

Insect Remains from the Annetwell Street site, Carlisle*

REPORT 4

Period 3A Structures

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Date: 16th December 1987

* Carlisle Excavation Unit Site Code CAR80-84ANN

[NB: This report was scanned and reformatted on 10th March 2008. The only changes have been to preserve internal consistency and to correct typographical errors. HK. The original was an archive report deposited at Environmental Archaeology Unit, Carlisle Archaeology Unit and Ancient Monuments Laboratory, and allocated *post hoc* as *Reports from the Environmental Archaeology Unit, York 87/16.*]

Summary

These deposits associated with structures gave varied insect assemblages. They were often rather modest in size, or small. Some were very mixed and may have been primarily 'background fauna' or imported in soil used for levelling. Most included typical Roman urban decomposers and grain pests.

Some samples gave large decomposer groups of very distinctive character indicating decaying plant remains, perhaps locally foul but mostly fairly open-textured; there may have been a component of insects imported in cut vegetation. Some of the structures may therefore have held beasts. Others appear to have had only a small net input of organic matter and may have been kept relatively clean; some samples included elements of a 'house fauna' regarded as characteristic of rather crude wooden structures.

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1. Introduction

Presented here is the fourth report on material from the Annetwell Street site, Carlisle, providing species lists, summary statistics and interpretations. This report and the subsequent document both deal with the structures from Period 3. All the samples discussed here are from Period 3A and, where known, more detailed phasing is given under the individual sample discussions.

Table 1. Annetwell Street, Carlisle. Descriptions of the sample material in sample number order. Water state was moist unless otherwise indicated.

Sample number	Context number	Description
384	5093	Mid yellowish brown to mid-dark brown silt with some tenacious pink clay. Heterogeneous. Twigs, plant fragments, wood and 5cm stones present.
408	5361	Mid-dark grey/brown slightly sandy, clay silt. Texture was plastic, crumbly and brittle. Yellow sandy patches, pink silt and darker charcoal (?). Small and very small stones present, wood fragments present.
411	5426	Mid grey/brown, crumbly, silty fine sand. Small stones and bone present. Some pale silt patches present. Dry-moist.
41.4	5478	Mid-dark grey/brown crumbly, humic, slightly sandy silt. Paler sandy silty clay patches. Abundant wood fragments.
417	5508	Dark brown organic sandy silt with sand flecks and quite a lot of vivianite. Some stones present. Half of volume consisted of well preserved splintery wood and well rotted wood. Dry-moist.
420	5592	Dark chocolate brown richly organic sandy silt; paler in places. Much fine plant material, wood chips, nutshells. Foul-smelling. Waterlogged.
424	5667	Light brown sandy silt. Crumbly-brittle. Small and very small stones present. Dry.
436	5705	Mid-dark brown, very humic clay silt with fine plant fragments.
438	5686	Dark brown crumbly silt, some lumps with clay bands. Lots of visible sand grains, some stones, wood fragments and specks of vivianite. Dry.
439	5708	Pale brown sandy silt. Almost black when wet. Some wood and small stones

440	5709	Light ginger brown sandy silt, with lumps of fine silt and reddish clay. Some vivianite. Dry.
442	5714	Mid reddish-brown silty clay with dark charcoal flecks. No obvious organic content.
444	5456	Light yellow-brown fine silty sand with darker patches containing charcoal and some patches of yellowish silt. Crumbly. Some stones and possibly a heat-shattered stone.
446	5762	Light chocolate brown, concreted, fine silty sand, with flecks of yellow and vivianite. Some small pebbles. Dry-moist.
447	5457	Mid-dark brown sandy clay silt with some yellowish brown patches. A few plant fragments but little other obvious organic matter. Dry-moist.
453	5443	Dark purplish brown slightly sandy clay silt. Plastic-crumbly. Small stones present, wood fragments abundant.
454	5943.2	Black richly organic silt with mid-dark brown patches. Some plant fragments.
455	5946	Reddish brown clay silt. Some burnt clay and pure clay with organic or charcoal rich bite in it. Some wood and small stones.
459	6115	Buttery-structured black organic material; peat-like in places. Olive coloured when broken. Some wood fragments
462	6192	Dark olive fine-amorphous organic matter; black externally. Fine chaffy appearance in places. A few small stones.
463	6192.2	Mostly pebbles in a matrix of mid brown sand. Some organic content.

