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## **Plant and invertebrate remains from Anglo-Scandinavian deposits at 16-22 Coppergate, York: Technical Report**

### **Part 4: Period 5B**

#### **Summary**

*This Technical Report provides a sample-by-sample account of the plant macrofossil and invertebrate remains (apart from hand-collected shell) from deposits dated to the fourth major part of the Anglo-Scandinavian sequence (Period 5B: c. 975 - early/mid 11th century) at 16-22 Coppergate. Samples are arranged into groups according to the position of the context from which they were taken by feature type or location on the site.*

**Keywords:** YORK; ANGLO-SCANDINAVIAN (PERIOD 5B); 16-22 COPPERGATE; PLANT MACROFOSSILS; PARASITE EGGS; INSECTS; FLY PUPARIA

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# Plant and invertebrate remains from Anglo-Scandinavian deposits at 16-22 Coppergate, York: Technical Report

## Part 4: Period 5B

### Introduction to this series of data archives and *Technical Reports*

The account of the non-vertebrate biological remains from Anglo-Scandinavian deposits at 16-22 Coppergate presented by Kenward and Hall (1995) was necessarily extremely condensed and it was impossible to publish, even in microfiche, the very large volume of data (there were at the time of writing, for example, nearly 19,000 records of identifiable plant remains from samples from 397 contexts, and about 25,000 records of adult beetles and bugs representing over 53,000 individuals). These archives and *Technical Reports*, published as *Reports from the EAU, York*, are intended as a means of placing on record the data behind the narrative of Kenward and Hall (1995).

In the data archives, information concerning timber identifications, records of other macrofossil plant remains, of insects, and of other invertebrate groups, is presented separately. The datasets for some of these groups are too extensive to produce under single covers and are thus presented as a series of separate parts. Unless stated otherwise, data have normally been sorted by context number to facilitate cross-reference with lists of contexts, samples and phasing information.

In the *Technical Reports*, accounts are structured by period, tenement and feature type, and include brief outlines of the implications of the recorded biota at the sample or subsample level.

(N.B. An account of the stratigraphic sequence and, in particular, the nature of the structures recorded, is in preparation at the time of compiling these archives and reports. The phasing used here follows that provided by York Archaeological Trust during 1997 and may be subject to slight modification when the sequences are eventually published.)

Abbreviations used for type of sample (see Dobney *et al.* 1992):

BS	'bulk-sieved' sample
C14	sample for radiocarbon dating
GBA	'general biological analysis' sample
Spot	'spot' sample

For GBA subsamples, '/T' indicates a 'test' subsample (*sensu* Kenward *et al.* 1986; Kenward 1992) usually examined for both insect and plant remains; '/M' represents a subsample specifically processed for recovery of plant remains alone (usually of 0.5kg, with '+' used to indicate subsamples larger than 0.5kg and '\*' indicating those of smaller weight); '/1', '/2' etc. are subsamples for which insects have been studied, but plant remains usually have not. A set of additional subsamples—mostly from floors of Period 4B—examined during 1998 and intended in part to plug some gaps in the coverage of context type and tenement, is designated by '/T3'; most of these were of 2 or 3kg.

For BS samples, 'V' indicates that remains extracted by 'rough sorting' from the residue have been recorded (i.e. they have only been examined during general sorting for all classes of remains and also for artefacts, by staff or volunteers with little archaeobotanical expertise). 'W' and 'R' indicate that material from the washover and from the residue, respectively, has been examined by means of a more thorough examination (by ARH).

### Methods

Practical and interpretative methods are summarised in the publication text. For insect remains see also Kenward *et al.* (1986) and Kenward (1992).

## Results of the analyses

For each of the periods covered by the separate *Technical Reports* in this series, material is discussed under feature types in the following order:

- (i) contexts forming part of a structure, including post-pits, construction trenches, and so on, and alignments of posts and/or wattle;
- (ii) floors and other deposits within buildings—these include contexts identified by the excavators as ‘made’ floors *sensu stricto*, and the deposits that built up on them during use, other use-phase deposits (including hearths and the fills of cuts of all kinds inside buildings), and dumps and other backfills of building cuts;
- (iii) external deposits immediately around and between buildings, particularly in the strips between them (identified as ‘alleyways’ for Period 4B);
- (iv) external surface deposits in the area behind each building or set of buildings;
- (v) fills of cuts identified as ‘pits’;
- (vi) fills of other cuts (gullies, wells, etc.), and of features described by the excavators as ‘scoops’ and here given the purely descriptive term ‘depressions’.

*Naturally, not all context types are necessarily represented at all periods.*

Within each context, a brief description of the archaeological nature of the deposit (provided by the excavators) and a brief, mainly lithological, description, taken from the context card, are given. In the discussion of results, bulk-sieved (BS) samples (if any) are dealt with first (except where subsamples of GBAs have been bulk-sieved but no detailed record made of their content), followed by general biological analysis (GBA) samples, and then spot and other types of samples (chemical, C14, wood, etc.). For GBA samples, there will usually be a series of sections as follows: (a)

sample description (made in the laboratory); (b) results of analyses of plant macrofossils; (c) results of analyses of the eggs of parasitic worms; (d) results of analyses of insects and other arthropods (this section deals primarily with adult beetles and bugs, but includes an outline of other groups). For cuts, fill contexts are dealt with as far as possible in order from stratigraphically lowest to highest.

**The primary purpose of these *Technical Reports* is to reveal the reasoning leading to the very condensed form of presentation used in the publication text (Kenward and Hall 1995). The text of the *Technical Reports* was written prior to 1994 (some in the mid 1980s) and has not been more than very superficially revised. It has not been possible to take account of subsequent re-phasing or re-interpretation, or of recent developments in interpretative methods, so that there are some inconsistencies with the published report (in particular, revisions to the insect species lists will not be reflected in the statistics presented in the *Technical Report* texts, although the data archives give definitive statistics).**

**Bearing in mind the nature of these texts, they should not be used as a source for citation without consultation with the authors, though the species lists and statistics given in the data archives may be used safely.**

## Introduction to Period 5B

This phase saw the construction of a series of partly-sunken plank-built structures, with one or more buildings on each of the four plots laid out in Period 4A. As before, there were many pits and other cuts dated to this phase, as well as deposits associated with the use of the buildings and layers which formed between and behind them. Organic preservation continued to be very good in many layers.

### *Tenement A*

Few samples were collected from the small area of floor deposits exposed in the two buildings on

Tenement A, but rather more from backfills of the earlier of two buildings on the tenement (the so-called 'cavity wall' building, 5/1) and from a long gully running down the slope behind the tenement. Only two cuts identified as pits were sampled.

### Structural elements of Structure 5/1

A series of joist-like cross-beams was associated with the earliest floor; these were immediately overlain by Context **20345**, with no evidence of a plank floor on them.

**Cut 20643**: the construction trench for Wall **20235** in Structure 5/1; it contained some sculptured stones, one of which was sampled.

**Context 20553**: the fill of the trench.

**Sample 1329** (Spot): This was a piece of rotten or very weakly-cemented pinkish medium-grained sandstone, probably from Pennine gritstone formation.

**Cut 2324**: part of the construction cut for the insertion of the sunken-floored building 5/1 at the front of Tenement A, its dimensions thus being those of the building plan.

**Context 2137**: fill of **2324**, a very dark grey clay loam, with patches of reddish-brown clay.

**Sample 14** (GBA): mid-dark grey-brown, crumbly, slightly clayey silty sand with clasts of pinkish 'natural' clay.

A 9kg subsample was bulk-sieved to 1mm after the main period of processing, but has not been sorted.

**Context 20502**: underlying **20342** and other peaty deposits within the outline of the earlier Tenement A structure, this was a mixture of olive and pale olive sand which in places had turned dark bluish-grey; it was not continuous, but filled a number of separate depressions (perhaps levelling

during construction or for an early stage in the life of Structure 5/1).

**Sample 1290** (Spot): This sample was a varicoloured (dark grey to light-mid yellow-brown), plastic to crumbly, slightly clayey sand with traces of stones 2-20mm; no further analysis undertaken.

**Sample 1293** (Spot): This spot find consisted of a lump of very vesicular tufa with a large component of contaminant soil and some bone fragments.

**Sample 1299** (GBA): no action to date.

**Context 20550**: in the same area as **20502**, a strip along the E wall of Structure 5/1 (about 3.8 x 0.5 x 0.1m) of very dark grey peaty clay loam, containing wood chips and patches of amorphous peat; a construction deposit.

**Sample 1309** (GBA): mid-dark grey-brown, plastic to crumbly, rather heterogeneous sandy clay silt with patches of pink and grey clay, abundant charcoal and traces of small bone fragments and woody and herbaceous detritus.

Parasitic worms: The subsample examined yielded two ?*Hymenolepis* eggs.

Insects (/T): There were 67 individuals of 46 beetle species, 'several' fly puparia, three human fleas, two cladoceran ephippia (of the 'fried egg' type) and various other remains. A quarter of the beetles were of taxa coded 'rd' but otherwise, and bearing in mind assemblage size, the main statistics were of no particular note. There were eight *Lathridius minutus* group and five *Xylodromus concinnus*; *Mycetaea hirta* was the only other species with more than two individuals. It appears that this group included a community of 'house fauna' taxa. There was also a small post-depositional invader group. If it was deposited during construction then it probably represented redeposition of a Period 4B floor.

In addition, a subsample of 9kg was bulk-sieved after the main period of processing; it has not been sorted.

**Cut 2420:** a trench that became the rear entrance to the building (5/1) on Tenement A, containing a limestone revetment.

**Context 2319:** soil from between the limestone blocks in the revetment; very dark grey silty loam with patches of clay.

**Sample 29 (Spot):** A fragment of mid-brown, crumbly, ?rotted mortar.

**Context 20670:** a fill in wall **20235**, Structure 5/1.

**Sample 1326 (BS—VW):** Of this rather large assemblage of 52 taxa, none scored more than 1 on the three-point scale used. Nearly 40% were weeds in CHEN, more than 25% weeds in SECA and the components of foodplants and dyeplants were rather modest. There was an unusually high AIV for emergent waterside taxa in PHRA, the five taxa including *Iris pseudacorus* and *Sparganium* sp(p), perhaps representing cut vegetation.

**Sample 1327 (GBA):** dark grey, crumbly, humic, slightly sandy clay silt with inclusions to about 25% of light grey clay and some buff clay in mm-sized clasts.

**Parasitic worms:** Four subsamples were examined, of which two were barren; the other two gave single *Trichuris* eggs and one, in addition, gave small numbers of ?*Hymenolepis*. It may be noted that for the subsample giving a single *Trichuris* egg, no further eggs were recorded on flotation with magnesium sulphate solution.

**Insects (/1A, /1B):** The material from subsample /1a was abandoned after an accident during processing. The flot from subsample /1B was recorded semi-quantitatively. It was estimated that there were 117 individuals of 47 beetle and bug taxa. Diversity was quite low ( $\alpha$  estimated as 29, SE = 4). The RD component made up almost one quarter of the assemblage, but foul matter taxa were rare (two individuals). Diversity of the decomposers was low (alpha RT = 14, SE = 2). There were four aphids, one containing a

hymenopteran parasite, and two human fleas. The assemblage appears to have been a mixture of 'house fauna' (for example, 'several' *Xylodromus concinnus*, *Crataraea suturalis*, *Cryptophagus scutellatus*, *Cryptophagus* sp. and *Lathridius minutus* group) and the oxyteline association (with 'several' *Anotylus complanatus*, *A. nitidulus* and *A. rugosus*). There were also 'many' *Aglenus brunneus*.

**Sample 1328 (GBA):** dark grey-brown, crumbly silt with pinkish clay lumps, peaty silty layers and grey clay lumps.

**Plants (/M):** A total of 40 taxa were recorded from this subsample, of which only *Chenopodium album* scored 2. All the groups achieved only rather modest AIVs, with CHEN and FOOS being the largest. The other components of the residue included modest amounts of charcoal and wood fragments, together with traces of mammal bone (some of it burnt), fish bone, and pottery.

**Parasitic worms:** The subsample examined yielded a single ?*Hymenolepis* egg.

**Insects (/1, /2):** The material from subsample /1 was not examined. Subsample /2, recorded semi-quantitatively, gave some 68 individuals of 44 beetle and bug taxa, with RD taxa accounting for a quarter of the assemblage and only two individuals of RF taxa. Other statistics were not unusual. There appeared to be a 'house fauna' component (including three human fleas) but, as in the case of Sample 1327, oxytelines and their typical associates at the Coppergate site were significant. There were 'many' fly puparia, a sheep ked, and 'several' unidentified insect larvae.

### Backfill deposits in Structure 5/1

**Context 15426:** The uppermost of the backfills of 5/1, located in the spine left by cutting the trenches for the construction of 5/2.

**Sample 795 (GBA):** dark red-brown layered, fibrous, somewhat heterogeneous amorphous

organic material and herbaceous detritus with ashy lenses.

Parasitic worms: The single subsample examined was barren.

Insects (/T): A small group of insects was recovered, including 33 individuals of 26 beetle and bug taxa. Main statistics were unremarkable in a small assemblage. There were four *Oxytelus sculptus*, three *Carpelimus fuliginosus* and two each of *Lathridius minutus* group and *Anthicus floralis* or *formicarius*. There may therefore have been some rather moist mouldering plant remains nearby. There were very slight hints of the 'hay' group, perhaps significant in view of the decomposer taxa present.

In addition, a subsample of <1kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 15463:** backfill in 5/1, under **15426**.

*Sample 801* (Spot): (?slag, according to excavator) no action to date.

*Sample 808* (GBA): mid-dark grey, crumbly, somewhat heterogeneous, slightly sandy clay silt, with traces of stones, 2-6mm, charcoal, small bone fragments and shellfish.

Although rejected for standard analyses, a subsample of 12kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 15467:** backfill in 5/1, below **15463**.

*Sample 812* (GBA): dark brown, layered, somewhat heterogeneous, sandy silty clay with a component of compressed amorphous organic material and herbaceous detritus.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/T): A moderately large group of beetles and bugs was recorded (N = 124, S = 55), and there were assorted other arthropods including

'several' ?*Labia minor*, fly puparia, scale insects, Proctotrupeoidea and mites. There were also adult and puparial sheep keds.

Diversity of the Coleoptera and Hemiptera was a little low ( $\alpha = 38$ , SE = 6). Coded decomposers formed only 54% of the individuals, although the abundant uncoded *Carpelimus fuliginosus* probably should be included, raising % N OB to 81. The true value of diversity of the decomposer component was also distorted by exclusion of *C. fuliginosus*. The abundant taxa with *C. fuliginosus* (33) were *Lathridius minutus* group (9), *Cercyon atricapillus* (8), and *Oxytelus sculptus* (7), with smaller numbers of many other taxa likely to have occurred with these in open-textured but rather foul organic material. The phytophages offered a weak hint that this may have included hay-like cut vegetation.

In addition, a subsample of 2kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 15483:** backfill in 5/1.

*Sample 821* (Chemical): A sample of light yellowish-grey, crumbly, silty fine sand; no further analysis undertaken.

*Sample 822* (Spot): A find consisting of fragments of avian eggshell; no further analysis undertaken.

*Sample 823* (Chemical): A deposit of mid grey-brown, plastic, sandy clay silt with moderate amounts of charcoal; no further analysis undertaken.

**Context 15577:** backfill in 5/1.

*Sample 862* (Spot): A sample of avian eggshell; no further analysis undertaken.

*Sample 867* (Spot): The fly puparia present comprised about 20 emerged and a few unemerged *Musca domestica* and a single *Stomoxys calcitrans*.

**Context 15628:** backfill in 5/1 (= 15575).

*Sample 888* (BS—VW): There were 55 taxa in this rather large assemblage, though with *Diphysium* alone scoring an abundance of 2. There were moderate AIVs for FOOS and DYES (there was a record for *Isatis* here, as well as *Diphysium*, *Genista*, *Rubia* and *Humulus*), but the largest component was annual nitrophile weeds in CHEN. This was one of only two Period 5B samples to yield remains of grape, *Vitis vinifera*.

*Sample 945* (GBA): mid-dark grey, crumbly, very heterogeneous, sandy silt with traces of ash and ?faecal concretions, and pinkish ‘natural’ clay.

A subsample of 11kg was bulk-sieved after the main period of processing. There was a variety of components, including pottery, wood, charcoal, nutshell, concretions, and mammal and fish bone

**Context 20342:** a layer of black structured peat under 20298 (and with same dimensions), covering the whole of the area excavated in the Tenement A building outline; immediately over the ‘joists’.

*Sample 1251* (BS—VW): Of the 16 taxa recorded, a large proportion might have originated in moorland/heathland. There were flowers and twig fragments (both scoring 2) of heather, seeds and capsules of *Erica tetralix* and flowers of *E. cinerea*. Some of the mosses, of which three taxa scored 2, may also have originated in such habitats and it is possible that there were turves, or the remains of them, in this sample.

*Sample 1250* (GBA): unconsolidated twigs and moss (‘leaf mould’ layer), with tiny pellets of clay and occasional lumps of silty humified material.

Plants (/M): This was a very distinctive assemblage, the 19 taxa comprising several different parts of heather (flowers, capsules, shoot and twig fragments, all scoring an abundance of 2), together with *Erica tetralix* leaves, and a range of mosses, of which *Pseudoscleropodium purum*, *Hypnum cupressiforme* and *Hylocomium splendens* all scored 2. Not surprisingly, there was a very high AIV of 17 for mosses in HEMO (the

highest for this group of samples). There were also leaf fragments and buds of willow, perhaps derived from Context 20298 which lay above.

Parasitic worms: The single subsample examined was barren.

Insects (/1): The flot from this subsample was very large. There was a small assemblage of beetles and a single heteropteran bug (N = 44, S = 34, semi-quantitatively scan-recorded). This group had no clear interpretative significance, and the main statistics suggested a rather random origin, although the fairly substantial proportion of rd-coded taxa and some elements of the species list perhaps hint at the presence of a small ‘house’ component. The only striking feature of the insects from this subsample was the abundance of the scale insects, of which there were ‘over 100’ (and probably many more than this). They were probably derived from the overlying layer.

*Sample 1260* (GBA): woody plant detritus and matted moss fragments.

Plants (/M): The 17 taxa were recorded were rather similar to those from 1250/M. Once again there were common remains of *Calluna* and traces of *Erica tetralix*, as well as willow leaf fragments, and a range of mosses including moderate amounts of *Pseudoscleropodium purum*, *Hylocomium splendens* and *Hypnum* cf. *jutlandicum* (the only record for this very characteristically heathland/moorland plant from Anglo-Scandinavian Coppergate). The traces of *Leucobryum glaucum* were also scored with the heathland/moorland biota and the AIV for HEMO was again very high (rank 2) at 16.

Parasitic worms: The single subsample examined was barren.

Insects (/1): The flot was huge and difficult to work with. There were 18 individuals of 16 beetle taxa, including an unusual record of *Chilocorus bipustulatus*. The proportion of outdoor forms was large (a third of the individuals) and some of them may have originated with the heathland plant

component. There were ‘many’ mites and ‘several’ each of *Chionaspis salicis* and *Lepidosaphes ulmi*.

**Context 20298:** a layer of brushwood in Structure 5/1, covering the inside of the building (about 8.5 x 3.2 x 0.1m); immediately over Context **20342**.

*Sample 1228* (BS—W): Only the washover from this sample was retained; the residue comprised twigs alone. Nine taxa were recorded, of which *Salix* twigs scored 3, the remainder 1. The other taxa included heather flowers and twig fragments and three mosses that might all have originated in heathland/moorland habitats (along with the heather). There were perhaps remains of turves present here along with the willow brushwood or they may be contaminants from **20342**, which lay beneath.

*Sample 1226* (GBA): brushwood and leaf fragments.

Parasitic worms: The single subsample examined was barren.

Insects (/1): The flot consisted of about 60ml of partly decayed leaf fragments, together with at least some bud-scales. Recording was by a semi-quantitative scan. There were ‘many’ scale insects, four almost entire insect larvae which appeared to be lepidopteran, and 14 individuals of nine beetle taxa. There were about six *Anthicus floralis* or *formicarius*, suggesting that this species at least was attracted to the material; some other taxa typically associated with the *Anthicus* were present as single individuals.

*Sample 1241* (GBA): brushwood with leaf fragments.

Parasitic worms: The subsample examined yielded two *Trichuris* eggs.

Insects (/1): There were no insects in the flot, apart from some apparently modern contaminant ones.

*Sample 1224* (Wood): these twigs were identified as *Salix*, perhaps *S. viminalis* (common osier); there were a few leaves present, too.

**Context 20233:** brushwood, immediately over **20298**.

*Sample 1181* (Wood): willow brushwood with fragments of leaf and some fine twigs; P. R. Tomlinson identified some twig epidermis as probably *Salix* sp.

*Sample 1183* (BS—VW): abundant *Salix* twig fragments with traces of hazel nutshell.

*Sample 1184* (Wood): matted twigs and leaves, from which P. R. Tomlinson identified some leaves as ?common osier, *Salix* cf. *viminalis*.

**Context 20234** backfill immediately over **20233**.

*Sample 1160* (BS—VW): This sample gave a small assemblage, all taxa being present in trace amounts. There were remains of several dyeplants and woodland mosses, flax capsule fragments and linseed, and hemp achenes.

*Sample 1161* (GBA): twiggy, probably *Genista*-rich detritus in a fine organic matrix, with some grit, silt and monocotyledon stems.

Insects (/T): A modest group of beetles (and a bug) was recovered, recording being by semi-quantitative scanning. The number of individuals was estimated as 69, with 39 taxa noted. Diversity was quite low ( $\alpha = 37$ , SE = 8), decomposers formed a large proportion of the assemblage (% N RT = 81), and ‘rd’ taxa were moderately important (% N RD = 19). Other statistics were unremarkable. There were ‘many’ *Anthicus formicarius* and ‘several’ *Acritus nigricornis* and *Atomaria* sp. Other taxa present in smaller numbers, together with these, suggested the existence of a community most likely to have occurred in somewhat moist, open-textured (but perhaps foul) plant remains.

There were ‘many’ *Lepidosaphes ulmi*, three *Chionaspis salicis*, and an adult *Melophagus* among the other remains.

**Context 18962:** dump.

*Sample 1149* (Spot): no action to date.

**Cut 15704:** an extensive cut against the shoring on the W side of the site, Tenement A, stratigraphically between two phases of sunken buildings; it was several metres long, but its width could not be established.

**Context 15659:** very dark grey loam with patches of olive ash.

*Sample 909* (Spot): avian eggshell; no further analysis undertaken.

**Cut 15914:** a scoop temporally between the two phases of building on Tenement A. It was cut on its W side by Cut **15116** for the second building (5/2) and on the E side by **15431** (whose fills were not sampled). It has been interpreted as a construction trench for a wall beam of Structure 5/2.

**Context 15915:** the second-to-lowest of the fill deposits; a black peaty silt.

*Sample 957* (GBA): mid grey-brown, plastic to crumbly to brittle, slightly sandy, slightly clay, silt, with traces of stones 2-6mm, some fine twiggy debris (?*Genista*) and streaks of grey ?clay/ash.

Parasitic worms: The subsample examined was barren.

Insects (/T): Recorded only by a rapid inspection of the flot and of beetles sorted from it. There were 'many' mites and 'several' fly puparia. The beetles constituted a small decomposer group, dominated by *Lathridius minutus* group, but with hints of colonisation by taxa associated with foul matter.

In addition, a 6kg subsample was bulk-sieved after the main period of processing; it was not sorted.

### Structural elements of Structure 5/2

**Cut 15500:** the cut for a sill beam for Structure 5/2.

**Context 15314:** fill of the cut.

*Sample 937* (Chemical): This sample comprised varicoloured—mid red-brown to dark grey-brown, via yellowish- and pinkish-brown—ash with traces of charcoal; no further analysis undertaken.

### Floors in Structure 5/2

**Context 15192:** a floor *in situ*, to W of building Cut **15116**, and thus within the Tenement A building outline; about 0.05m thick, and at least 1m across; black silty peaty clay loam; below **15193** (*q.v.*).

*Sample 807* (GBA): mid-dark grey-brown, crumbly to layered, somewhat heterogeneous, humic, slightly clayey silt with traces of charcoal and wood; heterogeneity through faint lamination/banding at centimetre scale.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/T): There were six human fleas, 'many' mites, 'several' scale insects (apparently *Chionaspis salicis* and *Lepidosaphes ulmis*) and Hymenoptera, at least two *Melophagus ovinus* adults (and a puparium), some lice (two *Damalinea ovis*, and a single *D. bovis*) and a modest group of beetles (N = 95, S = 41). Diversity was low ( $\alpha = 28$ , SE = 5); other statistics were unremarkable apart from a high proportion of RD individuals (% N RD = 33) and low diversity of the decomposers ( $\alpha$  RT = 13, SE = 3). 'House fauna' taxa predominated, as follows: *Aglenus brunneus* (15), *Mycetaea hirta* (12), *Anobium punctatum* and *Lathridius minutus* group (9) and *Xylodromus concinnus* (4). The only other taxa with more than two individuals fitted with this group: three each of *Cratarea suturalis* and *Ptinus ?fur*. Some other typical 'house fauna' taxa were present in small numbers. This appears to have been an archetypical 'house' group, with other remains quite possibly of background origin.

**Context 15404:** in the same area as **15382** (see below), about 0.8 x 0.5 x 0.01m in extent, and

thought to be part of a hearth; compact, pinkish-white ash with some crushed stone and black, sandy, peaty clay loam.

*Sample 786* (Spot): oyster shell observed in raw sediment; no further analysis undertaken.

**Context 15382:** a smallish area of about 1 x 0.6 x 0.02m in the north-west corner of the excavation, associated with Structure 5/2 and probably a floor; black silty peaty clay loam, with much decayed wood and organic material. It is unfortunate that neither sample from this context was processed, not having been signalled as floors at an early enough stage.

*Sample 783* (GBA): no action to date.

*Sample 785* (GBA): no action to date.

**Context 15543:** a small, irregular patch in the same area as 15451, but further N and E (still within Structure 5/2, and perhaps a floor or levelling deposit; very dark grey, sandy, silty clay loam, with a few flecks of clay.

*Sample 915543* (Spot): a fragment of ?faecal concretion containing wheat/rye 'bran' and a tentatively identified testa fragment of *Agrostemma*.

### Floors in Structures 5/1 or 5/2

**Context 15320:** archaeological details not requested, but thought to be from Tenement A, and located within outline of buildings.

*Sample 784* (Spot): no action to date.

### Backfill deposits in Structure 5/2

**Context 15189:** backfill.

*Sample 752* (Spot): no action to date.

*Sample 758* (Spot): A sample of avian eggshell; no further analysis undertaken.

**Context 15193:** above 15192, backfill.

*Sample 770* (GBA): mid-dark grey to grey-brown, plastic to crumbly, humic sandy clay silt, with traces of small and large bone fragments.

A subsample of 12kg was bulk-sieved after the main period of processing. It was sorted and yielded a variety of components including pottery, wood and charcoal fragments, nutshell, mammal and fish bone, and shellfish.

**Context 15451:** a small patch lying against the shoring in the north-west corner of the excavation; about 0.5 x 0.3m of pale brown, compact sand and ash.

*Sample 797* (Spot): varicoloured (pale yellow-brown to nearly black), layered, indurated (by baking) deposit, resembling repeatedly burnt soil; no further analysis undertaken.

**Context 15916:** backfill.

*Sample 958* (GBA): mid-dark grey-brown, crumbly, very heterogeneous, humic silt with traces of stones 2-20mm and inclusions of grey clay and laminated organic material.

Parasitic worms: The single subsample examined was barren.

A subsample of 8kg was bulk-sieved after the main period of processing; it has not been sorted.

### External layers on Tenement A

**Context 2136:** an irregularly-shaped layer, immediately behind Building 5/2 and abutting the SE corner of the building cut; it extended to a maximum of 2 x 2m and was up to 0.14m thick; it comprised very dark grey loam with a few flecks of charcoal and some wood inclusions.

*Sample 25* (GBA): mid grey-brown, plastic to crumbly, somewhat heterogeneous, humic, slightly sandy silt, with abundant wood fragments.

Insects (/T): Only subjected to a rapid examination, with non-quantitative recording, the flot from this subsample included 'many' fly puparia and mites, 'several' beetle larvae and a smallish group of adult beetles. There was, subjectively, a small, rather mixed, group of decomposers, with no species especially numerous.

In addition, a 5kg subsample was bulk-sieved after the main period of processing; it has not been sorted.

**Context 2147:** in the same area as 2136, but lying to the W by 1m, this was a somewhat irregularly-shaped area of about 1 x 0.5, up to 0.07m thick, of very dark grey loam covered extensively with fibrous plant remains.

*Sample 13* (GBA): dark brown, crumbly, humic, slightly sandy silt with fine herbaceous detritus and traces of wood fragments and much evidence of recent arthropod damage.

Parasitic worms: The single subsample examined was barren.

Insects (/T): The concentration of insect remains was high, there being 204 individuals of 68 beetle taxa, 'many' fly puparia (those counted including over 20 *Stomoxys calcitrans* and 'several' *Musca domestica* and Sepsidae sp.), seven human fleas, a honeybee, and a variety of other remains. There were also 'many' mites. For the beetles, whole-assemblage diversity was rather low ( $\alpha = 36$ , SE = 4), and that of the decomposer component a little low (alpha RT = 17, SE = 2). Foul-matter taxa were proportionally rather abundant (% N RF = 11). Apart from *Anobium punctatum* (rank 1, 24 individuals), all of the more abundant taxa may have co-existed in rather moist, open-textured foul matter (this makes assumptions about the habitat ranges of some of the Oxytelinae), although there may have been an admixture of taxa from drier material. There were 15 *Lathridius minutus* group (coded 'rd' and a typical associate of the supposed community associated with relatively dry litter, but somewhat eurytopic), 13 *Cercyon analis* (another eurytopic species), ten *Acrotrichis* sp., and smaller numbers of *Platystethus arenarius* (8), *Cercyon*

*atricapillus*, *Carpelimus fuliginosus*, *Anotylus nitidulus* and *Oxytelus sculptus* (all 7), *Cordalia obscura* and an *Atomaria* species (6), *Anthicus formicarius* (5). Many of the remaining taxa are likely to have lived with these.

There were two individuals of the heather-feeding bug *Ulopa reticulata* and a single *Tipnus unicolor*.

### Gully fills on Tenement A

**Cut 2181 (= 2378):** a ditch, at least 10.5m long and about 0.9m wide and 0.8m deep, running (site) N-S from just behind the building outlines. As might be expected, it had complex fills, with many layers of limited extent. Their precise location has not been identified in the account which follows.

This feature was difficult to date; it was Late Anglo-Scandinavian, presumably later than Structure 5/1 as it was located immediately outside its doorway! It may have been dug between the two phases of Period 5B buildings, or been located behind a building with no rear door; or it may have been a temporary drainage trench for Structure 5/1 when it flooded. It had a neatly tapering point behind the building.

**Context 2141:** black, loose loam, mainly wood fragments.

*Sample 12* (GBA): reddish-brown, crumbly, woody (and twiggy) detritus with some arthropod frass.

Plants (/M): A total of 34 taxa were recorded from this subsample, rather below the period and sub-period means. The greater part of the plant material proved to be *Genista* stems at an abundance of 3, with *Diphasium* and *Calluna* (both flowers and twig fragments) at 2. The first two taxa, together with traces of *Rubia*, gave an AIV for DYES of 18 (equal rank 6 for this series of subsamples in Period 5). The other taxa were mainly weeds, with a few probable foodplants and small numbers of taxa representing a variety of natural or semi-natural habitats. Both *Cannabis* achenes and *Linum usitatissimum* capsule fragments scored in the FIBR group. The presence

of *Sphagnum* shoots and *Cladium* (saw-sedge) fruits may indicate exploitation of peatland and wetland habitats for raw plant materials, the latter perhaps originating in roofing material.

Parasitic worms: The subsample examined was barren.

Insects (/T): A modest group of insects was rapidly recorded semi-quantitatively. There were 'many' fly puparia (those identified being *Musca domestica* and *Stomoxys calcitrans*) and 'several' mites. About 97 individuals of 29 beetle taxa were noted. Diversity was estimated as very low ( $\alpha = 14$ , SE = 2) and outdoor forms were rare (two individuals). Decomposers were strongly represented (% N RT = 74) and of low diversity (alpha RT = 12, SE = 2). The following taxa were recorded as important: *Oxytelus sculptus*, *Stenus crassus*, a small *Philonthus* species (all recorded as 'many'); *Cercyon analis*, *C. haemorrhoidalis*, a large *Philonthus* (this was probably *P. politus*), and *Lathridius minutus* group (all 'several'). *S. crassus* was determined by male genitalia; the majority of *Stenus* from the site were probably this species, but this was the only case where it was particularly abundant (17 cases of 4-6 individuals, only with >6). It appears to be one of the most typically 'compost' associated of its genus. This deposit appears to have been moderately foul but probably *not* dung-like.

The flot from this subsample was not available for re-examination.

**Context 2178:** fibrous plant material.

*Sample 52* (GBA): reddish-brown medium to coarse plant detritus (?including *Genista* stems) with some grey silty matrix.

Parasitic worms: The subsample examined was barren.

Insects (/T): This subsample was recorded by semi-quantitative rapid scanning. There were about 67 individuals of 39 beetle and bug taxa, 'many' fly puparia (mostly *Musca domestica*, with a few *Leptocera* sp., and two *Stomoxys calcitrans*), a

human flea and 'many' mites. Whole-assembly diversity was estimated to be quite low ( $\alpha = 39$ , SE = 9), and outdoor forms were not abundant (five individuals). Decomposer statistics were rendered rather meaningless by the presence of four uncoded probable decomposers in the upper ranks. There were 'many' *Carpelimus fuliginosus* (some pale and presumably newly-emerged at the time of death), 'several' *Carpelimus* sp., and three *Cercyon analis*, but no other taxa with more than two individuals. There may have been a rapidly developed decomposer population which was soon buried.

**Context 2214:** black structured peat.

*Sample 22* (GBA): dark, (slightly red) brown, crumbly, woody and herbaceous detritus with some humic silt.

Parasitic worms: There were traces of *Trichuris* and of *Ascaris* eggs in the subsample examined.

Insects (/T): The flot was large, consisting of red-yellow plant debris (though not apparently 'bran'). A rapid inspection showed that insects were moderately abundant and preservation was a little poorer than usual at this site. Unfortunately it was not possible to record the material further.

**Context 2366:** very dark greyish-brown structured peat.

*Sample 38* (GBA): distinctly red-brown woody detritus, much digested by arthropods (post-excavation).

Parasitic worms: Three subsamples were examined; one gave a single *Trichuris* egg, the other two were barren.

Insects (/T): Rapidly semi-quantitatively recorded, the insect assemblage was small: about 30 individuals of 20 beetles and a few other remains including 'several' fly puparia. 'Many' mites were recorded. There were 'several' *Oxytelus sculptus* and *Anthicus formicarius*, suggesting fairly foul mouldering matter. Other species were all singletons. There were quite large numbers of fly

puparia, almost all of them *Musca domestica*, but with at least one *Stomoxys calcitrans*.

**Context 2367:** very dark brown, hard, compressed wood.

*Sample 41* (GBA): reddish to purplish to gingery arthropod frass; probably largely woody detritus before post-excavation damage; a little silt.

Parasitic worms: The subsample examined was barren.

Insects (/T): About 63 individuals of 33 beetle taxa were recorded by semi-quantitative rapid scanning; there were also 'many' fly puparia (mostly *Musca domestica*, but with a few *Stomoxys calcitrans*, a human flea, and a few other remains, including 'several' earwigs and ?*Spalangia* sp. (a wasp parasitic in fly immatures). Diversity was estimated to be low ( $\alpha = 28$ , SE = 6) and outdoor forms were uncommon, but other statistics were of no special note. Four taxa were fairly numerous (all 'several'): *Carpelimus fuliginosus*, *Oxytelus sculptus*, a *Philonthus* species and *Anthicus formicarius*. The remaining species were represented by one or two individuals. Fairly foul organic matter, probably rather loose-textured, was perhaps present for this distinctive group to develop.

**Context 2368:** grey-brown silt.

*Sample 46* (GBA): light-mid yellowish-grey, crumbly, slightly heterogeneous silt with ?*Genista* stems. A 1kg /T subsample was requested but was not processed.

Parasitic worms: A trace of *Trichuris* eggs was recorded from the subsample examined.

**Context 2369:** very dark brown wood and (herbaceous) plant remains

*Sample 47* (GBA): no action to date.

**Context 2459:** dark brown compressed structured peat.

*Sample 42* (GBA): dark brown, layered, compressed herbaceous detritus.

Insects (/T): Insects were recorded by semi-quantitative rapid-scanning. There were about 54 individuals of 27 beetle taxa. Diversity appeared to be low ( $\alpha$  estimated at 22, SE = 5), with a smallish outdoor component (four individuals) and proportionally abundant foul decomposers (% N RF = 15, although only eight individuals). Decomposer diversity was estimated to be low (alpha RT = 12, SE = 4). There were 'several' *Cercyon atricapillus*, *Oxytelus sculptus* and *Anobium punctatum*, and five *Carpelimus fuliginosus*. The *A. punctatum* doubtless came from nearby timber, but most of the rest of this assemblage might have co-existed in rather foul, open-textured decomposing plant remains. There were 'several' mites, fly puparia and scale insects.

In addition an unweighed subsample was bulk-sieved to 1mm after the main period of processing; it has not been sorted.

**Context 2460:** dark reddish-brown, compact, structured peat.

*Sample 43* (GBA): no action to date.

**Context 2463:** pale brown, sandy, ashy loam.

*Sample 53* (GBA): light to mid yellow-brown, crumbly, sandy silt with moderate amounts of shellfish and eggshell.

Insects (/T): The flot was large and difficult to work with, consisting mostly of yellowish, tattered plant remains. It was only examined very rapidly and in part. There were moderate numbers of beetles, apparently a mixed assemblage dominated by decomposers, with no strongly-represented species or ecological group.

A separate subsample from this context was of bird eggshell was not examined further.

**Context 2465:** very dark grey silty loam.

*Sample 51* (GBA): mid-dark brown, crumbly, humic, slightly sandy silt, with ?a little arthropod damage (post-excavation).

Parasitic worms: There were no eggs in the subsample examined.

Insects (/T): Fairly large numbers of insects were present (N = 173, S = 71). There were ‘many’ fly puparia (most of those identified being *Musca domestica*) and mites. Diversity had an intermediate value ( $\alpha = 45$ , SE = 5); outdoor forms were moderately well represented (18 individuals, 10%). The proportion of coded decomposers was comparatively small (% N RT = 52), and diversity of this group quite high (alpha RT = 29, SE = 5), with a good proportion of RD taxa (% N RD = 19). These figures were distorted by the presence of 44 *Carpelimus fuliginosus* (26% of the assemblage), which perhaps should be included as an ‘rt’ taxon. There were 22 *Lathridius minutus* group and six *Carpelimus bilineatus*. A rather heterogeneous group of taxa were present at frequencies of two to four individuals. It appears that only two species were able to establish themselves in numbers, although the reason for this is not clear.

**Context 2466:** olive woody material.

*Sample 44* (GBA): matted moss (*Thuidium tamariscinum*) and ?cess; a little silt.

Parasitic worms: There was a trace of *Trichuris* eggs in the subsample examined.

Insects (/T): Recording was rapid and semi-quantitative. This subsample gave a very characteristic group of beetles (and one bug: N = 114, S = 39), with ‘many’ fly puparia (see blow) and mites, and ‘several’ beetle larvae. Diversity was estimated to be low ( $\alpha = 21$ , SE = 4) and there were few ‘outdoor’ forms (% N OB = 4). Decomposers were abundant (% N RT = 82, over 90% if some probably decomposers coded ‘u’ were included), with ‘foul’ taxa more numerous than usual (% N RF = 18). The decomposer component

was estimated to be of low diversity (alpha RT = 13, SE = 2). *Anthicus formicarius* was very abundant (‘many’, but the translation to 15 was probably an underestimate), and there were also ‘many’ *Cercyon atricapillus* and *Oxytelus sculptus*. There were ‘several’ of the following: *Philonthus discoideus*; a second *Philonthus* (which was probably *P. cephalotes*, although this was not confirmed); *Monotoma picipes*; and an *Atomaria* species. Communities resembling this one have been found by HK in foul, ammoniacal material such as old field-edge dumps of grain—open-textured, fairly moist and very mouldy.

This subsample yielded large numbers of fly puparia, of which the majority were *Musca domestica* but an appreciable proportion were *Stomoxys calcitrans*.

*Sample 104* (GBA): no action to date.

**Context 2467:** varicoloured—olive, brownish-yellow, black—compressed woody layer with large fragments of organic material.

*Sample 55* (GBA): dark purplish-brown to grey, crumbly, heterogeneous, highly humic, slightly sandy silt with wood fragments and ash.

Plants (/M): With 65 taxa, this one was of the larger assemblages from Period 5 subsamples. Several taxa scored more than 1—*Agrostemma githago* seeds were present at an abundance of 3, whilst *Diphysium*, *Stellaria media*, *Brassica* sp(p), *Calluna vulgaris* (twig fragments) and *Anthemis cotula* all scored 2. In addition, there were large amounts of wood fragments, with modest amounts of fly puparia and a range of occupation debris including tile, charcoal, shellfish, leather and bird eggshell.

From the statistics, it is evident that weeds were the most important taxa in terms of numbers and abundance, the AIV for CHEN being 44 (nearly one-third of the taxa) and that for SECA being 35 (35, equal rank 5). There was an unusually large components of grassland taxa in MOAR (AIV 19, rank 8) and perennial weeds in ARTE (AIV 17,

equal rank 3). Several taxa were scored in both these groups—*Anthriscus sylvestris*, *Daucus carota*, *Ranunculus* Section *Ranunculus* and *Torilis japonica*. They perhaps indicate rough grassland such as on a modern roadside or a field that has been out of cultivation for several seasons, rather than hay meadow or grazing land.

There was a rather long lists of mosses from this sample, though they represent a variety of habitats, notably woodland and grassland, but also various kinds of wetland and heathland/moorland.

Parasitic worms: The subsample examined was barren.

Insects (/T): Recording was by rapid scanning. Only 56 beetles and bugs were found (S = 38). There were also modest numbers of *Musca domestica* puparia and some *Leptocera*, an adult *Melophagus* and a few other remains. Main statistics were obviously unreliable, although ‘outdoor’ forms made up almost a fifth of the group. A low value for % N RT was accounted for by *Carpelimus fuliginosus*, uncoded but probably belonging to the decomposer group. Apart from *C. fuliginosus* (of which there were ‘many’), only a *Philonthus* was represented by more than two individuals: there were three. Inspection of the species list suggests affinities with some other groups from this cut.

*Sample 992467* (Spot): Small Find 527: a piece of plied cord, perhaps vegetable bast.

**Context 2473:** very dark greyish-brown peaty silt.

*Sample 60* (GBA): dark brown, crumbly, amorphous organic material with traces of moss and wood fragments and some silt; perhaps faecal.

Parasitic worms: No parasite eggs recorded in the single subsample, though there were modest numbers of some structures resembling *Hymenolepis* (of which several were measured).

Insects (/T): There were 102 individuals of 43 beetle taxa, ‘many’ insect larvae, scale insects, mites and fly puparia (the latter including a single

*Melophagus ovinus*, of which there was also an adult), and an assortment of other remains. Diversity was low ( $\alpha = 28$ , SE = 5) and outdoor forms poorly represented (% N OB = 6). Decomposer diversity was low (alpha RT = 13, SE = 3), but other statistics of this component unremarkable. *Oxytelus sculptus* (16) and *Carpelimus bilineatus* (11) were the most abundant beetles, with eight individuals of a *Philonthus* species, and five each of *Omalium ?rivulare*, *Carpelimus fuliginosus*, a second *Philonthus* (probably *politus*), and *Lathridius minutus* group. This was probably a breeding group in somewhat foul conditions, perhaps with a moisture gradient.

A single *Acalles turbatus* was the only one positively identified from the site.

**Context 2474:** dark brown, very woody, peaty silt.

*Sample 54* (GBA): mid-dark brown, crumbly amorphous organic material and herbaceous and woody detritus with traces of small limestone fragments and of large bird bone; abundant *Genista* and *Rubia*, though very heavily decayed.

Insects (/1): The material was recorded by semi-quantitative rapid-scanning, the flot being rather cloudy with fine particles. There were ‘many’ mites and ‘several’ fly puparia, other remains (apart from beetles) being rare. It was estimated that about 95 individuals of 37 taxa were present, giving a low estimate of diversity ( $\alpha = 22$ , SE = 4). ‘Outdoor’ forms were very rare (% N OB = 2). The decomposer component included a good proportion coded ‘rd’ (% N RD = 19), and was of low diversity (alpha RT = 12, SE = 2). ‘Many’ *Acrotrichis* sp., *Carpelimus fuliginosus* and *Atomaria* sp., and ‘several’ *Cercyon analis* and *Oxytelus sculptus* were recorded. These, and other rarer taxa, strongly suggest that there was moderately foul decomposing matter.

**Context 2475:** very dark grey, very woody peaty silt.

*Sample 56* (GBA): dark brown, crumbly, somewhat heterogeneous, humic silt with traces of woody detritus and bark fragments.

Plants: The material was not recorded in detail, but abundant *Genista* and modest amounts of *Rubia* were observed during the description of the deposit.

Insects (/T): Sixty-five individuals of 37 beetles were observed, together with a variety of other arthropods including 'several' fly puparia, two cladoceran ephippia and a human flea. There were eight *Atomaria* sp., seven *Carpelimus fuliginosus* and six *Ptenidium* sp.; other taxa were represented by three or fewer individuals. The assemblage was rather mixed ecologically, and main statistics were no more enlightening. This may have been a mixture of remains already present in material dumped in the cut with invading decomposers.

**Context 2476:** black peaty silt.

*Sample 57* (GBA): dark brown, crumbly to slightly plastic, slightly silty amorphous organic material, with traces of large limestone fragments and abundant wood and twig fragments.

Insects (/T, 1/, /2): There were 74 individuals of 39 beetle and bug species in the /T assemblage, with 'many' scale insects (mostly *Lepidosaphes ulmi*, but with 'several' *Chionaspis salicis*) and mites and assorted other remains including 'several' beetle larvae and fly puparia (amongst them a *Melophagus ovinus*), an adult ked, a louse, and two human fleas. The most abundant taxa were *Carpelimus fuliginosus*, *Leptacinus* sp. and *Atomaria* sp. (all 6), and *Ptenidium* sp. and *Oxytelus sculptus* (4). This material probably included invaders of foul material; whether a breeding community was established is uncertain. The /1 and /2 assemblages were not listed through lack of time.

**Context 2477:** very dark greyish-brown peaty silt.

*Sample 58* (GBA): mid-dark grey-brown, crumbly amorphous organic material and coarse and fine herbaceous detritus (probably faecal).

Parasitic worms: The subsample examined was barren.

Insects (/T): The rather small beetle assemblage (S = 33; N = 56) resembled several others from this cut, with broadly similar main statistics and a species list headed by *Carpelimus fuliginosus* and *Lathridius minutus* group (7), *Acrotrichis* sp. (5) and *Oxytelus sculptus* and *C. bilineatus* (both 3). There were also 'many' mites, 'several' beetle larvae, an adult sheep ked and a few other remains.

In addition a 4kg subsample was bulk-sieved but has not been sorted.

**Context 2478:** very dark greyish-brown, very woody, peaty silt.

*Sample 59* (GBA): this sample was not described in detail in the laboratory; there are descriptions of it as being 'very humic 'heather'' [perhaps, in fact *Genista* stems?] and the residue from the /1 subsample was recorded by a technician as being 'mostly heather, few wood chips with quite a lot of moss, and some hazel nutshell, mammal bone and shell fragments.'

Insects (/1): This was an unusual subsample, consisting of 6.8kg of deposit (presumably deliberately chosen to be so large because it was mostly woody material). A moderately large insect assemblage was recorded (N = 149, S = 31); there were also 'many' fly puparia, 'several' beetle larvae and mites, and a human flea. Diversity was low ( $\alpha = 12$ , SE = 2), the outdoor component negligible (2 individuals), and proportions of decomposers rather ordinary. Decomposer diversity was very low, however (alpha RT = 6, SE = 1), and there can be little doubt that there was a (probably rather restricted, perhaps short-lived) breeding community including *Oxytelus sculptus* (36), *Carpelimus fuliginosus* (19), *Lathridius minutus* group (11, perhaps in drier parts of the layer), *Cercyon analis* and *Acrotrichis* sp. (10), *Lithocharis ochraceus* (9), *Carpelimus bilineatus* and *Philonthus politus* (7), and *Omalium rivulare* and a second *Philonthus* species (5). A similar ecological picture was carried into the lower ranks of abundance. Foul organic material, perhaps

resembling stable manure (but probably not such) was present.

**Context 2481:** dark yellowish-brown peaty material (this layer included many large ash patches, mortar flecks and red staining in the southern part of its extent).

*Sample 103* (Spot): a small sample mostly comprising root fragments of madder, *Rubia tinctorum* with a little silty matrix. Not examined in any further detail.

**Context 2494:** very dark greyish-brown sandy loam with organic material.

*Sample 124* (Spot): light yellow-grey, crumbly, sandy silt—?ash with some wood fragments; no further analysis undertaken.

**Context 2920:** recorded in the field as white mortar.

*Sample 122:* no action to date.

**Context 2934:** black structured peat.

*Sample 118* (GBA): dark grey-brown, humic silt with moderate numbers of fly puparia and abundant woody detritus.

Plants (/M): Of the modest assemblage of 33 taxa, *Diphysium* stem fragments were recorded at an abundance of 3 (and there were also very large numbers of fly puparia), and *Genista* stems and *Calluna* twig fragments achieved a score of 2. These scores for clubmoss and greenweed account for the rather high AIV for DYES. For the most part, the remainder of the plant assemblage comprised weed taxa of various kinds: mainly annual, but also some perennial taxa.

Parasitic worms: Three subsamples were examined, all being barren of parasite eggs.

Insects (/T): This subsample was rapid-scan recorded. There were very few insect remains apart from very large numbers of fly puparia, all those

examined being *Musca domestica* (as was also the case with the remains from the /M subsample).

**Context 2974:** this is an overall context number for the fills of this feature south of a certain point; the individual fills have been identified as separate contexts but the single sample cannot now be related to these.

*Sample 130* (GBA): very humic silt with (?heather) twigs.

Insects (/1): The 0.4735kg subsample was semi-quantitatively scan-recorded. It gave a rather small group of insects (though of course concentration was quite high): about 54 individuals of 33 beetle taxa, ‘many’ fly puparia (those identified being *Leptocera* sp.), ‘several’ beetle larvae, and a few others. Bearing in mind the size and method of recording of this assemblage, the main statistics are unreliable, although whole-assemblage and decomposer diversity appear to be low. There were ‘several’ *Acrotrichis* sp., *Carpelimus ?bilineatus* and *Aglenus brunneus* and three *Cercyon atricapillus*, but only one or two of each of the remaining taxa. The material probably resembled other fills in the cut.

