are subdivided into (a) species primarily associated with somewhat dry habitats (RD, rd), (b) those found mostly in rather, to very, foul habitats (RF, rf), and (c) a residuum not easily assignable to one of these (rt). The category 'RT' includes all three of these groups of decomposers (rt + rd + rf). (In each case, the lower-case codes (e.g. 'rd') are those applied to species and the upper-case codes ('RD') are for the ecological group.)

A further ecological component quantified for the present site was the synanthropes, i.e. those species favoured by human activity (Kenward 1997). Taxa have been assigned codes for degree of synanthropy as follows: 'sf'—facultative synanthrope, common in natural as well as artificial habitats; 'st'—typically synanthropic, but able to live in nature; 'ss'—strong synanthrope, absent from or very rare in natural habitats in the relevant geographical area. These codes give rise to ecological groups SF, ST, and SS, which are summed to give SA (all synanthropes). A group of synanthropes regarded as particularly typical of buildings of various kinds has been termed 'house fauna' (Kenward and Hall 1995).

The quantification of an 'outdoor' component in what are sometimes clearly natural or semi-natural assemblages may not appear entirely logical, but in fact is useful when working with any deposits associated, even if rather indirectly, with human occupation.

The abundance of these 'ecological' groups is discussed against the background of values for many other assemblages from a large number of sites. Thus, % N OB = 30 is a high value, but % N RT = 30 is low; while % N W and % N RF are both high at 10.

The index of diversity offers a guide to the presence or absence of remains of insects which bred in or on the developing deposit (autochthones), low values indicating breeding communities, high ones faunas of mixed origins. Note that 'significantly' low values differ for the various components of assemblages; the more inherently rich a component is, the higher the value of the index of diversity for a living community will be. Thus, 'outdoor' communities associated with natural vegetation tend to give a high value of α, while very specialised communities, such as those of decaying matter deposited by humans, or stored grain, have low or very low ones.

Results

The results of these investigations are presented in approximate stratigraphic order based on the archaeological matrix. Table 1 gives a list of the GBA samples from this site selected for study. A full list of plant and invertebrate taxa recorded from these deposits appears in Table 2, with lists of plant remains by context in Table 3. AIVs for plant remains are given in Table 4. Main statistics for the assemblages of adult beetles and bugs are presented in Table 6 and species lists by context and sample for macro-invertebrates in Table 7.

In the following accounts the words 'several' and 'many' are used in the semi-quantitative sense of Kenward *et al.* (1986), i.e. estimates of more than three and less than ten individuals are recorded as 'several' and translated to '6' for statistical purposes, and estimates of ten or more are recorded as 'many' and translated as '15', unless the numbers are very large, in which case a rough approximation is used. Numbers of individuals are 'MNI's, calculated from the numbers of parts (heads, pronota, elytra, etc.) recorded.

Phase 4

Johnson (1999) describes this material as follows: 'The Phase 4 deposits were composed largely of domestic debris that included fragments of leather shoes, a stone disc, iron slag, a piece of sheet lead and fragments of worked and un-worked antler. In addition to residual Roman brick and tile, two iron objects, a key and a hinge strap were also recovered from these deposits. It is suggested that these contexts represent the dumping of domestic refuse. The case for this rests principally on the textural nature of the deposits that contain much organic and waste material, together with the uneven sloping nature of their profiles. The pottery assemblage from this group was composed of residual Roman and Anglo-Scandinavian wares that suggest a later 9th - early 10th century date for deposition. This accords well with the suggested dates for the antler and iron objects.'

Context 1042 (dump associated with remnants of wicker fence)

Sample 5 (2 kg): moist, dark brown, crumbly to brittle silty amorphous organic sediment with traces of bark, wood, mammal bone and ?wood chips and some patches of light orange vesicular material (?concretion).

The large residue of about 900 cm^3 contained large chunks of bark (in fragments to 100 mm, evidently of a thick type, perhaps oak), with some wood (to 140 mm), fish bone and charcoal (both to 20 mm). Fly puparia, earthworm egg capsules, sand and grit were also noted as being moderately common in the residue.

Although represented by remains scored at an abundance no higher than '2', there was a conspicuous component of dyeplants in this sample, entirely consistent with observations on Anglo-Scandinavian occupation deposits from all parts of the centre of York. The taxa recorded at an abundance of '2' were dyer's greenweed (stem fragments to 15 mm), and madder root, with traces of the clubmoss, *Diphasium complanatum*, and of leaves and twig epidermis of greenweed, and root bark fragments of madder. Some of the greenweed leaves were very well preserved and recorded as having a greenish colour, though by contrast some of the stem material of this plant appeared to have become somewhat dried at some stage since much of it floated. Preservation of plant material overall was recorded as 'generally a little worn with some material quite strongly decayed'.

Also counted in the DYES group for the analysis whose results are shown in Table 4 was hop, at an abundance of '2'. This plant is, however, as likely to have been a flavouring, though if so it was the only

such plant from this assemblage. Food remains were limited to traces of hazel nutshell (some of it charred), charred barley and ?bread/club wheat, and uncharred seeds and 'core' of apple and seeds of blackberry. Some of the apple seeds were mineralised and there were traces of faecal concretions (to 60 mm), indicating the food component probably to have originated in faeces, though possibly reworked from another deposit such as a pit fill. This is probably borne out by the observation that some of the concretions were very oxidised and had an orange colour and powdery texture. Eggs of the intestinal parasite *Trichuris* were noted in a small subsample of concretion examined under the transmission microscope; this sample was also noted as being rich in pollen of cereals and other herbaceous taxa, presumably largely from food containing flour and other polleniferous foods.

Other plant remains in this assemblage were the weeds of waste places and cornfields commonly recorded in deposits of this kind and date, together with five species of moss likely to have been used for sanitary purposes (though all were present only in trace amounts, again perhaps indicative of redeposition from a cess pit fill).

The assemblage of beetles (and a single bug) recovered from this sample was small (55 individuals of 41 taxa), but mites, fly puparia and fly pupae (presumably released when puparia were broken during processing) were all numerous. Preservation varied, from quite good to rather poor, and there were numerous small fragments which were difficult to identify. The presence of 'several' rat-tailed maggots (larvae of hover flies, probably *Eristalis tenax*), indicative of water, suggests that redeposited pit fill may have contributed to the dump. The beetles were an ecologically mixed lot, with a hint of fairly foul decomposing matter, but—if reworking had occurred—may not stand as evidence of conditions in the deposit as it formed.

This deposit appears to have contained reworked faecal material, unless it was a fill of a pit whose cut was not recognised in the cramped space afforded by the test pit in which excavation took place at this site (at less than 1 m in all dimensions the pit was smaller than many of the pit cuts at, for example, Anglo-Scandinavian 16-22 Coppergate).

Context 1032 (dump)

Sample 4 (1 kg spot examined by ARH): moist, mid reddish to yellowish-grey-brown, crumbly, brittle to indurated burnt soil or ash with some dark grey patches of clay silt.

This material included lumps, some of which exhibited flat surfaces and baking more intense than in the deposit in general, as if representing the soil abutting a structure. A1 kg subsample was disaggregated and sieved to 300 μm as a 'spot' sample to check for plant and invertebrate remains and to try to understand the nature of the sediment. For this, the darker, charcoal-rich parts were selected preferentially (these were also the unindurated parts which crumbled and could be disaggregated without too much force). There was a large resultant residue of undisaggregated burnt soil in all fractions, plus a little charcoal; some of the lumps of 'soil' were seen to have flat or curved surfaces and impressions of straw, suggesting they were daub. The <2 mm fraction was subsequently subjected to paraffin flotation for the recovery of insect remains.

