3927

The Environmental Indications of the Insect Faunas from Roman and Saxon Odell, Bedfordshire

Maureen A Girling

At Odell, Bedfordshire, permanent waterlogging over part of the archaeological site has led to the survival of a range of biological remains. The excavator, Mr B Dix, submitted organic silt and mud samples from a range of contexts to the Ancient Monuments Laboratory for analysis of plant and insect assemblages. Good preservation of organic remains was recorded from the Roman layers, although quality of survival decreased upwards, the higher samples being more prone to drying. Material from three Roman contexts dating from mid-1st to early 3rd century were studied. Preservation was markedly poorer in the Saxon layers from which two samples from a 7th century context were assessed.

Sample Processing

Insect remains were extracted from the silts by means of the paraffin flotation method described by Coope and Osborne (1967). The samples were disaggregated in warm running water, washed on to a 300 micron sieve, then mixed with paraffin. The addition of cold water produced a flotant from which insect remains were sorted. The flotant and residues were submitted to Miss P Paradine for extraction of plant macrofossils.

Over 3,400 beetles were identified from the deposits, and this was equalled by the total of other insects. A preliminary study was also made by Mr N Straw* of the bug remains present in the samples. These insect faunas are listed in Table I, in which nomenclature follows Kloet and Hincks (1977). The environmental assessment of the faunas is based upon all named species occurring in

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
INSECTA										
ODONATA										
AGRIIDAE										
Agrion splendens or virgo	-	-	-	-	1	-	-	-	-	1
DERMAPTERA										
Forficula auricularia	1	1	2	14	3	46	-	-	1	68
HEMIPTERA										
HETEROPTERA										
PENTATOMIDAE	-	-	-	-	1	-	-	-	-	1
LYGAEIDAE	-	1	1	5	7	-	-	2	-	16
SALDIDAE	-	-	?	-	-	-	-	-	-	?
CORIXIDAE	-	-	-	3	2	-	-	-	-	5
HOMOPTERA										
CICADELLIDAE										
Megophthalmus sp.	-	-	5	3	2	-	-	-	-	10
Idiocerus ? terricti	-	-	-	-	?	-	-	-	-	?
Aphrodes bicinctus (Schrank)	-	1	-	14	15	-	1	2	4	37
A. flavostriatus (Donovan)	-	11	10	4	22	-	-	-	-	47

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
A. histrionicus (F.)	-	-	?1	4	10	-	-	-	-	14
Macrosteles spp.	-	-	-	-	1	-	-	-	-	1
DELPHACIDAE	-	2	41	2	1	-	-	-	-	46
ASPHIDIDAE	-	-	7	-	-	-	-	-	-	7
TRICHOPTERA	-	-	2	3	1	-	-	-	-	6
DIPTERA										
MYCETOPHILIDAE										
Sciara sp.	-	-	-	-	-	3250	-	-	-	3250
	1	10	75	23	1	2	12	3	2	129
Indet. Diptera	1	24	164	29	7	11	148	13	40	437
SIPHONAPTERA										
PULICIDAE										
Ctenocephalides sp.	-	-	-	-	1	-	-	-	-	1
HYMENOPTERA										
APOCRITA PARASITICA										
BRACHONIDAE	-	6	-	21	-	-	12	-	2	41
Other Parasitica	3	9	24	110	9	-	33	-	9	197

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
FORMICOIDEA	1	6	18	25	1	-	59	-	1	111
COLEOPTERA										
CARABIDAE										
Carabus monilis F.	-	-	-	-	1	-	-	-	-	1
C. nemoralis Muell.	-	-	-	-	1	-	1	-	-	2
Nebria brevicollis (F.)	-	-	1	3	1	-	5	-	-	10
Notiophilus biguttatus (F.)	-	-	1	-	1	-	-	-	-	2
Notiophilus sp.	-	-	-	-	-	-	1	-	-	1
Loricera pilicornis (F.)	-	-	1	1	1	-	-	-	-	3
Dyschirius globosus (Herbst)	-	1	2	-	-	-	1	-	-	5
Clivina collaris (Herbst)	-	-	-	1	1	-	-	1	2	5
C. fossor (L.)	1	1	1	3	-	1	-	-	-	7
Trechus obtusus Er. or quadristriatus (Schrank)	-	4	3	72	19	-	8	1	8	115
Asaphidion flavipes (L.)	-	-	-	-	1	-	-	-	-	1
Bembidion lampros (Herbst)	-	-	2	-	2	-	2	-	-	6
B. properans Steph.	-	-	1	-	1	-	-	1	1	4
B. (Peryphus)sp.	-	-	-	-	-	-	1	-	-	1
B. clarki Daws	-	4	-	-	-	-	-	-	-	4