*Sample 145* (GBA): A series of about 15 subsamples (the record is not wholly clear) from various lenses within the ditch-fill were taken as *Sample 145*. Two subsamples from layers designated 3 and 5 were recorded for insects (these were fairly distinct layers of ‘reddish’ peaty silt, perhaps madder-rich?), as was a further test subsample from subsample 11. Layers and 3 and 5 were located in the upper part of the sequence, layer 11 towards its base.

Parasitic worms: Two subsamples were examined; both gave small numbers of *Trichuris* eggs.

Insects: Two subsamples (/A and /B) from layers 3 or 5 were investigated via 1kg subsamples which were scan-recorded. There were few insects: 18 individuals of 17 beetles in one, 18 of 16 in the other. Neither group lent itself to interpretation, but they were notable for the presence of elaterid larval abdominal apices as follows: ‘/A’—*Melanotus*

*erythropus*, 3 small, 1 medium-sized; ‘/B’—*M. erythropus* 3 small, 2 medium-sized and *Athous haemorrhoidalis* 1. There were also ‘many’ earthworm egg capsules in the first subsample and ‘several’ in the second.

A flot jar labelled ‘145/II/T’ was recorded non-quantitatively. The flot was large, including moss and much fine plant debris. Insects were abundant and varied, with ‘many’ large puparia and a distinct community of foul matter beetles.

### Pit fills on Tenement A

**Cuts 37116 and 37115:** these pits lay one above the other in the backyard behind Tenements A and B (and have been arbitrarily assigned to A for the purpose of this report). The lower, **37116**, was about 1.5m across and its remaining fills were up to 0.5m thick; the upper was about 1m across and its fills were of a similar thickness to those in **37116**.

#### Cut 37116

**Context 26900:** the uppermost of the five fills of this pit; very dark grey peaty loam.

**Sample 2105 (Spot):** immature bones of hen, *Gallus* sp.

#### Cut 37115 (details above)

**Context 26888:** the lower of the two fills; very dark grey slightly clayey, slightly peaty loam.

**Sample 1797 (GBA):** dark reddish-brown, oxidising to very dark blackish-brown, crumbly organic detritus with some coarse plant detritus and faecal concretions.

**Plants (/M):** A total of 41 taxa were recorded from this subsample, and of these the following achieved an abundance of 2: *Agrostemma githago* seed fragments, *Brassica* sp./*Sinapis arvensis* seeds, *Malus sylvestris* seeds and endocarp fragments, *Prunus spinosa* stones, and *Linum usitatissimum*

seeds, whilst wheat/rye ‘bran’ scored 3 and there is little doubt that this deposit was largely faecal material. The AIV for FOOS was 46 (rank 3), but other AIVs were all rather low. The assemblage was noteworthy for yielding waterlogged hila of both *Vicia faba* and *Pisum sativum* (and testa fragments of the former), as well as ?leek leaf fragments.

**Insects (/T):** Recording was semi-quantitative. There were about 62 individuals of 36 beetles and bugs, ‘many’ *Leptocera* sp. and ‘several’ *Teichomyza fusca* puparia. Other remains included ‘many’ mites. Whole-assemblage and decomposer diversity were estimated to be rather low ( $\alpha = 36$ , SE = 8; alpha RT = 13, SE = 3), but the main statistics were generally unexceptional. There were ‘many’ *Carpelimus bilineatus*, ‘several’ *Omalium ?rivulare* and three *Anotylus nitidulus* but only one or two of the remaining taxa. Subjectively this was a rather mixed group, perhaps with the beginnings of an autochthonous ‘oxyteline association’.

### Tenement B

There were two buildings on Tenement B in Period 5B: Structure 5/3 at the front and 5/4 at some distance to the rear. Sampling was extensive, especially of floor and backfill deposits within the buildings. Again, there were few sample pit fills associated with this tenement.

### Deposits associated with the construction of Structure 5/3

**Cut 18046:** a construction cut for the Period 5B building (5/3) on Tenement B; it was about 0.3m wide and 0.2m deep.

**Context 18021:** black, slightly clayey, peaty, silty loam, with flecks of brown clay, olive-brown ash and charcoal.

**Sample 967 (GBA):** dark brown, crumbly, very heterogeneous sandy humic silt with some moderately large lumps of pinkish or chocolate brown clay with some bone and wood fragments.

Plants (/M): A modest assemblage of 29 taxa was recorded from this subsample, all in trace amounts (though there were rather larger components of charcoal, mammal bone and wood fragments). No useful detailed interpretation can be based on the very 'ordinary' mixtures of weeds, foodplants, dyeplants and so on.

Parasitic worms: Three subsamples were examined; one was barren, the other two yielded traces of *Trichuris* eggs.

Insects (/1, 3kg): The assemblage was 'detail' recorded. It was noted that some remains, especially of 'outdoor' taxa, were very fragmentary. Beetles were abundant and there were a few bugs (N = 237, S = 86). Main statistics were quite unremarkable. There appeared to be a 'house fauna' element (for example, ten *Lathridius minutus* group, seven *Xylodromus concinnus*, six *Cryptophagus scutellatus*, five *Cratarea suturalis*, and smaller numbers of others including *Atomaria nigripennis* and *Mycetaea hirta*), and a moderately well represented oxyteline association (seven *Anotylus nitidulus*, four *Carpelimus fuliginosus* and *C. pusillus* group, and three each of *Acrilus nigricornis*, *Oxytelus sculptus*, *Leptacinus* sp., *Gyrophypnus fracticornis* and *Neobisnius* sp.). Much the most abundant species was, however, *Aglenus brunneus*, of which there were 63.

The fill of this cut appears to have consisted of floor debris, *A. brunneus* being part of the 'house' group or an invader of buried wood. Unfortunately the flot jar was not available for re-inspection, but scale insects ('several' *Chionaspis salicis* and a few *Lepidosaphes ulmi*) and two human fleas were among the recorded remains.

### Floors in Structure 5/3

**Context 15557:** a black, peaty, silty clay loam, with patches of grey clay, about 1.2 x 1m, abutting a curious blind-ended gully (Cut 15578) within the outline of Structure 5/3, and probably a floor.

**Sample 871 (GBA):** dark grey-brown, crumbly humic silt with some small lumps of sticky grey clay and wood fragments.

Plants (/M): There was an average-sized assemblage of 43 taxa from this subsample, with abundance scores of 2 for *Diphysium*, *Chenopodium album* and *Rubia*. These two dyeplants, together with *Genista* and *Humulus* account for the rather high AIV for DYES (16). The assemblage is dominated by weeds in CHEN and SECA, with smaller components for the other weed groups BIDE and ARTE. Other components included moderate amounts of charcoal and wood, with a range of other occupation debris including eggshell and eggshell membrane, fish bone and scale, and mollusc shell fragments.

Parasitic worms: Four subsamples were examined; one was barren, the remaining three yielded a trace of *Trichuris* eggs.

Insects (/1): Selected for examination by a fully processed 'detail' recorded 3kg subsample, this material produced a very large insect assemblage. In addition to 517 individuals of 115 beetle and bug taxa, there were a few *Leptocera* sp. puparia and at least 21 human fleas. There were small numbers of a variety of other remains, including at least one adult *Melophagus ovinus*, many puparial fragments of this species, and three Cladocera 'type F' ephippia. Diversity of the whole assemblage was moderate ( $\alpha = 46$ , SE = 3). Outdoor forms accounted for only 7% of the individuals, and all but one of them (*Trechus quadristriatus* or *obtusus*, with two) was represented by a single individual. Decomposers made up over four-fifths of the fauna, and 'rd'-coded taxa were exceptionally important (% N RD = 59, 73% of N RT). Although several decomposers were numerous, the mathematical measure of diversity of the component was not far from average—alpha RT = 18, SE = 2. This was presumably a result of the presence of a rich community of decomposer species.

Much the most abundant taxon was *Lathridius minutus* group, of which 201 were recorded (39% of the assemblage). All the remaining species at

rank 10 or better belonged to the ‘house’ group: *Atomaria nigripennis* (36); *Cryptophagus* sp. (20); *Xylodromus concinnus* (18); *Atomaria ?apicalis* and *Aglenus brunneus* (13); *Mycetaea hirta* (12); *Anobium punctatum* (11), *Cryptophagus scutellatus* (10); and *Crataraea suturalis* (9). These taxa in the first 10 ranks made up 67% of the assemblage, which therefore stands as a ‘type’ ‘house fauna’ group. Species present in smaller numbers indicated that rather fouler habitats were present—but whether in the floor or merely nearby is uncertain.

This subsample provided the only specimen of *Dromius longiceps* from the site. It was also recorded as a single specimen from the nearby 6-8 Pavement (Lloyds Bank) site (Hall *et al.* 1983). It is a denizen of reedbeds and rare in Northern England today.

**Context 15559:** immediately to the N of **15557** and not less than 1.4 x 1.3m in lateral extent; dark greyish-brown loamy silt with flecks of grey clay and of charcoal a floor in Structure 5/3.

*Sample 872* (GBA): very dark grey-brown, crumbly clay silt with some wood fragments and small clay lumps.

Plants (/M): Of the modest assemblage of 32 taxa, only *Chenopodium album* reached an abundance of 2. The AIV for CHEN was the largest at 32 (44% of the assemblage), the other groups all small or modest. There was one of only two records from Period 5 for saw-sedge (*Cladium mariscus*), a species that was never frequent at Anglo-Scandinavian Coppergate and which may perhaps represent roofing material.

Parasitic worms: Two subsamples were examined, both giving small numbers of *Trichuris* eggs.

Insects (/1): Treated in the same way as subsample 871/1, this produced an even large group of insects. There were 590 beetles and bugs of 122 species, at least 23 human fleas, ‘many’ scale insects (*Chionaspis salicis*), several *Leptocera* sp. puparia, two adult *Melophagus*, at least three honeybees, ‘several’ Cladocera ‘type F’ ephippia,

and small numbers of various other arthropods. There were also at least 50 mites. Main statistics were astonishingly close to those for subsample 871/1:  $\alpha = 47$ , SE = 3; % N OB = 8; % N RT = 80; % N RD = 59 (74% of NRT); alpha RT = 18, SE = 1. The more abundant species were the same as in 871/1 except for the interpolation of an Aleocharinae sp., as follows: huge numbers of *Lathridius minutus* group (211, 36% of the assemblage); *Atomaria nigripennis* (52); *Cryptophagus* sp. (23); *Aglenus brunneus* (20); *Mycetaea hirta* (19); *Xylodromus concinnus* (14); *Anobium punctatum* (14); an Aleocharinae sp. (13); *Cryptophagus scutellatus* (12); *Atomaria ?apicalis* (10); and *Crataraea suturalis* (9). The less abundant species were essentially similar to those in subsample 871/1. Contexts **15557** and **15559** must surely have been contemporaneous, and have formed under near-identical conditions.

**Context 15561:** a large layer of about 3.8 x 3.6 x 0.05m covering most of the S and E part of the interior of Structure 5/3 (it underlay **15557** and **15559**); very dark greyish-brown, slightly peaty, silty loam, with flecks of brown ash, brown clay and charcoal.

*Sample 876* (GBA): dark brown, crumbly, more or less humic, slightly sandy silt with lumps of pinkish-grey clay.

Plants (/M): A modest 46 taxa were recorded, with abundances of 2 for *Diphasium*, *Genista* and *Rubia*. There was thus a rather high AIV of 18 for DYES (equal rank 6 for this group of samples). Weeds in CHEN and SECA dominated the vegetation groups.

Parasitic worms: Two subsamples were examined; a trace of both *Trichuris* and *?Hymenolepis* eggs was recorded from each.

Insects (/1): A 3kg subsample was fully processed and detail-recorded. Beetles were fairly abundant (N = 207, S = 88) and there were at least three adult and a puparial *Melophagus ovinus*, several other puparia, ‘many’ mites, some lice (identifiable only to *Damalinea* sp.), seven human fleas, and various other remains. Diversity was moderately

high ( $\alpha = 58$ , SE = 7), the outdoor component well-represented but not large (% N OB = 13) and represented by single individuals apart from two *Aphodius granarius*. About a quarter of the assemblage was made up by 'rd' coded taxa (% N RD = 23).

The species list was rather characteristic, reminiscent of some others (see for example those from the subsamples from Sample 299, Context 8524), seemingly a mix of 'house fauna' and another component rich in Oxytelinae together with their apparent associates. There were 24 *Lathridius minutus* group, nine *Aglenus brunneus*, eight *Xylodromus concinnus*, five *Cryptophagus* sp. and *Atomaria ?apicalis*, four *Anobium punctatum* and *Ptinus fur*, and two or three individuals of several other taxa in the first group. Oxytelinae included *Carpelimus fuliginosus* (10), *Carpelimus bilineatus* (8), *Anotylus nitidulus* (7), *A. complanatus* (4) and two others at a frequency of 3; there were six other oxytelines with single individuals. There were also seven *Cercyon analis* and four *Neobisnius* sp.; both of these, subjectively, seem to increase in numbers with the oxytelines, but *C. analis* is very eurytopic and also commonly found in association with 'house fauna' without the oxyteline group.

*Sample 877* (GBA): dark grey-brown, crumbly silt with a little clay and some wood fragments.

Plants (/M): There were 54 taxa in this sample, and the similarity coefficient for this assemblage and that for 876 from the same context was 35% (the kind of figure to be expected, on past experience, for urban archaeological occupation deposits of this kind). Again, *Diphysium*, *Genista* and *Rubia* scored 2, as did *Chenopodium album*. The AIV for DYES (19) was at equal rank 3, CHEN and SECA again dominated the vegetation groups.

Parasitic worms: The single subsample examined was barren.

Insects (/1): This, too, was a 3kg fully processed and 'detail' recorded sample. There were 'many' mites, 'several' fly puparia, two adult sheep keds, at least three human fleas, three *Damalinea ovis*,

and assorted other remains. Exactly 200 individuals of 102 beetle taxa were identified. Diversity was high ( $\alpha = 83$ , SE = 10) and the outdoor component proportionally substantial (% N OB = 17). All the outdoor taxa were represented by one, or in three cases two, individuals. Decomposers included a substantial RD component (% N RD = 20), but diversity was quite high (alpha RT = 33, SE = 5). The more numerous species included a mixture of 'house fauna' and the oxyteline association reminiscent of that in the subsample from Sample 876, and doubtless essentially similar conditions obtained.

There was a specimen of *Anotylus inustus*, one of only two from the site (it was also in the subsample from Sample 891); it is possible that this species was occasionally overlooked, however.

*Sample 875* (Spot): a single snail (*Cepea* sp.) shell.

**Context 15608:** a layer to the front of Structure 5/3, butting up to (and perhaps an accumulation against) a wall; seen only in section but thought to be at least 0.55m in lateral extent and 0.12m thick; very dark greyish-brown, silty clay loam, with flecks of brown clay, light yellowish-brown ash and charcoal.

*Sample 889* (BS—VW): A total of 48 taxa were recorded from this sample, all in trace amounts. Together with a mixture of weeds and waste ground taxa, food- and dyeplants (an assortment like so many others from this site at this period), there were traces of ?beeswax, ?charred bread, leather and eggshell membrane fragments.

**Context 15622:** overlying 15608, a very large area (about 3.2 x 3.5 x 0.03m) in the middle and E part of Structure 5/3 (surrounding the bulbous 'blind end' of Gully 15578); the sample came from the NE corner of the area of this very dark grey peaty loam with patches of very dark grey silty loam.

*Sample 891* (GBA): dark grey-brown, crumbly, very 'earthy' and jumbled humic silt with clay flecks and tiny wood fragments.

Plants (/T3, 2kg): The moderately large residue was about 80% sand and gravel with some mortar; the organic fraction was mostly charcoal and bark with some very decayed wood and *Diphysium*, and rather few other components. The tally of 32 identifiable taxa consisted mainly of weeds with small amounts of foodplants and a modest range of other types.

Parasitic worms: Two subsamples were examined; both yielded a trace of *Trichuris* eggs.

Insects (/1-3): Three 1kg subsamples were fully processed and the resulting insects combined for 'detail' recording. Apart from seven rather poorly preserved human fleas, moderate numbers of puparia (those identified being Sepsidae sp. and some fragments of *Melophagus ovinus*), 'many' mites, an adult *Melophagus*, a single *Pediculus humanus* and a rich variety of other remains. There were 250 individuals of exactly 100 beetle and bug taxa. Main statistics were not unusual for a Period 5B house floor, with diversity rather high ( $\alpha = 62$ , SE = 6), a modest outdoor component (% N OB = 10) in which most species were single individuals, a quite large proportion of taxa coded 'rd' (% N RD = 18), and an RT component of rather high diversity despite a clearly autochthonous component (alpha RT = 30. SE = 4). The more abundant taxa followed the pattern seen in a number of other floor assemblages (for example Samples 876-7, 299), a mixture of 'house fauna' and Oxytelinae, with *Cercyon analis* (6) and *Neobisnius* sp. (5). The former group comprised: *Lathridius minutus* group (26), *Xylodromus concinnus* and *Aglenus brunneus* (12), *Crataraea suturalis* (6), *Anobium punctatum* and *Atomaria ?apicalis* (5), and smaller numbers of some other characteristic taxa. The oxytelines included *Carpelimus fuliginosus* (14), *C. bilineatus* (9), *Anotylus nitidulus* (9), *Carpelimus pusillus* group (5), and *Platystethus arenarius*, *Anotylus complanatus* and *A. rugosus* (4).

There was a specimen of *Anotylus inustus* (rare at the site but also recorded from Sample 877).

### Gully fills in Structure 5/3, Tenement B

**Cut 15578:** a gully towards the front of Tenement B, in the rear portion of Structure 5/3; in plan, the gully had widened rounded ends. Cut through the earliest floors (into 15557) at end of use phase, immediately below backfills 15529, 15531; cut was sealed by 15530.

**Context 15581:** the basal context, a very dark greyish-brown, silty clay loam.

*Sample 857* (GBA): very heterogeneous sandy clay silt with localised patches of sandier, siltier or more clayey sediment, some small pebbles, tile fragments, bone, and plant detritus; no structure.

Parasitic worms: Two subsamples were examined; both gave three *Trichuris* eggs, but no *Ascaris*.

Insects (/1-3): Processed as a 1kg and two 2kg fully-processed subsamples, the material was combined for listing in detail. Invertebrates were numerous and varied: human fleas were abundant (at least 14), and there were 'many' fly puparia (those identified being mostly *Leptocera* sp.) and mites, 'several' Cladocera, 'many' beetle larvae and *Chionaspis salicis*, three adult sheep keds, and two honeybees. A very large beetle and bug assemblage was present, 496 individuals of 119 taxa being recorded. Main statistics were not noteworthy apart from the large proportion of 'dry' decomposers (% N RD = 34, 48% of N RT).

There was a strong affinity in the fauna with that from subsamples 852/1-3, with abundant house fauna, of which the following were more abundant: *Lathridius minutus* group (61); *Aglenus brunneus* (42); *Atomaria nigripennis* (41); *Mycetaea hirta* (22); *Xylodromus concinnus* (20); *Cryptophagus scutellatus* (13); *Crataraea suturalis* (9); *Cryptophagus* sp. (8); *Anobium punctatum*, *Ptinus fur* and *Atomaria ?apicalis* (all 7) and a second *Cryptophagus* sp. (6). In this case, however, there were also some abundant oxytelines and their common associates: *Carpelimus bilineatus* (17); *Anotylus nitidulus* (15); *C. pusillus* group (12); *C. fuliginosus* and *A. complanatus* (9); *Cercyon analis* (8); and *Neobisnius* sp. (7). There were also smaller numbers of several other species subjectively associated with this group (in total 12

Oxytelinae of the genera *Carpelimus*, *Platystethus*, *Anotylus* and *Oxytelus* were present). This group presumably indicate fouler, wetter organic matter, unless the hypothesis of massive background fauna generated by swarming from the nearby River Foss can be accepted.

Seven individuals of aquatic beetles were recorded, including three *Ochthebius* sp. All might have arrived in buckets of water.

There were two *Phyllodrepa salicis*, a rarely recorded species today, but probably more common in the past (there were eight records in all from Anglo-Scandinavian Coppergate).

**Context 15579:** immediately overlying **15581**; black, slightly peaty, silty clay loam.

*Sample 856* (GBA): dark brown, crumbly, slightly humic sandy clay silt.

Plants (/M): There was a very large assemblage of 79 taxa from this subsample, the largest for any Period 5 subsample of this kind. This probably reflects the depositional environment. Only four taxa, probably of quite separate origins, were recorded at an abundance of 2 (*Corylus*, *Anthemis cotula*, *Agrostemma githago* and *Eleocharis palustris*), the remainder at 1. Most conspicuous amongst the vegetation groups were weeds (CHEN and SECA) and grassland taxa (MOAR); the AIV for CHEN was 52 (rank 5, a third of the taxa), that for SECA 40 (rank 1, 22%—and the largest number of SECA taxa of any Period 5 sample, viz. 17). The AIV for MOAR (26) was at rank 6, and was based on 13 taxa, though the securely and tentatively identified grass caryopses of *Poa*, *Alopecurus*, and *Agrostis* and the waterlogged spikelets/spikelet fragments of Gramineae would increase this parameter further had they been scored with MOAR.

With the exception of fibre/oil plants (represented by seeds and capsule fragments of flax), the ‘useful’ groups were very poorly represented and there is thus only modest evidence from the plant remains for dyeplant waste or for food remains (either from kitchen waste or faecal material). Such

concentrations of arable weeds and grassland taxa perhaps point to the presence of straw and hay, or to material deriving from them. The abundance of weeds in CHEN is rather surprising in a deposit that is thought to have formed within a building.

Parasitic worms: The three subsamples examined all gave traces of *Trichuris* eggs, but no *Ascaris*.

Insects (/M, treated as /1, and so recorded): The 0.5kg subsample produced a small assemblage of beetles (N = 33, S = 24). There were affinities with other groups from this feature, with ‘house fauna’ well represented. A single *Melophagus* puparium was noted.

**Context 15560:** immediately overlying **15579**; a black, slightly peaty silt.

*Sample 851* (GBA): mottled (black/red), rather heterogeneous (centimetre scale) sandy clay silt (‘loam’) with no internal structure.

Insects (/1-3): Insects from the three fully processed 1kg subsamples were combined for listing in detail. There were abundant and varied invertebrate remains, including ‘many’ mites, beetle larvae, Cladocera types ‘F’ and ‘C’ ephippia, human fleas, and *Chionopsis salicis*, at least three *Melophagus* adults, and some lice (two *Damalinea ovis* and a *Pediculus humanus*). Beetles and bugs were fairly numerous (N = 167; S = 88), but their concentration not exceptionally high. Many species were represented only by tiny fragments. Diversity was high ( $\alpha = 75$ , SE = 10) and outdoor forms were well represented (% N OB = 17; but only one species with more than one individual, this being *Aphodius granarius* with two). A quarter of the individuals were of taxa coded ‘rd’, more than half of these being *Lathridius minutus* group (23 individuals). There were moderate numbers of *Atomaria ?apicalis* (8) and *Carpelimus fuliginosus* and *Anotylus nitidulus* (6 each). The ecological mixture seen in the first four ranks continued throughout the list; a combination of ‘house fauna’ and the ‘oxyteline association’ being present.

There was a single *Sitophilus granarius* (see discussion of these grain beetles by Kenward and Hall 1995, 760-1).

*Sample 852* (GBA): black (more structured than 851) 'loam'; rather humic, but less so than others in this sequence; some leather fragments recorded.

Plants (/T3, 2kg): The residue was rather small, about 30% by volume bark and charcoal, the rest sand and gravel. Seeds were rather sparse. Of the 27 identifiable taxa, most were either weeds or foodplants and there were three dyeplants (of which *Diphysium* was recorded at '2' on the four-point abundance scale used).

Parasitic worms: One of the two subsamples examined gave traces of *Trichuris* eggs.

Insects (/1-3): The assemblages from three 1kg fully processed subsamples were amalgamated for recording processes; a 'detail' record was made, rendered somewhat difficult by the fragmentary nature of many of the remains. Insects were abundant—there were ten *Damalinia ovis*, five *Pediculus humanus*, single *Felicola subrostratus* and *Haematopinus apri*, 'many' *Chionaspis salicis*, 13 *Pulex irritans*, modest numbers of fly puparia (mostly *Leptocera* sp.), 'several' bug nymphs, numerous *Melophagus* adults (and some puparia), and 'several' Cladocera 'type F' ephippia. A characteristic beetle larva abdominal apex may have been *Malachius* sp., for it closely resembled that genus as figured by Böving and Craighead (1931, plate 91). A large number of beetle and bug taxa were present (S = 126, one of the highest values for the site), and 305 individuals were recorded. Diversity was high ( $\alpha = 80$ , SE = 7) and the outdoor component substantial (% N OB = 17). Diversity of this component was also very high. An unusually large part of the fauna was contributed by taxa coded 'rd' (% N RD = 42, 61% of N RT), but the decomposer component was not of exceptionally low diversity, perhaps because a rich and diverse autochthonous fauna was present. The predominant taxa were typical of those found in the 16-22 Coppergate floors: *Lathridius minutus* group (53); *Mycetaea hirta* (26); *Atomaria nigripennis* (21), *Xylodromus*

*concinus* and *Aglenus brunneus* (12), *Atomaria ?apicalis* (10), *Cryptophagus* sp. (7), *Anobium punctatum* (6); and *Crataraea suturalis* and *Cryptophagus scutellatus* (5). This gully was apparently filled by material from within the structure.

There were six individuals belonging to aquatic beetle taxa, including two *Helophorus grandis*. These and others might have been imported in buckets of water.

The record of two *Chrysolina ?menthastri*, a rare waterside leaf beetle, unfortunately from remains too fragmentary for certain identification, was notable, as was that of *Cymus ?clavicolus*, a bug found on vegetation by water and in damp places.

*Sample 853* (Chemical): mid-dark grey-brown, crumbly, humic, slightly sandy clay silt, with traces of tile and white flecks; no further analysis undertaken.

*Sample 854* (Chemical): mid-dark grey-brown, crumbly, humic, slightly clayey, sandy silt, with traces of charcoal and small bone fragments; no further analysis undertaken.

*Sample 855* (Spot): avian eggshell; no further analysis undertaken.

**Cut 15343**: gully on the western side of Tenement B, between Structures 5/2 and 5/3; perhaps a boundary or drain or eavesdrip for 5/3.

**Context 15178**: fill of gully, about 0.5m across and 0.25m thick, comprising dark olive grey silty loam.

*Sample 729* (GBA): no action to date.

### Backfill in Structure 5/3

**Context 13716**: a huge layer, covering most of the width of the cut and approx. 0.5m thick.

*Sample 662* (Spot): A sample of avian eggshell; no further analysis undertaken.

**Context 13866:** a spread of brushwood (compacted twigs and ?wattle) within Structure 5/3; it was about 2.8 x 1.2m across and up to 0.07m thick. Immediately below **13716**, and over **15179** (but separated by one intervening layer).

*Sample 668* (GBA): mid-dark brown, crumbly, slightly sandy woody detritus; no further analysis undertaken.

*Sample 669* (Wood): described by the excavator as ?collapsed wattle, this was all willow (*Salix*); details of the size of the twigs were not recorded.

**Context 13875:** below **15179**, largely separated from it by **15207**.

*Sample 772* (Spot): described by the excavator as ‘rush matting’, this material was examined by P. R. Tomlinson who found it to comprise plant stems identified as *Genista tinctoria* and *Diphysium complanatum*, with some unidentified epidermis, some of it from monocotyledons.

**Context 15179:** brushwood backfill in Structure 5/3, under **13716**.

*Sample 731* (GBA): brushwood with a little silty material.

Plants (/M): This sample consisted almost entirely of willow and other twigs; the other identifiable remains were traces of buds of leaf fragments of the same genus and a seed of *Chenopodium album*.

A subsample of wood was measured and the annual rings counted: of the 17 specimens examined, five were alder, the rest willow. The alder had a diameter range of 13-26mm (and were mostly moderately strongly compressed), with a mean ring count of 7.8, whilst the willow were 7-36mm across (mostly either moderately or very strongly flattened), and with a ring count of 5.8 (SD = 1.6).

The /M subsample was ‘floated’ for insect remains (see below).

Parasitic worms: The single subsample examined was barren.

Insects (/1, 3.95kg): In order to provide sufficient matrix, a large subsample of the material was processed. The resultant insect assemblage included 156 individuals of 29 beetle taxa. Diversity of this group was very low ( $\alpha = 11$ , SE = 1). There were only two ‘outdoor’ individuals, no taxa coded rf, and only a small RD component (% N RD = 5). Diversity of the decomposers was very low (alpha RT = 4, SE = 1). As might be expected from the values of  $\alpha$ , there were large numbers of individuals of some taxa and a rather specialised community was present: 76 *Rhizophagus parallellocollis* and 21 *Aglenus brunneus* dominated the assemblage. There were also nine *Trechus micros* and Euplectinae sp. and a *Trichonyx sulcicollis*. This characteristic group is tentatively regarded as of ‘post-depositional invaders’—particularly likely to invade a very open-textured buried deposit such as brushwood. The few other taxa recorded seem likely to have entered before burial or to have come from soil percolating down through the deposit from the overlying layer. In addition to the beetles, there were abundant scale insects, both of the commonly recorded species being numerous. Other insects, however, were rare.

The flot from the 0.5kg /M subsample was rapidly examined using non-quantitative recording. There appeared to be a broadly similar insect assemblage to that from subsample /1, although there were only rather small numbers of scale insects (‘several’ *Lepidosaphes ulmi*, but no *Chionaspis salicis* observed).

*Sample 732* (GBA): no action to date.

*Sample 733* (GBA): This was another sample of brushwood, from which a 0.5kg subsample (/M) examined for plant remains yielded only abundant willow twigs and traces of willow buds. A selection of wattle-sized stems was measured and their rings counted: all 17 pieces were willow, with a diameter range 8-23mm and a mean ring count of 6.1 (SD = 1.3); most were either uncompressed or only slightly compressed.

*Sample 734* (GBA): brushwood with a ?ashy, silty matrix; no further analysis undertaken.

*Sample 735* (GBA): brushwood with a large amount of silty matrix, including buff to grey clay.

Parasitic worms: Two subsamples were examined; one was barren, the other gave a single *Trichuris* egg.

Insects (/T, 2kg): A rather small group of beetles was recovered, together with huge numbers of scale insects (of the order of 1000 each of *Chionopsis salicis* and *Lepidosaphes ulmi*), ‘several’ mites, two adult *Melophagus*, and human flea. Hardly any other remains were noted. The scale insects presumably originated from the brushwood.

The beetle assemblage, recorded semi-quantitatively, included about 55 individuals of 37 species and had main statistics close to the means for Anglo-Scandinavian Coppergate. There were ‘several’ *Carpelimus bilineatus* and *Aglenus brunneus*. It appeared that there was a mixture of small numbers of ‘house fauna’ and other decomposer communities, but the entire group may have originated in soil which percolated from above.

*Sample 736* (GBA): brushwood, similar to 754, but with more clay in the matrix.

Parasitic worms: Two subsamples were examined but both were barren.

Insects (/1, 6.25kg): A large subsample was processed in order to obtain sufficient of the matrix, most of the sample consisting of brushwood fragments. A modest group of beetles (and one bug of the groups on which statistics are based) was extracted: N = 137; S = 56. Main statistics were close to the means for Anglo-Scandinavian Coppergate. The three most abundant taxa were components of the supposed post-depositional invader group (*Rhizophagus parallelocolis*, with 27 individuals, eleven *Aglenus brunneus* and nine Euplectinae sp.) and there were also five *Trechus micros*. Other components which

may have been represented were ‘house fauna’ and a group associated with rather foul matter.

Scale insects were numerous (‘many’ *Lepidosaphes ulmi* and ‘several’ *Chionopsis salicis*), and there were ‘many’ mites and a human flea.

*Sample 737* (GBA): wattle with matrix of grey clay and organic material, some yellow ?mineral matrix.

Insects (/1, 5.635kg): A large subsample was processed, but the recovered insect assemblage was small. There were ‘several’ scale insects (apparently the usual two species), and 38 individuals of 19 beetle taxa, but almost no other remains. There were seven *Rhizophagus parallelocolis* and six *Aglenus brunneus*. This group resembled a random extract from some of the larger ones from associated layers (and in particular that from *Sample 737*).

*Sample 738* (GBA): no action to date.

*Sample 739* (GBA): brushwood with very little matrix; some wood fragments show small incisions/axe cuts.

Parasitic worms: The single subsample examined was barren.

Insects (/1, 5.8kg): A large subsample was processed and recording was semi-quantitative. An estimated 40 beetles of 20 taxa were present (with ‘many’ *Rhizophagus parallelocolis*, ‘several’ *Aglenus brunneus* and one or two individuals of the remaining species), but there were ‘many’ of the two usual species of scale insect. There were few other remains and main statistics were unexceptional.

**Context 15207:** a layer of brushwood, about 3.7 x 3.4 x 0.06m, within Structure 5/3, under **15179**.

*Sample 754* (GBA): brushwood with organic detritus between the compacted twigs; twigs mainly 10-15mm diameter with some finer twigs. There was only a small mineral content. The whole sample of 19kg was sieved to 300µm and the

fraction less than 4mm subjected to paraffin flotation. (The residue was subdivided prior to treatment with paraffin and the resultant flots recombined.)

Parasitic worms: Both the subsamples examined yielded a single *Trichuris* egg.

Insects (/1): This very large (19kg) subsample was fully processed and detail recorded. It gave a large (N = 239, S = 56, with many other remains) and very characteristic group. Diversity was low ( $\alpha = 23$ , SE = 2), the outdoor component small (% N OB = 4, the concentration being near-zero), decomposers very abundant (% N RT = 81) and of low diversity (alpha RT = 11, SE = 1).

Very much the most abundant beetle (41% of the assemblage, 99 individuals) was *Rhizophagus parallellocollis*, and there were 29 *Aglenus brunneus*, 13 *Carpelimus bilineatus*, eight *Trechus micros* and *Carpelimus fuliginosus*, seven *Cercyon analis*, six *Neobisnius* sp. and four *Trox scaber* and *Ptinus fur*. It appears likely that this layer contained few beetles at burial and that *R. parallellocollis*, *A. brunneus* and *T. micros* invaded subsequently. It is felt that some of the oxytelines may also have lived in the deposit after burial.

This subsample was notable for the presence of huge numbers of scale insects; all those examined were *Chionaspis salicis* (of which there were some tens) and *Lepidosaphes ulmi* (with some hundreds) but other species present in very small numbers may have been overlooked. They certainly were imported attached to the willow branches among which they were found. Other remains included 'many' mites.

This brushwood was of uncertain origin. Two leading possibilities are that it was the remains of a roof (it was too disorganised to have been of use in any other structural context) or that it was rubbish, the offcuts perhaps from wattle manufacture. *Trox scaber* and *Ptinus fur*, both better represented here than in most other samples, perhaps hint at a roof.

*Sample 755* (Wood): flattened willow (*Salix*) stems to 25mm diameter with a 'binding' ?also of willow.

*Sample 756* (Spot): twigs of alder, *Alnus*, with buds and leaf fragments; a second, separate part of the sample comprised willow buds and poorly preserved ?willow leaves.

**Context 15361:** immediately below **13875**, in contact with **15207**.

*Sample 776* (GBA): richly organic clay silt with mottles of lighter clay, and wood fragments.

Parasitic worms: The single subsample examined was barren.

Insects (/T): Recording was by semi-quantitative scanning. Insect remains were varied and included 'several' beetle larvae, fly puparia and scale insects (mostly *Lepidosaphes ulmi*, but with a few *Chionaspis salicis*). There were 'many' mites, 'several' Cladocera 'type F' ephippia, and also a single *Daphnia*. These water fleas were not accompanied by many aquatic insects (only two aquatic and one obligate waterside species), however.

There were about 96 individuals of 47 beetle and bug taxa, with main statistics of little was the most abundant taxon ('many'), with modest numbers of a group of species most likely to be found together under somewhat, but not very, foul conditions.

**Context 15470:** under **15361/15207**.

*Sample 815* (GBA): dark brown, crumbly to somewhat layered, very heterogeneous mixture of clay and silt and organic detritus with some patches of pure organic material, a few twigs and wood fragments and some small lumps of greyish-pinkish clay.

Parasitic worms: Of the six subsamples examined, three were barren and three gave very small numbers of *Trichuris* eggs.

Insects (/1, 2, 3): Three 1kg subsamples were examined for insect remains, and each gave a

substantial assemblage. Recording was fully quantitative.

The first subsample gave 164 individuals of 68 beetle and bug taxa, together with a variety of other remains, including ‘many’ mites, puparia and ephippia of *Cladocera* sp. ‘type F’ (there were also ‘several’ *Cladocera* sp. ‘type C’ and a few *Daphnia*), ‘several’ beetle larvae and *Chionaspis salicis*, a human flea and adult and puparial sheep keds. Main statistics of the beetle and bug assemblage were of no special note. The most abundant taxa were *Acrotrichis* sp. (27), *Carpelimus fuliginosus* (14), *C. pusillus* group (13), *Cercyon analis* (10) and *Lathridius minutus* group (6); there was probably a rich community of decomposers of slightly foul conditions, with only traces of ‘house fauna’.

Subsample /2 produced an assemblage close in size to that from subsample /1 (165 individuals of 69 beetle taxa) and of broadly similar composition and implications. There were signs of rather fouler conditions, but no doubt that a rich and varied decomposer fauna was present as the layer formed. There were also large numbers of mites (over 100), and ‘several’ *Chionaspis salicis*, fly puparia and beetle larvae, but only small numbers of *Cladocera*.

The third subsample gave a somewhat smaller group of beetles and bugs (N = 127, S = 68). Although its implications were generally much as those of the other two subsamples (perhaps with closest affinities with /2), there were considerable differences in the precise composition. There were ‘several’ *Cladocera* sp. ‘type F’ and ‘many’ mites and fly puparia, as well as a human flea.

**Context 15471:** below 15361, over 15526.

*Sample 816* (GBA): essentially similar to *Sample 815*, but darker, more heterogeneous and with less internal structure, some pale ?ashy lumps, wood and bark fragments.

Parasitic worms: Five subsamples were examined, of which three were barren and two gave traces of *Trichuris* eggs.

Insects (/1, 2, 3): Three 1kg subsamples were processed and recorded fully quantitatively. Each gave a large assemblage. The first (/1) included 251 individuals of 71 beetle taxa. Diversity was quite low ( $\alpha = 33$ , SE = 3), but other statistics were of no special note. The species list was very reminiscent of those from *Sample 815*: there were 32 *Acrotrichis* sp., 29 *Carpelimus fuliginosus*, 15 *C. bilineatus* and smaller numbers of a mixture of other decomposers. This group did, however, give somewhat stronger indications of the presence of a ‘house fauna’ component. Other insects included ‘many’ fly puparia and beetle larvae, and ‘several’ *Chionaspis salicis*. There were ‘many’ mites and ‘several’ ephippia of both *Cladocera* spp. types F and C. Single adult and puparial *Melophagus* were recorded and there was a single human flea.

Subsample /2 produced 324 individuals of 72 bug and beetle taxa and a variety of other invertebrates, among which were ‘many’ mites, fly puparia and beetle larvae, ‘several’ *Cladocera* types F and C ephippia and *Chionaspis salicis*, and an adult *Melophagus*.

Diversity of the beetle and bug group was quite low ( $\alpha = 29$ , SE = 3), and other statistics were broadly as for the first subsample. The species lists had much in common, with a similar range of abundant species. There were 80 *Carpelimus pusillus* group, 28 *Acrotrichis* sp., 24 *C. fuliginosus*, 21 *C. bilineatus* and 11 *Cercyon analis*, with significant numbers of many other species likely to have found habitats in common with these. Again, there was a rich and varied community of decomposers, indicating fairly moist, rather foul conditions, probably with a modest ‘house fauna’ component, which included two human fleas.

Subsample /3 gave 256 individuals of 78 beetle and bug taxa and many other remains, including large numbers of mites, ‘many’ beetle larvae and fly puparia, ‘several’ *Chionaspis salicis* and *Cladocera* spp. types F and C, an adult *Melophagus* and a *Pulex*. Diversity was a little higher than in the previous subsamples ( $\alpha = 38$ , SE = 4), but this group clearly represented only a subtly (probably randomly) different variation on the same theme, with 28 *C. fuliginosus*, 21 *C.*

*bilineatus*, 21 *C. pusillus* group, 14 *Acrotrichis* sp. and nine *C. analis*.

**Context 15526:** under 15471, over 15528.

*Sample 827* (GBA): dark grey-brown, crumbly silt with a little sand and clay, stones, wood fragments and some herbaceous detritus.

Plants (/M): A rather large assemblage of 65 taxa was obtained from this subsample, though all scored an abundance of 1. Weeds in group CHEN were easily the largest component (AIV of 40, 29% of the taxa) but the next highest AIV (27) was achieved by MOAR (the fourth highest value for this parameter in the Period 5 samples) and SECA (high, but not especially so for this group). The grassland taxa included *Filipendula ulmaria* and *Heracleum sphondylium*, tall-growing plants that might have been brought with hay or in dung, but there was also a rather rare record for *Hydrocotyle vulgaris*, indicative of wetter, perhaps shorter grassland or maybe a fen community. The Leguminosae flowers may also be part of a meadow component, as might *Leontodon*. The record of *Picris hieracioides* points to calcareous land, whilst *Danthonia* is perhaps more likely to have been a calcifuge.

This assemblage was also marked by being one of only two from Anglo-Scandinavian Coppergate with *Scleranthus annuus*. This annual plant of dry sandy places contrasts in its ecology with most of the other taxa mentioned here.

‘Useful’ taxa were restricted to six in FOOS and four scored with DYES, plus a few others in other groups.

Parasitic worms: The single subsample examined yielded a trace of *Trichuris* eggs.

Insects (/1, 3kg): A large group of insects was noted from this ‘detail-recorded’ subsample. There were ‘many’ ephippia of both Cladocera spp. types F and C, over 100 mites, ‘many’ puparia (at least six Limosininae sp. and four *Musca domestica*), and an adult sheep ked, among others. The minimum number of beetles and bugs was

estimated to be 191, with 93 taxa recorded. Diversity was high ( $\alpha = 71$ , SE = 9), and the outdoor component large (% N OB = 19). There was a total of five individuals of three water beetles which, together with the Cladocera, surely must indicate either standing water or the redeposition of waterlain sediments. Inspection of the species list suggested that most of the insects were a mixture of ‘house fauna’ and decomposers of rather foul conditions, however, with indications of deposition in the open, and hints of a cut vegetation component (also noted in a weak form in some other backfill samples from this tenement).

**Context 15528:** under 15526.

*Sample 826* (Chemical): This was a piece of flaky to crumbly ?resinous material that could not be identified further.

**Context 15530:** largish layer, overlying the latest floors and with 15470 over it.

*Sample 831* (GBA): dark brown, crumbly, humic silt with some large stones, very ‘earthy’.

Parasitic worms: Of the five subsamples examined, two were barren and the rest yielded traces of *Trichuris* eggs.

Insects (/1, 2, 3): Three 1kg subsamples were recorded fully quantitatively. Each produced a modest assemblage of insects. The first gave ‘several’ fly puparia, mites, *Chionaspis salicis* and Cladocera ‘type F’ ephippia, a *Melophagus ovinus* adult, and three human fleas, together with 69 individuals of 48 beetle and bug taxa. There were hints of an affinity with the group from subsample 827/1, with rather high diversity and a substantial outdoor component. There were hints of ‘house fauna’.

The assemblage from subsample /2 was very similar. It included a fragment of a *Sitophilus granarius* elytron.

The assemblage from the third subsample was also broadly similar, with a clear ‘house fauna’

component including four *Pulex irritans*, and with some lice and adult and puparial *Melophagus*. If this layer was not a floor, then it must represent redeposited floor material.

*Sample 838* (Spot): avian eggshell; in addition two subsamples, apparently from this sample, were examined for parasite eggs. They both gave traces of *Trichuris* eggs, and one also a capillarid.

*Sample 839* (GBA): like 831 but ?more ashy, redder in colour, with substantial wood fragments and pebbles, but still an 'earthy' deposit.

Parasitic worms: Three subsamples were examined. One was barren, the other two yielded a trace of *Trichuris* eggs.

Insects (/1, 2, 3): The three 1kg subsamples were combined for recording purposes; a detailed record was made. A large assemblage of beetle and bugs was present (N = 222, S = 90), including a substantial outdoor group (% N OB = 16, 35 individuals). RD taxa were important (% N RD = 41), and this was clearly predominantly a 'house' group. There were 33 *Lathridius minutus* group, 22 *Atomaria nigripennis*, 11 *Mycetaea hirta*, nine *Xylodromus concinnus* and *Cryptophagus scutellatus*, eight *Aglenus brunneus*, seven *Cryptophagus* sp. and six *Crataera suturalis*, for example, and there were 21 human fleas. A variety of other components may also have other present, perhaps including some insects from cut vegetation.

Other remains were numerous and varied, and included 'many' mites and at least three adult *Melophagus*. A larval segment from subsample /1 was almost certainly *Dermestes lardarius*; a fragment of head capsule matching this species was also recovered. The same subsample gave a fragment of ?rotted beeswax. There can be little doubt that this material was deposited on a floor.

*Sample 842* (Spot): avian eggshell; no further analysis undertaken.

*Sample 849* (Spot): a small lump of compressed *Genista* stem fragments.

## Structure 5/4

**Cut 36676:** interpreted as the construction cut for a sill beam for the W wall of the rear structure (5/4) on Tenement B. The two deposits recorded as fills were more or less at the same stratigraphic horizon.

**Context 8666:** very dark grey peaty loam.

*Sample 352* (GBA): very dark grey-brown, crumbly, amorphous organic material and fine herbaceous detritus with some sand and silt and traces of wood fragments.

Insects (/T): A quite substantial insect assemblage was recovered, and there were 'many' mites. There were also 'many' fly puparia (those identified all being Limosininae sp.), 'several' insect larvae and scale insects (?*Chionaspis salicis*), and a human flea, among other remains. Recording was difficult because of the nature of the flots, but 136 individuals of 66 beetles and bugs were counted. With the exception of a moderately large RD component (% N RD = 21) the main statistics were bland: the assemblage was rather mixed ecologically. There were 18 *Lathridius minutus* group, ten *Carpelimus bilineatus* and seven *Cercyon analis*; other moderately abundant taxa were *Anobium punctatum* (5) and *Gyrophypnus fracticornis*, *Neobisnius* sp. and *Aglenus brunneus* (all 4). There were indications of a 'house fauna' group, with several characteristic taxa present, but hints of a more generalised decomposer group, perhaps invaders of moister patches.

In addition, a 3kg subsample was bulk-sieved after the main period of processing; it was not sorted.

*Sample 367* (Spot): a collection of at least 25 *Musca domestica* puparia.

**Context 8730:** very dark grey silty clay loam.

*Sample 375* (GBA): dark grey, crumbly, clayey silt with pale flecks.

Insects (/1, /2-3): The /1 subsample was recorded separately, but subsamples /2 and /3 were

combined for recording purposes. The /2-3 group was very large and was detail recorded. There were 805 individuals of 96 beetles and bugs, a human flea, two adult *Melophagus ovinus*, 'many' fly puparia, mites and beetle larvae. These last included a larval abdominal apex (from subsample /2) which appeared to be of *Tenebrio obscurus* by comparison with figures given by Larsson (1945, vol. xii, 279). Subsample /3 produced an abdominal segment which also clearly matched *Tenebrio* (only *T. molitor* larvae were available for comparison). Diversity was quite low ( $\alpha = 29$ , SE = 2) and outdoor forms proportionally very rare (% N OB = 2; but 19 individuals). Decomposers accounted for 84% of the individuals, and taxa coded 'rd' for 53% (62% of N RT). Foul decomposers were virtually absent (0% when rounded!). Diversity of the decomposer component was quite low (alpha RT = 13, SE = 1). The more abundant taxa constituted an almost archetypical group. There were 143 *Lathridius minutus* group, 133 *Aglenus brunneus*, 87 *Mycetaea hirta*, 56 *Atomaria nigripennis*, 46 *Cryptophagus* sp. A, 38 *Cryptophagus scutellatus*, 25 *Cryptophagus* sp. B, 23 *Xylodromus concinnus*, 20 *Anobium punctatum* and 15 *Atomaria* sp. There were also seven *Ptinus fur*. Taxa less characteristic of this group (at Coppergate) were *Ptenidium* sp. (20) and *Trechus micros* (9). There were modest numbers of *Acritus nigricornis*, but no decomposers incompatible with some aspect of the organic-based house and its floor.

Oxytelines and their associates were mostly not very common, but there were hints of the foul mouldering group typified by *Anthicus* sp. (in this case *A. floralis* was recorded).

The nine *Trechus micros* were accompanied by smaller numbers of other 'post-depositional invaders' *Coprophilus striatulus* (3), *Trichonyx sulcicollis* (2) and five Euplectini sp. It is possible, of course, that some or all of the *Aglenus* belonged with these.

Both subsamples /2 and /3 produced 'many' ephippia of type F ('fried eggs' on record sheets).

The /1 subsample produced almost exactly half the number of individuals recorded from /2-3 (411) and 64 taxa. Main statistics were similar in nature, but diversity was lower ( $\alpha = 21$ , SE = 2; alpha RT = 10, SE = 1). The species lists were remarkably similar. 'Many' human fleas were recorded, and there were also abundant Cladocera ephippia of type F, 'several' mites and fly puparia and a larval abdominal apex of *Tenebrio*, seemingly *T. obscurus* (see above).

#### Floors in Structure 5/4

**Context 8524:** dark reddish-brown peaty loam containing wood chips, forming a floor layer about 3.4 x 1.9m and up to 0.08m thick in Structure 5/4. Earliest floor as seen on Section 2049.

*Sample 299* (GBA): dark grey-brown, crumbly, slightly sandy silty amorphous organic material, with traces of wood fragments; this deposit was well-humified, having the appearance of 'potting compost'.

Plants (/T3, 2kg): The rather large residue was dominated by coarse bark fragments but there was also a large fine fraction of organic debris and sand, the mineral component making up about 20% of the whole volume. The organic material gave the impression of decay having occurred in store (there was pitting and channelling on the surfaces of hazel nutshell fragments, for example). The concentration of fruits and seeds was low, and the assemblage of identifiable plant remains (only 27 taxa) consisted mainly of weeds and foodplants with traces of dyeplants.

Parasitic worms: Two subsamples were examined; one was barren, the other yielded a single *Trichuris* egg.