Plant fossils were rare, the residue being recorded as consisting mainly of ?daub with some charcoal and moderate numbers of elderberry seeds. Some of the charcoal was certainly oak, other material perhaps hazel, and there were traces of charred hazel nutshell and seeds of the common annual weed fat hen.

Only a single invertebrate fragment was recovered.

There seems little doubt that this sample consisted mainly of burnt daub.

Context 1028 (dump; pottery spot date AD 850-900)

Sample 3 (2 kg): moist, dark grey, crumbly (working plastic), ?humic sandy clay silt with traces of wood and charcoal.

This subsample yielded a large residue of about 600 cm^3, almost all mineral material (gravel and sand), with a small washover of a few tens of cm^3 of charcoal (to 40 mm, and including hazel) and other charred material, of which rather a large proportion proved to be charred (and partly-charred) oats. The part-charring perhaps argues for *in situ* burning in a thick deposit of material. Most of the uncharred plant material was very worn or decayed.

Amongst the oat chaff, spikelets, and grains (some of which had begun to sprout prior to burning) were some other charred food remains: traces of hazel nutshell and two seeds of lentil. This last has previously been recorded in York only from Roman deposits: from at least two contexts of 2nd or 2nd-early 3rd century date at Tanner Row (Hall and Kenward 1990), tentatively from a further 2nd century sample, and from a single 11th-12th century context, where it may have been reworked. This suggests that the material from Clifford Street may similarly be redeposited from earlier (presumably Roman) levels.

There were also traces of other cereals: barley, including the six-row form, and rye. Other plants likely to have been used for food or flavourings were celery seed, blackberry and elderberry.

Dyeplants in this sample were restricted to traces of twig epidermis of greenweed and tentatively identified hop fruits. There was a small range of other plants, mostly weeds.

Invertebrate remains were rare (for the beetles, S = 19, N = 22), and only *Anotylus complanatus*, of which there were four, was represented by more than one individual. Preservation varied considerably, and some remains were very badly decayed (E 3.5-5.5, mode 4; F 2.5-5.5, mode 4), with a general colour change towards pale (degree of change 2-4, with a distinct mode of 4). Such variable preservation would be consistent with the presence of a component of redeposited fossils. This may have been entirely background fauna or reworked material.

In summary, there are good reasons for suspecting that some at least of the biological remains in this deposit were reworked, perhaps even from much earlier deposits.

Phase 6

The archaeological account pertaining to this phase is as follows: 'The scale of truncation of these deposits [by 19th century cellars] was such that only two contexts survived, 1009 and 1008. ... Both of these contexts displayed profiles that sloped gently from the east down to the west. The composition, sloping profile and nature of inclusions suggest that both deposits are best interpreted as the dumping of domestic type debris. Pottery recovered from these deposits was of Roman and Anglo-Scandinavian date, just over half being of the latter. This is a point of some note as it will be recalled that the earlier Phase 4 dump type deposits produced much greater amounts of residual Roman pottery than they did Anglo-Scandinavian. The date of the Phase 6 deposits is likely to be around the mid 10th century.'

Context 1009 (the earliest deposit of Phase 6, described in the field as a mid grey, clayey silt containing a number of soft organic lenses, fragments of decayed wood and producing five pieces of antler. Other inclusions were oyster shells, charcoal flecks, animal bone, fragments of brick and tile, a few mortar flecks and the occasional small stone; interpreted as a dump; pottery spot date AD 900-950)

Sample 2 (2 kg): moist, mid-dark grey-brown, crumbly (working plastic), ?humic, slightly clay, sandy silt with traces of charcoal, wood and small fragments of mammal bone.

The moderately large residue of about 350 cm^3 yielded only a small washover, mostly charred material. Of this some was charcoal (to 10 mm) with quite a lot of charred (and some partly-charred) oat grains and spikelets (with some of the grains again showing evidence of sprouting prior to charring). There were also modest numbers of charred wheat and barley grains and a trace of rye, with a variety of charred and uncharred seeds of weeds of cornfields or other cultivated land or waste ground, though mostly in very small numbers, and some plants of grassland or wetland habitats at levels considered to be a 'background' in urban archaeological deposits. Dyeplant remains were limited to traces of clubmoss and of charred and uncharred stem fragments of greenweed.

Insect remains were fairly abundant, a group of 138 adult beetles (no bugs) of 66 taxa being accompanied by numerous mites and fly puparia, and smaller numbers of a range of other invertebrates. Preservation was variable, generally poor but occasionally good (E 2.5-5.0, mode 4.0; F 1.5-5.0, mode 3.0); colours had often changed towards paler.

The beetles were dominated by species associated with decomposer habitats (PNRT = 75, with various other uncoded taxa probably part of the same communities). There were fairly large numbers of species assigned to 'house fauna' by Kenward and Hall (1995), and part of the material contributing to the deposit may have come from a building. Other decomposers may have had the same origin, but the most abundant species, *Anotylus complanatus* (21 individuals) might be more at home under fouler conditions than normal in floors, and may have bred in the deposit *in situ*. The occurrence of three honeybees (*Apis mellifera*) perhaps suggests a nearby hive (bees seem to have been kept not far away at 16-22 Coppergate, Kenward and Hall 1995), while the single puparium of the sheep ked *Melophagus ovinus* presumably derived from wool cleaning.

There was a single grain weevil, *Sitophilus granarius*; this, and the other common grain pests are suspected to have been contaminants or to have been redeposited in Anglo-Scandinavian deposits at 16-22 Coppergate, and in view of the evidence of reworking elsewhere at the present site may be of Roman origin in this case, too.

It seems likely that this deposit incorporated a component derived from thatch, but probably mixed with a range of other material, some of which may have been redeposited.

Context 1008 (dump, pottery spot date ?C10/11th)

Sample 1 (2 kg): moist, mid-dark grey to mid orange-brown, crumbly (working plastic), slightly silty clay with traces of stones 6-20 mm, and of concretions, charcoal and marine shell.

The large residue of about 900 cm^3 consisted mainly of faecal concretions (to 80 mm) with some charcoal (to 20 mm), fish bone (to 30 mm, some evidently having been chewed) and sand. The small washover was mostly very decayed faecal concretion and charcoal.

Despite the large proportion of faecal concretions, the food remains in this deposit were all present in trace amounts; they included mineralised linseed and apple seeds and testa fragments and hila of field bean, and charred material of oats, barley and bread/club wheat. Eggs of both *Ascaris* and *Trichuris* were noted from a fragment of concretion dissolved in dilute acid and examined under the transmission microscope.

Dyeplant remains were lacking in this sample, though there was a very small component of seeds from weeds of various kinds.

The concentration of insect remains was low, and only 22 individuals of 19 beetle and bug taxa were recovered, together with several fly puparia and mites, and a single moth chrysalis. Preservation was mostly poor (mode E 4.5), though variable, and many fossils showed a strong colour change towards yellow (range 1-4, mode 4). This was a somewhat mixed group of species, typical of the Anglo-Scandinavian period in York, and likely to have exploited decomposing matter of various kinds, but the whole assemblage may have been background fauna or reworked from earlier deposits. The remains of two *Bruchus* sp. were recorded as the only relatively well preserved remains, but whether this was because they became incorporated immediately before the deposit was sealed and became anoxic, were protected within faecal material, or were contaminants, is impossible to judge.

