

**Technical Report. Living conditions and resource exploitation at the
Early Christian rath at Deer Park Farms, Co. Antrim, N. Ireland:
evidence from plants and invertebrates. Part 1: Text**

by

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Summary

This report details the results of analyses of plant and invertebrate macrofossils from occupation deposits of 7th-8th century date from the rath at Deer Park Farms. The results are discussed, sample-by-sample, in approximately stratigraphic order, with some general comments on the nature of the biota.

There was remarkable preservation by anoxic waterlogging of abundant plant and invertebrate remains, which contributed to a detailed reconstruction of the environment and activities of the human occupants of the rath. Plant remains included large amounts of materials likely to have been used in the making of the buildings and in maintaining relatively clean living surfaces. Plants used for food or craft activities were sparse, with the exception of linseed. The remains of woad pods and seeds must represent the use of this plant in dyeing. The invertebrates included abundant internal and external parasites of humans and livestock. There was a rich fauna of beetles dependent on artificial habitats, whose presence at the rath suggest either very prolonged and unbroken occupation or the importation of abundant materials from pre-existing settlements.

An appendix (a separate volume) presents the data recorded and some statistics relating to the assemblages of plant and insect remains.

Keywords: DEER PARK FARMS; COUNTY ANTRIM; N. IRELAND; RATH; EARLY CHRISTIAN; 7TH-8TH CENTURY AD; FARMSTEAD; MACROFOSSIL PLANT REMAINS; INVERTEBRATE REMAINS; PARASITE EGGS; INSECTS; LICE; OCCUPATION DEPOSITS; FLOORS

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Introduction

In the late 1980s, Dr C. Lynn of the Archaeological Survey, Historic Monuments and Buildings Branch, Department of the Environment (N. Ireland) commissioned a generously-funded programme of analysis and research into the implications of plant and invertebrate (particularly insect) remains from his excavations of the Early Christian rath at Deer Park Farms, Co. Antrim, N. Ireland. A preliminary assessment had established that there was good preservation by anoxic 'waterlogging' of many kinds of plant and invertebrate remains in richly organic occupation deposits. The results of subsequent detailed analyses have more than justified the investment of resources in this part of the project, and these results have had an impact on the interpretation of archaeological insect assemblages, in particular (Kenward and Allison 1994; Kenward 1997).

A preliminary account of the insect remains from the site, and from two samples in particular, was given by Kenward and Allison (1994). A brief summary of some aspects of the analyses of plant remains was provided by Hall (1994).

This report presents a detailed account of the results of the analyses of plant and invertebrate remains from Deer Park Farms and is complemented by a separate volume containing species lists and summary statistics.

Practical methods

Samples for analysis of biological remains were selected on the basis of the archaeological information available shortly after excavation. The lithology of the samples was described in the laboratory and a record made using a standard *pro forma*. Processing of subsamples (usually of 1 kg)

was carried out following procedures outlined by Kenward *et al.* (1980) and Kenward *et al.* (1986), which involved disaggregation, typically using sodium carbonate, followed by paraffin flotation.

Recording of invertebrate macrofossils was generally fully quantitative for adult beetles and bugs and semi-quantitative for most other groups—'scan' recording *sensu* Kenward (1992), although identification of difficult and rare taxa were often taken further than normal using that methodology. A few groups were 'rapid scanned'.

Plant remains were examined in the 'flots' and residues, and insect and other invertebrate macrofossils in the 'flots'. Eggs of intestinal parasites were investigated using techniques described by Jones (1982; 1983; 1985). Three treatments were adopted: (i) subsamples of 6 g were soaked in sodium pyrophosphate solution and disaggregated using an ultra-sonic tank (treatment 'P'); (ii) a 1 kg subsample was disaggregated with water in a bucket, sieved to 300 µm, and 0.15 ml of filtrate examined (treatment 'Q'); (iii) as (ii), but using saturated magnesium sulphate solution to 'float' eggs and thus concentrate them (treatment 'R').

Identification of macrofossil material was made with reference to the collections held by the Environmental Archaeology Unit, University of York. Data were entered to Paradox databases, for the plants using an input system developed by AH, and for the insects a system largely written by John Carrott.

Interpretative methods

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

(see Kenward 1978, with modifications outlined by, for example, Kenward 1982; 1988; Hall and Kenward 1990; and Kenward and Hall 1995).

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

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

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

buildings of various kinds has been termed 'house fauna' (Kenward and Hall 1995).

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

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

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

Results

Tables conveying the results of the analyses discussed in this report appear as a separate volume (Hall and Kenward 1999). They include a complete list of taxa (Table 1), species lists for plants and other components recorded during the plant macrofossils analyses (Table 2), some statistics concerning selected plant macrofossil assemblages (Table 3, with an explanation of codes used in this table given in Table 4 and a list of the more abundant taxa in Table 5), species lists for the insect macrofossil assemblages (Table 6), main statistics for the insects (Table 7), and a key to the ecological groupings applied to adult beetles and bugs (Table 8). Data concerning ecto- and

endoparasites are presented in Tables 9-11.

The occupation deposits at Deer Park Farms were notable for the abundance of plant and invertebrate remains preserved by anoxic ‘waterlogging’ in many layers, although the earliest and latest deposits generally contained very few fossils. While preservation of organic materials in surface deposits is not unusual at urban sites in the British Isles, such material is extremely rare on rural occupation surfaces, preservation at such sites, if present at all, normally being confined to the fills of cuts, typically ditches or wells. The site at Deer Park Farms is thus of international importance in providing a wide range of data concerning rural living conditions and resource exploitation.

Where preservation was at its best, large quantities of plant remains were present, especially vegetative material like wood, bark, twigs and smaller material such as heather (*Calluna vulgaris*) and bracken (*Pteridium aquilinum*) stems, leaves, and so on. Amongst these were abundant mosses, typically the large branched forms (‘hypnoid’). There were even, in two cases, specimens of a leafy liverwort, representing a group of plants with hardly ever recorded from natural or archaeological deposits of any period. The excellent preservation of plants was mirrored by the insects, delicate remains such as lice and bug nymphs being in superb condition and often abundant. A diverse flora was represented by fruits and seeds, though in many contexts they were very much diluted by the vegetative fragments. In ecological terms, three main groups of plants predominated: those of peatland (moorland, heath or bog—represented mainly by groups HEMO, OXSP and NACA in Table 3), woodland/scrub (groups LIGN, QUER, QUFA, RHPR, SLIT, WOOF, and WOOD) and of waste places and cultivated land (i.e. weeds, groups BIDE, CHEN, PLAN, and SECA). One group of taxa is thought to be characteristic of turves from peatland or from areas of short grass and, if this interpretation is correct, turves were rather frequent at this site. Cultivated plants, apart from flax, were remarkably rare (woad, and a few cereals were recorded from a modest number of contexts), though there were remains of many wild plants

which can be assumed to have been collected from the vicinity (or perhaps further afield) to be used for various purposes within the rath. This latter group includes, of course, heather and bracken, and most if not all of the larger mosses, together with hazel nut and a range of fruits—blackberry, raspberry, dewberry, strawberry, sloe, and rowan.

Eggs of various parasitic nematodes were recorded from many of the deposits, although their concentrations were rarely very high (Tables 10-11). In addition to the frequently occurring whipworm (*Trichuris trichiura*) of humans, there were significant numbers of eggs of *T. ovis* (usually cited as a parasite of sheep), *Oxyurus equi* (of horses), *Capillaria* sp. (probably from rodents and birds) and perhaps also *Hymenolepis* (although this identification is tentative). There may have been a third species of *Trichuris*, and some other, unidentified, eggs may have been of further parasites.

Some of the insect remains reflected the large quantities of heathland/moorland plants and turf, and in a few samples this component was strong. There were many groups of insects which had clearly exploited accumulations of decaying organic matter, ranging from fairly dry plant litter, through rather foul but open-textured ‘mouldering’ litter to very foul material, in some cases probably herbivore dung. External surfaces must have had scatters of decaying matter and some colonisation by plants (there were abundant nettle-feeding beetles and bugs, as well as abundant nettle ‘seeds’ amongst the plant remains). Parasites of humans were represented by abundant human lice (*Pediculus humanus*) and fairly frequent human fleas (*Pulex irritans*). A range of lice of livestock was present (Table 9), with large numbers of pig lice (*Haematopinus apri*), and a good number of records of *Damalinea ovis* (sheep louse), *D. caprae* (of goats), *D. equi* (of horses), and *D. bovis* (of cattle).

The beetles included a wide range of species strongly favoured by human activity (synanthropes), the richness of this component being, at first sight, somewhat surprising at a small, isolated site. The synanthropic component

included representatives of 'house fauna' (as defined by Hall and Kenward 1990 and Kenward and Hall 1995), i.e. species typical of buildings of various kinds. Within this group, *Aglenus brunneus* must be mentioned as an essentially subterranean species; while it probably lived within many of the layers at Deer Park Farms as they formed, it may have bred deep in the deposits in some cases. A second noteworthy species is the spider beetle *Tipnus unicolor*, typical of Roman York and late medieval and post-medieval occupation sites more generally, but somewhat surprising at Deer Park Farms. Lastly, three bugs require mention. *Livia juncorum* and *Conomelus anceps* have rushes (*Juncus* spp.) as their hosts, *Strophingia ericae* is recorded from heather and *Erica*, and *Craspedolepta nervosa* is largely confined to yarrow (*Achillea millefolium*) and sneezewort (*A. ptarmica*). Some of these plants were well represented in the plant macrofossil record at this site, and the bugs were surely imported with their hosts.

Sample-by-sample account

In this section, the nature and content of the samples are considered in an order which, as far as possible, reflects the archaeological phasing available at the time of writing. For each entry, comments following context number (in square brackets) provide a brief summary of the archaeological context, whilst the kind of material sampled (where appropriate, and as recorded by the excavator) is given in square brackets after the sample number and sample type. After the laboratory description of the sample, the weight(s) processed is/are noted in parenthesis.

PHASE 0. PREHISTORIC, AND POSSIBLY PREHISTORIC, FEATURES

Context 3529 [subsoil under first archaeological features]

Sample F2780 (SPOT) [fibre/hair]

Context 3608 [possible old soil level over N. quadrant]

Sample 1020 (GBA): mid/dark grey-brown, brittle, rather indurated, humic clay with few wood fragments; lighter/darker patches may indicate oxidation/reduction (1 kg /T)

Most of the residue from the subsample examined consisted of basalt gravel though there were traces of twig fragments and small group of identifiable plant remains (15 taxa). They included only one taxon likely to have been favoured by disturbance (shepherd's purse, *Capsella bursa-pastoris*), though the remains of dock (*Rumex*) present might also fall in this category. Otherwise, there were some possible indicators of short, perhaps wet, grassland such as blinks (*Montia fontana* ssp. *chondrosperma*) and bugle (*Ajuga reptans*), and probably also the moss *Hylocomium splendens*. Given the presence of *Cenococcum sclerotia* (this is a common soil-dwelling fungus) and earthworm egg capsules, it is tempting to speculate that these remains do indeed originate in an old turf surface.

Only a small group of adult beetles and bugs was recovered from the flot (N = 19; S = 18), but there were quite large numbers of mites and fly puparia, and appreciable numbers of beetle larvae and earthworm egg capsules. Well over half of the assemblage for which statistics were calculated was contributed by the 'outdoor' component and, although no confident interpretation could be made, there was a strong subjective impression of a fauna accumulated in the open, perhaps in grazing land with a little scrub.

Thus the biological evidence suggests that at this initial stage the rath had been abandoned for long enough for the formation of a soil supporting vegetation.

Context 4287 [possible old soil level in W. quadrant]

Sample 1113 (GBA): mid/dark brown, brittle to slightly cheesy, slightly heterogeneous humic silt with a patch of gingery brown silt, traces of stones

2-20 mm and traces of organic detritus (1 kg /T)

The very small residue of basalt gravel and sand contained rather few taxa, though there were abundant achenes of stinging nettle (*Urtica dioica*), moderate numbers of blackberry (*Rubus fruticosus* agg.) seeds, and a few other taxa in very small amounts (and of no particular interpretative value). As in the case of the subsample from Context 3608, *Cenococcum* sclerotia and earthworm egg capsules were present, probably indicative of a soil.

Again, the recovered assemblage of insects was small (N = 18; S = 17), with half of the individuals being of 'outdoor' species. Two species indicated nettles: a *Brachypterus* and a nymph of *Trioza urticae*. The subjective impression was of an area with herbaceous vegetation.

Context 2560 [extensive layer (?old soil surface on subsoil) in E. quadrant]

Sample 865 (GBA): mid brown, crumbly to brittle, clay silt with traces of stones 2-20 mm ('looks like rotted basalt subsoil') (1 kg /T)

The residue consisted of a little basalt gravel and charcoal. Only a few traces of poorly-preserved insect cuticle were recovered.

Summary of Phase 0

Taken as a whole, the rather small numbers of biological remains recovered from the samples from these early deposits indicate an active soil with herbaceous vegetation, perhaps grazed. There must have been scattered patches of nettle plants (favoured by nutrient enrichment).

PHASE 1-2I: DEPOSITS TRANSITIONAL TO ESTABLISHMENT OF PRIMARY RATH

Context 2651 [thin grey clay over old subsoil (under 2546)]

Sample 1047 (GBA): mid grey-brown (with lighter brown and darker grey areas), crumbly to brittle sandy clay silt with traces of stones 2-20 mm and of charcoal (1 kg /T)

Although there was some sand and gravel in the modest-sized residue, this sample clearly had a much higher organic content than those from Phase 0. There were, indeed, quantities of material, especially in the largest (>4 mm) fraction), which were recorded as peat or mor humus (the highly humified plant debris forming typically under stands of heather on well-drained heathland or moorland sites). Given the lithological nature of the deposit, it seems most likely that these were inclusions rather than material forming *in situ* through the partial decay of organic matter within the sediment. The suite of identifiable plant remains were mostly present in small numbers. No one ecological group predominated although several taxa may have originated in woodland or woodland edge habitats (contributing to a high AIV for the hedge/scrub group RHPR)—their presence here may probably be explained if they arrived at the site in brushwood, for example. Traces of bracken frond and stalk may represent litter, whilst capsule fragments of flax (*Linum usitatissimum*) are the stratigraphically earliest record on this site for a plant which was to be recorded regularly through the later deposits. The presence of charcoal suggests some occupation material was included in this deposit as it formed.

There were single individuals of 19 beetles, over half of them from outdoor habitats and with little to indicate decaying matter nearby. A single *Aglenus brunneus* was noted, but may have been intrusive from later layers. Human occupation was more clearly indicated by a single human flea (*Pulex irritans*) and a human louse (*Pediculus humanus*), while the presence of horses and sheep, or their wool or skins, was shown by two *Damalinea equi* and one *D. ovis*. A very slight hint that this material included a waterlain component came from two water beetles and a 'rat-tailed maggot' larva of a syrphid fly.

Context 4201 [early clay layer resting on old soil

level]

Sample 1125 (GBA): strong brown, crumbly to brittle, humic silt (1 kg /T)

The very small residue was of sand and basalt gravel; the modest-sized assemblage of plant remains, mostly present in very small numbers, included some taxa which might indicate an old soil surface or turf (including *Cenococcum* sclerotia and earthworm egg capsules), but there were also some possible foodplants (blackberry, raspberry, hazelnut), and cornfield and waste ground weeds (annual weeds—including black bindweed, *Bilderdykia convolvulus*, corn spurrey, *Spergula arvensis*, prickly sow-thistle, *Sonchus asper*—forming two of the best-represented vegetation groups).

Rather few invertebrates were recovered, mostly beetles (N = 30; S = 28). There was a substantial outdoor component, including nettle feeders (a single *Trioza urticae* adult and nymph; *Brachypterus* sp.), and the overall (rather subjective) impression was of an open area heavily disturbed by human activity with some weeds.

These two contexts (2651, 4201) represent deposition and disturbance by human activity, and 2651 yielded clear evidence of human occupation from imported plant materials and parasites of humans and livestock, but there was no developed house fauna community.

Phase 1-2ii?

Context 2549 [organic spread in early phase of entranceway]

Sample F3243 (SPOT) [hair]

A small clump of animal hair to 35 mm in maximum dimension.

PHASE 2. THE PRIMARY RATH

Phase 2i

Context 3791 [build-up on subsoil: thin grey clay layers sealing old soil]

Sample 1115 (GBA): mid/dark brown, crumbly to brittle humic, slightly clay silt with traces of stones 6-20 mm (1 kg /T)

There was a very small residue of sand and basalt gravel with a few plant remains of no particular character; *Cenococcum* sclerotia were fairly frequent, but other plant taxa were very rare; two (fat-hen, *Chenopodium album*, and chickweed, *Stellaria media*) are likely to have been weeds of disturbed places and cultivated land.

A small group of beetles and bugs (N = 24; S = 21) was accompanied by numerous mites, some insect larvae, and a few other remains. No ecological group stood out as particularly well-represented, but there were hints of rather foul decaying matter and some indications that this was of artificial origin. Twigs were suggested by a single *Chionaspis salicis* scale, and two nymphs of *Livia juncorum* indicated the presence of growing or imported rushes at the point of deposition.

Phase 2i-?

Build-up on external surfaces, probably during life of earlier structures

Context 994 [midden ?pre-dating first structures, E. quadrant]

Sample 456 (SPOT) [wood, hair & other organic matter]

One spot sample labelled 456A consisted of a mat of more or less unidirectionally orientated coarse dark brown animal hair to 45 mm maximum dimension.

Context 998 [wash/scree fanning out from lower edge of rath bank and interleaved with midden deposits above]

Sample 658 (SPOT) [insect remains]

Context 2513 [middens deposit]

Sample 666 (GBA): dark grey, brittle, locally slightly layered, silty clay amorphous organic material, with some lighter mottles at 10 mm scale (perhaps oxidation), traces of twigs and burnt bone and herbaceous stem fragments (1 kg /T)

There was a modest-sized residue which comprised wood fragments (including some worked ‘chips’), hazel nutshell and basalt gravel. The above-average-sized assemblage of identifiable plant remains included a moderately large component of weeds of waste places and cultivated land, together with a suite of mosses typical of woodland floor and tree bark habitats and some other material likely to have derived from brushwood or woodland floor litter: buds/bud-scales and male catkin fragments of birch and buds of hazel. Other ‘litter’ may be represented by bracken stalk and grass culm fragments. There were also traces of plants from peatland. Besides hazel nutshell, potentially ‘useful’ plants comprised flax (present as seeds rather than capsule fragments) and woad (*Isatis tinctoria*) of which there was a single pod fragment in the flot.

Insects were abundant, with 119 individuals of 75 beetle and bug taxa, and many other taxa including numerous fly puparia. Just over a third of the beetles and bugs were ‘outdoor’ forms, with an appreciable proportion of aquatics (13 individuals of seven taxa, including five *Hydraena* sp. and three *Helophorus* sp.). Foul matter was clearly present in the deposit, for the most abundant beetle was *Cercyon haemorrhoidalis* (12 individuals), followed by *C. analis* and *Platystethus arenarius* (both 6). Decaying matter of various other kinds was indicated by smaller numbers of a range of species, with weak hints that some may have originated in a building. There were two sheep lice (*Damalinea ovis*) and a single human louse. Overall, accumulation in the open with some scatter from a building seems probable. There was no evidence of vegetation on the spot, the phytophages more probably being background fauna or, in the case of a nymph of *Craspedolepta nervosa*, imported in cut vegetation.

Sample 777 (SPOT) [insect remains]*Phase 2i-ii***Context 2681** [spread pre-dating Iota]

Sample 979 (GBA): dark grey-brown, brittle, crumbly, somewhat platy amorphous organic material and herbaceous detritus, with a little woody detritus (1 kg /T)

The residue was rather large, consisting mainly of woody detritus to 50 mm and with basalt gravel to 40 mm. The rather small assemblage of identifiable plant remains was not especially diagnostic: there were a few representatives of several kinds of vegetation—principally weed communities and woodland.

While adult beetles and bugs were present only in fairly modest quantities (N = 98, S = 70), there were huge numbers of mites and earthworm egg capsules. These underline the impression gained from the beetles that this was a disturbed area receiving small quantities of a large number of species from various habitats (both semi-natural and artificial, including a trace of house fauna). However, there were almost certainly nettles growing on the deposits, since *Trioza urticae* nymphs were extremely common (more than 50), though nettle seeds were only rare.

Context 4279 [organic layer pre-dating Nu]

Sample 1114 (GBA) [pre-dates Omega and Mu/Nu]: dark grey-brown, crumbly to brittle, humic silt (1 kg /T)

Though there were abundant stinging nettle achenes and moderate numbers of blackberry seeds, plant remains were generally rather sparse in the small residue from this subsample. The assemblage seemed to bear more resemblance to the material from Phase 1 than the more organic deposits from the first rath phase (2).

This group of invertebrates, including 100 adult individuals of 67 beetle and bug taxa and

numerous others, appears to have accumulated where there was a nettlebed. The most abundant beetle was *Brachypterus* sp. (10 individuals), and there were also two *Cidnorhinus quadrimaculatus*, and a *Trioza urticae* adult. Most convincing, however, were the abundant nymphs of *T. urticae* (21), most unlikely to have come from elsewhere (unless with cut nettles or—less probably—nettle-bed soil). Otherwise, the assemblage, which had a large outdoor component (%N OB = 38) suggested a disturbed area with various kinds of decaying matter in small quantities. The house fauna component was very weak.

Phase 2i-iii

Context 3650 [spread in N. quadrant]

Sample 1018 (GBA): mid/dark brown, crumbly to brittle, humic silty clay with ?slight mottling by organic matter (1 kg /T)

Amongst the rather small residue of basalt gravel was a small assemblage of plant remains mostly in very small amounts. If any particular group predominated it was ARTE (biennial and perennial weeds of nutrient-enriched places), but even here only four taxa contributed to the statistic. The rather restricted group of insects (including only 39 individuals of 32 beetles and bugs) seems to have formed in the open (over two fifths of the individuals were of outdoor forms), perhaps with some foul matter nearby as there were five *Platystethus arenarius*. A single *Trioza urticae* nymph suggests that there were nettles (nettle seeds were present amongst the plant remains).

Context 3698 [pre-dates construction of Omicron]

Sample 1072 (GBA): dark grey-brown, brittle to indurated, humic silty clay with traces of herbaceous detritus and stones 2-6 mm; mottles at 10 mm scale might be interpreted as patches of organic detritus within humic silt matrix and locally oxidised to a somewhat orange-brown colour (1 kg /T)

The small residue comprised basalt gravel and tree leaf fragments (including holly, *Ilex aquifolium*) with a modest-sized assemblage of identifiable remains amongst which were flax seeds and capsule fragments but no other cultivated plants (other ‘useful’ plants, presumably collected from the environs, were hazelnut, blackberry and rowan). Woodland taxa were the largest single group, perhaps mostly derived from brushwood or woodland floor litter, though it includes the wild-collected plants just mentioned.

A large group of beetles and bugs was recorded (175 individuals of 83 taxa), and various other invertebrates were present, including numerous mites and fly puparia. There were clear indications of the presence of water at some stage (or redeposition of waterlain material) since there were ten *Helophorus* sp. and some other aquatics. The remaining abundant species suggested that there was an appreciable amount of foul matter close by or in situ: there were 22 *Platystethus arenarius*, five *Aphodius prodromus*, and various others which may have lived with these. Much of the rest of the fauna may have been background fauna, with some scatter from a structure.

Context 3731 [clay below platform 3523, Structure Iota, N. quadrant]

Sample 1111 (GBA): dark grey-brown, crumbly to indurated and compacted, humic silt with herbaceous detritus and traces of bark fragments (1 kg /T)

Bark and wood fragments and basalt gravel made up a good proportion of the small residue from this subsample. There was a modest-sized assemblage of identifiable plant remains of which only shepherd’s purse, ?tormentil (*Potentilla* cf. *erecta*), blackberry and chickweed were present in more than trace amounts. Overall the assemblage was marked by the presence of grassland and heathland taxa, perhaps from turves, as well as by a variety of weeds of waste places and cultivated land, with a prominent (within the site, at least) component of weeds of trampled places.

