Ancient Monuments Laboratory
Report 46/86

ARTHROPOD REMAINS FROM ARCHAEOLOGICAL SITES IN SOUTHAMPTON.

Harry Kenward and Maureen Girling

Ancient Monuments Laboratory Report 46/86

ARTHROPOD REMAINS FROM ARCHAEOLOGICAL SITES IN SOUTHAMPTON.

Harry Kenward and Maureen Girling

Summary

Arthropod remains collected using non-standard techniques from a large number of contexts at a series of sites in Southampton have been examined. The majority were of saxon date from 'Hamwic'. Preservation was usually by 'mineralisation', and the great bulk of the fossils were of woodlice (Isopoda), millipedes (Diplopoda) and immature stages of flies (Diptera). These gave only limited ecological information. A few contexts contained remains, including beetles (Coleoptera), preserved by 'waterlogging'. The number of such samples was too small, and the abundance of the insects recovered too low, for much interpretation.

PLEASE NOTE:

This report has been prepared extremely rapidly in order to meet the publication deadline and shortcuts have been necessary. In particular, it has not been practicable (or probably justifiable) for HK to complete the identifications to the level adopted by MG.

Author's address:

Environmental Archaeology Unit
University of York
Heslington
YORK YO1 5DD

0904 59861 x5531

Arthropod remains from archaeological sites in Southampton

by

Maureen Girling and Harry Kenward

Date: 10th November 1986

File: SOU.TXT

Introduction and general comments on the material

This study was commenced by Maureen Girling, but following her death the available records and material were transferred to HK for completion of the practical work and for report preparation.

Arthropods had been recovered from a large number of contexts from the excavations at Southampton, the material having been processed by employees of the Southampton Excavation Unit and submitted to M.G. in gelatine capsules within labelled paper bags. In a few cases (SOU 30 samples 357-9) residues from dry-sorting (described as 'under 2mm') were provided, and these have been rehydrated and paraffin-floated to recover the remains of insects and other arthropods extractable by the method.

The majority of the remains are preserved by 'mineralisation', and are of millipedes, woodlice and fly puparia and pupae. A small number of samples contained insect remains preserved by 'waterlogging'

Much of the material (about half) was identified by M.G. It was necessary for H.K. to complete the work very rapidly. While M.G. clearly took great care to make as full an identification as possible of every fossil, reflecting her special interest in mineralised remains (see for example Girling 1979), this has not been feasible in the case of material examined by H.K. (Under the circumstances it has also been thought unjustifiable in terms of archaeological information obtainable.) Although the records obviously have interest to zoologists and those interested in the taphonomic process of 'mineralisation', and although there are clear exceptions, the archaeological information obtainable from 'mineralised' material tends to be limited. This is because only a very narrow range of organisms is generally so preserved. The presence of calcium salts in the cuticle appears to greatly favour mineralised preservation so that woodlice (Isopoda: Oniscoidea) and millipedes (Diplopoda) are particularly well represented. These are groups which are occasionally recorded from 'waterlogged' arthropod assemblages, but rarely in more than very small numbers.

It seems likely that the history of the deposits at Southampton was such that there was concentration of the mineralised fossils, perhaps through decay of a large bulk of organic debris of the type which remains in many waterlogged deposits. It is impossible to believe that Isopoda and Diplopoda were not common on sites such as 16-22 Coppergate, York, where insect preservation was often superb. However, the remains of millipedes and woodlice, although well-preserved and apparently not often secondarly mineralised, were not at all common at Coppergate, their frequency relative to insects such as the beetles being about what is observed in living communities.

None of the Southampton waterlogged insect assemblages were large enough for much interpretation. It is clear from the good condition of many of the remains that, had samples of sufficient size been appropriately processed, useful material could have been recovered. This should be borne in mind during any further excavations. In the present case no attempt has been made to draw 'archaeological blood from environmental stone' by making more of the assemblages than they deserve.

The records of arthropods from the material listed by M.G.,

together with those identified by H.K., are given in the appendix. A complete list of taxa recorded is given in taxonomic order in Table 1. Identifications by M.G. have been accepted without checking. In some cases, the manuscript species lists were very difficult to interpret and occasionally malapropic names were recorded. Where possible these have been interpreted, but in a very small number of cases uninterpretable records have been omitted. It should be noted that it has not been possible for H.K. to identify the Diplopoda and Isopoda because time was so limited. However, the range of species present in the samples examined by H.K. is believed to have been much as recorded by M.G.

A selection of the dipterous puparia have been examined by Professor J. Phipps of the E.A.U., who found the great majority to be unidentifiable internal casts.

Biological notes on some of the recorded taxa

Isopoda (woodlice) (source: Sutton 1972).

The terrestrial isopods are scavengers.

?Halophiloscia couchi - Provisionally identified only. H. couchi is a marine littoral species, recorded under stones around high water (springs). The records are from Phase Two of the Six Dials site, context 10490.

Oniscus asellus - Much the most commonly seen woodlouse in Britain, very eurytopic but perhaps with a preference for rotting wood and intolerant of extremely dry conditions.

Trachelipus rathkei and Trachelipus ratzeburgi - These species appear to be poorly known.

Metoponorthus pruinosus - Characteristically found in farmyards, particularly manure heaps: apparently becoming less abundant.

Porcellio laevis - Closely associated with man; at least one record from a compost heap.

Porcellio scaber - Extremely widespread and common; tolerant of fairly dry conditions; abundant on waste ground and in gardens.