Clearly this layer consisted largely of faecal material but it is possible it was reworked from a pit fill, for example, as described for Context 1042, rather than having accumulated *in situ*.

Discussion

Plant remains in these five samples were generally much like those from many deposits of Anglo-Scandinavian date in York, though more sparsely distributed. Two of the assemblages (from Contexts 1009 and 1028) were perhaps more atypical in having prominent components of material preserved by charring and consisting in large part of cereal grains or spikelets, primarily oats. At 16-22 Coppergate, for example, there were only three contexts (of 402 examined by means of a GBA or BS subsample) from which an assemblage with more than traces of charred oat grains or spikelets were recorded; all were from cut fills of Period 5B (cf. Hall and Kenward 1999).

By contrast, charred oats were frequent at 118-26 Walmgate (Hall and Kenward 2000) and part-charred material of the kind noted at Clifford Street was recorded at 41-9 Walmgate (Johnston *et al*. 2000). Whatever the source for this material, we may be beginning to see a pattern emerging in which sites more peripheral to the town centre are marked by the presence of concentrations of charred and partly-charred oats. One possible explanation is that roofing types—assuming the material represents thatch—differed, the more inflammable thatch perhaps being frowned upon where settlement was densest and conceivably replaced by turf or some other material.

As noted above, the faecal concretions recorded in four of the contexts at Clifford Street (though they were abundant only in 1008) may well have been reworked given the nature of the deposits as probable dumps, the resilience of the concretions, and the paucity of well preserved food remains (especially, for example, unconcreted 'bran'). This contrasts starkly with the evidence from so many pitfills at both 16-22 Coppergate (Kenward and Hall 1995) and 1-9 Micklegate (Kenward and Hall 2000), where unconcreted faecal material formed the bulk of many deposits.

At least some of the faecal material at Clifford Street seems to have been redeposited, presumably from approximately contemporaneous features (faecal concretions are believed to have formed extremely quickly), and it appears likely that there was also reworking from Roman layers. Consistent with this is the presence of Roman pottery in many of the layers dated as Anglo-Scandinavian. The redeposition of delicate organic remains such as insects may be more common than was formerly considered likely (cf. Dobney *et al.* 1997; Hall *et al.* 2000).

As usual for Anglo-Scandinavian deposits in York, dyeplants were recorded regularly, though mostly only in small amounts—greenweed was present in three contexts, clubmoss in two and madder in one. The sample richest in dyeplants (that from Context 1042) was most like assemblages from Anglo-Scandinavian 16-22 Coppergate; it was the one in this group where preservation of organic material by waterlogging was greatest, too.

The insect remains from 2 Clifford Street gave very limited evidence, and preservation was generally poor. Dumps of the kind seen here are hardly the most useful source of evidence about living conditions and activity on a site, although deserving of at least selective analysis. However, it may be said that the insect assemblages were generally very much like those from other Anglo-Scandinavian sites, and particularly from 16-22 Coppergate, to the extent that the small numbers of assemblages and remains permit realistic comparison.

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Table 1. List of samples from 2 Clifford Street, York, examined for plant and invertebrate remains. Wt.—weight processed (kg).

Context	**Sample**	**Context type**	**Wt.**
1008	1	dump	2
1009	2	dump	2
1028	3	dump	2
1032	4	dump	1
1042	5	dump associated with remains of wattle fence	2

Table 2. Complete list of plant and invertebrate remains recorded from samples from 2 Clifford Street, York, in taxonomic order. Order and nomenclature follow Tutin et al. *(1964-90) for vascular plants, Smith (1978) for mosses, and Kloet and Hincks (1964-77) for insects. Plant material not specifically noted as being preserved by charring or mineral replacement can be taken to be uncharred and unmineralised (i.e. 'waterlogged', but sometimes denoted simply as 'uncharred'). Where both secure and tentative identifications for a given taxon were recorded, only the former are listed here. For invertebrates, * = not used in calculating assemblage statistics (Table 6); ecode—ecological code used in generating main statistics (Table 6); sp(p).—species not previously listed; sp(p). indet.—may be a species already listed.*

BRYOPHYTA (parts were leaves and/or shoot fragments)

Neckera complanata (Hedw.) Hüb.
Thuidium tamariscinum (Hedw.) Br. Eur.
Eurhynchium striatum (Hedw.) Schimp.
Pleurozium schreberi (Brid.) Mitt.
Hylocomium splendens (Hedw.) Br. Eur.

PTERIDOPHYTA
Diphasium complanatum (L.) Rothm. (complanate clubmoss): shoot fragments

ANGIOSPERMAE
Corylus avellana L. (hazel): charred and uncharred nuts and/or nutshell fragments, charcoal
Quercus sp(p). (oak): buds and/or bud-scales, charcoal fragments
Humulus lupulus L. (hop): achenes
Urtica dioica L. (stinging nettle): achenes
U. urens L. (annual nettle): achenes
Polygonum aviculare agg. (knotgrass): fruits
P. persicaria L. (persicaria/red shank): fruits
P. lapathifolium L. (pale persicaria): fruits
P. persicaria/lapathifolium (persicarias): charred fruits
Bilderdykia convolvulus (L.) Dumort. (black bindweed): charred and uncharred fruits; uncharred fruit fragments
Rumex acetosella agg. (sheep's sorrel): fruits
Rumex sp(p). (docks): charred and uncharred fruits
Chenopodium album L. (fat hen): charred and uncharred seeds
Atriplex sp(p). (oraches): mineralised and uncharred seeds
Stellaria media (L.) Vill. (chickweed): seeds
Spergula arvensis L. (corn spurrey): seeds
Agrostemma githago L. (corncockle): mineralised casts/moulds of seed fragments, uncharred seeds and seed fragments

Ranunculus Section *Ranunculus* (meadow/creeping/bulbous buttercup): achenes
R. flammula L. (lesser spearwort): achenes
Thlaspi arvense L. (field penny-cress): seeds, seed fragments
Brassica rapa L. ('turnip'): seeds, seed fragments
Brassica sp(p). (cabbages, etc.): seeds, seed fragments
Brassica sp./Sinapis arvensis L. (brassica/charlock): mineralised cotyledons and seeds
Raphanus raphanistrum L. (wild radish): charred and uncharred pod segments and/or fragments
Rubus fruticosus agg. (blackberry/bramble): seeds
Malus sylvestris Miller (crab apple): endocarp, seeds, mineralised seeds/embryos
Genista tinctoria L. (dyer's greenweed): leaves, stem fragments, twig epidermis fragments, charred stem fragments,
Vicia faba L. (field bean): mineralised hila, testa fragments
cf. *V. faba*: charred cotyledons
Vicia sp(p). (vetches, etc.): charred seeds
Lens culinaris Medicus (lentil): charred seeds
Linum usitatissimum L. (cultivated flax): mineralised seeds
Euphorbia helioscopia L. (sun spurge): charred and uncharred seeds
Ilex aquifolium L. (holly): leaf epidermis fragments
Anthriscus sylvestris (L.) Hoffm. (cow parsley): mineralised mericarps
Aethusa cynapium L. (fool's parsley): mericarps
cf. *Anethum graveolens* L. (?dill): mericarps
Conium maculatum L. (hemlock): mericarp fragments
Apium graveolens L. (wild celery): mericarps
cf. *Calluna vulgaris* (L.) Hull (?heather, ling): charred root and/or basal twig fragments
Anagallis arvensis L. (scarlet pimpernel): seeds
Rubia tinctorum L. (dyer's madder): root and root bark fgts
Galeopsis Subgenus *Galeopsis* (hemp-nettles): nutlets
Prunella vulgaris L. (selfheal): nutlets
Hyoscyamus niger L. (henbane): seeds
Pedicularis palustris L. (marsh lousewort): seeds
Plantago major L. (greater plantain): seeds
P. lanceolata L. (ribwort plantain): charred seeds