Two subsamples were examined for parasite eggs: that using treatment R produced moderate numbers of *Trichuris* eggs (falling in the size range for *T. trichiura*), whilst that using treatment Q produced small numbers of testate amoebae and an egg recorded on the count sheet as ?*Fasciola* (?liver fluke), but no *Trichuris*.

A modest number of beetles and bugs (N = 71; S = 47) was accompanied by numerous mites and fly puparia, and various other remains. Much the most abundant beetle was *Platystethus arenarius* (10 individuals), suggesting the presence of foul matter, but few other species from such habitats were present. Although over a quarter of the assemblage from which statistics were calculated was contributed by outdoor forms, these gave little indication of vegetation, and probably were background fauna accumulated in a heavily disturbed area. Three *Craspedolepta nervosa* nymphs may indicate the importation of cut grassland vegetation or turves. There were two *Damalinia ovis* and a single *Haematopinus apri*, suggesting sheep and pigs or their skins.

Sample 1152 (SPOT) [insect remains]

Sample 1142 (BARK) [perf. bark]

Context 3752 [spread, part of midden build-up in N. quadrant]

Sample 1103 (GBA): black, crumbly, compressed amorphous organic material, with traces of wood fragments (1 kg /T)

The rather small residue contained wood, bark, charcoal and gravel; with these was a small range of identifiable plant remains of which stinging nettle was abundant, with sedge, dock, and chickweed remains quite frequent. The remaining taxa were mainly weeds, both those of waste places and of cultivated land, and plants from woodland/woodland edge habitats, amongst which were four taxa may have served as food: hazelnut, blackberry, raspberry and rowan, but in such small amounts all might well have reached the deposit by

other routes, the fruits seeds perhaps via bird-droppings, for example.

There seems little doubt that nettles grew on this midden as there were 26 *Brachypterus urticae*, three *Trioza urticae* adults, and a nymph of that species. The beetles suggest that there was a range of decaying matter, but if it was *in situ* then either large populations never developed, or most of the individuals emigrated rather than being preserved (not impossible if accumulation was not too rapid). Flies certainly gained a foothold, for puparia were abundant. That the deposit was exposed for a long period may be indicated by the numerous earthworm egg capsules; perhaps soil development was progressing. A little house fauna was present, but only in quantities which might represent random scattering from nearby. Much of the fauna may have been of background origin.

Context 3757 [layer pre-dating Iota]

Sample 1106 (GBA): dark brown, brittle, slightly heterogeneous, humic silt with a variable organic content (1 kg /T)

Charcoal and sand were the largest components of the moderate-sized residue; with them were moderate amounts of gravel and fruits of birch, seeds of blackberry and shoot fragments of the moss *Thuidium tamariscinum*. Five other mosses were identified in small amounts: as a group, they were mainly taxa of shaded and unshaded rocks or bark, though some were typical of heathland or grassland. The rest of the assemblage was a mixture of taxa representing various habitats, but with no one group predominant.

The beetle and bug assemblage, though quite large (N = 104; S = 63), may consist largely of background fauna, although the 18 *Platystethus arenarius* and 10 *Carpelimus bilineatus* may have lived *in situ* in rather foul matter, the presence of five *Aphodius* sp. perhaps just tipping the balance in favour of there being some dung. If so, it may have been of goats, sheep or pigs, since there were three *Damalinia caprae*, two *D. ovis* and a single *Haematopinus apri*, as well as a sheep tick (*Ixodes*

ricinus). A nymph of *Trioza urticae* perhaps points to the presence of some nettles. This deposit thus perhaps formed in the open, where livestock trampled.

Context 4064 [layer of clay on which Kappa built; seems to have acted as a floor layer for Kappa]

Sample 1128 (GBA): mid/dark brown, indurated amorphous organic material with traces of dark specks and moderate numbers of paler mottles at mm scale (1 kg /T)

Not surprisingly, there was only a small residue, mostly of sand and gravel, from the subsample from this layer; there were moderate amounts of charcoal (probably accounting for the dark colour and the consequent lithological description as 'organic') but only traces of uncharred plant detritus. The assemblage strongly resembled those of the Phase 1 deposits insofar as it is possible to compare small assemblages in which a good proportion of the taxa are not identified beyond genus.

A fairly small and very diverse group of beetles and bugs (N = 89, S = 71; alpha = 162, although SE = 41) was accompanied by considerable numbers of mites and fly puparia, and a limited range of other remains. It appears from the species list that this layer may have consisted of material formed in grazing land (and therefore likely to represent material brought to the rath, rather than a deposit forming *in situ*), although the evidence was limited. Only a trace of more than facultatively synanthropic fauna was present and, unusually at this site, there were no lice or fleas.

Sample 1153 (SPOT) [insect remains]

Context 4290 [post-hole (?fill) in W quadrant]

Sample 1116 (GBA): mid brown, very sticky, slightly plastic, slightly silty clay with a few greyer and paler mottles at 10 mm scale (1 kg /T)

The very small residue of sand and gravel contained rather large numbers of identifiable plant remains reminiscent, as an assemblage, more of Phase 1 deposits; there were many stinging nettle achenes and moderate numbers of three other taxa (docks, buttercups and bugle), with perhaps hints at material from short grassland or turf (*Cenococcum* sclerotia and earthworm egg capsules were present, as in many of the Phase 1 samples).

No parasite eggs were recorded from the single subsample examined (using treatment Q).

The few insects recovered were of no interpretative significance, although there were several fly puparia, probably indicating some decaying matter.

Phase 2i-v

Context 4327 [Compressed organic layer over wood, may be associated with this structure (associated with pit 4011 just inside threshold)]

Sample 1134 (GBA): dark brown, felted moss (mainly *Thuidium*) with some humic silt in interstices (1 kg /T)

The very large residue consisted mainly of moss shoots, although there was a large assemblage (40 taxa) overall. Most of the mosses were species of shaded rocks and tree bases or woodland floor habitats or heathland/moorland plants - the more abundant being *Hylocomium splendens* and *Thuidium tamariscinum*. Some, such as *Breutelia chrysocoma*, seem likely to have grown in upland areas. With the mosses were small numbers of woodland/scrub plants (alder, hazel, birch, all present as buds/scales or fruits) and some heather (modest numbers of shoot fragments and rare root/twig fragments) and bell heather (modest numbers of seeds). The overall impression is of a mixture of heather brushwood with detritus from a woodland floor.

Of the two subsamples examined for parasite eggs, one (using treatment R) yielded huge numbers of

Trichuris eggs, of which all those measured were large enough to be *T. ovis*. There were also traces of *Oxyurus equi* and *Capillaria* sp. eggs. The other subsample (using Q) was barren.

Insects from this sample were not recorded.

Phase 2ii

Context 2621A [skim of seeds on upper surface of 2621]

Sample 978 (GBA): dark brown, brittle to crumbly, somewhat platy and layered, amorphous organic material with woody and herbaceous detritus (1 kg /T)

The large residue was rich in wood fragments and there were also some quite large twigs; earthworm egg capsules were moderately common, but identifiable plant remains mostly rather sparse, though the number of taxa, which included a proportion (and moderate variety) of weeds of waste places and cultivated land, was above the average for the site as a whole.

The assemblage of beetles and bugs was of modest size (N = 89, S = 65) and there were similar numbers of other invertebrates. There appears to have been foul matter nearby (there were eight *Platystethus arenarius* and four *Cercyon haemorrhoidalis*), but the predominant impression is of a deposit forming in the open where insect habitats were restricted, this according well with the numerous earthworm egg capsules and mites. There were, however, traces of house fauna, including two human fleas.

Phase 2ii-iv

Context 995 [material on S side of rath below platform (S of X?)]

Sample 469 (GBA): dark grey-brown, crumbly, very heterogeneous sandy silt with abundant pale grey-yellow ash-like silt and yellower sandy patches, common charcoal and traces of bone (3 kg /T)

Gravel and charcoal formed the bulk of the moderately large residue from this large subsample. The presence of so much charcoal accords with the ashy nature observed in the whole sediment. Most of the rather few identifiable plant remains were uncharred, but charred specimens of

blackberry and pale persicaria (*Polygonum lapathifolium*) and a single very poorly preserved charred wheat (*Triticum*) grain probably arrived with the same material. Uncharred flax capsule fragments were present in trace amounts.

Eggs of intestinal parasites were sought but not observed.

Insects were rather rare, several larvae and single individuals of 13 beetle and bug taxa being recorded. A synanthropic component (*Lathridius minutus* group and *Tipnus unicolor*) indicated occupation, but further interpretation would be most unwise.

Phase 2ii-v

Context 1230 [extensive midden deposit]

Sample 873 (SPOT) [Rubus seeds]

Sample 1002 (BS/GBA): very dark grey-brown, slightly crumbly, slightly laminated, compressed, indurated, humic silt with much herbaceous detritus and wood fragments common (1 kg /T)

Only the 'flot' from paraffin flotation was examined for plant remains. It contained abundant flax capsule fragments (most likely to have originated either in seed extraction or in the removal of the bolls prior to retting during the fibre extraction process), with traces of flax seed fragments, but there were also moderate numbers of uncharred oat grains and of leaf fragments likely to have come from a tree or shrub (though not identified further). Weeds of waste places and cultivated ground formed the bulk of the remaining taxa, though there were some possible indicators of grassland and peatland in small numbers and small amounts. A single woad pod fragment was also recorded.

Two subsamples were examined for parasite eggs. One, using treatment R produced abundant *Trichuris* eggs, nearly half of those measured being large enough to be from *T. ovis*, the rest probably *T. trichiura*. The subsample treated by

method Q gave traces of unidentified eggs, one perhaps *Oxyurus equi*.

Sample 1005 (GBA): very dark grey-brown, crumbly to brittle, humic silt with herbaceous detritus and some wood and twig fragments and abundant vivianite; smells distinctly musty (1 kg /T)

Only the rather small flot for this subsample was examined; it contained moderate numbers of seeds of two weed taxa (stinging nettle and chickweed) and a small range of other taxa of weed, woodland, grassland, and peatland vegetation, all in small amounts.

A single subsample (using treatment P) was examined for parasite eggs; a single *Trichuris* egg was recorded, together with some testate amoebae.

Invertebrates were rapid-scan recorded, and it appears likely that no record of lice was made. Adult beetles and bugs were abundant (N = 133, S = 73), with a strong 'house fauna' component including *Aglenus brunneus* ('many'), *Xylodromus concinnus* (5), *Crataraea suturalis* (4), *Cryptophagus scutellatus* (3), and among the rarer species, *Tipnus unicolor* (1). Although the outdoor component was of appreciable size (a fifth of the fauna), it was probably all of transported origin, although a few nettle feeders and others may have originated close by.

Sample 1031 (GBA) [organic patch within 1230]: very dark brown, crumbly, layered, silty amorphous organic material with traces of wood fragments and buff?ash (1 kg /T)

There were large quantities of bark in the residue from this subsample, with some wood and moderate numbers of earthworm egg capsules. Identifiable plant remains, apart from modest numbers of chickweed seeds, were all rare; the list recorded included various weeds of waste places and cultivated land and smaller components of woodland/scrub plants. No clear interpretation of the assemblage can be made, though the bark—presumably from the decay of buildings or

brushwood—was clearly important in forming much of the matrix.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

Insects of various kinds were abundant, as were mites. There were 180 individuals of 89 taxa of adult beetles and bugs in an assemblage dominated by species associated with decaying matter of various kinds. The most abundant species were *Aglenus brunneus* (15), *Cercyon analis* (13), and *Platystethus arenarius* and *Stenus crassus* (9 of each), setting the tone for the remainder of a list which perhaps suggests both foul and rather drier and open-textured litter (evidence for the former included two puparia of the house fly *Musca domestica*). Although house fauna species were present (including two human lice and a human flea), they gave no clear evidence for an internally-formed deposit, and there were numerous outdoor taxa (their rather limited proportion, 14%, doubtless being caused by numerical swamping by the decomposers). The foul matter may have been pig faeces, since there were five *Haematopinus apri*, but these may of course have been deposited when skins were cleaned. There was also a goat louse, *Damalinia caprae*.

Sample 1006 (GBA) [organic spread within 1230, context changed to 3615]: mid brown to very dark grey to black, crumbly, brittle, rather heterogeneous, humic, slightly clay silt with traces of stones 2-20 mm, wood or woody root fragments, vivianite and leather (1 kg /T)

Though there was only a rather small residue from this subsample, it gave a very large plant assemblage (51 identifiable taxa), rich in remains of heather (*Calluna vulgaris*), especially root and twig fragments (the coarsest basal parts of the plant), but also flowers, leaves, shoot fragments and seeds. Several other taxa may well have arrived in heather brushwood or turves, notably some of the mosses (especially those of shaded rocks, which were rather prominent) and perhaps also the bracken (of which there were stalk and

frond fragments). There were some weed taxa and flax capsule fragments and seeds were present, but 'useful' plants were generally sparse in this sample.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

The 69 beetle and bug taxa recorded were represented by 132 individuals, the more abundant species suggesting foul conditions (15 *Cercyon analis*, 10 *Platystethus arenarius*, 9 *Neobisnius* sp., six *Carpelimus ?bilineatus* and a number of other taxa likely to have shared habitats with these). There were weak hints of house fauna, including a human louse and a single *Tipnus unicolor*, but nothing to suggest that this was floor debris as such, rather than simply including scattered or even redeposited material. A record of *Damalinia bovis* suggests the presence of bovids or their skins.

Sample 1150/F2693 [insect remains]

Sample F2560

A small amount of very curly plant fibres, perhaps vascular strands. Not identified further.

Sample F2597

A large mat of animal hair to 110 x 70 mm (as laid in bag).

Sample F2636

A loose mass of animal hair up to about 70 mm maximum dimension.

Sample F2703 (Context 1230C)

Dark coloured plant stem with fibres or vascular strands emerging from decay of softer matrix, very like F2560; maximum dimension 60 mm.

Sample F3244 (Context 1230A)

A small mat (to 50 mm maximum dimension) of fine wiry animal hair.

Sample F3249 [puff-ball]

Phase 2ii/iii

Context 2654 [ash/charcoal spread associated with hearth 2653]

Sample 1139 (GBA): mid/dark brown, crumbly to slightly brittle, humic clay silt with traces of stones 2-20 mm (1 kg /T)

The bulk of the very small residue was sand and gravel; there were only two identifiable plant taxa: stinging nettle and blackberry, and only traces of non-diagnostic insect remains.

Context 3760 [material below Structure Iota]

Sample 1099 (GBA): black, crumbly, humic sand with traces of wood fragments and lumps of grey-brown silt (1 kg /T)

The small assemblage of identifiable plant remains was recovered from a small residue of woody and herbaceous detritus with sand and a few pebbles to 10 mm, with a little charcoal; some of the wood fragments may have been 'chips'. Amongst the charred material were modest numbers of fragments of fucoid seaweed; the other more frequent remains were fruits of birch, seeds of blackberry and *Cenococcum* sclerotia. There were also modest numbers of snails. The remaining taxa included woodland/scrub plants (notably a seed of greater stitchwort, *Stellaria holostea*, the only record for the site of a plant which is only rarely recorded in archaeological deposits), some weeds, and a pod fragment of woad.

The beetle and bug assemblage was of rather limited size (N = 69, S = 53). Some of the beetles may have colonised decomposing organic matter nearby, but the bulk of them seem to have originated elsewhere, and to represent background fauna. In contrast, there were large numbers of mites, insect larvae and puparia, which seem to have lived *in situ*. Perhaps the deposit was too soil-like for typical decomposer beetles. Pig and goat lice were noted (*Haematopinus apri* and *Damalinia caprae*).

*Phase 2iii***Internal deposits**

Context 1448 [organic clay in Structure Iota, N. quadrant]

Sample 829 (GBA): dark grey-brown, crumbly, amorphous organic material to herbaceous detritus with moss and small lumps of silt (1 kg /T)

The rather large number of identifiable plant taxa recorded from the subsample examined (40) perhaps partly reflects concentration of remains by decay of the matrix, although wood and bark fragments made up a significant proportion of the residue. The more abundant taxa represented by fruits and seeds were mainly likely to have originated in wetland (sedges, rushes, lesser spearwort, bristle scirpus) or grassland (especially self-heal), though heather seeds were also very common. Overall, grassland communities were quite well represented and it is possible that very decayed turf was the source of these remains. Few plants likely to have been useful to the occupants of the site were recorded: strawberry, hazel nut, flax seed, blackberry, raspberry and bracken (stalks), with only the linseed present in more than very small amounts. Of the weeds present, the more important were taxa of trampled places (perhaps consistent with an origin in turf).

No parasite eggs were recorded from the single subsample examined (using treatment P).

There were modest numbers of insects (including 53 individuals of 38 beetle and bug taxa), and numerous mites. This group was notable for its aquatic component (nine individuals of four taxa, the first ranks of abundance being occupied by *Hydraena britteni*, with four individuals, and a *Helophorus* species with three). No other component was at all well represented, and if not redeposited from a ditch or some other aquatic habitat (turf in a wet area, perhaps), this may be a mixture of background fauna and aquatics colonising puddles, or entirely background fauna. Even so, there were single individuals of the parasites *Damalinia equi* and *Ixodes ricinus*.

Sample 906 (GBA): dark grey-brown, crumbly, silty amorphous organic material and herbaceous detritus (1 kg /T)

The assemblage of identifiable plant taxa was rather larger in this subsample (48) than in that from 829, though a large proportion were found in both (a simple similarity coefficient for the number of taxa in common was calculated as 0.51, a rather high value for subsamples of the same contexts in occupation deposits, in the authors' experience). However, in the present case, flax seeds were abundant, and with them were quite large numbers of woad pod remains. In contrast to the picture for the subsample from 829, grassland and wetland taxa were rather poorly represented, the more conspicuous groups being weeds and woodland plants. The large residue was another described as having a component of detritus like 'tea leaves', perhaps very fragmented tree leaves. Wood chips were quite frequent. Also recorded were traces of ascocarps of the fungus *Myxotrichum chartarum*, found elsewhere at this site in 'bedding' layers formed within structures.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

This sample produced a very different assemblage from that recovered from Sample 829. Insects were far more numerous, with 154 beetles and bugs representing 91 taxa, and large numbers of lice, mites and insect larvae, and a rich variety of other remains. Although there were two abundant species (35 *Aglenus brunneus* and 11 *Xylodromus concinnus*), diversity was high ($\alpha = 93$, $SE = 14$), and this and inspection of the species list suggest a very mixed group. While these two species suggest an origin indoors, they may have colonised material in the open since there were only small numbers of other house fauna taxa—other than 39 individuals of the human louse (*Pediculus humanus*). These last surely must represent a systematic delousing rather than the accumulation of occasional individuals; perhaps the occupants sat in the open where the light was good and picked each others' parasites off, or these are lice from clothing removed for a rare ablution.

Two *Rhinosimus planirostris* seem likely to have come from under bark of wattle; a single *Ulopa reticulata* may be of background origin rather than indicating importation of cut heather or turf. Four *Chaetocnema concinna* and a single *Phyllotreta nemorum* group may indicate the establishment of a few weeds. Like so many other samples from the sites, this yielded a range of parasites of livestock: five *Damalinia ovis*, and single individuals of *D. bovis*, *D. caprae* and *Haematopinus* sp.

Samples 1164/1165 (SPOTS) [insect remains]

Context 3659 [occupation material within Iota]

Sample 1025 (GBA): dark brown, crumbly, decaying wood, probably largely derived from wattle/wicker (1 kg /T)

Much of the large residue comprised wattle fragments and other woody debris. The rather small assemblage of identifiable plant macrofossils contained representative of several ecological groups all in small amounts—no one group was especially predominant, though grassland, woodland and biennial/perennial weed communities were the best represented amongst the vegetation groups. Remains of the ascocarps of the fungus *Myxotrichum chartarum*, found elsewhere on the site in bedding layers, may indicate the mode of use of at least part of the plant material in this sample.

Insects were very abundant (for adult beetles and bugs N = 248, although with rather few species, S = 54), and there were also immense numbers of mites. House fauna was represented by *Aglenus brunneus* (100), *Crataraea suturalis* (20), *Xylodromus concinnus*, *Cryptophagus* sp., *Atomaria* sp. and *Lathridius minutus* group (all 6), and others including *Tipnus unicolor* (1) and six human fleas. Fouler mouldering conditions were represented by a range of species including *Ptenidium* sp., *Carpelimus bilineatus*, and *Monotoma bicolor* (all 6), and *Acritus nigricornis* (3). A hint of the presence of carrion was provided by four *Gnathoncus* sp. The importation of cut vegetation (including rushes) was indicated by

Livia juncorum (15) and *Conomelus anceps* (6).

This deposit seems to represent a rather mucky occupation surface with cut vegetation perhaps used as litter.

Context 3691 [bedding in Structure Iota, N. quadrant]

Sample 1045 (GBA): dark grey-brown to black, unconsolidated herbaceous and woody detritus (1 kg /T)

There was a very large residue mainly comprising wood and bark; amongst these fragments were abundant male catkin fragments of birch, moderate numbers of unidentified twig fragments (perhaps wattle sail elements), birch fruits, buds and bud-scales, and a modest-sized group of other plant taxa including several from grassland, perhaps a wet meadow. Both seeds and capsule fragments of flax were present (the latter in moderate numbers), along with hazel nutshell. The bulk of the deposit appears likely, therefore, to represent decay of the wooden structure Iota during its life, although given the excavator's interpretation of this as a 'bedding' area, it may be that woody debris was used to provide a suitable surface for the location of some kind of structure on which the inhabitants could sleep. The fungus *Myxotrichum chartarum* recorded here may be characteristic of the dryish plant litter of these internal bedding layers (cf. Contexts 3659, above and 3549, below).

No parasite eggs were recorded from the single subsample examined (using treatment Q).

A very large assemblage of insects was recovered, including large numbers of Hymenoptera Parasitica, insect larvae, and fly puparia. Amongst the beetles and bugs two or perhaps three strong ecological groups could be seen. The first strongly represented group included *Livia juncorum* (61), *Conomelus anceps* (34), and *Craspedolepta nervosa* nymphs (13), which it suspected were all introduced in cut vegetation, presumably that making up the bedding. The second was house fauna, with 408 *Aglenus brunneus* (which may,

however, have been a post-depositional invader), 36 *Cryptophagus scutellatus*, 25 *Crataraea suturalis*, 11 *Xylodromus concinnus*, 10 *Cryptophagus* sp. and smaller numbers of some other species. This surely represented the fauna invading slightly damp plant litter, perhaps with a component from roof and walls. A second decomposer group included species which probably required rather damper conditions, among them *Carpelimus bilineatus* (21), *Ptenidium* sp. (14), *Cercyon analis* (12), *Anotylus rugosus* (6), and various others, some more typically associated with fouler mouldy material (eg. *Monotoma bicolor*, with 14 individuals, and *Acritus nigricornis*, with three). These remains surely represent the initial fauna of the bedding, those which invaded it while it was in a savoury state suitable for use, and those which gained a foothold as it became progressively damper and more foul. To accompany these decomposers were nine *Pediculus humanus* and four *Pulex irritans*.

A smaller ecological grouping was the species associated with twigs: the scale insect *Chionaspis salicis* (5) and the beetle *Rhinosimus planirostris*. There were also three sheep ticks (*Ixodes ricinus*), and single individuals of *Damalinea bovis*, *D. caprae* and *Haematopinus apri*; why these should be found in bedding is not clear! Also unclear is the extent to which this material was exposed to background fauna, although most of the outdoor species may have been brought with the cut plants.

Context 3692 [peaty clay interleaved with bedding 3691]

Sample 1046 (GBA): dark grey-brown, layered, indurated amorphous organic material with traces of twig fragments and bone (1 kg /T)

Although there was quite a large residue, much of it was very fine woody and herbaceous detritus recorded during examination as being like 'tea leaves'. The assemblage of identifiable plant remains was like many from these organic deposits: a modest-sized group comprising weeds, woodland/scrub plants and flax seeds and capsule fragments.

A single *Trichuris* egg was noted from a subsample processed using parasite egg treatment Q; it was of a size consistent with *T. ovis*.