Insects (/1-3): A total of 4kg was processed. The three subsamples were fully processed and detail recorded, in part as an exercise in observing within-sample variability. Main statistics were reasonably constant, as were the species lists. Certainly similar conclusions would have been drawn from each of the groups. The material has

been combined as subsamples 299/1-3 for discussion. A total of 393 individuals of 128 beetle and bug taxa were recorded, and there were many other invertebrates including 'many' earthworm egg capsules and mites, at least three human fleas, and probably several *Melophagus* adults. Diversity was quite high ( $\alpha = 66$ , SE = 5); it was very high for the outdoor component ( $\alpha$  OB = 122, although SE = 46), and about normal for the decomposers ( $\alpha$  RT = 21, SE = 2). Decomposers were well-represented (% N RT = 70, with % N RD = 19, % N RF = 5). The species list was not one which would have been predicted for a house floor. Although 'house fauna' was present there were abundant Oxytelinae, including, *Anotylus nitidulus* (55 individuals, rank 1), *A. complanatus* (32), *Carpelimus pusillus* group (11), *C. bilineatus* (8), *A. rugosus* (5) and *Platystethus nitens* (4). In all, twelve oxyteline taxa were present. The other more abundant taxa were *Lathridius minutus* group (47), *Aglenus brunneus* (17), *Cercyon analis* and an aleocharine (9), *Xylodromus concinnus* (7), a second aleocharine and *Anobium punctatum* (6) and an *Atomaria* sp. (5).

The origin of this group (and of a good number of others like it) requires careful consideration. It seems possible that there was a mixture of autochthonous 'house fauna' and background fauna (the oxytelines and outdoor forms in general). However, as more and more archaeological assemblages have been examined the suspicion has gradually arisen that some set of conditions in the past allowed diverse assemblages of Oxytelinae to breed in floor layers. Many of the species have at some time been recorded by entomologists as living in 'hotbeds' or other dungy material.

The Carabidae in this group may have lived outdoors around the structure and strayed inside.

**Context 8525:** a very dark grey clay loam floor in Structure 5/4, about 3.4 x 0.8m across and up to 0.1m thick.

**Sample 998525 (BS):** The sample was washed and sorted but there are no records of plant remains or of other components from this sample.

**Context 8526:** compact, very dark grey loam, containing patches of brown clay and a few wood chips; a floor of about 3.2 x 2.6m and up to 0.07m thick in Structure 5/4. Earliest floor level, contiguous with **8524**.

**Sample 296 (GBA):** no detailed description made in laboratory.

**Parasitic worms:** Two subsamples were examined, of which both gave small numbers of *Trichuris* eggs.

**Insects (/1-2):** The two subsamples were fully processed and detail-recorded; like Sample 299 (Context **8524**), this was used to observe intra-sample variation. The statistics for the two subsamples showed rather more variation than those for Sample 299, as did the relative frequencies of species, but the implications of the two assemblages were broadly similar. The following account is based on the combined assemblages (from 3kg). There were seven human fleas and 'many' mites and puparia, together with 'several' earthworm egg capsules, an adult *Melophagus* and a variety of other remains. A total of 359 individuals of 106 beetle and bug taxa was found. Diversity was moderately high ( $\alpha = 51$ , SE = 4). Main statistics were, indeed, generally unremarkable, although about a quarter of the assemblage was made up by 'rd' taxa (% N RD = 24).

The species list had much in common with that from Sample 299, with a similar mix of 'house fauna' and the oxyteline association. In this case there were, in the former group, 29 *Lathridius minutus* group, 20 *Atomaria* sp., 16 *Aglenus brunneus*, 15 *Anobium punctatum*, 10 *Xylodromus concinnus* and *Cryptophagus* sp., six *Cryptophagus scutellatus*, five *Atomaria* sp. and *Mycetaea hirta*, and the human fleas mentioned above.

The oxytelines were as follows: 39 *Carpelimus pusillus* group (rank 1), 28 *Anotylus nitidulus*, 11 *Anotylus complanatus*, 10 *C. bilineatus*, six *Platystethus nitens* and four *Carpelimus ?corticinus*. Again there were, altogether, twelve species of *Carpelimus*, *Platystethus*, *Anotylus* and *Oxytelus*. The discussion of Sample 299 applies here too.

There were other species present in moderate numbers: *Cercyon analis* (9), eurytopic but closely associated with both house fauna and fouler groups; an aleocharine (also 9), *Aphodius granarius* (much the best candidate in its genus for having regularly bred on the site), a second aleocharine and *Omosita colon* or *discoidea* (all 4). Mathematical diversity of the decomposer component was surely raised by the presence of more than one richly developed community in this case.

**Context 8528:** compact, black loam, containing patches of grey silty clay, forming a floor layer about 3.8 x 0.8m and up to 0.06m thick in Structure 5/4. Among the earliest floor levels.

*Sample 310* (GBA): mid-dark yellow-grey, crumbly, silty sand, with traces of stones 20-60mm, charcoal and large bone fragments, and lumps of buff sandy clay silt and clay.

Parasitic worms: Two subsamples were examined, both giving a trace of *Trichuris* eggs.

Insects (/1-2): Two subsamples were fully processed (the first of 1kg and the second of 2kg) and detail-recorded. Although recorded separately, the data were combined for processing; subjectively the two groups were rather similar. The concentration of remains was low by comparison with subsamples from Samples 299 and 296, and only 90 individuals of 52 beetle and bug taxa were found. There were also 'many' mites, 'several' puparia and earthworm egg capsules, three human fleas and assorted other remains. The main statistics were unremarkable in the context of Structure 5/4 floors. The species list had some resemblance to a subset of the fauna of subsamples from Samples 296 and 299. *Anotylus nitidulus* and

*Lathridius minutus* group were the most abundant taxa (8 each); there were four *Carpelimus bilineatus* and *Aglenus brunneus* and three each of *Xylodromus concinnus*, *Neobisnius* sp., *Anobium punctatum* and *Cryptophagus scutellatus*.

A specimen of *Rhamphus pulicarius* was recorded—one of only two from the site.

*Sample 329* (Spot): a coprolite. There were two fly puparia from this: a *Muscina* sp. embedded within the matrix, and a ?sepsid at the surface.

The following series of contexts interpreted as floors from Structure 5/4 had only parasite samples examined from them:

#### **Context 8123**

*Sample 998123* (Spot): The two subsamples examined both gave a trace of *Trichuris* eggs and one a single ?*Ascaris*.

#### **Context 8124**

*Sample 998124* (Spot): The two subsamples examined both gave traces of *Trichuris* eggs.

#### **Context 8128**

*Sample 998128* (Spot): The two subsamples examined both gave traces of *Trichuris* eggs.

#### **Context 8129**

*Sample 998129* (Spot): The two subsamples examined both gave small numbers of *Trichuris* eggs.

#### **Context 8132**

*Sample 998132* (Spot): The two subsamples examined both gave traces of *Trichuris* eggs.

#### **Context 8149**

*Sample 998149* (Spot): The two subsamples examined both gave traces of *Trichuris* eggs, one a trace of *Ascaris*.

**Context 8150**

*Sample 998150* (Spot): The two subsamples examined both gave small numbers of *Trichuris* eggs.

**Context 8156**

*Sample 998156* (Spot): The two subsamples examined both gave traces of *Trichuris* eggs.

**Backfills in Structure 5/4**

**Context 2400:** a large area, about 2 x 2m but only 0.02m thick, within the outline of Structure 5/4; there was a series of planks within or on this deposit, but it was not thought to be a floor; it comprised very dark grey, slightly clayey loam, containing fragments of semi-decayed wood and patches of amorphous peat.

*Sample 37* (GBA): crumbly humic clay silt.

Parasitic worms: Three subsamples were examined; all were barren.

Insects (/T): Only 17 individuals of 14 beetle taxa were noted; it was not practicable to check the flot for 'other orders'.

**Cut 2404:** a small hole (about 0.6m across) just inside the W wall of Structure 5/4, within the backfills.

**Context 2295:** a mixture of charcoal and dark grey loam, with quantities of iron-pan.

*Sample 30* (Spot): dark grey-brown, crumbly to indurated, layered, sandy silt with traces of charcoal. A subsample of about 0.5kg was washed to 300µm. It was difficult to disaggregate the indurated material which proved to be rather calcareous and to contain sulphides. On examination, the residue proved to consist of

granular metallic slag-rich concretions, perhaps soil bound together with tiny flakes of iron oxides. This material was sent to Dr P. J. Ottaway (YAT) for further comment.

**Context 2686:** a modest area to the NW of Cut 2261 and abutting drain 2414, a backfill within Structure 5/4; it was about 1.5 x 1.5m, and was a very dark greyish-brown, compressed organic material with many oyster shells.

*Sample 79* (GBA): dark grey-brown, crumbly (somewhat layered in some lumps), humic, slightly sandy silt with traces of wood and small bone fragments.

Insects (/T): Insects were moderately abundant; in addition to 114 individuals of 58 beetle taxa there were 'several' Diptera puparia, 'many' mites and a few other invertebrates. Whole-assembly diversity was moderate ( $\alpha = 47$ , SE = 8), the outdoor component quite strongly represented (% N OB = 18) and of low diversity ( $\alpha = 15$ , SE = 6). Decomposers were about normally represented, although the RF component was proportionally rather substantial (% N RF = 13). This component included four *Aphodius prodromus* and three *A. granarius*, coded 'ob' and important determinants of the size and low diversity of the outdoor component. There were also single individuals of two other *Aphodius*.

The more abundant taxa were *Anotylus complanatus* (12), *Leptacinus pusillus* (7), *Anotylus nitidulus*, *Cordalia obscura*, and *Orthoperus* sp. (all 5). It is likely that most of the other decomposers could have exploited the same habitats as at least some of these, and the value of alpha RT may reflect the richness of the community rather than diversity of origins. Rather moist organic matter was probably present at the point of deposition of the assemblage. 'House fauna' taxa were notably rare.

**Context 2712:** lying within the outline of Structure 5/4, and associated with a series of planks, this very dark greyish-brown silty loam with patches of clay and charcoal flecks was about 1.8 x 1m in

extent and up to 0.06m thick. Under **2400**, over **2875**.

*Sample 161* (GBA): no action to date.

**Context 2824** (formerly **2768**, an equivalent number): immediately S of **2712** and timber **2710**, occupying more or less the whole width of the building (about 3 x 1.5m, and up to 0.05m thick); a very dark grey peaty loam, with fragments of wood. Over **2875**.

*Sample 86* (Spot): no action to date (thought by excavator to be slag).

*Sample 94* (GBA): no action to date.

**Context 2869**: a horizontal timber in the NW corner of Structure 5/4, to the E of planks abutting layer **2712**.

*Sample 121* (Wood): this material was in fact bark, comprising large fragments of a coarse-textured kind, the largest approximately 0.2 x 0.05m; it was perhaps oak (*Quercus*).

**Context 2876**: an area immediately N of **2875**, and S of planks **2708-10** and **2870**; about 1.6 x 0.9m, and up to 0.3m thick, consisting of black clay loam with many flecks of dark grey clay.

*Sample 148* (Spot): dark grey, plastic to crumbly, humic, slightly sandy clay silt, with traces of stones 2-20mm, moderate amounts of (mainly fine) charcoal, traces of well-rotted wood fragments and eggshell, and inclusions of mid grey clay or silt flecks and whitish mineral material; no further analysis undertaken.

**Context 2996**: an area of about 1 x 0.4m, up to 0.1m thick, within the outline of Structure 5/4 in the middle rear part; a mixture of grey ash and grey clay.

*Sample 134* (GBA): grey clay silt with lighter and darker patches.

Parasitic worms: Four subsamples were examined; three were barren, the fourth gave a trace of *Trichuris* eggs.

Insects (/T): A small group of beetles and a single bug were recorded (N = 25, S = 19). There were few other remains. Almost a third of the individuals were coded as 'outdoor' forms; the assemblage may have had a background origin. There were two *Brachypterus urticae*, a hint that nettles grew at or near the point of deposition.

**Context 8122**: an irregular area within and to the N end of Structure 5/4; area about 2.7 x 1.5 and up to 0.05m thick, of very dark grey clay loam, containing much pinkish-grey clay. Overlies **8526**.

*Sample 467* (GBA): light and mid grey-brown, crumbly to indurated, slightly sandy clay silt, with traces of charcoal and flecks of vivianite, ash and moderate amounts of white flecks.

Insects (/T, 0.46kg): Insect remains were rare, and included only single individuals of seven beetle taxa.

**Context 2100**: a patch of about 1.9 x 0.8m, and up to 0.05m thick, of very dark grey, silty clay, with a varying content of wood and planks; backfill in Structure 5/4. At the bottom of the top third of the backfills.

*Sample 23* (GBA): (not described in detail in the laboratory).

Insects (/1): This material was recorded semi-quantitatively. There were about 64 beetles and a single bug (39 taxa). Main statistics were unremarkable apart from the very small number of individuals coded 'rd' (3). 'Several' *Carpelimus fuliginosus*, *Anotylus nitidulus* and *Leptacinus ?pusillus* were recorded, but no other taxa had more than two individuals. There were hints of the community dominant in Sample 62 (Context **1535**).

There were also 'several' mites and 'many' fly puparia, mostly Limosininae sp., and a characteristic elaterid larval abdominal apex, but few other remains.

**Context 2875:** a very large area of what appears to have been material deliberately dumped inside Structure 5/4; it covered an area at least 6 x 3m (most of the interior) and was up to 0.21m thick. It comprised dark reddish-brown structured peat with large numbers of wood chips. Large backfill layer, towards the middle third of the backfill sequence.

*Sample 120* (GBA): mid grey, crumbly, humic silt with abundant wood fragments.

Parasitic worms: Two subsamples were examined, both with traces of *Trichuris* eggs.

Insects (/T): The flot was large and would have been very time-consuming to record; it was abandoned.

*Sample 131* (GBA): (no record of laboratory description).

Parasitic worms: Both the subsamples examined gave single *Trichuris* eggs.

*Sample 132* (GBA): almost pure amorphous to fragmentary organic material, with some pale flecks, large bone and wood/charcoal lumps.

Parasitic worms: Four subsamples were examined of which two were barren and two gave traces of *Trichuris* eggs.

Insects (/T1, /T2): Two /T subsamples were processed through an administrative error; they were assigned codes /T1 and /T2 subsequently.

Subsample /T1 gave a modest group of beetles, which were recorded semi-quantitatively (N approximately 78, S = 44). There were also 'several' mites, but other remains were rare. Main statistics were of no special note. There were 'several' *Acritus nigricornis*, *Anotylus complanatus*, *A. nitidulus* and *Leptacinus ?pusillus*; these and various other taxa made the assemblage reminiscent of other oxyteline-rich groups, which in a number of cases included *A. nigricornis* in the higher ranks.

The second subsample, /T2, produced about 82 individuals of 41 beetle and bug taxa (recording again being semi-quantitative). There were also 'several' fly puparia and a small number of other remains. Allowing for the recording method, the main statistics differed little from those for subsample /T1, although whole-assemblage diversity was estimated to be quite low in the present case ( $\alpha = 33$ , SE = 6), as was that of the decomposers ( $\alpha$  RT = 16, SE = 3). Both of these figures were probably considerably affected by the presence of 'many' *Leptacinus* sp. (probably *pusillus*, but not re-examined). Other numerous taxa were much as in the first subsample, with 'several' *Acritus nigricornis*, *Anotylus complanatus* and *A. nitidulus* and a similar ecological mix.

*Sample 133* (GBA): dark grey, crumbly, humic silt, with traces of charcoal, wood fragments, large bone fragments and shellfish.

Parasitic worms: Two subsamples were analysed; both gave very small numbers of *Trichuris* eggs.

Insects (/T): There was not time to make a full record of the flot, which had, in any case, become indurated into an intractable 'biscuit' of detritus. There were considerable numbers of beetles, subjectively dominated by Oxytelinae, with *Gyrophypnus* sp., *Leptacinus* sp., *Cercyon* spp. and some house fauna.

**Cut 2769:** a pit or perhaps trench at the top of the backfills of Building 5/4 and dated as being well post-occupation (latest material of Period 5B); it was about 0.85m across and 0.35-0.4m deep. The basal fill was sampled.

**Context 2749:** black clayey loam with flecks of grey clay.

*Sample 81* (GBA): mid grey plastic, slightly heterogeneous, slightly sandy clay, with traces of small stones 2-6mm, clasts of pure grey 'natural' clay and of charcoal. Three '/T' subsamples were processed, apparently through administrative error.

Parasitic worms: Two subsamples were examined; both were barren.

Insects (/T(1), /T(2)): The /T(1) subsample gave a modest group of 52 individuals of 36 beetles and bugs. There were a few other remains, including 'several' mites. Main statistics were of little note (bearing in mind assemblage size), although 'rd' taxa were unusually rare (one individual!). The species list did not lend itself to interpretation. There were four *Cordalia obscura* and an assortment of other decomposers with three individuals. The assemblage may have been background fauna with some invaders of organic matter which was not too wet.

The second subsample gave another small group with no clear implications. Preservation was generally poor.

**Context 2379:** fill of scooped timber **2414**.

*Sample 33* (GBA): very dark grey, crumbly, somewhat heterogeneous, slightly sandy silt, with traces of wood and shellfish fragments.

Parasitic worms: The subsample examined was barren.

Insects (/T): Insect preservation was poor, with the remains generally pale and in some cases reduced to transparent 'ghosts'. Fragmentation, however, was less extreme than usual. A total of at least 189 beetles were identified, representing 39 taxa. Diversity was thus very low ( $\alpha = 15$ , SE = 2); the outdoor component was very small (% N OB = 2). Decomposers were abundant (% N RT = 77) and of low diversity (alpha RT = 8, SE = 1). Taxa coded 'rd' and 'rf' were very poorly represented (2% of the whole assemblage and 3% of the RT component in each case). Much the most abundant species was *Carpelimus bilineatus*, of which there were at least 72 (based on a count of left elytra), this amounting to 38% of the assemblage. There were also 15 *Anotylus complanatus*, eight *A. nitidulus*, seven *Cercyon analis* and *Neobisnius* sp., six individuals of an aleocharine, five each of *Carpelimus pusillus* group and a second aleocharine, and four *Anotylus rugosus*. This

component of the fauna was familiar enough, occurring repeatedly in pits at Coppergate and even in some surface layers.

Most of the fauna, apart from a very small possible background element, may have exploited similar habitats to these. However, there were ten *Coprophilus striatulus*, and three *Trechus micros* and *Rhizophagus parallelocollis*, probably representing a post-depositional invader group. If such species were able to exist in the layer, it was presumably fairly well oxygenated for at least a while, accounting for the decay of the fossils. It should be noted, however, that this group has been found repeatedly where other fossils were *not* too badly preserved.

There were abundant fly puparia, almost all of which (of the order of 200) were Limosiniinae. Other remains were rare.

**Context 8033:** from the lowermost part of the backfills, immediately over the floors, below **2875**.

*Sample 154* (GBA): highly organic, with fragments of plant detritus, wood, ?shell and limestone, white flecks, and only a trace of mineral sediment.

Parasitic worms: The two subsamples examined were barren.

Insects (/T): A rather small group of beetles and bugs was recovered (N = 65, S = 37), together with 'several' mites. There were small numbers of a few other insects, including an abdominal apex of a small *Melanotus erythropus* larva. Only *Anotylus complanatus*, amongst the beetles, was at all numerous (12 individuals) and, although the remaining taxa were rather mixed ecologically, there were indications of 'house fauna' and of rather foul organic matter.

*Sample 151* (Spot): no action to date.

*Sample 152* (Spot): dark grey-brown, crumbly to brittle, somewhat heterogeneous, very humic silt, with patches of plant detritus and some highly-fired burnt clay or daub (the latter brick-like, one fragments bearing the impression of a 15mm

diameter wooden rod); no further analysis was undertaken.

*Sample 153* (Spot): dark grey-brown, crumbly to brittle silty herbaceous detritus with some wood fragments.

*Sample 155* (Chemical): no action to date.

**Context 8044:** early in the backfill sequence, over **8033**, under **2876**.

*Sample 147* (GBA): not described in laboratory; no further analysis was undertaken.

*Sample 199:* dark grey-brown, crumbly, silty amorphous organic material with abundant white flecks up to 3-4mm diameter.

Insects (/1): The flot was recorded by a rapid examination, a non-quantitative record being made. The post-depositional invader group appeared to be represented (six taxa) and there were fragments of 'several' fly puparia and 'many' mites. Otherwise, only *Aglenus brunneus* ('many') and *Anobium punctatum* ('several') were noted as being particularly numerous.

**Context 8107:** dump immediately over the floors.

*Sample 198* (GBA): mid-dark grey clay silt with some lumps of pink/grey clay or silt and a few lumps of charcoal.

Parasitic worms: The two subsamples examined both gave traces of *Trichuris* eggs.

Insects (/1): A small beetle and bug group was recorded semi-quantitatively (N approximately 50, S = 39). There were also 'several' fly puparia and mites, but few other remains. 'House fauna' taxa were present in small quantities, but the origin of the assemblage was not clear.

**Context 8109:** deposit in bottom third of backfill sequence.

*Sample 203* (GBA): dark grey-brown, crumbly amorphous organic material with traces of faecal and ?other concretions.

Insects (/1): A substantial insect assemblage was present, with 138 individuals of 65 beetles and bugs. There were 'many' mites but only small numbers of other remains. A fifth of the assemblage was contributed by 'outdoor' taxa, and about the same amount by species coded 'rd'. A mixture of 'house fauna' and the oxyteline association appears to have been present.

## External deposits of Tenement B

### *Deposits behind Structure 5/4*

**Context 2399:** an area of about 1 x 0.5m as seen on plan, perhaps extending to the S by another 1m, and up to 0.02m thick; it lay just outside the outline of Structure 5/4; dark grey ashy loam with patches of yellowish-brown clay.

*Sample 992399* (Spot): Two subsamples of material designated Sample 992399 from this context were examined for parasitic worm eggs; one was barren, the other yielded a single *Trichuris* egg.

**Context 15583:** a modest-sized patch of about 1 x 0.7 x 0.04m of dark reddish-brown, structured peat, with matted twigs and leaves and traces of wood in the backyard of Tenement B.

*Sample 864* (GBA): dark grey-brown to red-brown, layered, somewhat heterogeneous herbaceous and woody detritus with traces of large bone fragments.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/T): The flot was semi-quantitatively rapid-scan-recorded. A substantial beetle and bug group was present (N estimated at 137; 56 taxa). Diversity was rather low ( $\alpha = 36$ , SE = 5). The outdoor component was small (% N OB = 6), but included two heath/moor taxa, *Micrelus ericae* and

*Ulopa reticulata*. Decomposers were of about normal proportional abundance. There were 'many' *Carpelimus fuliginosus* and nine taxa noted as having 'several' individuals, all these (together with many of the rarer taxa) forming a plausible community of fairly foul, mouldering organic remains, perhaps resembling stable manure.

There were 'many' *Musca domestica* and 'several' *Stomoxys calcitrans* puparia, as well as two human fleas, 'many' beetle larvae and mites, 'several' of each of the commonly recorded scale insects and a *Melophagus* puparium.

In addition, a subsample of 6kg was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 908* (GBA): very dark brown, layered to fibrous, somewhat heterogeneous herbaceous and woody detritus

Insects (T): Arthropods were moderately abundant, there being a fairly substantial group of beetles and bugs (N = 146, S = 53) and a range of other remains including 'many' mites (probably over 50) and *Chionaspis salicis* and also 'many' ephippia of each of two characteristic but so far unidentified Cladocera (types C and F). *Daphnia* ephippia were also recorded. There was in addition a larval abdominal apex of a click beetle, identified as an *Athous* species, and closely resembling *A. villosus* as figured by Hansen (1966, 139).

The assemblage was rather unusual for this site. Much the most abundant species was *Carpelimus fuliginosus*, with 31 individuals. The other more abundant taxa were *Ptenidium* sp. (12), *Oxytelus sculptus* and *Lithocharis ochraceus* (7), and *Cercyon analis*, *Carpelimus bilineatus*, a Euplectini sp. and *Lathridius minutus* group (all five). There were also four *Acrotrichis* sp. and *Leptacimus pusillus*. These and many of the remaining taxa may have formed a community in somewhat foul organic material which remained exposed for some time. The low diversity of the assemblage underlined the probability that there was a breeding community:  $\alpha = 30$ , SE = 4; the value of alpha RT was 15, SE = 3, but this would

have been sharply depressed had *C. fuliginosus* been coded 'rt', as perhaps should be the case.

**Context 15700:** about 1m to the S of **15583**, immediately W of Cut **11251** (a large post-Conquest pit), this layer in the backyard of Tenement B was about 0.7 x 0.7 x 0.07m in extent and comprised dark reddish-brown, very compact, structured peat containing large fragments of wood.

*Sample 902* (GBA): dark grey-brown, crumbly, layered, sandy amorphous organic material and herbaceous detritus with traces of twigs and wood fragments and modest amounts of faecal concretions.

Parasitic worms: Two subsamples were examined. Both yielded large numbers of both *Trichuris* and *Ascaris* eggs, many of which were measured.

In addition, a subsample of 8kg was bulk-sieved after the main period of processing; it has not been sorted.

## Other deposits from Tenement B

### Context 2779

*Sample 87* (Spot): no action to date. Sampled by the excavator to confirm presence of iron staining.

Archaeological details have not been requested for the next group of contexts but they are presumed to have been layers in the backyard of Tenement B.

**Context 15585:** *Sample 868* (GBA): no action to date.

**Context 15645:** *Sample 901* (GBA): no action to date.

**Context 15703:** *Sample 904* (GBA): no action to date.

**Context 18578:** *Sample 1067* (Chemical): mid greenish-grey silt with traces of wood fragments and some pale buff mineral material; no further analysis undertaken.

**Context 26064:** *Sample 1671* (Spot): a tracheal ring from a bird's neck.

### Pit fills on Tenement B

#### *Pits to E of buildings on Tenement B*

**Cut 2639:** a shallow cut (scoop) between rear of Structures 5/4 and 5/6, about 0.8m across and no more than 0.2m deep, containing five fill layers. The single sampled context was the uppermost as seen in section.

**Context 2571:** black peaty loam with pieces of wood.

*Sample 65* (GBA): mid-dark grey-brown, crumbly, amorphous organic; 'cessy'. Notes made during disaggregation indicate faecal material to have been present.

Parasitic worms: The subsample examined was rich in *Trichuris* eggs (many of which were measured), but no *Ascaris* eggs were recorded.

Insects (/T): There were only single individuals of 15 beetles, and 'several' mites, a human flea and a few other remains.

#### *Pits behind buildings on Tenement B*

**Cuts 15893** and **15873:** the lower pit, **15893**, was about 1.5m wide and 0.5m deep as seen in section; it contained some six fill layers and was cut from above on one side by **15873**. The latter was pit of which about a 0.6m width and 0.2m thickness of fills survived; two of the five fills were sampled. The pits were located in the backyard behind Tenement B.

#### **Cut 15893**

**Context 15791:** a thin layer sandwiched between the basal context, **15792** (unsampled), and **15782** (*q.v.*): mixture of olive to black structured peat and silty loam.

*Sample 920* (GBA): no action to date.

**Context 15782:** immediately overlying **15791**; very dark grey loamy peat with traces of wood.

*Sample 917* (GBA): dark red-brown to black, crumbly, layered, herbaceous detritus, including *Genista* twig fragments. A 1kg test subsample was requested but apparently not processed.

Parasitic worms: A trace of *Trichuris* eggs was recorded in the subsample examined. It also contained many phytoliths.

In addition, a 6kg subsample was bulk-sieved after the main period of processing; it was not sorted.

**Cut 15873:** (see above for details)

**Context 15745:** the basal fill; a mixture of very dark grey silty clay loam and structured peat.

*Sample 919* (BS—VW): A rather large assemblage of 57 taxa was obtained from this sample, weeds in CHEN and SECA predominating, though with rather modest AIVs. Three taxa scored abundances of 2—*Humulus*, *Chenopodium album*, and *Rubia*—though the AIV for DYES was, at 14, not especially large (*Diphysium* stem and *Isatis* pods were also present, in trace amounts). Woodland mosses were reasonably well represented but there was no evidence that they were used as toilet tissue.

*Sample 918* (GBA): a grey to red humic silt with some clay, shell fragments, bone, fine twigs and much wood.

Parasitic worms: A single *Trichuris* egg was recorded from the subsample examined, together with two ?*Hymenolepis*.

Insects (/T): The material was rapid-scan recorded. There were 'many' earthworm egg capsules, an adult and a puparial *Melophagus ovinus* and a few other remains, together with a small group of beetles (N = 43, S = 32) whose origin was hard to determine. The presence of 'several' *Oxytelus*

*sculptus* (and a few of the other records) suggests that there may have been foul matter nearby.

**Context 15588:** the second-to-highest fill; dusky red loamy amorphous peat: curious red staining colour; ‘fruitstones’.

*Sample 865* (Spot): a small sample composed mostly of fragmentary root material of madder, *Rubia tinctorum*, with a matrix of silt. This explains the red coloration and proves the material not to be ‘fruitstones’.

### Tenement C

There were buildings only on the rear part of the front of the tenement; two phases were recorded—Structure 5/5, followed by 5/6. There was a substantial build-up of deposits between the two phases building which was designated Period 5B ‘intermediate’, though this division is no longer recognised.

### Structural elements on Tenement C

These were mainly alignments; their relationship to the buildings on this tenement has not always been established. There were also some internal cuts and a stone wall.

**Context 5852:** alignment on Tenement C.

*Sample 1879* (Wood): Of the 25 specimens recorded, 14 were oak, whose diameter range was 15-28mm, and whose mean annual ring count was 7 (SD = 2.8). Almost all were uncompressed. The next most abundant taxon was willow, of which there were seven specimens (18-40mm, 10.1 rings), then birch (2, 27-37mm, 6.5) and hazel (2, 22-37mm, 10).

*Sample 1915* (Wood): Of the 12 pieces of wood examined, six were hazel (diameter range 20-33mm, mean ring count 12.3), five were oak (20-44mm, 7.3) and one willow (26.5mm, 8 rings). Most of the rods were uncompressed.

**Context 5982:** alignment (wicker fence, just behind position of buildings, about 1m long as seen in plan).

*Sample 1878* (Wood): Twenty-nine specimens were examined, of which 23 were of willow, whose diameter range was 12-33mm, and whose mean ring count was 11.7 (SD = 0.9), suggesting that these had perhaps been cut from a managed tree or trees. The six remaining rods were of oak, 20-28mm, 5.5 rings. All were uncompressed, except for two of the willow rods, which were moderately strongly compressed.

**Context 7511:** wattle fence joining fence **7512** at a right-angle to S and **1580=5852** to the N; again in the spine between the buildings on Tenements C and D.

*Sample 397* (GBA): this was thought to be turf in the wattle wall; in the laboratory, subsample 1 proved to be mid yellowish-grey-brown, crumbly, slightly silty sand with traces of twig fragments and burnt clay/daub. The main sample was not available.

Insects (/T): The flot, which was large and consisted of ragged plant tissue, contained ‘several’ fly puparia and a few other insects including two beetles.

The residue left after paraffin flotation was examined both wet and dry: most of the rather small amount of material remaining was fine mortar with perhaps some redeposited lime and some very decayed wood. If this *was* turf, there was certainly no evidence for it from the lithology!

**Context 29462:** a fence alignment running approximately E-W and about 3m long, in the front half of the outline of the Tenement C buildings (5/5 and 5/6).

*Sample 1934* (Wood): The sample comprised 40 pieces of wood of which 37 were oak, the rest hazel. The oak rods varied in diameter from 13 to 29mm, and their mean annual ring count was 6.9 (SD = 0.9); those of hazel were 11-24mm, and had a mean of 9.5 rings (SD = 3.6). Most of the

material was either uncompressed or only slightly compressed.

**Cut 29826:** contained stake/post **6395**, around which was wrapped a piece of skin or hide.

### Context 6395

*Sample 1270* (Spot): a large and convoluted piece of animal hide or skin covered with hair. Silty matrix contained several thorns of blackthorn, *Prunus spinosa* and seeds of *Atriplex* sp(p).

**Context 5863:** stone wall at the rear entrance to the rear Tenement C building.

*Sample 551* (Spot): light grey mortar, with some soil; no further analysis undertaken.

**Cut 6212:** a large cut, about 3m across and 1.75m deep, into which a feature described as a wall—perhaps part of the revetment for the rear entrance to the sunken building (5/5) on Tenement C.

**Context 6217:** the basal context, a greyish-brown silty clay with some peaty material.

*Sample 557* (Spot): no action to date.

**Context 6170:** not located on section.

*Sample 487* (Spot): no action to date.

### Floors in Structure 5/5

Structure 5/5 had a plank floor which was part of the construction phase.

**Context 29497:** lowest deposit in Structure 5/5, sealing plank floor **29556**, etc., and variously interpreted as a backfill or a floor. In view of the insect assemblage recorded, it has been included here with the floors.

*Sample 1966:* dark grey, plastic, slightly clay silt, with orange flecks.

Parasitic worms: The single subsample examined was barren.

Insects (/T): A rather large beetle assemblage was recovered (192 individuals of 61 taxa). Diversity was quite low ( $\alpha = 31$ , SE = 4), and the RD component very large (% N RD = 41). Decomposer diversity was quite low (alpha RT = 15, SE = 2). There was clearly a substantial ‘house fauna’ component. Much the most numerous taxon was *Lathridius minutus* group (of which there were 56), with some *Xylodromus concinnus*, *Cratarea suturalis*, *Atomaria nigripennis*, *Cryptophagus scutellatus*, *Mycetaea hirta* and other taxa typical of this group. There were some elements which were subjectively a little unusual in what was otherwise a very typical floor group: ten *Quedius* sp., five *Megasternum obscurum* and four *Clivina fossor*.

In addition to the beetles there were ‘several’ mites and fly puparia and small numbers of other insects.

**Context 29046:** archaeological details not requested but thought to be a deposit associated with Structure 5/5.

*Sample 1864* (Spot): avian eggshell; no further analysis undertaken.

**Context 29156:** a large area of about 3 x 3m as seen on plan; it met alignment **29586** on the E side and remnants of another (**29861**) on the W; it also abutted Cut **29493** (fills unsampled) on the W, in the N half of its lateral extent; associated with Structure 5/5 on Tenement C, this was a very dark grey silty peaty clay loam.

*Sample 1884* (Spot): avian eggshell; no further analysis undertaken.

*Sample 1890* (Spot): This putative coprolite, a subsample of which was analysed for parasite eggs, was found to be barren.

### Backfills in Structure 5/5

**Context 21746:** a large, irregularly-shaped area of about 5 x 5m of very mixed material: pieces of dark reddish-brown clay, strong brown clay, 20% charcoal fragments and dark reddish-brown clay loam with tile and limestone. Dump over the debris of Structure 5/5, cut by Gully 29158. Over 21925.

*Sample 1969* (GBA): dark grey-brown, crumbly, humic, slightly sandy silt and herbaceous detritus with traces of wood and small bone fragments. Although requested, a test subsample was not processed.

Parasitic worms: The single subsample examined was barren.

*Sample 1938* (Spot): a partly-fused mass of charred bread/club wheat (*Triticum aestivo-compactum*) caryopses.

**Context 27513:** a layer of about 7.5 x 1.3m of very dark grey, slightly clayey, silty loam with charcoal, wood fragments and small patches of yellowish-red clay; formed a strip immediately E of the Tenement B/C boundary, in the lower part of the backfill sequence.

*Sample 2054* (Spot): another partly-fused mass of charred bread/club wheat berries.

**Context 29465:** 'conflagration debris' of Structure 5/5, before 5/6 was built; covered an area of at least 1 x 1m (probably rather more than this), and consisted of ashes, ranging from light brownish-grey to black, with masses of loosely compacted lumps of charcoal. Low in the backfill sequence.

*Sample 1942* (Spot): a fused lump of bread/club wheat berries with at least one (?cultivated) oat caryopsis.

*Sample 1947* (Spot): charred cereals, not identified further.

*Sample 1961* (Spot): charred ?wheat grains.

*Sample 1967* (Spot): charred plant stems, identified tentatively by P. R. Tomlinson as flax, *Linum usitatissimum*.

### External deposits forming between phases of building

*External deposits lying to the (site) N of Structures 5/5 and 5/6*

**Context 14982:** a large area, at least 2 x 3m, towards the front of Tenement C (cut by the cut for Structure 5/6); mixed layer of sandy brown peat and dark grey clay loam, with flecks of brown clay and 10% wood and charcoal flecks. Thin layer, 0.2-0.3m thick.

*Sample 1243* (Spot): two puparia each of the flies *Stomoxys calcitrans* and *Musca domestica*.

**Cut 14720:** a shallow cut or scoop, about 1.1m across and 0.3m deep on section, with two of the three fills sampled; the scoop lay close to Cuts 14660 and 14532-3 (it abutted Cut 14533 at one side), towards the front of Tenement C. Low in the series; directly over 14660.

**Context 14941:** brown sandy silty organic material.

*Sample 1169* (BS and GBA): dark reddish-brown, silty, detritus with fine sand, layered plant material and some clay patches; heavily degraded by arthropods.

The bulk-sieved sample (measured as 5 buckets = approximately 50 litres) gave the largest assemblage of taxa from any BS sample in Period 5B or, indeed, from any of the samples examined from the Anglo-Scandinavian deposits at 16-22 Coppergate, large or small. However, only three taxa scored an abundance of 2—*Diphysium* and *Calluna* flowers and shoot fragments. The largest single component was weeds in group CHEN (over one fifth of the taxa, the AIV of 51 being high, but not especially so—it included the only record for annual mercury (*Mercurialis annua*) for

Anglo-Scandinavian Coppergate—with smaller components of cornfield and other weeds (AIV for SECA was 34, equal rank 6). Grassland taxa in MOAR (AIV 17, equal rank 5) were rather conspicuous, but the taxa concerned did not form a coherent group.

The scores of 2 for two part taxa of *Calluna* account in some degree for the high AIVs for NACA (20, rank 2) and OXSP (19, rank 1), but records for both seeds and flowers of *Erica tetralix* also contributed to the latter, along with *Andromeda polifolia* (the only record from the Anglo-Scandinavian deposits at this site) and *Empetrum* sp(p). (one of only two records; also scored with NACA). These remains seem most likely to have originated in an area of wet peatland, such as a raised bog (*Andromeda* is very characteristic of Roman deposits in York in which there are actual remains of raised-bog peat), though no peat was recorded during sorting (it is possible it was not recognised in the residue). Amongst the mosses, two taxa (*Sphagnum* sp(p). and *Leucobryum glaucum*) were scored in BOGS—as many as in any sample from Period 5—whilst six taxa (also including *L. glaucum*) contributed to the HEMO group which here achieved its highest AIV (13) in the Period 5 BS samples.

Mosses of bare soil also achieved their maximum AIV (6, based on three records, of which that for *Ditrichum flexicaule* was the only one for the site for this period. The largest moss group, however was LIGN (AIV of 17, equal rank 5), whilst GRAS at 10 achieved an equal first rank score, OLIT at 9 the first rank, and MARS at 6 equal rank 2.

Two other groups of vascular plants deserve mention here. ALNE and PHRA (sharing two taxa in common) both achieved their highest AIVs in the Period 5 BS sample series—both scored 11.

Amongst the useful plants, DYES and FOOS were moderately well represented, the latter including woodland/hedgerow taxa like *Prunus spinosa* and *P. domestica*, *Sorbus aucuparia*, *Malus sylvestris* as well as probable cultivated taxa like *Vicia faba* (charred seed) and *Linum usitatissimum*. Woodland taxa unlikely to have been collected for

food included *Oxalis* and *Ilex* (both present as seeds), as well as the woodland mosses mentioned above.

Insects (/T): jar dropped and contents lost before recording.

**Context 14434:** immediately overlying **14941**; mixture of dark grey silty loam and very dark grey structured peat.

*Sample 1009* (BS—VW): a large assemblage of 67 taxa was obtained from this sample, the only taxa scoring more than 1 being *Diphysium* and *Pteridium aquilinum* (stalk fragments), both at 2. There was a moderately high AIV for DYES (six taxa were scored in this group) but the values for this parameter for other groups was low or about average.

Parasitic worms: Two subsamples of putative faecal concretion were examined for parasite eggs but both were barren.

*Sample 1010* (GBA): no action to date.

*Sample 1071* (Spot): this small sample, examined by P. R. Tomlinson and ARH was a mat of moss and small twiggy detritus—the former comprising *Thuidium tamariscinum* and *Dicranum* sp., with one fragment of *Polytrichum commune*; several whole or fragmentary leaves of dyer's greenweed (*Genista tinctoria*) and fragmentary legume pods presumably also of this plant. The twiggy material was also *Genista*, with one large fragment of clubmoss, *Diphysium complanatum*. There were a few fragments of grass ?epidermis.

**Cut 14660:** a scoop outside the outline of the W wicker building, between building phases on Tenement C; it was not less than 2.5m across and its fills were about 0.25m thick. Low in the sequence. Directly below Cut **14720**.

**Context 14669:** a thin layer sandwiched between unsampled Contexts **14667** and **14659**; dark brown sandy peaty organic material.

**Sample 1044** (BS—VW): A total of 51 taxa, rather more than the average for this period for BS samples, was recorded from this sample. Only two taxa, *Rubia* and *Diphysium*, scored abundances of 2, the remainder being present in small amounts. Both *Genista* and *Isatis* were present, however, as well as *Humulus*, accounting for a high AIV for DYES of 19 (equal rank 4). Foodplants were rather poorly represented, but the AIV for FIBR was as large as from any Period 5 BS sample (9, based on three taxa—*Cannabis* achenes and *Linum usitatissimum* seeds and capsule fragments). An woodland element was reasonably prominent, with both *Oxalis* and *Ilex* seeds being recorded, but the woodland moss component was not especially large. Fragments of charred bread were also present but charred cereals were not.

**Cuts 14532 and 14533:** the first of these was a large cut, more than 2m across and with about 0.5m of its fills remaining; **14533** cut into it from above and was about 2m across and its fills were about 0.5m thick. The cuts lay towards the front of the site, roughly in the centre of the area that had been occupied by the W wicker building in Period 4B.

#### **Cut 14532**

**Context 22107:** the basal fill, black, amorphous sandy loamy peat with plentiful wood chips, twigs and a few ash patches.

**Sample 1364** (BS—VW): A total of 42 taxa were recorded from this sample, close to the period mean for this parameter. The assemblage was unremarkable—a mixture of food- and dyeplants, weeds, woodland and grassland taxa, and the AIVs all rather low. Just over one quarter of the taxa scored in CHEN, including the only taxon to achieve an abundance of 2: *Chenopodium album*. Of the mosses, most were woodland taxa, with an AIV of 12 (equal rank 3) for the woodland floor group, WOOF.

**Sample 1363** (GBA): dark reddish-brown organic material, much degraded by arthropods; originally

coarse plant detritus in a silty matrix; oyster shell fragments present.

Parasitic worms: The subsample examined was barren.

Insects (/1): Selected on the basis of a /T subsample as a particularly promising sample, a 1kg fully-processed subsample gave 178 individuals of 67 beetle taxa. There were, in addition, ‘many’ mites and fly puparia, ‘several’ beetle larvae, and a variety of other insects. The puparia included a *Melophagus ovinus*. Amongst the beetles, decomposers were abundant (% N RT = 81), with *Anthicus formicarius* much the most numerous (41 individuals, almost a quarter of the assemblage). There were nine *Leptacinus* sp. and *Lathridius minutus* group, six *Ptenidium* sp. and *Monotoma longicollis*, five *Oxytelus sculptus*, and four each of *Cercyon analis*, *Acritus nigricornis*, *Falagria caesa* or *sulcatula*, *Trox scaber*, *Monotoma bicolor* and *Atomaria* sp. The remaining taxa supported the impression of odorous, damp, mouldy plant remains, given by most of the more numerous taxa; *T. scaber* may have had a separate origin, but has been recorded in a pitfall trap with a foul bait set near a garden compost heap and so may have been attracted to the layer.

The /T subsample gave a smaller group which was rapid-scan recorded semi-quantitatively. There were ‘several’ mites, a few puparia of *Nemopoda* and *Musca domestica*, a single *Stomoxys calcitrans*, an adult and a puparium of *Melophagus ovinus*, and about 62 individuals of 36 beetle and bug taxa. Main statistics were of the same general kind as for the /1 subsample. There were ‘many’ *Anthicus formicarius*, ‘several’ *Oxytelus sculptus* and *Leptacinus* sp., and a variety of rarer taxa very much like those in the /1 subsample; the two groups were thus extremely consistent.

**Context 22103:** immediately overlying **22017**; dark brown, compact, sandy peaty loam, with plentiful twigs, wood flecks, ash patches and charcoal flecks.

*Sample 1361* (BS—VW): A modest assemblage of 32 taxa was obtained from this sample. *Diphysium* and *Genista* stem and *Rubia* root fragments were all scored at 2 (the only taxa present in more than small amounts), and these, together with *Isatis* and *Humulus* account for the high AIV of 22 (rank 3) for DYES. There was a small foodplant component and a variety of weeds; mosses were mostly taxa associated with timber and woodland habitats. Leather and wool fragments were also recorded from this sample.

*Sample 1360* (GBA): light grey-brown, crumbly, humic silt with wood and twig fragments and fish scale.

Parasitic worms: The subsample examined was barren.

Insects (/T): This subsample was rapid-scanned, recording being semi-quantitative. There were about 64 individuals of 47 beetle taxa and a variety of other remains including a few *Nemopoda* sp. puparia, a single *Melophagus ovinus* adult and puparium, and ‘many’ mites. Diversity was quite high ( $\alpha = 79$ , SE = 21) and almost a quarter of the individuals were ‘outdoor’ forms. Other statistics were not unusual bearing in mind the assemblage size and method of recording. Only *Lathridius minutus* group was at all frequent (‘several’) and there were three *Anthicus formicarius*. Little can be made of such a group, although there were hints of nearby foul matter (or the invasion of such material in this deposit).

**Context 22102:** immediately overlying **22103**; black, matted, fibrous structured peat with a few twigs.

*Sample 1359* (GBA): probably once rich in wood and twig fragments, this sample was very heavily degraded by arthropods; it was described as a mid-dark brown, highly humic silt or silty organic deposit.

Plants (/M): There was an assemblage of 43 taxa, close to the Period 5 mean for small subsamples. Much of the woody detritus was evidently dyeplant waste, for *Genista* stems scored 3 and *Rubia* root

2, these being the only identifiable taxa present in more than small amounts, though there were separate scores of 2 for bark fragments and 3 for wood fragments. Bone was also rather common (score 2), and there was a range of occupation materials including tile, charcoal, burnt mammal bone, fish bone, eggshell, oyster shell and pottery.

Not surprisingly, the AIV for DYES was rather high (18, equal rank 6) but, with the exception of mosses in the woodland groups LIGN and WOOF (and mosses in some other small groups such as GRAS and HEMO), most of the other AIVs were rather low.

Parasitic worms: The subsample examined was barren.

Insects (/T): Insects were rare, only single individuals of a few beetle taxa and some fly puparia (*Leptocera* sp.) being observed.

**Context 14548:** overlying **22102** and separated from it by an unsampled context; matted twigs and straw and traces of wood, charred in places.

*Sample 866* (GBA): dark red-brown, crumbly, layered, amorphous organic material and woody and herbaceous detritus, with some lenses of grey silt.

Plants: A small subsample examined for vegetative plant remains by P. R. Tomlinson revealed the presence of stems of *Genista tinctoria*, some of which were partly charred.

Parasitic worms: The subsample examined was barren.

Insects (/T): Arthropods were not very abundant. There were ‘several’ mites and *Lepidosaphes ulmi* (also two *Chionaspis salicis*), a human flea and a few other remains including fragments of a lepidopterous pupa, and a group of 66 individuals of 38 beetles and a single bug. Diversity was intermediate ( $\alpha = 40$ , SE = 9), the outdoor component proportionally fairly large (% N OB = 17, although only 11 individuals) and both ‘rd’ and ‘rf’ taxa (again proportionally) fairly well

represented (% N RD = 23; % N RF = 12). Diversity of the decomposer component was quite low (alpha RT = 15, SE = 4). Only *Lathridius minutus* group was particularly abundant (14 individuals, accounting for most of the RD group), and there were five each of *Cercyon atricapillus* and a *Philonthus* species. There were also three *Cercyon unipunctatus*, the two *Cercyon* accounting for the whole of the RF group. This assemblage appears to have had rather mixed origins, but the layer may have been house floor material invaded by a small fauna of fowl matter.

In addition, a 24kg subsample was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 1017* (Spot): no action to date.

**Cut 14533** (see above for details)

**Context 14536:** the basal context; very dark grey ash.

*Sample 811* (Spot): a large chunk of charred oak (*Quercus*) and a charred twig (to 15mm diameter) of *Corylus*.

**Context 14534:** immediately overlying 14536, though separated from it across part of the pit by unsampled clay 14535; very dark grey ash.

*Sample 787* (GBA): mid-dark grey friable, sandy silt with much charcoal and some plant detritus and ?ash.

Parasitic worms: The subsample examined was barren.

Insects (/T): The flot from this subsample was rapid-scanned. There were 'many' mites, an adult *Melophagus* and a few other remains, and 53 individuals of 39 beetle taxa, and a few other remains. Main statistics were not very enlightening bearing in mind assemblage size. This may have been background fauna, or a few colonisers of some kind of decaying matter may have been present.

**Context 14433:** immediately overlying 14534; very dark grey silty ash. N.B. The sample received was labelled as being from Context 14528 (the layer immediately above 14433) and some records may bear that number.

*Sample 777* (Spot): A test subsample was requested but was apparently not processed; a 7kg subsample was bulk-sieved after the main period of processing, but has not been sorted.

**Context 14432:** in the upper part of the pit fills, but exact location not discernible; very dark grey silty clay.

*Sample 746* (GBA): mid grey, crumbly, somewhat heterogeneous, slightly clayey, sandy silt, with traces of stones 6-60mm, moderate amounts of charcoal and large and small burnt bone fragments, and traces of twig fragments.

Insects (/T): There were not many insects. Ehippia of *Daphnia* sp. and another cladoceran were noted. Twenty-one beetles and a single bug were recorded, all single individuals except for two *Xylodromus concinnus*. A considerable number of charred cereal grains were present in the flot.

In addition, a 7kg subsample was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 778* (GBA): mid-dark grey, crumbly, humic, very sandy silt, with charcoal and stones and some pinkish ('natural') clay.

Plants: The material was not recorded in detail, but about 12 charred grains were noted as present in the paraffin flot.

Parasitic worms: The single subsample examined was barren.

Insects (/T): There were small numbers of 37 kinds of beetles and bugs (41 individuals). This was probably strictly background fauna; about a third were 'outdoor' forms and less than half decomposers. Presumably the insects entered after charring. They ranged from poorly to well

preserved. In addition to the beetles and bugs there were 'several' mites and fly puparia, an adult ked and small numbers of various other arthropods.

**Cut 14544:** this may have been a linear cut (neither plan nor section were available for inspection), about 1.4m across and 0.9m deep, towards the front of the site between Tenements C and D.

**Context 14546:** the basal context; compact, olive straw-like material.

**Sample 841 (Spot):** this small sample of matted vegetable material was found by P. R. Tomlinson to contain fragments of reed (*Phragmites*) culm, together with *Genista* stem fragments and flowers (with pollen), and a fragment of *Diphysium* stem.

**Context 14545:** immediately overlying 14546; very dark grey, sandy silty loam, with many patches of olive structured peat.