Table 2. Annetwell Street, Carlisle. Descriptions of dry-sorted sample residues in sample number order.

Sample number	Context number	Description
384	5093	Lots of wood and charcoal with some burnt mammal bone fragments and the tooth of a lamb.
408	5361	Small quantity of charcoal and nutshells, tiny amount of wood. Four pieces of mammal bone.
411	5426	Tiny amount of brick and a few pieces of wood and charcoal.
414	5478	Large amount of charred wood and organic material. A few pieces of nutshell and mammal bone.
417	5508	Quite a lot of wood which looks like work scraps; a 2mm insect burrow found in bark. Small quantity of charcoal and seeds. One fruit stone, two fish bones, a small fragment of burnt mammal

		bone, a mouse tooth and a frog or mouse bone
420	5592	Very organic with lots of wood, some charcoal and scraps of nutshell and mammal bone. Some seeds.
424	5667	Mostly small stones with a tiny quantity of charred wood.
436	5705	Very sandy with some wood, charcoal and seeds.
438	5686	Many small twiggy bits of wood with some seeds and nutshell fragments
439	5708	Mostly sand and wood scraps with some charcoal and seeds.
440	5709	Mostly sand and stones; barely any organic matter. Some seeds and a mammal rib fragment.
442	5714	Mainly sand and stones. Tiny scraps of wood, some seeds, and a fragment of mammal bone.
444	5456	Predominantly charcoal. Some sand, stones, seeds and burnt mammal bone.
446	5762	Mostly sand and stones. Tiny amount of charcoal, seeds, nutshell and fruit stones. Two fragments of mammal bone.
447	5457	Mainly sand with some wood, charcoal and seeds.
453	5443	Mostly wood fragments with some sand, small stones and charcoal.
454	5943.2	Some small bits of wood and charcoal, quite a lot of seeds and some hazelnut shells. Small fragments of small mammal bone and a few fly pupal fragments.
455	5946	Mostly brick/tile; some quite large lumps and lots of fragments. Lots of charcoal, some wood and small stones.
459	6115	Largely very fine organic matter with some twiggy bits of wood, pieces of charcoal, nut-shell and seeds. A piece of mammal tooth and a trout vertebra were also found.
462	6192	Mainly fine organic matter containing small wood fragment's, puparia and stones.
463	6192.2	Sand and stones with a few small wood scraps and one puparium.

2. Practical Methods

For a detailed description of the methodology employed refer to Report 2 in this series (*Reports from the Environmental Archaeology Unit, York 87/14*).

3. Interpretative Methods

Interpretation is discussed by Kenward (1978), Kenward (1982) and Hall *et al.* (1983). The methods are based on (a) species composition, (b) main statistics such as concentration, 'diversity' and the proportions of certain ecological groups and (c) population structure, as revealed by rank order and cumulative frequency plots.

4. Results of the Analyses

[Revised 2008. Data for this project can now be viewed in:

Kenward, H. (1999). Data archive: Insect assemblages from Annetwell Street, Carlisle (revised edition). *Reports from the Environmental Archaeology Unit, York* **99/32**, 126 pp.

The original edition of these reports included a large paper data archive. This has been omitted from the present version.]

5. Discussion of the Sample Assemblages

The assemblages are considered in sample number order within their structure group and the structures are in context number order. Most of the samples have been processed by the 1kg scan technique, but a small number have been treated as 3kg 'detail' samples. Unless otherwise indicated, the 1kg weight should be assumed.