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
B. genei Kust. ssp. illigeri Net.	-	-	-	-	1	-	-	-	-	1
B. doris (Panz.)	-	-	1	-	-	-	-	-	-	1
B. obtusum Serv.	-	-	-	-	2	-	-	-	-	2
B. biguttatum (F.)	-	-	2	-	5	-	7	-	-	14
B. guttula (F.)	-	-	2	-	7	-	1	-	-	10
B. lunulatum (Fourc.)	-	2	2	-	3	-	2	-	-	9
B. unicolor Chaud.	-	-	1	-	-	-	-	-	-	1
Bembidion spp.	-	-	-	2	-	-	-	-	-	2
Pterostichus anthracinus (Panz.)	-	-	1	-	-	-	-	-	-	1
P. cupreus (L.)	-	-	2	3	1	-	9	-	-	15
P. diligens (Sturm)	-	-	-	-	-	-	1	-	-	1
P. gracilis (Dej.)	-	-	1	-	-	-	-	-	-	1
P. kugelanni (Panz.)	-	-	1	-	-	-	-	-	-	1
P. melanarius (Ill.)	-	-	1	8	1	-	16	-	1	27
P. minor (Gyll.)	-	1	-	3	-	-	1	-	-	5
P. nigrita (Payk.)	-	-	-	1	1	-	-	-	-	2
P. strenuus (Panz.)	-	-	-	-	-	-	1	-	-	1
P. vernalis (Panz.)	-	-	-	1	1	-	1	-	-	3
P. versicolor (Sturm)	-	-	-	10	-	-	-	-	-	10
P. (Poecilus) sp.	-	1	-	-	-	-	-	-	-	1

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
Calathus fuscipes (Goeze)	-	-	5	16	3	-	5	1	6	36
C. melanocephalus (L.)	-	-	-	4	-	-	-	1	-	5
Laemostenus complanatus (Dej.)	-	-	-	-	-	-	1	-	-	1
Agonum dorsale (Pont.)	-	1	7	-	-	-	3	1	1	13
A. fuliginosum (Panz.)	-	-	1	-	2	-	-	-	-	3
A. livens (Gyll.)	-	-	-	-	1	-	-	-	-	1
A. moestum (Dufts.)	-	-	-	-	1	-	-	-	-	1
A. muelleri (Herbst)	-	-	1	-	-	-	-	-	-	1
Agonum spp.	-	-	-	-	1	-	1	1	-	3
Amara spp.	1	3	9	7	14	-	8	1	1	44
Zabrus tenebriodes (Goeze)	-	-	-	-	-	-	4	-	-	4
Harpalis rufipes (Deg.)	-	-	-	2	1	-	1	-	1	5
H. affinis (Schrank)	-	-	-	-	-	-	1	-	-	1
Harpalus spp	-	-	-	-	-	-	2	-	-	2
Badister bipustulatus (F.)	-	2	2	-	-	-	1	-	-	5
Dromius linearis (C .)	-	-	-	-	4	-	7	-	-	11
Dromius sp.	-	-	-	-	1	-	-	-	-	1
Brachinus crepitans (L.)	-	-	-	-	-	-	1	-	-	1
DYTISCIDAE										
Hygrotus inaequalis (F.)	-	-	-	-	-	-	1	-	-	1
Hydroporus planus (F.)	-	-	4	-	-	-	-	-	-	4
Hydroporus sp.	-	-	-	-	4	1	1	-	-	6

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
Agabus bipustulatus (L.)	-	1	6	13	1	4	2	-	1	28
A. nebulosus (Forst.)	-	-	1	-	-	-	-	-	-	1
Agabus sp.	-	-	1	-	1	-	-	-	-	2
Rhantus sp.	-	-	1	-	-	-	-	-	-	1
Colymbetes fuscus (L.)	-	-	1	2	1	-	-	-	-	5
Dytiscus semisulcatus Muell.	-	-	-	-	-	-	4	-	-	4
Dytiscus sp. (?spp.)	-	-	1	-	1	-	-	-	-	2
GYRINIDAE										
Gyrinus sp.	-	-	1	-	-	-	-	-	-	1
HYDROPHILIDAE										
Helophorus aquaticus (L.)	-	2	23	4	2	-	-	-	-	31
H. brevipalpis Bed.	6	24	145	20	59	6	-	-	1	260
H. grandis Ill.	-	-	4	-	3	-	-	-	-	7
H. rufipes (Bosc)	-	-	-	-	3	-	-	-	2	5
Helophorus spp.	-	1	7	-	2	-	-	-	-	10
Coelostoma orbiculare (F.)	-	-	2	-	-	-	-	-	-	2
Sphaeridium lunatum F.	-	-	-	1	-	-	-	-	-	1
Cercyon haemorrhoidalis (F.)	-	-	6	-	-	-	-	-	-	6
Cercyon unipunctatus (L.)	-	-	-	-	1	-	-	-	-	1