**Sample 840 (GBA):** mid-dark grey-brown humic silt, with compressed plant material, and charcoal, wood and bone fragments.

**Plants:** a small subsample examined by P. R. Tomlinson yielded evidence of possible hay or turf material. The taxa comprised abundant *Genista* twigs and flowers with some *Calluna* shoot fragments, an involucral bract of *Centaurea* (probably *C. nigra*), nine caryopses of heath grass (*Danthonia*) and small amounts of the mosses *Pseudoscleropodium purum* and *Neckera complanata*. Perhaps the grass and *Centaurea* merely arrived together with the *Genista* from an area of rough grassland?

**Parasitic worms:** The subsample examined was barren.

**Insects (/T):** Recording was by semi-quantitative scanning. There were 'several' aphids, *Chionaspis salicis*, and beetle larvae and 'many' mites; there were also a *Melophagus ovinus* adult and puparium, a louse and a human flea. Ninety-six species of beetles and bugs were noted (S = 65). Diversity was estimated to be high ( $\alpha = 88$ , SE =

18), and 'rd'-coded taxa fairly important (% N RD = 19). 'Outdoor' taxa accounted for 16% of the individuals and there were single individuals of five aquatics. There were 'several' *Atomaria* sp., *Lathridius minutus* group and *Aglenus brunneus*, and one to three individuals of the remaining species. The presence of a house fauna component appears likely. The aquatics may have been imported in some way, but no evidence of hay or turf was presented by the insects.

**Context 14543:** immediately overlying 14545; dark reddish brown, peaty, silty loam.

**Sample 833 (GBA):** dark grey-brown to reddish-brown humic silt with much fibrous plant detritus, some large bone fragments, wood, charcoal and stones.

**Parasitic worms:** Two subsamples were examined; one *Trichuris* egg was recorded from one of them (three *Hymenolepis* were also recorded from the same subsample).

**Insects (/T):** The flot was scan-recorded. Ninety-nine individuals of 59 beetle and bug taxa were present, together with various other remains including 'many' mites and beetle larvae, 'several' aphids, and fly eggs, two *Melophagus ovinus* adults (and a puparium), and two human fleas.

Main statistics were not far from the site means apart from a rather large proportion of foul matter individuals (% N RF = 15). There were ten *Cercyon atricapillus* and seven *Lathridius minutus* group (with genitalia of *L. pseudominutus*). A limited community of species exploiting fairly foul material may have been established.

**Context 14541:** immediately overlying 14543; a rather mixed layer—very dark grey silty loam to dark brown clay with silty loam and traces of wood and charcoal.

**Sample 828 (GBA):** dark brown, very heterogeneous (cm-scale), highly humic silt, with wood fragments, coarse plant detritus, limestone, and bone fragments.

Parasitic worms: Two subsamples were examined, but both were barren.

Parasitic worms: The single subsample examined gave a trace of *Trichuris* eggs.

Insects (/T): There were a human flea, 'several' fly puparia and Proctotrupoidea, and a variety of other remains among which a louse and an adult ked were notable. Beetles were not abundant, 52 individuals of 44 taxa being noted, with three *Anotylus nitidulus* and only one or two of the remainder. Diversity appeared to be high (although the standard error was large), and the outdoor component accounted for nearly a fifth of the assemblage. The assemblage may have been mostly background fauna; the presence of small numbers of ten Oxytelinae was of some note in such a small group.

Sample 997589 (BS): washed and sorted but plants not seen.

Sample 832 (GBA): no action to date.

**Context 7672:** another deposit in the spine between Tenements C and D; dark grey sandy clay loam, with many inclusions of wood chips and wicker or straw; about 3m long and up to 1.2m wide. Below **7553** and above **7688** and **7692**. In the upper half of the dump sequence.

Sample 1362 (Spot): two left valves of oyster, *Ostrea edulis*, one with one right valve cemented on, the other with two right valves. One harvested at the end of its fourth year, the other at the end of its third. Numerous barnacles, *Balanus crenatus*, were also present.

Sample 446 (GBA): very compacted, matted plant detritus in flattened lumps amongst loose silt.

Plants: P. R. Tomlinson recorded some *Genista* twigs, *Rubia* root fragments, and a few *Calluna* stems in the lumps of matted plant material

External deposits to the (site) E of Structures 5/5 and 5/6

Insects (/1, /2, /3): The flot from subsample /1 was extremely large—over 100ml—and consisted mainly of plant fragments including *Genista tinctoria* stems and pods. The nature of the flot made recording insects difficult. Recording was semi-quantitative. There were about 39 individuals of 29 beetle and bug taxa, abundant fragments of *Apis mellifera* and a few other remains including a human flea, an adult sheep ked and a louse. Over a quarter of the beetles and bugs were outdoor forms, and 'rd' decomposers were rather well represented (again, over a quarter of the assemblage). There were 'several' *Lathridius minutus* group, but the only other species with more than two individuals was *Apion ?difficile*, which was doubtless imported with the *Genista*.

**Context 7589:** lying to the (site) S of **7553**, on the same Tenement C/D spine, this was an irregular area across the whole width of the spine, running 3.5m down the site to Fence **7511**; it was at least 2.5m wide. It comprised dark greyish-brown, silty loamy clay, with patches of dark grey clay, flecks of charcoal, pink clay, limestone chips and tile dust. External dump quite low in the sequence. Located one context above **21746**, which seems to have been both within and external to Structure 5/5.

The flot from Subsample /2 was rapid scan-recorded. Only 23 individuals of 21 beetle species were noted, the assemblage having an ecologically mixed character. There were also assorted other arthropods, including 'many' honeybees, 'several' mites, a *Pediculus humanus*, three *Damalinea ovis*, four human fleas and two adult and one puparial *Melophagus ovinus*. There were abundant fragments of *Genista* stem and two probable *Apion difficile*.

Sample 396 (GBA): mid-dark grey, plastic to crumbly, sandy silty clay with some grey clay and silt and some pinkish clay. There were stones of 2-20mm and some charcoal. A 'test' subsample was requested but appears not to have been processed.

The third subsample was recorded non-quantitatively. There were again ‘many’ bees; *Apion difficile* was positively identified, and there were four human fleas, three *D. ovis* and adult and puparial sheep keds. There was an unusual bee wing, probably *Apis mellifera*, but more darkly pigmented than the remaining material from the site.

No puparia were recorded by J. Phipps and careful re-examination of the flots produced, in addition to *Melophagus ovinus*, only traces of fragmentary cuticle.

**Context 7688:** in the same area as **7672**, between **7692** and the cut for the Tenement D building; up to 2.75 x 0.8m; sample came from N end of strip; lithological description not available but thought by the excavator perhaps to be burnt turf. Immediately below **7672** in the sequence:

**7672** - half way through dumps

**7688**

**7689**

**7691**

**7692** - early stage of dumps

*Sample 445* (GBA): not described in detail in the laboratory, but the /2 subsample was recorded as being mostly sand and gravel, with a little clay, and the /1 as being fine loam.

Insects (/1, /2): There were very few insects; only twelve individuals of eleven beetles in the first subsample and single individuals of eight taxa in the second. Other arthropod remains were rare in both, but subsample /2 produced single adult and puparial sheep keds. There were also a few other puparia.

**Context 7691:** at the N end of the same strip on Tenement C, a roughly rectangular area up to 0.9 x 0.8m; abuts **7692** to the S; lithological description not available. See notes for **7688** (last entry).

*Sample 447* (GBA): described in the laboratory only as ‘crumbly, sandy’ when the /1 subsample was disaggregated.

Insects (/1): There were not many insects and preservation was rather poor. ‘Several’ fly puparia and fleas were noted. A total of 32 individuals of 22 beetles was recorded. A ‘post-depositional invader’ group appeared to be present, but no interpretation can reasonably be made.

**Context 7692:** a large area, encompassing most of the area of the strip between Tenements C and D at an early stage in its accumulation, and therefore up to 4m long and 2m wide; very dark greyish-brown clay loam, with wood chips, straw and charcoal flecks; *Sample 452* came from the northern-most fifth of area. Equivalent to **14515**. See notes for **7688** (above).

*Sample 452* (GBA): no action to date.

*Sample 1838* (Chemical): ash and burnt bone fragments; no further analysis undertaken.

**Context 7696:** an area of about 0.8 x 0.6m of ‘white silt’ in the NE corner of the same strip; thought by the excavator perhaps to include burnt turf. Over **7720**, half way through dump sequence.

*Sample 449* (GBA): light yellowish-grey, crumbly, sandy silt, with moderate amounts of charcoal and abundant ?ash.

Insects (/T): There were only single individuals of seven beetle taxa and a few scraps of other insects.

In addition, a 5kg subsample was bulk-sieved after the main period of processing. It was found to be rich in charcoal, with some wood and other occupation debris.

**Context 7720:** about 0.8 x 0.8 of yellow silt in the same area as and underlying **7696**; thought by the excavator perhaps to include burnt turf.

*Sample 454* (GBA): light brown, crumbly to brittle silt with a few stone 20-60mm; looks like ash.

Insects (/1): A human flea, single individuals of eleven beetles and a few other remains were all that was found. A record of *Cryptophagus acutangulatus* was one of rather few from this site.

The residue from the /1 subsample was rich in partly fused clay, with some charcoal and burnt and unburnt mammal bone, and traces of oyster shell and wood fragments.

In addition, a 3kg subsample was bulk-sieved after the main period of processing. It was found to be rich in ash with quite a lot of charcoal, and traces of wood and shellfish and a few stones.

**Context 21854:** a layer at least 1m across and up to 0.04m thick of mixed clays, ranging from very dark grey to grey, with 30% organic fragments, apparently between building phases on Tenement C and lying between buildings on C and D. Quite low in dump sequence, with at least two contexts over it before **7589**.

*Sample 1834* (Spot): well-humified reddish-brown woody detritus.

Plants: (/M): A 0.25kg subsample of this material was examined for plant remains. It gave an assemblage of 28 taxa, of which *Rubia* was the most abundant (score 3), with scores of 2 for *Diphysium* and *Genista*. The AIV for DYES was very high (22, rank 1 for this series of Period 5 samples), the other groups all rather modestly represented.

*Sample 1848* (Spot): this sample was described as 'red material' by the excavators but was not available for examination; on the basis of evidence from *Sample 1834*, it is most likely to have been further madder root debris.

**Cut 14405:** a cut about 0.45m across and 0.55m thick, between and to the front of the rear buildings on Tenements C and D; it abutted a post-line and contained two fills of which one was sampled. The archaeology was not wholly clear but the context lay quite low in the sequence of dumps.

**Context 14467:** very dark grey ashy loamy clay.

*Sample 747* (Spot): this sample was thought to contain fly puparia which, on disaggregation,

proved to be charred cereal grains. They have not been examined further.

**Cut 7450:** a cut about 1.7m long and perhaps as wide, behind Tenement C (between the rear buildings on Tenements C and D). Very near the top of the dump sequence.

**Context 7390:** the fill in the northern part of the cut, a very dark brown humic loam with charcoal flecks.

*Sample 272* (Spot): dark brown, crumbly, very degraded amorphous organic material with traces of stones 6-20mm, rotted wood and fly puparia. No record of further examination of the puparia.

#### *External deposits behind the buildings*

**Context 5321:** a layer of very dark greyish-brown peaty material at the N edge of **Cut 5691** (and thus just SW of Structure 5/5 on Tenement C), of irregular shape and dipping to the S; area about 1.5 x 0.4m. Part of the 'intermediate' sequence. Sampled because it was thought there might be evidence of 'pigment'.

*Sample 294* (GBA): varicoloured (dark grey-brown to mid-grey), crumbly, somewhat heterogeneous, humic sandy silt with herbaceous and woody detritus and traces of small and large bone fragments, *Rubia* root fragments and ?*Genista* stems.

Parasitic worms: The single subsample examined was barren.

Insects (/T): There were 43 individuals of 28 beetle and bug species, and a variety of other remains including 'several' puparia, 'many' scale insects and mites, a human flea and an individual of the rodent flea *Nosopsyllus* sp. (one of only ?2 records from the site). Allowing for assemblage size, main statistics were unexceptional, although diversity of the whole assemblage and of the decomposer component were rather low ( $\alpha = 35$ , SE = 11; alpha RT = 15, SE = 4). The most numerous taxon was

*Lathridius minutus* group (8), with four *Carpelimus bilineatus* and three *Omosita colon*. This was not a very informative group, and may have had one or more of several origins.

A specimen of *Phloeostiba plana* was identified, one of four from the site.

In addition, a 1.5kg subsample was bulk-sieved after the main period of processing; the residue was rough-sorted and was recorded as containing abundant wood, with small amounts of nutshell, bone, eggshell, shellfish, pottery, and brick/tile.

**Context 5588:** compact, very dark grey peaty loam with bone, oyster shells and wood fragments; build-up deposit to rear of Structure 5/6.

**Sample 318 (GBA):** Two bags of sediment appeared to have been collected, 318/1 and /2, renumbered as 3181 and 3182. The first was described in the laboratory as very reddish-brown compressed organic detritus, rather peat-like and laminated, interspersed with a more grey-coloured organic silt. The second was essentially similar with wood fragments, fly puparia and monocotyledonous stems all being noted.

**Plant (/M):** The residue from the 0.5 kg subsample was dominated by wood fragments, with moderate amounts of uncharred grass spikelets or spikelet fragments and toad-rush (*Juncus bufonius*) seeds. Of the remaining plants in this rather large assemblage of 51 taxa, most were annual weeds of waste places and cultivated land, with a moderate grassland component (perhaps representing hay) and some food plants. Small quantities of dyeplant material were also recorded (three taxa in trace amounts).

**Insects (/T1, /T2):** Insects were present in small numbers in the /T1 subsample (N = 44, S = 37) and no species was represented by more than two individuals. Although there were too few remains for reliable interpretation, there were hints of rather foul matter. The /T2 subsample also produced only limited numbers of remains (N = 35, S = 25), with 'several' *Platystethus cornutus* group and fly puparia, but only one or two individuals of the

remaining taxa. Both these groups of remains may have had rather mixed origins, with components from the nearby building, from *in situ* populations, and from background fauna.

**Context 5887:** a large area of at least 3 x 2m, up to 0.11m thick, between the two phases of building on Tenement C; very dark grey peaty loam; a dump or build-up deposit to rear of 5/6.

**Sample 419 (Spot):** dark brown to red-brown amorphous organic deposit.

**Insects (/T):** A small insect group was recovered, including 21 individuals of 19 beetle taxa; other remains included 'many' fly puparia (one *Melophagus ovinus* among them), and a human flea. Little can be made of such a group.

**Context 21197:** a large area in a central position within the excavation, to the rear of the Tenement C buildings; it was at least 3.2 x 2m in lateral extent and comprised black sandy silty peat with masses of structured, matted organic fragments and wood, seeds, etc. This was part of the 'intermediate' sequence but lay as much as 7.5 m behind the outline of the building.

**Sample 1576 (BS—VW):** A total of 45 taxa were recorded; of these, stem fragments of *Genista* and flowers of *Calluna* were recorded at 2. The remainder included four other dyeplant taxa (giving an AIV for DYES that was unusually, though only marginally, larger than that for FOOS). In other respects, however, the assemblage was unremarkable. There were traces of culm-nodes of a grass, perhaps common reed (*Phragmites*) but these were only tentatively identified. Fly puparia from this sample included modest numbers of *Stomoxys calcitrans* together with a few *Musca domestica* and a single *Nemopoda* sp.

**Sample 1575 (GBA):** no action to date.

**Sample 1574 (Spot):** J. Phipps and P. R. Tomlinson reported that this sample comprised a compacted mass of wood and *Genista* stem fragments with many puparia adhering to the surface; the latter were identified as 63 *Musca*

*domestica* and seven *Stomoxys calcitrans*, suggesting fairly foul conditions.

**Cut 29827:** a large shallow cut through the dumps on Tenement C behind and close to the buildings. Quite low in the backfill series. Sections and plans not available.

**Context 29457:** very dark grey, compact clay with charcoal fragments, mortar flecks and clay ‘blobs’.

**Sample 1939 (Spot):** dark greyish-brown silt with many charred grains and masses of fused grains.

**Plants (/M):** A 0.5kg subsample yielded only 13 taxa, but with very large numbers of charred bread/club wheat, modest amounts of cultivated oats and *Vicia hirsuta*, and traces of barley and rye, perhaps representing contaminants or a mixed crop. There were also waterlogged remains of a variety of taxa, mainly weeds.

*Not located accurately*

**Context 29044:** a deposit apparently lying between the Tenement B and C buildings.

**Sample 1863 (Spot):** avian eggshell; no further analysis undertaken.

**Context 21925:** archaeological details not requested; a layer, perhaps from Tenement C

**Sample 1881 (Spot):** avian eggshell (from a ‘large’ egg); no further analysis undertaken.

### Structural elements of Structure 5/6

**Cut 7571:** post-hole inside SE corner of Structure 5/6.

**Context 7574:** black, very organic, coarse sandy clay loam with lots of twigs.

**Sample 360 (GBA):** mid-dark grey, plastic to crumbly, slightly heterogeneous, sandy silty clay.

A 12kg subsample was bulk-sieved after the main period of processing, but the residue was not sorted.

**Context 7473:** deposit at base of build-ups within 5/6, probably trample and accumulation during construction.

**Sample 390 (GBA):** mid grey-brown, crumbly, sandy silt with traces of large bone fragments.

**Parasitic worms:** The two subsamples examined were both barren.

**Insects (/T):** There were few insects, only 31 individuals of 24 beetle taxa and a single adult fly being found. The fauna consisted of an assortment of typical Anglo-Scandinavian forms, and was only distinguished by the presence of three *Trechus micros*, quite possibly post-depositional invaders. There were ‘several’ mites. This was one of a number of samples producing fragments of plastic foam, presumably from the sponges used for cleaning timbers on site.

### Floors in Structure 5/6

(Note that the wood-turning waste was in a backfill so this was not necessarily a workshop as suggested in previous account of this part and phase of the site.)

**Context 7204:** a large area of about 6.4 x 3m, and up to 0.15m thick, filling most of Structure 5/6 and interpreted as a very mixed floor level; black sandy loam, with patches of charcoal and clay, becoming sandy and gravelly to the S end; it may represent several successive floor levels compressed into one.

**Sample 220 (GBA):** a very heterogeneous deposit of greyish silt and intercalated plant detritus, with abundant fly puparia.

**Plants (/M):** Sixty-one taxa—a large total—were recorded from this subsample. There were abundance scores of 2 for both pinnule and stalk fragments of bracken (*Pteridium aquilinum*), as

well as for toad-rush (*Juncus bufonius*); fly puparia scored 3 and wood fragments 2.

The presence of modest amounts of bracken suggests the incorporation of litter into the floor as it accumulated. Traces of some taxa that might have originated in hay were also present, but not well-represented. There was also a rare record for *Triglochin maritima*, a salt-marsh species rather regularly recorded from Roman York but only sporadically from Anglo-Scandinavian deposits.

The pod fragments of bird's-foot, *Ornithopus perpusillus*, were especially interesting, 7204 being the only Anglo-Scandinavian context at this site from which this taxon was recorded (see also Sample 223/M1, below). *O. perpusillus* is a small, low-growing legume of dry sandy and gravelly places (Clapham *et al.* 1987) and was recorded frequently from sandy soils in the Vale of York in the last century (Baker and Nowell 1854; Baines 1840; Robinson 1902). It still grows in sandy tracts in the lower Derwent valley but is decreasing (Crackles 1990). Another plant indicative of sandy soils that was rare in the Coppergate samples but present here was annual knawel, *Scleranthus annuus*; the record from this subsample was one of only two for the site, both from Period 5B samples. The seeds of *Juncus bufonius* might also indicate sandy tracks—this time ones which were seasonally, at least, waterlogged. The high AIV for ISNA (9, equal rank 1), however, is based on only this taxon and *Scirpus setaceus*. All these plants of sandy places most probably arrived on muddy boots since none seem likely to have been brought to the site deliberately, or incidentally with other materials.

Overall, though, the assemblage was dominated by annual weeds in groups CHEN and SECA, with only a very modest foodplant component and no dyeplants. Mosses were varied, though none was present in more than small amounts; the AIVs for LIGN (23, rank 4), SLIT (16, equal rank 3) and WOOF (12, equal rank 5) indicate woodland taxa to have been the most important.

Parasitic worms: Two subsamples were examined; each gave a single *Trichuris* egg.

Insects (/1): This material was examined by means of a 3kg fully processed 'detail' recorded subsample. The insect remains included over 1000 *Musca domestica* puparia (with some *Stomoxys calcitrans*, 'several' beetle larvae and (recorded initially but not noted on checking) 'many' scale insects (*Chionaspis salicis*); there were also three human fleas and 'many' mites. In total 214 individuals of 100 of the beetle and bug taxa used in the preparation of statistics were present. Diversity was rather high ( $\alpha = 73$ , SE = 8) and the outdoor component fairly substantial (% N OB = 18); the diversity of this component was also quite high ( $\alpha$  OB = 65, although SE = 25). Aquatics were well-represented—ten individuals of seven taxa, including three *Helophorus* sp., two *Ochthebius ? minimus*, single individuals of two Elminthidae (indicating flowing water—somewhere) and a few others.

Decomposers were important numerically, but not especially so proportionally; they included a good number of 'rd' and 'rf' coded taxa (each accounting for 16% of the individuals). The decomposer component was of rather high diversity in view of the likelihood that abundant autochthones were present (alpha RT = 26, SE = 4). This may have been the result of the development of a rich, mixed decomposer community (or communities). The species list included what appeared to be representatives of both 'house fauna' and a foul decomposer group: there were 14 *Lathridius minutus* group, nine *Xylodromus concinnus*, four *Cryptophagus* sp. and *Aglenus brunneus*, and three *Anobium punctatum*, *Cryptophagus scutellatus* and *Mycetaea hirta*, for example, representing the first group, and 12 *Cercyon unipunctatus*, ten *C. atricapillus* and four *C. terminatus* representing the second. Both groups included a variety of less abundant taxa. Other more numerous taxa included an aleocharine (7), *Acrotrichis* sp. (6), *Anotylus complanatus* and *A. nitidulus* (5), a *Philonthus* and a *Corticaria* species (4). It appears that if this was a house floor it was not a very clean one. It may have formed in a rather open structure, and the possibility that dung was present cannot be rejected on the basis of the insect remains.

*Sample 222* (GBA): dark grey-brown, crumbly, sandy clay silt, with stones, charcoal and wood fragments, some lumps of pinkish-grey clay.

Plants (/M): A somewhat smaller assemblage of 48 taxa was recovered, and all were scored at 1. There was only a rather modest overlap with the assemblages from 220/M and 223/M (similarity coefficients between 220 and 222 and between 222 and 223 were, respectively, 24 and 37, cf. the value for 220 and 223, which was 47). Given the nature of the deposit, its size and lithology, and the possibility that it represents floors building up over a considerable time, it is perhaps surprising that the assemblages should be so similar.

All the AIVs for this assemblage were modest, the largest being CHEN (24). Grassland plants in MOAR were fairly well represented, the seven taxa involved including some possible meadow plants—*Caltha*, *Prunella*, *Eleocharis palustris* and *Ranunculus flammula*—perhaps indicative of wetter rather than drier areas.

Foodplants were again rather sparse, but three dyeplants were recorded. Mosses were altogether much rarer than in 220/M. There were abundance scores of 2 for wood and charcoal from the residue from this subsample.

Parasitic worms: There was a single *Trichuris* egg in the subsample examined.

Insects (/1, /2): A 1kg /1 subsample was processed and the material chosen for fuller examination on the basis of a quick examination. This initial subsample was not recorded further.

The 3kg /2 subsample, fully processed and detail listed, produced one of the longest species lists from the site: 136 beetle and bug taxa, with 304 individuals. There were many fragmentary ‘outdoor’ forms which could not be identified or quantified and this should be remembered in interpretation. Other remains included ‘many’ fly puparia, ‘several’ mites and eleven human fleas. Diversity was extremely high ( $\alpha = 94$ , SE = 9; doubtless an even higher value would have been achieved had it been possible to identify the

fragmentary outdoor forms). The presence of a large clearly autochthonous group reduced the proportion of outdoor forms to 15% (47 individuals); this group was also of high diversity ( $\alpha$  OB = 91, although SE = 33). There were eleven individuals of seven aquatic taxa including four *?Esolus parallelepipedus*, a species indicating flowing water, although unlikely to find habitat on the site. Decomposers were abundant, but this component was of moderately high diversity—as in *Sample 220* this seems to be a result of mixed and rich autochthonous, or very short-travelled, autochthonous communities. There was a strong and almost archetypical ‘house fauna’ group: *Xylodromus concinnus* (27), *Cryptophagus scutellatus* (16), *Atomaria ?apicalis* (10), *Cryptophagus* sp. (9), *Atomaria ?nigripennis* (8), *Crataraea suturalis*, *Ptinus fur* and *Mycetaea hirta* (all 4). Some of the moderately abundant taxa hinted at fouler conditions: *Gyrophypnus angustatus* (6), *Aphodius granarius* (4) and *Cercyon haemorrhoidalis* and *G. fracticornis* (both 3), for example. A few other fairly abundant taxa were of less certain ecological significance, *Anotylus nitidulus* (6) and the eurytopic *Cercyon analis* (5) in particular. The former may have had a background origin or belonged to a community of rather damp organic litter, while the latter would have existed happily in almost any of the decomposer habitats indicated by other species.

In summary, this assemblage supports very similar implications to that from *Sample 220*, again suggesting an open structure or some mechanism importing large quantities of insects.

*Sample 223* (GBA): reddish- or yellowish-brown to blackish, compressed, fissile, heterogeneous peaty detritus with some silty parts, lumps of ash, stiff grey clay. In places: small wood and leather fragments, brick/tile and bone.

Plants (/M): With 74 taxa, this was the equal fourth largest assemblage from this series of Period 5 samples. There were scores of 2 for *Rumex acetosella* agg., Leguminosae (flowers/petals) and *Juncus bufonius*, and five pod fragments of *Ornithopus perpallidus* were also recorded. The *Rumex*, *Juncus* and *Ornithopus* are suggestive of

sandy tracks, for which there was evidence in the assemblage from 220 and to a lesser extent in that from 222.

The AIV for CHEN was rather higher in this sample (40), as was that for SECA, the value for MOAR being intermediate between the figures for this parameter in 220/M and 222/M. Foodplants were slightly better represented than in 220; DYES achieved the same value as in 222. The traces of waterlogged grass culm-nodes and grass/cereal chaff perhaps represent hay/straw debris, but they were either a very small component of the original deposit or, if abundant, they have decayed very comprehensively. There was quite a diversity of mosses, but fewer than in 220/M. They included somewhat unusual records for *Barbula* and *Pohlia* sp(p), both of which genera have taxa typical of soil, walls and roofs; they presumably originated locally, the bulk of the other taxa (primarily from woodland or wetland habitats) probably being imported to the town.

Parasitic worms: The single subsample examined was barren.

Insects (/1, /2): A 1kg subsample (/1) was processed, but after a rapid inspection the sample was chosen for detailed examination. A quite large assemblage was recovered from the 3kg /2 subsample—183 individuals of 95 beetles and bugs and other remains which included ‘many’ scale insects and mites, at least two human fleas, adult and puparial sheep keds, ‘several’ other fly puparia, beetle larvae and lice (‘several’ *Damalinea ovis*). Whole-assemblage diversity was high ( $\alpha = 79$ , SE = 10), the outdoor component quite strong (% N OB = 15) but mostly represented by single individuals, and the RD group well-represented (25% of the assemblage). As in other samples from this context, decomposer diversity was quite high (alpha RT = 28, SE = 4), despite the presence of some species in numbers suggesting breeding, and again this appears to be the result of the development of a rather heterogeneous species rich community. The present group differed in the abundance of *Lathridius minutus* group (21, rank 1); other more abundant taxa were *Anotylus complanatus* (10), *Anobium punctatum* (8), a

*Cryptophagus* species (7), *Cryptophagus scutellatus* and *Aglenus brunneus* (6) and *Cercyon analis*, *Xylodromus concinnus* and ?*Neobisnius* sp. (all 5). This assemblage gave less indication of fouler habitats than did those from Samples 220 and 222; it was a rather more typical ‘house floor’ group as seen in the Period 4B structures.

Sample 230 (GBA): (N.B. this sample was recorded as containing some material from Context 7258, the layer beneath 7204.) Varicoloured (light and dark grey-brown), crumbly, very heterogeneous sandy silt with some bone, stones 6-20mm, lumps of light brown silt and pinkish clay.

Parasitic worms: The single subsample examined was barren.

Insects (/1): A 3kg ‘detail’ sample was fully processed on the basis of the preliminary inspection of the sediment. There were 129 individuals of the 65 taxa used in the preparation of main statistics, and also ‘many’ mites, a few scale insects, ‘several’ fly puparia (including *Melophagus ovinus*) and as well as an adult sheep ked. Diversity was rather lower than in Samples 220, 222 and 223,  $\alpha = 52$ , SE = 8, and the outdoor component rather smaller (% N OB = 12). Decomposers coded ‘rd’ formed 29% of the individuals and 45% of the RT component. Other statistics were unremarkable. The more abundant taxa were a typical house floor group, except in the abundance of *Enicmus* sp. (15 individuals; usually present in smaller numbers but, although fairly eurytopic like *Lathridius minutus* group, a clear candidate for inclusion beside that taxon in the house fauna group). *Lathridius minutus* group itself was represented by 12 individuals; an abdomen containing male genitalia was identified as *L. pseudominutus* by comparison with illustrations of Freude *et al.* (1967, 177). There were also six *Anobium punctatum*, five *Cryptophagus* sp., *Atomaria nigripennis* and *Atomaria* sp., four *Cercyon analis*, *Aleocharinae* sp. and *Cryptophagus scutellatus*. There were also three *Mycetaea hirta*.

**Sample 232 (GBA):** dark grey-brown crumbly, ashy silt with structured peat in places and some large charred wood fragments.

**Insects (/1):** The 1kg subsample was fully processed and 'detail' recorded. In addition to a modest beetle and bug group (N = 94, S = 71) there were some scale insects, five *Pulex irritans*, 'many' mites, and 'several' fly puparia, including a *Melophagus ovinus*. Fisher *et al.*'s  $\alpha$  took a value of 131, with a large error (SE = 30). The outdoor component was large (% N OB = 27), although mostly represented by single individuals (there were two *Platystethus cornutus* group and *Sitona* sp.). Decomposers were not particularly abundant (% N RT = 56), but 'rd' taxa were proportionally well represented (% N RD = 23, 42% of N RT); the RT component was of relatively high diversity (alpha RT = 38, SE = 10). The fauna consisted of elements seen in the lists from other samples from **7204**; there were seven *Lathridius minutus* group, five of a *Cryptophagus* sp., three *Xylodromus concinnus* and *Anotylus complanatus*, but only one or two individuals of the remaining taxa.

**Sample 997204 (Spot):** Two subsamples from hand-collected material both gave single *Trichuris* eggs.

**Context 7216:** a patch of floor in the NE corner of Structure 5/6 (Tenement C), over **7204**, about 1.6 x 0.8m, and up to 0.2m thick, of brown straw-like material, with leather offcuts.

**Sample 221 (GBA):** heterogeneous: some parts humic silt, others fissile coarse plant detritus; some pinkish-grey clay lumps.

**Plants (/T3, 3kg):** (Though the significance of this observation is not clear, it may be worth noting that the rather small residue was marked by a very strong build-up of black sulphides and free hydrogen sulphide in the period between processing and examination for plant remains.) A large proportion of the residue was 'grassy' (including traces of charred and uncharred grass/cereal culm nodes) and the deposit may have included stable manure or similar material, though the range of identifiable taxa consistent with this was small.

Herbaceous detritus scored '3' on the four-point abundance scale used, but there were also modest amounts of bark, charcoal and sand (the mineral component of the residue was about 20-30% by volume). A diversity of identifiable plant remains was recorded (54 taxa), weeds being the most abundant, but with some foodplants and a noticeable wet ground component (*Eleocharis* and *Juncus bufonius* both scored '2', the former perhaps part of a cut vegetation element from hay or manure).

**Parasitic worms:** The single subsample initially gave a trace of *Trichuris* eggs but flotation using magnesium sulphate solution gave large numbers, of which many were measured, though none retained polar plugs. A single *Ascaris* was also recorded.

**Insects (/T):** Semi-quantitatively recorded, this subsample gave about 90 individuals of 60 beetles and bugs. There were also 'several' fly puparia (all those examined being *Musca domestica*), two human fleas, two adult sheep keds, and a few other remains. Diversity was high ( $\alpha$  = 78, SE = 16), outdoor forms well-represented (% N OB = 22), and decomposers not very abundant (% N RT = 52, well below the mean and mode for the site). Both the RD and RF components were relatively substantial (% N RD = 16; % N RF = 14). The species list showed a mixture of communities, although whether of background origin or at least in part autochthonous (or mass-transported) was hard to determine. There were six each of *Cercyon atricapillus*, a *Philonthus* species and an aleocharine, and three *Cercyon analis*, *Lathridius minutus* group and *Aglenus brunneus*. Two *Cercyon unipunctatus* and single individuals of other foul-matter taxa supported the indication from *C. atricapillus* that rotting matter formed part of the deposit or was at least very close.

**Context 7232:** very dark greyish-brown sandy clay with patches of clay, areas of ash/mortar, lots of charcoal and wood and a few limestone pieces and cobbles. A floor deposit, about 2.4 x 2m in lateral extent and up to 100mm thick, underlying **7216**. In the NW corner of the building, immediately below **7204**.

**Sample 236** (GBA): very dark brown silty clay with shell, charcoal, bone and wood chips.

Insects (/1): ‘Detail’ recorded, this subsample produced 83 individuals of 56 beetle species. There were also ‘many’ mites, ‘several’ fly puparia (including *Melophagus ovinus*) and an adult *M. ovinus*. A single ?*Tipnus unicolor* head appeared to be too fresh to be an ancient fossil and may have been a modern contaminant. Diversity was high ( $\alpha = 75$ , SE = 16). The outdoor component was moderately large (% N OB = 17), but is likely to have been underestimated as the fossils in this sample were very fragmented, especially those of ‘outdoor’ forms. Among the decomposers, ‘rd’ taxa were important, making up 28% of the whole assemblage and 43% of the RT component. Only *Lathridius minutus* group (10), *Cercyon analis* (4), and *Anobium punctatum* and an *Atomaria* species (three each) were present at a frequency of more than two.

**Sample 237** (GBA): dark yellowish-brown sandy silt with bone, charcoal and limestone.

Parasitic worms: Two subsamples were examined, both yielding trace amounts of *Trichuris* eggs.

Insects (‘/3’—in fact subsample 1 of bag 3): Bag 3 of the three collected was the only one from which material was processed. The subsample was fully processed and ‘detail’ recorded. There were two probable modern contaminants of note: a *Stegobium paniceum* and a *Sitophilus granarius*, both single sclerites which were clearly very fresh. There were two human fleas; other insects included ‘many’ fly puparia. There were also ‘many’ mites. Beetles were moderately abundant, 98 individuals of 60 taxa being found. Diversity was rather high ( $\alpha = 65$ , SE = 12), the outdoor component fairly large (% N OB = 15) and the decomposer statistics rather undistinguished. The most numerous species was *Carpelimus bilineatus* (6), with five each of *Neobisnius* sp., an aleocharine and *Lathridius minutus* group; there were also four *Xylodromus concinnus*. This appears to have been a rather heterogeneous group, within the range of taxa common at Coppergate. There was probably ‘house fauna’, but a background origin for the

whole group, or at least a very diverse origin, cannot be ruled out.

**Context 7257**: a floor layer of about 1.2 and 0.9m and perhaps 0.15m thick, below **7204** (or contemporary with it, or even a variation of it) and above **7258** and **7260**; burnt daub of various colours with charcoal and clay mixed in.

**Sample 227** (GBA): mid-dark grey, plastic to crumbly, very heterogeneous sandy clay silt to silty clay, with traces of stones 20-60mm, and sandstone, and a smaller component of sticky light brown clay and light-mid red-brown clay. It was felt that whilst this was not primarily daub, it may have contained material that was derived from it.

Plants (/T3, 2kg): The moderate-sized residue was dominated by lumps (to 100mm) of baked clay or daub, so it was examined dry rather than wet. There was also a small washover (<10% of the total residue volume) of charcoal with some small (10mm diameter or less) roundwood fragments. Amongst the charred material, linseeds and capsule fragments of flax were prominent, the seeds reaching an abundance score of ‘2’ on the four-point scale used. Otherwise, the plant remains were a mixture of foodplants and weeds, though overall the assemblage was quite small (34 taxa).

Insects (/1): There were not many insects, only 68 individuals of 31 beetle taxa and various other remains, including three human fleas being found. Preservation was rather poor, but there was no sign of remains having decayed completely. The low whole-assemblage diversity ( $\alpha = 22$ , SE = 4), small proportion of outdoor forms (four individuals), large decomposer component dominated by the RD group (% N RT = 78; % N RD = 49, 62% of N RT) and low diversity of the decomposers (alpha RT = 10, SE = 2) all tend to support the subjective impression given by the species list that this was a small, autochthonous, ‘house fauna’ group. Much the most abundant taxon was *Lathridius minutus* group, and there were six *Atomaria* sp. and *Mycetaea hirta*, five *Aglenus brunneus* and four *Xylodromus ?concinnus*.

*Sample 231* (GBA): varicoloured light and dark grey-brown crumbly very heterogeneous sandy silt, with some bone, pebbles (to 10mm), lumps of light brown silt and pinkish clay lumps, with a very large (?re-used) brick, and ash and charcoal.

Parasitic worms: The single subsample examined was barren, but subsequent flotation with magnesium sulphate gave two *Trichuris* eggs.

Insects (/1): The remains were poorly preserved, very pale in some cases, and rare. Only 'several' *Lathridius minutus* group and single individuals of seven other beetle taxa were observed. Other remains were also uncommon; they included a human flea and a *Melophagus* puparium.

**Context 7258:** a floor layer of about 1.8 x 0.8m (up to 0.08m thick as seen in section), of black, charcoally iron pan material between **7204** and **7257** (above) and **7232** and **7260** (below).

*Sample 229* (GBA): dark grey, crumbly to slightly brittle, sandy silt with much charcoal and a few small pinkish-brown clay lumps and small stones and a slight ashy smell. From NW corner of structure.

Plants (/M): A rather modest assemblage of 33 identifiable taxa was recovered, all at an abundance score of 1. Of the other components in the subsample, only charcoal scored highly (3), but there were few charred plant macrofossils (?rye, ?barley and cultivated oats), perhaps suggesting that most of the charcoal came from wood ash. The list of plants is unremarkable save for the record of the moss *Anomobryum filiforme*.

Parasitic worms: All three subsamples examined were barren.

Insects (/1+2, total 3kg): Two subsamples, of 1 and 2kg, were processed. The beetles (and a single bug) from these were combined for listing purposes; they were recorded in detail and 168 individuals of 84 taxa noted. Other remains included 'many' fly puparia, mites and beetle larvae, a *Melophagus* adult, seven *Pulex irritans* and a few scale insects. This sample also contained a modern contaminant

*Aridius nodifer*, an Australasian species of 20th century introduction.

Diversity of the beetle and bug group was fairly high ( $\alpha = 67$ , SE = 9) and the outdoor component of modest size (% N OB = 14), consisting of 23 individuals of 22 taxa, only the large and rather synanthropic ground beetle *Pterostichus melanarius* being represented by more than one individual. A quarter of the individuals were of 'rd' coded taxa. The species list showed a strong 'house fauna' element: *Lathridius minutus* group (14 individuals, with one abdomen containing genitalia identified as *L. pseudominutus*), *Anobium punctatum* (13), *Cryptophagus* sp. (10), *Xylodromus concinnus* and *Cryptophagus scutellatus* (6), and *Mycetaea hirta* (4). The other more abundant taxa were *Anotylus complanatus* (9), an aleocharine (6) and *Cordalia obscura* and a second Aleocharinae sp. (5).

There were remains of some taxa not or rarely recorded in other samples from the site: *Elaphrus riparius*, ?*Henoticus serratus* and *Hygronoma dimidiata* (the last probably present elsewhere, but here identified on the basis of male genitalia).

**Context 7260:** a very dark grey, very hard, mortared floor surface, mixed with bits of tile, limestone and charcoal to form an almost cement-like surface (?re-used *opus signinum* or an Anglo-Scandinavian equivalent of it), at least 1m across, but probably covering the majority of the interior of Structure 5/6 (which would be 4 x 3m). Perhaps about 0.06m thick as seen in section. Below **7204**, and **7257-8**. One of the earliest deposits of the floor sequence, but with some floors below.

*Sample 287* (GBA): light brown, crumbly, sandy stony silt with traces of stones 2-6mm.

Parasitic worms: Two subsamples were examined of which one was barren and one yielded a single *Trichuris* eggs.

Insects (/T): The only insects recorded were single individuals of ten beetle taxa. The record of

*Microlestes maurus* was the only one from the site. There was also a single adult sheep ked.

*Sample 302* (Spot): no action to date.

**Context 7551:** a black silty layer extending along the E side of sill beams **7446** and **7471** in Structure 5/6.

*Sample 394* (Spot): avian eggshell; no further analysis undertaken.

### Cut fills in Structure 5/6

**Cut 5229:** a drain within Structure 5/6. The northern part was given cut number **7263**. Four fill contexts were sampled. The drain was contemporaneous with the use of the building. There was no clear evidence for a cover, but there were numerous associated timbers which may have been a lining, and the position of the drain was such that a cover would have been predicted.

**Context 5529:** dark brown silt with some mortar.

*Sample 312* (GBA): mid-dark grey, plastic to crumbly, somewhat heterogeneous, sandy clay silt with 10mm-scale mottles and trace amounts of small limestone fragments.

Parasitic worms: No eggs were recorded from the subsample examined.

Insects (/T): Insects were moderately abundant and included 'several' fly puparia and beetle larvae, a human flea and 150 individuals of 74 beetles and bugs. There were also 'many' mites. Main statistics were not of special note in the context of the present site, although the RD component was important (% N RD = 27, N RD as % N RT = 41). There were a number of 'house fauna' taxa (e.g. *Lathridius minutus* group, rank 1, 13 individuals), *Mycetaea hirta* (6), *Atomaria ?nigripennis* (5), *Cryptophagus* sp. (4), and also two *Cryptophagus scutellatus* and various other decomposers including *Ptenidium* sp. and *Anotylus complanatus* (6), *Cercyon analis* (5), *Omalium caesum* or *italicum* (4) and various species at frequency 2 or

3. This group was perhaps a variation on the 'house fauna'/'oxyteline association' assemblages seen in a considerable number of samples from the site. It seems likely that much of the assemblage came from the adjacent floor layers, either 'on the hoof' or dead in redeposited material.

**Context 5651:** dark brown silty, slightly peaty loam.

*Sample 343* (GBA): mid-dark grey-brown, plastic, slightly humic, slightly sandy, clay silty, with traces of stones 2-20mm and granules of ?finer clay throughout and some whitish buttery patches.

Insects (/1, /2): There were two site-collected 'subsamples' (ss 1, ss 2) of this sample and a 1kg subsample of each was processed, both being recorded semi-quantitatively. '343/1', from ss 1, produced approximately 116 individuals of 51 beetle species, and other remains including 'several' beetle larvae, mites, fly puparia and earthworm egg capsules and single individuals of two Cladocera, one of them a *Daphnia*. Diversity was estimated to be low ( $\alpha = 35$ , SE = 5), and the outdoor component was small (% N OB = 4), but other statistics were of little note.

There were 'many' *Carpelimus bilineatus* and *Anotylus rugosus*, 'several' *Trechus micros*, *Anotylus complanatus*, *Neobisnius* sp., Euplectini sp. and *Atomaria* sp. The remainder of the assemblage was much as might be predicted on the basis of the more abundant species and experience of material from the site. Thus 'house fauna' was limited, the 'oxyteline association' was clearly represented, and some 'post-depositional invaders' or subterranean taxa were present. The interpretation of such a group remains rather uncertain. This subsample also yielded modest numbers of *Leptocera* sp. puparia.

The second subsample (/2 from ss 2) produced an assemblage of 132 individuals of 40 taxa, of very similar flavour but differing in detail. Diversity was estimated to be even lower ( $\alpha = 20$ , SE = 3) and the outdoor component was also small (% N OB = 6). In this case the abundance of several 'u' coded taxa reduced the proportion of coded decomposers to

40%, though some of these ‘u’ taxa doubtless belonged to the decomposer community. Alpha RT was low (alpha RT = 9, SE = 2) and would have been lower still had these uncoded forms been included.

Five taxa were recorded as ‘many’: a Ptiliidae sp., *Carpelimus bilineatus*, *Anotylus rugosus*, *Neobisnius* sp. and a euplectine. There were ‘several’ individuals of *Trechus micros* and an aleocharine. Again there were two *Coprophilus striatulus* and *Trichonyx sulcicollis* to accompany the *T. micros*.

Other remains were not very abundant, but included ‘several’ mites.

*Sample 349* (GBA): mid-dark grey-brown, plastic, sandy clay silt with abundant stones 2-6mm, moderate amounts of stones 6-20mm, including limestone fragments, traces of charcoal, and patches of coarse sand and mm-sized clay lumps.

Insects (/T): A modest assemblage of 87 individuals of 43 beetle and bug taxa was present. A fifth of the individuals were of ‘outdoor’ species of miscellaneous kinds. Whole-assemblage diversity was quite low ( $\alpha = 34$ , SE = 6), as was that of the decomposer component (alpha RT = 14, SE = 3). There were nine *Carpelimus bilineatus*, six individuals of an euplectine, five *Lathridius minutus* group and four each of *Anotylus complanatus*, *A. nitidulus* and an *Atomaria* sp. This was probably background fauna, with some invading decomposers attracted to rather indefinable habitats.

**Context 7251:** very dark greyish-brown peaty loam with much wood debris.

*Sample 238* (GBA): dark brown, crumbly, very heterogeneous, highly humic silt with patches of lighter brown pure silt, small stones, limestone, and charcoal.

Parasitic worms: A single *Trichuris* was recovered using a magnesium sulphate ‘concentration’ technique, but none were recorded using the conventional method.

Insects (/1): A 1kg subsample was fully processed and detail recorded; there were 221 individuals of 65 beetle and bug taxa, and other remains including ‘several’ beetle larvae and mites, an adult sheep ked and a small larva of *Melanotus erythropus*. Diversity was quite low ( $\alpha = 31$ , SE = 3), the proportion of ‘rd’ coded forms high (% N RD = 24), but the remaining statistics were not unusual. The most abundant taxa were *Lathridius minutus* group and, rather unusually at this site, *Enicmus* sp. (both 17). There were 15 *Anobium punctatum*, 13 *Trechus micros*, and *Carpelimus bilineatus* (12), *Atomaria nigripennis* (11), *Mycetaea hirta* (9), *Cercyon analis*, *Quedius ?mesomelinus* and a euplectine (7 each), and *Coprophilus striatulus*, an aleocharine, a *Cryptophagus* sp. and *Aglenus brunneus* (all 5). This rather unusual group appears to have consisted of house fauna mixed with the ‘subterranean’ group—here perhaps *not* post-depositional but having lived within the drain. This component formed a significant part of the assemblage, perhaps 38 individuals if *Aglenus brunneus* and the euplectines are admitted. It may be suggested that *Trechus quadristriatus* may have been cavernicolous in this case.

**Context 7252:** black organic peaty silt, changing to a green organic silt at the southern end.

*Sample 225* (GBA): dark reddish-brown to black, crumbly, very heterogeneous, silty detritus, with some stones and paler organic patches, charcoal patches and wood fragments 10-20mm; an ‘ashy smell’.

Parasitic worms: Two subsamples were examined; the first was barren, the second gave a trace of *Trichuris* eggs using a conventional technique and abundant *Trichuris* (which were measured) using magnesium sulphate flotation. The latter subsample also produced two capillarid eggs.

Insects (/1): A 1kg fully processed detail recorded sample. There were ‘many’ mites, ‘several’ fleas (not identified, but probably *Pulex irritans*) and scale insects. Fly puparia were present in moderate numbers; Limosiniinae and *Teichomyza fusca* accounted for the majority. Beetles and bugs amounted to 157 individuals of 77 species; main

statistics were of little note apart from the substantial RD component (% N RD = 27, 41 % of the RT group) and high decomposer diversity (alpha RT = 32, SE = 5). *Lathridius minutus* group (12) and *Mycetaea hirta* were the most abundant species, with seven taxa of assorted ecological affinities at frequency 5. 'House fauna' was the predominant group, and there were four *Cryptophagus scutellatus* and three *Atomaria nigripennis* to underline this.

*Sample 226* (GBA): dark grey-brown, crumbly, highly humic clay silt with puparia, 10mm-sized wood fragments, small fragments of bone, and fine plant detritus.

Insects (/1): A subsample of 1kg was fully processed and detail recorded. There were 158 beetles and bugs (77 taxa), other remains including 'several' beetle larvae, an adult sheep ked, a human flea and some fly puparia, mostly *Musca domestica* but including a *Melophagus*. Main statistics were unexceptional, although 'rd' taxa accounted for 27% of the individuals. The assemblage had strong affinities with that from subsample 225/1, with 'house fauna' the most recognisable component. There were 12 *Lathridius minutus* group, and *Mycetaea hirta* (11), *Anobium punctatum* and an *Atomaria* (8), *Cryptophagus* sp. (5), *C. scutellatus* (3), and *Atomaria nigripennis* (3), for example. In this case, however, there were eight *Anotylus complanatus*.

*Sample 239* (GBA): mid-dark grey-brown, crumbly, somewhat sandy silt with coarse wood fragments and some fine plant detritus.

Parasitic worms: Traces of *Trichuris* eggs were recorded from the subsample examined, together with three *?Hymenolepis*.

Insects (/1): The subsample of 1kg was fully processed and detail recorded. There were five *Pulex irritans*, 'many' puparia, 'several' beetle larvae, and a quite substantial group of Coleoptera and Hemiptera (N = 173, S = 73). Main statistics were not very informative and the more abundant taxa were a disparate group of decomposers. A clear 'house fauna' element was present, albeit in

restricted numbers, and a subterranean or post-depositional group was also recognisable (*Trechus micros* (4), *Coprophilus striatulus* (3), *Quedius mesomelinus* (2), and also six individuals of an euplectine).

*Sample 997252* (Spot): This, a further, hand-collected, subsample examined for parasite eggs (and labelled 997252) gave four *Trichuris* and four *Ascaris* eggs and some *?Hymenolepis*.

### Backfill deposits in Structure 5/6

**Context 1478:** a rather large, irregular dump of about 3.2 x 1.2m; it comprised black sandy clay loam. The uppermost backfill context within the collapsed timbers of the building; immediately below 1473, which spread beyond them.

*Sample 107* (Spot): mid grey, plastic to crumbly, very heterogeneous, humic sandy silt, with traces of wood fragments and fly puparia; there were also inclusions of light grey and mid grey clay, brown silty clay, patches of charcoal, patches of more richly humic material and of organic detritus, and patches of ?limestone/mortar.