5.1 Samples from Structure A5754

5.1.1 Sample 439, Context 5708

This sample was taken from a patch of sand in the floor of Room 1. Apart from beetle and bug remains the small flot contained many seeds and mites and a scale insect. The plant material was not very well preserved. Thirty one taxa of beetles and bugs were noted, and there were 37 individuals. Interpretation was thus limited, but 'outdoor' forms were certainly proportionally abundant (%N OB = 27), while decomposers were not too numerous (%N RT = 46). Inspection of the species lists suggests that many of these insects may have bred within the building, but that much fauna from outside was incorporated.

5.1.2 Sample 442, Context 5714

Also from Room 1, this sample was taken from a patch of clay in the floor. The small flot yielded quite a few seeds and one *Leptocera* sp. puparium, but a meagre beetle assemblage; there were only single individuals of eleven taxa. Of these, five were outdoor species (45%, although derived statistics may of course mean little for such a small group), and subjectively there was a similarity to the fauna of sample 439.

5.1.3 Sample 444, Context 5456

Taken from a circle of ash and charcoal which may have been a hearth, in Room 1. This flot contained barely any remains; just some charcoal, burnt seeds, a bug nymph, one *Leptocera*, sp. puparium and eight pieces of beetle. These represented only seven individuals and while they may resemble a random subset of the fauna of sample 439, this is clearly not an interpretable assemblage.

5.1.4 Sample 446, Context 5762

A sample of clay from one of the walls. A medium-sized flot containing lots of well

preserved weed seeds, many mites, a *Leptocera* sp. and an ant. The beetle remains from this 3kg sample were reasonably well preserved and produced 96 individuals of 49 taxa. This assemblage was rather curious in composition. There was no single clearly predominant ecological group and a very mixed origin must be assumed. It is not impossible that a proportion - some ground beetles, phytophages and others - were brought in the 'clay', that others invaded while it was fulfilling its intended function, and yet others subsequently.

5.1.5 Sample 447, Context 5457

Another clay sample from the floor of Room 1. This was a very small flot with an ant, some mites and one *Copromyza* sp. There were only 20 beetles and bugs, including 19 taxa; a restricted fauna with affinities to the fauna of sample 439.

5.2 Samples from Structure A6266

5.2.1 Sample 459, Context 6115

This sample was taken from a spread of demolition soil. A large assemblage of insects was recovered from a 3kg fully-processed sample. There were at least 327 individuals, and 93 taxa were recognised. Diversity was moderate ($\alpha = 43$, $SE = 4$), as was the size of the outdoor component (%N OB = 18). Decomposers were very abundant - 230 individuals (%N RT = 70), with taxa associated with relatively dry remains very numerous (%N RD = 43, 61% of the decomposer group). These included 86 *Lathridius minutus* group, 25 *Typhaea stercorea* and 17 *Cryptophagus* sp. There were other taxa likely to have bred in company with these: *Corticaria* spp. (15 and 14), *Ptenidium* sp. (9), *Cryptophagus scutellatus* (5), and so on. This group must have bred in plant debris, which decayed to form the very humic deposit (see Table 1). There may have been fouler patches to support some taxa (*Cercyon haemorrhoidalis*, for example). Little evidence exists to suggest that this layer accumulated in the open air, unless rather quickly, or that it was used by animals (which might be expected within a structure or enclosure where there was such organic build-up). On the other hand, there were 3 *Apion craccae*, 6 *Apion* sp., 9 *Longitarsus* sp. and single individuals of *Sitona hispidulus* and *Gymnetron ? pascuorum* (there were also other taxa which may have originated with them). This kind of component was frequently recorded from Roman deposits at the Tanner Row site in York, (Engleman *et al.* (1986-7), where it was regarded as indicative of the importation of hay or other cut vegetation - in this particular structure it is presumed to have been either stored or used in the keeping of beasts. A less probable interpretation is that this material is the remains of a demolished 'hay' roof.

5.2.2 Sample 462, Context 6184.3

A sample from a drain-fill, taken from what was probably a linear soakaway inside the building. The medium sized flot contained several puparia (eight Sepsidae sp., four *Musca domestica*, one *Leptocera* sp., and one *Stomoxys calcitrans*) and some mites. The small group of beetles - 39 individuals, 29 taxa - was not very well preserved. It included elements of the fauna seen in sample 459, but was generally undistinguished.