Sambucus nigra L. (elder): seeds
Valerianella dentata (L.) Pollich (narrow-fruited cornsalad): fruits
Compositae (daisy family): mineralised achenes
Anthemis cotula L. (stinking mayweed): charred and uncharred achenes
Centaurea sp(p). (knapweeds, etc.): charred achenes
Sonchus asper (L.) Hill (prickly sow-thistle): achenes
Juncus inflexus L./*J. effusus* L./*J. conglomeratus* L. (hard/soft/compact rush): seeds
J. bufonius L. (toad rush): seeds
Gramineae (grasses): charred and waterlogged caryopses
Gramineae/'Cerealia' (grasses/cereals): charred culm fragments and culm nodes, waterlogged chaff and culm fragments
'Cerealia' indet. (cereals): charred caryopses, waterlogged spikelets/fragments
Bromus sp(p). (bromes, etc.): charred caryopses
Triticum 'aestivo-compactum' (bread/club wheat): charred caryopses
Triticum sp(p). (wheats): charred caryopses
Secale cereale L. (rye): charred caryopses
Hordeum vulgare L. (six-row barley): charred caryopses, some twisted grains
Hordeum sp(p). (barley): charred caryopses
Avena sativa L. (cultivated oat): charred spikelets/spikelet fragments, some grains sprouting
Avena sp(p). (oats): charred caryopses, some or all sprouting, charred chaff and spikelets/spikelet fragments, mineralised caryopses
Eleocharis palustris s.l. (common spike-rush): nutlets
Carex sp(p). (sedges): charred and uncharred nutlets

ANNELIDA: OLIGOCHAETA

*Oligochaeta sp. (egg capsule)	u

INSECTA

HEMIPTERA

Auchenorhyncha sp.	oa-p
*Coccoidea sp.	u

LEPIDOPTERA

*Lepidoptera sp. (pupa)	u

DIPTERA

**Melophagus ovinus* (Linnaeus) (puparium)	u
*Nematocera sp. (larva)	u
*Syrphidae sp. (larva)	u
*Diptera sp. (pupa)	u
*Diptera sp. (puparium)	u

SIPHONAPTERA

*Siphonaptera sp.	u

COLEOPTERA

Trechus obtusus or *quadristriatus*	oa
Trechus micros (Herbst)	u
?Trechus sp. indet.	ob
Pterostichus melanarius (Illiger)	ob
Laemostenus ?terricola (Herbst)	ss
Carabidae sp.	ob
Helophorus aquaticus or *grandis*	oa-w
Cercyon analis (Paykull)	rt-sf
Cercyon atricapillus (Marsham)	rf-st
Cercyon haemorrhoidalis (Fabricius)	rf-sf
Cercyon unipunctatus (Linnaeus)	rf-st
Megasternum obscurum (Marsham)	rt
Acritus nigricornis (Hoffmann)	rt-st
Histerinae sp.	rt
Ptenidium sp.	rt
Catops sp.	u
?Dropephylla sp.	u
Omalium caesum or *italicum*	rt-sf
Omalium ?rivulare (Paykull)	rt-sf
Xylodromus concinnus (Marsham)	rt-st
Carpelimus ?bilineatus Stephens	rt-sf
Carpelimus pusillus group	u
Platystethus arenarius (Fourcroy)	rf
Platystethus cornutus group	oa-d
Platystethus nitens (Sahlberg)	oa-d
Anotylus complanatus (Erichson)	rt-sf
Anotylus nitidulus (Gravenhorst)	rt
Anotylus rugosus (Fabricius)	rt
Oxytelus sculptus Gravenhorst	rt-st
Stenus spp.	u
Leptacinus intermedius Donisthorpe	rt-st
Leptacinus sp. indet.	rt-st
Gyrohypnus angustatus Stephens	rt-st
Gyrohypnus ?fracticornis (Müller)	rt-st
Neobisnius sp.	u
Philonthus spp.	u
?Creophilus maxillosus (Linnaeus)	rt
?Quedius sp.	u
Staphylininae sp.	u
Falagria sp.	rt-sf
Aleocharinae spp.	u
Pselaphidae sp.	u
Trox scaber (Linnaeus)	rt-sf
Aphodius granarius (Linnaeus)	ob-rf
Aphodius sp.	ob-rf
Elateridae sp.	ob
Anobium punctatum (Degeer)	l-sf
Ptilinus pectinicornis (Linnaeus)	l-sf
Ptinus ?fur (Linnaeus)	rd-sf
Ptinus sp. indet.	rd-sf
Anthocomus fasciatus (Linnaeus)	ob
?Meligethes sp.	oa-p
Omosita discoidea (Fabricius)	rt-sf
Omosita sp. inet.	rt-sf
Rhizophagus sp.	u
Monotoma longicollis (Gyllenhall)	rt-st

Monotoma sp.	rt-sf
Cryptophagus scutellatus Newman	rd-st
Atomaria spp.	rd
Lathridius minutus group	rd-st
Enicmus sp.	rt-sf
Corticaria spp.	rt-sf
Corticarina or *Cortinicara* sp.	rt
Typhaea stercorea (Linnaeus)	rd-ss
Aglenus brunneus (Gyllenhal)	rt-ss
**?Blaps* sp. (larva)	rt-ss
Tenebrio obscurus Fabricius	rt-ss
Anthicus sp.	rt
Bruchus ?rufimanus Boheman	st
?Gastrophysa sp.	oa-p
Chrysomelinae sp.	oa-p
Chaetocnema concinna (Marsham)	oa-p
Apion sp.	oa-p
Sitophilus granarius (Linnaeus)	g-ss
Cryptophagus spp.	rd-sf
Curculionidae sp.	oa
Scolytus ?rugulosus (Müller)	l
Xyloterus sp.	l
Coleoptera sp.	u
*Coleoptera sp. indet. (larva)	u
HYMENOPTERA	
**Apis mellifera* Linnaeus	u
*Hymenoptera Parasitica sp.	u
*Hymenoptera sp.	u
*Proctotrupoidea sp.	u
ARACHNIDA	
*Aranae sp.	u
*Acarina sp.	u

Table 3. Lists of plants remains and other components of the samples from 2 Clifford Street, York, in context and sample order. For each list records are presented in descending order by abundance score (on a 3- or 4-point scale as appropriate for the kind of sample) and for each score in alphabetical order.

Abbreviations:b—bud(s); bs—bud-scale(s); ch—charred; c/m—casts/moulds; c/n—culm-nodes; cot—cotyledons; dec—decayed; endo—endocarp; ff—fruit fragment(s); fgt/s—fragment/s; inc—including; lef—leaf epidermis fragment(s); lf—leaf; lfless—leafless; lvs—leaves; max—maximum; mf—mericarp fragment(s); min—mineral-replaced ('mineralised'); rt-tw—root or basal twig; segs—segment(s); sf—seed fragment(s); spklts—spikelet(s); spr—sprouting; st—stem; tef—twig epidermis fragment(s); twstd—twisted; v—very; w/l—waterlogged.