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
Cercyon spp.	-	1	5	-	4	2	-	2	6	20
Megasternum obscurum (Marsh.)	1	17	11	60	12	6	27	3	1	138
Cryptopleurum minutum (Gyll.)	-	-	-	-	-	-	-	-	1	1
Hydrobius fuscipes (L.)	-	1	5	10	4	-	5	-	1	26
Anacaena limbata (F.)	-	-	3	-	-	-	-	-	-	3
Anacaena spp.	-	4	-	-	2	2	4	-	-	12
Enochrus spp.	-	-	3	-	-	-	-	-	-	3
Chaetarthria seminulum (Herbst)	-	-	1	-	-	-	-	-	-	1
HISTERIDAE										
Acritus nigricornis (Hoff.)	-	-	-	-	-	-	-	1	5	6
Saprinus sp.	-	-	-	-	6	-	-	-	-	6
Kissister minimus (Aube)	-	-	-	-	3	-	-	-	-	3
Hister spp.	-	1	1	-	2	-	2	-	-	4
Onthophilus striatus (Forst.)	1	2	4	26	1	-	2	-	2	38
HYDRAENIDAE										
Ochthebius bicolon Germ.	-	-	1	1	1	-	-	-	1	4
O. minimus (F.)	2	17	41	22	2	3	6	-	2	95
Hydraena testacea (urt.)	-	-	1	2	1	2	4	-	-	10
Hydraena sp.	-	-	-	-	-	-	1	-	-	1

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
Limnebius spp.	-	-	9	-	19	-	-	-	-	28
PTILIIDAE										
Gen. et sppe indet.	1	1	5	2	-	2	-	-	1	12
LEIODIDAE										
Catops or Choleva spp.	-	-	5	-	25	-	6	-	2	38
SILPHIDAE										
Silpha atrata L.	1	-	1	-	2	1	4	-	1	10
S. laevigata F.	-	1	-	-	-	-	-	-	-	1
S. obscura L.	-	-	-	-	-	-	3	-	-	3
S. tristis Ipp.	-	-	-	-	-	-	3	-	-	3
SCYDMAENIDAE										
Gen. et sp. indet.	-	1	-	-	-	-	-	-	-	1
STAPHYLINIDAE										
Micropeplus staphylinoides (Marsh.)	-	1	-	-	1	1	1	-	-	4
Metopsia retusa (Steph.)	-	-	-	-	-	1	1	-	-	2
Acidota cruentata Mann.	-	-	-	-	-	-	-	-	1	1

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
Lesteva longoetytra (Goeze)	-	16	19	201	82	10	30	-	-	358
L. heeri Fauv.	-	3	-	-	-	-	-	-	-	3
Lesteva sp.	-	-	-	5	-	-	-	-	-	5
Omalium sp.	-	-	-	2	3	-	-	-	-	5
Coprophilus striatulus (F.)	-	-	-	-	-	-	-	-	1	1
Carpelimus or Thinobius spp.	-	2	10	8	2	8	7	2	5	44
Platystethus arenarius (Fourc.)	-	-	1	2	-	-	1	1	4	9
P. cornutus (Grav.) or degener Muls. & Rey	-	3	3	-	-	-	-	1	7	14
P. nitens (Sahl.)	-	-	1	-	-	-	-	2	10	13
Playtystethus sp.	-	-	-	2	-	-	1	-	-	3
Anotylus complanatus (Er.)	-	-	-	-	2	-	-	-	-	2
A. insecatus (Grav.)	-	-	-	-	-	-	1	-	-	1
A. nitidulus (Grav.)	-	3	4	-	3	-	-	2	13	25
A. rugosus (F.)	-	9	8	17	9	2	8	-	4	57
A. sculpturatus (Grav.)	-	2	-	-	-	-	-	-	-	2
A. tetracarinatus (Block) group	-	-	1	-	-	-	-	-	-	1
Anotylus sp.	-	-	-	-	1	-	-	-	-	1
Oxytelus sp.	-	-	-	2	-	-	-	-	-	2
Stenus spp.	-	16	6	11	1	2	6	-	4	46
Paederus sp.	-	-	1	-	1	-	1	-	-	3