5.2.3 Sample 463, Context 6184.4

This sample also came from the drain-fill mentioned above. The flot was smaller, with a few mites and four *Leptocera* sp. Only 16 individuals of 14 beetle taxa were recovered. This group was too small for interpretation although subjectively there were affinities with other assemblages from this structure.

As a summary for structure A6266: while two samples gave small groups, the third, from context 6115, gave a large and distinctive decomposer group probably associated with plant litter. This was perhaps at least in part hay-like and may have been stored or associated with stock. It is less likely to have been part of a roof.

5.3 Samples from Structure A6267

This structure was probably more of an enclosure than a roofed building.

Where there was a large enough number of insects for interpretation, the evidence for structure A6267 points to an area strewn with hay-like cut vegetation, possibly including dung.

5.3.1 Sample 436, Context 5705

This sample came from a pit which cut the floor of the building. Apart from beetles and bugs the small flot yielded some fleas, mites, a *Leptocera*, sp. and two *Copromyza* sp. One egg of the horse parasite, *Oxyuris equi*, was also found in this sample.

The beetle and bug assemblage (N =31; S = 26) had no special character in the context of Roman deposits at the present site. The outdoor component was well represented (%N OB = 29), but cast no clear light on the degree of exposure of the forming deposits.

5.3.2 Sample 438, Context 5686

Taken from a layer of peaty silt which probably represents a period of decay. Apart from beetles and bugs the flot yielded some puparia: one *Leptocera* sp. and some Sphaeroceridae sp.

This 3kg sample produced a very substantial beetle and bug assemblage - 139 taxa represented by 439 individuals. Diversity was high (alpha = 70, SE = 5), and bearing in mind the presence of what was clearly a large breeding assemblage of decomposers, the outdoor component was substantial (%N OB =19, %S OB = 33). The large number of decomposers (N RT = 243) accounted for 55% of the fauna, not an exceptionally high proportion, and clearly this is not just a 'compost heap' assemblage. The more abundant taxa do include such a group, however: *Lathridius minutus* group (35 individuals), probably *Carpelimus bilineatus*, *Cercyon analis*, *Anotylus rugosus*, *Ephistemus globulus*, *Typhaea stercorea*, *Oxytelus sculptus*, *Carpelimus pusillus* group, *Cryptophagus* spp., *Atomaria* sp., *Monotoma picipes* and many others forming a rich community likely to be found in accumulating organic remains of varying or zoned moisture content. Strong hints as to the nature of this material come, as in sample 459, from taxa which might have been imported in cut vegetation resembling hay: *Conomelus anceps* (9), *Apion* spp. (6+1+1), *Sitona hispidulus* (2), *Hypera punctata* (2), etc. Many other taxa may have been sheltering in this 'hay pile', or entered to predate the breeding taxa, or have been

background fauna. There are hints of rather foul conditions - even dung - from *Aphodius contaminatus* (7), *Gyrophypnus fracticornis* (6), *Cercyon haemorrhoidalis* and *C. terminatus* (5 each). It appears possible that animals were kept in the area in which this deposit formed. The grain pests may have come from feed grain, but an origin in 'background fauna' strays is equally likely.

5.3.3 Sample 440, Context 5709

The sample was recovered from the remains of a clay floor on the west side of the structure. Puparia recovered from the flots include eight Sphaeroceridae sp. and one *Leptocera* sp.

Another 3kg detail sample, but this time yielding only 25 beetles and bugs (24 taxa). Considering the context of this site and period, the assemblage is rather characterless.

5.4 Samples from Structure A6268

From the limited entomological evidence there seems to have been little net deposition of organic matter within this structure.