Context 1008, Sample 1/T1		
faecal concretions	4	max 80 mm
charcoal	2	max 20 mm
fish bone	2	max 30 mm
sand	2	
Agrostemma githago (min c/m)	1	
animal hairs	1	
Anthriscus sylvestris (min)	1	
Ascaris (eggs)	1	
Atriplex sp(p).	1	
Atriplex sp(p). (min)	1	
Avena sp(p). (inc spr)	1	
Avena sp(p). (min)	1	
bark chips	1	max 10 mm
beetles	1	
bone fgts	1	max 25 mm
Brassica rapa	1	
Brassica rapa (sf)	1	
Brassica sp(p).	1	
Brassica sp./Sinapis arvensis (min)	1	
brick/tile	1	max 80 mm
Bromus sp(p).	1	
burnt bone fgts	1	max 15 mm
Cerealia indet.	1	
Chenopodium album	1	
Compositae (min)	1	
earthworm egg caps (min)	1	
eggshell fgts	1	max 2 mm
eggshell membrane fgts	1	
Euphorbia helioscopia	1	
fly puparia	1	
glassy slag	1	max 10 mm
grit	1	
Hordeum sp(p).	1	
Linum usitatissimum (min)	1	
Malus sylvestris (min)	1	
oyster shell fgts	1	max 60 mm
pottery	1	max 10 mm
Sambucus nigra	1	
Thlaspi arvense (sf)	1	
Trichuris (eggs)	1	
Triticum aestivo-compactum	1	
Vicia faba (min hila)	1	
Vicia faba (min testa fgts)	1	
wood chips (ch)	1	max 10 mm

Context 1009, Sample 2/T1		
Atriplex sp(p).	2	
Avena sp(p). (inc spr)	2	
Avena sp(p). (spklts/fgts)	2	some or all only partly ch
bark fgts	2	max 35 mm
charcoal	2	max 10 mm
Chenopodium album	2	
gravel	2	max 40 mm
grit	2	
Hordeum sp(p).	2	
Juncus bufonius	2	
Rumex acetosella agg.	2	
sand	2	
Triticum sp(p).	2	
?daub	1	max 10 mm
Aethusa cynapium	1	v dec
Agrostemma githago (sf)	1	
Anagallis arvensis	1	
Anthemis cotula (ch)	1	
Avena sativa (spklts/fgts)	1	
Avena sp(p). (chaff)	1	some or all only partly ch
beetles	1	
Bilderdykia convolvulus	1	
Bilderdykia convolvulus (ff)	1	
bone fgts	1	max 55 mm
Brassica rapa	1	
Brassica sp./Sinapis arvensis (min cot)	1	
brick/tile	1	max 10 mm
Bromus sp(p).	1	
burnt bone fgts	1	max 10 mm
Carex sp(p).	1	
Carex sp(p). (ch)	1	
Centaurea sp(p). (ch)	1	
cf. Calluna vulgaris (ch rt-tw fgts)	1	
cf. Vicia faba (ch cot)	1	
Conium maculatum (mf)	1	
Corylus avellana	1	inc material with apical knife marks
Corylus avellana (ch)	1	
Diphasium complanatum	1	v dec
earthworm egg caps	1	
Eleocharis palustris sl	1	
Euphorbia helioscopia (ch)	1	
faecal concretions	1	max 10 mm
fish bone	1	max 20 mm

fish scale	1	
fly puparia	1	
Galeopsis Subgenus Galeopsis	1	
Genista tinctoria (ch st fgts)	1	
Genista tinctoria (st fgts)	1	
glassy slag	1	max 25 mm
Gramineae	1	
Gramineae/Cerealia (ch culm fgts)	1	
Gramineae/Cerealia (w/l chaff)	1	
Hylocomium splendens	1	
Hyoscyamus niger	1	
leaf ab pads	1	
Malus sylvestris	1	
Melophagus ovinus (sheep ked)	1	
Neckera complanata	1	
Plantago lanceolata (ch)	1	
Plantago major	1	
Polygonum lapathifolium	1	
Polygonum persicaria	1	
Polygonum persicaria/lapathifolium (ch)	1	
pottery	1	max 60 mm
Quercus sp(p). (b/bs)	1	
Ranunculus flammula	1	
Ranunculus Section Ranunculus	1	
Raphanus raphanistrum (ch pod segs/fgts)	1	
Raphanus raphanistrum (pod segs/fgts)	1	
Rumex sp(p).	1	
Rumex sp(p). (ch)	1	
Sambucus nigra	1	inc fgts
Secale cereale	1	
small mammal bone	1	
small mammal tooth	1	
Spergula arvensis	1	
Stellaria media	1	
teeth	1	
Thlaspi arvense	1	
twig fgts (ch)	1	max 10 mm
Valerianella dentata	1	
Vicia sp(p).	1	
wood fgts	1	max 10 mm

Context 1028, Sample 3/T1

gravel	3	
sand	3	
Avena sativa (spklts/fgts inc spr)	2	some or all only partly charred
Avena sp(p). (chaff)	2	some or all only partly charred
Avena sp(p). (inc spr)	2	
Bromus sp(p).	2	
charcoal	2	max 40 mm
Chenopodium album	2	
grit	2	
Juncus bufonius	2	
stones	2	max 60 mm
Agrostemma githago (min c/m)	1	
Agrostemma githago (sf)	1	
Apium graveolens	1	v dec
Atriplex sp(p).	1	
Chenopodium album	1	
bark fgts	1	max 15 mm
beetles	1	
Bilderdykia convolvulus	1	
Bilderdykia convolvulus (ch)	1	
Bilderdykia convolvulus (ff)	1	
bone fgts	1	max 60 mm
Brassica rapa	1	
burnt bone fgts	1	max 5 mm
burnt eggshell fgts	1	max 2 mm
Carex sp(p).	1	
Cerealia indet.	1	
cf. Anethum graveolens	1	v dec
cf. Humulus lupulus	1	
Chenopodium album (ch)	1	
Corylus (charcoal)	1	max 40 mm
Corylus avellana (ch)	1	
earthworm egg caps	1	
eggshell fgts	1	max 2 mm
Eleocharis palustris sl	1	v dec
faecal concretions	1	max 35 mm
fish bone	1	max 5 mm
fish scale	1	
fly puparia	1	
Galeopsis Subgenus Galeopsis	1	
Genista tinctoria (tef)	1	max 2 mm
glass	1	max 10 mm
Gramineae	1	
Gramineae (ch)	1	
Gramineae/Cerealia (ch c/n)	1	some or all only partly charred
Gramineae/Cerealia (ch culm fgts)	1	
Hordeum sp(p).	1	
Hordeum vulgare (inc twstd)	1	
Hyoscyamus niger	1	
Juncus inflexus/effusus/conglomeratus	1	
Lens culinaris	1	a single specimen
moss (lfless stems)	1	
Polygonum persicaria	1	
Quercus sp(p). (b/bs)	1	
Raphanus raphanistrum (ch pod segs/fgts)	1	
Rubus fruticosus agg.	1	
Rumex acetosella agg.	1	
Rumex sp(p). (ch)	1	
Sambucus nigra	1	inc fgts
Secale cereale	1	
slug granules	1	
small mammal bone	1	
Stellaria media	1	
Urtica dioica	1	
Urtica urens	1	
Vicia sp(p). (non faba)	1	