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
Lathrobium terminatum Grav.	-	-	-	-	-	-	1	-	-	1
Lathrobium sp.	-	-	1	-	3	-	-	-	1	5
Rugilus spp.	-	1	1	-	-	-	-	-	-	2
Leptacinus sp.	-	-	-	-	-	-	-	-	1	1
Xanth•linus linearis (Ol.)	-	3	3	26	2	-	10	1	3	48
X. longiventris Heer	-	-	-	8	-	-	1	-	-	9
X. linearis or longiventris	-	-	-	-	-	2	-	-	-	2
Philonthus spp.	1	6	6	32	1	-	12	2	3	63
Staphylinus sp.	-	-	-	-	-	-	2	-	-	2
Quedius spp.	-	1	1	5	1	-	4	-	1	13
Tachinus signatus Grav.	5	2	8	3	19	-	15	2	-	54
Tachinus spp	-	1	1	-	4	1	-	1	2	10
Tachyporinae indet.	2	28	24	30	2	1	11	-	7	105
Falagria caesa Er.	-	2	-	-	-	-	-	-	-	2
Falagria sp.	-	-	-	-	-	-	-	1	1	2
Drusilla canaliculata (F.)	-	1	-	-	-	-	8	-	-	9
Aleocharinae indet	-	28	23	67	1	7	21	1	8	156
TROGIDAE										
Trox scaber (L.)	-	-	-	-	2	-	-	-	1	3
GEOTRUPIDAE										
Geotrupes spp.	-	2	1	-	3	-	-	-	-	6

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
SCARABAEIDAE										
Colobopterus erraticus (L.)	-	-	-	-	1	-	-	-	1	2
C. subterraneus (L.)	-	-	-	-	3	-	1	1	2	7
Aphodius granarius (L.)	-	-	4	7	3	1	-	3	11	29
A. luridus (F.)	-	-	-	-	1	-	-	-	-	1
A. obliteratus Panz.	-	1	1	5	24	-	-	-	1	32
A. porcus (F.)	-	1	-	3	6	-	-	-	-	10
A. rufipes (L.)	-	-	1	3	1	-	-	-	-	5
A. rufus	-	-	-	-	-	-	4	-	-	4
A. sordidus (F.)	-	-	-	-	2	-	-	-	-	2
A. sphacelatus (Panz.)	-	-	-	-	-	-	-	-	2	2
Aphodius spp.	1	2	9	7	6	-	-	2	6	33
Oxyomus sylvestris (scop.)	-	2	1	9	-	-	3	4	22	41
Onthophagus nuchicornis (L.)	-	-	-	-	4	-	-	-	-	4
O. nutans (F.)	-	-	-	-	1	-	-	-	-	1
O. ovatus (L.)	1	4	2	-	4	-	1	-	-	12
Hoplia philanthus (Fuess.)	-	-	-	-	-	-	1	-	-	1
Phyllopertha horticola (L.)	-	-	1	-	1	-	1	-	-	3
SCIRTIDAE										
Gen. et spp. indet.	-	1	1	9	1	5	21	-	1	39

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
BYRRHIDAE										
Simplocaria semistriata (F.)	-	-	1	1	-	-	-	-	-	2
Cytilus sericeus (Forst.)	-	-	-	1	-	-	-	-	-	1
Byrrhus sp.	-	-	-	1	1	-	-	-	-	2
DRYOPIDAE										
Dryops sp.	-	-	3	2	-	-	-	-	-	5
ELATERIDAE										
Agrypnus murinus (L.)	-	1	1	-	7	-	2	-	2	13
Ampedus sp.	-	-	-	-	1	-	-	-	-	1
Hypnoidus riparius (F.)	-	-	1	-	1	-	1	-	-	3
Agriotes obscurus (L.)	-	2	1	-	1	-	9	1	-	14
CANTHARIDAE										
Cantharis livida L.	-	-	-	-	1	-	2	-	-	3
C. rufa L.	-	-	2	-	15	-	1	-	-	18
C. rustica Fall.	-	1	-	-	2	-	4	-	-	7
Cantharis sp.	-	-	-	2	2	-	-	-	-	4
Rhagonycha fulva (Scop.)	-	-	-	-	3	-	8	-	-	11

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
ANOBIIDAE										
Grynobius planus (F.)	-	-	-	-	1	-	-	-	1	2
Stegobium paniceum (L.)	-	-	-	6	1	-	-	-	-	7
Anobium punctatum (Deg.)	-	1	2	61	11	1	1	1	3	81
PTINIDAE										
Tipnus unicolor (Pill. & Mitt.)	-	-	-	5	1	-	-	-	-	6
MELYRIDAE										
Malachius sp.	-	-	-	-	1	-	-	-	-	1
NITIDULIDAE										
Cateretinae indet.	-	8	-	27	-	-	2	1	2	40
CRYPTOPHAGIDAE										
Cryptophagus spp.	-	1	-	-	5	-	-	2	8	16
Cryptophagidae indet.	-	-	-	-	2	-	-	-	-	2
PHALACRIDAE										
Phalacrus sp.	-	-	-	-	1	-	-	-	-	1
Olibrus sp.	-	-	-	-	1	-	-	-	-	1
Stilbus testaceus (Panz.)	-	-	-	-	1	3	-	-	-	4