Armadillidium vulgare - Widespread and common; the 'pillbug'. Restricted to calcareous soils except in coastal habitats, preferring stony chalk or limestone turf.

Diplopoda (Millipedes) (Source: Blower 1985).

Millipedes are scavengers and plant-feeders.

Tachypodoiulus niger - A very eurytopic and commonly encountered species indeed, often found in houses.

Cylindroiulus londinensis - British records given by Blower are from natural habitats, but the species appears poorly known. In France from woods and open terrain.

Cylindroiulus caeruleocinctus - Usually found in calcareous soils under cultivation; the commonest species in a pitfall study of London gardens and so obviously tolerant of man.

Brachyiulus pusillus - Common on the coast and inland, generally in arable or grassland habitats.

Polydesmus angustus - Very eurytopic, present practically everywhere that millipedes occur. Frequently found in association with man as well as in natural habitats.

Brief notes on the material from the sites

SOU 24: Six Dials site.

Material from only one sample (342) was seen; the sample was taken from the lower fills of a pit (2133). Preservation was by 'waterlogging' and a single fly puparium and a small group of beetles were recovered. They had no particular interpretative value but would not have been unexpected from a pit in, for example, Anglo-Scandinavian York.

SOU 25: Westgate site

Five kilogramme samples were processed by the excavation team, using 600 micron mesh sieves for the 'flots' and 2mm for the 'residues'. Thus only the larger arthropod remains will have been retained with any degree of certainty.

With the exception of a single Trechus micros (a burrowing beetle and so perhaps intrusive) all the arthropod material was 'mineralised'.

Fly puparia (mostly unidentifiable) and diplopods were present in modest numbers in many of the samples. It was not practicable to identify the latter to species but the taxa present appeared to be those recorded by M.G. from the Six Dials site, Phase Two (SOU 69). No ecological information can be drawn from these, except that conditions during and after deposition were not conducive to preservation of most arthropod remains.

SOU 26: Six Dials site

Material from only a single sample was submitted; it included a few millipedes and woodlice.

SOU 29: Maddison Street site

Only two samples produced arthropod remains, unidentified insect larvae in each case.

SOU 30: Six Dials site

The samples which gave arthropod remains came from pits and wells. Some gave only a few remains, but wells 2014 and 2016 produced modest numbers of insects preserved by waterlogging, as follows;

F 2014 - Three samples (364-6) from the lower layers of the fills of this well gave a few beetle, bug and fly remains. Even if all three groups are combined the assemblage is too small for much information to be drawn from it. However, many of the insects are outoor forms, and there is no suggestion of a large decomposer element. Probably the insects are largely background fauna from the area around the well.

F 20126 - Samples 358-9 represented primary fills of this well and gave modest numbers of insects. They probably represent background fauna. While there is may be considerable bias introduced by the non-standard extraction technique, it does appear that the surroundings of the well were probably open, with a sparse vegetation. There is no obvious significant difference between these assemblages and that from sample 344, taken from an early infilling deposit.

SOU 123: Upper Bugle Street site

A small number of insects were recovered from samples 297a-g, from the sump of Garderobe 1 (13th century). Preservation was by waterlogging. Some decomposer taxa were fairly abundant (e.g. Hister merdarius and Cercyon ?unipunctatus) and it appears that the deposits included foul matter exposed to insect colonisation. The presence of several Tipnus unicolor (a spider beetle) is notable, since this is a taxon typical of Roman and medieval deposits in York and elsewhere, being much rarer in Anglo-Scandinavian York, for example. The present evidence fits the pattern well. Osorne (1981) records T. unicolor from a latrine at Worcester, and at there and at the present site this 'domestic' species, typical of old, rather damp, buildings (e.g. O'Farrell and Butler 1948), was probably abundant in the room served by the latrine.

SOU 169: Six Dials site, Phase Two

This site produced a large number of arthropods from many contexts; almost all were preserved by mineralisation. M. G. identified the majority of the millipedes and woodlice and notes on the recorded taxa are given above. Little ecological information can be drawn from such records, however, since most of the taxa are very common and found in a wide range of habitats, in association with man or 'in the wild'.

SOU 177: Downer Baker site

One sample gave a few mineralised remains of no interpretative value.

General remarks

It is, unfortunately, not sensible to make any comparison between sites and periods on the basis of this material. The presence of well preserved 'waterlogged' remains in some deeper features suggests that such deposits should be sampled specifically for insects. Large numbers of such samples should be processed using a standard paraffin-floatation technique (Kenward et al. 1980, 1986), preferably in the laboratory where the identifications and interpretation are to be carried out. Records of a large number of assemblages from such features could be combined to produce information which would be both useful and comparable to evidence from other sites.

Acknowledgements

Catherine Fisher assisted H. K. in the inspection of the material and compiled the Table and the Appendix. Archaeological information was kindly provided by Jennifer Bourdillon, John Oxley and P. R. Cottrell, molluscs were identified by Terry O'Connor, and some of the Diptera by Professor John Phipps.

References

Blower, J. G. (1985). 'Millipedes. Keys and notes for the identification of the species'. Linnaean Society of London and The Estuarine and Brackish-Water Sciences Association, London etc.

Girling, M. A. (1979). Calcium carbonate-replaced arthropods from archaeological deposits. Journal of Archaeological Science **6**, 309-20.

Kenward, H. K., Hall, A. R. and Jones, A. K. G. (1980). A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits. Science and Archaeology **22**, 3-15.