Context 1032, Sample 4/SPT

?daub	4	
charcoal	2	max 10 mm
Sambucus nigra	2	
'straw' impressions (in daub)	1	
Bromus sp(p).	1	
cf. Corylus (charcoal)	1	
Corylus avellana (ch)	1	

Quercus (charcoal)	1	
root/rootlet fgts (?modern)	1	
sand	1	

Context 1042, Sample 5/T1

bark fgts	4	max 100 mm
Juncus bufonius	3	
Atriplex sp(p).	2	
Brassica sp(p).	2	
Brassica sp(p). (sf)	2	
charcoal	2	max 20 mm
Chenopodium album	2	
earthworm egg caps	2	
fish bone	2	max 20 mm
fly puparia	2	
Genista tinctoria (st fgts)	2	max 15 mm
grit	2	
Humulus lupulus	2	
Rubia tinctorum	2	max 5 mm
sand	2	
wood fgts	2	max 140 mm
?charred bread	1	max 30 mm
?daub	1	max 5 mm
Agrostemma githago	1	
Agrostemma githago (sf)	1	
animal hairs	1	
Anthemis cotula	1	
beetles	1	
Bilderdykia convolvulus	1	
Bilderdykia convolvulus (ff)	1	
bone fgts	1	max 100 mm
Brassica rapa (sf)	1	
brick/tile	1	max 15 mm
burnt bone fgts	1	max 5 mm
Carex sp(p).	1	
Cerealia indet. (w/l spklts/fgts)	1	
Corylus avellana	1	
Corylus avellana (ch)	1	
Diphasium complanatum		v dec, max 15 mm
Eleocharis palustris sl	1	
Eurhynchium striatum	1	
faecal concretions	1	max 60 mm
fish scale	1	
fly puparia (min)	1	
Genista tinctoria (lvs)	1	
Genista tinctoria (tef)	1	
Gramineae	1	
Gramineae/Cerealia (culm fgts)	1	
gravel	1	max 15 mm
herbaceous detritus	1	
Hordeum sp(p).	1	a single specimen
Hylocomium splendens	1	
Hyoscyamus niger	1	
Ilex aquifolium (lef)	1	
leaf ab pads	1	
Malus sylvestris (endo)	1	
Malus sylvestris (min)	1	
Neckera complanata	1	
Pedicularis palustris	1	
percid scale	1	
Pleurozium schreberi	1	
Polygonum aviculare agg.	1	
Polygonum lapathifolium	1	
pottery	1	max 10 mm
Prunella vulgaris	1	
Ranunculus Section Ranunculus	1	
Raphanus raphanistrum (pod segs/fgts)	1	
Rubia tinctorum (root bark)	1	
Rubus fruticosus agg.	1	
Rumex sp(p).	1	
Sonchus asper	1	
Thuidium tamariscinum	1	
Trichuris (eggs)	1	
Triticum cf. aestivo-compactum	1	
unwashed sediment	1	max 10 mm
Valerianella dentata	1	

Table 4. Values for the 'abundance-indicator value' (AIV) for assemblages of plant remains from 2 Clifford Street, York, in context order (data for Sample 4 are not included). For each sample, AIVs are given in descending order; an explanation of the group codes is given in Table 5. Also presented are sums for the 'amount' (on a four-point scale) of the taxa in each group. Note that the AIVs, whilst internally comparable, use a different scale for 'score' from that used by, for example, Hall and Kenward (1990); instead of an indicator score of 1, 2 or 3, the scale 1, 5, 25 is used to 'stretch' the range of the resulting AIVs. The 'unclassified' group UNCL is included here because, although it does not produce AIVs, the sums of taxon amounts are worth recording.

Group		*Sum*	*AIV*
Context 1008, Sample 1/T1			
U	FOOS	10	178
V	CHEN	8	120
V	SECA	3	35
U	FOOO	3	27
U	FIBR	1	25
V	ARTE	3	15
V	BIDE	2	10
V	CAKI	2	10
V	MOAR	1	5
V	QUFA	1	5
V	RHPR	1	5
*	UNCL	4	0
Context 1009, Sample 2/T1			
U	FOOS	15	255
V	CHEN	25	201
V	SECA	15	171
V	MOAR	8	80
U	DYES	3	75
V	QUFA	6	62
V	ISNA	2	50
V	PLAN	3	35
V	BIDE	6	30
E	FUGE	1	25
V	ARTE	5	21
V	EPIL	3	15
V	FEBR	4	12
V	NACA	3	11
M	WOOF	2	10
V	CAKI	2	10
V	RHPR	2	10
V	SESC	2	10
V	TRGE	2	10
V	PHRA	2	6
M	GRAS	1	5
M	HEMO	1	5
M	LIGN	1	5
M	SLIT	1	5
V	LITT	1	5
V	SCCA	1	5
U	USEF	3	3
U	HERB	2	2
U	FOOO	1	1
U	WOOD	1	1
V	OXSP	1	1
V	QUER	1	1
*	UNCL	9	0
Context 1028,Sample 3/T1			
U	FOOS	13	253
V	CHEN	15	175
V	SECA	8	100
V	MOAR	4	60
V	ISNA	2	50
V	QUFA	6	42
U	USEF	5	29
U	FOOF	3	27
U	DYES	2	26
V	ARTE	5	25
V	EPIL	4	20
V	RHPR	4	16
V	BIDE	3	15
V	NACA	2	10
V	ALNE	2	6
V	CAKI	1	5
V	PHRA	1	5
V	PLAN	1	5
V	SESC	1	5
V	TRGE	1	5
U	HERB	2	2
U	FOOO	1	1
U	WOOD	1	1
V	FEBR	1	1
V	QUER	1	1
*	UNCL	7	0
Context 1042, Sample 5/T1			
U	DYES	10	202
U	FOOS	7	175
V	CHEN	14	126
V	SECA	10	126
V	MOAR	8	120
V	QUFA	7	83
V	ISNA	3	75
U	FOOF	2	50
M	HEMO	2	30
V	PLAN	2	30
M	WOOF	4	20
V	TRGE	4	20
V	ARTE	4	16
M	LIGN	3	15
M	SLIT	3	15
V	BIDE	3	15
V	RHPR	3	15
V	ALNE	2	10
V	CAKI	2	10
V	FEBR	5	9
U	HERB	6	6
V	PHRA	2	6
M	GRAS	1	5
V	NACA	1	5
V	SCCA	1	5
U	USEF	2	2
U	FOOO	1	1
U	WOOD	1	1
*	UNCL	7	0

Table 5. Explanation of the codes used for AIV groups in Table 4.