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
CORYLOPHIDAE										
Corylophus cassidoides (Marsh.)	1	1	-	17	-	-	14	-	13	46
COCCINELLIDAE										
Coccidula rufa (Herbst)	-	-	-	-	1	-	1	1	-	3
Coccinella sp.	-	-	-	-	2	-	2	-	-	4
LATHRIDIIDAE										
Lathridius pseudominutus (Strand)	-	1	2	121	7	-	15	-	8	154
Enicmus transversus (Ol.)	1	2	-	-	-	-	7	-	1	11
Corticaria sp.	-	-	-	-	-	-	-	-	1	1
Corticarina fuscula (Gyll.)	-	1	-	-	-	-	1	-	-	2
Corticarina sp.	-	-	-	-	-	-	-	-	1	1
Cortinicaria gibbosa (Herbst)	-	-	-	4	-	-	-	-	-	4
TENEBRIONIDAE										
Opatrum sabulosum (L.)	-	1	-	-	3	-	-	-	-	4
Lagria hirta (L.)	-	1	-	2	-	-	-	-	-	3
PYROCHROIDAE										
Pyrochroa serreticornis (Scop.)	-	-	-	-	-	-	1	-	-	1

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
ANTHICIDAE										
Anthicus floralis (L.)	-	3	1	-	3	-	5	1	1	14
BRUCHIDAE										
Bruchus rufimanus Boh.	-	-	-	-	4	-	-	-	-	4
CHRYSOMELIDAE										
Macroplea sp.	-	-	-	-	3	-	2	-	-	5
Oulema sp.	-	-	-	-	1	-	1	-	-	2
Chrysolina polita (L.)	-	-	1	-	-	-	-	-	-	1
C.staphylaea (L.)	-	1	-	-	3	-	3	-	1	8
Chrysolina sp.	-	-	-	1	-	-	-	-	-	1
Gastrophysa viridula (Deg.)	-	-	1	-	1	-	1	1	-	4
Phyllotreta undulata Kuts.	-	1	-	1	-	-	1	-	2	5
P. vittata (F.)	-	-	-	-	-	-	-	-	1	1
Phyllotreta sp. (? spp.)	-	2	-	1	-	-	-	-	1	4
Longitarsus sp.	-	-	-	-	2	-	-	-	-	2
Chaetocnema concinna (Marsh.)	-	1	-	-	-	-	1	-	2	4
Psylliodes sp.	-	-	-	-	1	-	-	-	2	3
APIONIDAE										
Apion aeneum (F.)	-	-	-	4	-	-	1	2	15	22

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
A. craccae (L.)	-	1	-	-	-	-	-	-	1	2
Apion spp.	3	20	17	27	42	11	28	2	6	156
CURCULIONIDAE										
Otio hynchus ligneus (Ol.)	-	1	-	-	-	-	-	-	-	1
Polydrusus spp.	-	1	-	-	-	-	1	-	-	2
Barypithes sp.	1	-	-	-	-	-	17	-	-	18
Barynotus	-	-	-	-	-	-	5	-	-	5
Sitona lineellus (Bons.)	-	8	1	1	2	-	17	-	-	29
Sitona spp.	-	2	-	-	-	-	-	-	-	2
Cleonus piger (Scop.)	-	-	1	-	-	-	-	-	-	1
Hypera punctata (F.)	-	-	-	-	2	-	1	-	-	3
Hypera spp.	-	-	-	1	1	-	-	-	-	2
Tanysphyrus lemnae (Payk.)	2	3	9	4	2	1	6	-	-	28
Acalles ptinoides (Marsh.)	-	1	-	-	1	-	-	-	-	2
Notaris acridulus (L.)	-	-	1	-	-	-	-	-	-	1
Ceutorhynchus contractus (Marsh.)	-	1	-	2	-	-	-	-	1	4
Ceuthorhynchinae indet.	-	5	2	10	-	2	2	3	8	32
Mecinus pyraster (Herbst)	-	-	-	1	1	-	-	-	-	2
Gymnetron beccabunge (L.)	-	-	-	-	-	-	1	-	-	1
G. labile (Herbst)	-	1	-	1	-	1	2	-	-	5
Gymnetron sp.	-	2	-	-	-	-	-	-	-	2

	77/2	77/3	77/4	62/5	62/6	350 3	350 4	123 8	123 8b	Total
ARANAEA										
LYNIPHIIDAE	-	3	3	26	1	-	7	2	4	46
Indet. ARANAEA	-	2	6	36	-	-	29	-	1	74

each sample. To avoid repetition, the sources from which data on Coleoptera have been derived are listed here: Freude, Harde and Lohse (1964-81), Jeanell (1941-49), Joy (1932), Landin (1961), Lindroth (1974) and Reitter (1908-1916).