A large insect assemblage was recorded, including 235 individuals of 88 taxa of adult beetles and bugs, and numerous others. The more abundant beetles suggested foul conditions, and perhaps dung: *Carpelimus bilineatus* (37), *Aphodius prodromus* (32), a *Ptenidium* species (17), *Cercyon analis* (11), and *Carpelimus pusillus* group, *Philonthus ?cephalotes* and *Cordalia obscura* (all 6). The foul matter may have been pig manure, for there were 43 individuals of a pig louse, *Haematopinus apri*, although there were also two *Damalinea bovis* and single *D. caprae*, *D. equi* and *D. ovis*, suggesting a veritable menagerie of large mammals.

External deposits

Context 2615 [organic spread within midden layer 1230]

Sample 955 (GBA): very dark grey-brown, crumbly, slightly sandy silty amorphous organic material with twig fragments common and wood chips abundant (1 kg /T)

Much of the rather large residue was wood, bark and coarse herbaceous plant detritus. Amongst these were moderate numbers of holly leaf fragments (including prickles), and birch fruits and bud-scales, and there were also traces of hazel buds/bud-scales. This material may have originated in brushwood or have been collected as woodland floor litter—consistent with either of these interpretations, most of the mosses present were species of bark or woodland floor habitats, too. Most of the other taxa recorded were weeds, mainly annuals of waste places and cultivated land. No overtly 'useful' plants were present except flax (as seeds) and, if not reaching the site accidentally, also raspberry and blackberry.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

There were modest numbers of adult beetles and bugs (89 individuals of 68 taxa), and other invertebrates including numerous mites. There were hints that there was a little foul matter in the surroundings (from six *Platystethus arenarius*, four *Megasternum obscurum*, and three each of *Cercyon analis* and *C. haemorrhoidalis*). A substantial number of the rarer species may have been imported in moss or turf, for example *Olophrum* sp., *Acanthosoma haemorrhoidale*, *Dascillus cervinus* and *Mecinus pyraeter*. A larva of *Athous haemorrhoidale* seems almost certainly to have been imported. House fauna was very weakly represented amongst the beetles, although there were four human lice; this seems most peculiar and suggests the possibility that lice were being removed and disposed of separately rather than dropping or being dropped on to floors. Possibly de-lousing was an outdoor activity.

Context 3616 [build-up between Iota and Lambda, ?abandonment of Iota]

Sample 1131 (GBA): very dark brown, slightly silty amorphous organic material with traces of stones 6-20 mm, rotted wood fragments and some mid-brown silt (1 kg /T)

In contrast to the case for many of the occupation deposits of Phase 2, the subsample from this context gave a very small residue of fine plant detritus and sand—i.e. most of the organic material in it had rotted and the inorganic fraction was mostly fine-grained. Perhaps partly because of the low content of coarser organic debris, there was a rather larger assemblage of identifiable plant remains than for other deposits in this part of the sequence though as usual they were of somewhat mixed origins. Most abundant were seeds of the annual weeds fat-hen and chickweed, but there were also significant numbers of dock and stinging nettle propagules and weeds were certainly the chief ecological group represented (both the annual weed groups BIDE and CHEN achieved AIVs within their respective top 10%). This is perhaps more consistent with the interpretation that this deposit formed on abandonment rather than during occupation.

Invertebrates were numerous, with 162 individuals of 92 taxa of adult beetles and bugs, numerous mites, insect larvae, and fly puparia and many others. This was a diverse group ($\alpha = 88$, $SE = 12$), probably including background fauna or mixed imported remains. It seems likely that it included a component from within a structure - there were 12 *Xylodromus concinnus*, 11 *Aglenus brunneus*, and five *Lathridius minutus* group - but even these may have colonised material on an external surface or been redeposited, as other house fauna taxa were poorly represented (there were single individuals of *Tipnus unicolor* and a few others, and two human fleas). Plant feeders included four *Conomelus anceps* and three *Livia juncorum*, perhaps imported in cut vegetation but possibly from local plants, and two *Trioza urticae* nymphs, suggesting the growth of some nettles. Other notable remains were two *Haematopinus apri*, presumably indicating the presence of pigs, or at least their skins, assuming that they were not redeposited.

Context 3662 [external occupation layer of Structure Iota]

Sample 1098 (GBA): mid/dark brown, crumbly to brittle, silty amorphous organic material with occasional patches of woody and herbaceous detritus, and mottling of darker and lighter, yellowish/redder or greyish/browner coloration at mm scale (1 kg /T)

The moderately large residue included much woody material, amongst which were some recognisable wood chips. There were also some pebbles up to 30-40 mm. That soil—perhaps from turves?—had been mixed into this deposit may be attested by the moderate numbers of earthworm egg capsules and *Cenococcum sclerotia* recorded; a few of the identifiable plant taxa present were not inconsistent with this interpretation, perhaps especially the traces of flowers, seeds and shoot fragments of heather. For the rest, there were traces of possible food in the form of two charred hulled barley (*Hordeum*) grains and a single strawberry (*Fragaria* cf. *vesca*) achene (and perhaps also traces of blackberry seeds). Although

the total number of identifiable plants was well above average, none of the AIVs was especially high, indicating a high diversity with no groups of taxa especially well represented.

Although there were numerous mites, earthworm egg capsules and fly puparia, adult beetles and bugs were rare (only 25 individuals, 22 taxa). Interpretation is difficult, especially in view of the presence of single goat and sheep lice and a *Craspedolepta nervosa* nymph. Notable is a record of a larva of one of the large *Carabus* ground beetles.

Context 3758 [gravel spread within midden material]

Sample 1107 (GBA): mid brown, crumbly to indurated clay silt with traces of stones 6-20 mm (1 kg/T, residue reparaaffined as /T2)

Perhaps not surprisingly, there were few plant remains from this deposit, described by the excavator as a 'gravel patch'; the three taxa identified as seeds (fat-hen, sedge and chickweed) offer no useful interpretative information. Insects were rather rare, and only 29 individuals of 18 beetle and bug taxa were recovered. There was a component suggesting compost-like decaying matter.

Context 4206 [gravelly clay fringing the base of the kerb stones 4014]

Sample 1084 [nuts/seeds = 11084 of archaeological narrative; seeds show signs of insect attack]

Abandonment deposits

Context 3617 [organic layer under 1230, destruction/abandonment of Iota]

Sample 1007 (GBA): very dark grey-brown, crumbly, compressed, slightly silty amorphous organic material and herbaceous detritus, with twig and wood fragments common and some large

fragments of monocotyledon leaves (1 kg/T)

Though consisting largely of twig and wood fragments (including wattle and wood chips), the rather large residue yielded quite a rich assemblage of identifiable plant remains with annual weeds, woodland and heathland/moorland plants and mosses of bark and shaded rocks the most abundantly represented groups, and the woodland groups rather significant for the site taken as a whole (high AIVs for groups LIGN, SLIT, WOOD and QUFA). It is possible that some of these arrived in turf (the layer is described *passim* by the excavator as 'turfy'), though the botanical evidence for this resides only in the presence of certain mosses.

The subsample examined for parasite eggs (using treatment Q) yielded a single *Trichuris* egg, two *Hymenolepis* and two testate amoebae.

A quite large and rather diverse group of adult beetles and bugs was recorded: 206 individuals of 102 taxa; alpha = 80, SE = 9. There was probably an autochthonous community of decaying plant debris of mixed foulness, for there were 23 *Aglenus brunneus*, 11 *Cercyon analis*, eight *Platystethus arenarius*, seven *Ptenidium* sp., six *Xylodromus concinnus*, and various other species likely to have cohabited with some of these. Although *A. brunneus* and *X. concinnus* were fairly common, there was no distinct house fauna accompanying them. This appears to be the fauna of an external pile of litter, a view supported by the high diversity and great ecological mixture. This said, there was doubtless contemporaneous occupation and perhaps de-lousing on the spot, since thirteen *Pediculus humanus* (human lice) were found. There were also parasites of livestock: single individuals of *Damalinia caprae* and *D. ovis*.

Sample F2864 (SPOT) [fibres]

Fragments of plant stem with 'fraying' fibres, the largest to about 80 x 7 mm; perhaps a bundle of plant fibres or strips of stem pulled from stems or twigs, perhaps even vascular material from

bracken. No further identification at this stage.

Phase 2iii/iv

External deposits

Context 3545 [extensive fibrous later, pre-dates Iota; below 1230 and above 3550]

Sample 1110 (GBA): dark brown to black, crumbly to slightly layered amorphous organic material with some herbaceous detritus (1 kg /T)

The moderately large residue contained moderate amounts of basalt gravel and some tree leaf fragments. Identifiable plant remains included abundant stinging nettle achenes and modest numbers of several other weed taxa—overall, there was a somewhat above-average-sized (for this site) assemblage of which weeds formed the largest group. Possible litter debris was represented by traces of bracken stalk fragments and uncharred grass/cereal culm nodes and culm fragments. Of particular interest was a rather well-preserved fruit of woad; the seed was present inside the pod and a substantial amount of the wing (which is normally strongly eroded) had survived.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

The insect assemblage was rapidly recorded. There were six *Brachypterus urticae*, with six *Trioza urticae* nymphs and two adults, so this layers seems to have formed in the open and supported nettles. There were various decomposers, suggesting a scatter of decaying material, and modest numbers of some house fauna taxa.

Context 3550 [grey/black midden layer pre-dating Iota]

Sample 903 (GBA): dark brown, brittle, amorphous organic detritus with yellowish mineral material in places which appears to dissolve in dilute hydrochloric acid (mineral deriving from rotting basalt) (1 kg /T)

The small assemblage of plant remains included a few taxa which might have originated in short

grassland or turf, but can scarcely provide a definitive interpretation. Amongst the wood fragments were some 'chips' to 15 mm in maximum dimension. A rather small group of insects was recovered, including 45 individuals of 36 beetles and bugs, together with 'many' mites. The deposit appears to have built up in the open (over a quarter of the individuals were from 'outdoor' taxa), probably where there was considerable disturbance, some fairly foul decaying matter, and perhaps a little weed vegetation.

Sample F3248 (SPOT) [puff-balls]

Abandonment deposits

Context 3652 [woody clay over path 3661 at paved entrance to Iota; abandonment]

Sample 1021 (GBA): very dark grey-brown, crumbly, slightly silty amorphous organic material with some woody detritus (1 kg /T)

The subsample from this context yielded one of the larger assemblages of identifiable plant remains (45 taxa), in a matrix which included abundant wood and twig material and frequent wood chips. Most of the fruits, seeds and mosses were present in small numbers, however, and no one group was especially abundant in terms of numbers of taxa, except perhaps for a annual nitrophile weeds. However, taking the site as a whole, this assemblage gave high AIVs for mosses of shaded rocks, and for weeds of trampled places and cereal fields.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

A very substantial insect assemblage was recovered; it included 244 individuals of 99 taxa of adult beetles and bugs, and a range of other remains. The more abundant beetles seem likely to represent colonisation of rather mixed organic detritus, foul at least locally: they were *Carpelimus bilineatus* (25 individuals), *Ptenidium*

sp. (12), *Cercyon analis* (11), a euplectine pselaphid (10), two Aleocharinae species and *Aglenus brunneus* (all 8), *Acrotrichis* sp., *Platystethus arenarius*, *Cordalia obscura* and *Lathridius minutus* group (all 7), and *Falagria caesa* or *sulcata* (6). A similar pattern persisted into the lower ranks of abundance. Other components may have included a few plant feeders from local vegetation. There was little to suggest a house fauna community, even in the lower ranks of abundance, although there were six human lice. Livestock was represented by *Damalinea ovis* and *Haematopinus* sp., both single individuals. There were rather large numbers of respiratory processes of aquatic hover flies (Syrphidae), perhaps indicating temporary episodes when there were puddles of foul water.

Phase 2iv

Internal deposits

Context 1446 [occupation deposit in Structure Lambda]

Sample 725 (GBA): black, crumbly to brittle amorphous organic material to woody and herbaceous detritus with trace of ?flint (1 kg /T)

The moderately large residue included much coarse charcoal with some wood fragments and herbaceous plant detritus. The largest group amongst the 47 taxa identified were weeds of various kinds (but especially annual nitrophile types). Much more significant to interpretation, however, were the quantities of woad pods and seeds (both scored '2'; this was one of only two contexts in which seeds were recorded) and also the moderate amounts of flax capsule fragments (there were also traces of charred and uncharred flax seeds). Preservation of the woad pod fragments was better than for any material previously recorded from British archaeological deposits, with some specimens consisting of the two valves with a seed still inside. The presence of woad pods in the absence of any evidence for the vegetative remains (cf. Coppergate, York, Kenward and Hall 1995 and some other sites, Hall

1996) is somewhat difficult to account for, unless the vegetative remains, already very strongly decayed by the point at which they would be discarded from the dye bath, were simply not preserved; they are unlikely to have been overlooked if present in more than very small amounts.

Two subsamples were examined for parasite eggs, one using treatment P, the other with no treatment recorded. Neither yielded more than a trace of testate amoebae.

Insects were numerous. For adult beetles and bugs, $N = 307$, $S = 119$; diversity was high both mathematically ($\alpha = 71$, $SE = 7$) and ecologically; remains seem to have come from a variety of habitats in small numbers. House fauna was well-represented, however, as there were 100 *Aglenus brunneus*, 14 *Xylodromus concinnus*, 13 *Crataeraea suturalis*, seven *Tipnus unicolor*, six each of a *Cryptophagus* species and *Lathridius minutus* group, and various others including three *Mycetaea hirta*. A few taxa indicated rather more foul conditions, but their numbers were small.

The insects offer no evidence that this material was derived from woad processing—there was no indication of large quantities of foul matter and the only aquatic was a single *Helophorus* water beetle—a member of a genus of highly migratory species known to be abundant in background fauna. There were hints of colonisation by nettles from three *Trioza urticae* nymphs, three *Brachypterus* sp. and a single *Cidnorhinus quadrimaculatus*. Thus the deposit may have been exposed for a long time, and accumulated background fauna. The possibility (unfortunately only supported by subjective evidence) should be considered that this was cut turf. However it formed, it was able to accumulate its allocation of parasites: four *Pediculus humanus*; three *Damalinia ovis*; two *Pulex irritans*, *Damalinia* sp. and *Ixodes ricinus*; and single *D. bovis* and *Haematopinus apri*.

Context 3549 [fibrous material from bedding in Structure Lambda]

Sample 898 (GBA): very dark brown, crumbly to slightly layered, slightly compressed amorphous organic material with woody detritus and wood, bark and twig fragments all common (1 kg /T)

The moderately large residue contained abundant twig fragments (mostly of the order of 10-15 mm in diameter and at least some of them hazel and willow) with much bark and some wood and herbaceous detritus. There was a large assemblage of identifiable taxa (59) in which weeds were prominent (annual nitrophiles in groups CHEN and BIDE, cornfield weeds in SECA, and biennial/perennial taxa in ARTE, all of which achieved AIVs in the top 10% for the site as a whole), but in which there were also quite large numbers of remains from woody plants: buds/bud-scales and male catkin fragments of hazel, anthers, buds/scales and female catkin scales of birch, buds of willow and leaf fragments of holly (giving the highest AIV for the site for groups WOOD and QUFA). An origin in brushwood or perhaps woodland floor litter seems likely for this suite of remains—material quite likely to have been sought for bedding. The record of moderate amounts of ascocarps of the fungus *Myxotrichum chartarum* from this layer may be of significance as an indicator of bedding deposits rich in dryish plant litter.

‘Useful’ plants in this subsample included abundant flax capsule fragments and seeds (debris from processing of the crop, or waste used as part of the bedding?); these records account for the highest AIVs for the site for the FIBR and FOOO groups, though they are the only plant contributing to them.

Testate amoebae in moderate numbers and many phytoliths were the only microfossils noted in the subsample examined for parasite eggs (using treatment P).

This subsample produced an enormous number of insect remains, including 2386 individuals of 96 beetle and bug taxa, large numbers of lice, mites, earthworm egg capsules, Proctotrupoidea (parasitic wasps), insect larvae and fly puparia. A very large proportion of the beetle remains was

contributed by *Aglenus brunneus*, however (2005 individuals); while this beetle may have continued to reproduce in the buried deposit, two other house fauna taxa were abundant (42 *Xylodromus concinnus* and 29 *Crataraea suturalis*) and small numbers of some further species were present, implying that a well-developed community existed before burial. This is supported by a range of other species which are considered to be appropriate bedfellows with the three mentioned, if conditions were rather damp and much mould developed: *Leptacinus pusillus* and *Monotoma bicolor* (22 each), *Cryptophagus* sp. (11), *Acritus nigricornis* (10), and a substantial number of others. A second ecological component seems to have been imported in cut vegetation, presumably the bedding: *Livia juncorum* (30), *Conomelus anceps* (24), seven *Craspedolepta nervosa* nymphs, and perhaps some taxa represented by one or two individuals. While this bedding was perhaps originally intended for human use, since although there were eleven human lice (*Pediculus humanus*) and six human fleas (*Pulex irritans*), a secondary use is possible, as 21 goat lice, *Damalinia caprae*, were found. These were not likely to have come from a goatskin used for bedding unless it was employed immediately it was stripped from its original owner, without any form of treatment. Other lice from livestock were present, too: six *Haematopinus apri*, four *Damalinia bovis*, one *D. ovis*, and four *Ixodes ricinus*. Overall, then, the evidence from the insects suggests secondary use of this area, or that it was shared with beasts (even so, it is difficult to imagine such a concentration of goat lice arising in the deposit from parasites simply dropping from their hosts, so skin or hair processing may be suspected).

Context 4028 [fill of central ash and charcoal-filled pit, Structure Kappa]

Sample 982 (GBA): light yellow-grey-brown, crumbly ash, slightly mottled on 10 mm scale, with traces of burnt bone and charcoal and also of some organic detritus (N.B. 3 kg /T)

Prominent in the residue were charcoal and burnt bone fragments; there were few identifiable plant

remains, charred or uncharred, though birch buds/bud-scales were quite common. Uncharred flax seeds and hazel nutshell were present in trace amounts.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

Although the subsample was large, rather few insects were recovered: 47 individuals of 32 beetle and bug taxa, and small to modest numbers of a few other groups. There appeared to be a clear house fauna group, however, the upper ranks of abundance being occupied by *Xylodromus concinnus* and *Aglenus brunneus* (5 each), and *Cryptophagus scutellatus* (3), with two *Crataraea suturalis*, *Tipnus unicolor* and *Cryptophagus* sp.; the two other taxa represented by more than one individual were likely to have co-existed with these, and there were single individuals of other typical house fauna. There was also a single human louse. There was little to indicate exposure to the open air or the importation of material.

It appears that debris from the surrounding floor found its way into what was presumably a fire pit.

External deposits

Context 2537 [spread—below paving 1288 in entranceway 1259]

Sample 826 (GBA): very dark grey-brown, crumbly, humic silt with abundant wood and twig fragments (1 kg /T)

The largest components of the residue from the subsample examined were wood chips and unidentified plant stem fragments but there were also abundant twig and root fragments, as well as heather leaves and chickweed seeds. A wide range of remains was present in moderate amounts, and indeed the number of identifiable taxa (61) made this one of the top 5% of the subsamples examined in terms of this parameter. Many of the AIVs (Table 3) were within the top 10% for the site as a whole, often within the top 1-2%.

By far the best represented remains were those of the heathland/moorland groups NACA and OXSP, though in the case of NACA this is to a large extent influenced by the inclusion in the calculations of ecological and other groups of separate records for six different parts of the heather plant. There were, however, also remains of leaves and seeds of bell-heather, *Erica cinerea*, also suggesting recruitment of material from drier peatland environments. All the weed groups were well represented, in terms of numbers of remains, if not numbers of taxa. There were also high values for the grassland taxa in groups FEBR and MOAR, though the actual numbers of taxa were low (in the case of FEBR, only two!).

Amongst the rather few 'useful' plants flax seeds were moderately common and there were traces of woad pod fragments.

Two subsamples were examined for parasite eggs. One (using treatment P) yielded a few testate amoebae (and there were abundant unidentified spores of some kind); the other (treatment not recorded), likewise produced a few testate amoebae.

A fairly large assemblage of beetles and bugs was recorded ($N = 106$, $S = 77$); it was of high diversity ($\alpha = 126$, $SE = 26$). Although decomposing matter, probably locally foul, was suggested by *Platystethus arenarius* (7), *Xylodromus concinnus* (5), *Carpelimus ?bilineatus* and *Aglenus brunneus* (4 each), and *Cercyon unipunctatus* and *Anotylus tetracarinatus* (3 each), the remaining fauna may have been transported or representatives of poorly-established species. House fauna was not represented by a clear community (although the possibility that some species were not present at the site in certain phases must be entertained), but there were four human lice. There were also four *Damalinia ovis*.

Sample F2483 (SPOT) [unknown material]

A flattened piece of skin-like material to 100 mm maximum dimension (though folded roughly in half). This was a fragment of outer skin of a

puffball, probably the giant puffball, *Calvatia gigantea* (the inner face bore characteristic capillitium threads and spores).

Context 1494 [soil over early phase entranceway wall, associated with Lambda]

have developed *in situ* or been imported.

Sample 1154 (SPOT) [insect remains]

Phase 2iv/v

Abandonment deposit

Context 1318 [may have built up during period of Pi or have been associated with an unidentified structure contemporary with Pi, between Lambda and X]

Sample 733 (GBA): dark brown, crumbly amorphous organic material to herbaceous detritus with a little woody detritus (0.355 kg /T)

The smaller than usual /T subsample produced quite a large residue containing mostly 'tea leaf'-like herbaceous detritus with wood fragments (including chips) to 30 mm and a few pebbles to 20 mm. There were moderate numbers of herbaceous stem fragments which resembled those of flax, but were not identified with certainty (flax seeds were also present, though only in trace amounts). At least one woad pod fragment was recorded from this sample but otherwise the plant assemblage bore no particular character and was like many others from the site in containing taxa likely to have been weeds together with woodland mosses and some wet grassland plants.

The rather small group of beetles and bugs (N = 62, S = 48) was accompanied by numerous mites and various other remains. Although there was a modest-sized house fauna component in the upper ranks of abundance (and a human flea was present) the overall impression was of a mixed group, probably accumulated in the open. However, unless they managed to invade on the spot, just possible in view of the lithology, larvae of two species of click beetle (*Melanotus erythropus* and *Athous haemorrhoidalis*, two of each) may have been imported in peaty turf. There was nothing to indicate the establishment of vegetation at the point of deposition, and the modest numbers of earthworm egg capsules may

Phase 2v or earlier

Context 2538 [clay below entrance-way (1259) paving (1288)]

Sample 824 (GBA): light grey to mid red-brown, plastic to slightly brittle, sandy silty clay with 10 mm-scale mottles common and traces of stones 2-20 mm (decaying basalt sand/gravel) (1 kg /T)

The rather small residue was of reddish basalt gravel and sand, and there were few biological remains: traces of bark, twig, wood, charcoal and burnt mammal bone, with a little hazel nutshell, *Cenococcum* sclerotia and rare seeds of chickweed and stinging nettle. This suite does not offer much interpretative information other than to suggest the layer consisted mainly of rather clean subsoil (*in situ?*).

This sample gave only single individuals of two beetle taxa and an adult fly.

*Phase 2v***Internal deposit**

Context 4013 [occupation layer associated with Pi]

Sample 962 (GBA): dark grey-brown, crumbly, silty amorphous organic material with a little herbaceous and wood detritus and traces of stones 6-20 mm (1 kg /T)

There was a rather small residue of herbaceous detritus and, unusually for this site, no wood or bark was recorded other than a single piece of wood up to 30 mm in maximum dimension (and a few pebbles to 10 mm); the residue was another to which the description 'tea leaf'-rich was applied.

The more abundant fruits and seeds were of weeds of waste places with a high nutrient status (stinging nettle and two species of *Polygonum*) and weeds formed the largest group of plants overall. Flax seeds and woad pod fragments, both present in trace amounts, were the only two overtly

'useful' plants present.