*	UNCL	unclassified
E	FUGE	plants with distinctly calcifuge habit
M	GRAS	mosses of grassland
M	HEMO	mosses of heathland and moorland
M	LIGN	mosses growing on tree bark/dead wood
M	SLIT	mosses of shaded rocks
M	WOOF	mosses of woodland floors
U	DYES	plants certainly or probably used in dyeing
U	FIBR	plants certainly or probably used as a source of fibre
U	FOOF	plants used as flavourings (including herbs, spices)
U	FOOO	plants certainly or probably used for oil
U	FOOS	primary food plants
U	HERB	plants certainly or probably used medicinally
U	USEF	plants useful in some way other than for food, fibre, oil, dyeing, medicine or as ornamentals
U	WOOD	plants likely to have originated with brushwood or timber
V	ALNE	plants of alder carr
V	ARTE	plants of biennial and perennial nitrophilous tall-herb weed communities of waste places, river-banks, waysides and hedgerows
V	BIDE	plants of nitrophilous weed communities of pond edges, ditches and other places subject to periodic inundation
V	CAKI	plants of nitrophilous weedy communities of shingle beaches and sandy strandlines
V	CHEN	plants of annual nitrophilous weed communities of cultivated and other disturbed land, especially rootcrop fields and gardens
V	EPIL	plants of nitrophilous woodland edge and clearing communities
V	FEBR	plants of drier, typically calcareous, grassland
V	ISNA	plants of short-lived dwarf-rush communities of winter-wet (often sandy) habitats, pond edges, wet tracks
V	LITT	plants of rooted aquatic vegetation at the edge of (usually oligotrophic) waters
V	MOAR	plants of grassland, including the wetter meadows and pastures, and adjacent paths
V	NACA	plants of grass- and dwarf-shrub (typically *Calluna*-) dominated dry heaths and moors
V	OXSP	plants of raised bogs and wet heaths
V	PHRA	plants of freshwater reedswamp communities
V	PLAN	plants of trampled places
V	QUER	plants of deciduous woodland on poorer soils
V	QUFA	plants of deciduous woodland on better soils
V	RHPR	plants of woodland edge scrub communities
V	SCCA	plants of poor to intermediate fen communities (acid to mildly basic peat)
V	SECA	plants of annual weed communities in cereal fields
V	SESC	plants of established vegetation of sand dunes and other sandy acidic soils
V	TRGE	plants of species-rich communities of grassland/scrub boundaries, often calcicolous

Table 6. Main statistics for the assemblages of adult Coleoptera and Hemiptera (excluding Aphidoidea and Coccidoidea) from 2 Clifford Street, York. For explanation of codes see Table 8.

Context	**1008**	**1009**	**1028**	**1032**	**1042**	**Whole site**
Sample	**1**	**2**	**3**	**4**	**5**	
Ext	/T	/T1	/T1	/T1	/T1	
S	19	66	19	1	41	97
N	22	138	22	1	55	238
ALPHA	64	50	64	0	72	61
SEALPHA	37	7	37	0	21	6
SOB	4	11	2	0	7	19
PSOB	21	17	11	0	17	20
NOB	4	12	2	0	7	25
PNOB	18	9	9	0	13	11
ALPHAOB	0	0	0	0	0	37
SEALPHAOB	0	0	0	0	0	17
SW	0	1	0	0	0	1
PSW	0	2	0	0	0	1
NW	0	1	0	0	0	1
PNW	0	1	0	0	0	0
ALPHAW	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0
SD	2	0	0	0	0	2
PSD	11	0	0	0	0	2
ND	2	0	0	0	0	2
PND	9	0	0	0	0	1
ALPHAD	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0
SP	1	4	0	0	2	6
PSP	5	6	0	0	5	6
NP	1	4	0	0	2	7
PNP	5	3	0	0	4	3
ALPHAP	0	0	0	0	0	0
SEALPHAP	0	0	0	0	0	0
SM	0	0	0	0	0	0
PSM	0	0	0	0	0	0
NM	0	0	0	0	0	0
PNM	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0
SL	1	3	0	0	2	4
PSL	5	5	0	0	5	4
NL	1	5	0	0	2	8
PNL	5	4	0	0	4	3
ALPHAL	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0
SRT	10	37	11	1	21	75

Context	1008	1009	1028	1032	1042	Whole site
Sample	1	2	3	4	5	
PSRT	53	56	58	100	51	77
NRT	12	103	14	1	31	161
PNRT	55	75	64	100	56	68
ALPHART	0	21	0	0	29	55
SEALPHART	0	3	0	0	11	7
SRD	1	9	0	0	3	13
PSRD	5	14	0	0	7	13
NRD	2	30	0	0	3	35
PNRD	9	22	0	0	5	15
ALPHARD	0	4	0	0	0	8
SEALPHARD	0	1	0	0	0	2
SRF	2	6	1	0	1	10
PSRF	11	9	5	0	2	10
NRF	2	9	1	0	1	13
PNRF	9	7	5	0	2	5
ALPHARF	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0
SSA	8	30	6	1	20	44
PSSA	42	45	32	100	49	45
NSA	10	90	9	1	29	139
PNSA	45	65	41	100	53	58
ALPHASA	0	16	0	0	29	22
SEALPHASA	0	3	0	0	11	3
SSF	5	17	5	1	10	24
PSSF	26	26	26	100	24	25
NSF	6	61	8	1	16	92
PNSF	27	44	36	100	29	39
ALPHASF	0	8	0	0	0	11
SEALPHASF	0	2	0	0	0	2
SST	3	9	1	0	7	13
PSST	16	14	5	0	17	13
NST	4	24	1	0	10	39
PNST	18	17	5	0	18	16
ALPHAST	0	5	0	0	0	7
SEALPHAST	0	2	0	0	0	2
SSS	0	4	0	0	3	7
PSSS	0	6	0	0	7	7
NSS	0	5	0	0	3	8
PNSS	0	4	0	0	5	3
ALPHASS	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0
SG	0	1	0	0	0	1
PSG	0	2	0	0	0	1
NG	0	1	0	0	0	1
PNG	0	1	0	0	0	0
ALPHAG	0	0	0	0	0	0

Context	1008	1009	1028	1032	1042	Whole site
Sample	**1**	**2**	**3**	**4**	**5**	
SEALPHAG	0	0	0	0	0	0

Table 7. Insects and other macro-invertebrates from 2 Clifford Street, York: species lists by sample. Taxa are listed in descending order of abundance. Key: n - minimum number of individuals; q - quantification (s - semi-quantitative 'several', m - semi-quantitative 'many', both sensu *Kenward* et al. *(1986), e - estimate); ec - ecological codes (see Table 8 for explanation); * - not used in calculation of statistics in Table 6.*

Context: 1008 Sample: 1/T ReM: S
Weight: 2.00 E: 4.50 F: 3.50

Notes: Entered 7.3.2000. Recorded in flot, problems on filter paper. Very decayed fossils. Colour change to yellow: range 1-4, mode 4 (very distinct). A few fossils from AH residue tube added. The two *Bruchus* were the only fresh-looking fossils. Modern alate aphid.

Taxon	n	q	ec
Falagria sp.	2	-	rt-sf
Atomaria sp.	2	-	rd
Bruchus ?rufimanus	2	-	st
Auchenorhyncha sp.	1	-	oa-p
Cercyon unipunctatus	1	-	rf-st
Histerinae sp.	1	-	rt
Omalium ?rivulare	1	-	rt-sf
Platystethus cornutus group	1	-	oa-d
Platystethus nitens	1	-	oa-d
Anotylus complanatus	1	-	rt-sf
Anotylus nitidulus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Staphylininae sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Anobium punctatum	1	-	l-sf
Corticaria sp.	1	-	rt-sf
Aphodius sp.	1	-	ob-rf
*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u
*Lepidoptera sp. (pupa)	1	-	u

Context: 1009 Sample: 2/T1 ReM: S
Weight: 2.00 E: 4.00 F: 3.00

Notes: Entered 10.3.2000. Listed in flot, problems on filter paper. Preservation generally poor but occasionally good (E2.5-5.0, F1.5-5.0). Many unidentifiable fragments. Refloat jar not recorded (it would increase numbers appreciably but not change interpretation). Material from AH residue tube included (quite a lot of remains). Colour change to pale. One *Trox* rb in concretion. One charred beetle larva.