A subsample of about 1kg was treated as a spot find and checked quickly for plant remains. The residue after sieving was found to be rich in charcoal, with small amounts of tile, burnt clay/daub, eggshell, bone, fish scale, oyster shell and wood fragments and other occupation debris. The plant remains represented mainly annual weed groups, but there was some possible evidence for hay/straw in the form of charred grass/cereal culm-nodes and for straw or grain cleanings in the form of waterlogged cereal chaff. There were foodplants—charred hazel nut, barley, hexaploid wheat and rye—and traces of probable and possible dyeplants (*Rubia* and *Humulus*), and there was a record, too, of *Cannabis*. This assemblage is like many others from this site at this period and warrants no further comment.

**Context 1473:** backfill (or perhaps floor) within Structure 5/6.

*Sample 88* (GBA): undense, somewhat laminated, dark reddish-brown richly organic silt with some compressed plant remains, bone fragments and wood.

Invertebrates were not common (S = 24, N = 27), but subjectively the assemblage resembled a subset of that from *Sample 92/T* (see below). Plant remains and parasite eggs were not examined.

*Sample 89* (GBA)

Described as a very dark brown humic silty herbaceous detritus with traces of wood fragments, but not examined further

*Sample 92* (GBA): dry fine-sandy organic silt with ?wood (or peaty matrix).

Plants (/M): Annual nitrophile weeds, cornfield weeds and grassland plants were the best represented taxa in the large assemblage of 78 taxa. Three of the five more abundant plants fell in groups CHEN and/or SECA whilst the remaining two, *Juncus bufonius* and *Eleocharis palustris*, indicate short, damp grassland or pond-margin habitats or, in the case of the rush, perhaps wet tracks. Overall, there was a rather strong representation of plants which may have served or arrived as litter of one kind or another, especially taxa from grazing land and/or turves.

Of the remaining taxa, all recorded in trace amounts, the following may have originated in foods: celery, hazelnut, flax, apple, sloe, raspberry and elderberry.

A rather small group of beetles (and a single bug, S = 39, N = 54) was accompanied by several mites and fly puparia. Recording was semi-quantitative. The most abundant beetles were *Anotylus complanatus* and *A. nitidulus* (both 'several'), and the rarer taxa included numerous species likely to have lived in foul matter with these, notably two each of *Cercyon unipunctatus* and *Platystethus arenarius*. Outdoor forms were rather important (almost a quarter of the assemblage). Deposition on the open seems possible. There were two bark beetles (Scolytidae: *Scolytus* sp. and

?*Dryocoetinus villosus*), the origin of which is uncertain.

*Sample 991473* (Spot)

This spot find was of bracken pinnule (frond) fragments.

**Context 7004:** post-occupation dump in Structure 5/6; archaeological details not requested.

*Sample 112* (GBA): no action to date.

**Context 7005:** at least 1.8m long and up to 0.2m thick, this dump butted the E wall of Building 5/6; it was about halfway up the sequence of 'fills' in the building cut and comprised very dark grey, very sandy silty loam. Over **7005**, roughly contemporaneous with **7009**, just above it, half way through backfill sequence. Apparently three subsamples were collected according to the section.

*Sample 113* (GBA): mid grey, crumbly, silty clayey fine sand with wood fragments.

Insects (/T): Insects were not abundant, and only 38 individuals of 35 beetle taxa were found. Other remains were few. They included 'several' mites and a larval abdominal apex of *Athous haemorrhoidalis*. The beetle list was not unusual for Anglo-Scandinavian Coppergate, but was not interpretable in detail.

In addition, a 4kg subsample was bulk-sieved after the main period of processing; it has not been sorted.

**Context 7006:** a lens within **7004**.

*Sample 114* (GBA): no action to date.

**Context 7008:** very dark brown peaty clay up to 0.1m thick, forming a wedge (as seen in section) between **7019** and **7009**.

*Sample 115* (GBA): mid-dark grey, crumbly, slightly sandy silt with traces of stones 2-20mm, small limestone fragments, and eggshell and very abundant tile.

Insects (/T): Only a single beetle and a fragment of fly puparium were recorded.

**Context 7009:** black peaty silty clay loam with grey-brown mottling, up to 0.2m thick, lying between **7002** and **1473**, and over **7008**.

*Sample 116* (GBA): mid grey-brown, crumbly, rather heterogeneous, slightly sandy clay silt with traces of charcoal and of wood fragments.

Parasitic worms: There were three *Trichuris* and a single *Hymenolepis* egg in the subsample examined.

Insects (/T): Insect remains were rare—there were only 32 individuals of 31 beetle taxa and a small number of other remains. Outdoor forms accounted for over a quarter of the beetles; other statistics were unremarkable. Only *Cercyon analis* was represented by more than one individual. There is every possibility that this material had an entirely random origin.

In addition, an 8kg subsample was bulk-sieved after the main period of processing; it has not been sorted.

**Context 7016:** archaeological details not requested.

*Sample 146* (Spot): no action to date.

**Context 7019:** very dark grey sandy silt with clay flecks, lying beneath **7005** and **7009**, and above **7020** and **7022**. Under **7018** in lower half of the backfills.

*Sample 138* (GBA): dark grey-brown, plastic to crumbly to brittle, rather heterogeneous slightly clay, sandy silt, with traces of stones 2-20mm, charcoal, wood and small bone fragments, and with some grey silt and clay patches.

Parasitic worms: The single subsample examined was barren.

Insects (/T): There were few beetles (N = 34, S = 31), and two human fleas and a *Melophagus* puparium fragment. This was another small

assemblage rich in outdoor forms; as was often the case at Coppergate in small groups from layers, there were about a quarter of such. The species were typical of the site and period and this was probably background fauna.

*Sample 140* (Spot): described as having a very 'disturbed' lithology, this was a mid-dark grey-brown, crumbly to brittle, very heterogeneous sandy silt with traces of sandstone, charcoal and wood fragments with some more or less pure silt and buff clay; no further analysis undertaken.

*Sample 144* (Spot): described as looking like reworked soil from various origins; a dark grey-brown, crumbly, very heterogeneous, humic silt with traces of charcoal, wood, horncore, and large and small bone fragments, nutshell, and lumps of buff clay, with locally some patches of organic detritus; no further analysis undertaken.

**Context 7020:** very dark greyish-brown sandy silty clay, with patches of grey clay and brown peat, beneath **7019**.

*Sample 139* (GBA): varicoloured (dark grey to pinkish-brown via light brown), crumbly, somewhat heterogeneous, slightly clayey, sandy silt, with modest amounts of charcoal and traces of wood fragments and large bone fragments.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/T): There were single individuals of three beetle taxa and a small number of other insect remains.

**Context 7022:** very dark greyish-brown sandy silty peat, beneath **7019** and above **7204** and **7257**.

*Sample 141* (GBA): a jumbled lithology, compatible with the interpretation of this deposit as a dump; dark grey, crumbly to brittle (and slightly layered in places), rather heterogeneous, humic, slightly sandy silt with thin layers of organic detritus; no further analysis undertaken.

**Context 7036:** on the W side of the same fill deposits in Structure 5/6, this was a rather large area of about 2 x 1m, of dark reddish-brown, very loamy sandy clay, with black organic flecks, many pink and some light grey clay lenses and a few wood chips; below **1478**. Triangular in section, up to 0.4m thick, against west wall.

*Sample 233* (GBA): dark grey-brown, crumbly sandy silt, with a few small stones, small wood fragments and charcoal; apparently sterile of waterlogged animal and plant macrofossils.

Parasitic worms: The single subsample examined was barren.

Insects (/1): Fully processed and 'detail' listed, this subsample gave only 51 individuals of 32 beetle taxa (in contradiction of the view taken during description in the laboratory that this deposit was devoid of waterlogged remains). Many of the remains were fragmentary. Diversity was a little low ( $\alpha = 37$ , SE = 10), with a good proportion of RD taxa (one fifth of the individuals). There were hints that a small 'house fauna' group was present (three *Anobium punctatum*, *Atomaria nigripennis* and *Lathridius minutus* group, for example), but the significance of such a group is hard to determine in isolation. Non-beetles were rare.

**Context 7040:** an irregular area of up to 2 x 1.5m in the SE corner of Structure 5/6; dark olive-grey peaty clay, with some wood chips; below **7016**, **7044**. One of the lowest dumps, over the floors.

*Sample 157* (Spot): a very large number of puparia of *Musca domestica*, of which at least half were unemerged, indicating some catastrophe to have befallen them.

**Context 7044:** to the S of and overlying **7040**; at least 1.7 x 0.7m in extent; very dark grey silty sandy clay with black organic flecks and patches of light greyish-brown clay; below **7016**.

*Sample 158* (GBA): mid-dark grey, crumbly (locally slightly layered), very heterogeneous silt with abundant modern collembolans and wood fragments (including wattle fragments), some more

clayey parts and some plant detritus. This had more the appearance of a floor than a dump.

Insects (/T): Recorded by a non-quantitative rapid inspection, the beetles appeared to represent a small, ecologically mixed group of typical Anglo-Scandinavian taxa. There was a human flea, and 'many' mites were noted.

**Context 7062:** this dump lay in the far SW corner of Structure 5/6, lying beneath **1478**; it was a very dark grey silty clay with patches of light grey clay. Over **7045**.

*Sample 159* (GBA): light-mid brown, plastic, slightly sandy silty clay with abundant charcoal and a mottle of lighter and darker patches.

Parasitic worms: The two subsamples examined were barren.

Insects (/T): Insects were very rare: the only records were only nine individuals of eight beetle taxa and a single unidentified larva.

**Context 7994:** overlying **7997**; thick dump, to 0.5m, of dark yellowish-brown sandy silt with much charcoal.

*Sample 666* (Spot): no action to date.

**Context 7997:** overlying **14001**; a dark greyish-brown sandy silt with much ash, up to 0.2m thick.

*Sample 689* (Spot): no action to date.

**Context 14001:** the lowest of this sequence of layers, up to 0.35m thick, a very dark grey silty loam with much clay, ash, charcoal and mortar.

*Sample 696* (GBA): no action to date.

**Context 7332:** dark greyish-brown silty clay loam, lying immediately over the collapsed timbers of Structure 5/6 on the W side, at the N end; up to 0.08m thick, but lateral extent cannot be discerned from records. Below **7175**, a dump or backfill in 5/6

*Sample 273* (Spot): charred grain, not examined further.

### Miscellaneous external deposits on Tenement C

These deposits lay in front of and behind the outlines of Structures 5/5 and 5/6 but were not assigned to a specific phase of building construction, use or abandonment.

#### *Deposits in front of Structures 5/5 and 5/6*

**Context 14529:** a layer 0.15m thick and more than 2m across (as seen in section), comprising dark grey ashy clay loam with flecks of wood and charcoal. It underlay the fills of Cut **14523** (*q.v.*) at the front of Tenement C, immediately outside Structure 5/6 and sliced by the cut for it.

*Sample 884* (BS—VW): A rather small assemblage of only 28 plant taxa was recorded, all in trace amounts. Over 40% were annual weeds in CHEN, with 25% weeds in SECA. Useful plants included a small group of foodplants. Amongst the other components of the sample were charred bread and fragments of the calcareous red alga *Corallina*.

#### *Deposits behind Structures 5/5 and 5/6*

**Context 5439:** a modest-sized layer of 1.2 x 1m in the backyard of Tenement C; dark brown sandy clay loam with charcoal, tile and mortar flecks.

*Sample 404* (Spot): no action to date.

*Sample 409* (Spot): separate lumps of limestone (including tufaceous limestone), pinkish, coarse-grained sandstone and mortar; no further analysis undertaken.

**Context 5478:** a small area on Tenement C, just behind the later rear building (5/6); about 1.6 x 0.6m in area; very dark greyish-brown compacted straw and wood.

*Sample 305* (GBA): not described in detail in laboratory, but recorded as being laminated material with both straw and wood chips.

Insects (/1): Non-quantitatively recorded; a modest insect group was present. It had no clear character, although dominated by Oxytelinae and *Cercyon analis*. There were 'several' mites.

**Context 5480:** a small area of about 0.6 x 0.6m, just behind Building 5/6, in the stone-lined entrance, perhaps an upper fill of the drain system emerging from this building, or a sealing layer; black silt.

*Sample 307* (GBA): dark grey, crumbly, sandy clay silt.

Parasitic worms: The single subsample examined gave a single *Trichuris* egg.

Insects (/1): A subsample of 0.5kg was processed, single individuals of 23 beetle species being found and few other invertebrates being noted. About a quarter of the fauna was of 'outdoor' taxa. This was probably an assemblage of 'background fauna'.

**Context 5714:** a dark greyish-brown clay loam with wood, mortar and clay, underlying Drain **5229** at the rear of the Tenement C buildings; it was about 1 x 0.8m as seen in plan. Associated with 5/6.

*Sample 362* (GBA): mid grey-brown, crumbly, slightly humic sandy silt, with traces of stones 6-60mm, and wood chips.

Insects (/T, 0.43kg): The flot could only be subjected to a short inspection, with non-quantitative recording. There were 'many' mites, 'several' fly puparia, and a very nondescript group of beetles typical of Anglo-Scandinavian Coppergate.

*Sample 389* (Spot): no action to date.

**Context 5639:** a rather large area of about 3 x 1.6m abutting and to the W of Fence **5852** (which

may be the boundary between Tenements C and D) and Cut **5691**; dark brown clay loam with a large amount of yellow straw-like material; underlay **5321** (*q.v.*).

*Sample 457* (GBA): dark brown, crumbly amorphous organic material with traces of wood and bark fragments and patches of compressed plant stem/leaf.

Insects (/T): There was a rather high concentration of insect remains—197 individuals of 39 beetle taxa being noted ( $\alpha = 15$ , SE = 2). Over half of the assemblage was accounted for by *Carpelimus fuliginosus*, however, with 105 individuals (53%). The presence of this uncoded species was responsible for the exceptionally low value of % N RT (35); were *C. fuliginosus* added, as perhaps it should be, this value would be 88%. The diversity of the RT component was low (alpha RT = 10, SE = 2), so there is little doubt that the other more abundant taxa formed a community, which doubtless also included the *C. fuliginosus*. There were twelve *Cercyon analis* and nine each of *Anotylus nitidulus* and *Lathridius minutus* group, with four each of an *Acrotrichis* species, *Carpelimus bilineatus*, *Platystethus arenarius* and *Falagria caesa* or *sulcatula*. Moist open-textured, perhaps muddy, organic deposits seem a likely habitat in which most of these species could co-exist.

Other arthropod remains included huge numbers of pupal and adult Nematocera, suspected of breeding in the bag after collection (also seen in many other samples), ‘many’ mites and traces of various other insects.

**Context 6153**: an area of about 1 x 1m, though not clearly delineated on plan, to the rear of Tenement C; very dark grey peaty loam with many wood chips.

*Sample 469* (Spot): sampled as a possible apple core, this indeed proved to be a closely-packed group of *Malus* seeds with endocarp in a matrix of brown amorphous organic material itself within an inorganic matrix.

**Context 6276**: small area of about 1 x 0.2m, well to the rear of the Tenement C buildings; very dark grey loamy peat with a large amount of organic material including wood chips and ‘rushes’. Up to 10m behind buildings. Temporally associated with the later building (5/6).

*Sample 1050* (Spot): the whole sample (about 200 cm<sup>3</sup>) was disaggregated and found to contain many stem fragments of *Genista* (no doubt the ‘rushes’ of the excavator) and some fly puparia (large numbers of *Musca domestica*).

**Context 6433**: a large area of about 3 x 2.5m E of the later medieval limestone-walled well behind the Tenement C building, and SW of fence line **6346**; abuts **6781** to the S; very dark grey silty peaty loam with flecks of wood and charcoal. Perhaps rather late in Period 5B.

*Sample 1095* (BS—VW): An average-sized assemblage of 44 taxa was recorded, with abundance scores of 2 for *Chenopodium album*, *Atriplex* sp(p), *Lamium* Section *Lamiopsis* and *Sambucus nigra*. There were also rather large numbers of fly puparia. Overall, the assemblage was dominated by weeds of waste ground, the AIV for CHEN being very high at 60 (rank 3 for this series of samples). Other weed groups were moderately high, but there were only rather small AIVs for FOOS (21, based on 6 taxa) and only 2 taxa scored in DYES.

*Sample 1100* (Spot): a near-spherical, partly-charred, hollow piece of ?wood, perhaps a knot or wound callus that had rotted away inside to leave a ‘shell’; not identifiable further.

*Sample 1135* (Spot): At the time the sample was examined (4/89) there was no obvious ‘spot find’ in the bag, except a fragment of wood and some ?faecal concretions; otherwise there was only dark grey-brown, crumbly to brittle, humic silt with traces of small limestone fragments.

*Sample 1325* (Spot): This spot find of fly puparia was passed to J. Phipps, who identified considerable numbers of *Musca domestica* and two *Stomoxys calcitrans*.

**Context 6788:** archaeological details not requested, but thought to lie at the rear of Tenement C.

*Sample 1919* (Spot): a single modern snail (*Helix aspersa*) shell.

**Context 6924:** a small area of about 0.8 x 0.4m, immediately NE of Gully **21142**, at the rear of Tenement C; very dark grey peaty silty clay loam, with wood and charcoal flecks. At about the middle of the Period 5B buildup.

*Sample 1206* (Spot): the large number of fly puparia recovered by J. Phipps from this sample were *Musca domestica*.

**Context 7467:** an irregular area abutting the N edge of **5321**, just behind the later Period 5B building (5/6); very dark greyish-brown peaty material with reddish stains.

*Sample 293* (GBA): mid-dark grey-brown, crumbly, somewhat heterogeneous humic silt, with traces of wood and large bone fragments, white flecks, inclusions of mid grey clay silt and coarse plant fragments including some large bracken (*Pteridium*) stalk fragments and patches of madder root (no doubt accounting for the red stains). Fly puparia were abundant, about 150 *Stomoxys calcitrans* and three *Musca domestica* being counted.

Insects (/1): The flot was recorded non-quantitatively. Arthropods were rather numerous, with 'many' fly puparia and mites, 'several' scale insects, and assorted other remains, including an adult ked and two human fleas. Beetles included 'several' *Neobisnius* sp., *Lathridius minutus* group and *Carpelimus bilineatus*, with smaller numbers of a variety of other decomposers. Most of these insects probably invaded, or bred in, a fairly heterogeneous 'compost'-like accumulation rich in organic matter.

**Context 15731:** a small patch of brown, very friable clay, at the E end of **15736** (not sampled), under a concrete raft beam from the overlying cellar floor; just within the area of Tenement C, on its W side.

*Sample 1024* (Spot): mid grey-brown, crumbly, sandy clay silt with some orange colouration ?round rootlets; no further analysis undertaken.

**Context 21252 (= 21257):** in the same area as and below **21197** (rear of Tenement C), an area of not less than 1.75 x 0.8m of matted, organic, compact sandy structured peat with patches of ash 7-10m behind the building.

*Sample 1620* (BS—VW): A total of 37 taxa were recorded, with scores of 2 for *Diphysium* and *Genista*. Unusually, there was a much larger AIV for DYES than for FOOS, but the largest group present was weeds in CHEN (35% of the assemblage). The AIV for MOAR (14) was relatively high though this partly reflects the score of 2 for *Genista*.

*Sample 1624* (BS—VW): The assemblage of 45 taxa gave a similarity coefficient of 36.7% when compared with that from *1620*, a figure not unexpected for heterogeneous material of this kind. *Genista* again scored 2, as did *Humulus* and *Chenopodium album*. DYES achieved a (slightly) higher AIV than FOOS but the assemblage was dominated by weeds in CHEN and SECA. There was a record for coriander (*Coriandrum sativum*), the only one for Period 5B and one of only two for Period 5 as a whole (the taxon was rather regularly recorded from Period 3 deposits but rare thereafter, perhaps reflecting to some extent the nature of the sampled deposits, Period 3 including a large proportion of cess pit fills).

This sample also yielded rather large numbers of fly puparia, 26 *Musca domestica* and 22 Sepsidae sp. being identified.

*Sample 1623* (GBA): dark grey, crumbly, humic, slightly sandy silt with amorphous organic material and woody detritus, modest amounts of wood fragments and traces of small bone fragments.

Parasitic worms: The single subsample examined was barren.

Insects: A small group of beetles (and one bug: N = 57; S = 43) was accompanied by 'many' fly

puparia (those identified being *Musca domestica* and a single *Melophagus ovinus*) and mites, 'several' beetle larvae, and small numbers of other remains. There were small numbers of decomposer beetles which probably had invaded the deposit, which may have been somewhat moist. A single death-watch beetle, *Xestobium rufovillosum*, was recorded.

*Sample 1619* (GBA): dark grey-brown, crumbly, somewhat heterogeneous, humic silt with many fly puparia. A 1kg /T subsample was disaggregated, primarily to investigate fly puparia.

**Insects:** The fly puparia were mainly *Musca domestica*, of which there were 'many'. The other insect remains were only subjected to a very rapid examination; there were not very many, the beetles perhaps including a small autochthonous/invader decomposer group of no clear character.

In addition, a subsample of 5kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 21543:** an irregularly-shaped area of about 1.9 x 1.4m of brown clay with shell and bone. Position in time sequence not certain, but not very late. Position in space: 12.5 m behind buildings.

*Sample 1760* (Spot) a small pad (approximately 40 x 30 x 2.5mm) of the moss *Calliergon cuspidatum*.

**Context 29259:** a small boring patch of dark grey clay with 5% charcoal and organic fragments, cut by post-hole **29258**; interpreted as a dump in the backyard of Tenement C. Perhaps associated with Structure 5/5.

*Sample 1903* (Spot): an acorn (fruit of the oak, *Quercus*); these remains are rather rare on archaeological sites, the outermost layer of the acorn being flimsy (compared, say, to the shell of walnut or hazelnut). The only other Anglo-Scandinavian records of acorns from this site were a single specimen from BS Sample *1120*, Context **6795** (Period 5CR pit fill) and isolated, hand-collected specimens from Contexts **2211**

(Period 5B, backyard behind Structure 5/1), and **6123** and **8538** (both Period 5B, and recorded in the site archive as stakes!).

#### *Deposits to E of Buildings*

**Context 7352:** an irregularly-shaped area between buildings at the N end of the spine of deposits between Tenements C and D; about 0.8 x 0.6m of ash mixed with charcoal patches. Contemporary with Structure 5/6.

*Sample 253* (Spot): the charcoal from a 1kg subsample processed in 1977 was examined at that time by D. Williams. He recorded that there were several species present, the larger fragments being ash (*Fraxinus*), some of the other material being of diffuse-porous type. Further identifications were not pursued.

A 0.5kg subsample of the sediment was analysed by ARH in 1984 and gave a very small assemblage (eight taxa), including charred wheat and ?rye and some unidentified charred cereal chaff. The remaining taxa were hazel nut and some seeds which were probably from weeds.

#### **Cut fills on Tenement C**

These cuts were not assigned to a particular phase in the lives of Structures 5/5 and 5/6. They all lay to the rear of Structures 5/5 and 5/6:

**Cut 21850:** a N-S gully just behind the Tenement C building, of uncertain length (but at least 1.4m), about 0.3m across and less than 0.15m deep; a single sampled fill, the two contexts being equivalent.

**Context 21849:** mixture of ash and charcoal.

*Sample 1952* (Spot): mid yellow-grey, crumbly, very heterogeneous, slightly sandy silt with modest amounts of charcoal and traces of wood fragments, many lumps of light grey-brown plastic clay and some ash; no further analysis undertaken.

**Context 29463:** mixture of ash and charcoal.

*Sample 1957* (Spot): a calcareous concretion, probably tufa, with much replaced and non-replaced organic material; maximum dimensions 150 x 80 x 60mm.

*Sample 1958* (Spot): a brown (iron-stained) tufaceous concretion containing wood chips and other plant remains.

**Cut 5699:** a pit just behind Structure 5/6, with which it was associated. If circular, it would have been about 1.6m in diameter, and the fills were about 0.6m in thickness.

**Context 5673:** very dark grey peaty loam containing compact lenses of ash and small pieces of wood (the excavator suggests wood chips were present).

*Sample 398* (GBA): mid-dark brown, slightly sandy, slightly silty woody and herbaceous detritus with large wood (?wattle) fragments and some paler patches; much evidence of post-excavation decay by arthropods.

Plants (/M): A total of 35 taxa were recorded from this subsample, rather below the sub-period mean of 40 and the period mean of 42. Several taxa scored an abundance of 2—*Corylus avellana*, *Chenopodium* Section *Pseudoblitum*, *C. album*, and *Atriplex* sp(p)., and there were modest numbers of fly puparia (see below for evidence from /T subsample). The largest groups were annual weeds in CHEN, SECA and BIDE, though the AIVs were not especially large.

Parasitic worms: The single subsample examined was barren.

Insects (/T): There were moderate numbers of insects, and a fairly small group of 65 beetles (S = 48) was recorded by rapid scanning. There were moderate numbers of *Nemopoda* and *Leptocera* spp. and a single *Melophagus ovinus* among the fly puparia, three human fleas, and 'several' mites. Outdoor forms made up almost a fifth of the

assemblage, and foul matter taxa were proportionally well-represented (although of course numbers were small—nine individuals). There were six *Anotylus nitidulus* and smaller numbers of a variety of decomposers. Decomposer diversity was estimated to be high (alpha RT = 42, although SE = 13). There may have been invaders of decaying matter, but this assemblage was perhaps either of random origin, through re-deposition or strictly as background fauna.

**Cut 21692:** a scoop behind Structure 5/6. Its dimensions were difficult to ascertain from the available section. There were several fills, only one of which was sampled. At the very top of the sequence between buildings, or associated with 5/6.

**Context 6141:** The uppermost fill of this cut, equivalent to **21550**, this was a very dark grey, clay loam, with charcoal flecks, and patches of reddish-grey clay.

*Sample 546* (GBA): not described in detail in the laboratory, but recorded as having much stone, some wood and a fair amount of charcoal.

Insects (/1): Insects were rare; only single individuals of 15 beetle taxa, three *Nemopoda* sp. puparia and small numbers of a few other remains were seen. There were 'several' earthworm egg capsules. It is possible that this layer was rather 'earthy', or at least open-textured when forming.

**Cut 28183 (= 37081):** a pit in the middle to front part of the backyard of Tenement C, of which the diameter may have originally been about 1.5m, the depth at least 0.5m. Two of the four fills were sampled. At the very bottom of the 5B series; presumably contemporaneous with Structure 5/5.

**Context 28084:** the third fill from the base, a mixture of very dark greyish-brown silty loam and compacted peat.

*Sample 1855* (GBA): well-rotted, very dark grey-brown, crumbly 'cess' with faecal concretions and much wood, though heavily degraded

post-excavation by arthropods (including fly larvae) and earthworms.

Plants (/M): (N.B. this subsample had decayed further in the period between subsampling and processing.) A rather large assemblage of 54 taxa was recovered from this 0.5kg subsample. Wheat/rye 'bran' scored 3, as did *Agrostemma githago* seed fragments, and there were scores of 2 for *Urtica dioica* achenes, *Malus* (endocarp), and *Solanum nigrum* seeds. Amongst the other components, faecal concretions and fly puparia both scored 3.

Given the faecal nature of the deposit, the AIV for FOOS was not surprisingly rather high (38, rank 8 for this series of samples), but there was also a fairly large AIV for CHEN (42) and a very high one for SECA (39, rank 2, of which 9 was accounted for by the *Agrostemma* record). Other foodplants included ?leek, ?bilberry, 'cherry', pea, linseed and blackberry.

Insects (/T, /1): The /T subsample was recorded semi-quantitatively and by rapid scanning. There were 'several' of nine taxa and 'many' of one, as well as large numbers of Sepsidae and *Leptocera* puparia, with a few each of *Muscina stabulans* and *Tephrochlamys* sp.. The /T assemblage was rather distinctive so the material was selected for examination by a 3kg fully-processed sample, which was not, however, 'detail' recorded.

The /1 subsample gave 642 individuals of 108 beetles and bugs with a character similar to that assessed for the /T sample.

Diversity was moderately low ( $\alpha = 37$ , SE = 2) and the outdoor component proportionally small (% N OB = 4; there were 25 individuals). Decomposers were predominant (% NRT = 82; addition of some uncoded probable decomposers would carry this above 90%). Foul decomposers were exceptionally abundant (134 individuals, 21% of the assemblage). There were 16 taxa with ten or more individuals and they, and indeed most of the less frequent taxa, might have co-existed in a mass of organic remains varying in foulness from somewhat dry locally to generally wet and foetid. There were

99 *Ptenidium pusillum* type (probably that species), 50 *Cercyon terminatus*, 38 *Atomaria* sp., 37 *Cercyon haemorrhoidalis*, 29 *C. analis*, 29 *Platystethus arenarius*, 24 *Oxytelus sculptus*, 22 *Lathridius minutus* group (*L. pseudominutus* genitalia being identified), 17 *Philonthus politus*, 14 each of *Carpelimus bilineatus* and an Aleocharinae sp., twelve *Clambus* sp. (probably *pubescens*), eleven *Falagria caesa* or *sulcatula*, and ten each of an *Acrotrichis* species, a ptiliid and *Omosita colon*. The pattern of ecological requirements seen in the abundant taxa was carried down the ranks and the assemblage indicated a highly-developed, rich, probably long-lived decomposer community in perhaps dung-like conditions. Doubtless there were strays and background fauna as well.

This subsample included substantial numbers of beetle larvae (with 'several' *Hister* sp. *sensu lato*) and mites, and smaller numbers of other remains. There were also abundant fly puparia.

Both subsamples contained numerous earthworm egg capsules, with several tens in each.

**Context 18824:** immediately overlying **28084**; a very dark grey, peaty loam, with charcoal flecks.

*Sample 2043* (Spot): a pad of moss, about 100 x 40 x 10mm, comprising abundant *Neckera complanata* and *Isothecium myurum*, with some *I. myosuroides*. The matrix contained eggs of *Trichuris* and *Ascaris* and fragments of *Triticum/Secale* 'bran'. It is very likely that this material had been used as toilet 'tissue'.

**Cut 6126:** this must originally have been rather larger than the 1.5 x 1m area seen in plan (it was not recorded on a section). No information was available about the disposition of the fills. A pit in the Tenement C backyard.

**Context 6150:** very dark grey peaty loam with some wood chips.

*Sample 549* (GBA): no action to date.

**Cut 37120:** a pit of perhaps 2m diameter in the backyard behind Tenement C; two sampled fills whose relationships could not be discerned from the records. It was stratigraphically halfway through the Period 5B sequence so could not be clearly related to either building.

**Context 18541:** very dark grey peaty loam with charcoal flecks.

*Sample 1043* (Spot) [described by the excavator as ‘puparia’]: no action to date.

**Context 18838:** very dark grey, very peaty loam.

*Sample 1892* (Spot): pods and stem fragments of dyer’s greenweed, *Genista tinctoria*.

**Cut 7686:** a linear cut of about 1.2m by 0.45m as seen on plan, and up to 0.13m deep, outside the NE corner of Structure 5/5 in the area of the Tenement C/D alley; perhaps a drainage gully.

**Context 7556:** pale brown sandy silt.

*Sample 438* (GBA): dark buff, sandy clay silt to silty fine sand, rich in calcium carbonate (?rotted mortar).

Plants (/M): Only 18 taxa were recorded from this subsample; all were recorded in trace amounts, as were the other components of the residue apart from charcoal (score 2). The majority of the taxa were weeds of some kind, but there were also dyeplants (*Diphysium* and *Rubia*) and petiole abscission scars of *Oxalis acetosella*—elements common in many other deposits from this site in the Anglo-Scandinavian period, the *Oxalis* being especially common in Period 4B samples (present in 15% of small Period 4B samples, but in only two—of which this is one—from Period 5). This perhaps indicates some reworking, consistent with one interpretation of this deposit as the backfill of a construction cut.

Parasitic worms: The subsample examined was barren.

Insects (/T): A very restricted group of beetles (N = 18, S = 17) and a few other remains including ‘several’ mites were recovered (rapid scan-recording). Little can be offered by way of interpretation—there may have been foul matter nearby. This subsample gave one of very few records of *Cercyon melanocephalus* from the site.

In addition, a 7 kg subsample was bulk-sieved after the main period of processing; it has been sorted but gave only small amounts of a variety of occupation materials, including tile, glass, charcoal, charred grain, nutshell, bone, shellfish and eggshell.

**Cut 21260:** a gully in the backyard behind Tenements C and D, cut by Well 4976. It was about 6m long and 0.8m across and contained a single fill. Temporally associated with Structure 5/6, but with no structural connexion.

**Context 21204:** very dark grey, sandy, slightly silty peat, with wicker fragments, bone, limestone chips, charcoal and ash.

*Sample 1603* (BS—VW): A total of 59 taxa were recorded from this sample, putting it just within the top 20% of Period 5 BS samples for this parameter. Foodplants were very much predominant, with scores of 2 for both *Malus* seeds and endocarp, and for *Prunus spinosa*, and there were trace amounts of ‘bran’, *Rubus fruticosus*, *Prunus domestica* and *P. Section Cerasus*, *Vicia faba*, and tentatively identified *Pisum sativum*. The AIV for FOOS, 57, based on 17 taxa, was the third highest of the Period 5 BS samples, the other AIVs all rather moderate or small. It is not clear from this sample whether there were faecal remains (no parasite analysis was undertaken, and there is no record of faecal concretions having been recovered from the rough-sorting, though ‘concretions’ were recorded from the BS subsample of 1602: see below).

*Sample 1602* (GBA): very dark grey, crumbly, humic, slightly sandy silt, with traces of stones 2-20mm, small bone fragments, shellfish and tile.

Insects (/T): There were moderate numbers of insects, including ‘many’ fly puparia, ‘several’ mites, a human flea and 95 individuals of 61 beetles and bugs. Diversity of the whole assemblage and of the decomposers was high ( $\alpha = 73$ , SE = 14; alpha RT = 35, SE = 9). Five each of *Carpelimus bilineatus*, *Anotylus nitidulus* and an aleocharine were present, and there were four *Platystethus cornutus* group and *Lathridius minutus* group. These and the remainder of the list suggest a mixture of invaders of fairly foul matter and background fauna.

In addition, a 6kg subsample was bulk-sieved after the main period of processing; the rough-sorting yielded a variety of occupation debris, including slag, mortar, pottery, bone and shell, as well as wood and charcoal, and some concretions which were not examined further.

*Sample 1604* (Spot): two left valves of oyster, *Ostrea edulis*, with some calcareous red alga, *Corallina officinalis*, attached to them.

**Cut 6392**: the size of this cut could not be ascertained from the plan on which it was recorded; it was not shown on any section. It was located in the backyard behind (and associated with) Building 5/6, adjacent to and just NE of a limestone-lined well of C16th date. The relationships of the fills were not recorded.

**Context 6347**: richly organic sandy peat with a large content of wood pieces.

*Sample 1375* (Spot): a single caudal centrum fragment with neural arch and spine from a salmonid fish.

**Context 21381**: structured and amorphous sandy silty peat.

*Sample 1665* (BS—VW): There were 50 taxa in this assemblage, rather higher than period or sub-period means for BS sample; of these, only *Chenopodium album* scored an abundance of 2. Nearly one-third of the assemblage was scored in group CHEN, with more than one-quarter in

SECA, though 22% were possible foodplants—the 11 taxa including blackberry, apple seeds and endocarp, hawthorn, sloe, ‘plum’, and charred bread/club wheat and oats. There was a modest component of large branching mosses of the kind often associated with cess pit fills, but there was no supporting evidence for faecal material. Traces of a pale silty material recorded as ‘?fuller’s earth’ were also present; this sediment, which may have been ash rather than clay/silt, was often recorded from deposits with large concentrations of dyeplant remains. In this case, there were only traces of *Rubia* and *Genista* in addition to the abundant *Diphysium* stems.

The fly puparia from this sample included a single *Stomoxys calcitrans*, 12 *Musca domestica*, six *Muscina* sp. and, unusually, one *Polietes albolineata*.

*Sample 1673* (Spot): This appeared to be a lump of ?modern road bitumen to judge from its behaviour when heated in a Bunsen flame (it melted and burned smokily with a characteristic tarry odour).

**Context 21323?**: this may be the context from which *Sample 1678* was taken; the sample was received from YAT with the context number **21284** but this cannot be correct since **21284** was a stake. Context **21323** lay between fencelines **6470** and **6662** just E of the NE corner of the large medieval limestone-walled well in a rear central position on the excavation; it was a fill in Cut **6392**.

*Sample 1678* (GBA): dark grey, crumbly, sandy silt with traces of wood fragments, humic material and some ashy lumps.

Insects (/T): This subsample gave a small flot rich in insect remains, with preservation a little better than normal at Anglo-Scandinavian Coppergate. Apart from 98 individuals of 58 beetle taxa, there were ‘many’ mites, ‘several’ syrphid spiracular processes, Proctotrupeoidea, and scale insects, and a few other remains. Main statistics were not very instructive: diversity was not especially high ( $\alpha = 59$ , SE = 11), but outdoor forms were quite abundant (% N OB = 17), while the decomposer component was rather characterless.

Only *Anotylus nitidulus* was at all abundant (ten), and there were four other Oxytelinae with four individuals and two with two. The 'oxyteline association' was thus present, and some of its other members and common associates were also recorded (three *Neobisnius* sp., for example). The possibility that this was just upcast produced when an ancient pit was accidentally re-excavated cannot be ruled out. Such an explanation would perhaps account for the observed mixture of components, but no definite interpretation can be offered.

**Cuts 21681 and 21748:** **21681** was a pit of about 1.5m diameter and 0.5m depth, containing three fills. It lay in the backyard to the rear of Tenement C. It was probably stratigraphically fairly early in Period 5B, perhaps associated with Building 5/5. **21748**, a sub-rectangular pit about 1.7 x 1.5 m and 0.9 m deep, was cut by **21681**.

**Cut 21681**

**Context 21680:** black, wet, sandy amorphous and structured peat, with patches of olive-brown ash, fragments of wood and wicker.

**Sample 1808 (BS—VW):** A modest assemblage of 35 taxa was recorded from this sample. The only taxa to score an abundance of 2 were two of the dyeplants, *Diphasium* and *Genista*, and with *Isatis* (and some tentatively identified *Genista* pods), DYES gave the largest AIV (16, rather high within this group of samples) for the 'useful' groups. Weeds and woodland taxa dominated the 'vegetation' groups, but they were not especially important.

**Sample 1809 (GBA):** dark grey-brown, crumbly, humic, slightly sandy silt, with traces of stones 60-200mm, charcoal, wood and large and small bone fragments. A test subsample was requested but appears not to have been processed.

Parasitic worms: The single subsample examined was barren.

In addition, a 16kg subsample was bulk-sieved after the main period of processing; it gave a wide

range of occupation material, including pottery, metal, tile, wood, charcoal, bone and eggshell.

**Cut 21748** (see above)

**Context 21747:** the lower and more substantial of the two fills; very dark grey, sandy, structured and amorphous peat, with wattle and wood fragments, and patches of ash.

**Sample 1820 (BS—VW):** An average-sized assemblage of 42 taxa was recorded; only *Diphasium* scored an abundance of 2. Taxa were distributed between the usual groups—foodplants, dyeplants, weeds of various kinds, and woodland and grassland plants, but none of the AIVs was particularly large. This was an 'average' sample in every way.

**Sample 1819 (GBA):** dark brown, compressed, slightly sandy silt with large and fine twigs (?*Genista*) and rotted wood, ?ash patches, small pebbles, leather fragments and pot.

Parasitic worms: Two subsamples were examined; both were barren.

Insects (/T): Semi-quantitatively rapid-scanned; recording was difficult because the flot was large and consisted mostly of wood fragments. There were various invertebrates, including 'many' mites and 'several' worm capsules. 'Many' fly puparia were noted, those identified being *Leptocera* sp. There were about 45 individuals of 35 taxa (34 beetles, one bug). Main statistics were unexceptional. There were two or three individuals of a few decomposers; there was probably an element of colonisers of organic remains of an unspecifiable nature.

In addition, a 22kg subsample was bulk-sieved after the main period of processing. The residue was rich in wood fragments, with nutshell and moss, mammal bone and charcoal all recorded as common; there was also some pot, tile, mortar, fish and bird bone, snails, shellfish and slag.

**Cut 6931:** one of a series of pits including Cut 6867 (*q.v.*, under Tenement 'R'), in the backyard behind Tenement C. It was about 1.2m across and 0.3m deep. Dated to Period 5B, but chronological position in the sequence uncertain.

**Context 6947:** the second-to-lowest context; a very dark grey, compact peaty clay loam with wood and charcoal flecks.

**Sample 1296 (Spot):** this sample was much attacked by fly larvae when it was examined; it consisted primarily of *Prunus spinosa* stones.

**Plants (/M+):** The whole sample (0.65kg) was examined. There were abundant *Prunus spinosa* stones (score 3), with scores of 2 for *Linum usitatissimum* (seeds), *Agrostemma githago* (seed fragments), *Triticum/Secale* ('bran'), and *Anthemis cotula* and *Lapsana communis* achenes. Faecal concretions also scored 2 and there is little doubt that this deposit was primarily faecal in origin. The AIV for FOOS was very high (50, rank 2), that for FOOO (10, equal rank 1) exaggerated by the linseed component. The high score for sloe stones accounts to some extent for the very high AIV for the hedgerow group, RHPR (24, rank 1), and woodland group QUFA (21, equal rank 5), but other probable foodplants that originated in such habitats—*Crataegus monogyna*, *Prunus domestica* ssp. *insititia*, *Malus* (seeds and endocarp)—are also implicated here. The *Agrostemma* seed fragments are consistent with so many other examples from this and other sites of weed seeds milled with grain; they partly account for the high AIV of 36 (equal rank 5). Also present in this group was one of the rather few (16) late Anglo-Scandinavian records for *Chrysanthemum segetum* (all were Period 5A or later).

**Sample 1297 (Spot: bone):** a part skeleton of ?domestic cat, *Felis* cf. *domesticus* showing transverse knife cuts on frontal bones, consistent with skinning.

## Cuts between Tenements C and D

**Cut 14723:** a linear trench about 0.6m across and 0.3m deep (as seen on section), between Tenements C and D towards the front of the site; associated with a line of posts or stakes. At least two fills, the upper one sampled. Various dates to Periods 4B, 5A and 5B; apparently now regarded as of 5B date.

**Context 14694:** very dark grey, sandy, clay loam with patches of yellowish-brown ash; the topmost fill.

**Sample 1068 (Spot):** a concentration of fly puparia in a dry silty matrix; J. Phipps's examination yielded identifications of a large number of *Musca domestica*, of which very few were unemerged, two *Stomoxys calcitrans* and a single *Leptocera* sp.

**Sample 1072 (Spot):** well-rotted fragments of willow (*Salix* sp(p).) wood with some small lumps of buff-coloured calcareous material—perhaps mortar or lime?

**Sample 1089 (Spot):** three fragments, the largest 25mm long, of stem material of clubmoss, *Diphasium complanatum*.

## Deposits not properly located archaeologically

In the following two cases, information has not been sought or the context has not been located accurately on the site:

**Context 7668:** 'horizontal timber'.

**Sample 997668:** unidentified twig fragments (*sf* 2082).

**Context 7804:** dump.

**Sample 646 (Spot/C14):** charcoal, including hazel, from which an uncalibrated radiocarbon date of ad840 (HAR-3089) was obtained.

**Sample 697 (Spot):** charcoal, including oak, from which an uncalibrated radiocarbon date of ad770 (HAR-3088) was obtained.

**Context 14005:** archaeological details not requested (?from Tenement C).

*Sample 763* (GBA): no action to date.

**Context 14646:** an area of at least 1.6 x 1.4m on the boundary between Tenements B and C, probably mostly on the C side; white/orange ash with 30% charcoal flecks.

*Sample 1028* (Chemical): light grey wood ash with traces of charcoal; no further analysis undertaken.

*Sample 1882* (Spot): a mass of debris concreted into a loose, vesicular structure with calcium carbonate; perhaps a tufa formed naturally at the site.

*Sample 1932* (Spot): a single ?modern snail (*Cepea hortensis*) shell.

*Sample 921925* (Spot): fragments thought to be rope (sf 10210) and identified by P. R. Tomlinson as bast fibres.

### *Tenement D*

This tenement had a more complicated history of building, with the single-roomed Structure 5/7 on the rear part of the front of the plot being replaced by two-roomed Structure 5/8.

### **Structural elements in Tenement D**

**Context 1385:** a horizontal timber, part of the sill beam for Structure 5/8

*Sample 78* (Spot): mid-dark grey brown, plastic to crumbly, rather heterogeneous sandy clay silt, with traces of stones 2020mm, and of charcoal, and with minor matrix components of buff silt, grey silt, yellowish patches and pale 'ashy' material. This was presumably the matrix into which the timber was set.

A 1kg subsample was requested but does not appear to have been processed.

### **Fence 6530**

**Context 6528:** post in Fence 6530. A spot find of 'unknown material' was labelled with this context number; it is assumed to have been associated with the post, but the site record does not permit confirmation of this.

*Sample 1070* (Spot): a compressed mat of stem fragments, mostly only 10-20mm long, the whole sample being about 100 x 100 x 10mm; although on initial examination the epidermis present could not be matched exactly to *Linum usitatissimum*, P. R. Tomlinson records that the remains were flax.

**Context 14615:** part of Drain 33224, running through the Tenement D buildings from front to back; a small member running across the drain, about halfway along the front section.

*Sample 998* (Wood): This may be the same as Timber 8544, which was not been submitted for identification.

**Context 14618:** another small cross-timber towards the south end of the N section of the drain.

*Sample 999* (Wood): This may be the same as Timber 8545, which was not been submitted for identification.

**Context 29119:** a fence running E-W, between phases of building on Tenement D. It met 5982 at its W end and 5852 at its E to form three sides of a rectangular shape.

*Sample 1880* (Wood): Ten pieces of wood were examined: six were willow (diameter range 16-31mm, mean ring count 11.5), the rest being birch (2 pieces, 25-35mm, 9.5 rings), hazel (1, 22mm, 9 rings) and oak (1, 30, 25); none of the material was compressed.

## Deposits associated with Structure 5/7

### Floors and other deposits in Structure 5/7

**Context 29577:** an extensive layer immediately to the S of 29572 and at the same level (middle to rear of building); dark reddish-brown peaty clay loam with 5% inclusions of ash, charcoal and clay; considered either to be a backfill deposit within 5/7 or to consist wholly or in part of redeposited Period 4B material from the digging of the construction trench for 5/7.

**Sample 1982 (GBA):** mid-dark grey-brown, crumbly, humic sandy clay silt with traces of small limestone fragments and of wood and large bone fragments.

**Parasitic worms:** The subsample examined yielded two *Trichuris* eggs.

**Insects (/T):** Insects included ‘many’ fly puparia (most of those examined being *Limosininae* sp.), ‘several’ mites, two cladoceran ephippia, a human flea, a single *Nosopsyllus* sp. and various other remains. The beetle and bug assemblage was quite large (N = 153, S = 74). Main statistics were of no special note, except for a large proportion of ‘rd’-coded taxa (% N RD = 24). There were 15 *Lathridius minutus* group, together with *Ptenidium* sp. and *Atomaria nigripennis* (8), *Carpelimus bilineatus* (6), *Acritus nigripennis*, *Carpelimus fuliginosus* and *Mycetaea hirta* (all 5) and *Neobisnius* sp. and *Cryptophagus* sp. (4). These, and much of the rest of the list, suggest a mixture of ‘house fauna’ and the oxyteline association. If this was a dump, it was perhaps of house floor debris already or subsequently colonised by taxa favoured by fouler conditions.

In addition, a subsample of 9kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 14778:** an irregular area of at least 1.3 x 0.6m; light bluish-grey ashy loam; probably contemporary with Structure 5/7.

**Sample 1222 (GBA):** light yellowish-brown, wholly unconsolidated sandy silt, perhaps ash- or mortar-rich.

**Plants (/M):** Only a rather poor assemblage of 28 taxa was recorded, though they included many kinds recorded repeatedly from these deposits, amongst them holly leaf fragments, madder, clubmoss and hop. All were present with an abundance of 1. Amongst the other components of the residue, mammal bone and charcoal both scored 2 and trace amounts of burnt and unburnt fish bone, burnt mammal bone, eggshell, oyster shell, pottery and at least one respiratory process from a syrphid larva—usually associated with foul, standing water.

**Parasitic worms:** The two subsamples examined both yielded traces of *Trichuris* eggs.

**Insects (/T):** This subsample was recorded very rapidly. Twenty-five individuals of 20 beetle taxa were noted, only *Aglenus brunneus* with more than two. In view of assemblage size and recording method no significance can be attached to the rather bland main statistics. Non-beetles were rare, although there were a few *Leptocera* puparia, single *Musca domestica* and *Melophagus ovinus* puparia, and ‘several’ mites.

### Fill of feature within Structure 5/7

**Cut 29726:** a cut containing a box-like structure of vertical planks, at the far south-eastern corner of Structure 5/7; the cut was roughly rectangular, about 0.7 x 0.5 m and at least 0.5 m deep with three fills (which may include some redeposited Period 4B material)..

**Context 29576:** perhaps the uppermost and the most substantial fill layer; silty black material with appearance similar to peat, though granular rather than smooth.

**Sample 1987 (GBA):** dark yellow-brown, crumbly to brittle, layered, somewhat heterogeneous, slightly sandy silt with dark and lighter patches.

Insects (/T): There were rather few insect remains, including 'many' *Damalinia* sp., some ?*Pediculus humanus*, an adult sheep ked and 45 individuals of 35 beetle taxa. Over a fifth of the latter were 'outdoor' forms. There were five *Lathridius minutus* group and three *Cryptophagus* sp., but only one or two individuals of each of the remaining taxa. There was probably a small 'house fauna' component, but the assemblage was not easily interpretable.

*Backfill in Structure 5/7 and other deposits forming between phases of building*

**Context 29572:** an extensive backfill or dump layer in the NW quarter of Structure 5/7, between thick, squared timbers. A dark brown peaty loam, with inclusions of wood, charcoal, clay and ash, up to 0.08m thick.

*Sample 1998 (GBA):* mid grey, crumbly, somewhat heterogeneous (mm scale), slightly humic, slightly sandy, slightly clay silt and herbaceous detritus, with traces of stones 6-60mm, wood fragments and hazel nutshell. A 1kg /T was asked for but apparently not processed.

Plants (/T3, 2kg): About 30-40% by volume of the rather small residue was sand and gravel, the rest decayed bark with some wood and charcoal. There was a low concentration of seeds, all present in trace amounts, the total number of identifiable taxa amounting only to 20, a depauperate mixture of the same types seen in so many of these deposits.

Parasitic worms: The single subsample examined was barren.

Insects (/T3): Invertebrates were quite abundant, the numerous beetles being accompanied by a range of other remains including many mites. *Carpelimus bilineatus* (31 individuals) was the most common beetle, followed by *Lathridius minutus* group (25), *Xylodromus concinnus* and *Atomaria nigripennis* (10 each), and a *Cryptophagus* (6). There were smaller numbers of both house fauna (including human fleas) and species indicative of rather damper conditions.