Environmental Implications of the Faunas

1. F77, layers 4, 3 and 2: mid-late 1st century well.

The deposits from the well produced rich insect faunas from the lower part of the feature, and remains in the basal layer, 4, were strikingly abundant. The most numerous species are those likely to have been inhabitants of the well and additionally less common species appear to have been derived from a wider area, allowing the suggested environmental reconstruction to extend to the surroundings. Carabidae, or ground beetles, by virtue of their often fastidious selection of habitat type, provide the major evidence for the surface conditions around the well. Several species of dry or moderately dry ground are present in low numbers and include Bembidion lampros, B.properans and Pterostichus kugelanni, the latter often typical of sandy heaths. Another species of open, dryish soils, Agonum muelleri, is frequently found on cultivated ground. Other Carabidae, however, prefer damper or wet substrates, perhaps available near or bordering the well. B.guttula and lunulatum both occur usually on thickly vegetated, wet soils or banks near water, a habitat also favoured by P.gracilis. P.anthracinus typically occurs on wet, shaded soils, often muds, near water. At Odell, both latter species are confined to the basal layer of the well. The suggestion from the ground beetle fauna of wet banks is abundantly reinforced by records of Hydrophilidae and Hydraenidae. The commonest beetle in the layer, Helophorus brevipalpis which totals 145 individuals, is known for its habit of swarming often away from its usual habitat. The species breeds in shallow, vegetated pond margins or wet, muddy edges, a pabulum shared by H.aquaticus and Ochthebius minimus, recorded

as 23 and 41 individuals respectively. Further species typical of weedy pools or pond edges include Anacaena limbata, Coelostoma orbiculare, Chaetarthria seminulum all recorded only from this sample, and H.grandis, Hydrobius fuscipes and Enochrus spp. Seven of the 10 taxa of true water beetles present at the site occur in the basal well layer, the highest number for any sample, and these include Hydroporus planus, Agabus nebulosus, Colymbetes fuscus and indeterminate fragments of Dytiscus sp; the great diving beetle. Gyrinus sp.: the surface dwelling whirligig beetle is also present. One further indication of standing water is the weevil, Tanysphyrus lemnae, whose host plant is duckweed.

A number of dung beetle species are present in the well silts, amongst them Aphodius granarius, A.obliteratus, A.rufipes, Oxyomus sylvestris and Onthophagus ovatus. Other species which frequently, but not exclusively, occur in dung include Cercyon haemorrhoidalis, Megasternum obscurum the three Platystethus species, Anotylus rugosus and A.nitidulus. The grass root-miner, Phyllopertha horticola is present, and the host plants of the phytophages include moss (Simplocaria semistriata) and thistles (Cleonus piger).

A similar environmental scene emerges from assessment of the layer 3 and 2 faunas, although numbers are decreased in 3, and low in 2. One new species record of note is Silpha laevigator a predator of snails and worms but generally beetles not present in layer 4 provide additional evidence of habitat types already indicated. For instance, Corylophus cassidoides is found at the muddy edges of ponds and Opatrum sabulosum is an inhabitant of sandy terrain. The leaf beetles Phyllotreta undulata and Chaetoenema concinna respectively live on a variety of Cruciferae and Polygonaceae. Weevils not recorded from the basal sample feature Acalles ptinoides, a feeder on ling or

saplings including oak, and Gymnetron labile amongst whose host plants are plaintain and dodder. There is a single record of the vetch feeder Apion craccae from layer 3.

The overall reconstruction of the layers is of a well set in an open landscape where grazing and possibly cultivation are carried out. The well itself appears to be more in the nature of a pond, or, if a conventional straighter sided structure, one whose approaches or nearby surrounds are saturated and subject to at least seasonal flooding. The evidence for standing water is most strongly gained from the lowest fauna, but higher, the poorer preservation precludes any prediction of whether its water supply continued.

ii. F62, layers 6 and 5: terminal 1st century to Late Hadrianic quarry pit.

Preservation in both layers sampled from this feature was good and they yielded rich assemblages of insect remains. The lower layer contained a number of species restricted to this sample, amongst them Carabus monilis, a large ground beetle often found on cultivated ground, and Bembidion obtusum, another open or cultivated land species. Most of the carabids in this sample are encountered near or at the edges of water. Asaphidion flavipes prefers unshaded soils, usually near running or standing water and B.genei ssp. illigeri is often found on wet, unvegetated mud. Agonum livens and A.moestum are both markedly hygrophilous or water-loving species. Further examples of species found near water include B.biguttalum, B.guttula and B.unicolor. The insect assemblage from layer 6 also includes the remains of Agrion sp., one of the damsel flies. Females lay their eggs in water plants and the larvae are aquatic. The presence of water is further implied by

records of five dytiscid species, and as with context 77, the pond margin faunal element is well represented. Species of Helophorus include rufipes, present only in this sample. This is one of two species known as turnip-mud beetles because the larvae have been known to burrow into the leaves and tubers of turnips. Wet vegetated banks would suit several staphylinids from the deposit, including the commonest species, Lesteva longoelytrata, 82 and 201 individuals of which were recoverd from the layers.