Kenward, H. K., Engleman, C. A. and Robertson, A. (1986). Rapid scanning of urban archaeological deposits for insect remains. Circaea **3**, 163-72.

O'Farrell, A. F. and Butler, P. M. (1948). Insects and mites associated with the storage and manufacture of foodstuffs in Northern Ireland. Economic Procedings of the Royal Dublin Society **3**, 343-407.

Osborne, P. J. (1981). Coleopterous fauna from Layer 1. pp. 268-71 in J. R. A. Greig, 'The investigation of a medieval barrel latrine from Worcester'. Journal of Archaeological Science **8**, 265-82.

Sutton, S. L. (1972). 'Woodlice'. Ginn and Co., London.

Table 1. List of taxa recorded.

Isopoda

?Halophiloscia couchi (Kinahan)
Oniscus asellus Linnaeus
Trachelipus rathkei (Brandt)
T. ratzburgi (Brandt)
Metoponarthrus pruinosus (Brandt)
Porcellio laevis Latreille
P. dilatatus Brandt
P. scaber Latreille
Armadillidium vulgare (Latreille)

Diplopoda

Tachypodoiulus niger (leach)
Cylindroiulus londinensis (Leach)
C. caeruleocinctus (Wood)
Brachyiulus pusillus (Leach)
Polydesmus angustus Latzel

Insecta

Dermaptera:

Forficula auricularia Linnaeus

Hemiptera:

Auchenorhycha sp.
Hemiptera sp.

Lepidoptera:

Spp. (pupae)

Coleoptera:

Nebria brevicollis (Fabricius)
Notiophilus auquaticus (Linnaeus) or aestuans (Motschulsky)
Clivina collaris (Herbst)
C. fossor (Linnaeus)
Trechus micros (Herbst)
Bembidion properans Stephens
B. sp.
Pterostichus cupreus (Linnaeus)
P. melanarius (Illiger)
P. minor (Gyllenhal)
Calathus sp.
Amara aenea (Degeer)
A. sp.
Harpalus rufipes (Degeer)
H. sp.
Carabidae spp. indet.

Helophorus nubilus Fabricius
Cercyon ?haemorrhoidalis (Fabricius)
C. ?unipunctatus (Linnaeus)

C. sp.
Megasternum obscurum (Marsham)

Hister merdarius Hoffmann

Catops sp.
Catops or Choleva sp.

Platystethus cornutus (Gravenhorst) group
Anotylus nitidulus (Gravenhorst)
Stenus sp.
?Gauropterus fulgidus (Fabricius)
Gyrohypnus fracticornis (Muller)
Philonthus spp.
Staphylinus olens Muller
Staphylininae sp.
Tachinus laticollis Gravenhorst
Aleocharinae sp.
Staphylinidae sp.

Trox scaber (Linnaeus)

Aphodius ater (Degeer)
A. constans Duftschmidt
A. granarius (Linnaeus)
Onthophagus sp.
Melolontha sp.

Athous haemorrhoidalis (Fabricius)
Elateridae sp.

Anobium punctatum (Degeer)
Ptilinus pectinicornis (Linnaeus)

?Niptus hololeucus (Faldermann)
Tipnus unicolor (Piller and Mitterpacher)
Ptinidae sp.

Lathridius minutus (Linnaeus) group

Aglenus brunneus (Gyllenhal)

?Bruchus sp.

Phyllotreta undulata Kutschera
P. sp.
Chaetocnema concinna (Marsham)

Apion sp.

Otiorhynchus ligneus (Olivier)
O. sulcatus (Fabricius)
Sitona sp.
Cleoninae sp.
Hypera sp.
Cidnorhinus quadrimaculatus (Linnaeus)
Ceutorhychus spp.
Rhinoncus sp.
Ceuthorhynchinae sp.

Curculionidae sp.

Diptera:

?Fannia sp. (puparia)
Teichomyza fusca (puparia)
Diptera spp. (puparia)

Hymenoptera:

Lasius sp.
Myrmica sp.
Formicidae spp.
Parasitica sp.

Arachnida

Acarina sp.

In addition to the Arthropoda there were a few fragmentary **Mollusca**, identified by Dr T. P. O'Connor as follows:

Cochlicopa lubrica Müller
?Pyramidellidae sp.
?Clausilia bidentata Strøm
cf Cepea sp.

APPENDIX

Records listed in Sample Number order

NOTE: Species are not listed in taxonomic order under sample heads in order to save time in compilation. 'pup' = puparium or puparia.

Six Dials site

SARC 24

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
	F2133	342	Gyrohypnus fracticornis	1
			Anobium punctatum	1
			Diptera sp. pupa	1
			Aglenus brunneus	1
			Cercyon ?haemorrhoidalis	1
			Hymenoptera sp.	1
			Stenus sp.	1
			?Gauropterus fulgidus	1

Westgate site

SOU 25

Under heading TRENCH notation P is PIT, L is LIME FURNACE.