5.4.1 Sample 384, Context 509.3

The sample was retrieved from a drain which appears to have been draining from inside the building (period 3A/2), but may have also been present during period 3A/1. The small flots contained a few seeds, an earwig and many *Leptocera* sp. Beetles and the single bug were well preserved, but not abundant (S = 33, N = 38). Outdoor forms were relatively plentiful (%N OB = 39), decomposers not very important, in urban terms (%N RT = 42). Only the four typical Roman grain pests - *Cryptolestes ferrugineus*, *Oryzaephilus surinamensis*, *Palorus ratzeburgi* and *Sitophilus granarius* - were at all numerous. These may be of nearby origin, but such numbers of grain pests can probably be regarded as normal in the 'background fauna' of Roman urban deposits (Hall *et al.*, forthcoming). The remaining beetles and bugs very probably are background fauna, but some may conceivably have been imported with cut vegetation. There is no clear indication as to whether this was a use-phase drain fill or simply trample and backfill.

5.4.2 Sample 408, Context 5361

This sample came from a deposit of orange-pink gravelly clay which extended both inside and outside the walls and is regarded as being part of a demolition phase. The flots were small, with mites, quite a lot of charcoal, eight *Leptocera* sp. and many seeds. Preservation was average. Over half of the beetle individuals recovered from this sample were grain pests (%N G = 56), and as in sample 384 they occupied the first four ranks of abundance. The remainder of the list may be of local or transported origin.

5.4.3 Sample 411, Context 5426

A portion of the interior of this structure contained a yellow gravelly clay spread from which this sample was taken. It is not certain, but the spread may have been a floor. The large flots contained mostly plant material; some of this was heather shoots, lots of it was cereal. There were also many seeds and mites, and some charcoal.

In this assemblage only 18 beetles were present, including 15 taxa. They may well be a

small group introduced by trampling, in material, or which entered as background fauna, and became incorporated into a fairly clean floor.

5.5 Samples from Structure A6271

5.5.1 Sample 417, Context 5508

Taken from a layer of demolition silt containing lots of wood and cobbles. The layer also spread beyond the west wall. Fly remains were represented by some Sphaeroceridae sp., a few Sepsidae sp., some *Copromyza* sp. and a few *Leptocera* sp..

The 3kg fully-processed sample gave 164 individuals of 99 taxa of Coleoptera and Hemiptera. Grain pests made up 10% of the assemblage. Diversity was high (alpha = 107, SE = 15) and a quarter of the individuals were classified as 'outdoor' (OB), half of this component in turn consisting of phytophages and other strongly plant-associated taxa. All the outdoor taxa were represented by only one or two individuals, however, and they appear to have had a 'background' origin. The decomposers (with grain pests) dominated the higher ranks and were a mixture of eurytopic taxa together with some primarily associated with dryer conditions, and others with foul. The origin of this group is not clear, but they could also have been background fauna.

5.5.2 Sample. 424, Context 5667

This sample was removed from a spread of yellow silty clay in the eastern half of the structure. The flot was very small; one Sphaeroceridae sp. was present together with four beetles. This group cannot usefully be interpreted.

5.5.3 Sample 453, Context 5943.1

Another sample which was taken from the demolition spread. The flot was of medium size and fairly well preserved. Many seeds, mites and Sphaeroceridae puparia of more than one species were recovered. There were 50 beetle taxa and a single bug: N estimated as 77. Diversity and the percent-age of outdoor forms were moderate, but overall there was considerable similarity to the assemblage from sample 417.

5.5.4 Sample 454, Context 5943.2

Between the rampart and the north wall of A6271 was a shallow gully with no inlet or outlet and within which there was a shallow deposit of silt from which this sample was taken. Apart from beetles and bugs the 3kg sample yielded many fly remains: one *Musca domestica*, a few *Copromyza* sp., several *Leptocera* sp., a few *L. zosteriae*, many Sphaeroceridae sp. and two Muscidae sp. (possibly *Thricops* sp.).