Outdoor forms were unusually rare (PNOB = 2), so the deposit (or at least its fauna) may have formed in a very protected environment.

A subsample of 9kg was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 2000 (Spot):* avian eggshell; no further analysis undertaken.

*Sample 2001 (Spot):* avian eggshell; no further analysis undertaken.

**Context 9721:** a narrow strip, widening out to be at most 2m wide, running for 5m through the middle of the outline of the rear part of the two-room building (5/8), and dating to the period between phases of building; very dark grey peaty loam with small wood chips.

*Sample 461 (GBA):* mid-dark brown, plastic to crumbly, humic silt, with traces of charcoal, rotted wood and silt lenses.

Insects (/T): Insects were only moderately abundant, with 102 individuals of 66 beetles and bugs and other remains including 'many' fly puparia (there was a single *Melophagus ovinus*) and 'several' beetle larvae. There were also 'many' mites.

The outdoor component amounted to about a quarter of the individuals (% N OB = 24) and diversity was high ( $\alpha = 81$ , SE = 15). Only about half of the assemblage consisted of coded decomposers (% N RT = 51), with a large proportion of these (42%) being coded 'rd'. No species was very abundant, although there were seven *Lathridius minutus* group and five individuals of a *Cryptophagus* species, and there was an ecologically mixed group of decomposers. Perhaps this was background fauna or dumped or scattered material.

Notable was the record of *Chlaenius vestitus*, a large bright green waterside ground beetle rarely found at Coppergate.

**Context 14898:** recorded only in the NE corner of the excavation, against the shoring, this deposit of very dark grey silty amorphous peat mixed with black sandy ash probably lay outside the cut for Structure 5/8 on Tenement D, being deposited between the two phases of building. It was probably at least 3m in length.

*Sample 1126* (GBA): very dark grey, crumbly, charcoal-rich sandy silt with lumps of rotten iron-rich sandstone and a fragment of cloth.

Plants (/M): A rather small assemblage of 34 taxa was recorded, of which only *Chenopodium album* was present at a score of 2 (charcoal scored 3). The foodplant component was restricted to three taxa, as were taxa scored in DYES; capsule fragments of flax constituted the sole representative of fibre/oil plants. Other components of the residue included *Daphnia* ephippia, oyster shell, pottery, fish and mammal bone and brick/tile.

Insects (/T): The only insects were single individuals of two beetle taxa and two fly puparia.

**Context 14973:** a dump below Structure 5/8 and to the N of 5/7; below **14297** by two layers. An area of at least 3 x 1m of dark grey ashy, peaty loam, with flecks of ash, charcoal and clay, and patches of pale yellow ash. It lay to the N of Cut **14970** and abutted the cut for the drain running through Structure 5/8 on Tenement D (Cut **14589**).

*Sample 1261* (BS—VW): The assemblage of 41 taxa was near the average for the period. Only *Sambucus nigra* scored 2, the remainder 1. There was a mixture of weeds and waste ground taxa with only a very modest component of 'useful' plants, including two dyeplant and seven foodplant taxa. Traces of ?charred bread were also recorded.

*Sample 1262* (GBA): no record of lithology made in the laboratory.

Parasitic worms: Two subsamples were examined; both yielded traces of *Trichuris* eggs and one also a single *Ascaris* egg.

Insects (/T): There were 'several' fly puparia and mites, and about 55 individuals of 41 beetles and bugs, rather rapidly recorded. In view of this there was nothing of special note in the main statistics. There were four *Carpelimus bilineatus* and eleven taxa with two individuals. Perhaps this was wholly background fauna, or there were in addition the first invaders of an oxyteline association.

*Sample 1258* (Spot): this sample was examined by J. Phipps, who noted a fragment of hazel nutshell and some beetle fragments, the latter identified as an adult of *Blaps* sp.

*Sample 1264* (Spot): J. Phipps noted beetle fragments from this sample but the material was not examined further.

*Sample 1272* (Spot): although sampled as possible rope fragments, these plant remains could not be identified more closely by P. R. Tomlinson than '?woody fragments'.

*Sample 1273* (Spot): avian eggshell; no further analysis undertaken.

*Sample 1274* (Spot): avian eggshell; no further analysis undertaken.

*Sample 1275* (Spot): a single modern snail (*Helix aspersa*) shell.

*Sample 1294* (Spot): examined by J. Phipps, who noted beetle remains (which were not examined further).

**Context 21796:** a horizontal timber in a strip of deposits by the shoring about mid-way along the E side of the site; the Timber no. was **8888**. Part of the sequence between the two phases of building.

*Samples 1906* (Spot) and *2059* (Spot): these were both partly-fused masses of charred bread/club wheat berries, associated with the timber and given the same context number.

The timber was oak (*Quercus*), about 120mm in diameter, and a series of 67 rings from its

cross-section gave a date for the wood of AD942-1008 and a felling date of AD1009-19.

**Context 29263:** a very large and thick dump within Structure 5/7, about 8 x 4m across and up to 0.8m thick; very dark grey, slightly clayey loam, with 15% ash and charcoal and patches of clay, ranging from dark grey to reddish-brown. Turves were marked on the section for this layer.

*Sample 2296* (Spot): a whitish spherical object of 18-19mm diameter, somewhat foliated within, and with a grooved surface. This was a ball of beeswax (sf 15666) that had presumably been used for waxing twine or thread.

**Context 29494:** Backfill in 5/7.

*Sample 1965:* mid-dark grey, crumbly, slightly heterogeneous, sandy silt with traces of stones 2-20mm, charcoal, ?ash, and wood fragments and fine grey-brown sand; some arthropod damage (?in store).

Parasitic worms: The single subsample examined was barren.

Insects (/T): Insect remains were abundant, with 144 individuals of 70 beetle and bug taxa, 'several' fly puparia and small numbers of other remains. There were also 'many' mites and huge quantities of fragments of fly pupae, the latter accounting for a large part of the flot but possibly of modern origin. Main statistics of the beetle and bug assemblage were close to the means for the site. There were 23 *Carpelimus bilineatus* and seven each of *C. fuliginosus* and a *Euplectini* sp. The other more abundant taxa included other components of the oxyteline association. There was a single *Psammoecus bipunctatus*, found in litter by water; it was also recorded from the Lloyds Bank site, Pavement.

In addition, a subsample of 7kg was bulk-sieved after the main period of processing; it has not been sorted.

**Cut 14331:** a cut of about 0.45m across, as seen in section, and perhaps 0.35m thick. The single sampled context was the middle of three fills. The cut lay in the south-west corner of the outline of the front room of Structure 5/8, but between building phases.

**Context 14324:** olive-yellow loamy ash.

*Sample 721* (Spot): fine silt with some buff-coloured clay (?like fuller's earth).

### Deposits associated with two-roomed Structure 5/8

#### Floors in Structure 5/8

The sequence here was truncated and thus hard to evaluate.

**Context 1386:** a possible floor deposit towards the N end of the rear room of Structure 5/8 on Tenement D, about 0.3 x 0.3m in extent; a black clay loam with some organic material. Apparently early in the sequence of floors.

*Sample 76* (GBA): crumbly humic silt, rather heterogeneous, with some wood fragments; there was evidence of considerable decay during storage.

Plants (/M\*): A 0.25kg subsample was examined for plant remains; an assemblage of 42 taxa (near the mean for Period 5 samples, most of which were of 0.5kg) was recorded. Several taxa scored an abundance of 2: *Chenopodium album* (seeds), *Raphanus raphanistrum* (pod segments/fragments), Gramineae (caryopses) and *Carex* sp(p). (nutlets) but this group offers no particular interpretative insight. There were also quite large numbers of fly puparia.

No groups were especially well represented within the series of samples as a whole; CHEN and SECA were most important for this particular assemblage. There were very modest amounts of foodplants and dyeplants, too.

**Context 1404:** quite a thick deposit of black clay loam immediately overlying Sill Beam 1599. Thus probably a floor; in the rear room of Structure 5/8; it was cut by the Victorian cellar floor. Nothing overlay it!

*Sample 991404* (BS—V): a few remains recorded by rough sorting the residue from this sample were identified, but the data have not been included in the main corpus. There were some large foodplant remains (*Corylus*, *Prunus spinosa*, *Avena*, *Triticum* and ?*Secale*, as well as several weed taxa.

*Sample 448* (Spot): a small mat of the moss *Neckera complanata* in a silty matrix; this species is one that is often associated with faecal deposit, sometimes in the form of small pads, invested with faecal matter rich in worm eggs.

**Context 9779:** immediately N of 9772 and stratigraphically above it, this floor deposit in 5/8 was about 0.4 x 0.2m in extent and comprised black silt loam with wood chips and a sprinkling of very fine sand. The remarks concerning later intrusion in 9772 apply here, too.

*Sample 583* (GBA): dark grey, crumbly, humic, slightly sandy silt, with traces of wood fragments, and moderate recent damage by arthropods.

Parasitic worms: The single subsample examined was barren.

Insects (/T): There were abundant fly puparia, all those examined being Limosininae sp., 'several' mites, an adult *Melophagus ovinus*, and 76 individuals of 47 beetle and but taxa, but hardly any other remains. Four-fifths of the individuals were accounted for by the RT component, with a substantial proportion of 'rd' forms (about a quarter). *Mycetaea hirta* was much the most abundant species (10), while there were five *Aglenus brunneus*, six taxa with three individuals and the rest with ones and twos. It seems like that there was mouldy organic matter to support *M. hirta*, but there was little other evidence to indicate ecological conditions.

**Contexts 14294, 14296-7, 14299, 14300-1:** these were, in much of its area, the uppermost floor deposits in Structure 5/8. They were overlain by thick dumps 14200 and 14184, but also by floor layer 14350 in at least one part. The samples represent a series across the whole floor area were originally designated as Samples 705 (A, B, D-K), 706C, 707-9, 714; limitations of computer database storage necessitated the re-numbering of those with single-letter suffixes as 70501-2, 70504-70510 and 70603. With the exception of 70603 (706C) and 707 (from 14296), they were all recorded as coming from 14297, but this large context was later resolved into one extensive layer with several separate floor contexts overlying it in parts. For the present purpose, the original context numbers have been retained, particularly because some of the sampled areas cut across the later-defined context boundaries.

**Context 14296:** a very dark grey humic clay loam, with charcoal flecks, up to 0.03m thick, in the NE corner of the area of 5/8.

*Sample 70603* [formerly 706C] (GBA): not described in the laboratory.

Plants (/T3, 2kg): The rather small residue was about equally (by volume) organic and inorganic, the former fraction mostly charcoal and bark, the latter sand and gravel. Only 29 identifiable taxa were recorded, of which most were weeds of some kind; there were traces of food and dyeplants but there was no particular character to the assemblage.

Parasitic worms: Two subsamples were recorded though their numbering is ambiguous (they are listed as context 14297, sample 707); it is most likely that they are from 70603. One of the subsamples was barren, the other gave a trace of *Trichuris* eggs.

Insects (/T, /1): The /T has vanished from the record, but the 3kg /1 was fully processed and detail recorded, having been selected as of special importance. Beetles were abundant, and with a single bug of the groups used in the statistics gave an MNI of 288 (S = 106). There were some other

arthropods, including ‘many’ scale insects, ‘several’ beetle larvae, puparia and mites, an adult and a puparium of *Melophagus ovinus*, and a single louse. Main statistics were not far from those for many of the P5B house floors, with diversity moderately high ( $\alpha = 61$ ,  $SE = 6$ ), a modest ‘outdoor’ component (% N OB = 11), and ‘rd’ taxa quite important (% N RD = 17). The more abundant taxa included a mixture of ‘house fauna’ and oxyteline associates (cf. many other samples!), but in this case the most abundant species was *Aglenus brunneus*, with 34 individuals. ‘House fauna’ taxa included *Lathridius minutus* group (16), *Xylodromus concinnus* (11), *Crataraea suturalis* (8), *Cryptophagus scutellatus* and *Atomaria nigripennis* (7 each), *Anobium punctatum* (6), and *Cryptophagus* sp. and *Atomaria* sp. (5). On the other hand there were: *Carpelimus bilineatus* (13), *C. fuliginosus* (11), *Anotylus nitidulus* (9), *Cercyon analis* and *Neobisnius* sp. (7), and *Acrotrichis* sp., *Oxytelus sculptus* and a euplectine (6).

There were rather large numbers of fly puparia of *Leptocera* and *Sepsidae*, with some *Nemopoda*.

*Sample 707* (GBA): this was a ‘general sample’ of the deposits around the area taken as *Sample 70603* (*706C*); no action to date (but see note above regarding numbering confusion).

**Context 14297**: black humic clay loam up to 0.06m thick.

*Sample 70501* [formerly *705A*] (GBA): mid-dark grey-brown, crumbly to brittle (and slightly laminated in places), sandy clay silt, with traces of large limestone fragments and some shellfish fragments.

Parasitic worms: The single subsample examined was barren.

Insects (/1): This material was selected for examination via a 3kg ‘detail’ subsample. The concentration of insects was not especially high, 146 individuals of 81 taxa being recovered. Diversity was high ( $\alpha = 75$ ,  $SE = 11$ ) and the outdoor component proportionally large (% N OB

= 20). Other statistics were not much different from those for other 5/8 floors.

A set of species much like those seen in many other samples in this group occupied the upper ranks. There were 14 *Lathridius minutus* group, with *Carpelimus bilineatus* (8), *Xylodromus concinnus* (7), *Cercyon analis* (6), *Carpelimus fuliginosus* and *Aglenus brunneus* (5 each), and *Atomaria* sp. (4). This pattern was continued into the lower ranks.

There were ‘many’ mites, and ‘several’ fly puparia (including *Melophagus ovinus*, also represented by remains of an adult) and worm capsules.

*Sample 70502* [formerly *705B*] (GBA): mid-dark grey-brown, crumbly to brittle, humic, slightly sandy silt, with traces of stones 60-200mm, large bone fragments and ?charcoal, and some lumps of darker, greasier material and paler and more reddish streaks./M subsample described as being charcoal-rich.

Plants (/M): A rather modest assemblage of only 35 taxa was recorded; of these, *Corylus* and *Juncus bufonius* scored abundances of 2, the remainder 1. There was also a large proportion of charcoal in the residue. ‘Useful’ plants were limited to a small range of foodplants, including the possible flavourings *Apium graveolens*, cf. *Anethum graveolens* and *Satureja hortensis*. There were also traces of two dyeplants—*Diphysium* and *Rubia*. Otherwise the assemblage was a mixture of taxa from a variety of possible habitats, though the largest single group were annual nitrophile weeds, with a fairly high proportion of grassland taxa, including *Danthonia*, which has been mentioned elsewhere as a possible indicator of imported turves.

Insects (/T): Recorded by a rapid inspection only. No taxon was abundant in a group of perhaps a few tens of beetles. This was probably a small house fauna-dominated assemblage.

*Sample 70504* [formerly *705D*] (GBA): mid-dark grey-brown (though rather variable throughout the sample), crumbly to brittle, slightly humic, slightly

sandy clay silt with traces of charcoal and small bone fragments and inclusions of pinkish, buff and greyish clay.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects: A rapid inspection was made, a modest range of insects typical of Anglo-Scandinavian deposits at this site being noted. There was an adult *Melophagus ovinus*.

Sample 70505 [formerly 705E] (GBA): mid-dark grey-brown, crumbly, slightly humic, slightly sandy clay silt with some wood fragments, herbaceous plant detritus, bone, leather and brick/tile.

Plants (/T3, 2kg): Even after treatment with dilute sodium pyrophosphate solution, there were still some clay clasts which were difficult to disaggregate, so the rather small, mainly mineral residue is probably larger than it would have been had all the fine (<300 µm) material been removed. About 30% of the residue was organic material, mainly bark and charcoal, but all the material was rather battered and worn (in this case, perhaps most consistent with the route into the deposits rather than decay during storage or the effects of processing). The small assemblage of identifiable plants (31 taxa) was mostly weeds with small amounts of dyeplants (though *Diphysium* scored '2' on the four-point abundance scale used) and probable foodplants.

Parasitic worms: The single subsample examined was barren.

Insects (/1, /T): This was a 3kg fully processed subsample 'detail' recorded. There were about 50 scale insects, 12 human fleas, 'several' fly puparia and mites, and assorted other remains including an adult *Melophagus ovinus*. An assemblage of 211 individuals of 103 beetle and bug taxa was recorded. Main statistics were not unusual for this context, and the more abundant taxa resembled those in Sample 70603/1. *Aglenus brunneus* was the most numerous (15), followed by *Lathridius minutus* group (12), *Carpelimus fuliginosus* (10), *Cercyon analis* (8), *Carpelimus bilineatus* and

*Cryptophagus* sp. (7), *Xylodromus concinnus* (6), *Anotylus nitidulus*, *Crataraea suturalis* and *Anobium punctatum* (5), and several equally assorted taxa at a frequency of 4 or 3.

/T: A rapid inspection showed a small group of insects of no outstanding character to be present—doubtless similar to that from the /1 subsample. A single larval apex, apparently of *Blaps* sp., was noted. There were a few *Leptocera* sp. puparia.

Sample 70506 [formerly 705F] (GBA): mid-dark grey-brown, crumbly, slightly humic, slightly sandy silt.

Insects (/1): A 3kg fully-processed 'detail' recorded subsample. Insects were numerous, with 240 individuals of 101 beetle and bug taxa and other remains which included over 50 scale insects, several lice, mites and Cladocera ephippia, 'many' fly puparia (*Leptocera* sp.), Parasitica including numerous Proctotrupoidea, five human fleas, and an adult and a puparium of *Melophagus ovinus*. Main statistics followed the pattern typical of this context and the more abundant taxa were also typical; this sample fell into the group with abundant *Aglenus brunneus* (17).

There was a specimen of *Chlaenius vestitus*.

Sample 70507 [formerly 705G] (GBA): dark grey-brown, crumbly humic silt with stones, bone, pale flecks, wood fragments and tiny lenses of buff clay.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/1, 3kg): The subsample gave a large insect assemblage. There were at least 21 human fleas, but also two other flea species: *Nosopsyllus* sp. (one female head) and *Ctenophthalmus nobilis* (three male abdomens). There were also 'many' lice (recorded during sorting but subsequently lost to the record) and mites, an adult *Melophagus ovinus*, and 'several' bug larvae. The beetles and bugs included many small scraps of cuticle which could not be reliably quantified and were often not closely

identifiable. It was estimated that there were 332 individuals of 105 beetle and bug taxa (one of the longest species lists from the site). Main statistics were not unusual, apart from a very high proportion of individuals of taxa coded 'rd' (% N RD = 36), accounting for almost half of the coded decomposers. *Lathridius minutus* group (including some male genitalia of *L. pseudominutus*) was represented by 80 individuals, and there sp., eight each of *Mycetaea hirta* and *Aglenus brunneus*, five *Cryptophagus scutellatus* and *Enicmus* sp. and various other indicators of a 'house fauna' group, reinforcing the evidence from the fleas.

Some other components were present, however, particularly 28 *Acritus nigricornis* and six *Omosita discoidea*. The long list of 'outdoor' taxa, often represented by fragmentary remains, was noteworthy and paralleled those seen in some other 'floor' assemblages from this site. This appeared to have been a rich, breeding group of decomposers, most likely to have exploited fairly dry conditions. There may have been 'background fauna', but remains may have entered in some other way, such as in predator droppings or by infiltration from roofing.

Puparia included quite large numbers of *Leptocera* sp. and some Sepsidae.

*Sample 70508* [formerly 705H] (GBA): mid-dark grey-brown, crumbly to brittle humic, slightly sandy clay silt with some charcoal, wood fragments and bone. Clay, where unbroken, showed a slightly layered jumble of lithology at 5mm scale.

Parasitic worms: The single subsample examined was barren.

Insects (/1): Rapidly examined only as the flot appeared to have degraded as a result of drying out. Insects were not very abundant but there was a typical Anglo-Scandinavian group. A human flea was noted.

*Sample 70509* [formerly 705J] (GBA): mid-dark grey-brown, crumbly, humic, slightly sandy silt, with stones >20mm, limestone fragments >10mm, some bone and small clay lumps.

Parasitic worms: The single subsample examined was barren.

Insects: In addition to a modest group of beetles (N about 60; S = 39), there were 'several' mites and assorted other remains including an adult *Melophagus ovinus*. Recording was by a rapid scan. 'Outdoor' forms were proportionally well represented (% N OB = 17) and decomposers numerous (% N RT = 75). The RD component was very large (% N RD = 42, 56% of the RT group). Most abundant was *Lathridius minutus* group ('many'), but there were smaller numbers of several other house fauna taxa.

*Sample 70510* [formerly 705K] (GBA): lithology similar to other samples from this context.

Parasitic worms: The single subsample examined was barren.

Insects (/1): This was a subsample of 3kg, fully processed but not 'detail' listed. There were 104 beetle and bug taxa, represented by 260 individuals. In addition there were 'many' scales, at least 50 in number and including a large proportion of *Chionaspis salicis*, 'many' mites, 'several' puparia and worm egg capsules, five human fleas, a louse, an adult *Melophagus ovinus* and a variety of other remains. Main statistics did not deviate significantly from those for the other samples from this context and the species list resembled those from, for example, 70506 and 70505. This sample was notable for providing the only record of the ground-living weevil *Tropiphorus terricola* from the site.

*Sample 708* (Spot): avian eggshell; no further analysis undertaken.

*Sample 709* (GBA): (this was a 'general layer sample taken just S of 70501'.

Parasitic worms: the single subsample examined yielded a trace of *Trichuris* eggs.

*Sample 714* (GBA) mid-dark grey-brown, crumbly, slightly heterogeneous sandy silt with ashy patches

and traces of stones 6-60mm (taken from around sample point for 70509).

Insects (/T): There were only modest numbers of insect remains, with 75 individuals of 47 beetles and bugs and, among other remains, 'several' mites and scale insects (mostly *Chionaspis salicis*), an adult sheep ked and a human flea. The main statistics were about normal for the 5/8 floors. There were nine individuals each of *Lathridius minutus* group and *Aglenus brunneus*, but no more than three of any other species. Subjectively this group resembled a small random extract of an assemblage not unlike that of Sample 70603.

In addition, a subsample of 12kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 14350:** floor layer above or contemporaneous with 14297 and its associated contexts. It covered the wood-lined drain.

*Sample 923* (GBA): no action to date.

#### *Drain within Structure 5/8*

**Cut 33224 (=14589 = 21803):** a narrow linear wood-lined drain perhaps 0.3m wide and about 0.25m deep, running through the 'two-roomed' Structure (5/8) on Tenement D for a length of over 6m and perhaps having a total length of as much as 12m. Three cut numbers were assigned to parts of its course. The first context here was recorded from that part numbered Cut 33224. Appeared to be contemporaneous with 14297 and related contexts. Plank-covered in the front room.

**Context 14581:** dark grey silty loam with much peaty material and iron staining, especially on planks of drain lining.

*Sample 960* (Chemical): mid-dark brown, plastic to crumbly, very heterogeneous, slightly sandy, silty clay, with traces of stones 2-6mm and large bone fragments, and modest amounts of ash. A 16kg subsample was bulk-sieved after the main period of processing, but has not been sorted.

*Sample 969* (GBA): dark grey-brown, plastic, slightly sandy clay silt, with traces of stones 6-60mm, ash and wood fragments, and hazel nutshell (a second subsample was dark grey, plastic to crumbly, sandy clay silt with woody detritus, small limestone fragments, traces of charcoal, twig and wood fragments).

Parasitic worms: Of the two subsamples examined, one gave two *Trichuris* and one gave a single *Ascaris* eggs.

Insects (/T, /1): A /T subsample was processed in addition to a /1, apparently through an administrative slip. The /1 subsample produced 'many' fly puparia, but few other remains, apart from an assemblage of 64 individuals of 38 beetle taxa. Preservation was rather good. Main statistics were of very little interpretative value. There were eight *Carpelimus fuliginosus*, five *Aglenus brunneus* and four *Carpelimus bilineatus*; the nature of the group was not very clear.

The /T group was smaller, with 44 individuals of 35 beetles, 'several' scale insects and fly puparia, and an adult and puparium of *Melophagus ovinus*. Main statistics were again not helpful. In this assemblage there were four *Lathridius minutus* group, three *Cercyon analis*; interpretation was again uncertain.

This deposit was perhaps a heterogeneous one, with some invading or breeding insects, although the remains may have been introduced in dumped material.

In addition, a 16kg subsample was bulk-sieved after the main period of processing. The residue included pot, daub, slag, charcoal, nutshell, concretions, mammal and fish bone, leather, shellfish and eggshell.

**Cut 21803:** the contexts sampled from this part of the cut are thought to have formed in the gully in that part of its course that lay inside the building, in the rear room.

**Context 21886:** very dark grey-brown, slightly clayey silty loam with extensive iron staining; it was recorded at the time of sampling as having heavy modern contamination.

*Sample 1841* (BS—VW): With 44 taxa, this assemblage was close to the period mean, though all the taxa were recorded in small amounts. There were modest components of weed taxa in CHEN and SECA, and a rather high AIV (18) was achieved by weeds in ARTE; foodplants were rather limited in their diversity, and there was a single record for a possible dyeplant (*Humulus*—also scored with FOOF, HERB, ALNE, QUFA, RHPR).

*Sample 1839* (GBA): light-mid grey-brown, crumbly, slightly sandy, slightly clayey silt, with traces of ash.

Parasitic worms: The single subsample examined gave two *Trichuris* eggs.

Insects: There were only a few arthropod remains, including single individuals of six beetle taxa.

In addition, a 14kg subsample was bulk-sieved after the main period of processing, but has not been sorted.

*Sample 1840* (GBA): mid grey-brown, plastic to crumbly, humic, sandy silt, with abundant mottles at centimetre scale (indications of reduction from ginger to black, via grey-brown).

Insects: The flot was in poor condition and was submitted to a rapid inspection only. There were a few beetles of no special character.

In addition, a 14kg subsample was bulk-sieved after the main period of processing, but has not been sorted.

**Context 1089:** a squarish-shaped patch of backfill in the rear room of building 5/8; it was about 1.2 x 1m and up to 0.1m thick, and comprised very dark greyish-brown wood.

*Sample 61* (GBA): dark brown, crumbly, humic silt with evidence of modern damage by arthropods. Two ‘test’ samples were processed: /T1 was discrete lumps of the deposit, /T2 the loose matrix.

Parasitic worms: The single subsample examined was barren.

Insects (/T1, /T2): The first subsample produced 28 individuals of 22 beetle and bug taxa, and other remains including numerous scale insects (*Chionaspis salicis*), two *Craspedolepta nervosa*, and an adult sheep ked. Over a third (ten individuals) were ‘outdoor’ forms; these included one of only two of the weevil *Strophosomus melanogrammus* from the site. There were five *Lathridius minutus* group but only one or two of the remaining taxa. Main statistics were rather like those of the /T2 assemblage, allowing for the small size of the group.

Subsample /T2 produced a rather larger group of insects (N = 65, S = 37). There were ‘several’ fly puparia, mites and scale insects, but few other remains. Diversity was somewhat low ( $\alpha = 36$ , SE = 8), the outdoor component proportionally quite substantial (12 individuals, % N OB = 18), the RD component important (two fifths of the assemblage) and decomposer diversity quite low (alpha RT = 15, SE = 4). There were 20 (counted) *Lathridius minutus* group, three of a *Cryptophagus* species, and a mixed group of rarer taxa. Presumably the eurytopic and rapidly-invading *L. minutus* group found habitat at or very near the point of formation of the deposit, but the remaining fauna may have been of ‘background’ origin or have included some rapid invaders.

**Cut 14589:** the single sampled fill lay at the rear end of the first segment of the drain, in front of the ‘dog leg’ in the front room of Structure 5/8 (though it was not delineated on any plan or section).

**Context 14624:** yellowish-brown peaty, silty loam with patches of dark grey ash.

*Sample 972* (Spot): sampled for identification of plant material, this ochreous silty deposit contained

some poorly preserved wood fragments but no other remains were recorded; it may have suffered some decomposition in store.

*Backfill in two-roomed structure, 5/8*

**Context 1091:** A very dark grey loam with mortar flecks, isolated cobbles, limestone and wood fragments, about 0.8 x 0.4m and up to 0.35m thick, lying immediately underneath **1089** and interpreted as backfill in the rear room of Structure 5/8.

*Sample 63* (GBA): dark grey-brown, crumbly to greasy amorphous organic material, with traces of small bone fragments and tiny patches of mid-grey clay silt.

Insects (/1): There was some uncertainty in the records pertaining to this material, which has consequently only been superficially examined. A large flot ascribed to subsample /(1) included abundant insects with 'many' large fly puparia; J. Phipps recorded modest numbers of fly puparia, of which the majority were *Musca domestica*, although *Stomoxys calcitrans* was represented by three individuals.

**Context 1315:** A modest patch of about 0.6 by 0.6m, in the same area of Tenement D as Contexts **1089** and **1091**; black, decayed wood with silty loam.

*Sample 66* (GBA): dark grey, crumbly, humic sandy silt, with traces of wood fragments, large bone fragments, shellfish and fly puparia, with evidence of recent damage by arthropods.

A 1kg /T subsample was marked to be processed, but there is no record of this having been done.

A 3kg subsample was bulk-sieved after the main period of processing, but the resultant residue has not been sorted.

**Context 1535:** a rather large area of about 1.6 x 1.2m and up to 0.19m thick, of dark brown peaty clay loam with abundant wood fragments,

interpreted as a backfill in the rear part of Structure 5/8 on Tenement D.

*Sample 62* (GBA): a dark brown silt rich in wood fragments.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/T): Insect remains were rather abundant, with 'many' fly puparia, 'several' insect larvae and Parasitica, two *Pulex irritans* and a variety of other remains. There were also 'many' mites. An assemblage of 108 individuals of 49 beetles was recorded. Diversity was quite low ( $\alpha = 35$ , SE = 6). RD taxa were rare (% N RD = 6). The species list was unusual at Coppergate, although a few similar assemblages have been seen. There were at least 18 *Anthicus formicarius*, about nine *Leptacinus intermedius* and seven *L. pusillus* (relative numbers of these were difficult to determine as elytra were the most abundant part and are hard to differentiate consistently as fossils). The other more abundant taxa were *Anotylus complanatus* and *Monotoma longicollis* (both 6), *Cercyon analis* (5) and *A. nitidulus* (4). Many of the remaining taxa probably co-existed with the community of mouldering, rather foul plant remains indicated by *A. formicarius*, *Leptacinus* spp. and *M. longicollis*, but others appear to have had some other origin, perhaps in the background rain.

In addition, a 4kg subsample was bulk-sieved after the main period of processing; it has not been sorted.

**Context 1575:** A patch of very dark grey clay loam with patches of grey clay, about 1.8 x 0.5m, overlying the W sill beam of Structure 5/8, and probably a backfill deposit.

*Sample 75* (GBA): no action to date.

**Context 9772:** a small area of about 0.8 x 0.6m, originally identified as a probable dump or backfill in Structure 5/8 but heavily disturbed by later activity and containing what is assumed to be intrusive (12th century) pottery.

*Sample 582* (GBA): varicoloured—dark brown, with red-brown to black parts—layered, somewhat heterogeneous, compressed herbaceous detritus, with fly puparia.

Parasitic worms: The single subsample examined was barren.

Insects (/T): This subsample gave a modest insect assemblage including 103 individuals of 76 beetle and bug taxa. Diversity was estimated to be very high mathematically ( $\alpha = 130$ , SE = 28) and about a quarter of the individuals were of ‘outdoor’ species (% N OB = 24). These last included single individuals of five aquatics. *Lathridius minutus* group was, as so often, the most abundant beetle (10 individuals), while there were seven *Acrotrichis* sp., five *Cercyon analis* and only one or two of all the remaining taxa. Subjectively, the more abundant taxa (two or more individuals) were an unusual mix for the site, but obviously the numbers were too small to give this any significance.

The fly puparia (of which there were ‘many’) were mainly Limosiniinae sp., but there were small numbers of *Musca domestica* and *Stomoxys calcitrans*. ‘Many’ mites and beetle larvae were also noted, and there were small numbers of other remains.

In addition, a 21kg subsample was bulk-sieved after the main period of processing; it has not been sorted to date.

**Context 14184:** a thick layer (about 0.5m) covering a very large area in the NE corner of the site (at least 6.25 x 4.5m as seen on plan), this was a dark brown, sandy silty clay loam, with areas of reddish-grey clay; it lay underneath the sill beams and supports for the later building at the front of Tenement D (5/10). Immediately over floor layers **14297, 14300**.

*Sample 700* (GBA): pinkish-grey, slightly silty clay (‘natural’ drift), with some dark grey humic silt/clay around lumps of ‘natural’.

Parasitic worms: The single subsample examined was barren.

In addition, a subsample of 22kg was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 702* (Spot): avian eggshell; no further analysis undertaken.

*Sample 914184* (Spot): sampled by the excavator as ‘?rope’ (sf 3648), this material was only tentatively identified by P. R. Tomlinson as bast, a material likely to have been used for rope (though from one of several possible plant sources).

**Context 14200:** in the same area as **14184**, and probably in fact the same deposit, this was a somewhat irregular area of about 2.5 x 1.1m, about 0.5mm thick, immediately N of the sill beam for Structure 5/10 (Tenement D) at its S end; it was a very dark grey sandy silty loam, containing patches of grey clay.

*Sample 678* (Spot): a small mat of moss with a silty matrix; the taxa identified were *Thuidium tamariscinum* and *Eurhynchium praelongum*. The former was recorded from more than half the Period 5 samples examined, *E. praelongum* rather more rarely. Both are large weft-forming mosses that might have been used for sanitary purposes or in buildings, on floors, and so on.

#### *Other deposits associated with Structure 5/8*

**Context 14574:** archaeological details not requested but thought to be a layer associated with hearth in Structure 5/8.

*Sample 962* (Chemical): no action to date.

**Context 14626:** variously described as a hearth fill or a floor.

*Sample 1204* (Chemical): mid grey-brown, crumbly, sandy humic silt with traces of charcoal, wood chips, (?burnt) bone and hazel nutshell fragments; no further analysis undertaken.

## External layers on Tenement D

### *Deposits to the W of the Tenement D buildings*

**Context 1090:** a deposit which appears to have been above and around a wooden post to the W of the earlier Period 5B building on Tenement D, at roughly the same height as the W wall sill beam for the later building on this Tenement; dark grey loam.

**Sample 71 (GBA):** light grey, crumbly silt with traces of small burnt bone fragments; no further analysis undertaken.

**Context 5895:** a small patch of clay loam with many wood chips and charcoal, to the E of and more or less abutting alignment **5852** (i.e. on the Tenement D side of the C/D boundary) and abutting **5964** to the N and **5893** to the S; about 0.4 a 0.2m in extent. Dated to between the two phases of building.

**Sample 423 (GBA):** mid-dark grey-brown, crumbly to brittle, humic silty amorphous organic material with traces of shellfish

Parasitic worms: There were small numbers of *Trichuris* eggs, together with a single *Hymenolepis* in the subsample examined.

Insects (/T): It was not possible to list this material fully, since it was only recognised as of Anglo-Scandinavian date late in the project. The flot contained many insect remains, subjectively with indications of deposition where there was foul matter. It would be very desirable to record this material if it was a primary surface deposit.

In addition, a subsample of 4kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 7369:** in the same Tenement C/D ‘spine’ as **7352** (listed as deposit to E of buildings on Tenement C), and towards the N end, this was a very dark brown organic layer with a high concentration of straw-like material, about 0.6 x 0.3m; best regarded as on Tenements C/D.

**Sample 260 (GBA):** mid grey-brown, crumbly, rather heterogeneous, sandy amorphous organic material with traces of wood and twig fragments and herbaceous detritus in some parts.

Parasitic worms: The single subsample examined was barren.

Insects (/T): Insects were not very abundant. Forty-two beetles of 31 species were recorded, and there were various other remains including ‘several’ fly puparia (*Stomoxys calcitrans* was the most numerous, with six individuals) and scale insects, a honeybee and a human flea. Bearing in mind assemblage size, the main statistics were not unusual. Only *Lathridius minutus* group (5), *Oxytelus sculptus* (4) and *Platystethus arenarius* (3) were represented by more than two individuals. This may have been background fauna, or there may have also been colonisers of rather foul material.

**Sample 271 (Spot):** lithology not recorded in laboratory but informally described as including ‘much laminated organic matter’ during disaggregation.

Insects (/1): This material was recognised too late in the project to be recorded fully. Preservation of insects was excellent and there were indications of foulness and hints of a ‘house fauna’ element. There were ‘many’ mites and at least four human fleas.

**Context 7488:** on the spine between Tenements C and D, a long narrow strip about 3 x 0.6m, against the building cut for the rear building; very dark greyish-brown, peaty organic material.

**Sample 295 (GBA):** mid-dark grey-brown, crumbly, slightly sandy silty woody and herbaceous detritus.

Parasitic worms: The single subsample examined was barren.

Insects (/T): There were modest numbers of beetles (N = 67, S = 50), and a few other remains; these included scale insects (‘many’ *Lepidosaphes ulmi*

and 'several' *Chionaspis salicis*), mites and an adult *Melophagus ovinus*. Diversity of the whole assemblage and of the decomposers was quite high ( $\alpha = 89$ , SE = 24; alpha RT = 42, SE = 15). Outdoor forms accounted for over a fifth of the assemblage. There were six *Lathridius minutus* group, and three each of an aleocharine, *Monotoma picipes* and an *Apion* species. There were also two individuals of a second *Apion*, a *Sitona* and a *Gymnetron*, so the possibility that the layer received material from hay-like cut vegetation is worthy of consideration.

**Context 7553:** a large area in the spine between Tenements C and D (perhaps allocatable to Tenement D), about 2.5 x 1.5m of dark yellowish-brown loam containing a large amount of straw and wood chips.

**Sample 427 (GBA):** mid-dark brown, crumbly, silty amorphous organic material and herbaceous detritus, with traces of stones 20-60mm, twig, wood and bark fragments and moderate amounts of *Diphasium* (clubmoss) stem fragments. This sample was recorded as having 'large hunks of straw ... ?twisted and bound...' some of which were removed and sent to YAT Conservation Lab, but of which no further record exists. It is possible that some, at least, was clubmoss, since this formed such a large component of the material examined in 1990 when the remainder of the sample was processed (in which no large clumps of matted plant material were noted). Another likely candidate is dyer's greenweed, also recorded in quantity here, as from Anglo-Scandinavian deposits at another York site, 1-9 Micklegate. The history of sample 427 is discussed by Kenward (1991).

**Plants:** P. R. Tomlinson recorded some 'handfuls of *Genista* stems' from this sample, and AH recorded a variety of remains, including walnut and hazel nut, hop, charred wheat and barley, a heather flower, a little moss and a variety of weeds in the residue from the /1 subsample processed for insect remains. Fragments of red wool were also recorded.

The residue from bulk-sieving of the remaining 8kg of the sample in 1990 (which was examined prior

to drying) gave large amounts of *Genista* and *Diphasium*, with traces of *Rubia*. There were legume pods that were probably *Genista* and some of the *Diphasium* stem fragments, it was noted, were bright red, having presumably taken up alizarin from the madder. There were also hop achenes and an abundance of remains of bees.

**Insects (/1, /2, /3):** The first subsample was fully processed but semi-quantitatively 'scan' recorded. Apart from about 36 individuals of 19 beetle taxa there were large numbers of honeybees (*Apis mellifera*), a single *Melophagus ovinus* and a few other remains. Main statistics must be viewed with some suspicion in this case because there were five jars of flot (perhaps 0.5 l.) and recording may not have been as accurate as usual; in addition there was only one abundant taxon, whose numbers were estimated. However, whole-assemblage diversity appears to have been low ( $\alpha = 17$ , SE = 5), even though outdoor taxa were important (% S OB = 33; % N OB = 17). Over half of the assemblage was estimated to be made up by taxa coded 'rd'. Decomposer diversity was very low (alpha RT = 6, SE = 2). Many of these statistics were gravely influenced by the presence of 'many' *Lathridius minutus* group, accounting for nearly half of the assemblage. There were no more than two individuals of any other taxa. It is possible that the *L. minutus* group were autochthonous (but what they colonised is uncertain), the rest of the assemblage being background fauna or colonisers which did not have the opportunity to develop substantial populations.

The second subsample produced four jars of flot. There were four adult *Melophagus ovinus*, a human flea, 'many' honeybees, a rather small group of beetles (N = 56, S = 31), and various other remains. This group showed similar characteristics to that from subsample /1, although in a more modest form. Diversity was quite low ( $\alpha = 29$ , SE = 7), the outdoor component large (a quarter of the individuals), 'dry' decomposers abundant (over a third of the assemblage) and the decomposer component of low diversity (alpha RT = 10, SE = 3). The effects of semi-quantitative estimation on subsample /1 were thus not too extreme. Again *Lathridius minutus* group was

predominant (17 individuals, nearly a third of the fauna), but in this case there were six *Apion ?difficile*. There were also three *Oxytelus sculptus*, other taxa being represented by one or two individuals. The *A. ?difficile* presumably were imported with dyers' greenweed.

The third subsample of 0.5kg was processed and sorted. The flot contained the remains of 'several' bees and mites, an adult ked, a human flea and a small group of beetles and bugs. Recording was non-quantitative.

It is worthy of note that no fly puparia were recorded from any of the material checked by J. Phipps and only two puparia of flies other than *Melophagus ovinus* were found on careful re-examination of all three flots.

*Sample 997553* (BS): washed and sorted but plant remains not seen.

**Context 21904:** archaeological details not requested; a layer.

*Sample 1852* (Spot): avian eggshell; no further analysis undertaken.

#### *Deposits to the rear of buildings on Tenement D*

**Context 5848:** on the E side of and abutting Alignment **5852**, and to the E of large Cut **5542**, in the backyard behind the Tenement D buildings; at least 3 x 1m on plan, and up to 0.17m thick; dark greyish-brown silty loam, with charcoal, occasional patches of mortar and occasional chips of wood.

*Sample 995848* (BS—V): only plant remains recovered by rough sorting were recorded; they were almost all remains of larger foodplants (including sloe, hazel nut, charred oats, wheat and barley).

**Context 6305:** Dump or build-up deposit behind buildings on Tenement D; brown peaty loam with abundant wood chips.

*Sample 1016* (Spot): Very abundant fly puparia, identified as *Musca domestica*, were recorded from this sample.

**Context 9275:** brown peaty material containing some leather offcuts; behind the rear of Structure 5/8; 7.5 m back from the building.

*Sample 288* (GBA): dark grey-brown, plastic and crumbly to brittle, humic silt with coarse and fine woody detritus, and traces of small bone fragments.

Parasitic worms: The single subsample examined gave a trace of *Trichuris* eggs only.

Insects (/T): A rather small assemblage of beetles (and a single bug) was recovered (N = 75, S = 55). Other remains included a single human flea, an adult *Melophagus ovinus*, 'several' fly puparia and 'many' mites. Diversity was high ( $\alpha = 92$ , SE = 23) and the outdoor component substantial (% N OB = 20). Decomposers were (relatively) rare (% N RT = 53) and of (again relatively) high diversity (alpha RT = 37, SE = 12). The most abundant species was a *Stenus*; not the species usually found at the site, however (which from a number of records of male genitalia is believed to have been *S. crassus*). There were only three other taxa with more than two individuals: *Ptenidium* sp., *Cryptophagus* sp. and *Lathridius minutus* group. Little can be made of such a group except to say that it may have been mostly or entirely of background origin.

**Context 9360:** very dark grey silty loam, a large area behind Tenement D.

*Sample 379* (Spot): mid-dark grey-brown, crumbly to brittle, slightly humic, sandy silt with traces of stones 6-60mm, rotten sandstone, and leather.

This was sampled as a spot find of a snail, but no remains of molluscs were recorded during the laboratory examination.

[The next series are included here though they cross the 30N grid, since they form a coherent group which is clearly related to the rear part of Tenement D.]

**Context 21021:** an irregular area just E of Fenceline **6530** (Tenement D); about 0.8 x 1m of dark yellowish-brown (oxidising to black), silty peat with charcoal flecks and some ashy patches.

*Sample 1292* (Spot): a small cache of *Iris pseudacorus* seeds.

**Context 21460:** a layer of at least 1m lateral extent and up to 0.07m thick, immediately overlying fill **21477** in Cut **35809** (unsampled); very dark grey clay loam with charcoal.

*Sample 1702* (Spot): bones of a chaffinch, *Fringilla coelebs* Linnaeus.

**Context 21463:** a narrow strip of black silty peat, perhaps 0.02m thick, containing small twigs, grass, wood chips and ash, curving around the N end of the Period 5C Pit **6786**, near the E edge of the excavation, towards the rear of Tenement D. It is possible that this, and Contexts **21464** and **21474** were fills of an unrecognised pit. Archaeology cannot be further elucidated.

*Sample 1705* (BS—VW): Though yielding only 31 taxa, several achieved a score of 2: *Calluna* twig fragments, *Hypnum cupressiforme* and cf. Gramineae culm bases. These, together with moderate amounts of peaty material thought perhaps to be mor humus from under a stand of heather, suggest that turves might be present in this deposit. The mosses included *Polytrichum juniperinum*, a typical heathland/moorland taxon and together gave the equal second highest AIV (8) for HEMO for the Period 5 BS samples. The other plants present represent a range of other kinds of habitats, but it is notable that, amongst the vegetation groups, NACA is at rank 2 behind CHEN.

*Sample 1704* (GBA): black, crumbly, somewhat heterogeneous amorphous organic material; with traces of wood fragments and some woody detritus that was somewhat laminated.

Insects (/T): The concentration of insects was very high, the 1kg subsample giving 236 individuals of 95 beetle and bug taxa; there were a few other

remains including ‘several’ scale insects and Hymenoptera and ‘many’ mites. The assemblage was of special note for its large outdoor component (% N OB = 28, 65 individuals), which was of relatively low diversity ( $\alpha$  OB = 27, SE = 6) and included a large group of species which seem to have originated from moor/heath habitats. This group was of exceptional size at 16-22 Coppergate and included the following taxa of definite moor/heath origin: *Ulopa reticulata* (11, rank 4), *Scolopostethus decoratus* (4), *Lochmaea suturalis* (3), *Strophosomus sus* (2), *Macrodema micropterum* (2) and *Rhacognathus punctatus* and *Micrelus ericae* (1). Other species which probably originated with these were: Hydroporinae sp. (6), *Trechus secalis* (4), *Olophrum fuscum* or *piceum* (3), *Altica* sp. (3), *Olisthopus rotundatus* (2), *Agonum obscurum* (2), *Euaesthetus ?ruficapillatus* (2), *Quedius boops* group (2), *Pterostichus diligens* and *Calathus ambiguus* (both 1). A good number of other remains may have arrived by the same route as these, most of the outdoor component falling in this category. Some of these insects would need wet conditions, others suggest drier soils. The only likely mechanisms for the introduction of such insects are (a) in collected moss or lichen and (b) in cut turves, probably living turf rather than buried peat since the remains survived in good condition. Such large quantities of mixed remains seem very unlikely to have been imported in, say, cut heather or other calcifuge vegetation.

Although the assemblage included a relatively small proportion of decomposers (% N RT = 37), these formed a distinct community of low diversity ( $\alpha$  RT = 14, SE = 2) and were quite possibly autochthonous. There were 29 *Carpelimus fuliginosus* (rank 1), 19 *Acrotrichis* sp., 14 *Oxytelus sculptus*, ten *Cercyon atricapillus*, eight *Neobisnius* sp., five *Cercyon analis* and four each of *Carpelimus bilineatus* and *Lithocharis ochraceus*. Several other taxa may have co-existed with these. Providing the inferences concerning the habitats exploited by the speculative oxyteline association (discussed by Kenward and Hall 1995, 464 and *passim*) are correct, this was probably a community of ‘muddy’ organic-rich deposits, moist and perhaps rather foul, but aerated.

This and Sample 1705 have provided the only strong evidence for the importation of turf to the site and, as such, a rare insight into possible roofing materials, which are conspicuously absent from the record otherwise. The purpose of the turf may, of course, have been other than for roofing—for example in the packing of walls.

In addition, a subsample of 5kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 21464:** a very dark grey silty peat with ash, about 0.03m thick, curving around and underlying in part Context 21463. Not dated more closely than Period 5B.

*Sample 1706* (GBA): dark grey-brown, crumbly to somewhat brittle, humic, slightly sandy silt with wood detritus and wood and twig fragments.

Parasitic worms: The single subsample examined was barren.

Insects (/T): A rather large group of beetles was recovered (no bugs): 182 individuals of 59 taxa. Diversity of the whole assemblage was unusually low ( $\alpha = 30$ , SE = 4), the proportion of outdoor forms small (% N OB = 6), decomposer diversity low (alpha RT = 14, SE = 2), and the proportion of foul matter individuals higher than normal (% N RF = 11). The species list supports the indication from the main statistics that a foul matter decomposer community lived *in situ*: there were 45 *Oxytelus sculptus*, twelve *Cercyon analis*, eleven *C. atricapillus*, ten *Carpelimus fuliginosus*, and smaller numbers of other taxa all likely to have lived together in fairly open-textured but moist plant debris rich in nutrients. Such, presumably, were the conditions presented by the dyeplant waste (cf. Sample 1708, below), which was perhaps enriched by other materials used in dyeing.

Fly puparia were numerous, and there were 'several' mites, but other invertebrates were rather rare.

In addition, a subsample of 5kg was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 1708* (Spot): A 0.1kg subsample was washed to 500 $\mu$ m; it was found to be composed largely of *Rubia* (abundance score 3) and *Genista* (2) with a trace of *Diphysium*. All the other taxa were also regularly recorded from these deposits.

**Context 21474:** a black, compact silty peat with twigs, grass and ash, below 21464; about 0.02m thick.

*Sample 1709* (GBA): dark red-brown, crumbly, layered, slightly sandy herbaceous and woody detritus with a little humic silt; it was thought mostly to consist of *Genista* stems.

Parasitic worms: The subsample examined yielded a single *Trichuris* egg.

Insects (/T): The concentration of remains in this sample was exceptionally high, 307 individuals of beetles and bugs being recovered from the 1kg subsample (69 taxa). There were 'many' fly puparia (those identified being *Stomoxys calcitrans* and *Musca domestica*) and a few other insects; mites were also abundant (estimated at more than 100). Diversity was low ( $\alpha = 28$ , SE = 3) and the outdoor component relatively small (% N OB = 6, although there were 19 individuals). Decomposers accounted for 66% of the individuals, but had some uncoded probable decomposers been included this would have been nearer to 90%. This component was of low diversity (alpha RT = 11; SE = 1), suggesting the presence of a relatively pure and specialised community. Inspection of the species list suggests that this was the case, providing the speculative oxyteline association exists (Kenward and Hall 1995, 464 and *passim*). *Oxytelus sculptus* was very abundant (71 individuals), as was *Carpelimus fuliginosus* (46). There were 21 *Cercyon unipunctatus*, 17 *Anthicus formicarius*, and the following: *Cercyon analis* and *Neobisnius* sp. (12), *Monotoma longicollis* (11), *Platystethus arenarius* (9), *Acrotrichis* sp., *Carpelimus bilineatus* and *Leptacinus pusillus* (8), and *Acrotrichis* sp., *Philonthus* sp. and *Monotoma*

*picipes* (6). Thus all the taxa with more than three individuals (and many of those with less) probably co-existed, in damp, organic-rich, perhaps muddy, rather foul material. No other community was significantly represented.