TRENCH	CONTEXT	SAMPLE	ARTHROPODA	TOTAL
L1328	1101	44	Diplopoda sp.	Several
P1124	1126	63	Diplopoda sp.	Several
P1335	1157	79	Diptera sp. pup	1
P1335	1160	81	Diplopoda sp.	2
			Diptera sp. pup	2
P1010	1165	83	Diptera sp. pup	Several
			Diplopoda sp.	Several
P1161 /1162	1168	87	Diplopoda sp.	Many
P1335	1175	90	Diplopoda sp.	1
P1335	1177	93	Diplopoda sp.	1
P1181	1180	95	Diplopoda sp.	3
			Diptera sp. pup	Many
P1130	1120	99	Diplopoda sp.	2
			Diptera sp. pupae	1
			Diptera sp. pup (globular)	1
P1189	1190	101	Diplopoda sp.	Several
P1189	1192	102	Diplopoda sp.	Several
P1189	1193	103	Diplopoda sp.	Several
P1189	1194	104	Diplopoda sp.	2
P1206	1211	108	Diptera sp. pup	Many
			Diplopoda sp.	Several
P1220	1222	116	Diptera sp. pup	Several
P1236	1238	118	Oniscoidea sp.	1
			Diplopoda sp.	1
			Diptera sp. pup	1
P1236	1246	123	Diptera sp. pupae	1
			Diptera sp. pup	1
P1236	1246	126	Diptera sp. pup(a)	1
			Diptera sp. pup(b)	1
P1260	1249	129	Diptera sp. pup	3
			Diplopoda sp.	Many
L1328	1254	134	Diptera sp. pup	1
			Diplopoda sp.	1
P1239	1234	136	Diplopoda sp.	Several
P1260	1259	137	Diplopoda sp.	Several
-	1258	141	Oniscoidea sp.	1
P1236	1238	143	Diptera sp. pup	Several
P1239	1258	144	No insects	0
P1239	1258	145	Diptera sp. pup	2
			Diplopoda sp.	2
L1328	1267	149	Acarina sp.	1
			Diplopoda sp.	1
			Diptera sp. pup	1
L1328	1272	153	Diplopoda sp.	2
			Diptera sp. pup	1
L1328	1273A	154	Diptera sp. pup	3
L1328	1281A	159	Diptera sp. pup	Several
			Diplopoda sp.	Many
L1328	1281B	159	Diplopoda sp.	Several
			Diptera sp. pup	2

L1328	1281C	159	Diplopoda sp.	1
			Diptera sp. pup	Abundant
L1328	1286A	163	Diplopoda sp.	Abundant
			Diptera sp. pup	Abundant
L1328	1286B	163	Diplopoda sp.	Abundant
			Diptera sp. pup	Abundant
L1328	1287	168	Diplopoda sp.	Abundant
			Diptera sp. pup	Abundant
L1328	1290A	170	Diplopoda sp.	Abundant
			Diptera sp. pup	Abundant
P1260	1291	172	Oligochaeta sp. MODERN	1
P1260	1292	179	Diplopoda sp.	1
P1297	1298	204	Diplopoda sp.	1
P1297	1299	209	Diplopoda sp.	2
P1297	1300	211	Diplopoda sp.	3
			Trechus micros	1
P1260	1305	217	Diplopoda sp.	1
			Diptera sp. pup	1
P2096	2121	244	Unidentifiable scrap of cuticle	0
P2192	2193	247	Diptera sp. pup	1
			Diplopoda sp.	2
P1318	1319	291	Diplopoda sp.	2
P2192	2197	300	Diplopoda sp.	2

Six Dials site

SOU 26

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
	F1018	215	Diplopoda sp.	Several
			Oniscoidea sp.	Several

Maddison Street site

SOU 29

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
	2	1	?Elaterid or tipulid larva	1
	1	5	?Elaterid or tipulid larva	1

Six Dials site

SOU 30

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
	F2016	264	Amara sp.	1
	F1008	283	Diplopoda sp.	1
	F1009	305	Porcellio sp.	1
			Armadillidium sp.	1
	F2016	344	Nebria brevicollis	2
			Pterostichus melanarius	1
			Trechus micros	1
			Harpalus sp.	1
			Catops or Choleva sp.	3
			Diptera sp. pupae	7
			Lasius sp.	1
			Amara aenea	1
			Otiorhynchus sulcatus	1
			Hypera sp.	1
			Notiophilus aquaticus or aestuans	1
			Clivina collaris	1
			Athous haemorrhoidalis	2
			Aphodius constans	1
			Bembidion sp.	1
			Cleononinae sp.	1
			Diplopoda sp.	1
			Curculionidae sp.	1
			Earthworm egg capsule	1
			Pterostichus sp.	1
			Trox scaber	1
			Harpalus rufipes	1
	F2016	358	Diptera pupa	5
			Forficula auricularia	1
			Nebria brevicollis	2
			Pterostichus melanarius	2
			Bembidion sp.	1
			Staphylinus olens	1
			Aphodius granarius	1
			Otiorhynchus ligneus	1
			Ceuthorhynchinae sp.	2
			Melolontha sp.	1
			?Formicicidae sp.	1
			Staphilininae sp.	1
			Elateridae sp.(a)	1
			Elateridae sp.(b)	1
			?Bruchus sp.	1
			?Sitona sp.	1
			Lepidoptera sp. pupa	1
			Ptilinus pectinicornis	1
			Staphilinus sp.	1
			Carabidae sp. small	1
			Carabidae sp. brassy	1
			Megasternum obscurum	1
			Lathridius minutus group	1
			Notiophilus sp.	1
			Amara sp.	1
			Catops sp.	1
			Carabidae sp.	1
			Harpalus rufipes	1