A substantial assemblage, 297 individuals of 118 taxa, was recovered. Diversity was moderately high and 16% of the individuals were outdoor forms; recalculation after removal of grain beetles (which accounted for 20% of the assemblage) raised both values somewhat, but not substantially. There were a few aquatics but these comprised three *Helophorus* spp., very likely to have had a background origin, giving no evidence for open water. Decomposers made up 48% of the individuals – 60% after subtraction of grain beetles – and RD forms were well represented (N RD as %N RT = 37). In fact

there appeared to be a group associated with rather moist but open-textured mouldering remains. This community perhaps included *Lathridius minutus* group (23), *Cryptophagus* sp. (14), *Acrotrichis* spp. (8, 5), *Oxytelus sculptus* (8), *Typhaea stercorea* (6), *Atomaria* sp. (5), *Corticaria* sp. (4), *Anthicus* sp. (4), and some less numerous taxa. It is possible that a small group of foul-matter taxa bred with them (e.g. *Cercyon* spp., perhaps even *Aphodius contaminatus*). There may have been a group of beetles imported in cut vegetation.

5.5.5 Sample 455, Context 5046

This 3kg detail sample was also taken from the demolition layer described above.

A small group of insects was recovered (24 individuals of 20 taxa) which in the context of the present site, was of no special character. A single *Colyidium elongatum* was a notable record.

5.6 Samples from Structure A6272

This was a short-lived structure with four phases identified on the basis of re-floorings.

5.6.1 Sample 414, Context. 5478

A sample taken from a layer of organic silt which was probably occupation silt on the floor during phase 4 of this structure; demolition material may also be included. The small, fairly well preserved flot contained lots of seeds, many mites, and some Sphaeroceridae sp.

The assemblage of beetles and bugs was small, there being 29 taxa and an estimated 46 individuals. Diversity was estimated to be rather low ($\alpha = 34$, $SE = 10$), and there appeared to be a small breeding component of 'house fauna' taxa (Hall *et al.*, forthcoming), giving an RD component making up 35% of the assemblage and 64% of the decomposers, both large proportions. This 'house fauna' occupied the first four ranks (*Lathridius minutus* group, *Cryptophagus* sp., *Xylodromus concinnus* and *Ptinus fur*). The remaining fauna may have included taxa which bred with these, but all might have been background fauna; outdoor forms were well represented (%N OB = 24) and the structure was perhaps either rather open or received material such as cut vegetation which contained insects. Grain beetles were rare.

5.6.2 Sample 420, Context 5592

This sample was from a small pit or the end of a soakaway drain. It may have existed during phase 2 or was a phase 3 feature functioning below the timber floor. Apart from beetles and a single bug the smallish flot contained many seeds, mites, a scale insect and four *Copromyza* sp.

The assemblage of beetles and bug was small (N estimated as 40, S = 26). Dry decomposers were well represented (%N RD = 38, N RD as, %N RT = 68). Although outdoor forms were quite important (%N OB = 23) this layer may well have formed indoors. The insects do not, however, cast much light on the function of the feature.

6. Discussion

This group of samples gave varied faunas. Many were small and, beyond noting a character typical of Roman urban deposits, an interpretation cannot be made. Some contained large assemblages of decomposers from material which probably resembled old hay or straw - mostly open-textured but perhaps locally foul. Animal bedding contaminated with dung is a possible parallel.

It is tempting to speculate that the phytophages in some of these assemblages included a group imported with cut hay-like vegetation, as postulated for the Tanner Row site, York (Hall *et al.*, forthcoming), but the evidence is not definite. Investigation of the plant material may cast light on this point, for the deposits may have included some stable floor litter; such material was deduced to have been present in some layers at Tanner Row and at the Castle Street, Carlisle, site (Kenward and Morgan (1985).

7. Further Action Required

Examination of plant remains - particularly tissue fragments – is required to investigate further the possibility that some layers include a cut vegetation component, perhaps animal bedding or hay.

8. Acknowledgements

The authors wish to thank Ian Caruana and Mike McCarthy for providing archaeological information, Simon Pearsall and John Pickering for their assistance with sample processing and the sorting of dry residues, Professor John Phipps for the identification of flies and Sally Scott for help with identifying bones found in the residues.

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