In addition, a subsample of 5kg was bulk-sieved after the main period of processing; it has not been sorted.

**Context 21478:** a large layer, at least 3m in one direction, and up to 0.3m thick; black compressed structured peat lying below **21474**.

*Sample 1711* (GBA): dark brown, layered amorphous organic material and herbaceous detritus with a trace of charcoal. A /T was processed.

**Insects:** This subsample gave a fairly substantial group of beetles and bugs (N = 140; S = 51), together with various other arthropods including ‘many’ mites and an adult *Melophagus ovinus*. Diversity was rather low ( $\alpha = 29$ ; SE = 4) and the proportion of outdoor forms quite small (% N OB = 8). Decomposers were abundant (% N RT = 74) and of low diversity (alpha RT = 12; SE = 2). The assemblage was dominated by *Acrotrichis* sp. (47 individuals) and *Oxytelus sculptus* (13), with six *Carpelimus fuliginosus*, five *Cercyon analis* and various other taxa which probably live with these species in rather foul, open-textured, plant litter, or perhaps stable manure.

*Sample 1712* (Spot): no action to date.

*Sample 1715* (Spot): dark grey-brown, firm to crumbly, but compressed and layered in parts, silty herbaceous detritus with white flecks, traces of hazel nutshell, white waxy material and flecks of sandy silt.

**Insects** (1kg, /T): A modest group of insects was semi-quantitatively rapid scan recorded; there were about 52 individuals of 30 beetle taxa, with assorted other remains including ‘many’ fly puparia, ‘several’ scale insects, two human fleas and an adult *Melophagus ovinus*. Bearing in mind recording method and assemblage size there was

nothing of special not in the main statistics apart from an exceptionally high proportion of RF individuals (over a third of the assemblage). There were ‘many’ *Cercyon atricapillus*, and smaller numbers of various other taxa likely to have co-existed with it in somewhat foul, rather damp, litter. Thus, although the species list differed from that for *Sample 1711*, the interpretation was similar and the samples may just indicate slight variation in the layer, or a time succession.

The dried residue from the 1kg /T subsample was checked briefly; it was composed mainly of woody and herbaceous detritus with a little sand, brick/tile, mortar/plaster, charcoal, and eggshell.

**Context 21490:** a small patch of black, structured peat with wood a little to the N of **21463**, **21464** and **21474**.

*Sample 1767* (Spot): a spot find of bones, tentatively identified as ?’hen’, cf. *Gallus* sp.

**Context 21766:** a large (up to 3 x 2m), irregular area S of Fence **29119** and between Fencelines **5982** and **5852**; it was formed apparently between phases of building on Tenement D and comprised very dark grey structured sandy peat with 10% sandy amorphous peat.

*Sample 1862* (BS—VW): dyeplants were predominant in this sample, with scores of 3 for *Genista* and of 2 for *Diphysium* and *Rubia*. There was also a record of a single achene of pot-marigold, *Calendula officinalis*, the only certainly identified *Calendula* material from Anglo-Scandinavian Coppergate (there were otherwise only single records of *Calendula* sp(p).—but probably also this species— from both Period 3 and 4). The abundant *Genista*, together with *Agrimonia* accounts for the odd AIV for MOAR of 11 (based on only two taxa); this exceeds that for CHEN, which is only 8. That for DYES, however, is 23, the second highest value for the Period 5 BS samples.

This assemblage is also unusual in its record for *Fissidens adianthoides*, the only one for Anglo-Scandinavian Coppergate. *Leucobryum*

*glaucum* is also a rare record; together with the *Sphagnum* sp(p). leaves and perhaps also the *Dicranum* sp. this may be an indicator of acid peat or of turf. The record for *Juglans* is one of only two for Period 5.

*Sample 1860* (GBA): no action to date.

**Context 29101:** a thin layer, up to 0.03m thick, right at the E edge of the site by the shoring, just behind the position of the rear walls of the rear Tenement D buildings and associated with Structure 5/7; a black silty loam with ash.

*Sample 1910* (GBA): unconsolidated sand with fine humic material and a little charcoal; has the appearance of 'potting compost' rich in sharp sand.

Plants (/M): The assemblage of 39 taxa from this subsample was unusual in having no dyeplants and a higher AIV for weeds in SECA than for those in CHEN (though the proportion, 18%, was the same for both groups). There was evidently some food remains or faeces present, for 'bran' scored 2 (though it was mostly poorly preserved material in the <1mm fraction) and there were traces of apple endocarp, blackberry, ?dewberry, linseed and sloe. The other taxa scoring 2 were *Agrostemma* seed fragments, likely to have been a grain/flour contaminant, and *Juncus bufonius*, perhaps growing on wet tracks and paths in the vicinity.

Charcoal was abundant in the residue, along with traces of brick/tile, burnt bark and burnt mammal bone, pottery, oyster shell and fish scale, but there was a lack of charred plant remains other than charcoal and some charred hazel nutshell.

This sample was notable for the only records from Anglo-Scandinavian Coppergate for two plants: the extremely poisonous waterside herb, cowbane, *Cicuta virosa* (also recorded from contemporaneous deposits at Lloyds Bank, 6-8 Pavement) and corn gromwell, *Buglossoides arvensis*, a cornfield weed, otherwise recorded from one context of similar date at 1-9 Micklegate.

Insects (/T): Jar dropped and flot consequently destroyed.

## Pit fills on Tenement D

**Cut 6422:** a deep, steep-sided pit with a wicker lining in the rear two-thirds of the site, towards the (site) north-east corner; it was perhaps a well, overlain by Norman dumps and therefore believed to be of late Period 5B date. It was about 2m deep and up to 1m in diameter. Its bottom was cut into 'natural'.

**Context 6536:** the basal fill context, overlying natural; black silty sandy layer.

*Sample 1062* (GBA): dark grey to grey-brown humic clay silt, with small stones, wood fragments (much less richly organic than higher deposits in this fill sequence).

Plants (/M): Amongst the identifiable plant remains in this rather large assemblage of 51 taxa, only wheat/rye 'bran' scored an abundance of 2 (bran was also recorded from the /T flot). For the rest, there was only a rather modest component of foodplants, weeds in groups CHEN and SECA being the most abundant taxa.

Parasitic worms: Two subsamples were examined; both gave trace amounts of *Trichuris* eggs.

Insects (/T): Rapidly semi-quantitatively recorded, the subsample gave about 49 individuals of 38 beetle and bug taxa. Main statistics were somewhat like those for *Sample 1057* (from the layer above). In this case there were 'several' *Platystethus arenarius*. Again, rather mixed origins seem likely but there may have been colonists of foul matter. If the latter was the case, events appear to have prevented population build-up—through burial or the arrival of winter perhaps. There were some fly puparia, those identified being *Leptocera* sp., Sepsidae sp. and *Melophagus ovinus*.

**Context 6532:** immediately overlying **6536**; black silty organic material with wood flecks.

*Sample 1058* (BS—VW): With 63 taxa, this was one of the larger assemblages from Period 5 BS sample. Two weed species and two probable food

taxa scored 2—*Chenopodium album* and *Agrostemma githago* (seed fragments) and *Linum usitatissimum* and *Triticum/Secale* ‘bran’. The *Agrostemma* and ‘bran’ are probably remnants of undigested food containing flour contaminated with ground corncockle seed. (Concretions, presumably faecal, were recorded from the residue for this sample.) Although only two foodplant taxa were present in moderately large amounts, the overall food component was large (AIV for FOOS was 48, rank 5, 24% of the taxa); other taxa included here were blackberry, dewberry, apple (seeds and endocarp), hawthorn, sloe, ‘plum’ and cultivated oat. Dyeplants were rather unimportant in this assemblage, woodland mosses (perhaps material used for sanitary purposes) moderately well represented.

The small numbers of fly puparia recorded from this sample included *Musca domestica*, *Stomoxys calcitrans* and *Muscina stabulans*. This sample also produced a few large beetles and one of the very small number of woodlice from the site: a head of *Oniscus asellus*. There were hints of mineralisation of the insects and preservation of the woodlouse may have been connected with this.

Parasitic worms: Two subsamples were examined; both gave traces of *Trichuris* eggs and one a trace of *Ascaris*.

*Sample 1057* (GBA): blackish-brown humic silt with a large hazel stave [from the lining?], bone fragments, some concreted lumps; has the feel of a ‘mud’ (a finely-divided, colloidal organic deposit); much charcoal.

Plants (/M): A total of 62 taxa made up this rather large assemblage, with ‘bran’ at an abundance of 3, suggesting that the deposit was largely faecal in origin (parasite eggs scored 2 in a smear of sediment from the residue). Other taxa at an abundance of 2 were *Agrostemma githago* seed fragments (no doubt a contaminant of milled grain), *Linum usitatissimum* (presumably a foodplant in this context), and *Bromus* sp(p). (waterlogged caryopses, perhaps a grain contaminant, though the presence of whole grains is more consistent with

their having been discarded from the crop before milling).

The AIV for FOOS was high (39, rank 7), whilst the high value of 10 for oil-plants in FOOO was exaggerated by the score of 2 for linseed. Besides the usual components of annual weeds in CHEN and SECA, grassland taxa in MOAR were rather important (AIV 18, within the top quartile of the range). The taxa concerned in this last group were rather diverse in their probable origins, however, and are not easily interpretable in terms of importation of a particular material, like hay.

This subsample also gave a record of fly puparia including six *Teichomyza fusca* and four *Leptocera* sp. Some other insects were also picked out, most being larger taxa.

Parasitic worms: the single subsample gave small numbers of *Trichuris* eggs.

Insects (/T): A modest assemblage was semi-quantitatively rapid scan recorded. There were ‘several’ scale insects and moderate numbers of fly puparia (‘many’ *Leptocera* and a few Sepsidae sp.) but few other remains apart from a rather small group of beetles (S = 46, N estimated as 62). Diversity appeared to be high ( $\alpha = 80$ , SE = 22) and the proportion of outdoor forms quite substantial (10 individuals, ‘16%’). As often the case at Coppergate in small groups, ‘rf’ coded taxa were a little more abundant than usual (6 individuals, ‘10%’). There were ‘several’ *Carpelimus bilineatus*, three *Lathridius minutus* group and a group of taxa at frequency 2 which included some suggesting nearby foul matter or colonists of such material *in situ*. This may have been essentially background fauna, however.

**Context 6531:** immediately overlying 6532 in the same stratigraphic position as 6472 (q.v.); very dark grey silty, sandy ‘cessy’ peat with wood pieces.

*Sample 1055* (GBA): dark brown, slightly ‘cheesy-brittle’, humic silt, with wood chips and lighter buff or light brown silty inclusions, small twigs, sand and grit.

Plants (/M): The presence of faecal material is again suggested by the abundant 'bran' (score 3) in this subsample, though the AIV for FOOS of 30 is rather low compared with that for the subsample from Sample 1057. Taxa other than bran that were present in more than small amounts were *Atriplex* sp(p). seeds, charred rye grains, and capsules, flowers and shoot fragments of *Calluna* (all scoring 2), and there were abundant waterlogged chaff fragments of unidentified cereals. Wood chips were another abundant component of the residue. Although not present in large amounts, there were five taxa scored in DYES.

The *Calluna* remains account for the large AIVs for NACA and OXSP (respectively 21, equal rank 6, and 12). Some of the mosses may have originated with imported heather, but most are essentially woodland/grassland taxa (indeed, the AIV for GRAS at 11 was the third highest for this series of subsamples and is based on six taxa).

Parasitic worms: The subsample examined gave small numbers of *Trichuris* eggs.

Insects (/T): Rapidly and semi-quantitatively recorded, this subsample gave some 52 individuals of 33 beetle species. There were modest numbers of puparia of *Leptocera* and Sepsidae, but apart from 'several' mites other remains were present in small numbers. Main statistics were of little note for a small group recorded in this way. There were 'several' *Cercyon analis*, *Carpelimus fuliginosus* and *Lathridius minutus* group, these and some other taxa perhaps suggesting an affinity with some other layers in this cut.

Sample 1056 (GBA): mid yellowish-grey-brown ('khaki'), crumbly to brittle, slightly sandy silt with traces of stones 2-6mm, of charcoal, and of wood fragments, with small lumps of amorphous organic material and fibrous plant detritus; ?very ashy. N.B. This was a very different lithology to Sample 1055.

Parasitic worms: Two subsamples were examined; one was barren, the other gave a single *Trichuris* egg.

Insects (/T): A very small group of beetles (19 taxa, 20 individuals) was noted by rapid scan-recording. There were some *Leptocera* and Sepsidae puparia, and a single *Fannia* sp. puparium, but few other insects. Over a third of these beetles were 'outdoor' forms, but little more can be said except to suggest that this was perhaps background or redeposited surface fauna.

**Context 6472:** immediately overlying 6532 in the same stratigraphic position as 6531 (q.v.); very dark grey silty organic material.

Sample 1053 (BS—VW): with *Genista* stem fragments scoring an abundance of 3, and three other taxa present as traces, the AIV for DYES was quite high (16), and the same value was achieved by the FOOS group with six taxa (all at trace amounts). Another unusual feature of this rather average-sized assemblage was that the AIVs for MOAR and NACA were larger than those for CHEN and SECA and there were larger numbers of mosses (nine taxa) in group LIGN than in any other single group. Indeed, the AIVs of 12 for CHEN and of 10 for SECA were unusually low.

Although the AIV for MOAR was 17 (equal rank 5), there were only five taxa scored in it (and five also in NACA, of which three were part taxa of *Calluna*), so the assemblage cannot be seen as rich in grassland or heathland taxa, rather it is poor in weeds! Amongst the mosses, the AIV of 17 for LIGN was at equal rank 5, those for SLIT and WOOF (both 14) GRAS (10), and HEMO (6) being respectively at ranks equal 3, 1, 1 and equal 4. Only *Pseudoscleropodium purum* scored an abundance of 2; this contributed to the AIVs for GRAS and HEMO.

Sample 1052 (GBA): loosely consolidated fine twiggy/grassy plant detritus, oxidising to dark brown from light yellow-brown, with a slight manure smell; some patches of dark grey silt and clay and stones; looks like twiggy large herbivore dung.

Plants (/M): Amongst the 69 taxa in this large assemblage, there were abundant (score 3) stems of *Genista* with modest amounts of *Diphysium* stem

fragments and capsules, flowers and twig fragments of heather and, rather unusually, of *Danthonia* caryopses. Amongst the non-identifiable remains, twig fragments scored 3 and wood fragments 2, and there were some ?bast fragments, bark fragments, and wood chips. Not surprisingly, there was a very large AIV for DYES (22, equal rank 1) and a modest component of foodplants.

The abundant *Genista* and large numbers of *Danthonia* fruits contributed largely to the very high AIV of 31 for MOAR (rank 1), though there were nine other taxa in this group, including a capsule (containing seeds) of *Plantago media* and seed of *P. lanceolata*. There were also waterlogged chaff remains of grass/cereal and this appears to be one of the few samples from the site with good evidence for grass-dominated turf, though perhaps as likely to have originated in herbivore dung as turf *per se* or hay. Another group with a high AIV was NACA (24, equal rank 4), though this reflects the scores of 2 for three separately-scored parts (capsules, flowers and twig fragments) of heather, the three other taxa contributing to the group being *Danthonia* and *Rubus fruticosus*.

Parasitic worms: Two subsamples were examined; one was barren, the other yielded a single *Trichuris* egg.

Insects (/T): There were ‘many’ fly puparia (mostly unemerged *Leptocera* sp.), but few other insects. Recording was by rapid scanning and was semi-quantitative. There were about 26 beetle taxa (about 38 individuals). Main statistics clearly need approaching with circumspection, but over a third of the individuals were outdoor forms, one species recorded as ‘several’ (there were in fact at least six) being responsible for half of this—*Apion difficile*, primarily associated with dyers’ greenweed (*Genista tinctoria*). There were also ‘several’ of the eurytopic *Lathridius minutus* group. The weevils presumably were imported with their host plant, and the *Lathridius* doubtless colonised plant litter before or after its entry to the pit.

**Context 6471:** immediately overlying 6472; black silty organic mass.

*Sample 1048* (GBA): varicoloured light grey to red-brown clay with blackish (reduced, sulphide-rich) to dark brown humic silt, with leather fragments and fibrous plant material and some lumps of pure ‘natural’ clay.

Plants (/M): With 76 taxa, this was the second-largest assemblage from Period 5 subsamples in this series, yet only *Anthemis cotula* and waterlogged cereal chaff reached an abundance of 2 (there were also modest numbers of wood fragments). The components of foodplants (including a trace of ‘bran’ and dyeplants, and of weeds in CHEN and SECA were not especially high, but several other vegetation groups achieved unusually high AIVs. Thus the two grassland groups, FEBR and MOAR, reached their second-to-highest AIVs of 8 and 30, respectively, based on 5 and 15 taxa (2.3 and 2.8 SDs above their respective period means). Amongst the wetland/waterside groups there were unusually high values for PHRA (11, based on 5 taxa, rank 3, more than 3 SDs above period mean), ISNA (AIV 8, 11 taxa, 1.9 SDs) and SCCA (4, 2 taxa, 1.9 SDs). Moreover, of the 30 taxa scored in these groups, 14 were scored in only one, suggesting that a diversity of grassland and wetland habitats really is represented. Taxa present here but not frequently recorded in other samples include *Lythrum salicaria* (one of four records scattered through the Anglo-Scandinavian period), *Typha* sp(p). (one of five records), and *Bellis perennis* (the only record for the site).

Another rather well-represented group, though overlapping with MOAR, was weeds of trampled places, scored in PLAN (AIV 10, equal rank 3, nearly 2 SDs above mean). The largest deviation for an AIV from the period mean in this sample was salt-marsh taxa in ASTE, the AIV of 3 being 3.4 SDs above the mean; however, this represents a trace of one taxon, *Juncus gerardi*, and cannot be seen as an interpretatively significant statistic (and, though not coded with MOAR, the species may well have come from wet meadows well beyond the influence of brackish water).

Parasitic worms: Two subsamples were examined; one was barren, the other gave a single *Trichuris* egg.

Insects (/T): Preservation varied from good to poor. There were only 29 individuals of 25 beetle taxa, so main statistics were unreliable. The species list offered little information in isolation, but perhaps this group had affinities with some other assemblages from this pit. There were a few *Leptocera* sp. puparia and a single adult and puparium of *Melophagus ovinus*, but few other remains.

**Context 6444:** immediately overlying **6471** and also in contact with **6472** and **6531**; light brown organic layer.

*Sample 1046* (BS—VW): Several of the 43 taxa in this average-sized assemblage were scored with an abundance of 2: *Genista* stem fragments, *Calluna* capsules, flowers and shoot fragments and charred bread/club wheat and rye grains, and also the moss *Hylocomium splendens*. The *Calluna* records account almost entirely for the high AIVs for NACA and OXSP, though there is a rare record for *Erica cinerea* flowers (this heath is likely to have grown with heather on drier heathland/moorland) and the *Hylocomium* might have been collected with *Calluna* from heathland/moorland habitats, along with at least two other taxa (giving an AIV for HEMO of 8, equal rank 2), or it may have arrived with woodland moss (LIGN had a high AIV of 17, WOOF a score of 12). Some grass culm-nodes and spikelets/fragments were also recorded from this subsample, but there is no especial evidence for grassland as such. With the charred wheat and rye were traces of barley and oats, all presumably waste from cereal processing or storage.

*Sample 1047* (GBA): dark brown detritus of wood fragments (?chips), fine twigs (?*Genista*) and small lumps of mineral soil; disaggregated very readily.

Plants (/M): There were 55 taxa in this assemblage; it was thus quite large. As in the BS sample, there were abundance scores of 2 for *Genista* stems and *Calluna* (seeds and twig frag-

ments, as well as capsules, flowers and shoot fragments), and there were similar scores for *Erica tetralix* leaves (which with flowers of the same species, contrasts with the evidence from the /M subsample, where *E. cinerea* was recorded), *Juncus acutiflorus* seeds and *Avena* sp(p). (waterlogged spikelets/spikelet fragments; there were also traces of waterlogged *Avena* caryopses). As might be expected, perhaps, charred grain was much more limited than in the BS sample. Amongst the unidentifiable plant remains, bark scored 2 and wood fragments 3.

The abundance of *Calluna* and *E. tetralix* accounts for the high AIVs for NACA and OXSP (both at rank 1 in this series); there was, however, only one moss that could be scored in the HEMO group. Grassland taxa in MOAR achieved quite a high AIV for this series of samples (18), but this was exaggerated by the score of 2 for *Genista*; along with the *Juncus acutiflorus*, also at 2 in this group, though, were records for *Eleocharis palustris* and *Pedicularis palustris*, both perhaps taxa of short wet grass/rush-dominated communities. Two of these taxa are also scored in the fen community represented by SCCA whose AIV of 6 (equal rank 1) was 3.2 SDs above the period mean, albeit based on these two alone.

Parasitic worms: The subsample examined was barren.

Insects (/T): Rapid scanned and semi-quantitatively recorded, this subsample gave 'several' scale insects and lice, a *Melophagus ovinus* puparium and two human fleas, components hinting at dumping or re-deposition from a house floor layer. There were also a few fly puparia. There were about 28 individuals of 16 beetle and bug species. Little regard can be paid to the main statistics. There were 'several' *Oxytelus sculptus* and *Lathridius minutus* group, these and other remains suggesting affinities with some other fills of the cut.

**Context 6437:** immediately overlying **6444** and extending across the whole diameter of the pit as seen in section 4250; black, wet, organic mass with wood chips.

**Sample 1045** (GBA): black, very loose, crumbly charred grain with some charcoal and organic detritus in a silty matrix.

**Plants (/M\*):** This was a very unusual sample, and given the abundance of charred grain visible in it in the hand, only a 0.25kg subsample was disaggregated for plant macrofossil analysis. Of the 26 taxa recovered, six were cereals of some kind, though on close inspection waterlogged remains were better represented than charred. Thus there were abundant (score 3) wheat/rye 'bran' fragments and whole, waterlogged wheat/rye caryopses, with charred rye (score 2) and bread/club wheat (score 1) grains, with some barley and oats, and charred and waterlogged *Bromus* sp(p). caryopses. The impression given is that here was a dump of partly-burnt flour and grain, most of it rye, but with some other cereals as weeds or part of a 'maslin' crop. Weeds of arable fields made up 35% of the assemblage, with a score of 2 for *Agrostemma githago* and traces of *Vicia hirsuta*, *Raphanus raphanistrum* and *Bilderdykia* also fall in this category; other annual weeds of waste places and cultivated land (CHEN) made up 38% of the assemblage. The possibility that this food material had been destined for animals rather than humans cannot, of course, be ruled out.

**Parasitic worms:** The subsample examined was barren.

**Insects (/T):** This group showed a characteristic 'foul mouldering' community. Recording was by a rapid scan. There were some 54 individuals of 19 taxa, so diversity was very low ( $\alpha = 11$ , SE = 2; even allowing for some missed taxa this value would remain low). Other statistics were a little like those of Samples 1033 and 1041, with alpha RT very low (6, SE = 2). There were 'many' *Anthicus formicarius*, ten *Monotoma longicollis*, 'several' *Carpelimus fuliginosus* and three *Lathridius minutus* group. Other taxa were a restricted group, most of which were likely to have co-existed with the abundant species in a somewhat varied layer of rather moist mouldering plant litter, perhaps mixed with dung-like matter.

**Context 6434:** immediately overlying 6437; very dark grey organic material.

**Sample 1040** (BS—VW): in this average-sized assemblage of 40 taxa, weeds predominated, with CHEN forming the largest single group (10 taxa, 25%, AIV a modest 20) Foodplants were as plentiful as in many samples from this period, and much less abundant than in many, dyeplants quite abundant (boosted by a score of 2 for *Genista* stems, the only taxon scoring more than 1, and with traces of *Diphysium*, *Isatis* and *Rubia*, as well as *Humulus*). The *Genista* score also boosted the AIV for MOAR to 12, putting it second only to CHEN in the vegetation groups, though it was not especially high within the series as a whole (the Period 5 mean for BS samples was 10).

This sample also gave moderate numbers of fly puparia, those identified including 18 *Musca domestica* and four *Stomoxys calcitrans*.

**Sample 996434** (Spot): Small find sf5312, a spot find of ?bast fibres of some kind, but not identifiable further.

**Sample 1041** (GBA): blackish fine-twiggy detritus with more concentrated humic silt matrix in places between the twigs (?*Genista/Calluna*).

**Plants (/M):** The presence of *Genista* and *Calluna* was confirmed by this analysis, with the former scoring 2 for stem fragments, the latter 2 for flowers, shoot fragments and twig fragments; all other taxa scored 1. Of the remaining taxa in this average assemblage of 44, weeds in CHEN formed the largest group, though the AIV was not very high for this group. NACA and OXSP scored well, their importance exaggerated by the *Calluna* records, MOAR benefiting in the same way through the *Genista* score. The list of mosses was very familiar, the majority species of woodland, growing on bark, shaded rocks, or the woodland floor.

Waterlogged wheat/rye caryopses were also recorded amongst the probable foodplants, along with some charred wheat and rye, and unidentified waterlogged cereal chaff. Some possible bast

fragments were also noted, though it is not possible to say whether these originated naturally in decaying wood with bark, or were deliberately extracted for some purpose.

Parasitic worms: The subsample examined was barren.

Insects (/T): This subsample was rapidly scanned, with semi-quantitative recording. There was a single *Melophagus ovinus*; other fly puparia included *Leptocera* sp. and possibly some other Sphaeroceridae. There were 'several' beetle larvae, mites and scale insects. Approximately 68 beetles of 29 taxa were noted. Main statistics were reminiscent of those for Sample 1033/T (see below), and the more abundant taxa had some affinities. There were 'many' *Carpelimus bilineatus*, and 'several' *Cercyon atricapillus*, *Carpelimus fuliginosus*, *Oxytelus sculptus* and *Anthicus floralis* or *formicarius*. It is suspected that these represent another facies of essentially similar ecological conditions to those implied by Sample 1033.

**Context 6418:** overlying 6434 but separated from it by several thin or lateral restricted layers; dark olive grey structured organic 'cessy' material.

*Sample 1036* (Spot): a small sample mostly of fragmentary root material of madder, *Rubia tinctorum* with some mid grey-brown silty amorphous organic matrix.

**Context 6416:** a thin deposit stratigraphically immediately overlying 6418 on one side of the pit and separated from it by several other deposits on the other; dark brown or dark reddish-brown mottled organic material.

*Sample 1033* (GBA): the material comprised matted *Genista* stems.

Plants (/M\*): In this 0.25kg subsample there were 12 taxa but the bulk of the material was fine twiggy detritus, predominantly *Genista tinctoria*, with some *Calluna*. The remainder were taxa widely recorded from these deposits and of no further interpretable value.

Insects (/T): The 1.1kg subsample was recorded by very rapid semi-quantitative scanning and so results should be treated with some circumspection. There were 'many' mites and 'several' fly puparia. It was estimated that there were 85 individuals of 290 taxa, giving an estimate of  $\alpha$  of 16 (SE = 3). Outdoor forms were barely represented (two individuals), foul decomposers relatively proportionally abundant (% N RF = 9) and diversity of the decomposer component estimated to be low (alpha RT = 10 SE = 2). There were 'many' *Carpelimus fuliginosus* and 'several' of seven taxa likely to have been able to co-exist with it in fairly moist but not extremely foul organic matter. A texture resembling that of stable manure is a strong possibility.

**Context 6780:** wattle lining to pit 6422.

*Sample 1107* (Wood): A total of 65 measurements and identifications was made on this sample. The bulk of the pieces examined (52) were willow, with smaller numbers of oak (12) and a single hazel stem; all were well preserved and mostly uncompressed (the hazel fragment was moderately flattened, five of the willow specimens slightly so). The willow stems were in the diameter range 11-32mm, with a mean ring count of 11.1 (SD = 3.9); for the oak, the equivalent figures were 19-32mm, 9.5 and 2.4. The hazel rod had a mean diameter of 11mm and was 6 years old.

Parasitic worms: A subsample of sediment associated with this lining was examined for parasite eggs but was found to be barren.

**Context 6535:** dark brown, manure-like material full of straw, very silty with bone and a little pot. Below 6532, over 6536, about half way down the sequence.

*Sample 1060* (BS—VW): A total of 51 taxa were recorded from this sample, making a reasonably large assemblage. The 'straw' component seems likely to have been *Genista* stems, for these were present with an abundance of 3. The only other taxon to score more than 1 was *Linum usitatissimum* at 2. The *Genista* largely accounts for the high AIV for DYES (19, rank 4), though

four other taxa were recorded in small amounts, including *Isatis*, *Rubia*, and *Diphysium*. Most other groups were not especially well represented. Fragments of ?charred bread were recovered from this sample.

*Sample 1061* (GBA): no action to date.

**Cut 29816**: a small cut, about 0.5m across and deep in the mid-backyard area of Tenement D.

**Context 21488**: orange-speckled, changing to very dark grey, silty peat with wood chips.

*Sample 1717* (Spot): avian eggshell; no further analysis undertaken.

### Other deposits from Tenement D

#### Context 9419

*Sample 338* (Spot): sample of unidentified charcoal.

#### 'Rear area'

This group is arbitrarily defined as deposits lying south of grid 30N and therefore not easily assigned to any one of the four Tenements A-D recognised at the front of the site. It has sometimes been referred to by the authors as 'Tenement R'.

#### Structural elements in rear area

**Cut 6948**: a post-pit cut about 0.4m across, towards the rear of the site behind Tenements C and D.

**Context 6949**: very dark grey, silty, sandy clay loam with wood and charcoal fragments.

*Sample 1257* (GBA): mid-dark grey to grey-brown, plastic to slightly stiff, very sandy, silty clay with moderate amounts of charcoal and traces of small

bone fragments, clay flecks and plant detritus; no further analysis undertaken.

#### Layers in the rear area

N.B. A few deposits lying across grid 30N at the rear of Tenement D have been included with the account of that Tenement since they form part of a coherent group with those lying behind.

**Context 15371**: a layer of black sandy silty clay loam containing much limestone rubble and a human skull in the south-west corner of the excavation; it was about 4.5 x 4.1 x 0.15m; it lay underneath the extensive Period 5C layer **15311** (*q.v.*).

*Sample 820* (Spot): mid grey, crumbly, slightly humic, slightly clayey silty sand with traces of large bone fragments; no further analysis undertaken.

**Context 15447**: at the very rear of the excavation, a modest patch NE of Cut **10908/15462A**; about 1.4 x 1.1m in lateral extent; dark grey silt.

*Sample 1246* (Spot): avian eggshell; no further analysis undertaken.

**Context 15548**: a skeleton from the SW corner of the site; no description of the sediment in which the skeleton was found was available.

*Sample 834* (Spot): this sample, taken for investigation of parasite remains, was not available for examination.

**Context 16878**: archaeological details not requested.

*Sample 1173* (Spot): a single modern snail (*Helix aspersa*) shell.

**Context 19188**: an extensive layer across the area of Structure 5/12 (rear of Tenement C, Period 5CR), comprising black, silty sandy clay loam with patches of clay.

*Sample 1170* (Spot): a concreted tube with ?vivianite on the interior, perhaps the mould of a root channel or earthworm burrow.

*Sample 1171* (GBA): mid grey, plastic, slightly sandy silty clay with traces of stones 6-20mm, small limestone fragments, charcoal, small bone fragments, brick/tile, and pottery.

Parasitic worms: The subsample examined yielded a single *Ascaris* egg.

Insects (/T): No arthropod remains were present. This was one of only five Anglo-Scandinavian samples investigated at Coppergate which were devoid of insect remains.

In addition, a subsample of 14kg was bulk-sieved after the main period of processing; it has not been sorted.

*Sample 1172* (GBA): no action to date.

*Sample 1176* (Spot): four modern snail (*Helix aspersa*) shells.

*Sample 1200* (Spot): no action to date.

*Sample 1223* (Spot): a single modern snail (*Helix aspersa*) shell.

*Sample 1225* (Spot): no action to date.

*Sample 1237* (Spot): a single snail (*Cepea* sp.) shell.

**Context 19285:** below **19188**; a similarly extensive layer of black, silty sandy clay loam, with charcoal, ash, tile and limestone fragments.

*Sample 1239* (GBA): very light grey silty clay with whitish flecking and abundant fine charcoal.

Plants (/M): Only nine taxa were recorded from this subsample, all of them plants which were regularly recorded from other samples from this site; there were modest amounts of mammal bone, too.

Parasitic worms: The subsample examined yielded two *Trichuris* eggs.

Insects (/T): This was one of the very few flots from the site in which no identifiable insect remains were present.

In addition, a subsample of 12kg was bulk-sieved after the main period of processing; sorting yielded considerable amounts of mammal bone with a little fish bone, some pottery, coal, brick/tile, charcoal and nutshell.

*Sample 1240* (Spot): a single ?modern snail (*Helix aspersa*) shell.

*Sample 1271* (Spot): single shells of the snail *Helix aspersa* and the whelk *Buccinum undatum*.

**Context 19320:** this layer covered the same area as **19188** and **19285** and lay beneath the latter; it was a black, silty sandy clay loam, with charcoal, ash, tile and limestone flecks.

*Sample 1282* (Spot): a short length of (modern) plastic string!

*Sample 1300* (GBA): mid-dark grey, crumbly, slightly sandy clay silt, with traces of stones 20-60mm and of large and small bone fragments.

A subsample of 5kg was bulk-sieved after the main period of processing; it yielded very small amounts of mammal and fish bone and shell, a little wood and charcoal, some brick/tile, mortar, clinker and three fragments of pottery.

**Context 20052:** archaeological details not requested.

*Sample 1220* (Spot): a single modern snail (*Helix aspersa*) shell.

*Sample 1242* (Spot): a single snail (*Helix aspersa*) shell.

**Deposits from rear of site with uncertain location or type**

**Context 5530:** archaeological details not requested.

*Sample 311* (Spot): no action to date.

**Context 5672:** the archaeological records for this context are too poor to be of use; fortunately the sample was not examined in any way.

*Sample 350* (GBA): no action to date.

**Context 6140:** this context was recorded on site as *opus signinum*.

*Sample 470* (Spot): this was recorded in the laboratory as a very rotted oak timber! It appears that there was a numbering error.

**Context 6171:** archaeological details not requested.

*Sample 486* (Spot): no action to date.

**Context 6836:** archaeological details not requested.

*Sample 1179* (Spot): two snail (*Helix aspersa*) shells.

**Context 6927:** archaeological details not requested and location not known.

*Sample 1311* (Spot): an oyster shell with some *Corallina* (red calcareous alga) attached.

**Context 7378:** archaeological details not requested.

*Sample 267* (GBA): no action to date

**Context 7523:** archaeological details not requested.

*Sample 346* (Spot): no action to date.

**Context 9594:** archaeological details not requested.

*Sample 455* (Spot): no action to date.

**Context 14358:** archaeological details not requested.

*Sample 910* (Spot): no action to date.

**Context 14550:** archaeological details not requested (not located).

*Sample 1008* (Chemical): no action to date.

**Context 14575:** archaeological details not requested.

*Sample 1252* (Spot): no action to date.

**Context 16883:** archaeological details not requested.

*Sample 1197* (Spot): two modern snail (*H. aspersa*) shells.

**Context 20260:** archaeological details not requested.

*Sample 1213* (Spot): a single snail (*Helix aspersa*) shell.

**Context 21069:** archaeological details not requested.

*Sample 1644* (Chemical): very calcareous light-mid grey-brown, crumbly, slightly sandy, slightly clayey silt with traces of charcoal; no further analysis undertaken.

**Context 21452:** archaeological details not requested but perhaps a layer in the central area, Tenements C/D.

*Sample 1697* (Spot) avian eggshell; no further analysis undertaken.

**Context 21852:** archaeological details not requested but perhaps a layer between building phases, Tenements C/D.

*Sample 1831* (Chemical): light-mid grey, crumbly, sandy silt or ?ash; no further analysis undertaken.

**Context 21943:** an isolated stake, at least 0.29 m long.

This was not collected as a sample (it is included in the catalogue of timber identifications), but its

identification (as purging buckthorn, *Rhamnus cathartica*) is unusual and demands brief discussion here. This stem fragment of about 65mm length and up to 25mm diameter was the only wood of this species identified from the huge corpus of material from Anglo-Scandinavian and medieval Coppergate and presumably represents no more than the chance inclusion of *Rhamnus* wood amongst the various types used at the site rather than deliberate collection. The identification is thought to be secure (it has been re-checked since the original determination was made): it has very clear flame-like distribution of pores and rays mostly two cells wide (the latter character distinguishes it from taxa such as *Ulex* (gorses), where the rays are five cells wide, and *Sarothamnus scoparius* (broom), where they are mainly 2-3 and 7-9 cells wide). It is thought unlikely to be *Genista*, given the size of the stem.

**Context 29471:** archaeological details not requested (location unknown).

*Sample 1968* (Chemical): fused organic material rather like clinker, but not thought to be residue from burning coal; no further analysis undertaken.

#### Pit fills in rear area

**Cut 6867:** a modest pit of about 1.4m across and up to 0.8m deep, in the backyard behind Tenement C.

**Context 6879:** the basal context, a very dark grey peaty clay loam with a few charcoal flecks.

*Sample 1175* (GBA): mid-dark grey-brown crumbly, humic silt to clay silt, with some flecks and larger inclusions of 'natural' clay and some rounded pebbles. Some root traces visible.

Plants (/M): A rather large assemblage of 58 taxa was recorded. Of these, much the largest component was weeds in groups CHEN, BIDE, and PLAN, the first and third achieving their highest AIVs (62 and 15, respectively) in this series of samples, BIDE its second highest (26). Some taxa contributed to more than one group, of course,

and abundance scores of 2 for *Chenopodium* Section *Pseudoblitum*, *C. murale*, and *Stellaria media* account in large measure for these high values. Clearly a well-developed Chenopodietea community of nitrophile annual weeds was established at or near the site of deposition, for *Chenopodium album*, *C. ficifolium* and *C. polyspermum* were all recorded, too, and there were traces of *Polygonum* spp. (*PP. hydropiper*, *persicaria*, and *lapathifolium*). With the exception of SECA and MOAR (which both share some taxa with those already mentioned), other groups were poorly represented. There was a trace of 'bran' and several other possible foodplants; dyeplants were limited to traces of *Diphysium*.

Parasitic worms: A single *Trichuris* egg was recorded from the subsample examined.

Insects (/T): A large insect assemblage was present, including 'many' *Chionaspis salicis*, 'several' puparia, beetle larvae and unidentified insect larvae, two human fleas, an unidentified louse and a *Melanotus erythropus* larva. There were also 'many' mites. Eighty individuals of 60 beetle and bug taxa of the groups used in calculating statistics were recorded. Diversity was apparently high ( $\alpha = 108$ , but SE = 27), and the proportion of outdoor insects large (almost a quarter). Decomposers were a little less proportionally abundant than normal at this site, and the diversity of this component estimated to be unusually high (alpha RT = 50, but again SE high, at 16). There were five *Acritus nigricornis*, four *Neobisnius* sp. and three *Carpelimus bilineatus*, *Anotylus rugosus* and, unusually, *Pterostichus melanarius*. There were probably invading decomposers, but this material may have accumulated slowly. The preservation, recorded as good, militates against the deposit having been dumped from a surface.

**Context 6866:** above **6879** and separated from it by unsampled Context **6870**; structured peat with abundant wood fragments and lenses of carbonised vegetable matter.

*Sample 1167* (BS—VW): A rather large assemblage of 57 taxa was recovered, with weeds

in CHEN and BIDE again abundant (the AIVs were 62, rank 2, and 22, rank 4, respectively), and SECA rather well-represented. There were abundance scores of 2 for *Chenopodium murale*, *Stellaria media*, *Urtica urens*, *Lamium* Section *Lamiopsis*, and *Sonchus asper*, all scored with either or both of these groups, with some unusual scores of 2 also for *Pastinaca sativa*, charred Gramineae caryopses and charred *Avena sativa* grains. Perennial nitrophile weeds in ARTE were also a significant component, achieving an AIV of 22 (equal rank 2). The assemblage was thus a rather curious mixture of taxa with some foodplants (*Prunus spinosa*, *P. domestica* and traces of charred bread/club wheat, and rye, as well as the oats) as well as some taxa of wet habitats (*Ranunculus sceleratus*, *Hydrocotyle vulgaris*), perhaps related to the position of this pit towards the rear of the site and thus closer to the river Foss.

**Context 6853:** immediately above 6866, though separated from it across part of the pit by unsampled Context 6856; very dark grey, compact, amorphous peaty loam with plentiful charcoal.

*Sample 1158 (Spot):* This sample consisted of about 300g of sediment mainly consisting of charcoal and charred cereal grains, with some wood fragments and ?cereal stem fragments. The bulk of the grains were of cultivated oat, *Avena sativa* (confirmed by the presence of whole spikelets), with some free grains of *Avena* sp.

**Context 6798:** immediately overlying 6853; very dark grey peaty clay loam with a few charcoal flecks.

*Sample 1136 (Spot):* a collection of 23 herring (*Clupea harengus*) vertebrae, all perhaps from the same fish.

*Sample 1140 (Spot):* no action to date.

**Cut 15436:** a rather substantial pit towards the rear of the site behind Tenement B, truncated by the shoring; it was about 1.7m wide and 0.7m deep and contained four fills, two of which were sampled.

**Context 15466:** the basal fill; a black mixture of silty loam and structured peat.

*Sample 809 (GBA):* dark grey-brown, plastic to crumbly, rather heterogeneous, humic, sandy clay silt and amorphous organic material with traces of twig fragments and some pinkish grey-brown silty clay (?‘natural’). A 1kg test subsample was requested but appears not to have been processed.

Parasitic worms: The single subsample examined gave large numbers of *Trichuris* eggs, a selection of which were measured, and a modest number of *Ascaris* eggs.

In addition, a 10kg subsample was bulk-sieved after the main period of processing, but has not been sorted.

**Context 15456:** immediately overlying 15466; very dark greyish-brown structured peat with wood fragments.

*Sample 799 (GBA):* dark brown, crumbly, highly humic, charcoal-rich silt with concretions and a slight clay content, yellow flecking, and patches of lighter silt and others of more concentrated organic matter, making the deposit rather heterogeneous at the cm scale.

Plants (/M): A total of 42 taxa were recorded from this subsample, close to the period mean. There were traces of both faecal concretions and wheat/rye ‘bran’, indicating that some, at least, of this layer was faecal in origin, but the largest component was weeds in CHEN (more than one quarter of the assemblage, though with a rather low AIV of 31, despite scores of 2 for *Atriplex* and *Chenopodium album*). Other groups were mostly poorly represented within the ranges for this series of subsamples and, unusually for Period 5, DYES were quite absent. Amongst the other components of the residue, eggshell and eggshell membrane fragments, fish and mammal bone point to further elements of the diet, whilst leather, charcoal and rather abundant wood fragments indicate that a range of occupation materials was incorporated with the faeces.

Parasitic worms: The single subsample gave small numbers of *Trichuris* eggs.

Insects (/T): This subsample was recorded by semi-quantitative rapid scanning. Although preservation was good, many of the insects were more fragmentary than usual. There were ‘many’ fly puparia (those identified being *Leptocera* sp., Sepsidae sp. and a single *Melophagus ovinus*) and mites and ‘several’ Proctotrupoidea and beetle larvae. There were 133 individuals of 63 beetle and bug taxa. Main statistics were not unusual apart from a somewhat high proportion of foul matter forms (% N RF = 10). There were ‘many’ *Carpelimus bilineatus* and *Anotylus rugosus* and ‘several’ *Cercyon analis*, *Platystethus arenarius*, *Neobisnius* sp., *Anobium punctatum* and *Atomaria* sp. Most of these probably bred *in situ* in fairly foul matter; the *A. punctatum* doubtless originated from nearby timber as other characteristic ‘house fauna’ elements were rare.

*Sample 915456* (Spot): Four subsamples from hand-collected material gave, together, small or modest numbers of both *Trichuris* and *Ascaris* eggs.

**Cuts 19312 and 19306:** Cut **19312** was modest in size (about 1.1m across and 0.45m deep); the single fill context was subdivided, but there is no record of which of the two subcontexts was sampled. Cut **19312** was cut above and on one side by **19306**, a cut of about 1.7m diameter and 0.5m depth. The latter was cut from the same level as post-pit **19290** (*q.v.*) though since it crosses the line of the E wall of Structure 5/12 (**19172**, to rear of Tenement C) it probably immediately pre-dates that structure. There were two fills, only the lower, basal one being sampled.

#### **Cut 19312**

**Context 19313** (A, B): very dark grey, sandy, clay loam with charcoal and wood fragments, and with patches of pinkish-grey clay in the upper layer (**19313A**).

*Sample 1254* (BS—VW): Although 52 taxa were recorded, all were present in trace amounts. The largest component was annual nitrophile weeds in CHEN (AIV 47, within the top quartile), but there was also a rather large contribution by perennial nitrophile weeds (ARTE, AIV of 18), and grassland plants in MOAR (AIV 18, equal rank 3) were unusually conspicuous, though the latter included *Genista* and *Agrimonia* which were also recorded amongst the dyeplants. *Beta* fruit remains were present, one of only seven records for the site for the Anglo-Scandinavian period (though these were distributed across deposits of Period 4A to 5C date). Otherwise, the assemblage contained small numbers of plants from a variety of other types of habitat, such as heathland/moorland and woodland/scrub, and there was a small component of probable foodplants.

*Sample 1253* (GBA): grey sandy clay silt, with paler ashy lumps and a little humic material and wood.

Parasitic worms: A single *Trichuris* egg was recorded from the subsample examined.

Insects (/T): There were ‘several’ mites and puparia and a few other remains, and a group of about 55 beetles and bugs (S = 39). Recording was by a semi-quantitative rapid scan. Main statistics were best treated with caution. There were ‘several’ *Carpelimus bilineatus* and *Anotylus nitidulus*; no other taxa were represented by more than two individuals, but there may have been a small ‘oxyteline association’ group, probably invaders, and there were weak hints of a fauna of open-textured foul plant litter.

**Cut 19306** (details above)

**Context 19307:** black sandy clay loam with many wood and wattle fragments.

*Sample 1248* (BS—VW): There were 51 taxa in this assemblage, two of them (*Corylus* and *Humulus*) scoring an abundance of 2. There were also rather large amounts of wood and bark fragments. The *Humulus* accounts in large part for

the rather high AIV for FOOF, but otherwise the AIVs are unremarkable. As in Sample 1254, weeds in CHEN and SECA were statistically the most important, MOAR rather less so. The AIV of 10 for PLAN proves to be the largest for the Period 5 BS sample, but it is based on only four taxa (it includes *Coronopus squamatus*, a species found in samples from a single Period 4A context, four from Period 4B, six from 5A and 4 from 5B).

*Sample 1247* (GBA): dark brown, crumbly, humic silt with wood fragments (some large) and much fine ?oyster shell.

Parasitic worms: Two subsamples were examined; one was barren, the other gave a single *Trichuris* egg.

Insects (/T): Rapid-scanned and semi-quantitatively recorded, this subsample gave about 49 individuals of 33 taxa of beetles, 'several' mites, a human flea and a few other remains. Main statistics were of no special note. There were 'several' *Carpelimus bilineatus* and *Neobisnius*, with other remains hinting at the presence of a small 'oxyteline-dominated' group which may have been colonisers.

**Cut 19354**: a scoop or depression cut about 1.25m across and with a fill up to 0.1m thick as seen on the available section; it lay towards the very rear of the site behind Tenement C.

**Context 19353**: the single fill context, a dark grey, sandy, silty, clay loam with a high proportion of bone, shells, 'brick', limestone, and wood fragments and charcoal flecks; it also contained some human bones.

*Sample 1298* (BS—VW): Only eight taxa were recovered from the rough-sorting of the residue and from more detailed examination of the washover; all were present in trace amounts, all might have been recorded from almost any of the deposits in this period (and, with the exception of *Diphysium*, from any earlier Anglo-Scandinavian period).

**Cut 19445**: a shallow pit, about 1m across and up to 0.25m deep, containing a single fill context. It lay at the very rear of the site, behind Tenement C.

**Context 19446**: very dark grey, sandy, silty clay loam with charcoal, wood, bones, limestone fragments and lumps of clay.

*Sample 1303* (GBA): mid grey (?clay) silt with some sand and grit but little obvious organic material.

Parasitic worms: Two subsamples were examined; one was barren, the other gave traces of *Trichuris* eggs and a single ?*Hymenolepis* egg.

Insects (/T): A small group of insects was recorded by rapid scanning: 32 individuals of 28 beetles and a few other remains, including a human flea. Main statistics were unremarkable in a small assemblage recorded in this way. Oxytelines were proportionally well represented, however, so affinities with many other assemblages may be suspected, although this may have been background fauna.

**Cut 19447**: this pit was very badly cut by wattle-lined Pit 19191 (Period 5C) and very little of it remained; it lay very close to 19445 (q.v.) at the rear of the site behind Tenement C. The two fills were both sampled.

**Context 19451**: the lower fill, a dark brown (oxidising to dark grey) sandy, silty clay loam (though presumably with an appreciable organic content to explain the colour change).

*Sample 1308* (GBA): mid-dark brown, crumbly, slightly sandy silt with some coarse sand, beetle fragments (*Pterostichus melanarius*), bone, charcoal, eggshell, pot fragments and small stones.

Plants (/M): A total of 38 taxa was recorded from this subsample, with some unusually high scores for abundance: 3 for *Urtica urens* and *Chenopodium* Section *Pseudoblitum*, and 2 for *U. dioica*, *C. ficifolium* and *Ranunculus sceleratus*. This led to a high AIV of 46 for CHEN, but more

especially a very high value for BIDE (30, rank 1). It may be no coincidence that this high value was achieved in a pit fill at the lower end of the site, nearest the supposed course of the river, for the community represented by taxa in BIDE is vegetation of at least seasonally wet, nutrient rich habitats like ditches and drying mud by ponds and shallow rivers (the group was very well represented in assemblages from contemporaneous deposits at Lloyds Bank, 6-8 Pavement, at a location approximately the same distance from the presumed course of the Foss as 16-22 Coppergate). Other groups are all rather weak in the statistics, though there was a modest component of probable foodplants, including blackberry, linseed, and charred wheat and barley.

Parasitic worms: Two subsamples were examined, but both were barren.

Insects (/T): Rapidly scanned, with semi-quantitative recording, this subsample produced a modest beetle and bug assemblage (N about 97, S = 60). Diversity was estimated to be high ( $\alpha = 67$ , SE = 123 and the outdoor component proportionally extremely large, with an unusually high concentration also (% N OB = 46; 44/kg). There were various other remains including 'many' mites and some 'bees' (probably honeybees, but the flot was too degraded in storage to be checked satisfactorily). Aquatics were proportionally abundant (% N W = 18, 17 individuals) and decomposers (relatively) insignificant (% N RT = 34).