		Auchenorhyncha sp.	1
F2016	359	Pterostichus melanarius	3
		Pterostichus minor	1
		Nebria brevicollis	1
		Megasternum obscurum	1
		Amara sp.	2
		Calathus sp.	1
		Diptera sp. pupa	1
		Myrmica sp.	1
		Harpalus rufipes	1
		Elateridae sp.	1
		Rhinoncus sp.	1
		Onthophagus sp.	2
		Harpalus sp. small	1
		Staphilininae sp.	1
		Stenus sp.	1
		Curculionidae sp.	1
		Cercyon sp.	1
		Cidnorhinus quadrimaculatus	1
		Phyllotreta sp.(black)	1
F2014	364	Megasternum obscurum	1
		Platystethus cornutus gp.	1
		Aleocharinae sp.	1
		Diptera pupa	1
F2014	365	Amara sp.	1
		Pterostichus melanarius	1
		Cercyon sp.	1
		Staphilinus olens	1
		Sitona sp.	1
		Aphodius ater	1
F2014	366	Diptera	2
		Hemiptera sp.	2
		Apion sp.	1
		Helophorus nubilus	1
		Chaetocnema concinna	1
		Bembidion properens	1
		Pterostichus cupreus	1
		Pterostichus melanarius	1
		Tachinus laticollis	1
F1010	334	Diplopoda sp.	1
		Porcellio sp.	1
F2016	357	Diptera sp. pup	1

U.B.S II site

SOU 123

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
	A	296a	Trechus micros	1
			Tipnus unicolor	1
			Philonthus sp.	3
			Megasternum obscurum	1
			Curculionidae sp.	1
			Diptera sp. pup	1
			?Lepidoptera pupa	1
			Enicmus sp. MODERN	1
	A	296b	Coccinella septempunctata ?MODERN	1
			Hister merdarius	6
			Hister sp. s.lat larvae	1
	A	296c	Hister merdarius	5
			Hister sp. s.lat larvae	1
			Philonthus sp.	1
	A	296e	Hister merdarius	5
			Hister sp. s.lat larvae	2
	A	296f	Hister merdarius	7
			Hister sp. s.lat larvae	9
			Diptera sp. pup	1
			Aranae sp.	1
			Curculionidae sp.	1
	A	296g	Teichomyza fusca pup	5
			Diptera	3
			Tipnus unicolor	2
			Chaetocnema concinna	1
			Megasternum obscurum	1
			Cercyon ?unipunctatus	5
			Staphylinidae sp.	7
			Philonthus sp. A	2
			Philonthus sp. B	4
	A	297a	Anotylus nitidulus	1
			Tipnus unicolor	2
			Hister sp.	1
			Teichomyza fusca pup	3
			Porcellio sp.	1

Six Dials site, Phase Two

SOU 169

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
2	8464	3	Oligochaeta sp. egg capsules	1
2	8530	9	Ceutorhynchus sp. black	1
			Diptera sp. pup	1
			?Niptus hololeucus	1
2	8555	23	No identifiable arthropods	
2	8545	24	No identifiable arthropods	
2	8588	36	Unidentifiable cuticle	
2	8591	37	Oniscoidea sp.	Several
			Diptera sp. pup	Many
2	8652	48	Diplopoda sp.	1
2	8672	53	Oligochaeta sp. egg capsule	1
			Ptinus sp.	1
1	8627	61	Diplopoda sp.	1
2	8631	70	Diplopoda sp.	1
2	8735	94	No identifiable remains	
1	8767	98	Porcellio scaber	1
			Isopoda sp.	2
			Tachypodoiulus niger	1
			Juliformia sp.	1
2	8841	113	Oniscoidea sp.	1
2	8843	115	No identifiable remains	
2	5146	116	Diplopoda sp.	1
			Diptera sp. pup	1
2	9706	124	No identifiable remains	
2	9702	125	Diplopoda sp.	Several
2	9706	127	cf Cepea sp. fragments	2
			?Clausilia bidentata apex	1
1	8854	135	Diptera sp. pupae	1
1	8611	139	Indeterminate cuticle	1
2	9732	140	Diplopoda sp.	Several
2	9729	141	Diplopoda sp.	Several
2	9730	142	No identifiable remains	
2	9743	157	Diptera sp. pup	Abundant
			Oniscoidea sp.	Several
2	9745	158	Diptera sp. pupae	1
			Diplopoda sp.	1
			Oniscoidea sp.	1
1	8860	164	No insects	
1	8880	166	Diplopoda sp.	2
			Oniscoidea sp.	1
1	8898	177	Juliformia sp.	1
1	8786	178	Oniscus asellus	1
			Juliformia sp.	1
			Polydesmus sp.	3
1	8900	180	Diptera sp. pup	2
			Isopoda sp. indet	1
1	9858	183	Oniscus asellus	2
			Porcellio laevis	2
			Porcellio scaber	2
			Armadillidium vulgare	1
			Cylindroiulus caeruleocinctus	3
			Juliformia sp.	3
			Polydesmus angustus	1
1	8637	185	Juliformia sp.	1