Invertebrate remains were abundant, and included very large numbers of mites, numerous beetle larvae and fly puparia, 189 adult individuals of 105 beetle and bug taxa, and various larvae and representatives of other groups. The more abundant beetles suggested varied decomposer habitats, from rather to slightly foul. Although *Xylodromus concinnus* was the most numerous beetle (11) and there were one or two individuals of species such as *Pulex irritans*, *Crataraea suturalis*, *Tipnus unicolor* and *Mycetaea hirta*, there was no clear house fauna community. Three *Conomelus anceps*, two *Livia juncorum* adults and a nymph, and four *Craspedolepta nervosa* nymphs, perhaps indicate the importation of cut vegetation or turf. Four larvae of the click beetle *Athous haemorrhoidalis*, found at plant roots, often in grassland but also in open woods, seem most likely to have been imported in turf, and a range of other species present in small numbers, including adults of four species of click beetles, may have had a similar origin.

External deposits

Context 2559 [build-up below Structure X]

Sample F2628 (SPOT) [fibres]

Flattened plant fibres, strips of tissue very like F2560 and perhaps also F2703.

Context 4100 [organic occupation layer, possibly associated with the occupation of Theta, Zeta and X but pre-dating the construction of Eta 1]

Sample 1050 (GBA): dark grey-brown, crumbly herbaceous and woody detritus with traces of charcoal and twig fragments and some amorphous organic material (1 kg /T)

The rather large residue produced one of the larger assemblages of identifiable taxa (46, well above average) from amongst the matrix of bracken stalk and frond fragments and fine woody and

herbaceous detritus. Most of the remains were present in small amounts and included a wide range of taxa in terms of their likely origins: some were from heathland/moorland (heather, and probably some of the mosses), others were weeds of cultivated soils and waste places, while yet others seem likely to have been brought from woodland or scrub (birch buds and male catkin scales, holly leaves, hazel buds). There were also traces of woad pods, uncharred oat caryopses and seeds and capsule fragments of flax.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

Beetles and bugs were present in quite large numbers (180 individuals of 103 taxa), and there were numerous other remains. There were indications of a range of habitats, with a small but clear house fauna group, hints of foul matter (including a puparium of the fly *Thoracochaeta zosterae*), and indications of local vegetation (nettles, from five *Brachypterus urticae* and a single *Cidnorhinus quadrimaculatus*). There was probably a substantial background component, contributing to the high diversity (alpha = 100, SE = 13). There were three *Haematopinus apri*, two human fleas and a cattle louse.

Phase 2v/vi

Context 4171 [organic clay on which X constructed]

Sample 1062 (GBA): dark grey to grey-brown, crumbly, sandy herbaceous and woody detritus with traces of ?vivianite, insect fragments, bracken rhizome and lumps of brown silt (1 kg /T), (1 kg /T2)

The two lists of plants from the separate subsamples were combined for this analysis. Altogether there were 74 identifiable taxa, making this one of the largest assemblages from the site (not wholly a function of the larger combined sample size) and for 13 of the AIV groups there were values within the top 10% for the site as a whole.

The more abundant remains included seeds of a range of weeds, both annual and biennial/perennial, but there were also capsules and root/twig fragments of heather, leaves of bell heather (giving a high value for NACA), shoots of a variety of mosses of woodland and heathland/moorland habitats (especially groups LIGN, SLIT and WOOF), leaves of *Sphagnum*, and stalk fragments of bracken, all present in moderate amounts. The presence of culm fragments and culm nodes of grass may indicate that some hay or other cut grassland vegetation was present, but if so it was not a large component for the residue consisted mostly of rather fine wood fragments (to 20 mm) including wood chips.

Small numbers of *Trichuris* eggs were recorded from the single subsample examined (using treatment Q).

The rather large assemblage of adult beetles and bugs (N = 215, S = 108) appeared to include a house fauna component, but a range of other habitats was represented. House fauna beetles included *Lathridius minutus* group (8), *Xylodromus concinnus* (7), a *Cryptophagus* (6) and *Tipnus unicolor* and *Mycetaea hirta* (4 each), but the human louse was predominant, with 26 individuals recognised. The assemblage was notable for the abundance of *Micropeplus fulvus* (18, the most numerous beetle); this species and *M. staphylinoides* seem to have been able to become established at Deer Park Farms in greater numbers than normal in occupation deposits. They are seen as perhaps being facultative synanthropes (see Discussion). There were five nymphs of *Craspedolepta nervosa*, perhaps imported with cut grassland vegetation, two *Damalinia ovis* and *Haematopinus apri*, and a single *D. bovis*.

Phase 2v?

Context 4016 [vegetable matter from fibrous layer between Strs Theta and Zeta; may be associated with Pi]

Sample 974 (GBA): dark brown, layered, fibrous, compressed herbaceous detritus with bracken stalk

fragments (1 kg /T)

Examination of the moderate-sized residue revealed that bracken stalks were, indeed, a major component of this deposit; with them were abundant grass culm (stem) fragments (further litter?) and some bracken frond material and heather root/twig and shoot fragments. Weeds formed the largest single use or vegetation group, some of them being quite frequent (or abundant in the case of stinging nettle), but woodland and woodland margin taxa were rather well represented (with very high AIVs for QUER and RHPR for the site as a whole). 'Useful' plants other than bracken and heather were restricted to hazel nutshell and flax, both in trace amounts.

Three subsamples (all processed using treatment P) were examined for parasite eggs; all three produced traces of *Trichuris* eggs and of testate amoebae. Some of the whipworm eggs were measured.

Adult beetles and bugs were numerous (236 individuals of 135 taxa), and substantial numbers of other invertebrates were present including 'many' mites, Parasitica, earthworm egg capsules and fly puparia. Diversity of the beetle and bug assemblage was very high ($\alpha = 131$, $SE = 15$), and this reflected the ecologically mixed nature of the species list. Three components appeared to be present in moderately large numbers: various generalised decomposers ('compost' species); plant feeders and litter dwellers typical of disturbed ground; and house fauna. Nettles probably grew at the point of deposition, for there were seven *Brachypterus* sp. and two adult and four nymphal *Trioza urticae*. The initiation of development of a soil *in situ* is perhaps indicated by the numerous earthworm egg capsules. There were hints of importation of species such as might be found in moss mats or natural litter (eg. three each of *Olophrum* sp., *Acidota cruentata* and *Othius myrmecophilus*), although they may have invaded litter at the site. Assuming that the remains were not residual, the house fauna (including four *Pediculus humanus*) indicates contemporaneous occupation. The presence of livestock is suggested by two *Haematopinus apri* and a single *Damalinea*

bovis, although there was no evidence of dung.

Context 4098 [peaty layer stratigraphically between Mu/Nu and Eta and Theta in W. quadrant]

Sample 1095 (GBA): very dark grey-brown, crumbly to layered to compressed and indurated, humic silt with much woody and some herbaceous detritus (1 kg /T)

There was a large residue from this subsample, much of it consisting of wood fragments, amongst them material from wattle/wicker. The rather small assemblage of identifiable plant remains were mostly weeds of waste places and arable fields. Plants likely to have been useful included flax (seeds and capsule fragments were both present), hazel nut, and bracken.

Two subsamples were examined for parasite eggs: that using treatment Q produced no eggs, whilst that using treatment R yielded quite large numbers of *Trichuris* and modest numbers of *Capillaria* sp. One of the *Trichuris* was large enough to be identified as *T. ovis*.

A large invertebrate assemblage was recorded, including 174 individuals of 91 beetle and bug taxa and numerous fly puparia. Various habitats were indicated. The very eurytopic decomposer *Megasternum obscurum* was the most abundant species, and various other taxa perhaps suggested conditions such as those in a rather poor compost heap. Nettles were probably present very near the point of accumulation, since there were six *Brachypterus* sp. and two *Cidnorhinus quadrimaculatus*. There was a distinct house fauna component, including three each of *Crataeraea suturalis*, *Tipnus unicolor*, and *Lathridius minutus* group, and a human flea. It was not clear whether this might be scatter rather than floor material, however. On balance this fauna seems to have accumulated in the open.

Phase 2vi

Construction deposit

Context 4256 [occupation material associated with construction of Eta 1]

Sample 1100 (GBA): dark grey-brown, crumbly to fibrous amorphous organic material and herbaceous detritus with patches of brown silt and traces of stones 2-6 mm (1 kg /T)

The rather large residue consisted of fine to coarse woody and herbaceous detritus, although no one component predominated: there were moderate amounts of various parts of heather, along with some mosses (including *Sphagnum* leaves), stinging nettle achenes and charcoal. The rarer remains included a mixture of further mosses of various kinds (there were unusually high AIVs for mosses of heathland/moorland and grassland habitats, though the numbers of taxa were small), seeds of weeds and grassland plants, and traces of bracken stalk and frond and flax seed.

Invertebrates were quite abundant and included 109 individuals of 79 beetle and bug taxa. The more abundant taxa were house fauna: *Xylodromus concinnus* (7), *Crataeraea suturalis* (6), *Tipnus unicolor* (5) and a *Cryptophagus* (3). All the other beetles and bugs were represented only by one or two individuals, and the assemblage was ecologically and mathematically diverse ($\alpha = 128$, though $SE = 26$). There may have been imported turf or peat on the basis of single adult specimens of a range of species and three *Strophingia ericae* nymphs. Nettles probably grew nearby, as there was a nymph of *Trioza urticae*. Pig lice (*Haematopinus apri*) were abundant (17 individuals), and there were five human lice. The invertebrates thus support the excavational interpretation of an accumulation of occupation material in the open.

Sample 1102 (GBA): dark grey, crumbly to brittle, compressed, humic silt with much woody detritus, bracken stalk and hazel twigs to 10 mm diameter (1 kg /T)

Only the 'flot' was examined for this sample. It

contained moderate numbers of uncharred cereal rachis fragments with traces of bracken frond and a few other remains in very small amounts, most of them vegetative material (heather flowers and leaves, birch buds and male catkin scales, grass culm fragments). It is possible that some kind of litter made up a large proportion of the deposit originally but that most of it had decayed beyond the point of recognition when sampled.

Quite large numbers of *Trichuris* eggs were recorded from one of the two subsamples examined (using treatment R). Some were large enough to be *T. ovis*; there were also traces of *Oxyurus equi* eggs. The other subsample (using treatment Q) was barren.

This assemblage, somewhat larger than that from Sample 1100 (132 adult individuals of 70 beetle and bug taxa, although with fewer other remains), was similar to it, and also included a clear house fauna group and representatives of various other habitats.

Internal deposits

Wall fills from Eta 1

Context 3098 [cavity wall fill of Structure Eta on outer face of inner wall, N. side]

Sample 981 (GBA): largely bracken (*Pteridium aquilinum*) stalk and pinnule fragments (1 kg /T)

The large residue consisted mainly of one plant material—bracken—of which there were abundant stalk and frond fragments (leading to the high values for AIVs for USEF and RHPR). Present in moderate amounts were the moss *Hylocomium splendens* and seeds of two taxa likely to have originated in damp areas: sedge and bristle scirpus (the latter largely accounting for the high AIV for ISNA). These may have arrived with turf and, indeed, some basalt gravel was recorded together with traces of seeds of water blinks, self-heal and bugle, all perhaps indicating that turves were part of the infill of this cavity wall. There were also a few weed seeds.

The rather small group of insects ('many' fly puparia and 59 individuals of 34 beetles) included house fauna and a few other decomposers, but little else.

Bedding in Eta 1

Context 2194 [within 2437, a grass spread, within Eta 1]

Sample 880 (GBA): very dark brown, layered, fibrous, compressed amorphous organic material ('like wet Sundeala board') (1 kg /T)

There was a very large residue of fine herbaceous detritus evidently resulting from a rather well humified concentration of plant material. Amongst it were lumps of peaty material which may simply have been undisaggregated sediment rather than an inclusion, although the presence of the fen/marsh mosses *Calliergon* cf. *giganteum* and *Drepanocladus* sp. with rather frequent sedge nutlets perhaps point to the presence of some peat or turf from damp grassland. Moreover, seeds or fruits of heath grass, purging flax and bugle all recorded here have, as elsewhere at this site, been considered likely to indicate the presence of turves. Further investigation of the vegetative material from this sample may help elucidate its origins.

No parasite eggs were recorded from the single subsample examined (using treatment P).

While there were 86 adult individuals of 62 beetles and bugs, and a few other remains, the ecological diversity of this group made interpretation difficult. The only outstanding ecological component was the aquatics, of which there were 13 individuals of eleven taxa. There were also four *Lesteva punctata*, from waterside habitats. Small numbers of a range of other species suggested an origin in peat or turf; the aquatic and waterside forms may have been brought in this, as may 'several' earthworm egg capsules.

Context 4068[woven bed in lower level of Structure Eta, W. quadrant]

Sample 1022 (SPOT): dark grey-brown, crumbly, slightly silty woody detritus with abundant wood and twig fragments (1 kg /T)

There was a huge residue consisting mainly of broken wattle fragments with twigs and much fine woody detritus. Identifiable remains present in moderate or large quantities were from male catkins of birch—anthers and catkin and floral scales, together with buds and scales of this tree. Not surprisingly, these remains gave a high AIV for the group WOOD. There were few other remains (dilution by the abundant wood fragments being no doubt partly responsible for this): amongst them were a few seeds, including flax (capsule fragments of which were also recorded), and stalk fragments of bracken.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

This material had been invaded by a large population of the beetle *Aglenus brunneus* (70), and some other species appear have become established (*Monotoma bicolor*, 11; *Leptacinus ?pusillus* and *Cordalia obscura*, 7 each, for example). Together, they suggested rather foul but open-textured mouldering material. The protected nature of the deposit is indicated by the small proportion of outdoor forms (% N OB = 9).

Context 4021 [fibrous bedding in lower level Structure Eta 1, W. quadrant, over 4068, i.e. upper bedding layer]

Sample 1010 (GBA): very dark brown, crumbly, slightly silty amorphous organic material and well-rotted woody and herbaceous detritus (1 kg /T)

No one component was especially abundant in the rather small residue; the implication may be that the plant material had largely decayed in this case (cf. the other 'bedding' deposits). There were no remains of heather and only traces of bracken stalk, but spikelets and/or cleistogenes of heath grass (*Danthonia*) were present in moderate numbers, and further cleistogenes were recorded separately, suggesting perhaps that grassland

material (perhaps turves) formed part of this deposit. One of the mosses might also have grown in such a habitat, but certainly no strong grass/turf group was present.

No parasite eggs were recorded from the single subsample examined (using treatment Q), though there were modest numbers of testate amoebae.

Substantial numbers of macrofossil invertebrates were recovered, including abundant beetles and bugs (N = 228, S = 58). The main ecological components were house fauna (the most numerous being 99 *Aglenus brunneus*, ten *Xylodromus concinnus*, and five *Crataera suturalis*), species favoured by rather foul mouldering matter (eg. five *Oxytelus sculptus*, *Monotoma picipes* and *Carpelimus bilineatus*, and four *Monotoma bicolor*), and cut vegetation (or turf: eight *Conomelus anceps* and *Livia juncorum* and some other homopterans including *Cicadella viridis*). Human lice were abundant, 31 individuals being recorded.

Context 4023 [clay layer in Structure Eta 1, W. quadrant]

Sample 1000 (GBA): very dark grey-brown, crumbly, layered, humic silt with traces of herbaceous and woody detritus (1 kg /T)

Although only the 'flot' was examined for plant remains, it gave a large assemblage of identifiable plant remains - 55 taxa. None was abundant, but the more frequent remains included seeds and capsule fragments of flax, birch, sedge and grass fruits, and seeds of self-heal, hemp-nettle, stinging nettle and chickweed. There were several 'unusual' taxa - i.e. taxa not recorded elsewhere from this site. Amongst these were wood sorrel (*Oxalis acetosella*) and daisy (*Bellis perennis*), whilst several other taxa were only recorded in a very few other cases (e.g. the moss *Rhodobryum roseum* and the weed *Sonchus oleraceus*). There is no particular pattern to these results; overall, the assemblage was dominated by weeds and woodland taxa, as so often at Deer Park Farms. High AIVs were obtained for eight groups, most

notably SOIL (though the number of taxa contributing was small), and some of the weed and woodland groups.

No parasite eggs were recorded from the single subsample examined (using treatment Q), though there were traces of testate amoebae.

The assemblage of beetles and bugs was distinctive, being dominated by two groups: firstly, species associated with rather foul mouldering plant remains and, secondly, species likely to have been brought in cut vegetation or turf. The first group included the two most abundant taxa, *Monotoma longicollis* (27) and *M. picipes* (17), together with *Anthicus floralis* (11) and a few of the rarer taxa. The second group was represented by *Conomelus anceps* (14), *Livia juncorum* (9), *Cicadella viridis* and *Galerucella* sp. (3), and again some of the rarer species. A third group, perhaps allied with the second if turf had been imported, included rare remains of heathland or moorland forms: single individuals of *Ulopa reticulata*, *Dyschirius* sp., and *Micrelus ericae*. There was also a small house fauna component, but there were huge numbers of human lice (136 individuals being counted). Nine human fleas were also recorded, together with a range of lice of livestock.

Sample F3052 (SPOT)

A small clump of animal hairs to 30 mm maximum dimension.

Deposits in Zeta

Context 3069 [cavity wall fill, spilling as spread in back of Zeta over collapsed wall, W. quadrant]

Sample 853 (GBA): very dark brown to black, layered, fibrous, compressed herbaceous and woody detritus with moderate numbers of twig fragments and much moss (1 kg /T)

There was a large residue from processing the subsample and much of it was made up of heather

and moss. Of the former, there were moderate to large amounts of shoot and root/twig fragments, seeds and capsules, and there were also large numbers of *Erica cinerea* seeds, a further indication of the use of moorland brushwood for this wall fill. The two abundant mosses were *Hylocomium splendens* and *Hypnum* cf. *cupressiforme*. The former is very likely to have been collected from upland grassland or moorland (along with *Breutelia chrysocoma*; and several other mosses recorded in small amounts). The latter is more cosmopolitan but might also have come from such habitats (it is not surprising that the heathland-moorland mosses achieved their second highest AIV for the site as a whole in this sample—there were also high AIVs for groups GRAS, NACA, WOOD and OXSP, largely based on the abundance of the taxa mentioned).

Also present in this sample were moderate amounts of epidermis fragments of one or more kinds of monocotyledon; these might repay further examination. For the rest, the assemblage included a few weed taxa, but also grass/cereal culm and culm-nodes and *Danthonia* fruits and bracken frond fragments; these might all be part of a litter or wall-packing component.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

The heathland or moorland group of insects represented in Sample 918 was much more strongly represented in this assemblage, which included 107 adult individuals of 61 beetle and bug taxa. Clearly belonging to it were *Strophingia ericae* (4 adults, 3 nymphs), *Micrelus ericae* (3), *Scolopostethus ?decoratus*, *Ulopa reticulata* and *Bradycellus ruficollis* (all 2). *Conomelus anceps* and *Olophrum* sp. (4), *Anthobium* sp. (2), *Stygnocoris pedestris*, *Cicadella viridis* and *Hypnoidus riparius* (all 1) probably had the same origin, and all were probably brought in turf. Small numbers of synanthropes subsequently became incorporated, but no strong decomposer community seems to have developed.

Context 3083 [fibrous layer (cavity wall fill) in

back of Structure Zeta, W. quadrant]

Sample 874 (GBA): very dark brown, layered herbaceous detritus with much bracken and perhaps also straw debris (1 kg /T)

The largest components of the moderate-sized assemblage of plant remains from the large residue were stalk fragments of bracken, but there were also abundant fragments of unidentified plant material recorded during sorting as ‘tea-leaves’. The sample also contained moderate amounts of wood fragments, monocotyledon stem/leaf material (described as ‘grassy debris’ during sorting) and the moss *Hylocomium splendens*, but the majority of the taxa present were weeds, represented by one or a few seeds, heathland/moorland plants (mainly heather), and perhaps also some plants perhaps representing turf. Altogether, 20 identifiable taxa were recorded.

No parasite eggs were recorded from the single subsample examined (using treatment P); a few testate amoebae and perhaps also some cereal ‘bran’ were noted, however.

Invertebrates were numerous, and included large numbers of mites and 127 adults of 61 beetle and bug taxa. There were hints of the importation of the same kind of heathland/moorland material as seen in Sample 874, but the synanthropic component was rather more highly developed, represented by a mixture of house fauna and more generalist decomposers.

Context 4012 [floor of Structure Zeta]

Sample F3245 (SPOT) [eggshell]

Context 3071 [heather-rich occupation material layer in Structure Zeta]

Sample 854 (GBA): dark grey, unconsolidated herbaceous detritus, ‘like forest bark’ (2 x (1 kg /T) [/TP2 is preferred as paraffin flotation for TP1 was not good])

Heather root/twig and shoot fragments and the moss *Hypnum* cf. *cupressiforme* made up the two largest components of the large residue from the /T2 subsample. With them were moderate amounts of other parts of heather plants (flowers, capsules and seeds), as well as seeds and leaves of bell heather and shoots of the upland moss *Breutelia chrysocoma*. Other taxa included a few weeds and grassland plants and there may have been some turf present if the *Cenococcum* sclerotia and earthworm egg capsules can be counted as evidence for importation of soil by this route. Altogether there was a rather large assemblage of identifiable taxa (44), with very high AIVs for heathland/moorland vegetation and moss groups and the montane and stream moss groups (though these latter two never contained more than one or two taxa in any sample from the site, so the relatively high values are perhaps somewhat misleading).

No parasite eggs were recorded from the single subsample examined (using treatment Q); there were, however, traces of testate amoebae.

The insect remains were recorded rapidly. There was a clear house fauna component, with three human lice, and a distinct heathland/moorland group (including numerous *Strophingia ericae* adults and nymphs).

Internal deposit in Theta

Context 3187 ['rushes and straw' in Theta (2)]

Sample 899 (GBA): more or less wholly composed of compressed fragmentary bracken (*Pteridium aquilinum*) stalk and pinnule fragments (1 kg /T)

A large proportion of the huge residue comprised bracken—mainly stalk fragments (the coarse upright parts of the plant), but with abundant pinnule (frond) fragments and also some rachis (frond 'stalk') material (these were largely—and rather misleadingly—responsible for the very high AIVs for groups USEF, QUER and RHPR). There were also moderate quantities of grass culm and culm-nodes and this and the bracken is no doubt

the 'rushes and straw' observed during excavation. Other possible litter or roofing material included heather (traces of capsules, seeds and root/twig fragments were recorded), but the small assemblage of identifiable remains (27 taxa in all) was a mixture of plants mainly classifiable as weeds and woodland/scrub plants. There were no remains of plants likely to have served as human food.

Two subsamples were examined for parasite eggs, one prepared using treatment R, the other Q. The former produced modest numbers of *Trichuris* eggs (of which one was large enough to be *T. ovis*, the remainder probably *T. trichiura*), the latter a single *Trichuris* egg.

Fly puparia were abundant, and there were 115 adult individuals of 56 beetle and bug taxa; there were rather few other invertebrates. Much of the fauna may have invaded litter *in situ*, and the presence of a breeding community is suggested by the (relatively) low value of alpha (43, SE = 7). The more abundant species were *Xylodromus concinnus* (12 individuals), *Micropeplus fulvus* (10), *Megasternum obscurum* and a *Corticaria* species (6), and a *Cryptophagus* (5). This material probably remained fairly dry, none of the recorded species being reliant on foul conditions.

Context 3039 ['cladding' of heather on first (later inner) wall of Eta]

Sample 821 (GBA): unconsolidated twiggy detritus with some lumps of more or less coherent debris; mostly heather (*Calluna*) (1 kg /T)

The large residue was mostly composed of heather root/twig fragments, together with some capsules and seeds and traces of flowers and shoot fragments. The only other taxon present as more than a trace was the moss *Hylocomium splendens*, present in moderate amounts. Given the large concentration of *Calluna* remains, it is not perhaps surprising that other plants were sparse: there were traces of bracken stalk and frond and three other mosses but seeds of only two plants: stinging nettle and sedge.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

While invertebrates were not particularly numerous, there were clear indications of the importation of heather from eleven *Strophingia ericae* adults and four nymphs; single individuals of *Ulopa reticulata*, *Dyschirius* sp. ?*Micrelus ericae* and some others doubtless being brought with them. Beyond this, ecological interpretation is difficult, although there were ten *Neobisnius* sp. and four *Anotylus rugosus*, perhaps invading rather moist litter.