Surrounding the water-filled pit, evidence suggests a generally open landscape of grassland and low plants. There are records of the pea and bean pest Bruchus rufimanus and a number of weeds feature in the host plant lists of other phytophages, including clover, medick and restharrow (Hypera punctata and ribwort plantain (Mecinus pyraster). Dominating the assemblage, however, are the numbers of dung and other animal associated species. 11 of the 14 true dung beetles recorded from Odell are present in this layer. Notable species are Onthophagus nutans, today restricted to localities in south England and its relatives O.nuchicornis and ovatus which occur more frequently in the south. The presence of animals is further suggested by Trox scaber, often found on bones or dry carcasses, and the 25 individuals of Catops or Choleva, taxa frequently associated with carrion.

Layer 5 continues to indicate a similar overall landscape but some change is apparent. Large numbers of carabids occur and these are dominated by open ground species. The commonest is Trechus obtusus or quadristriatus, and although the remains have not been separated to species, both are open, dry land inhabitants. Pterostichus cupreus, P.melanarius and P.versicolor occur in dry meadows or other open places and are regarded as synanthropic species. Calathus fuscipes and C.melanocephalus are also found in dryish meadows or

cultivated ground; the latter is also the usual habitat of Harpalus rufipes. The pattern of drier surface conditions is supported by a reduction of true water beetles. Only two species are present, Colymbetes fuscus and Agabus bipustulatus. The latter is a very strong flier and will readily take advantage of any temporary water body or flooded area, and in isolation, is not indicative of standing water. Hydrophilidae are present but, with the exceptions discussed below, in generally lower numbers than previously. When layer 5 was deposted, it appears that the former water body was restricted, possibly to a swampy area with few, if any, stretches of open water. T.lemnae, also present in the lower layer, indicates the continued growth of duckweed. Other inhabitants of wet muddy or marshy ground include C.cassidoides, of which 17 were recorded, Scirtidae and Dryops sp.

Dung beetles, although less common than in Layer 6, still make up a significant component of the fauna, and there are a total of 60 Megasternum obscurum, a hydrophilid species often taken in dung. A similar species, Sphaeridium lunatum, occurs only in this sample. The histerid Onthophilus striatus, present in numbers also includes dung as a habitat. The archaeological interpretation of a quarry pit subsequently used as a watering hole is borne out by the insect evidence. The influence of the substratum, sands and gravels, is seen in the carabid fauna as well as in such species as Opatrum sabulosum. The dung beetle records are sufficiently high to suggest that the surroundings were grazed, but the water supply was reduced, apparently as the pit silted up.

As with the Roman well, there are indications of overall land use, but this context provides more direct evidence of human activity in the area. The samples have yielded large numbers of beetles associated with buildings,

including one imported pest present in both layers. Stegobium paniceum breeds in a variety of dry stored foods including flour and farinaceous products (hence its name, the biscuit beetle), seeds and spices. At present, it has a cosmopolitan distribution, but fossil records for this country date to Roman times and it is regarded as a Roman import (Osborne 1970, Buckland 1981). * Other species are regarded as synanthropic because they commonly occur indoors, amongst them the plaster-beetles, so called because they often live in damp walls. Lathridius pseudominutus reaches totals of 7 and 121 in layers 6 and 5. Values for Anobium punctatum, the woodworm or furniture beetle are 11 nd 61. The species is present in most other samples, but nowhere else as abundantly. Another species often found in or around buildings is Tipnus unicolor, present in both layers, but absent elsewhere from the site. These records argue for a wooden structure or building in the vicinity and available dried foodstuffs. There is insufficient evidence to support any prediction of its use, but a store or animal outhouse would provide suitable habitats for all the beetles. One other significant occurrence is a head comb of the flea, Ctenocephalides sp. It was not possible to assign a specific name to this part but the two most likely candidates are the dog and cat flea. The latter species often gives rise to present infestations of houses and will readily bite man (Smit 1957).

iii. F350, layers 4 and 3: late 1st-2nd century sump.