			Tachypodoiulus niger	1
1	9861	186	Oniscus asellus	4
1	9852	190	Diptera sp. pupae	1
1	9864	191	Juliformia sp.	1
1	9863	192	Juliformia sp.	23
			Tachypodoiulus niger	1
			Porcellio scaber	1
			Porcellio laevis	1
			Oniscus asellus	1
1	9878	196	Polydesmus angustus	3
			Juliformia sp.	2
			Metoponorthus sp	3
			Oniscus asellus	5
			Isopoda sp.	3
			Diptera sp. pup	1
1	9854	197	Tachypodoiulus niger	1
2	9755	211	Diptera sp. larvae	1
2	9935	212	Diplopoda sp.	1
1	9851	235	Juliformia sp.	5
			Polydesmus angustus	1
			Isopoda sp.	2
1	10001	239	Cylindroiulus caeruleocinctus	4
			Tachypodoiulus niger	2
			Isopoda sp.	3
			Diptera sp. pup	1
1	10008	248	Polydesmus angustus	1
			Tachypodoiulus niger	2
1	10014	261	Diplopoda sp.	Abundant
1	10029	281	No identifiable remains	
2	10075	306	No identifiable remains	
1	10104	309	No identifiable remains	
1	10105	310	Oniscoidea sp.	1
			Diplopoda sp.	1
	10015	317	Diplopoda sp.	Several
1	10108	318	Cylindroiulus caeruleocinctus	4
			Tachypodoiulus niger	2
			Porcellio scaber	2
			Armadillidium vulgare	5
			Indeterminate insect cuticle	1
1	10109	319	Diptera sp. pup	Several
			Diplopoda sp.	Several
1	10110	320	Diplopoda sp.	Several
			Oniscoidea sp.	2
			Diptera sp. pup	Several
1	8869	331	Oniscoidea sp.	1
			Diplopoda sp.	2
1	8869	333	Diplopoda sp.	3
1	10101	347	Diptera sp. pup	2
			Diplopoda sp.	1
1	10242	353	Tachypodoiulus niger	1
2	8457	363	No arthropod remains	
1	10304	365	Tachypodoiulus niger	1
1	10313	372	Tachypodoiulus niger	1
			Juliformia sp.	1
			Isopoda sp.	1
1	10317	374	Diptera sp. pup	1
1	10309	376	?Diptera sp. larvae	Abundant
1	10318	379	Diplopoda sp.	1
1	10329	381	Oniscoidea sp.	1
			Diplopoda sp.	1

			Diptera sp. pup	1
1	10347	394	Diptera sp. pup	Many
			Oniscoidea sp.	1
			Diplopoda sp.	1
1	10341	395	No identifiable remains	
2	10517	415	Diplopoda sp.	1
2	10522	419	Diptera sp. pup	1
			Diplopoda sp.	1
1	10481	425	No arthropod remains	
1	10482	426	Tachypodoiulus niger	1
1	10315	429	Tachypodoiulus niger	1
			Juliformia sp.	1
2	10551	430	Diptera sp. pup	1
			Diplopoda sp.	1
1	10479	435	Diptera sp. pup	5
			Polydesmus angustus	3
			Juliformia sp.	5
			Porcellio scaber	1
			Armadillidium vulgare	1
1	10488	448	Tachypodoiulus niger	1
			Cylindroiulus caeruleocinctus	1
			Juliformia sp.	1
			Armadillidium vulgare	2
1	10594	457	Cylindroiulus ?londinensis	1
1	10491	460	No identifiable remains	
2	10586	461	Diptera sp. pupae	1
			Insect ?larval moulds/casts	2
2	10587	462	Diptera sp. pupae	1
			Diptera sp. pup	1
			Oniscoidea sp.	1
1	10490	464	Armadillidium vulgare	1
			Oniscus asellus	1
			Porcellio scaber	4
			?Halophiloscia couchi	3
			Cylindroiulus caeruleocinctus	3
			Polydesmus angustus (small)	2
			Diptera sp. pup	5
2	10485	467	Oniscoidea sp.	1
1	10761	472	Oniscoidea sp.	1
			Diplopoda sp.	1
1	10764	473	Diptera sp. pup	6
			Porcellio scaber	1
			Lasius sp.	1
			Juliformia sp.	1
			Philonthus sp.	1
1	10766	474	Diptera sp. pup	1
			Diplopoda sp.	1
1	10760	477	Ptinus fur	1
1	10771	481	?Diptera pupa	1
1	10781	489	?Diptera pupa	1
1	10783	495	Isopoda sp.	1
1	10314	499	Tachypodoiulus niger	1
			Juliformia sp.	2
			Diptera sp. pup	10
			Armadillium vulgare	2
			Isopoda sp.	1
1	10796	501	Diptera sp. pup	1
			Oniscus asellus	4
			Porcellio scaber	3
			Armadillium vulgare	3

			Tachypodoiulus niger	2
			Cylindroiulus caeroleocinctus	2
			Juliformia sp.	2
			Polydesmus angustus	2
2	10264	524	Diplopoda sp.	1
			Cochlicopa lubrica (apex)	1
			?Pyramidellidae sp.	2
			Mollusca eggs	Several
2	11140	526	Diplopoda sp.	1
1	11047	537	Diplopoda sp.	1
			Isopoda sp.	1
			Diptera sp. pup	1
1	11048	538	Diplopoda sp.	3
			?Porcellio sp.	1
			?Armadillium sp.	1
1	11019	552	No arthropod remains	
1	11204	556	Diptera sp. pup	16
			Diplopoda sp.	2
			Armadillium vulgare	5
			Porcellio scaber	4
			Isopoda sp.	2
1	11214	568	Armadillidium vulgare	3
			Diptera sp. pup	4
			Teichomyza fusca pup	6
			Diplopoda sp.	1
			Polydesmus sp.	1
1	11215	569	Armadillidium vulgare	7
			Oniscus asellus	4
			?Porcellio laevis or dilatatus	1
			Diplopoda sp.	3
			Diptera sp. pup	20
2	11302	573	Diptera sp. pup	1
			Diplopoda sp.	2
			Oniscoidea sp.	2
			Diptera sp. pupae	1
2	11301	575	Diptera sp. pupae	Abundant
			Aleocharinae sp.	1
			Coleoptera sp.	1
			Oniscoidea sp.	Abundant
			Diptera sp. pup	1
			Hymenoptera Parasitica	1
			?Ptinidae sp.	1
1	11401	596	No identifiable remains	
1	11404	598	Armadillidium vulgare	6
			?Oniscus asellus	1
			Porcellio scaber	2
			Diplopoda sp.	4
1	11408	600	Diplopoda sp.	1
1	11405	601	Acarina sp. ?MODERN	1
1	11415	602	Diplopoda sp.	5
			Oniscus asellus	2
			Diptera sp. pup	1
1	11416	603	Diplopoda sp.	1
1	11414	605	Diplopoda sp.	1
1	11422	609	Armadillidium vulgare	12
			Diplopoda sp.	8
			Diptera sp. pup	1
2	11511	611	?Insect internal mould	1
1	11427	613	Oniscus asellus	4
			Armadillidium vulgare	4