External deposits

Context 1266 [middens to N of and associated with X and Eta; = 3065, see below]

Sample 643 (GBA): dark brown, layered, fibrous herbaceous detritus ('peat') with rootlets (turves?) (1 kg /T)

Several taxa present in moderate amounts in this sample concur with the suggestion made during inspection of the sample in the laboratory that turves were present in this context: sedge, heath grass (both as caryopses and cleistogenes), and ?tormentil; also recorded were traces of bugle, hawkbit (*Leontodon*), purging flax (*Linum catharticum*), all likely to have grown in short grassland habitats (and the group MOAR was rather well represented). There were also unidentified monocotyledonous root/rhizome fragments which may well have been grass or sedge material, again consistent with an origin in turves.

No parasite eggs were recorded from the single subsample examined (using treatment P), though some unidentified ?eggs were sketched during recording of the material.

Although mites and fly puparia were numerous, only modest numbers of beetles and bugs were present, and of 40 taxa only two were represented by more than a single individual (two of each). While there were weak hints of the importation of

turf or a similar material, the evidence was not conclusive.

Sample 1143 [BARK]

Context 1282 [layer over path 1283, N of Structure X, =4150]

Sample 648 (GBA): dark brown, crumbly herbaceous and woody detritus with traces of stones 2-6 mm, moderate amounts of twig fragments and abundant moss, with some silt between the layers of organic matter (1 kg /T)

Material from heathland/moorland dominated the assemblage of 37 identifiable plant taxa from the large residue. These were heather (represented by moderate numbers of capsules, but with traces of leaves, seeds, shoots and root/twig fragments), bell heather leaves, and perhaps also the more abundant mosses (*Dicranum* and *Hypnum* cf. *cupressiforme*). In general, though, the assemblage was rather mixed, with moderately strongly represented woodland and annual weed components, the only 'useful' plants being flax seeds and hazel nuts (both present in trace amounts).

Two subsamples were examined for parasite eggs, both using treatment P. One yielded a single *Trichuris* egg (noted as having large polar plugs) and the other a trace of testate amoebae.

The modest-sized group of beetles and bugs included small numbers of several ecological components, including traces of house fauna, weed phytophages, and species typically found in somewhat foul decaying matter. The best-represented group was that from heathland or moorland, including two individuals of each of *Ulopa reticulata*, *Bradycellus ruficollis*, *Lochmaea suturalis* and *Micrelus ericae*, and two *Strophingia ericae* nymphs. These probably came from turf, as perhaps did two click beetle larvae and two chrysomelid (leaf beetle) larvae. There were four human lice and three sheep ticks.

Context 3065 [staked turves in space between Strs X, Eta and Zeta, possibly a fuel store, =1266]

Sample 1009 (GBA): mid/dark brown, indurated, with hints of layering in places, amorphous organic material; this seems to be an amorphous 'peat' rich in *Juncus bufonius* seeds and *Carex* nutlets with other pond-edge/marsh taxa; quite a lot of diatoms (1 kg /T)

The botanical evidence for the likely presence of turves in this layer is fairly convincing, though all of the likely 'turf' taxa were recorded in very small amounts; indeed, only a small assemblage, overall, was obtained from the small residue—this in itself perhaps betokens material formed from the rotting of turves in which the fine mineral and organic fractions forming the bulk of the sediment would be lost during processing.

There were numerous mites but other invertebrates were rare (only 31 individuals of 28 beetle and bug taxa). There were hints of foul matter, but little else can be ventured.

Sample 1038 (GBA): dark brown, indurated amorphous organic material with traces of twig fragments, with the appearance of having dried out in antiquity and then having become rehydrated (1 kg /T)

The small assemblage of plants (18 taxa from a small residue of fine organic detritus) included several which have been considered to be characteristic of the remains of turves—notably heath grass (spikelets and cleistogenes, both recorded in moderate numbers), self-heal, ?tormentil, and lesser spearwort, and with them also bugle and buttercup. The presence of moderate amounts of pellets of undisaggregated well-humified peat or mor humus in the >4 mm fraction is also highly suggestive of the presence of turves; the pellets may also indicate that this material had dried out at some point and become indurated.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

This sample gave an even more restricted invertebrate group than Sample 1009; 21 beetle and bug taxa (only one with more than one individual), and a few other remains. No interpretation can reasonably be made; perhaps most insect remains had decayed.

Context 1414 [soft organic layer over cobbled path 1415, N. quadrant]

Sample 682 (GBA): dark grey-brown, crumbly to slightly layered, humic silt with traces of charcoal, ash, burnt soil, and twig fragments and moderate amounts of wood fragments (1 kg /T)

The large residue yielded quite a wide range of plant taxa (35), of which none were especially abundant, suggesting the deposit formed slowly and/or comprised material from several sources, perhaps forming gradually from the addition of material already on the site. There were modest amounts of wood and twig debris and tree leaf fragments, and with them some stinging nettle, fat-hen and persicaria seeds (all probably weeds growing locally) and sedge nutlets and moss (*Hylocomium splendens*) shoots, probably imported with some material. Also recorded were traces of a variety of parts of heather plants, as well as leaves of bell heather; flax seeds and capsule fragments were present, but there were no other overtly 'useful' plants.

Three subsamples were examined for parasite eggs, all using treatment P. A single *Trichuris* egg was noted from one subsample and this also yielded a few testate amoebae; the other two subsamples were barren except for traces of phytoliths.

There was a clear house fauna component in the upper ranks of abundance of the modest-sized beetle and bug assemblage (N = 87, S = 58), and six human lice were recorded. Thus an origin indoors is likely, the material perhaps having been subsequently scattered outdoors. Three horse lice and a single sheep tick were present. There were ten *Chionaspis salicis* scales, probably from twigs or small branches used for structural or other

purposes.

Context 1573 ['heathery' layer outside Structure Epsilon, S. quadrant]

Sample 793 (GBA): dark brown, layered to fibrous compressed woody and herbaceous detritus, mostly moss, heather (*Calluna*) and bracken (*Pteridium*) fragments (1 kg /T)

Although rather a modest-sized assemblage of plant remains was recovered from the huge residue in terms of the number of taxa (25, about the average for the site as a whole), there were very large amounts of heather root/twig fragments, large amounts of capsules, flowers, shoot fragments and detached leaves, and modest numbers of seeds of heather, and this plant clearly made up the bulk of the deposit, as suggested by the initial inspection of the sediment. There were also large amounts of four mosses: *Breutelia chrysocoma*, *Hylocomium splendens*, *Hypnum* cf. *cupressiforme* and *Pseudoscleropodium purum*, together most likely to indicate heathland or moorland and probably collected with the heather. Another well-represented peatland plant was *Erica cinerea*, of which both leaves and seeds were quite frequent. In contrast to the description made of the sample prior to processing, remains of bracken were confined to a traces of the stalk of this plant.

Given the records for these taxa it is not surprising, therefore, this assemblage achieved the highest AIVs for several groups for the site taken as a whole: GRAS, HEMO, MONT, OLIT, and STRM, amongst the mosses, and the vegetation groups NACA and OXSP. The remaining taxa might well also have been collected incidentally with the heather, or have been weeds growing in the vicinity.

No parasite eggs were recorded from the single subsample examined (using treatment P); a few testate amoebae were recorded, however.

The small group of beetles and bugs (N = 67, S = 43) included a distinct component from heathland or moorland: *Micrelus ericae* (4), probably

?*Stygnocoris* sp. ((3), *Ulopa reticulata* (also 3), and *Dyschirius ? globosus* (1). These were mixed with a little house fauna (*Tipnus unicolor*, with five individuals, being the most numerous beetle).

Sample F2432 (SPOT) [?puff-ball]

Sample F2433 (SPOT) [puff-ball]

Context 1575 [clay/organic spread to east of Epsilon and probably associated with occupation of it]

Sample 812 (GBA): dark grey-brown, crumbly, silty amorphous organic material to woody detritus (1 kg /T)

There was a smallish residue and a well above-average-sized assemblage of plant remains (35 taxa), amongst which none was abundant; only stinging nettle and chickweed seeds were recorded in moderate numbers. Overall, the assemblage was a mixture of weeds and woody taxa, with mosses mainly representing tree bark, shaded rock, and woodland floor habitats. The only 'useful' plant remains present were flax seeds, hazel nutshell, and bracken stalk and frond fragments, all in small amounts.

The invertebrates appeared to have various origins, with a little house fauna, a suggestion of foul matter, hints of imported turf or other material, indications of a local weed fauna, and a few parasites of humans and stock. There were 112 individuals of 76 beetle and bug taxa.

Context 1576 [black peat pre-dating Structure Epsilon, equivalent to 994]

Sample 799 (GBA): mid/dark brown, crumbly to indurated, humic clay silt to amorphous organic material with traces of stones 2-6 mm, and twig and wood fragments, and with small patches of grey-brown silt (1 kg /T)

Plant remains were only recorded from the flot from paraffin flotation; it contained abundant

achenes of stinging nettle and moderate numbers of chickweed seeds, and the other plant remains were a mixture of taxa from grassland (including damp grassland), and weeds, with traces of flax capsule fragments. The presence of *Cenococcum sclerotia* and earthworm egg capsules perhaps suggests that, if this was a midden, dumping was sufficiently intermittent to allow the development of a soil-like deposit, although alternatively these remains may have arrived in soil being dumped onto the midden (e.g. from turves).

Two subsamples were examined for eggs of parasitic worms. One (using treatment Q) gave only traces of testate amoebae, but another (using treatment R) produced a rich assemblage of eggs of at least four types, of which (after concentration) *Trichuris* were abundant. There were also some *Oxyurus equi*, and *Capillaria*. Analysis of measurements of *Trichuris* eggs showed that four were large enough to be *T. ovis*, the whipworm of sheep. Most of the remainder were consonant with *T. trichiura*, the whipworm of man, but two were intermediate and may be from *T. suis*, the whipworm of pig (or another species).

The fairly substantial beetle and bug assemblage was rather mixed in its ecological origins, but suggested the presence of foul matter, perhaps dung, in an outdoor area (two fifths of the individuals were from outdoor habitats) which was strongly disturbed and which had been colonised by a limited weed vegetation including nettles (host to six individuals of three species) and perhaps docks or knotgrasses (hosts to *Gastrophysa viridula*). Other invertebrates were abundant, and included the following parasites: *Damalinea caprae* (goat louse); *D. equi* (horses); *D. ovis* (sheep); *Pediculus humanus* (human louse); and *Ixodes ricinus* (sheep tick, found on a wide range of mammals). Whether the lice of domestic animals came from penned beasts or were deposited when skins (or wool) were cleaned can only be guessed. The weak 'house fauna' component (only two individuals, one being the burrowing *Aglenus brunneus*) perhaps suggests that these lice did not necessarily come from floor sweepings or scatter from within a building, despite the presence of the human louse.

Samples 1144, 1145, 1146 (SPOT)

1144 [no information]

1145, 1146 [insect remains]

Context 1577 [midden-like material lapping against Strs X and Zeta]

Sample 816 (GBA): dark grey-brown, crumbly to indurated, humic silt with herbaceous and woody detritus and traces of charcoal and twig fragments and moderate quantities of bracken stalk fragments (1 kg /T)

The rather large residue gave a rather large assemblage of plant remains (32 taxa) including large numbers of stinging nettle achenes and moderate numbers of seeds of chickweed with wood and twig fragments and basalt gravel. Other taxa, all present in small amounts, included various other weeds, as well as a variety of mosses of heathland/moorland, woodland floor and shaded rock/tree bark habitats. There were traces, too, of horsetail (*Equisetum*) stem and nodal sheath fragments, though it cannot be certain without identification to species what sort of habitat these represent, and trace amounts like these do not suggest the plant was used for a specific purpose (they have, in the past, served as pot scourers, for the tissues contain silica, causing them to present a very rough surface).

Two subsamples were examined for parasite eggs; the first (using treatment R) gave very large numbers of *Trichuris* eggs, along with modest numbers of *Oxyurus equi* and a few *Capillaria*. One of the *Trichuris* was large enough for *T. ovis*. The other subsample (using treatment Q) was barren.

The small group of invertebrate macrofossils (only fly puparia were at all numerous, and there were 52 individuals of 45 beetle taxa) was ecologically diverse, although there were very weak indications that it accumulated in the open.

Samples 1155/1156 (SPOTS) [insect remains]

Context 1585 [material dipping into robber pits 1579-80, Structure Epsilon, S quadrant]

Sample 808 (GBA): dark brown, crumbly, slightly

silty amorphous organic material with traces of stones 6-60 mm and small patches of yellowish silt (1 kg /T)

The large assemblage (46 taxa) was recovered from a very small residue consisting mainly of sand and gravel. Only stinging nettle achenes were abundant, and the more frequent seeds present were mostly of taxa likely to have been growing as weeds (especially in communities of biennial/perennial plants), with the exception of lesser spearwort (a plant mainly of damp grassland or pond margins). The presence of *Danthonia cleistogenes*, along with remains of *Ajuga*, *Prunella* and *Scirpus setaceus*, perhaps argues for the presence of turf. Remains of four wild fruits were found together in this sample: blackberry, raspberry, rowan and sloe, together with hazel nutshell, though only blackberry was present in more than trace amounts; they were probably all collected for food.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

A variety of invertebrates were present, including numerous mites and fly puparia and an assemblage of 86 beetles and bugs (62 taxa). Few species were represented by more than one or two individuals, but there were ten *Platystethus arenarius*, suggesting foul matter nearby. A few parasites of humans and livestock were also noted.

Context 1781 [peaty layer beneath Epsilon]

Sample 863 (GBA): dark brown, crumbly to brittle, silty amorphous organic material (1 kg /T)

The plant remains in the small residue were almost all fruits and seeds—mainly of weeds such as chickweed, persicarias, prickly sow-thistle, stinging nettle and hemp-nettle. Only 19 taxa in all were recorded but quite a large proportion were present in moderate to large numbers and are the basis of the high AIVs for the weed groups BIDE, CHEN and SECA. There were traces of heather root/twig fragments and bracken frond, but other vegetative remains were absent. The deposit

appears to have undergone rather strong humification if, indeed, it ever contained much coarse plant detritus. This mechanism was responsible, perhaps, for ‘concentrating’ the propagules, though clearly the deposit was forming in an area where weeds were prevalent.

There were ‘many’ mites and fly puparia, a modest-sized group of adult beetles and bugs (N = 87, S = 62), and various other invertebrates. There may have been a local component of generalist to foul decomposers (all in small numbers), and there were hints of imported peat or turf, particularly from two *Melanotus erythropus* larvae and a nymph of *Strophingia ericae*.

Context 3061 [thick peat layer against inner (first) wall of Eta; dump or continuation of a midden on the W. (burying Theta while Eta still occupied)]

Sample 851 (GBA): dark brown, indurated, compressed amorphous organic material and herbaceous detritus (1 kg /T)

The rather small residue of fine herbaceous detritus contained only a rather small assemblage of identifiable remains, though the suite of plants considered to be characteristic of turves was well represented—tormentil, bugle, heath grass, self-heal were all present. Indeed, rarely for this site, the grassland group MOAR achieved the highest AIV of any of the ‘vegetation’ groups, ahead of the woodland and peatland groups (though it was barely half the highest score for the site as a whole).

No parasite eggs were recorded from the single subsample examined (using treatment Q).

There were rather few macrofossil invertebrates, and the material gave no indications of ecological conditions as the layer formed.

Sample F2986 (SPOT) [unknown material]

Context 3063 [thin peaty material (?lens) external

to Eta and X]

Sample 846 (GBA): mid/dark brown, crumbly, slightly heterogeneous humic silt with woody detritus and patches of olive granular material and traces of stones 2-6 mm (1 kg /T)

The rather large residue of coarse and fine plant detritus with much gravel and sand contained a modest number of taxa (23), of which chickweed seeds were abundant (the plant was probably growing at the site), and heather shoot and root/twig fragments and *Hypnum* cf. *cupressiforme* shoots quite frequent. The other remains were a mixture of heathland/moorland plants and weeds but the assemblage had no prevailing characteristic.

The 87 individuals of 66 beetle and bug taxa included some which were probably imported in peat or turf: *Ulopa reticulata*, *Conomelus anceps* and *Anthobium* sp. (2), and one *Strophingia ericae* and a *Craspedolepta nervosa* nymph. Some generalist decomposers probably invaded subsequently (notably seven *Micropeplus fulvus*). There were two human lice.

Context 4095 [organic material against kerb 4026, around the platform of Eta]

Sample 1027 (GBA): dark brown, crumbly to brittle to indurated amorphous organic material and woody and herbaceous detritus (1 kg /T)

The moderately large residue of plant detritus with some sand and gravel yielded a large assemblage of plant remains (43 taxa) amongst which unidentified monocotyledonous epidermis fragments made up the largest single component. With these were moderate numbers of heather root/twig fragments, uncharred grass/cereal culm nodes and culm fragments (these perhaps indicate that the monocot epidermis was most likely to have come from grasses) and seeds of sedges, hemp-nettle and chickweed. Overall, annual nitrophile weeds in CHEN made up the largest single AIV group.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

group may have accumulated in the open.

There were 97 adult individuals of 62 beetle and bug taxa, and quite large numbers of other remains including numerous earthworm egg capsules, mites and fly puparia. The beetles included small numbers of a range of rather generalist decomposer species, with a tendency towards the foul end of the spectrum, the most numerous being *Ptenidium* sp. (8), *Micropeplus fulvus* and a *Quedius* sp. (5), *Philonthus politus* (4) and *Cercyon unipunctatus* (3). There were only traces of house fauna other than 20 *Pediculus humanus*, emphasising the impression gained from a number of other assemblages from Deer Park Farms that these lice entered by some specialised route.

This deposit may represent build-up in a rather mucky yard area but probably with a concentration of some strawy or hay-like debris.

Context 4150 [ramp of clay and organic material, final stage of path to Eta]

Sample 1052 (GBA): mid brown, stiff silt with some basalt gravel, hazel nutshell, and organic detritus; clasts grey internally (0.75 kg /T)

The residue from this subsample from 1052 was mostly mineral material—sand and basalt gravel, including stones to 40 mm, with only about 10% by volume of plant material. Amongst this organic fraction there were, however, rather large numbers of identifiable remains (35 taxa), of which the more frequent were hazel nut and flax seed, shoot fragments of heather, seeds of stinging nettle and shoots of three mosses (*H. cf. cupressiforme*, with *Thuidium tamariscinum* and *Neckera complanata*, which account for the high AIVs for LIGN, SLIT and WOOF). Peatland and woodland taxa formed the largest groups overall, with weeds being rather poorly represented.

Apart from mites ('several') and human lice (3), only single individuals of any invertebrate macrofossils were present; 17 beetle and bug taxa were recorded. Ecologically indeterminate, this

Context 4172 [peat layer against platform of Structure Eta]

Sample 1077 (GBA): dark grey-brown, crumbly, brittle, silty amorphous organic material with some herbaceous detritus, traces of stones 2-6 mm and wood fragments (1 kg /T)

The rather small residue of gravel with wood fragments, hazel nutshell and bracken stalk included moderate numbers of sedge and chickweed seeds and a modest range of other taxa in small amounts (there were 28 identifiable taxa in all). Woodland plants predominated, though weeds and peatland forms were also present and there was a noticeable component of mosses of shaded rocks and tree bases. Both seeds and capsule fragments of flax were recorded, but 'useful' plants were otherwise very sparse.

Two parasite eggs were recorded from the single subsample examined (using treatment Q); they were both *Trichuris*

The assemblage of beetles and bugs was quite small and ecologically rather mixed, but this subsample produced 15 human lice, three *Damalinia equi*, a human flea, and a rodent flea, *Nosopsyllus fasciatus*. This was probably a rather randomly accumulated group, with house fauna and a background component; the human lice must have been picked off, perhaps on the spot.

Sample F3010 (SPOT)

A strip of plant stem to 110 mm (extended length) by 7 mm width; a little like bracken, but not certainly this taxon.

Sample F3011 (SPOT)

Flattened, folded plant stem fragments, perhaps stalk of bracken, *Pteridium aquilinum*, the longest about 230 mm extended length.

Sample F3013 [fibrous matl/bark?]

Phase 2vi-vii

Internal deposits

Context 988 [cavity wall fills of X]

Sample 422 (GBA): very dark grey to black, layered, fibrous, compressed fine humic material and silt with patches or cushions of moss *in situ* (1 kg /T)

Though rather small in size, the residue contained abundant remains of heather, especially root/twig fragments and seeds, with small numbers of flower, capsules, and shoot fragments, but also many bell heather seeds (there were, not surprisingly, high AIVs for NACA and OXSP). Mosses were quite common, too, notably *Breutelia chrysocoma*, a species of damp to wet upland habitats (including moorland), *Hylocomium splendens* and *Sphagnum* (the first two accounting for high AIVs for the moss groups MONT and HEMO, respectively). There was also a considerable quantity of an acrocarpous (tuft-forming) moss whose identity could not be established. It was superficially similar to *Funaria hygrometrica* but certainly not that species. Acrocarpous mosses are not surprisingly rather infrequent (and present in small amounts) in occupation deposits since they are not suitable for collecting for any purpose, unlike the larger branching hypnoid mosses or *Sphagnum*. The presence of this moss may be accounted for through growth *in situ* if it is the material observed during examination of the sediment in the laboratory, though this is not consistent with a primary cavity wall fill! (Alternatively the moss may have grown in cushions on roofs.) That the deposit did not consist purely of material used to fill the cavity is, however, established by the presence of many weed seeds, unless they were collected with debris scooped up from a surface to add to the heather brushwood which evidently formed the bulk of the fill.

Two subsamples were examined for parasite eggs; one (using treatment R) yielded a single *Trichuris* egg (perhaps suggesting the presence of re-excavated or surface-laid sediment), the other

(using Q), only a few testate amoebae.

There were fairly large numbers of beetles (139 individuals of 51 taxa), but the only other invertebrates noted were some fly puparia. The fauna was unusual, being dominated by an *Orthoperus* species (40 individuals), accompanied by a *Corticaria* species (19) and *Mycetaea hirta* (10). These and much of the rest of the restricted fauna ($\alpha = 29$, $SE = 4$) may have exploited fairly dry mouldering plant debris, presumably reflecting the very sheltered environment. This material may have included heathland or moorland soil (or perhaps moss), since there were three *Micrelus ericae* and a *Strophingia ericae* from such places. Traces of house fauna had perhaps crept from within the building, or even found suitable habitats within the wall.

Context 1441 [cavity wall fill, Structure X]

Sample 710 (SPOT) [insect remains]

Sample 745 (GBA): dark grey-brown, crumbly to layered herbaceous detritus with compressed plant stems (0.17 kg /M [this had dried out somewhat during storage in the laboratory]; 1 kg /T)

The residue of the 0.17 kg subsample and the residue and rather large flots from the /T were all examined for plant remains. Amongst the rather stony debris there were abundant seeds of some plants likely to have grown as weeds, especially prickly sow-thistle (*Sonchus asper*), hemp-nettle (*Galeopsis* Subgenus *Galeopsis*) and pale persicaria (*Polygonum persicaria*), but also stinging nettle, buttercup and chickweed. They account for the high AIVs for the weed groups ARTE, CHEN and SECA. Such a large concentration of seeds perhaps represents an accumulation as a seed 'bank' in soil which was then used to fill the cavity wall of this structure; it is difficult to see how they arrived in the deposit otherwise, unless plants at a late stage of flowering were uprooted and used to make the fill. Certainly there were quite large amounts of fragments of herbaceous stem and leaf material but it all seemed to be from cereals or grasses. The rather frequent

earthworm egg capsules were perhaps part of the 'soil' component of this deposit.

Two subsamples were examined for parasite eggs. The first (using treatment R) yielded a single *Trichuris* egg; the second (using Q) gave only traces of testate amoebae. Both were perhaps derived from soil.