The lower of the two layers from the sump feature yielded a rich beetle assemblage in which Carabidae are an important component. With few exceptions, most of these ground beetles prefer open country habitats. One species of dry, unshaded, often chalky soils is Brachinus crepitans known as the bombadier beetle because when it is attacked, it suddenly emits a small cloud

* Stegobium paniceum has since been recorded in an Iron Age deposit in Lincolnshire (Girling and Greig in press).

of gas from the abdomen to deter its predator. Pterostichus melanarius, represented by at least 16 individuals, is an open ground species. P.cupreus also common in the sample, also lives in open terrain, often in meadows. Other well represented species include Calathus fuscipes and Dromius linearis, both preferring open soils, the latter often in sandy areas. Two of the ground beetles, found only in Layer 4, are also likely to be introductions to this country. Zabrus tenebriodes is an open country species, occurring in cultivated ground and fields. Unlike the majority of Carabids which are predators, it feeds on plants, and in Europe, it is described as a pest of cereal crops. The species is known in Britain from interglacial deposits (Dr Co (Pers. comm.) but as yet there are no post-glacial records earlier than Roman, with a record at Empingham Well, (Buckland in press). Its association with cereals raises the possibility that it owes its presence in post-glacial Britain to accidental importation in grain in which the beetle had become incorporated during harvesting. There are parallels with the pests of stored foods, for instance Stegobium paniceum present in F62, although historically the most important of these introductions are the cereal pests such as Sitophilus granarius (L.) and Oryzaephilus surinamensis (L.), responsible for major losses in food stores. The other importation is Laemostenus complanatus, a species cited by Lindroth (1974) to have originated from North Africa and spread by trade. It is strongly synanthropic and lives mostly in houses, cellars and outhouses where it lives on other arthropods and occasionally, on stored fruit. The ecological requirements of the very small beetle fauna are in keeping with this reconstruction. There is a single record of Aphodius granarius, and several Staphylinidae and Hydrophilidae do occur in dung, but this evidence, while suggesting the debris was highly rotted, does not constitute evidence for dung as a constituent of the rubbish. In the fauna there is also a scarcity of true water beetles. The upper sample of the sump contained very few beetles, but the remains of over 3,000 Sciara (fungus gnats) were recovered There were also 46 individuals of Forficula auricularia, the 'common earwig'.

The two layers of sump infill suggest that the pit originally held water, and at this stage, was possibly covered. Later it served as a trap for debris, perhaps as a result of removal of the cover, and as it filled the accumulation of leaves etc decayed in situ. The feature could also have served as a site for dumping rubbish, but except for one woodworm, there are no synanthropic beetles to suggest settlement refuse, and the infill probably accumulated naturally. In its final stages, the decaying matter attracted the fungus gnats which probably swarmed tightly overhead.

iv. F123, layers 8 and 8b, 7th century well.

The fauna of the Saxon well is generally less well preserved than the Roman insects, and overall, is lacking in diversity although there are records of species not recovered earlier. Layer 8 contains a poorer assemblage. There are low numbers of Carabids, generally of dry, open ground habitats, and there are no true water beetles. The commonest element is that associated with dung but this is far stronger in layer 8b which has more significant totals of dung beetles, including A.granarius (11) and O.sylvestris (22). Colobopterus erraticus and C.subterraneous are also present. Reinforcing this are Platystethus arenarius, P. cornatus or degener, P.nitens and Anotylus nitidulus recorded from both layers. One of the species new to the site, Coprophilus striatulus also frequently occurs in dung. The phytophages are mainly species of cultivated plants and weeds, including various Cruciferae (Plyllotreta undulata and vittula), vetch (Apion craccae) and mallows (A.aeneum of which 15 were recorded in layer 8b). A suggested reconstruction is of a dry, open, probably grazed landscape. There is no strong evidence that the well contained water at the time the deposit accumulated. There are general similarities with the Roman faunas and the landscape does not appear to have greatly altered since that time.

References

Buckland, P.C. (1981) The early dispersal of insect pests of stored products as indicated by archaeological records. Journal of Stored Products Research, 17, 1-12.

Coope, G.R. and Osborne, P.J. (1968) Report on the coleopterons fauna of the Roman Well at Barnsley Park, Gloucestershire. Transactions of the Bristol and Gloucestershire Archaeological Society, 86, 84-87.

Freude, H., Harde, K.W. and Lohse, G.A. (1964-81) Die Kafer Mitteleuropas. Vols 2-10. Gueke and Evers: Krefeld.

Jeanell R. (1941-49) Coleopteres Carabiques Faune de France, 39, 40, 51. Lechevalier: Paris

Joy, N.H. (1932) A Practical Handbook of British Beetles. Witherby: London.

Kloet, G.S. and Hincks, W.D. (1977). A Checklist of British Insects. Roy. Ent.

Landin, B.O. (1961) Ecological studies of dung beetles. Opuscula Entomologiska, Supplement 19.

Lindroth, C.H. (1974) Coleoptera: Carabidae. Handbooks for the Identification of British Insects IV(2). Royal Entomological Society: London

Osborne, P.J. (1971) An Insect fauna from the Roman site at Alcester, Warwickshire. Brittania, 2, 156-165

Reitter, E. (1908-16) Fauna Germanica Vols 1-5. Lutz: Stuttgart.

Smit, F.G.A.M. (1957) Siphonaptera. Handbooks for the identification of British Insects 1(16). Royal Entomological Society: London.