The group was very unusual in having 'several' of the large ground beetle *Pterostichus melanarius*; these and eight individuals of six other ground beetles may have been trapped in the cut by a 'pitfall' effect. Other more abundant beetles were a small *Helophorus* species, *Carpelimus bilineatus*, *Anotylus nitidulus* and a *Stenus* species (all 'several'). There were three *Neobisnius* and only one or two of the remaining taxa. The aquatics were all eurytopic and probably invaded exposed water surfaces. A small 'oxyteline association' decomposer group may have invaded organic-rich matter, although a background origin for these beetles would be hard to dispute.

**Context 19448:** dark olive grey, sandy clay loam, with bone, shell, charcoal flecks and wood chips.

*Sample 1306* (BS—VW): An average-sized assemblage of 40 taxa was recorded, with *Urtica urens* and *Chenopodium album* both achieving an abundance of 2. Weeds in CHEN made up nearly half the assemblage (AIV 47, in the top 25% of values for Period 5 BS samples), with nearly one third of the taxa contributing to SECA. There was a rather large component of perennial nitrophile weeds, too, but taxa scored in BIDE were only moderately common (AIV 11, 5 taxa). There were traces of dyeplants and a smallish component of foodplants, including *Prunus spinosa* and *P. domestica*, as well as *Corylus* and *Rubus fruticosus*.

*Sample 1305* (GBA): light to dark grey-brown clay silt to silty clay, with some bone fragments and probably a low organic content.

Plants (/M): As might have been predicted, a modest assemblage of only 26 taxa was recorded from this subsample. The list calls for little comment other than to remark that *Chenopodium* Section *Pseudoblitum* scored 3, and *Urtica urens* and *C. album* both scored 2, giving a similar impression of a strong weed component as the BS sample and, indeed, other samples from this fill sequence. Again, BIDE was rather well represented (with an AIV of 18, equal rank 6), given the small size of the assemblage.

Parasitic worms: Two subsamples were examined; one gave a single *Trichuris* egg, one gave two.

Insects (/T): rapid scan (semi-quantitative recording) produced records of 58 individuals of 48 beetles and bugs; a large proportion (two-fifths) were 'outdoor' forms, including eight individuals of seven aquatics. The presence of open water in the cut is therefore suspected. Diversity was estimated to be very high ( $\alpha = 129$ ; SE = 44) and the decomposer component was small (about two-fifths of the individuals).

In addition, a 9.5kg subsample was bulk-sieved after the main period of processing; the rough

sorted residue yielded a variety of occupation debris, including some organic concretions though not examined in detail.

*Sample 1307* (Spot): one adult and one immature *Helix aspersa* snail shell.

*Sample 1310* (Spot): recorded by the excavators as a ‘crustacean’, this spot find was not available for inspection in the laboratory.

**Cut 20223**: a pit of about 0.5m depth and 1.2m width, a few metres NW of **20142**, in the central part of the site. There were at least three fills, of which two were sampled.

**Context 20231**: the basal fill, a very dark grey structured peat with wood fragments.

*Sample 1157* (BS—VW): An average-sized assemblage of 43 taxa was recorded from this sample. Foodplants predominated, with the AIV for FOOS (43) standing at rank 8 for this series of samples. There were scores of 2 for *Rubus fruticosus*, *Prunus spinosa* and *Sambucus nigra*, with traces of ‘bran’, ‘cherry’, apple, ‘plum’, linseed and grape (one of very few records for the Anglo-Scandinavian period at this site). A further taxon that may have been ingested—as a purgative—was *Euphorbia lathyris*, caper spurge (seeds of white bryony, *Bryonia cretica* ssp. *dioica* may also have arrived in the pit as a cathartic).

For the rest, there was a mixture of weeds and waste ground taxa and a few mosses. Faecal concretions were present in trace amounts and there were eggshell membrane fragments and modest numbers of fly puparia.

Parasitic worms: Two subsamples of concretion from the BS residue were examined; both gave small or modest-sized samples of *Trichuris* eggs.

*Sample 1156* (GBA): dark grey, very crumbly organic silt with wood fragments and some slightly laminated patches of plant detritus; an ashy smell.

Parasitic worms: There were traces of *Trichuris* and *Ascaris* in the single subsample examined.

Insects (/T): Recording was by semi-quantitative rapid-scanning. In addition to about 88 individuals of 47 beetles and bugs there were ‘many’ mites and fly puparia and ‘several’ larval spiracular processes of syrphid flies. Whole-assemblage diversity was estimated to be somewhat low ( $\alpha = 41$ , SE = 8), and foul matter taxa were a little better represented than usual (ten individuals, i.e. over one-tenth of the assemblage). There were ‘several’ of the following: *Cercyon analis*, *Carpelimus bilineatus*, *Philonthus politus*, *Lathridius minutus* group and *Anthicus formicarius*. There were also three *Cercyon unipunctatus* and *Omalium ?rivulare* and several taxa at frequency 2 which probably formed an *in situ* community of fairly foul matter with most of the more abundant taxa. There was a hint, no more, of a very small ‘house fauna’ group.

Fly puparia from this subsample comprised modest numbers of Sepsidae, *Nemopoda* sp. and *Leptocera* sp., with a single *Spilogona* sp.

#### Context 20225

*Sample 1151* (Spot): a cache of about 150 sloe (*Prunus spinosa*) fruitstones, with a few large plum/bullace, *P. domestica sensu lato*, stones.

**Cuts 20287 and 20230A**: the large pit, **20287**, lying towards the front of the central rear third of the site, was cut into ‘natural’. Into it, in turn were cut **20230A** (also Period 5B) and **20165** (Period 5C) and, which also reached ‘natural’.

#### Cut 20287

**Context 20294**: the single sampled fill, a black structured peat.

*Sample 1194* (GBA): dark brown (with reddish mottle), highly organic silt or silty amorphous to structured organic material rich in moss, with some bone fragments. A slightly brittle character, perhaps ‘cess’.

Plants (/M\*): A somewhat smaller than usual subsample of 0.41kg was processed. It gave a large assemblage of 55 taxa, but only grassland taxa in MOAR were especially well represented (the AIV of 22 was at rank 7 for this series of samples). This high value is accounted for in part by the unusual abundance score of 2 for *Prunella vulgaris*; had Gramineae and *Agrostis* sp(p). (which also achieved abundances of 2) been scored in MOAR its AIV would have been very much higher. Altogether nine taxa were included in MOAR and they may represent cut vegetation or perhaps more likely grazed pasture, the remains arriving in herbivore dung.

The only other taxon scoring 2 was madder, with which, as dyeplants were scored dyer's greenweed, clubmoss and hops; other 'useful;' plants included celery seed, flax, cat-mint and summer savory. Weeds in CHEN and SECA made up the biggest components but were not especially abundant taking assemblages from the site as a whole.

Parasitic worms: The single subsample examined was barren.

Insects (/T): Only 35 individuals of 24 beetles and other remains including 'many' mites, a human flea and an adult *Melophagus ovinus* were recorded by rapid scanning. There were five *Lathridius minutus* group and three *Ptenidium* sp., with only one or two individuals of the remaining taxa. The implications of this small group are uncertain.

There was a single *Phyllobius oblongus*, one of only two from the site, but remaining taxa were typical of Anglo-Scandinavian Coppergate.

*Sample 1199* (Spot): four eroded shells of the common snail *Helix aspersa*.

**Cut 20230A:** the size of this pit is difficult to assess since it was cut in turn from above by a large medieval limestone-walled well. It was probably at least 1m deep and 1m across. There were two sampled fills.

**Context 20279:** dark grey sandy silty loam with patches of pale olive ash and flecks of charcoal.

*Sample 1189* (Spot): two modern *Helix aspersa* shells.

*Sample 1301* (Spot): a lump of tufa with ?mortar firmly affixed to it and perhaps implicated in its formation. Tufa was observed in two other Period 5B layers, two Period 5B gully fills, and in one each of a post-hole fill, pit fill and layer from Period 4B.

**Context 20286:** black structured peat.

*Sample 1187* (BS—VW): A moderately large assemblage of 48 taxa was recorded from this sample, all at an abundance of 1. There were smallish components of foodplants and dyeplants (the latter including *Isatis*, *Diphysium*, *Genista* and *Rubia*), but with the largest components being annual weeds in groups CHEN and SECA.

*Sample 1185* (GBA): dark greyish, soft, highly humic silt rich in wood fragments, and with some fine plant detritus, stones (including decaying sandstone) and ash.

Parasitic worms: The single subsample examined was barren.

Insects (/T): Rapid-scanned, this subsample produced records of 93 individuals of 62 beetles and bugs, and a few other remains including 'many' mites. Diversity was high ( $\alpha = 81$ ; SE = 16), the outdoor component of about normal size (% B OB = 11), the decomposer component of about average size (% N RT = 66), but of rather high diversity (alph RT = 73; SE = 9) and with a substantial RD component (% N RD = 18, over a quarter of the decomposers). *Lathridius minutus* group (9 individuals) and *Cordalia obscura* (6) were the only species with more than three individuals, and there were three each of *Cercyon analis*, *Ptenidium* sp and *Mycetaea hirta*. There may have been house fauna present (some of the less frequent taxa fell in this category), but clearly

there were components of various origins, perhaps including pitfalls and well as background fauna and possibly dumped debris from a building.

*Sample 1198* (Spot): a single *Helix aspersa* shell.

**Cut 20290:** pit in the rear third of the site, behind Tenement C; it was about 1.3m across and up to 0.5m thick, as seen on section. There were three fills, of which one was sampled.

**Context 20289:** one of two laterally contiguous basal fill contexts, a black amorphous peat.

*Sample 1207* (GBA): dark reddish-brown, crumbly, highly humic silt or silty detritus with plant fragments including moss (occasionally felted).

Plants (/M): A rather large assemblage of 63 taxa was recovered from this subsample, with the following taxa scoring an abundance of 2: *Polygonum persicaria*, *P. lapathifolium*, *Chenopodium album*, *Raphanus raphanistrum* (pod segments/fragments) and *Lapsana communis*, with wheat/rye 'bran' at 3. There were also traces of faecal concretions, indicating this to be a deposit containing at least some faeces, but also a very large weed component. Thus CHEN achieved an AIV of 54 (equal rank 3) and SECA one of 38 (rank 3), whilst FOOS was only 15. The only other vegetation group worthy of mention is MOAR; grassland plants in this group reached an AIV of 24 (rank 6), the 12 taxa representing a range of possible grassland habitats from short turf to wet meadow/pasture. It may be significant that grass caryopses and spikelet/spikelet fragments were also recorded from this subsample (though not scored in MOAR).

A variety of occupation debris is represented amongst the other components of the residue—including tile, bone, eggshell membrane, stone and oyster shell.

Parasitic worms: The subsample examined was barren.

Insects (/T): The insects were recorded by semi-quantitative rapid scanning. There was a pig louse, *Haematopinus apri*, together with 'many' mites and 'several' fly puparia. About 70 individuals of Coleoptera were present, and some 34 taxa. Diversity was estimated to be low ( $\alpha = 26$ , SE = 5) and the outdoor component was small (two individuals). Decomposer diversity was moderately low (providing the estimation of numbers did not distort the value: alpha RT = 16, SE = 4). There were 'many' *Carpelimus bilineatus* and 'several' *C. pusillus* group, *Anotylus rugosus*, *Neobisnius* sp. and *Lathridius minutus* group. These and the remaining taxa suggested that this was a rather typical oxyteline-dominated assemblage, probably indicating moist organic matter.

**Cut 20371:** a rather large pit towards the rear of the site, behind Tenement B; it was about 2.5m across and 1.25m deep and contained a series of five fills, of which two were sampled.

**Context 20441:** the second-to-lowest fill, a black structured peat.

*Sample 1267* (BS—VW): A rather small assemblage of 34 taxa was recorded; however, five of them reached an abundance of 2—*Stellaria media*, *Neckera complanata*, *Thamnobryum alopecurum*, *Isothecium myosuroides* and *Hylocomium splendens*. These abundant mosses account for the high AIVs for LIGN (24, rank 1), SLIT (21, rank 1), and WOOF (17, rank 1) and point to exploitation of woodland floor/tree bark for importation of large branching moss. There was, however, no evidence from the plant remains for faecal material and the foodplant component was very limited.

*Sample 1266* (GBA): sandy silty amorphous organic material/detritus with coarse woody fragments (?chips or shavings), moss, twigs, ?monocot stem/leaf fragments, and bone.

Parasitic worms: Two subsamples were examined; one was barren, the other gave a trace of *Trichuris* eggs.

Insects (/1): There were about 51 individuals of 42 beetle and bug taxa, 'many' beetle larvae and fly puparia (some Sepsidae and *Leptocera* sp., and a few *Stomoxys calcitrans*), 'several' mites and assorted other remains (including a puparium and an adult of *Melophagus ovinus* and a larva of (*Athous haemorrhoidalis*) from the 2kg subsample.

Diversity was estimated to be high ( $\alpha = 110$ , but  $SE = 39$ ), the outdoor component accounted for over a third of the assemblage (with rather more aquatics than might be expected by chance), and the decomposer component was small (well under half of the individuals). This deposit clearly formed in the open, but whether it included any autochthonous or invading species is not clear; the fauna was ecologically very mixed.

**Context 20372:** immediately overlying **20441**, a very dark grey, slightly peaty clay loam, with many small pieces of wood.

*Sample 1263* (Wood): a collection of timbers including some large ash (*Fraxinus*) stems, to 50mm diameter, oak (*Quercus*) and hazel (*Corylus*) to 20mm diameter, and an irregularly-shaped piece of alder (*Alnus*) about 30mm in diameter.

*Sample 1276* (Spot): one eroded snail (*Helix aspersa*) shell.

**Cuts 29809** and **21727:** **29809** was a large roughly rectangular pit of up to 2.3 x 1.8m and 1.5m deep, with the smaller cut, **21727**, of about 0.6m diameter and 0.25m depth cut from above; they lay in the backyard behind Tenement D.

#### **Cut 29809**

**Context 21682:** in the lower half of the pit, at its N end; a layer of twigs.

*Sample 1796* (Spot): avian eggshell; no further analysis undertaken.

#### **Cut 21727**

**Context 21674:** the main fill (unsampled Context **21737** comprised redeposited natural); very dark grey, slightly peaty, silty clay loam.

*Sample 1789* (BS—VW): A rather large assemblage of 57 taxa was recorded from this sample; foodplants were important, the AIV of 56 for FOOS being the fourth highest for the BS samples from Period 5. It was accounted for in part by abundances of 2 for both seeds and endocarp of *Malus*, stones of *Prunus spinosa* and seeds of *Linum usitatissimum* and wheat/rye 'bran'. Other food remains included *Prunus domestica*, *Apium graveolens*, *Vaccinium* sp(p). and charred bread/club wheat, and the moderately abundant *Agrostemma* seed fragments are likely to have been a contaminant of flour.

*Sample 1790* (GBA): dark grey-brown rather heterogeneous, rather humic, sandy silt, with bone, plant detritus, some coarse sand and fine gravel.

Insects (/T): A rapid scan revealed only 17 individuals of 16 beetle taxa and small numbers of a variety of other arthropods, including a sheep ked puparium. There was 'bran', and fruitstones were also noted.

**Cut 24871:** a narrow, steep-sided cut, about 2.5m deep and only 0.6-0.8m in diameter, close to the later cut for the large limestone-walled well in the extreme rear of the site behind Tenement C. A single fill of the several present was sampled.

**Context 26015:** very dark grey, peaty clay loam.

*Sample 1677* (BS—VW): A total of 49 taxa were recorded from this sample; there were abundance scores of 2 for *Linum usitatissimum* (capsule fragments), *Ilex aquifolium* leaf fragments, *Sambucus nigra* seeds, and for fly puparia. There were not, however, especially large AIVs for any group except perennial weeds in ARTE (22, equal rank 2 for this set of samples), though most of the taxa scored in this group were also scored in at least one other group. There was certainly no primary component of this fill that could be

identified from the plant remains and it may be that it was largely backfill or post-use accumulation.

**Cut 29810:** a substantial pit of at least 1.8m across and up to 0.35m deep, towards the south-east corner of the site, behind Tenement D. It had a rather complex series of fills of which two were sampled.

**Context 21511:** exact location uncertain, but lying between unsampled Contexts **21730** and **19567**, the same relative position as **21510** (below); dark reddish-brown silty peat with much woody material.

**Sample 1781 (Spot):** a small lump of vivianite-coated sandstone.

**Context 21510:** a fairly substantial layer, towards the top of the fill sequence; very dark greyish-brown silty peat, with many large flecks of ash and a few charcoal flecks.

**Sample 1751 (BS—VW):** A modest assemblage of 33 taxa was recorded, but with clear evidence for faecal remains. Although faecal concretions and ‘bran’ only scored 1, there were scores of 2 for *Prunus spinosa* and the food component (FOOS) reached an AIV of 39, within the top 15% of values for this parameter for the Period 5 BS samples. The foodplants from woodland/hedgerow habitats (blackberry, apple, sloe) account for the large AIVs for QUFA and RHPR relative to other groups like CHEN, which is here rather poorly represented. The moss component was unusually limited.

**Parasitic worms:** Two subsamples of concretion from the BS residue were examined; they gave modest numbers of well preserved *Trichuris* eggs, many of which were measured.

**Sample 1746 (GBA):** blackish, highly humified silty organic detritus (‘cess’) with a large wood fragment.

**Plants (/M):** Somewhat in contrast to the BS sample, this subsample yielded 70 taxa, the sixth highest score for small Period 5 samples. It also

yielded the largest AIV for FOOS (51) for any sample in this series, with scores of 3 for wheat/rye ‘bran’ and of 2 for *Rubus fruticosus* seeds, *Malus endocarp*, *Linum usitatissimum* seeds. The score of 2 for cereal chaff may be connected with food processing (or perhaps the food represented was intended for, or eaten by, animals rather than humans?), and the scores of 2 for *Agrostemma githago* seed fragments and *Anthemis cotula* and *Lapsana communis* achenes may point to grain contaminants which were or were not removed prior to milling. They partly account for the high AIV of 36 (equal rank 5) for SECA. Other foodplants included *Prunus domestica*, *Vaccinium*, and *Vicia faba* (testa fragments), and possible flavourings included *Apium graveolens*, *Anethum graveolens* and *Satureja hortensis* (giving the equal highest AIV for FOOF of 15 for this sample). The abundant (score 3) faecal concretions complete the delineation of this deposit as primary faecal material.

Mosses were rather well represented in this assemblage, with a score of 2 for *Neckera complanata*, partly accounting for the high AIV of 18 for LIGN (equal rank 5). They were probably used as toilet tissue.

There were also, however, rather large components of weed taxa—especially CHEN and SECA (see above).

**Insects (/T):** Rapid-scan recorded. There were some 51 beetles and bugs of 41 taxa, and ‘many’ fly puparia (mostly Sepsidae and *Leptocera* sp., with a few *Muscina stabulans*) and mites and a few other remains. Main statistics were not very informative bearing in mind assemblage size and recording method, although foul decomposers were relatively abundant, making up almost a fifth of the assemblage. There were no more than three of any species, but strong hints of foul matter (three *Platystethus arenarius* and two *Cercyon terminatus*, for example).

**Sample 1759 (Spot):** This sample was a 21g coprolite, identified as that of a dog on the basis of small bone fragments, yielded no parasite eggs when analysed.

*Sample 1766* (Spot): an almost complete beetle, identified as *Blaps* sp.

### Gully fills in rear area

*Cut 19638*: a probable gully of about 1.7m in width and at least 3m long (it was difficult to trace it clearly on the relevant plan), apparently following the line of the Period 4B Gully *19642*.

**Context 19623**: the basal context; a very dark grey, sandy silty amorphous and structured peat.

*Sample 1763* (BS—VW): With 69 taxa, this was the eighth largest assemblage from a Period 5 BS samples. Several taxa scored 2: *Polygonum persicaria*, *Chenopodium album*, *Stellaria media* and *Sambucus nigra*, and the largest single group of taxa was weeds of waste places (CHEN, the AIV being 57, equal rank 4 in this series). Other weed groups, SECA, ARTE and BIDE were also well represented. Foodplants achieved an AIV of 30, based on nine taxa, which included blackberry, apple, strawberry, sloe and ‘plum’. This was the only record of strawberry from the Anglo-Scandinavian deposits at this site; this species is usually quite common in cess pits of later medieval date in York and elsewhere, but seems not to have been collected by the Anglo-Scandinavian inhabitants of Coppergate.

There were traces of five taxa scored with DYES, and the presence of linseed, hemp-seed and poppy seed, as well as the more dubiously included *Brassica rapa*, accounts for the high AIV of 10 for oil-plants in FOOO. Three possible food flavourings were recorded—hops, summer savory, and poppy seed.

*Sample 1762* (GBA): no action to date.

*Sample 1775* (GBA): dark red-brown, layered amorphous organic material and herbaceous detritus. A test subsample was requested but appears not to have been processed.

Parasitic worms: The single subsample examined gave single specimens of *Trichuris* and *Ascaris*.

In addition, a 6kg subsample was bulk-sieved after the main period of processing; it was not sorted.

**Context 19620**: overlying **19623**, a black, fibrous, sandy slightly silty peat, very sandy in places, with bone, limestone fragments and cobbles.

*Sample 1693* (BS—VW): This sample yielded the fourth largest assemblage for Period 5 BS samples: 75 taxa. Here, there was some definite evidence for faecal material, in the form of faecal concretions at a score of 1. Foodplants were not much better represented than in the BS from 1763, however. Other probable food components included quantities of bone, fish and mammal bone both scoring 2.

For the rest, most taxa were scored in one of the weed groups. The AIV for CHEN was 54 (rank 8), that for SECA 36 (equal rank 3), with BIDE at 23 (equal rank 2) and ARTE at 20 (equal rank 5). Grassland taxa in MOAR reached their second highest AIV of 20, with ten taxa, including three also scored with ARTE. Another group that was unusually well represented was fen/marsh plants in SCCA—giving an AIV of 8, the largest for the Period 5 BS sample. These taxa were *Pedicularis palustris*, *Ranunculus flammula*, *Potentilla palustris* and *Menyanthes trifoliata*. With the exception of *Potentilla palustris*, all are scored in at least one other group. Whilst imported fen peat is one possible source of these remains, it is perhaps more likely that they arrived with river water; given the other botanical evidence, it seems hardly possible that the gully supported vegetation including these taxa.

Some high AIVs were recorded from this assemblage for woodland mosses in LIGN (18, equal rank 3) and SLIT (14, equal rank 3). These may have been used as toilet tissue.

*Sample 1694* (GBA): dark grey-brown, crumbly, sandy silt, with wood fragments and perhaps some ash (note the contrast with the excavators’ context description above).

Insects (/T): Rapid scanned. There were an estimated 63 individuals of 46 beetle taxa together

with various other remains including a few puparia of *Leptocera* and *Nemopoda* sp., 'several' scale insects and Proctotrupoidea and an unidentified flea. Main statistics were unexceptional in a small assemblage recorded in this way, although over a fifth of it was made up by outdoor forms and diversity was high ( $\alpha$  estimated at 76; SE = 20). There were three individuals each of *Platystethus arenarius* and *P. cornutus* group, and of two species of *Atomaria*. Other taxa were represented by only one or two individuals. The implications of this group were not clear, and all might have been background fauna. There were, however, hints of a small group associated with rather foul, probably open-textured, plant remains.

In addition, a 19kg subsample was bulk-sieved after the main period of processing. It yielded large amounts of mammal bone and wood with smaller quantities of charcoal, other plant remains, tile, fly puparia, shellfish and eggshell.

*Sample 1716* (Spot): identified by superficial inspection as a faecal concretion; no further analysis undertaken.

**Context 19622:** exact stratigraphic relationships uncertain; very dark grey, silty, sandy structured and amorphous peat with some slight iron-panning.

*Sample 1748* (BS—VW): A total of 61 taxa were recovered from this sample, another high value for this parameter. Here the foodplant component was more conspicuous, with an AIV for FOOS of 41 (equal rank 11). This group included walnut—one of only two records from Period 5 samples (it was rather more common in earlier periods), as well as sloe (abundance 2, the only taxon to be so scored), apple (seed and endocarp), hawthorn, blackberry, dewberry, and 'plum'. Although faecal concretions were not recorded by ARH during sorting of the washover, they were apparently present in the residue and were noted as present during rough sorting.

There was again a 'background' of dyeplant taxa, and rather modest components of weeds of various kinds. Mosses, mainly woodland taxa, were

numerous, the AIVs being quite high for LIGN and WOOF.

This sample also yielded modest numbers of Sepsidae sp. puparia.

*Sample 1747* (GBA): dark grey-brown, crumbly, slightly sandy, silty amorphous organic material with coarse herbaceous and woody detritus, traces of clay flecks and moderate amounts of wood and twig fragments and traces of ?faecal concretions. Large (*Prunus*) fruitstones were recorded during disaggregation of the 1kg /T subsample.

Parasitic worms: Two subsamples were examined; both gave considerable numbers of *Trichuris* eggs and moderate numbers of *Ascaris*; measurements of some of each taxon were made.

Insects: Semi-quantitative rapid scanning gave a list of 45 beetles of 33 taxa together with 'several' fly puparia, 'many' mites and a small number of other remains. Main statistics were not unusual for this site apart from a proportionally very large RF group (over a quarter of the individuals). There were 'several' *Platystethus arenarius* and three *Cercyon haemorrhoidalis*, suggesting that there was foul matter *in situ* or nearby. The other taxa recorded were very typical of 16-22 Coppergate; apart from those mentioned, only *Lathridius minutus* group was represented by more than two individuals (there were three).

Fly puparia included small numbers of *Nemopoda* sp. and Limosiniinae and rather more Sepsidae sp.

In addition, a 5kg subsample was bulk-sieved after the main period of processing; it was not sorted.

**Cut 21142:** a gully in the south-east quarter of the site to the rear of Tenements C and D, corresponding to Cut **19213** (apparently unsampled) in Area V. It was at least 15m in length and was cut in turn by Cuts **21190** and **21147** (the fills of neither of these were sampled). At the top of the uppermost fill, the gully was about 0.4m across. The stratigraphic relationships of the

sampled contexts could not always be established from the excavation record.

**Context 19326:** the basal fill, dark greyish-brown, sandy, silty clay loam with charcoal and wood fragments.

*Sample 1313* (GBA): light yellow-grey, crumbly, sandy silt with traces of wood fragments and sloe stones.

Plants (/M): A somewhat above-average assemblage of 49 taxa was recovered, with several achieving abundances greater than 1: *Stellaria media*, *Prunus spinosa*, *Sambucus nigra* and *Sonchus oleraceus* all scored 2 and, most unusually, *Apium graveolens* scored 3. This last is, of course, a major contributor to the AIVs of FOOS (42, rank 6) and FOOB (15, equal rank 1). Not counted amongst the foodplants were traces of fruit fragments of beet, *Beta vulgaris*. This, with *Apium graveolens*, might have grown as a coastal plant (or secondarily as a weed inland?) or may even have been cultivated—it cannot be discerned which. It is one of only seven records of *Beta* from the site.

Weeds were very much the largest component of this assemblage, with CHEN achieving an AIV of 48 (rank 8) and a very large value for ARTE (20, rank 1), reflecting in part the *S. oleraceus* score. Unusual records for characteristic ARTE taxa—*Malva sylvestris* and *Ballota nigra*—were made for this subsample. BIDE was rather well represented, too, the AIV of 18 being at equal rank 6.

This assemblage was also noteworthy for being one of the few from this corpus to have good preservation of macrofossil plant remains but to have yielded no identifiable mosses. There was, however, a variety of occupation debris, including tile, bone, charcoal, leather, and oyster shell, and fly puparia were rather common.

Parasitic worms: The single subsample gave trace amounts of both *Trichuris* and *Ascaris* eggs.

Insects (/T): The modest insect group was rapid-scanned and semi-quantitatively recorded. A few *Nemopoda* sp. puparia were also recorded, but remains other than of beetles and bugs were rare. About 82 beetles and bugs were present, with 56 taxa recorded. Diversity was estimated to be high ( $\alpha = 77$ ; SE = 17) and the outdoor component was substantial (% N OB = 18). RF taxa were quite well represented (over a tenth of the assemblage, but of course only a quite small number of individuals). Diversity of the decomposer component was high (alpha RT = 40; SE = 12). ‘Several’ *Carpelimus bilineatus* and *Anobium punctatum* were observed, and there were three *Platystethus arenarius*. The less abundant taxa included a considerable number suggesting invasion of habitats which would favour somewhat foul conditions, but there was clearly a substantial ‘background’ component.

*Sample 1295* (Chemical): A faecal concretion on the basis of superficial inspection, but not analysed further.

**Context 19457:** immediately overlying 19326; dark brown, silty, amorphous peat with wood and charcoal.

*Sample 1312* (GBA): mid grey to grey-brown, crumbly, slightly humic, sandy clay silt with wood fragments, charcoal and fish bone.

Plants (/M): There were 38 taxa in this sample, making it slightly below the period mean. There were abundance scores of 2 for *Apium graveolens* and *Sonchus oleraceus* and of 3 for *Sambucus nigra*, suggesting that it was very similar to the subsample from 1313. Faecal concretions were present in small amounts, and there was a range of occupations debris, including burnt and unburnt fish and mammal bone (some in modest amounts), oyster shell, charcoal and wood fragments (the last of these also rather common). The AIVs were all rather smaller than for the assemblage from 1313, though that for ARTE (18) was at rank 3, bolstered by the *S. oleraceus* record and by the tentative record for feverfew, *Tanacetum parthenium*, the only record for the plant from Anglo-Scandinavian

Coppergate. The record for ?oxeye daisy, cf. *Leucanthemum vulgare*, is also the only one.

Again, mosses were absent, but there was background of dyeplants and a modest food plant component, though no 'bran' was recorded.

Parasitic worms: The single subsample gave small amounts of *Trichuris* eggs and a single *Ascaris*.

Insects (/T): Recording was by semi-quantitative rapid scanning. There were 'many' mites and *Nemopoda* sp. puparia, a few other remains including a larval apex of *Athous haemorrhoidalis*, and a modest group of beetles (N about 79, S = 51). The proportion of decomposers was rather small (52%), but this was depressed by a number of uncoded taxa perhaps belonging to decomposer communities. There were 'several' of the following: *Carpelimus bilineatus*; a large *Philonthus* (probably *P. politus*); and *Anobium punctatum*. There was probably foul matter exposed for colonisation, but a substantial background component was doubtless present.

**Context 19245:** overlying 19457 but separated from it by 19452 and 19453 (both unsampled); very dark grey, very silty, ashy, sandy, clay loam.

*Sample 1182* (GBA): mid grey to grey-brown, crumbly, sandy clay silt to silty clay, with some charcoal, rotted wood, and stones, but low organic content.

Plants (/M): Only 20 taxa were recovered from this subsample, reflecting the low organic content recorded when the sediment was described. Most taxa were weeds, nearly half (45%) in group CHEN. This included four species of *Chenopodium*, among them *CC. murale* and *ficifolium*, apparently found most often at this site in assemblages rich in annual weeds of disturbed places and presumably part of the local flora. Only *Sambucus nigra* scored 2; this is likely also to have been part of the vegetation of a neglected corner of the site.

Parasitic worms: There were modest numbers of *Trichuris* eggs in the single subsample examined.

Insects (/T): There were only 21 individuals of 20 beetle taxa, including two *Carpelimus fuliginosus*. There were also 'many' mites. The assemblage had no clear interpretative significance.

*Sample 1174* (Spot): two broken snail shells of *Helix aspersa*.

*Sample 1177* (Spot): one eroded snail shell of *H. aspersa*

*Sample 1178* (Spot): one broken snail shell of *H. aspersa*.

*Sample 1188* (Spot): one eroded snail shell of *H. aspersa*.

*Sample 1190* (Spot): one eroded snail shell of *H. aspersa*.

*Sample 1193* (Spot): one broken snail shell of *H. aspersa*

The following contexts could not be located more accurately within the fills of Gully 21142:

**Context 6820:** very dark grey, peaty, silty clay loam containing wood fragments.

*Sample 1154* (Spot): one fragmentary shell of the common snail, *Helix aspersa*.

**Context 19308:** dark greyish-brown, very sandy, silty clay with wood flecks, calcined bone and shell.

*Sample 1249* (Spot): one fragmentary modern snail shell of *H. aspersa*.

*Sample 1281* (Spot): two ?modern snail shells of *H. aspersa*.

**Context 19324:** dark greyish-brown, silty clay loam, with patches of white ash, charcoal, burnt bone, wood fragments and oyster.

*Sample 1278* (Spot): a single ?modern snail shell of *Helix aspersa*.

**Context 19369:** grey, silty clay loam, with flecks of pink clay and substantial amounts of wood and charcoal.

*Sample 1288* (Spot): 12 ?modern *Helix aspersa* shells, and a single *Cepea nemoralis* shell.

**Context 21182:** mixture of black charcoal and pale yellow ash.

*Sample 1645* (Chemical): light-mid grey, crumbly ash with moderate amounts of charcoal and traces of large burnt bone fragments; no further analysis undertaken.

**Context 21404:** black, very silty, amorphous peat, with limestone, bone, shell and charcoal and wood flecks.

*Sample 1692* (BS—VW): A rather large assemblage of 59 taxa was obtained from this sample, all in trace amounts. The largest component by number of taxa was CHEN (33%, fairly large AIV of 35), but judged by AIV, the most important group was FOOS. This included *Malus* seeds and endocarp, *Prunus spinosa* and *P. domestica*, *Vicia faba* and *Vaccinium*, and there was also some 'bran'. The only group with an unusually high AIV was FOOF, with 15 (rank 1), based on five taxa (*Humulus lupulus*, *Papaver somniferum*, *Anethum graveolens*, *Apium graveolens* and *Satureja hortensis*), the largest count of taxa for this group for any Period 5 BS sample. Other possible food remains in this sample were eggshell membrane fragments and some ?charred bread.

Parasitic worms: Two subsamples of concretion were examined; one gave rather large numbers of *Trichuris* eggs, the other moderate numbers. Preservation was generally good and many eggs were measured.

An unusual range of fly puparia was obtained from this sample: together with frequently-recorded taxa such as *Musca domestica*, *Muscina* sp. and Sepsidae sp. (all present in modest numbers), there were, among others, specimens of *Phaonia* sp. and *Spilogona* sp.

**Context 21438:** yellowish-brown, sandy, silty peat.

*Sample 1691* (Spot): avian eggshell; no further analysis undertaken.

**Context 21847:** very dark greyish-brown, peaty, silty loam, with bone, shell and wicker, and occasional patches of sand.

*Sample 2115* (Spot): a single *Muscina* sp. puparium attached to a piece of wood.

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Sample 1028 . . . . .	74	Sample 1161 . . . . .	7	Sample 1242 . . . . .	102	Sample 1309 . . . . .	3
Sample 103 . . . . .	16	Sample 1167 . . . . .	104	Sample 1243 . . . . .	42	Sample 131 . . . . .	34
Sample 1033 . . . . .	99	Sample 1169 . . . . .	42	Sample 1246 . . . . .	101	Sample 1310 . . . . .	108
Sample 1036 . . . . .	99	Sample 1170 . . . . .	101	Sample 1247 . . . . .	106	Sample 1311 . . . . .	102
Sample 104 . . . . .	13	Sample 1171 . . . . .	101	Sample 1248 . . . . .	106	Sample 1312 . . . . .	116
Sample 1040 . . . . .	98	Sample 1172 . . . . .	101	Sample 1249 . . . . .	117	Sample 1313 . . . . .	115
Sample 1041 . . . . .	99	Sample 1173 . . . . .	101	Sample 1250 . . . . .	6	Sample 132 . . . . .	35
Sample 1043 . . . . .	70	Sample 1174 . . . . .	116	Sample 1251 . . . . .	6	Sample 1325 . . . . .	66
Sample 1044 . . . . .	43	Sample 1175 . . . . .	103	Sample 1252 . . . . .	102	Sample 1326 . . . . .	4
Sample 1045 . . . . .	98	Sample 1176 . . . . .	101	Sample 1253 . . . . .	106	Sample 1327 . . . . .	4
Sample 1046 . . . . .	97	Sample 1177 . . . . .	116	Sample 1254 . . . . .	105	Sample 1328 . . . . .	4
Sample 1047 . . . . .	97	Sample 1178 . . . . .	116	Sample 1257 . . . . .	100	Sample 1329 . . . . .	3
Sample 1048 . . . . .	96	Sample 1179 . . . . .	102	Sample 1258 . . . . .	78	Sample 133 . . . . .	35
Sample 1050 . . . . .	66	Sample 118 . . . . .	16	Sample 1260 . . . . .	6	Sample 134 . . . . .	34
Sample 1052 . . . . .	96	Sample 1181 . . . . .	7	Sample 1261 . . . . .	77	Sample 1359 . . . . .	45
Sample 1053 . . . . .	96	Sample 1182 . . . . .	116	Sample 1262 . . . . .	77	Sample 1360 . . . . .	44
Sample 1055 . . . . .	95	Sample 1183 . . . . .	7	Sample 1263 . . . . .	111	Sample 1361 . . . . .	44
Sample 1056 . . . . .	95	Sample 1184 . . . . .	7	Sample 1264 . . . . .	78	Sample 1362 . . . . .	47
Sample 1057 . . . . .	94	Sample 1185 . . . . .	110	Sample 1266 . . . . .	111	Sample 1363 . . . . .	44

Sample 1364 . . . . .	44	Sample 1711 . . . . .	92	Sample 1915 . . . . .	40	Sample 25 . . . . .	9
Sample 1375 . . . . .	71	Sample 1712 . . . . .	92	Sample 1919 . . . . .	66	Sample 253 . . . . .	68
Sample 138 . . . . .	62	Sample 1715 . . . . .	92	Sample 1932 . . . . .	74	Sample 260 . . . . .	88
Sample 139 . . . . .	63	Sample 1716 . . . . .	114	Sample 1934 . . . . .	40	Sample 267 . . . . .	102
Sample 14 . . . . .	3	Sample 1717 . . . . .	100	Sample 1938 . . . . .	41	Sample 271 . . . . .	88
Sample 140 . . . . .	63	Sample 1746 . . . . .	112	Sample 1939 . . . . .	51	Sample 272 . . . . .	50
Sample 141 . . . . .	63	Sample 1747 . . . . .	114	Sample 1942 . . . . .	42	Sample 273 . . . . .	64
Sample 144 . . . . .	63	Sample 1748 . . . . .	114	Sample 1947 . . . . .	42	Sample 287 . . . . .	58
Sample 145 . . . . .	16	Sample 1751 . . . . .	112	Sample 1952 . . . . .	68	Sample 288 . . . . .	90
Sample 146 . . . . .	62	Sample 1759 . . . . .	113	Sample 1957 . . . . .	68	Sample 29 . . . . .	4
Sample 147 . . . . .	36	Sample 1760 . . . . .	67	Sample 1958 . . . . .	68	Sample 293 . . . . .	66
Sample 148 . . . . .	34	Sample 1762 . . . . .	113	Sample 1961 . . . . .	42	Sample 294 . . . . .	50
Sample 151 . . . . .	36	Sample 1763 . . . . .	113	Sample 1965 . . . . .	78	Sample 295 . . . . .	88
Sample 152 . . . . .	36	Sample 1766 . . . . .	113	Sample 1966 . . . . .	41	Sample 296 . . . . .	31
Sample 153 . . . . .	36	Sample 1767 . . . . .	93	Sample 1967 . . . . .	42	Sample 299 . . . . .	30
Sample 154 . . . . .	36	Sample 1775 . . . . .	113	Sample 1968 . . . . .	103	Sample 30 . . . . .	33
Sample 155 . . . . .	36	Sample 1781 . . . . .	112	Sample 1969 . . . . .	41	Sample 302 . . . . .	58
Sample 157 . . . . .	63	Sample 1789 . . . . .	111	Sample 198 . . . . .	37	Sample 305 . . . . .	65
Sample 1574 . . . . .	51	Sample 1790 . . . . .	112	Sample 1982 . . . . .	75	Sample 307 . . . . .	65
Sample 1575 . . . . .	51	Sample 1796 . . . . .	111	Sample 1987 . . . . .	76	Sample 310 . . . . .	32
Sample 1576 . . . . .	51	Sample 1797 . . . . .	17	Sample 199 . . . . .	36	Sample 311 . . . . .	102
Sample 158 . . . . .	64	Sample 1808 . . . . .	72	Sample 1998 . . . . .	76	Sample 312 . . . . .	58
Sample 159 . . . . .	64	Sample 1809 . . . . .	72	Sample 2000 . . . . .	77	Sample 318 . . . . .	50
Sample 1602 . . . . .	71	Sample 1819 . . . . .	73	Sample 2001 . . . . .	77	Sample 329 . . . . .	32
Sample 1603 . . . . .	71	Sample 1820 . . . . .	73	Sample 203 . . . . .	37	Sample 33 . . . . .	35
Sample 1604 . . . . .	71	Sample 1831 . . . . .	103	Sample 2043 . . . . .	70	Sample 338 . . . . .	100
Sample 161 . . . . .	33	Sample 1834 . . . . .	49	Sample 2054 . . . . .	42	Sample 343 . . . . .	59
Sample 1619 . . . . .	67	Sample 1838 . . . . .	49	Sample 2059 . . . . .	78	Sample 346 . . . . .	102
Sample 1620 . . . . .	67	Sample 1839 . . . . .	84	Sample 2105 . . . . .	17	Sample 349 . . . . .	59
Sample 1623 . . . . .	67	Sample 1840 . . . . .	84	Sample 2115 . . . . .	117	Sample 350 . . . . .	102
Sample 1624 . . . . .	67	Sample 1841 . . . . .	84	Sample 22 . . . . .	11	Sample 352 . . . . .	29
Sample 1644 . . . . .	103	Sample 1848 . . . . .	49	Sample 220 . . . . .	52	Sample 360 . . . . .	52
Sample 1645 . . . . .	117	Sample 1852 . . . . .	89	Sample 221 . . . . .	55	Sample 362 . . . . .	65
Sample 1665 . . . . .	71	Sample 1855 . . . . .	69	Sample 222 . . . . .	53	Sample 367 . . . . .	29
Sample 1671 . . . . .	38	Sample 1860 . . . . .	93	Sample 223 . . . . .	54	Sample 37 . . . . .	33
Sample 1673 . . . . .	72	Sample 1862 . . . . .	93	Sample 225 . . . . .	60	Sample 375 . . . . .	29
Sample 1677 . . . . .	112	Sample 1863 . . . . .	51	Sample 226 . . . . .	60	Sample 379 . . . . .	90
Sample 1678 . . . . .	72	Sample 1864 . . . . .	41	Sample 227 . . . . .	57	Sample 38 . . . . .	11
Sample 1691 . . . . .	117	Sample 1878 . . . . .	40	Sample 229 . . . . .	57	Sample 389 . . . . .	65
Sample 1692 . . . . .	117	Sample 1879 . . . . .	40	Sample 2296 . . . . .	78	Sample 390 . . . . .	52
Sample 1693 . . . . .	113	Sample 1880 . . . . .	75	Sample 23 . . . . .	34	Sample 394 . . . . .	58
Sample 1694 . . . . .	114	Sample 1881 . . . . .	52	Sample 230 . . . . .	55	Sample 396 . . . . .	48
Sample 1697 . . . . .	103	Sample 1882 . . . . .	74	Sample 231 . . . . .	57	Sample 397 . . . . .	40
Sample 1702 . . . . .	90	Sample 1884 . . . . .	41	Sample 232 . . . . .	55	Sample 398 . . . . .	68
Sample 1704 . . . . .	90	Sample 1890 . . . . .	41	Sample 233 . . . . .	63	Sample 404 . . . . .	64
Sample 1705 . . . . .	90	Sample 1892 . . . . .	70	Sample 236 . . . . .	56	Sample 409 . . . . .	64
Sample 1706 . . . . .	91	Sample 1903 . . . . .	67	Sample 237 . . . . .	56	Sample 41 . . . . .	12
Sample 1708 . . . . .	92	Sample 1906 . . . . .	78	Sample 238 . . . . .	59	Sample 419 . . . . .	51
Sample 1709 . . . . .	92	Sample 1910 . . . . .	93	Sample 239 . . . . .	60	Sample 42 . . . . .	12

Sample 423 . . . . .	87	Sample 689 . . . . .	64	Sample 787 . . . . .	46	Sample 876 . . . . .	19
Sample 427 . . . . .	88	Sample 696 . . . . .	64	Sample 79 . . . . .	33	Sample 877 . . . . .	20
Sample 43 . . . . .	12	Sample 700 . . . . .	86	Sample 795 . . . . .	5	Sample 88 . . . . .	61
Sample 438 . . . . .	70	Sample 702 . . . . .	87	Sample 797 . . . . .	9	Sample 884 . . . . .	64
Sample 44 . . . . .	13	Sample 70501 . . . . .	80	Sample 799 . . . . .	105	Sample 888 . . . . .	6
Sample 445 . . . . .	48	Sample 70502 . . . . .	81	Sample 801 . . . . .	5	Sample 889 . . . . .	20
Sample 446 . . . . .	48	Sample 70504 . . . . .	81	Sample 807 . . . . .	8	Sample 89 . . . . .	61
Sample 447 . . . . .	49	Sample 70505 . . . . .	81	Sample 808 . . . . .	5	Sample 891 . . . . .	20
Sample 448 . . . . .	79	Sample 70506 . . . . .	82	Sample 809 . . . . .	104	Sample 901 . . . . .	38
Sample 449 . . . . .	49	Sample 70507 . . . . .	82	Sample 81 . . . . .	35	Sample 902 . . . . .	38
Sample 452 . . . . .	49	Sample 70508 . . . . .	82	Sample 811 . . . . .	45	Sample 904 . . . . .	38
Sample 454 . . . . .	49	Sample 70509 . . . . .	82	Sample 812 . . . . .	5	Sample 908 . . . . .	37
Sample 455 . . . . .	102	Sample 70510 . . . . .	83	Sample 815 . . . . .	26	Sample 909 . . . . .	8
Sample 457 . . . . .	65	Sample 707 . . . . .	80	Sample 816 . . . . .	27	Sample 910 . . . . .	102
Sample 46 . . . . .	12	Sample 708 . . . . .	83	Sample 820 . . . . .	101	Sample 914184 . . . . .	87
Sample 461 . . . . .	77	Sample 709 . . . . .	83	Sample 821 . . . . .	5	Sample 915456 . . . . .	105
Sample 467 . . . . .	34	Sample 71 . . . . .	87	Sample 822 . . . . .	5	Sample 915543 . . . . .	9
Sample 469 . . . . .	65	Sample 714 . . . . .	83	Sample 823 . . . . .	5	Sample 917 . . . . .	39
Sample 47 . . . . .	12	Sample 721 . . . . .	79	Sample 826 . . . . .	28	Sample 918 . . . . .	39
Sample 470 . . . . .	102	Sample 729 . . . . .	23	Sample 827 . . . . .	27	Sample 919 . . . . .	39
Sample 486 . . . . .	102	Sample 731 . . . . .	24	Sample 828 . . . . .	47	Sample 92 . . . . .	61
Sample 487 . . . . .	41	Sample 732 . . . . .	24	Sample 831 . . . . .	28	Sample 920 . . . . .	39
Sample 51 . . . . .	13	Sample 733 . . . . .	24	Sample 832 . . . . .	47	Sample 921925 . . . . .	74
Sample 52 . . . . .	11	Sample 734 . . . . .	24	Sample 833 . . . . .	47	Sample 923 . . . . .	83
Sample 53 . . . . .	12	Sample 735 . . . . .	24	Sample 834 . . . . .	101	Sample 937 . . . . .	8
Sample 54 . . . . .	14	Sample 736 . . . . .	25	Sample 838 . . . . .	28	Sample 94 . . . . .	33
Sample 546 . . . . .	69	Sample 737 . . . . .	25	Sample 839 . . . . .	28	Sample 945 . . . . .	6
Sample 549 . . . . .	70	Sample 738 . . . . .	25	Sample 840 . . . . .	46	Sample 957 . . . . .	8
Sample 55 . . . . .	13	Sample 739 . . . . .	25	Sample 841 . . . . .	46	Sample 958 . . . . .	9
Sample 551 . . . . .	40	Sample 746 . . . . .	46	Sample 842 . . . . .	29	Sample 960 . . . . .	83
Sample 557 . . . . .	41	Sample 747 . . . . .	50	Sample 849 . . . . .	29	Sample 962 . . . . .	87
Sample 56 . . . . .	14	Sample 75 . . . . .	86	Sample 851 . . . . .	22	Sample 967 . . . . .	17
Sample 57 . . . . .	15	Sample 752 . . . . .	9	Sample 852 . . . . .	22	Sample 969 . . . . .	83
Sample 58 . . . . .	15	Sample 754 . . . . .	25	Sample 853 . . . . .	23	Sample 972 . . . . .	85
Sample 582 . . . . .	86	Sample 755 . . . . .	26	Sample 854 . . . . .	23	Sample 991404 . . . . .	79
Sample 583 . . . . .	79	Sample 756 . . . . .	26	Sample 855 . . . . .	23	Sample 991473 . . . . .	62
Sample 59 . . . . .	15	Sample 758 . . . . .	9	Sample 856 . . . . .	22	Sample 992399 . . . . .	37
Sample 60 . . . . .	14	Sample 76 . . . . .	79	Sample 857 . . . . .	21	Sample 992467 . . . . .	14
Sample 61 . . . . .	84	Sample 763 . . . . .	74	Sample 86 . . . . .	33	Sample 995848 . . . . .	89
Sample 62 . . . . .	85	Sample 770 . . . . .	9	Sample 862 . . . . .	5	Sample 996434 . . . . .	99
Sample 63 . . . . .	85	Sample 772 . . . . .	24	Sample 864 . . . . .	37	Sample 997204 . . . . .	55
Sample 646 . . . . .	74	Sample 776 . . . . .	26	Sample 865 . . . . .	39	Sample 997252 . . . . .	61
Sample 65 . . . . .	38	Sample 777 . . . . .	46	Sample 866 . . . . .	45	Sample 997553 . . . . .	89
Sample 66 . . . . .	85	Sample 778 . . . . .	46	Sample 867 . . . . .	5	Sample 997589 . . . . .	48
Sample 662 . . . . .	23	Sample 78 . . . . .	74	Sample 868 . . . . .	38	Sample 997668 . . . . .	74
Sample 666 . . . . .	64	Sample 783 . . . . .	9	Sample 87 . . . . .	38	Sample 998 . . . . .	75
Sample 668 . . . . .	23	Sample 784 . . . . .	9	Sample 871 . . . . .	18	Sample 998123 . . . . .	32
Sample 669 . . . . .	23	Sample 785 . . . . .	9	Sample 872 . . . . .	19	Sample 998124 . . . . .	32
Sample 678 . . . . .	87	Sample 786 . . . . .	9	Sample 875 . . . . .	20	Sample 998128 . . . . .	32

Sample 998129 . .	32
Sample 998132 . .	32
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Sample 999 . . . . .	75