A fairly substantial beetle and bug assemblage ($N = 190$, $S = 74$) included what appeared to be a variant of house fauna, for there were large numbers of *Ptenidium ?pusillum* (26) and *Aglenus brunneus* (21), and ten each of *Micropeplus fulvus*, *Xylodromus concinnus* and *Tipnus unicolor*, together with *Lathridius minutus* group (8), and *Mycetaea hirta* (7). These and some of the rarer forms suggest slightly damp plant debris, with development of mould. The presence of numerous aphids in a group with an otherwise restricted outdoor component is peculiar and it may be that they were brought with the original plant material used as packing. None of the other insects seem to have had a similar origin, however.

Context 3741 [hearth fill in pit cut into 1318, 4171]

Sample 1085 (SPOT) [insect remains]

Bedding areas, North

Context 1290B (lower part)

Sample 610 (GBA): dark grey-brown, crumbly herbaceous and woody detritus (0.522 kg /1)

A 0.522 kg subsample was processed but only the very large flots were examined. In it were abundant buds and bud-scales of birch, with moderate numbers of male catkin scales and anthers (as well as a trace of the fruits of this tree), together with moderate numbers of twig fragments and capsule fragments of flax. These might all have formed components of bedding material (and it may be no coincidence that the fungus *Myxotrichum chartarum* was again recorded here as in the 'bedding' samples from

3549 and 3691).

This sample produced a large ($n = 279$, $S = 71$) and distinctive group of insects able to exploit mouldering plant remains. The most abundant species were *Aglenus brunneus* (52), *Xylodromus concinnus* (35), *Ptenidium* sp. and *Cryptophagus scutellatus* (19), *Leptacinus intermedius* (11), *Atomaria nigripennis* (10), *Heterothops dissimilis* and *Crataraea suturalis* (9), *Mycetaea hirta* (8), and *Cercyon analis*, *Tipnus unicolor*, *Ephistemus globulus* and *Lathridius minutus* group (all 5). These species, and many less abundant ones in the list, represent a community likely to occur in a sheltered pile of plant debris of variable moisture content, locally a little foul but probably nowhere wet. This ecological coherence is reflected in the rather low diversity ($\alpha = 31$, $SE = 3$), and the relative rarity of outdoor forms (% N OB = 8, one of the lowest values for the site). Fleas and lice were no more numerous than in many deposits at the site. The insects gave little evidence as to the nature of the plant debris; a nymph of *Craspedolepta* may have been imported with hay-like material.

Context 1290A (upper part)

Sample 611 wood/charcoal): dark grey-brown, crumbly to brittle to fibrous, humic silt with traces of moss and patches of more woody or more silty sediment (1 kg /T)

The large flot and residue from this subsample contained moderate numbers of twigs and wood fragments and was another for which 'tea leaves' were described as being present. Though there was a rather large assemblage of identifiable plant taxa (39), no one group was especially well represented (the groups whose AIVs were high by comparison with values for the site taken as a whole were FOOS and RHPR, though neither was especially important). Remains of 'useful' plants were limited to flax (capsule fragments and seeds), bracken (frond and stalk fragments) and a few fruits which might have arrived by routes other than as human food. There was, however, at least one charred oat grain, a rare example of cereals at this site.

No parasite eggs were recorded from the single subsample examined (using treatment P), though phytoliths were recorded as present.

Bedding areas, South

Context 1281 [bedding]

Sample 844 (GBA): dark grey-brown to black, layered, fibrous herbaceous detritus with traces of wood and nutshell fragments; 'compressed strawy material' (1 kg /T)

Only the (large) flot for this subsample was examined. It contained large amounts of unidentified plant epidermis with some grass culm fragments and culm-nodes and other 'grassy' debris.

Two subsamples were examined for parasite eggs. One (using treatment P) yielded two *Trichuris* eggs of which one was large enough to be *T. ovis*, whilst the other subsample (using treatment Q) was barren.

Immense numbers of insects and mites were present, and this was a highly distinctive assemblage. There were 1078 individuals of 78 beetle and bug taxa, diversity being low ($\alpha = 19$, $SE = 1$), even though at least two quite disparate communities could be discerned among the more abundant taxa. The first community was house fauna, but with a distinct trend into rather more foul, mouldering, conditions. The classic house fauna group was represented by *Aglenus brunneus* (784), *Xylodromus concinnus* (62), *Crataraea suturalis* (31), perhaps *Ephistemus globulus* (18), *Cryptophagus scutellatus* (10), *Tipnus unicolor* (7), *Mycetaea hirta* (5) and various rarer species. Fouler conditions were indicated by *Leptacinus pusillus* (17), *Monotoma bicolor* (14), and *Acritus nigricornis* (3). These two groups probably occupied patches of varying moisture content in the same mass of decaying material. There was no indication of much fouler conditions. People clearly used the surface on which this material was deposited; there were many human lice (*Pediculus humanus*: 63) and

fleas (*Pulex irritans*: 33). There were also a few parasites of livestock (three *Damalinea bovis*, and single *D. equi* and *D. ovis*).

The second major habitat represented in this assemblage was damp pastureland or waterside vegetation. There were 20 *Conomelus anceps*, eight *Livia juncorum*, and four *Cicadella viridis*, all denizens of such places, and some water beetles, together with *Megophthalmus* sp. may have had a similar origin. This component seems most likely to have been imported in cut vegetation which contributed to the layer.

Context 1281B [occupation layer]

Sample 540 (GBA): dark red-brown, crumbly, woody detritus (1 kg /T)

The large residue which was mostly of wood and twig fragments (the latter including alder and oak) produced one of the largest assemblages of identifiable plant remains for the site as a whole—75 taxa (the second to highest). Some were present in large amounts, notably flax seeds, hazel buds/scales and *Cenococcum* sclerotia, with frequent remains of a wide variety of taxa including flax caspule and bracken stalk fragments, heather shoots, hazel nutshell, and some material likely to have arrived with brushwood (leaf abscission pads and bark fragments). Overall, the assemblage was dominated by three groups: woody plants, weeds and heathland/moorland taxa and there were many very high AIV values (for some major groups such as CHEN, FOOS, LIGN, OLIT, SLIT and WOOF, but also for some of the less important ones, like GRAS and MARS).

Amongst the mosses was *Bartramia ithyphylla* (the only record for the site). This moss is restricted to montane habitats in the British Isles—‘most frequently found in shaded crevices of mildly basic mountain-cliffs’ (Bates in Hill *et al.* 1994, 162) with at least two stations in the NE of Ireland today. Its occurrence in this deposits at Deer Park Farms may perhaps be explained if it arrived with some material collected from the upland areas in the vicinity of the site, though what

these might have been—other than moss itself, perhaps—is not clear from the other plant remains recorded.

No parasite eggs were recorded from the single subsample examined (using treatment P); phytoliths were recorded as present.

The invertebrate macrofossil assemblage from this sample had much in common with that from Sample 844. The number of beetles and bugs was almost identical (N = 1096, S = 73), and the same range of components could be seen. However, the relative abundance of these components was different, fouler habitats being better represented in the present sample. Here there were 25 *Acritus nigricornis*, 14 *Leptacinus pusillus* and six *Monotoma bicolor*, suggesting somewhat moist (not wet) conditions. House fauna was represented by *Aglenus brunneus* (926) and *Xylodromus concinnus* (13), but there were no more than two of the remaining house fauna species other than parasites (51 *Pulex irritans* and 33 *Pediculus humanus*). Again, parasites of livestock were present, but in small numbers (two *Damalinea caprae*, and a single *D. bovis*). Cut vegetation was represented by *Conomelus anceps* (11), *Livia juncorum* (9), and *Notaris acridulus* (2). Overall, this assemblage and that from Sample 844 appear simply to represent the dryer and moister ends of a continuum.

Context 1281A [upper part]

Sample 907 (GBA): dark grey-brown, unconsolidated humic silt with plant fragments common (1 kg /T)

The rather small residue included much basalt gravel together with large numbers of flax seeds and hazel nutshell fragments (contributing significantly to the high AIV for FOOS). In addition, there were moderate numbers of hazel and birch buds and/or scales, sedge nutlets and seeds from a variety of weed taxa. Woodland and weed taxa made up the bulk of the assemblage but

there was also a modest-sized component of grassland taxa, though the plants concerned represented rather diverse habitats within that category.

The insect assemblage was only inspected rapidly. It was broadly similar to that from the subsample from 844, and also included abundant human lice (65 counted) and there were five *Ixodes ricinus* nymphs and nine *Damalinia ovis*.

Context 1287 [fine fibrous material over bedding 1291]

Sample 539 (GBA): dark grey-brown, crumbly herbaceous and woody detritus (1 kg /T)

A large assemblage of identifiable plant remains (41 taxa) was recorded from the large residue of plant detritus and large flots. Flax capsule fragments were abundant and flax seeds moderately so, suggesting that this deposit probably included waste from flax preparation, though whether this was connected with fibre or seed processing (or both) is difficult to say. There were also moderate numbers of woad pod fragments, indicating a further activity (dyeing) which must have gone on at some stage in the vicinity (although as explained above the pods are not, in theory, themselves directly indicative of dyebath waste since it is the leaves that are used). Brushwood was evidently also present in this deposit as there were fruits and female catkin scales of birch and buds/scales of hazel, as well as holly leaf fragments. Some litter may be indicated by frond and stalk fragments of bracken. For the rest, weeds made up the largest group of taxa but none was especially abundant.

No parasite eggs were recorded from the single subsample examined (using treatment P); phytoliths were recorded as present.

There were numerous and varied insects: a group of 180 individuals of 73 adult beetle and bug taxa, numerous mites, insect larvae and fly puparia, and assorted other remains. There was a clear house fauna group, the most abundant species being

Aglenus brunneus (40), *Xylodromus concinnus* (21), *Ptenidium* sp. (10), *Mycetaea hirta* (8) and *Crataeraea suturalis* (7). Rarer species included *Tipnus unicolor* and *Cryptophagus scutellatus* (both 3). There were only hints of moister material, and relatively little outdoor fauna (% N OB = 11). Human parasites were well represented (eight *Pediculus humanus* and five *Pulex irritans*), and there were parasites of stock too (five *Haematopinus apri*, two *Ixodes ricinus*, a *Damalinia caprae*, and a *D.* sp.). The presence of these in an essentially 'clean' association is noteworthy, if not easily explained; presumably the hosts did not live on the spot, and these parasites came from hair or skins, or conceivably via humans, having jumped ship when their true hosts were killed (see Sample 571, however).

Sample 570 (SPOT) [?hair]

Two small (to 15 mm maximum dimension) clumps of pale coloured animal hair, perhaps originally twisted into a kind of skein.

Sample 571 (GBA): mid/dark brown, crumbly to brittle, slightly humic silty clay with ?rootlets; mottles present at 10 mm scale and perhaps also some evidence of oxidation/reduction (3 kg /T)

A large subsample of this material was processed and it yielded a modest-sized flots (the residue was not examined for plant remains). There was a rather different flora here, with abundant nutlets of sedges and moderate numbers of fruits and cleistogenes of the heath grass, *Danthonia decumbens*. Cleistogenes are flowers formed in the bases of the culms of this grass which are self-fertilised; they are perhaps most likely to arrive at an occupation site with the whole plant in turves. Indeed, several of the taxa present might also have been brought with turves—*Ajuga*, *Montia*, *Scirpus setaceus*, *Prunella*, and some other probable grassland plants (there were, not surprisingly, high AIVs for the grassland groups FEBR and MOAR and the damp turf/pond margin group ISNA). Another possible source is in animal dung, especially in view of the evidence from the beetles.

No parasite eggs were recorded from the single subsample examined (using treatment P); phytoliths were recorded as present.

A fairly small assemblage of adult beetles and bugs (N = 62, S = 38) was accompanied by numerous mites and fly puparia, but rather few other remains. This group was very different from that recovered from Sample 539. It had a strong outdoor component (% N OB = 50), and one of the most abundant species was *Aphodius ?prodromus*, a dung beetle (six individuals); in addition there were two *A. contaminatus*, a single specimen of a third *Aphodius*, and a *Geotrupes* sp. There was also a total of seven individuals of four *Helophorus* water beetles, and four *Longitarsus* sp. (feeding on a wide range of plants). The most likely explanation is that this layer formed in the open where there was dung, and received a background fauna including aquatics from a nearby body of water (which may have been small and temporary). Alternatively, the water beetles may have arrived in dung, having been drunk accidentally by the livestock.

Context 1291 [bedding layer, Structure X]

Sample 1147 (SPOT) [insect remains]

Context 2555 [(charcoally) spread within X]

Sample 902 (GBA): mid brown, crumbly, clay silt with traces of stones 6-60 mm (1 kg /T) and (1 kg /T)²

Perhaps not surprisingly, there was only a small residue from the subsample examined: sand and gravel to 30 mm, with only traces of organic detritus. Amongst the latter was a small assemblage of identifiable plant remains of which only stinging nettle and dock fruits and hazel nutshell fragments were present in more than trace amounts. The rest of the assemblage comprised mainly taxa scored with the woodland and scrub/hedgerow categories, though it is not a very distinctive group when the list of taxa is examined more closely. As in so many samples from this

site, the only cultivated plant represented was flax, of which traces of the seeds were recorded.

A small group of adult beetles and bugs (N = 52, S = 44) and a variety of other invertebrate remains were recovered, and their ecological implications were not clear. Outdoor forms were rather numerous (% N OB = 42), and were of mixed ecological origins. House fauna was absent, apart from one human louse; there were some livestock parasites (single *Damalinea caprae*, *D. ovis* and *Ixodes ricinus*). Perhaps this material initially accumulated in the open and was imported as floor make up, or alternatively the building was disused and in decay.

Context 3082 [fibrous layer N of hearth in Structure Zeta]

Sample 918 (GBA): dark grey-brown, crumbly, silty amorphous organic material with some herbaceous detritus (1 kg /T) and 0.67 kg /T²

The combined lists for the two subsamples examined comprised 43 taxa (well above the mean for the site), though the residues were proportionally much smaller than those for the more fibrous deposits in this part of the sequence (Contexts 3069, 3071, 3083, all from Phase 2vi). Either coarser plant material did not form part of this deposit, or it had much more completely humified during or after deposition. The most abundant remains were achenes of stinging nettle, with moderate amounts of wood, bark and twigs, flax seeds and hazel nutshell fragments, but only traces of heather, *Breutelia* and other plants which might have been brought as litter or packing material. Woad pod fragments were present in trace amounts, as were capsule fragments of flax and frond fragments of bracken. The relatively high value for the AIV for FOOS (fourth largest for the site as a whole) is based on only seven taxa, almost all of which must have been collected from the wild and which also contributed to the high AIVs for the woodland groups QUFA and RHPR.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

Invertebrates, especially insects, were quite abundant, and there were 141 individuals of 60 beetle and bug taxa. These included what may have been a rather specialised house fauna component, with 48 *Lathridius minutus* group and 12 *Xylodromus concinnus*, accompanied by four each of *Cryptophagus* sp. and *Aglenus brunneus*. Other house fauna taxa were very rare, apart from 13 *Pediculus humanus* and seven *Pulex irritans*, strongly suggesting that this surface was in domestic use. There were also three cattle lice and two sheep lice. Two individuals of *Livia juncorum* and *Strophingia ericae* and single *Conomelus anceps* and *Bradycellus ruficollis* may give a hint as to the material contributing to the layer: perhaps turf and cut damp-ground vegetation.

External deposits

Context 1228 [midden, N. of X]

Sample 698 (GBA): large wood fragments with a little dark red-brown amorphous organic material (1 kg /T)

The very large residue was dominated by bark fragments with smaller amounts of wood (including chips) and large amounts of the moss *Isothecium myosuroides*, a species of shaded rocks and tree-bases. The few other mosses present were also consistent with this kind of habitat and it seems very likely that most of it originated in wood or timber brought to the site and used for construction or other purposes, during the preparation for which it became detached (with the bark). Of the rather few vascular plants recorded, there was a mixture of taxa representing disturbed places, peatland and woodland/scrub.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

Insects were rare (only 16 individuals of 10 beetle taxa), although there were 'many' mites. This group may have incorporated house litter, but is essentially uninterpretable.

Samples 617, 647 and 779 (SPOT) [insect

remains]

Context 1229 [gravelly organic layer N. quadrant]

Sample 676 (SPOT) [insect remains]

Context 1289 [midden, N. of Structure X]

Sample 545 (GBA): very dark grey-brown, crumbly to brittle to layered, slightly heterogeneous, slightly silty amorphous organic material and herbaceous detritus (1 kg /T)

There was a rather small residue with a small range of identifiable plant remains amongst the well-humified organic detritus and a small amount of gravel. The only taxon present in more than trace amounts was sedge, with which there were traces of several plants which might have arrived in turves—heath grass, bugle, ?tormentil and maybe the moss *Rhodobryum roseum*. There were traces of peatland plants—leaves of heather and bell heather and perhaps some of the other mosses.

No parasite eggs were recorded from the single subsample examined (using treatment P).

There were rather few insect remains, including only 54 individuals of 40 beetle and bug taxa and small numbers of fly puparia. Mites were rather numerous. The assemblage as a whole had rather unclear implications. There were proportionally large numbers of aquatics, and the most abundant beetle was *Hydraena britteni* (5). House fauna was largely absent, although there were two human lice, and there were hints of an imported heathland component.

Context 1293 [midden associated with Structure X]

Sample 565 (GBA): mid grey-brown, crumbly to brittle silt with moderate amounts of vivianite and fly puparia and traces of ?plant detritus (3 kg /T)

The residue from this large subsample was not especially big, consisting as it did mainly of gravel (to 5 mm) and plant detritus (much of it ‘tea leaves’), though a rather large assemblage of identifiable taxa (41) was recorded. The more abundant remains were seeds of *Atriplex*, *Chenopodium album*, *Polygonum persicaria*, *Urtica dioica*—essentially weeds of disturbed places and/or cultivated soils, with the weed group

BIDE (nitrophile communities of wet places) rather prominent—and leaves of bell heather and shoot fragments of heather. ‘Useful’ plants included seeds and capsule fragments of flax, pod remains of woad, and stalk fragments of bracken, and seeds of rowan and hazel nutshell are also to be considered with this group.

No parasite eggs were recorded from the single subsample examined (using treatment P).

Although ecologically mixed (and probably deposited in the open), the assemblage of beetles and bugs (N = 106, S = 69) clearly included a foul-matter community. The most abundant species was *Platystethus arenarius* (10), and other species with similar requirements included an *Aphodius* species (4) and *Cercyon haemorrhoidalis* (3). Fly puparia were immensely abundant, too. It is possible that these insects indicate dung *in situ*. There were hints of imported material, perhaps turf. Horse lice were numerous (11), and the same number of human lice was recorded. In addition there were eight *Ixodes ricinus*, and some *Damalinia bovis* (3), *D. caprae* and *Haematopinus* sp., (2), and a human flea. As for many other deposits at this site, the means of deposition of the lice requires much consideration.

Sample 569 (SPOT) [insect remains]

Sample 678 (SPOT) [?puffball from inside leather bag]

Context 1297[midden N. of and associated with Structure X]

Sample 550 (GBA): dark grey-brown, crumbly, slightly heterogeneous amorphous organic material with paler silty patches, traces of stones 2-20 mm and rootlets; some of this material had the appearance of turves (1 kg /T)

The possibility that this deposit contained turves is very much borne out by the assemblage of plant remains which, although only of about average size, included large numbers of sedge (*Carex*)

nutlets and moderate numbers of both caryopses and spikelets/cleistogenes of *Danthonia*, nutlets of *Ajuga*, achenes of ?tormentil and earthworm egg capsules, which together make a very convincing ‘turf’ indicator group. Some of the other taxa identified might also belong with this group, though there were also a few remains of plants which seem likely to have originated from other sources—though remarkably few, given the generally rather heterogeneous nature of the assemblages from these deposits taken overall.

No parasite eggs were recorded from the single subsample examined (using treatment P).

Other than abundant mites, earthworm egg capsules and fly puparia, invertebrates were rare, and there were only 16 individuals of 15 beetle taxa. No interpretation may be made, other than to suggest that perhaps large populations of beetles did not develop in this midden layer, and so perhaps it was more soil-like than compost-like.

Context 1298 [midden layer N. of Structure X.]

Sample 600 (GBA): mid/dark grey-brown, crumbly to brittle, humic, slightly sandy clay silt with a little herbaceous and woody detritus and traces of stones 2-20 mm (1 kg /T)

The small residue consisted largely of sand with some basalt gravel; amongst the 32 identifiable taxa recorded, the only taxa recorded in more than trace amounts were heather shoot fragments, hazel buds/scales, and a moss (*Hylocomium splendens*). There were perhaps some indications of the presence of turves (*Danthonia* here as in the sample from 1297), but in general the assemblage was more mixed and therefore less readily interpreted in a straightforward way. ‘Useful’ plants included woad pod fragments and flax seeds and capsule fragments, all in very small numbers.

Insects were quite rare, and there were only 27 individuals of 24 beetle and bug taxa; no clear interpretation could be made, although there were hints of decaying matter. There were three human lice and two *Damalinea equi*, however.

Sample 616 (SPOT)

A small clump of animal hairs to 30 x 3 mm.

Context 1300 [midden layer against gravel of bank **1488** behind wall **1259**]

Sample 576 (GBA) very dark brown, plastic to fibrous, slightly heterogeneous silt and compressed herbaceous detritus (1 kg /T)

The 1 kg subsample examined gave by far the largest assemblage of plant remains from this site (91 taxa), with a concomitantly very large number of high AIVs (23 groups achieved an AIV in the top 10% for that group for the site, and of these, nine were at the highest rank). By contrast, the residue was not very large—it consisted mainly of gravel, twig and wood fragments (including chips) with large numbers of seeds of *Brassica rapa* (turnip, probably the wild form growing as a weed) and moderate concentrations of a wide variety of other taxa, including flax seeds and capsule fragments, heather leaves and shoot fragments, uncharred oat caryopses and various weeds. The woodland component included modest numbers of hazel buds/scales and birch male catkin-scales, and with these can probably be counted the shoots of a leafy liverwort, *Frullania dilatata*. This last represents a group of plants whose record in archaeological or, indeed, natural deposits is extremely sparse (*vide* Dickson 1973). It adds to the very small body of records known (*ibid.*, 64-8) though it contributes little to the interpretation of the deposit, having most probably simply arrived as a bark-dwelling species on brushwood or perhaps been collected with material from shaded rocks or short turf.

Overall, the assemblage of plant remains was dominated by weeds, mainly annual nitrophile types, but also some which were probably weeds of arable cultivation. Probable foodplants were rather well represented (certainly given the low numbers of remains such plants overall at Deer Park Farms), with records from this subsample for oat and barley 'bran', uncharred barley caryopses, blackberry, raspberry, hazel nut, and linseed,

though all except the last of these were present in trace amounts. Other remains of cereals included uncharred barley rachis internodes ('ear stalk segments') and charred oat spikelets, but there were also traces of uncharred culm nodes and glume bases which may have been from a large grass or a cereal.

The suite of mosses present included 14 taxa which might have grown on bark and 13 (mostly the same ones) likely to have grown on shaded rocks, with a further group of seven (again overlapping with the first two groups) from woodland floor habitats. Heathland/moorland forms were also present and there was one species, *Breutelia chrysocoma*, which could be counted as montane, though it is not exclusively an upland moss.

Last, but by no means least, this sample yielded several pod fragments of woad.

No parasite eggs were recorded from the single subsample examined (using treatment P), though testate amoebae and phytoliths were both recorded as present.

This sample produced a small assemblage of invertebrates with no clear ecological implications. There were, however, five human lice.

Sample 677 (SPOT)

The find consisted of twelve whole hazel nuts, smallest 12 mm long by 11 mm wide, the largest 17 x 12 mm.

Context 1309 [spread between N bank entranceway 1259 and N wall of Structure X]

Sample 549 (SPOT): dark brown, crumbly, slightly heterogeneous humic silt with abundant coarse bark fragments and small lumps of light grey-brown silt mixed with brown silt and bark; some bark bears moss (0.2 kg /T)

The small subsample examined consisted mainly of

granular material amongst which there were quite large numbers of taxa (given the small subsample size) including moss typical of tree bark or shaded rocks: principally *Isothecium myosuroides*, but also *I. myurum* and *I. cf. holtii*. hoots of *Sphagnum imbricatum*, on the other hand, are likely to have originated in a raised bog or peat from such a habitat. Unusually for this site, remains of weeds were very sparse in this sample, suggesting the bulk of the material was from one source.