Taxon	n	q	ec
Anotylus complanatus	21	-	rt-sf
Ptilinus pectinicornis	1	-	l-sf
Lathridius minutus group	8	-	rd-st
Ptinus ?fur	6	-	rd-sf
Cryptophagus sp. C	6	-	rd-sf
Corticaria sp. B	6	-	rt-sf
Xylodromus concinnus	5	-	rt-st
Anotylus nitidulus	4	-	rt
Aleocharinae sp. A	4	-	u
Omalium caesum or italicum	3	-	rt-sf
Anobium punctatum	3	-	l-sf
Cryptophagus scutellatus	3	-	rd-st
Trechus micros	2	-	u
Cercyon unipunctatus	2	-	rf-st
Platystethus arenarius	2	-	rf
Anotylus rugosus	2	-	rt
Leptacinus sp.	2	-	rt-st
Falagria sp.	2	-	rt-sf
Trox scaber	2	-	rt-sf
Aphodius granarius	2	-	ob-rf
Omosita discoidea	2	-	rt-sf
Monotoma sp.	2	-	rt-sf
Atomaria sp. A	2	-	rd
Enicmus sp.	2	-	rt-sf
Corticarina or Cortinicara sp.	2	-	rt
Typhaea stercorea	2	-	rd-ss
Trechus obtusus or quadristriatus	1	-	oa
Pterostichus melanarius	1	-	ob
Laemostenus ?terricola	1	-	ss
Helophorus aquaticus or grandis	1	-	oa-w
Cercyon atricapillus	1	-	rf-st
Cercyon haemorrhoidalis	1	-	rf-sf
Megasternum obscurum	1	-	rt
Acritus nigricornis	1	-	rt-st
Catops sp.	1	-	u
Carpelimus ?bilineatus	1	-	rt-sf
Carpelimus pusillus group	1	-	u
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Gyrohypnus angustatus	1	-	rt-st
Gyrohypnus ?fracticornis	1	-	rt-st
Neobisnius sp.	1	-	u
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Philonthus sp. C	1	-	u
?Creophilus maxillosus	1	-	rt
Staphylininae sp.	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Aphodius sp.	1	-	ob-rf
Elateridae sp.	1	-	ob
Anthocomus fasciatus	1	-	ob

?Meligethes sp.	1	-	oa-p
Rhizophagus sp.	1	-	u
Cryptophagus sp. A	1	-	rd-sf
Cryptophagus sp. B	1	-	rd-sf
Atomaria sp. B	1	-	rd
Corticaria sp. A	1	-	rt-sf
Tenebrio obscurus	1	-	rt-ss
Anthicus sp.	1	-	rt
?Gastrophysa sp.	1	-	oa-p
Chrysomelinae sp. A	1	-	oa-p
Chaetocnema concinna	1	-	oa-p
Sitophilus granarius	1	-	g-ss
Xyloterus sp.	1	-	l
Coleoptera sp.	1	-	u
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Oligochaeta sp. (egg capsule)	6	s	u
*Coleoptera sp. (larva)	6	s	u
*Proctotrupoidea sp.	6	s	u
*Apis mellifera	3	-	u
*Diptera sp. (pupa)	1	-	u
*Melophagus ovinus (puparium)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Siphonaptera sp.	1	-	u
*?Blaps sp. (larva)	1	-	rt-ss
*Hymenoptera Parasitica sp.	1	-	u
*Aranae sp.	1	-	u

Context: 1028 Sample: 3/T1 ReM: S
Weight: 2.00 E: 4.00 F: 4.00

Notes: Entered 10.3.2000. Recorded in flot, problems on filter paper. Preservation variable, to very poor (E3.5-5.5, F2.5-5.5). Colour change towards pale, range 2-4, mode 4 (distinct). AH residue tube listed.

Taxon	n	q	ec
Anotylus complanatus	4	-	rt-sf
?Trechus sp.	1	-	ob
Cercyon ?analis	1	-	rt-sf
Megasternum obscurum	1	-	rt
Histerinae sp.	1	-	rt
?Dropephylla sp.	1	-	u
Omalium ?rivulare	1	-	rt-sf
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Neobisnius sp.	1	-	u
Staphylininae sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Aphodius sp.	1	-	ob-rf
Omosita sp.	1	-	rt-sf
Trox scaber	1	-	rt-sf
Aphodius granarius	1	-	ob-rf
Enicmus sp.	1	-	rt-sf
*Acarina sp.	6	s	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Coleoptera sp. (larva)	2	-	u
*Diptera sp. (puparium)	1	-	u
*Siphonaptera sp.	1	-	u

Context: 1032 Sample: 4/T1 ReM: S
Weight: 1.00 E: 0.00 F: 0.00

Notes: Trace flot. Recorded in flot. Only a single invertebrate fragment.

Taxon	n	q	ec
Omosita sp.	1	-	rt-sf

Context: 1042 Sample: 5/T1 ReM: S
Weight: 2.00 E: 0.00 F: 0.00

Notes: Entered 10.3.2000. Recorded in flot, problems on filter paper. Preservation variable (E2.5-4.5, F2.5-4.5, no mode; this record may omit numerous very tiny fragments which account for the large number of uncertain identifications of common taxa). AH residue tube included.

Taxon	n	q	ec
Cercyon analis	5	-	rt-sf
Oxytelus sculptus	3	-	rt-st
Ptenidium sp.	2	-	rt
Xylodromus concinnus	2	-	rt-st
Carpelimus ?bilineatus	2	-	rt-sf
Neobisnius sp.	2	-	u
Philonthus sp. B	2	-	u
Falagria sp.	2	-	rt-sf
Aleocharinae sp. B	2	-	u
Aleocharinae sp. D	2	-	u
Auchenorhyncha sp.	1	-	oa-p
Trechus obtusus or quadristriatus	1	-	oa
?Pterostichus melanarius	1	-	ob
?Laemostenus terricola	1	-	ss
Carabidae sp.	1	-	ob
Acritus nigricornis	1	-	rt-st
Omalium ?rivulare	1	-	rt-sf
Anotylus complanatus	1	-	rt-sf
Anotylus nitidulus	1	-	rt
Leptacinus intermedius	1	-	rt-st
Gyrohypnus angustatus	1	-	rt-st
Philonthus sp. A	1	-	u
Philonthus sp. C	1	-	u
?Quedius sp.	1	-	u
Staphylininae sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. C	1	-	u
Pselaphidae sp.	1	-	u
Anobium punctatum	1	-	l-sf
Ptinus sp.	1	-	rd-sf

Monotoma longicollis	1	-	rt-st	*Acarina sp.	50	e	u
Cryptophagus sp.	1	-	rd-sf	*Diptera sp. (puparium)	30	e	u
Lathridius minutus group	1	-	rd-st	*Diptera sp. (pupa)	15	m	u
Corticaria sp.	1	-	rt-sf	*Syrphidae sp. (larva)	6	s	u
Aglenus brunneus	1	-	rt-ss	*Proctotrupoidea sp.	2	-	u
?Tenebrio obscurus	1	-	rt-ss	*Coccoidea sp.	1	-	u
Apion sp.	1	-	oa-p	*Nematocera sp. (larva)	1	-	u
Curculionidae sp.	1	-	oa	*?Apis mellifera	1	-	u
Scolytus ?rugulosus	1	-	l	*Hymenoptera sp.	1	-	u

Table 8. 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 2 Clifford Street, York. Alpha - the index of diversity alpha (Fisher et al. *1943); Indivs - individuals (based on MNI); No - number.*

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 taxa (sf)	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 taxa (st)	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 (ss)	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