			Isopoda sp.	1
			Diplopoda sp.	2
			Diptera sp. pup	1
1	11433	620	No identifiable arthropods	
1	11602	637	Oniscoidea sp.	2
			Diplopoda sp.	2
1	11615	643	Diplopoda sp.	1
1	11618	649	Armadillidium vulgare	3
			Porcellio scaber	3
			Diplopoda sp.	2
			Polydesmidae sp.	2
1	11619	650	Diplopoda sp.	2
			Polydesmidae sp.	1
			Porcellio scaber	1
			Porcellio ?laevis	2
			Armadillidium vulgare	1
1	11620	651	Oniscus asellus	1
			Porcellio scaber	2
			?Porcellio laevis	1
			Polydesmidae sp.	2
			Diplopoda sp.	2
1	11623	655	Polydesmus sp.	2
			Armadillidium vulgare	1
			Porcellio scaber	2
1	11624	663	Diplopoda sp.	1
2	11598	664	Diptera sp. pup	19
			Diplopoda sp.	4
			Porcellio scaber	2
1	11636	671	Indeterminate egg	1
1	11640	675	Diplopoda sp.	5
1	11641	676	No identifiable arthropods	
1	11642	677	Diplopoda sp.	4
			Armadillidium vulgare	4
			Oniscus asellus	7
			Porcellio scaber	5
			Diptera sp. pup	1
1	11021	678	Diplopoda sp.	2
			?Oniscoidea sp.	1
			Diptera sp. pup	1
1	11645	679	Diptera sp. larvae	1
			Diplopoda sp.	2
1	11755	685	Diplopoda sp.	1
2	11598	686	Diplopoda sp.	2
			Oniscoidea sp.	2
			Insect larval casts	2
1	11650	691	Diplopoda sp.	1
1	11622	700	Armadillidium vulgare	1
			Porcellio scaber	1
2	?11571	710	Diplopoda sp.	2
1	8760	723	Porcellio scaber	1
1	8787	724	Diplopoda sp.	2
			Polydesmidae sp.	2
			Diptera sp. pup	3
			Oniscus asellus	1
			Metoponorthus pruinosus	1
			Armadillidium vulgare	3
1	11800	751	Armadillidium vulgare	43
			Oniscus asellus	4
			Porcellio scaber	4
			Metoponorthus pruinosus	1

			Milipede	1
			Polydesmidae sp.	1
			Diptera sp. pup	3
1	11864	783	No identifiable arthropods	
1	11869	790	Unidentifiable scrap of MODERN cuticle	1
1	12113	819	Aphodius sp. MODERN	1
2	12129	820	Oniscoidea sp.	1
1	10036	823	No identifiable arthropods	
1	12117	831	Diptera sp. pup	1
			Diplopoda sp.	1
			Armadillidium vulgare	1
			Isopoda sp.	1
1	10319	832	Armadillidium vulgare	131
			Oniscus asellus	288
			Porcellio scaber	89
			Diptera sp. pup	114
			Polydesmus angustus	15
			Tachypodoiulus niger	4
			Brachyiulus pusillus	4
			Cylindioiulus londinensis	1
			Cylindioiulus caeruleocinctus	15
			?Coleoptera sp.	1
			?Trachelipus ratzeburgi	1
			Porcellio laevis	4
			Porcellio dilatatus	5
			?Trachelipus rathkei	6
			Metopornorthus pruinosus	4
			Carcinus sp.	1
			Amphipoda sp.	1
1	12122	838	Diptera sp. pup	2
			Oniscus asellus	2
			Isopoda sp.	2
			Juliformia sp.	1
1	12123	839	Diptera sp. pupae	8
1	11441	844	No identifiable arthropods	
1	12146	846	Diptera sp. pupae	1
1	12156	859	Armadillidium vulgare	2
1	12167	868	Porcellio scaber	1
			Megasternum obscurum	1
1	12164	871	Diplopoda sp.	1
1	12186	882	Cylindroiulis caeruleocinctus	3
			Polydesmus angustus	2
			Porcellio scaber	2
			Tipulidae sp.	1
1	12187	886	Diptera sp. pup	6
			Juliformia sp.	1
			Isopoda sp.	1
1	12199	909	Diplopoda sp.	1
1	12198	914	Juliformia sp.	1
			?Tachypodoiulus niger	1
			Diptera sp. pup	2
			Isopoda sp.	1
1	12164	915	Porcellio scaber	1
			Isopoda sp.	1
			Juliformia sp.	1
1	12259	916	Diptera sp. pupa	1
1	12253	923	Diplopoda sp.	1
1	12283	950	Oniscus asellus	6
			Armadillidium vulgare	1