There were single individuals of six beetle taxa, some fly puparia, and a trace of other invertebrates, forming an undiagnostic group.

Context 1423 [layer pre-dating path 1415 (?over entranceway 1259 and wall 1423)]

Sample 674 (GBA): mid/dark brown, crumbly to slightly plastic, humic clay silt rich in herbaceous detritus with traces of stones 2-20 mm and wood fragments (1 kg /T)

The modest-sized assemblage of plant remains amongst the rather large residue of wood fragments (including ?chips), sand and gravel included moderate numbers of several taxa likely to have originated in heathland or moorland (perhaps with turves?) but also flax seeds (the presence of moderate numbers of sclerotia of *Cenococcum* perhaps also stands as evidence for turves). The rarer taxa were mainly weeds and woodland plants of various kinds.

The assemblage of beetles and bugs was of modest size and suggested that there may have been a little decaying matter nearby. There were, however, 13 human lice and five human fleas, together with two *Haematopinus apri*, a *Damalinia equi*, and a *D.* sp. The implications of this assemblage are far from clear.

Context 1425 [organic layer (midden)]

Samples 687, 688, 689, 690, F2372 [all SPOT 'insect remains' except F2372 = 'fibres']

Context 1498 [peaty layer in N. quadrant]

Samples 848, 1166 [both SPOT, 1166 = ‘insect remains’]

Sample 5001 (SPOT): dark grey-brown, crumbly to slightly layered, compressed, humic silt with abundant fly puparia. The sample, which weighed 0.82 kg, was processed for puparia.

Context 2519 [fill of narrow stone-lined drain in S. arm of entranceway]

Sample 809 (GBA): mid/dark grey-brown (with browner and greyer patches), plastic to crumbly, humic clay silt with traces of stones 2-6 mm and twig fragments to 10 mm diameter (1 kg /T)

The small residue of gravel with a little wood, twigs and charcoal, also contained a few identifiable plant remains, amongst which were flax seeds and at least one woad pod fragment, though the assemblage was too small to warrant further comment. There was certainly nothing to suggest the nature of the material filling the drain other than it included remains of plants commonly recorded from many of the deposits at this site.

Adult beetles and bugs were present in modest numbers (N = 76, S = 53), but were of unclear ecological implications. There were several larvae of aquatic hoverflies, suggesting the presence of standing water, perhaps too foul for other aquatics to invade. If so, most of the assemblage may have been essentially a random accumulation of insects from nearby habitats.

Context 2531 [clay between two parallel lines of stone /fill between stones marking ‘path’ to S of Structure X; N.B. context number also used for stone drain itself]

Sample 1033 (GBA): mid brown, crumbly, clay silt with stones 2-20 mm common (1 kg /T)

There were only traces of sand and charcoal and ?modern rootlets in the flot from the subsample

examined. The residue was not, apparently, recorded. No parasite eggs were recorded from the two subsamples examined (using treatments R and Q).

The only invertebrate recorded was a single, unidentified, beetle fragment.

Context 4218 [thin black organic layer on gravel path 1489/4219 (4219 leads to Eta)]

Sample 1093 (GBA): dark grey-brown, crumbly, silty amorphous organic material to herbaceous detritus with traces of stones 6-20 mm (1 kg /T)

There was a large assemblage of plant remains amongst the wood fragments (including oak chips) and gravel making up the rather small residue, and 45 identifiable taxa were recorded. Amongst these, achenes of stinging nettle were the most abundant, but there were moderate numbers of seeds of other weeds as well as of birch fruits and heather shoots. Remains of two mosses were also quite frequent: *Sphagnum* (from peat or collected moss?) and *Hypnum* cf. *cupressiforme* (from turf or brought with heather?). Indeed, the presence of turf and/or litter of some kind seems quite likely from the nature of the assemblage overall since, together with a variety of parts of heather, there were leaves of bell heather (*Erica cinerea*), and seeds of some plants likely to have grown in short turf (e.g. *Potentilla* cf. *erecta*, *Montia fontana*, *Prunella vulgaris*) and stalk and frond fragments of bracken. ‘Useful’ plants were limited to traces of flax (seeds) and hazel nutshell as well as sloe stones and blackberry seeds.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

There were numerous mites and a range of other invertebrates, but beetles and bugs were not very abundant (N = 71, S = 54) and of rather unclear implications. Probably there was a little decaying matter, and there were hints of imported heathland or moorland material. There were three cattle lice, and rare parasites of other livestock and of humans. This may have been an open area with a

few weeds and some litter.

Context 3500 [midden to N of and associated with X]

Sample 840 (GBA): mid brown, crumbly, humic, very slightly sandy silt with traces of wood fragments and a slightly open texture; some oxidation, since freshly brown lumps very dark at core (1 kg /T)

The subsample examined yielded a large number of identifiable plant taxa (50) amongst the wood, bark and twig fragments which made up the bulk of the residue. Concentrations of certain fruits and seeds (and other discrete items) were high, notably nutlets of sedges and bristle scirpus (*Scirpus setaceus*), sclerotia of the soil-dwelling fungus *Cenococcum* and achenes of lesser spearwort (*Ranunculus flammula*). Apart from the sclerotia, these remains together suggest the presence of material from short, damp grassland habitats, though another taxon present in modest numbers (*Linum catharticum*) might point to somewhat drier turf. Indeed, the assemblage was unusual in having more taxa included in the grassland group MOAR than any other, and in yielding the highest AIVs for the grassland groups MOAR, FEBR and ISNA (Table 3) for the site as a whole (cf. Sample 829 from Context 1448). The sample was only one of two from this site to include material of a liverwort, *Frullania dilatata* (cf. Sample 576 from Context 1300).

No parasite eggs were recorded from the single subsample examined (using treatment P).

There were rather few beetles and bugs (54 taxa, 59 individuals), and only a *Longitarsus* sp. (7) was represented by more than two individuals. Members of this genus feed on a wide range of plants. The remaining fauna was of mixed ecological origins, and included rare parasites of humans and livestock.

Phase 2vi-viii

External deposits

Context 1286 [peaty layer N of entranceway 1259, N. quadrant]

Sample 547 (SPOT) [insect remains]

Sample 572 (SPOT) [insect remains]

Context 4010 [peaty layer (?midden) external to Theta and Eta]

Sample 929 (GBA): dark brown, indurated amorphous organic material with some plant fragments (1 kg /T)

There was a strong suggestion from the moderate-sized assemblage of identifiable plant remains in the flot (the residue was not, apparently recorded) for the presence of turves in this context. Taxa likely to have been brought with such material included water blinks, bugle, heath grass, bristle scirpus, ?tormentil and self-heal, and perhaps the rushes (seeds of *Juncus inflexus/effusus/conglomeratus* were quite frequent). For the rest, there were a few weeds and traces of peatland taxa (including heather flowers).

The assemblage of beetles and bugs was of modest size (N = 94, S = 75) and of mixed origin. Water beetles were rather well represented (nine individuals of five taxa) and there were hints of peat or turf, with which the aquatics perhaps came. Mites were very abundant, and there were numerous earthworm egg capsules and ten nymphs of *Craspedolepta nervosa*, presumably from turf or hay.

Phase 2vii

Construction

Context 993 [layer in platform build-up, platform to S of X, built up against inner face of rath bank]

Sample 452 (GBA): mid/dark red-brown, crumbly, humic silt with fine herbaceous detritus and ?moss

(1 kg /T)

The very small residue of gravel, sand and fine plant detritus contained large numbers of *Cenococcum* sclerotia and moderate numbers of a variety of identifiable plants (27 taxa—at the mean for the site as a whole), including seeds of stinging nettle, self-heal, ?tormentil, grasses, birch and *Alchemilla*. Some, at least, of these, are likely to have arrived in turf, and the abundant *Cenococcum* are consistent with an origin in soil for much of the context (unless there was development of living soil *in situ* at this stage in the development of the rath). Grassland plants made up the largest single group of taxa, but this component was still not especially large.

No parasite eggs were recorded from the single subsample examined (using treatment P).

Internal deposits

Context 3037 [patchy internal layer of Gamma]

Sample 822 (GBA): mid/dark brown, crumbly to brittle to layered (strongly compressed and with a ‘platy’ structure), amorphous organic material; phytoliths visible in a ‘squash’ of a small amount of this sediment; ‘the whole sample looks like grass leaf/stem fragments as in cow manure’ (1 kg /T)

The residue was large and rich in coarse bark fragments and basalt gravel; there were also moderate numbers of heather shoot fragments and capsules, flowers and leaves of this plant. The rather small assemblage was thus appeared to dominated by the peatland group (composed almost wholly of the separately recorded parts of heather), with a few weeds and woodland/scrub plants. The ‘grass’ fragments observed in the whole sediment did not appear to have survived processing or were overlooked during sorting.

The assemblage of 90 individuals of 37 beetle and bug taxa included a range of species favoured by artificial accumulations of decaying matter. House fauna was weakly developed (although there were 14 *Atomaria* sp. and 12 *Xylodromus concinnus*, so

perhaps these species were able to establish breeding populations in or near to the deposit). There were small numbers of a range of taxa suggesting rather damp, mouldy conditions.

Context 3041 [occupation deposit: charcoal around hearth in Eta 2]

Sample 895 (GBA): mid brown, crumbly, brittle, ?slightly heterogeneous, silt with greyer mottling on 10 mm scale, traces of charcoal (in patches through the matrix) and pale flecks

There was a rather small residue of herbaceous and twiggy detritus with some gravel to 30 mm, from which a modest-sized assemblage of remains, almost all in trace amounts was recorded; most frequent were probable woodland/scrub plants, but even this group was represented by only five taxa. Although burnt bark and charcoal were both recorded, neither was present in more than small amounts. The ‘relatively’ high AIV for the reedswamp vegetation group PHRA (rank 1 for the site as a whole) is illusory, being based on the records for two taxa both with abundances of 1: plants of this kind were simply very rare at this site, in contrast to the norm in many urban archaeological deposits of Roman and medieval date examined by the authors.

The invertebrate assemblage appeared to be of mixed origins, with weak components of house fauna and remains probably imported in turf. The latter included four larvae (‘wireworms’) of the click beetle *Athous haemorrhoidalis*, but subjectively there were small numbers of a considerable number of other taxa of similar origins. Parasites of humans and livestock were present in small numbers, too.

Sample 1157 (SPOT) [?peat block]

Context 3182 [bedding of grass and straw over twigs (3312) in Eta 2 (material from bedding in woven bed)]

Sample 894 (GBA): dark brown, layered herbaceous and woody detritus (1 kg /T)

Not surprisingly, there was a large residue of herbaceous detritus with a distinctly 'strawy' character, which also contained some moss, twigs and wood. The herbaceous material was not identified, though moderate amounts of possible grass/cereal culm fragments and bracken stalk fragments were noted amongst it. The remaining plants were a mixture representing peatland and woodland/scrub, but there was no particular diagnostic character to the assemblage and little to suggest the nature of the plant material forming the 'bedding'.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

There were 92 individuals of 52 adult beetles and bugs, but the assemblage was notable for some of the other remains present. That this deposit included cut vegetation from moist soils is strongly indicated by the records of *Conomelus anceps* (9), *Livia juncorum* (6), and probably also by various other homopteran bugs (of which there were at least eight). Remarkably, there were 34 nymphs of the bug genus *Anthocoris*, small predators found on a wide variety of plants, probably also imported with vegetation. There were traces of house fauna, and numerous human lice (47 counted). In addition, seven *Damalinea ovis*, three *D. bovis*, and two human fleas were recorded.

Context 3042 [cavity wall fill spilling from collapsed walls of Eta]

Sample 820 (GBA): black, crumbly herbaceous and woody detritus (1 kg /T)

The very large residue consisted almost entirely of heather root-twig fragments to about 5-8 mm diameter, though mostly much finer (the largest were about 100 mm long and 10 mm diameter), with abundant herbaceous detritus. Few other identifiable remains were recovered, presumably partly a function of dilution by the woody heather debris; they were mostly taxa likely to have been

imported with the heather. Concentrations of the basal parts of the heather plant are perhaps more likely to represent decayed turves than any other material.

No parasite eggs were recorded from the single subsample examined (using treatment P), though traces of testate amoebae were noted.

There were abundant mites and insect larvae, 74 adults of 50 beetle and bug taxa, and a few other invertebrates. There were small numbers of various decomposer beetles, with no particular ecological significance. *Strophingia ericae* was represented by six adult individuals, and there were various other beetles and bug likely to have been imported with it in turf (or less probably in cut vegetation), including two *Olophrum* sp. and *Micrelus ericae*, and single *Ulopa reticulata* and *Olisthopus rotundatus*. Most notable in this group, however, were 16 nymphs of *Strophingia ericae*.

External deposits

Context 2435 [turfy bank material of Gamma]

Sample 827 (GBA): dark brown, brittle ?very humified peat with a patch of orange-brown silt; some mould growth on surfaces (1 kg /T)

There was a small residue of fine woody and herbaceous detritus, consistent with the largely mineral nature of this deposit. It is very likely that turves formed a large part of the original layer, since there were modest numbers of sedge nutlets and earthworm egg capsules and the other seeds included bugle and ?tormentil. It could not, however, be said to be an assemblage with a 'characteristic' turf component.

Invertebrates were present only in rather small numbers, and there were only 35 adults of 27 beetle and bug taxa. There were proportionally large numbers of aquatics (NW = 9, SW = 4) and three waterside taxa. The origin of these is not clear, although they may have come from wet turf or mud thrown up from a ditch, or even from imported water.

Abandonment deposits

Context 2437 [thick dump of turf-like material inside Eta after it ceased to be occupied]

Sample 861 (GBA): dark brown, indurated amorphous organic material and herbaceous detritus ('peat'), with quite a few *Potentilla* sp(p). achenes visible on broken clasts (1 kg /T)

Though very large, the residue consisted mainly of unidentifiable herbaceous detritus (of the kind described by DMA as 'tea leaves') with some large fragments of wood. There were very few identifiable remains, this assemblage having one of the smallest groups for the site as a whole (this is likely to be at least partly a function of dilution, since preservation was not recorded as poor). It is possible that some of the material present was highly degraded turves, consistent with the excavator's interpretation, since detritus resembling rootlets and tiny fragments of ?mor humus were recorded, both in moderate amounts and taxa such as bugle and ?tormentil were present.

There were single individuals of nine beetles, and two *Neobisnius* sp., 'many' mites and traces of other remains, offering no grounds for ecological interpretation.

Sample 892 (GBA): dark brown, crumbly, fibrous, compressed, humic silty herbaceous detritus (1 kg /T)

Evidence for the presence of turves was rather more convincing in the subsample from this sample; amorphous peat fragments were abundant, and with them were moderate amounts of sedge nutlets, ?grass culm, and monocotyledonous root/rhizome fragments. The presumed turf indicators bugle, heath grass, and ?tormentil were also recorded.

No parasite eggs were recorded from the single subsample examined (using treatment P).

The flot from the test subsample was not examined for invertebrate remains.

Samples 1148 and 1151 (SPOT) [insect remains]

Phase 2vii-3i

Context 1209 [organic layer (middens material), N quadrant]

Sample 381 (GBA): mid brown, layered, indurated amorphous organic material to woody and herbaceous detritus; somewhat like herbivore dung (1 kg /T)

Though the residue was small, there was rather a large assemblage of identifiable plant taxa (43) amongst which weeds and peatland taxa predominated. The most abundant plant debris were bark and bracken frond fragments with moderate numbers of seeds of sedge, flax and chickweed with several mosses (mainly the shaded rocks/tree bases groups: there were very high AIVs for LIGN, SLIT and WOOD). There were also moderate numbers of *Sphagnum* leaves (and traces of shoots), presumably from plants collected from wet mire vegetation.

No parasite eggs were recorded from the single subsample examined (using treatment Q).

The assemblage of 87 adults of 52 beetles and bugs appeared to include a component from foul matter, perhaps dung, nearby: the most abundant species was *Platystethus arenarius* (9), and there were two *Cercyon haemorrhoidalis* and *Cryptopleurum minutum*, and small numbers of a range of taxa likely to have exploited similar materials. There were some parasites of stock (single cattle and sheep lice), and 15 human lice.

Phase 2vii-?

Context 2503 [spread on surface of platform to S. of X]

Sample 533 (GBA): light/mid brown, layered, very compressed herbaceous detritus with some small wood, bark and charcoal fragments. Sample somewhat dry and with mould on surfaces (1 kg /T)

The modest-sized residue contained 'tea leaf'

herbaceous detritus with one large twig (to 100 mm) and some gravel to 20 mm; there was some unusual granular wood in the flots, the clasts being coated with silt. Some of the plant remains, e.g. some of the heather leaves, were pale in colour. No one component of the assemblage of 28 taxa predominated although the best-represented vegetation groups were all weeds. For the 'useful' plants, there was hazel nutshell, and flax and blackberry seeds, all in very small amounts (and the uncharred oat caryopses might also be counted with this group, though whether they were from wild or cultivated species could not be determined).

There was only a small and ecologically undiagnostic group of invertebrates.

Context 2504 [thin spread on surface of platform to S. of X]

Sample 505 (GBA): mid/dark brown, crumbly to brittle to slightly platy to distinctly layered, humic silty clay with traces of charcoal and wood fragments, hazel nutshell fragments and whole nuts, and bracken (*Pteridium aquilinum*) stalk fragments (1 kg /T)

The rather small residue was mostly hazel nutshell halves and fragments with a few pebbles to 10 mm, twigs and wood fragments (including chips). Weeds formed the largest group of taxa, but were not diverse; three taxa—hemp-nettle, stinging nettle and chickweed—were all present in moderate numbers, the rest much more sparsely. The presence of bracken stalk fragments (seen during the initial laboratory inspection) was confirmed.

Although substantially more invertebrates were recovered than from Sample 533 (N = 52, S = 43, and a range of other remains), the implications of this group were little clearer. Mixed origins seem likely, perhaps with some colonisers of various kinds of decaying matter nearby.

*Phase 2vii-viii***Context 1388** [fill of hollow in Structure X]

Sample 633 (GBA): mid grey-brown, crumbly to almost brittle, slightly greasy, slightly heterogeneous, humic silt with herbaceous detritus and patches of light/mid brown silt and more and less organic patches (1 kg /T)

The very small residue consisted largely of sand with some gravel and a rather modest-sized assemblage of plant remains (29 taxa, a little above the site mean) of which only stinging nettle achenes were present in more than trace amounts. The other taxa recorded were mostly weeds, with some peatland and woodland taxa. An unusual record was for a fragment of nodal sheath (the covering of the 'knee' on a stem) of a horsetail, *Equisetum*, perhaps more of interest as a rarity than for its interpretative value. (A similar structure was recorded from one other sample from this site, together with a fragment of stem itself.)

Apart from numerous mites and fly puparia, invertebrates were not very abundant, and there were only 24 individuals of 21 beetle and bug taxa. Ecological implications are not clear, although the only beetle represented by more than one individual was *Platystethus arenarius* (4), indicative of foul, perhaps dung-like, material. This coincides with the presence of eight *Damalinia equi*, parasites of horses, and single *Damalinia bovis* and *Ixodes ricinus*. House fauna was effectively absent, although there were two human lice. This may have been a surface on which livestock were kept.

*Phase 2vii/viii***Context 3183** [gravelly clay: build-up between 1st and 2nd phases of Structure Eta]

Sample F3246 (SPOT): This object was a semicircular flattened structure, clearly a puffball fruiting body; the maximum dimension of the flattened structure was 80 mm. Capillitium threads within the body were of the *Bovista*-type, and it is

probably *B. nigrescens*. It is unclear whether this may have grown on the surface and become buried within it or was disposed of as the layer formed.

Sample F3247 [puff-ball]

*Phase 2viii***Context 1260** [heather spread at base of build-up at end of occupation of X]

Sample 454 (GBA): black, layered, fibrous herbaceous and fine woody detritus with orange patches of ash (1 kg /T)

The very large residue consisted almost wholly of heather root/twig material with moderate numbers of seeds and shoot fragments and traces of flowers, capsules, and detached leaves; bell heather seeds were moderately frequent and leaves of this plant also recorded. Heathland/moorland plant remains thus dominated the assemblage; with these vascular plants were at least four mosses typical of such habitats. Other plant remains were sparse (no doubt diluted by the abundant heather).

No parasite eggs were recorded from the single subsample examined (using treatment P).

That this deposit contained or consisted of imported heathland turf or cut vegetation was strongly indicated by the presence of *Strophingia ericae* (13 adults, 5 nymphs), *Lochmaea suturalis* (3) and *Ulopa reticulata* (2) amongst the insect remains. Other elements probably included some invaders of the forming deposit, and fauna likely to have exploited open air habitats on the site. A record of the scale insect *Diaspidiotus bavaricus* is believed to be the first from an archaeological site, but its significance is uncertain.

*Phase 2?***Context 1254** [midden]

Sample 437 (GBA) mid orange-brown, crumbly to brittle (sticky when wet), clay silt (1 kg /T)

The small residue consisted mainly of sand and gravel with some fine plant detritus (up to about 20% by volume). Amongst the latter was a small range of identifiable plant remains, mainly seeds of weeds, especially those of trampled places, but with a few taxa which have elsewhere in this report been considered as possible indicators of es.

Only 32 individuals of 13 beetle and bug taxa (and a few other invertebrates) were recovered, but there were 19 *Aphodius contaminatus*. This dung beetle is rather eurytopic (ie. it has a wide habitat range) and is highly migratory (see eg. Kenward 1983), but such large numbers may indicate that it was breeding *in situ* or was imported with turf from grazing land. Of the remaining beetle fauna, most may have exploited dung. Even in this apparently distinctive community, there was a single human louse.

PHASE 3 - MAJOR EPISODE OF HEIGHTENING

Phase 3i-ii

Context 802 [layer pre-dating Z and probably associated with Alpha]

Sample 245 (GBA): mid/dark grey, crumbly ('like soft sugar'), humic sand (1 kg /T)

Sand and charcoal formed the bulk of the tiny residue from this sample; with it were a little bone (some of it burnt) and some charred fragments of plant material which are thought to be from a fucoid seaweed.

The only invertebrate noted was a single pselaphid beetle.

Phase 3ii

Context 1226 [middens material, N. side]

Sample 391 (GBA): dark grey-brown, crumbly to brittle to layered, silty herbaceous to woody detritus (1 kg /T)

The large residue was rich in remains of heather—principally root/twig fragments, but also capsules and traces of leaves, seeds and shoot fragments. There were also moderate amounts of the moss *Hylocomium splendens*, perhaps collected with the heather. Altogether there were 45 identifiable taxa, with peatland plants predominating; there were a few weeds of various kinds, and a small number of possible useful plants: bracken frond fragments, strawberry seeds and flax seeds and capsule fragments.

No parasite eggs were recorded from the single subsample examined (using treatment P), though traces of phytoliths were noted.

The more abundant species in the assemblage of 102 individuals of 53 species of adult beetles and bugs were *Cercyon analis* and *Platystethus arenarius* (11 individuals of each) and *Oxytelus sculptus* (7). These would have lived happily in rather foul, even dung-like, conditions, but if some of the other species present co-existed with them (rather than representing a succession) a patchy environment is perhaps indicated, locally rather drier, though still rather foul. The deposit seems to have received a component derived from heathland turf or cut vegetation, for there were specimens of *Lochmaea suturalis* (3), *Strophingia ericae* (two adults and 12 nymphs), and single individuals of various species likely to have been brought with them. House fauna was barely represented, though there were eight human lice; there were also assorted lice of livestock.

Context 2393 [occupation layer associated with Structure Alpha]

Sample 761 (GBA): light/mid brown, crumbly sandy clay silt with white flecks and traces of stones 2-6 mm (1 kg /T)

The small residue was of basalt gravel and sand with moderate amounts of charcoal and some burnt mammal bone; it is very likely that a large component of this deposit was ash.

No invertebrate remains were recovered.

Phase 3ii-?

Context 723 [layer lapping against outer revetment wall of mound]

Sample 218 (GBA): light/mid brown, plastic clay with traces of mottles at 10 mm scale, charcoal common, and some white flecks (1 kg /T)

Plant remains other than charcoal were lacking in the very small residue of sand and gravel (with angular stones to 30 mm); some material which may have been burnt soil or daub was noted from the >4 mm fraction and there was burnt and unburnt bone. No invertebrate remains were found.

Phase 3ii-iii

Destruction deposits

Context 391 [destruction layer of Structure P]

Sample 327 (GBA): mid brown, crumbly to brittle silt with traces of stones 2-20 mm (1 kg /T)

There was a small residue of sand and gravel with a little charcoal and burnt bone. There were no invertebrate remains.

Phase 3iii

Context 964

Sample 302 (SPOT) pit fill (sample from crust on pot within fill)

Phase 3iii-?

Context 2064 [destruction layer, Structure P]

Sample 764 (GBA): black, crumbly silty charcoal or charcoal-rich silt (1 kg /T)

The small residue was mainly of sand and charcoal with some basalt gravel and traces of a few

charred seeds of weeds of wetland taxa, the assemblage as a whole offering little interpretative information.

As for the invertebrate macrofossils, only a single tachyporine beetle was found.

Context 2523 [hollow fill assoc with Structure G]

Sample 3250 (SPOT)

A strip of unidentified plant stem of 40 mm extended length.

Phase 3vi

Destruction deposit

Context 2247 [destruction deposit, Structure W]

Sample 621 (GBA): light/mid red-brown, crumbly to brittle, slightly sandy clay silt with traces of stones 2-6 mm and charcoal (1 kg /T)

The very small residue contained moderate amounts of charcoal, sand and basalt gravel, with traces of flint, charred hazel nutshell, burnt bone and a shoot of the moss *Hypnum* cf. *cupressiforme*. No invertebrate remains were recorded.

Phase 3v

Context 936 [occupation layer between Strs Z and R]

Sample 252 (GBA): dark grey-brown (with bright red-brown flecks), crumbly, clayey silty sand with stones 2-20 mm common and charcoal abundant (1 kg /T)

All of the very few identifiable plant remains in the moderate-sized residue of charcoal (to 10 mm) and (?burnt) gravel were charred; they included a few flax and weed seeds with a trace of heather root/twig material. The charcoal included ash and

?hazel. There were no invertebrate remains.

Phase 3vii

Internal deposits

Context 322 [layer assocd with Structure J]

Sample 186 (GBA): black, crumbly to slimy charcoal (1 kg /T)

The small residue was mostly charcoal (including a few fragments up to 30 mm in maximum dimension, of which some at least were hazel), with some sand and a little gravel. Two charred cereal grains were recorded, one tentatively identified as barley, the other ?oats, and a charred sedge nutlet was also noted. No invertebrates were recovered.

Context 325 [layer assocd with Structure N]

Sample 99 (GBA): dark brown, crumbly, humic silt with traces of charcoal and small clasts of subsoil (0.3 kg /T)

The tiny residue was mostly sand and gravel with some fine charcoal amongst which ash and hazel were both recorded. Other charred material included bracken frond and stalk fragments and twigs and bark, as well as a charred dock (*Rumex*) fruit and some burnt bone. No invertebrate macrofossils were recorded.

External deposits

Context 398 [turfy clay overlying rath bank]

Sample 130 (GBA): mid/dark grey-brown, plastic to crumbly to brittle, humic, slightly clay silt (1 kg /T)

The tiny residue was mostly sand and gravel with traces of hazel nutshell, charcoal, and bark and twig fragments; from the flot, some root/rootlet fragments were noted in moderate numbers—if

they are ancient, they are consistent with the archaeological interpretation of a turfy layer. The only invertebrates found were single individuals of four beetle taxa; the remains had no ecological significance.

No parasite eggs were recorded from the single subsample examined (using treatment P).

Destruction deposits

Context 184 [burnt thatch destruction layer associated with later Structure R]

Samples 111 (Charcoal/SPOT); *255* (Charcoal/SPOT)

Discussion

Conditions on the rath

For those phases of occupation of the rath at Deer Park Farms where there was good preservation of plant and invertebrate remains, the surfaces on which the inhabitants lived must have been more or less continually damp. Evidence from sites elsewhere suggests that organic preservation may occur without surfaces being objectionably foul, however (cf. the Anglo-Scandinavian buildings at York: Kenward and Hall 1995; and floors in a post-medieval house in Coffee Yard, York: Robertson *et al.* 1989). It seems likely that during the phases in which waterlogged preservation occurred on the rath there was impeded drainage, probably resulting from the presence of a peripheral bank downslope. In a small number of cases it appeared likely that there were at least temporary pools which supported a few aquatic insects (e.g. Contexts 2651 in Phase 1-2i and 3652 in Phase 2iii/iv). The second factor favouring organic preservation was probably the deposition of large quantities of organic matter which both sealed earlier deposits and acted to hold water—both from rainfall and that drawn from beneath by capillary action.

Were conditions ever actually *foul* on the rath? The

insect remains strongly suggest that there was very foul material exposed on surfaces. The small staphylinid *Platystethus arenarius* occurred in moderate to large numbers in a substantial number of the deposits. It probably exploited dung (which seems to have been common, to judge from the evidence from the parasite eggs, see below). It is rather peculiar that *P. arenarius* is the only well-represented foul decomposer in many of the layers. This might be seen as evidence that it had arrived as ‘background fauna’, but it is at least as likely that it was attracted to short-lived and small patches of herbivore dung (e.g. sheep droppings) which were unfavourable to other generalist foul decomposers. In this category, there were only two instances of *Cercyon haemorrhoidalis* being represented by more than three individuals (Contexts 2513 and 2621), in contrast to *P. arenarius*, which was recorded at a frequency of four or more from 23 contexts. The hypothesis that *P. arenarius* exploited small droppings is perhaps supported by the rather frequent records of *Aphodius* dung beetles, although it should be noted that the species represented (mostly *A. prodromus* and *A. contaminatus*) are probably able to exploit other kinds of foul matter. It must be emphasised that there is no evidence for long-term penning of livestock which would—unless removal of manure was rigorous—have led to the build-up of recognisable layers consisting largely of dung. (The question of the keeping of livestock on the rath is considered further, below.)

There appear to have been times when plants grew on the rath, to judge from the abundance of stinging nettle ‘seeds’ (and concomitant records for nettle-feeding insects) in some samples. It is not clear whether any other plants were able to find a niche on the mound—certainly the numbers of seeds and variety of nitrophile weeds, the kinds of plants most likely to occur in this kind of heavily eutrophicated and disturbed habitat, were rather low compared with, for example, Anglo-Scandinavian Coppergate. This suggests intensive disturbance or grazing.

Turning to the interiors of the buildings at Deer Park Farms, the plant and invertebrate remains provide a picture of domestic living conditions. For

the most part, the floors and bedding areas within the structures would have consisted of spongy organic material, probably not unlike well-decayed leaf-mould, with litter consisting of heather, bracken, brushwood and even fallen leaves (perhaps sometimes even consisting of imported leaf mould itself). How far such material was deliberately laid and how far it accumulated through the processes of construction, use, decay and demolition of the buildings is, though, rather difficult to judge. Insects associated with mouldy but not too damp litter were abundant in many of the layers and probably lived in the floors. Most of these species would have been able to exploit the packing between the double walls of those of the structures with such a construction. Some floor deposits contained a fauna regarded as indicative of rather fouler conditions, so perhaps at times they became quite unpleasant. By contrast, the richly organic nature of the occupation deposits may well have provide additional heat through the composting of plant matter! One instance where a floor appears to have been very foul as a result of the housing of livestock has been mentioned above.

A number of the deposits subjected to bioarchaeological analysis had been identified during excavation as areas of bedding within the structures. The assemblages of plant remains from these contexts were sometimes dominated by debris from brushwood (including tree leaf fragments), while in other cases a ‘turf’ (grass or heathland sod) component seemed to be prominent. In one or two other instances there were concentrations of remains of flax or woad which may have served as part of the bedding material or may have accumulated within the houses where activities involving these plants were going on. The presence of hay-like cut vegetation was suggested in some instances by the presence of abundant bugs (*Livia juncorum*, *Conomelus anceps* and *Craspedolepta nervosa*, with a few *Cicadella viridis*) which as a group seem most likely to have occurred in damp meadows. The beds had been invaded by abundant insects. Although beetles associated with slightly damp hay were numerous, there were also quite large numbers of a range of species associated with damper hay, such as would typically be visibly mouldy and smell of ammonia. Whether this

represents a vertical zonation from fresh dry material down into older, wetter and possibly befouled litter is difficult to say.

The people using the beds identified in some of the structures at Deer Park Farms certainly carried abundant parasites, particularly the human louse *Pediculus humanus*, which was present in large numbers in several cases. Human fleas (*Pulex irritans*), too, were generally present, and in some cases very abundant, in these bedding layers. Curiously, lice of stock were also consistently present, although usually in quite small numbers. Those of the samples from within buildings which were analysed for intestinal parasite eggs mostly yielded no, or one or two eggs. Only in one case were larger numbers of *Trichuris* present (Table 11). This was Context 3187, a dark organic layer described by the excavator as ‘rushes and straw’, but actually consisting largely of bracken in Structure Theta [2]. This layer seems not to have been particularly foul, however, and the *Trichuris* (which were, with one exception, consistent in size with those of *T. trichiura*, the whipworm of humans) may represent no more than a moment of incontinence on the part of a child.

It is worth mentioning at this point that there were numerous records of human lice from the site which came from *external* deposits. These lice were in some cases not associated with ‘house fauna’ and seem unlikely to have been ejected with floor sweepings. It thus seems quite likely that they were shed out of doors, either as a result of grooming or possibly when clothes were cleaned. It is hard to resist the image of the inhabitants casting off their lousy garments on the first warm day in spring, depositing the winter’s load of lice, but there is no supporting evidence for this.

Amongst the deposits examined for plant remains, the quantities of charcoal seem rather small for a site where there is so much evidence for domestic occupation. One explanation for this is that, in buildings composed of and containing so much inflammable material, great care was exercised in containing fires and avoiding the strewing of ashes. Alternatively, it may be that wood was not the normal fuel, peat/turves replacing it and leaving

traces which were not detected by the techniques employed here. Even so, the lack of charred peat fragments or of charred remains (such as heather) likely to have been components of it, seems remarkable. Charred heather and peat have frequently been recorded from other sites—including Roman Tanner Row and Anglo-Scandinavian Coppergate, York (Hall and Kenward 1990; Kenward and Hall 1995) and medieval North Bridge, Doncaster (Carrott *et al.* 1997).

Plant foods

Evidence from occupation sites for plant foods typically comes either from faeces (usually in pit fills) or waste from crop-processing, food preparation or table waste (often in floors). The rarity of evidence for human faeces in deposits within the structures at this site has been mentioned above. The same is largely true for the external layers (Table 11), only a few contexts yielding appreciable numbers of eggs of parasites of the human intestinal tract. These deposits did not, however, give particularly prominent concentrations of food remains (none fell in the top 10% for the AIV for FOOS). Indeed, there were no very convincing concentrations of food plant remains likely to have been deposited in faeces anywhere on the site. There was no evidence of waste disposal in pits—which is hardly surprising on a small rural site where organic waste would have been valued for fertiliser or (if not) would have been easily disposed of in the surrounding countryside.

Almost all the evidence for plants likely to have been used for food was for taxa which were probably collected in the wild: the more frequent kinds were blackberry, hazelnut, raspberry, rowan and sloe, with a few records for wild strawberry, rose, dewberry and elderberry. These taxa were mostly recorded in very small amounts and it should be remembered that, in the absence of evidence for faeces, such remains may well have arrived at the site through routes other than consumption as food by humans, e.g. casually with brushwood and leaf litter or dispersed by birds. It

is perhaps surprising that, given the quantities of moorland materials evidently brought to the site, no seeds of bilberry (*Vaccinium myrtillus*) or any of the other upland *Vaccinium* species was recorded.

There were a very few records for cereals (some charred grain: four records of oats, and one each of barley and bread/club wheat; and records for uncharred ‘bran’—one each for barley and oats). Of uncharred grains there were 18 records for oats (in three cases these reached moderate numbers) and one each for barley and wheat/rye. These are remarkably small quantities compared with other sites with comparable quantities of well-preserved plant remains, even allowing for the small sample size and the dilution effects of abundant vegetative material. The only other cultivated plant likely to have served as food was linseed, for which there were records from 48 contexts, of which 13 were for moderate or large numbers of seeds.

Raw materials

A prominent feature of the richly organic deposits at this site was the abundance of vegetative material from plants likely to have been used as some kind of raw material, whether for construction (in the broadest sense) or craft activity. As in the case of the food plants, most of the taxa implicated here are likely to have been gathered from the environs of the rath—brushwood from a variety of trees, bracken, heather, mosses, and turves. Cultivated plants in this category comprise cereals (there were a few traces of cereal chaff), flax (capsule fragments were often recorded, sometimes in rather large quantities) and woad (of which pod fragments were present in 16 contexts).

The presence of flax and woad at this site (together with evidence from sheep lice) leads to the suggestion that textile processing must have been practised here or nearby, though the woad is perhaps more likely to have been used to colour wool than linen since vegetable dyes have more affinity for animal than plant fibres. We may speculate on what other plants may have been used

in dyeing, though with the exception of heather, bracken and the various tree species recorded as leaves and present amongst the unidentified bark, none of them is represented by sufficient quantities of the appropriate kinds of preserved debris to make a convincing case (cf. the abundant remains of dyer’s greenweed and madder, and vegetative remains of woad at Anglo-Scandinavian Coppergate, York, and remains of these plants at a number of other sites: Kenward and Hall 1995; Hall 1996). The frequently recorded ‘seeds’ of ?tormentil (*Potentilla* cf. *erecta*; the identification is probably secure) may be secondary evidence for the use of this plant in dyeing or, more likely, tanning (the roots are a rich source of tannins), though leather was not commonly recorded at this site. One group of plants very likely to have been used but undetectable in the plant macrofossil record is the lichens (though their chemical signature may be read from fragments of dyed cloth and yarn).

Imported raw material were undoubtedly the source of many of the insects from semi-natural habitats found at the site. Species associated with damp meadowland were frequent and occasionally abundant, and seem to have been imported both with turf and with cut vegetation. Insects likely to have been brought in cut heathy vegetation and with twigs were recorded in small numbers in many samples. There were also several samples where cut herbaceous vegetation seemed to be present, though none was identified further. This should perhaps be the subject of further study to ascertain whether the nature of the plant fragments can be identified (two examples with moderate to large amounts of unidentified herbaceous stem material were from Contexts 1318 and 2537, though it is possible these are nothing more than flax stems remaining after fibre extraction).

The presence of charred remains of fucoïd seaweed in two contexts (in one case in moderate quantities) requires some explanation. The site lies only a few kilometres from the Antrim coast, but it seems unlikely that this kind of material would have been brought so far unless it was of special value as a manure, for example, or conceivably as animal feed in times of great shortage (cf. Newton 1951,

31 ff.); it seems unlikely that seaweed could have survived in the guts of animals grazed at the coast and brought up to the rath, there to be charred accidentally. Seaweed has, of course, a variety of other uses (ibid. —one possibility is that it was brought to the site dried to be burnt to provide lye for use in textile working, including dyeing (or that the charred fragments came as a contaminant of such a processed product).

Livestock

Ecto- and/or endoparasites of sheep, goats, cattle, horses and pigs were all present, supplementing the evidence from vertebrate remains for the exploitation of these animals in some way. Lice associated with livestock were present in a large number of samples (Table 9) and occasionally abundant. Four species of *Damalinia* were recorded, all in appreciable quantities: *D. bovis* of cattle, *D. caprae* of goats, *D. equi* of horses, and *D. ovis* of sheep. *Haematopinus apri*, a louse of pigs, was also rather frequent and sometimes abundant. Clearly these domestic animals were present within the rath, either live or in the form of skins, hair or wool which had been brought in to be processed. Eggs of intestinal parasites of sheep and horse were also present in a number of contexts (Table 10) suggesting that their faeces had been deposited. This, together with the evidence for dung outlined above, might be taken to imply that live animals co-existed with humans, but it is not impossible that live animals were only very rarely present, and indeed the dung of sheep may have been deposited during wool cleaning (the quantity of ‘dags’ on modern fleeces can be very substantial). The presence of small amounts of sheep or goat dung may, alternatively, have resulted from animals straying into the enclosure.

The records of *Haematopinus apri* suggest rather more definitely that the host was present, for in two cases substantial numbers were present (Contexts 3692, with 43 individuals, and 4256, with 17). The first of these contexts was deposited within a building (Structure Iota) and it contained abundant dung beetles (*Aphodius prodromus*). This rather suggests that the structure at least

temporarily housed a pig or pigs, the only reasonable—but perhaps implausible—alternative being that a pig was dehaired and gutted inside the building, the resulting foul waste being left where it fell.

As for other sites examined by the authors, there is no evidence for the presence of chickens from lice.

The surroundings of the rath

It is inconceivable that the quantities of plant material (and, incidentally, many insects) from woodland, heathland, and grassland habitats did not originate in the immediate environs of the rath. That materials from such types of vegetation seem to have been freely available throughout the period of occupation represented by the richly organic deposits suggests that they were abundant locally. It is difficult to reconstruct these habitats in great detail, but the evidence from the fossil remains suggests that most of the woodland materials, for example, came from scrub or coppiced woodland rather than ‘high forest’: for the most part, the remains were small twigs, buds and leaf fragments, but not large timbers. A large proportion of the mosses recorded were consistent with an origin in woodland, being taxa commonly seen on woodland floors, tree boles and shaded rocks. However, a number of them are also common in unshaded habitats and, in this highly humid corner of the British Isles are less likely to be good indicators of woodland than they would be further east and south (e.g. at Coppergate in York, where there was a clear woodland floor moss flora together with woodland insects and some other plants such as wood sorrel, *Oxalis acetosella*, which were rare or absent at Deer Park Farms).

The presence of heathland/moorland vegetation in the vicinity of this site is not surprising, given its location in a valley on the edge of the Antrim Plateau, where moorland prevails today. It was clearly heavily exploited as a source of construction materials (heather and moss used in wall-packing and for bedding) and perhaps for peat. A component of the insect assemblages evidently arrived with this material: the psyllid bug *Strophingia ericae* was present as adults and

nymphs (juveniles) in quite large numbers and the weevil *Micrelus ericae* was frequent (though never abundant). Other insects likely to have been associated with vegetation dominated by heather which were present in several samples included *Lochmaea suturalis*, *Ulopa reticulata*, and *Bradycellus ruficollis*. These remains seem unlikely all to have arrived by natural dispersal (as 'background fauna'), and the flightless nymphs of *S. ericae* in particular, must have been imported with heathland plant material or (less probably) turves.

The tally of grassland plants at this site is rather modest, though some groups of taxa likely to have lived in short grass- or sedge-dominated turf were quite frequent and formed a conspicuous part of the assemblages from some of the stratigraphically earliest deposits examined from the rath. Some are consistent with an origin in damp or wet meadows, others more likely to have arrived in turves or cut vegetation (perhaps even via herbivore dung) from drier places. Unfortunately it is rather difficult to define precisely the source of many plants which grow in grassland, since their ranges are broad and grassland forms a continuum from the edges of water-bodies to the driest turf covering rocks on mountain slopes. Various insects were brought to the site together with grassland resources, the psyllid *Livia juncorum* being the most numerous and suggesting swards or wetland edges which included abundant rushes (seeds of which were sometimes numerous). These evoke a picture of wet rushy pasture of a kind which can be observed throughout the island of Ireland today.

Records of plants from permanently wet habitats were extremely rare, though this is perhaps not surprising at a site whose local source of water was a modest-sized stream which probably did not support a large aquatic flora, in a location on the upland margins. The aquatic insects recorded were probably a mixture of background fauna, individuals introduced with turf or cut vegetation, and a few colonists of short-lived water-bodies on the site. Some may even have been deposited with herbivore faeces, having been accidentally ingested when the beasts were watered.

Wider issues

The plant and invertebrate remains from Deer Park Farms gave no good evidence for the long-distance importation of goods or materials. Even woad, perhaps the most 'exotic' plant recorded, may well have been cultivated in N E Ireland, though there is no history of commercial production of this dyeplant so far to the north-west in Britain. As observed above, almost all the remains of plants used for food could have originated in the vicinity of the site and were presumably not cultivated, let alone imported. The exceptions here are the cereals and (if it was eaten) flax/linseed, which were clearly cultivated, probably at lower altitudes than that of the rath. It may be no coincidence that the most frequently recorded cereal was oats, the one most likely to give a reliable yield in an area with such a cold climate and short growing season (although it is likely that temperatures were a little higher than at the present day).

The remarkable and unexpected richness of the insect fauna favoured by artificial habitats on occupation sites (the synanthropes) has been noted upon elsewhere (Kenward and Allison 1994 and Kenward 1997). While some very specialised synanthropes found repeatedly at urban sites were not recorded (examples being *Tenebrio* and *Blaps* species), a large proportion of the synanthropic beetles recorded in large long-lived towns such as York was present at Deer Park Farms. It was suggested that the site either had experienced continuous occupation over a very long period (probably centuries) or that large quantities of materials, incidentally containing insects, were imported from existing settlements which supported a rich synanthropic fauna. The second explanation is perhaps the more plausible, for it is not difficult to envisage large quantities of farmyard material being brought to a site either when it was initially set up or periodically thereafter (for example on marriage or change of ownership).

While the insect fauna had many similarities with those recorded from urban sites of Anglo-Scandinavian and medieval date (and, with certain exceptions, with Roman ones), there appear to be

some subtle differences which require further investigation. A study of the statistically-defined associations of species at various sites indicated differences between Deer Park Farms and assemblages from urban deposits. At 16-22 Coppergate, York, analysis of the fauna from Anglo-Scandinavian deposits revealed a series of clearly defined 'species associations'. These were by no means so clear at Deer Park Farms, a group identified as 'house fauna' (*sensu* Kenward and Hall 1995) at Coppergate being rather intimately associated with species regarded as typical of somewhat foul, mouldering debris. This may be a result of fouler conditions within the buildings at Deer Park Farms; this has been discussed above.

There were suggestions from the insect fauna recorded from Deer Park Farms that some species, although present in the urban sites, were much more abundant at the rath. It is possible that elements of the urban fauna had been substituted for by 'facultative' synanthropes (Kenward 1997). *Micropeplus* species may fall in this category. Whether their abundance reflected the absence of a competitor or predator, or subtle differences in the artificial habitats, is uncertain.

Conclusion

The rich deposits at Deer Park Farms have provided a remarkable opportunity to study living conditions and aspects of economy (the latter albeit largely through 'negative evidence') for a period and in an area where little or nothing was previously known. We are fortunate that the site was, for the period in which it was excavated, exceptionally well sampled. The study described here provides a baseline for further investigations of plant and invertebrate remains from Early Christian Ireland and any similar deposits discovered in the future should undoubtedly be sampled even more thoroughly and with close regard for the requirements of botanical, parasitological and entomological analyses as currently understood. The potential of material of this kind for addressing wider issues, as well as for reconstructing site environment and activity, can hardly be underestimated.

Acknowledgements

The authors would probably not have had the opportunity to become involved with this project had it not been for the good offices of Dr Peter Addyman who visited the site during the period of excavation and pointed out its immense potential for bioarchaeological study.

Much of the tedious task of processing samples was undertaken by Diane Alldritt, John Carrott, and Cath Fisher, with contributions by Jane Richardson and a number of other students working in the EAU; sorting for insects was mainly carried out by EPA, John Carrott, and Ildiko Kemenes; sorting for plant remains was almost all carried out by Dianne Alldritt, with some assistance from Brian Leddington; Dr Philippa Tomlinson examined some samples for vegetative plant remains; work on parasite eggs was undertaken by Brian Leddington, Brian Douglas and Andrew Hutchinson, under the supervision of Dr Andrew K. G. Jones. The late Prof. John Phipps, Frances Large and Dr R. A. Crowson all made useful contributions to the work.

The Ancient Monuments Laboratory of English Heritage are acknowledged for recognising the research potential of this site and allowing ARH, HKK and AKGJ to work on the material from it.

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