			Metoponorthus pruinosus	1
			Porcellio scaber	1
			Porcellio laevis	1
			Juliformia sp.	1
1	12292	961	Collembola sp. MODERN	4
1	12284	963	Diptera sp. pup	16
			Diplopoda sp.	3
			Armadillidium vulgare	1
			Isopoda sp.	1
1	12293	964	Diplopoda sp.	1
			Isopoda sp.	3
1	12294	965	Diptera sp. pupae	3
1	12285	972	Diptera sp. pup	15
			Diplopoda sp.	1
			Armadillidium vulgare	1
1	12297	973	Diptera sp. pup	4
			Diplopoda sp.	3
			Armadillidium vulgare	2
3	12397	976	Diptera sp. pup	22
			Oniscus asellus	3
			Diplopoda sp.	1
3	12451	977	Diptera sp. pup	60
			Diplopoda sp.	1
			Oniscus asellus	2
			Porcellio ?dilatatus	2
1	12300	980	Diplopoda sp.	2
1	12428	982	Diplopoda sp.	2
1	12498	995	Diptera sp. pup	43
			Diplopoda sp.	2
			Oniscus asellus	3
			Porcellio scaber	1
3	12483	999	No identifiable arthropods	
3	12515	1001	Diplopoda sp.	4
			Polydesmidae sp.	1
			Diptera sp. pup	1
			Oniscus asellus	1
			Porcellio laevis	1
			Porcellio sp.	1
3	12536	1002	Diptera sp. pup	3
			Diplopoda sp.	1
			Porcellio scaber	1
3	12543	1004	Diptera sp. pup	15
			?Fannia sp. pup	1
			Diplopoda sp.	3
			Polydesmidae sp.	1
			Porcellio scaber	1
			Porcellio laevis	1
			?Tipnus unicolor	1
3	12398	1006	Diptera sp. pupa	1
3	12564	1013	No identifiable arthropods	
3	12587	1014	Tipulidae sp.	4
			Diptera sp. pup	1
			Armadillidium vulgare	3
			Diplopoda sp.	1
3	12843	1016	Armadillidium vulgare	37
			Porcellio scaber	6
			Porcellio laevis	5
			Diplopoda sp.	1
			Tipulidae sp.	2
			Phyllotreta undulata	1

3	13010	1024	Diplopoda sp.	1
3	13070	1028	Amara sp.	1
			Diptera sp. pup	1
1	12876	1029	Aleocharinae sp. MODERN	1
3	13078	1030	Diplopoda sp.	4
			Diptera sp. pup	7
			Porcellio scaber	1
3	13080	1031	Diptera sp. pup	78
			Armadillidium vulgare	2
			Oniscus asellus	7
			Porcellio scaber	4
			Porcellio laevis	3
			?Trachylipus rathkei	1
			Diplopoda sp.	6
3	13099	1033	Armadillidium vulgare	14
			Oniscus asellus	4
			Polydesmidae sp.	1
			Diplopoda sp.	6
			Diptera sp. pup	3
3	13101	1034	Diptera sp. pupa	2
3	13102	1036	Armadillidium vulgare	1
			Diplopoda sp.	1
3	13030	1039	Diplopoda sp.	4
			Armadillidium vulgare	2
			Porcellio scaber	1
			Porcellio laevis	2
3	13108	1044	No identifiable arthropods	
3	13164	1048	Diplopoda sp.	2
			Diptera sp. pup	3
3	13163	1049	Diptera sp. pupa	15
3	13165	1050	Collembola sp. MODERN	present
3	13173	1053	Bembidion sp.	1
			Nebria brevicollis	1
			Diptera sp. pup	2
3	13174	1054	Teichomyza fusca pup	52
1	13210	1058	Cercyon sp.	1
			Diplopoda sp.	2
3	13108	1104	Diptera sp. pupa	1
3	12396	1107	Diptera sp. pup	4
			Diplopoda sp.	2
			Polydesmidae sp.	1
			Porcellio scaber	2
			Armadillidium vulgare	2
			Diptera sp. pupa	10
3	12396	1112	Diptera sp. pup	34
			Oniscus asellus	1
			Diplopoda sp.	1
1	8635	1116	Armadillidium vulgare	11
			Porcellio scaber	1
			Polydesmidae sp.	1
			Diplopoda sp.	2
3	13012	1117	Diptera sp. pup	4
			Diplopoda sp.	1
			?Metoponorthus pruinosus	4
			Porcellio scaber	1
			Armadillidium vulgare	1
3	12364	1119	Diplopoda sp.	1
3	12947	1120	Diptera sp. pup	16
			Armadillidium vulgare	2
			Porcellio scaber	1

			Diplopoda sp.	2
			?Hister sp.	3
3	12399	1123	Porcellio scaber	2
			Oniscus asellus	2
			Armadillidium vulgare	2
			Polydesmidae sp.	1
			Diplopoda sp.	1
			Diptera sp. pup	5
3	12520	1126	Diplopoda sp.	2
			Isopoda sp.	2
			Porcellio sp.	1
			Oniscus asellus	1

Downer Baker site

SOU 177

TRENCH	CONTEXT	SAMPLE	RECORDS OF ARTHROPODS	TOTAL
2	307	185	Oniscoidea sp.	1
			Diplopoda sp.	1
			Diptera sp. pup	1