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Ancient Monuments Laboratory
Report 36/88

THE INSECT ASSEMBLAGES FROM THE POND SEDIMENTS AT SITE 30, WHARRAM PERCY, YORKSHIRE.

Maureen Girling and Mark Robinson

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Summary

Sequences of samples were examined for insect remains from waterlogged sediments which accumulated in a possible mill pond behind the Saxon dams at Wharram Percy. The aquatic fauna from them was impoverished, comprising species characteristic of temporary bodies of water. There were also species of waterside habitats and mud. The absence of a mature aquatic fauna suggests that the pond was frequently drained, as would occur if the pond supplied a water mill.

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Three sequences of samples from Saxon or medieval sediments which accumulated in the pond behind the Saxon dams at Site 30, Wharram Percy, were examined for insect remains. The sample codes, weights and descriptions are given in Table 1. Column 1 probably corresponds to Section 1 and Column 2 to Section 2 of the pollen samples (Bush, this volume). It is to be hoped that dating evidence will become available for the samples.

The insect remains were recovered by Maureen Girling, using the standard paraffin flotation technique (Coope and Osborne 1967), and identfied by her by direct comparison with modern reference, specimens. Results are given in Table 2 for the minimum number of individuals represented by the fragments in each sample, the nomenclature following Kloet and Hincks (1977). This report has been written by Mark Robinson, using the results and notes of the late Dr. Girling.

The Environment of the Pond

The pond at Wharram Percy was created by the damming of the valley bottom in Saxon times to retain the flow of a small stream which issues from the chalk. The original purpose of the pond was probably to supply a water mill but subsequently it is possible that it became used as a fish pond. The chalk bedrock would have ensured that the pH of the water was high, a

factor that would usually favour the colonisation of the pond by large numbers of insects. (This is in contrast to acid pools which tend to be inhabited by low numbers of fewer species.) Aquatic and marginal plants, with their attendant insect fauna, would also be expected to colonise readily. The majority of the samples, however, produced sparse insect assemblages. The amount of organic material in the samples was low and it is possible that rapid sedimentation behind the dam was in part responsible for the low concentration of insect remains.

The insects from the SW Column and Column 1 only included a small proportion of aquatic and pond edge taxa. Most seem to have been individuals living in the vicinity which strayed into the water and drowned. The most numerous beetle from these samples was Helophorus nubilus a phytophagous species which feeds on cruciferous weeds. The remaining insects were from a variety of habitats but even summation of the results from the two columns does not give a large enough assemblage for further interpretation.

Only a small assemblage was recovered from Sample 1472, but the combination of a greater concentration of insect remains with, in some instances, larger samples, makes a more detailed interpretation possible for the lower part of Column 2, Samples 1473, 1474 and 1475. Again aquatic Coleoptera were in the minority but they were a significant part of the assemblage, comprising about a third of the total number of individuals. However, the aquatic fauna was not one of a mature pond. By far the most abundant water beetle was Helophorus brevipalpis. This species is much more common in temporary ponds, puddles and ditches than permanent ponds and streams. It

readily takes to the wing and newly created bodies of water can be colonised rapidly by quite large numbers of individuals (Grenstead 1939). The only other water beetles that were at all well represented were Helophorus aquaticus and Ochthebius minimus, which again tend to favour stagnant water and do not require a well vegetated habitat. Beetles which feed on aquatic and marsh plants were entirely absent.

Staphylinidae which live at the edge of ponds etc. in accumulations of decaying vegetation or on exposed mud comprised the other main group of Coleoptera from Samples 1473, 1474 and 1475. The most abundant taxa were Lesteva longoelytrata, Carpelimus spp., Platystethus nitens and Anotylus nitidulus. Some of them, for example P. nitens and A. nitidulus also occur in other sorts of decaying organic material such as manure heaps but L. longoelytrata is restricted to the waterside habitat (Horion 1963, 130, 231, 250). Many of the taxa of Staphylinidae from the Wharram Percy pond, including Aleocharinae, were recorded by Donisthorpe (1939, 25-50) at Windsor Great Park in reed refuse, on mud around ponds and alongside ponds or in a willow swamp.

Various factors could have contributed to the impoverishment of the fauna of the pond including a rapid rate of silting resulting in frequent clearing out of sediments and regular weeding of the vegetation, but they do not provide sufficient explanation. The main factor was perhaps related to the use of the pond as a source of power for a watermill. The flow of the stream in summer was probably insufficient for continuous operation of the mill. The insect fauna suggests a rather hostile environment of a temporary pool and temporary expanses of mud. This would be consistent

with milling commencing with a full pond and continuing until the pond was empty.

The Surrounding Environment

The insects from Column 2 suggest that the background environment of the site was an open agricultural or pastoral landscape. There was no evidence for woodland or scrub. A couple of chafers, Serica brunnea and Phyllopertha horticola, were present and they have larvae that feed on the roots of plants in permanent grassland. Dung beetles from the genus Aphodius suggest the presence of pastureland because they only occur in dung as individual droppings, not manure heaps. The phytophagous beetles Helophorus nubilus, Phyllotreta nigripes and Ceutorhynchus contractus suggest cruciferous weeds growing in the vicinity.

There was no evidence of human habitation given by the insect remains. Synanthropic species including household pests and grain beetles were absent apart from a single specimen of Anobium punctatum. There was a notable absence of insects associated with accumulations of rubbish other than the pondside species. Studies of other Saxon and medieval insect assemblages have demonstrated how sensitive the faunas are to nearby human presence (Girling 1981; Girling and Robinson, in prep; Hall et al 1983; Robinson 1980).

Comparison with other Biological Evidence from the Site

The waterlogged samples from the adjacent millpond of Site 71 contained few seeds of aquatic species and none which suggests a standing body of water

(Jones, this volume). Thus conditions in the ponds of Sites 30 and 71 show certain similarities.

In Section 2, the only sequence of pollen samples from the pond at Site 30 to contain well preserved pollen, grassland taxa predominated and values for tree and shrub pollen were low (Bush, this volume). The consistent representation of Helianthemum sp. and Poterium sanguisorba indicates unploughed calcareous grassland. Cereal pollen and pollen from arable weeds were also present. The pollen evidence serves to amplify the evidence from Column 2, the analagous sequence of samples for insects, of an open landscape.

Much charred grain, some of it showing insect damage, was recovered from the upper sediments behind the dam at Site 30 (Hillman, this volume) in complete contrast to the absence of any grain beetles or those beetles which tend to occur mill buildings (Walker 1916) from the waterlogged sediments. The reason for this discrepancy is uncertain, but it is possible that the carbonised remains post-date the functioning of the mill and represent the disposal of crop-processing waste.

Acknowledgements

This work was funded by the Historic Buildings and Monuments Commission (England).

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Table 1

WHARRAM PERCY POND SAMPLES			Weight (Kg.)	Description
SW	Column			
SW79	0-9cm	1290	7.95	clay and chalk gravel
SW75	33-36cm	1294	2.5	silt and chalk gravel
SW72	55-75cm	1299	10.8	dark clay and stones
Column	1			
WP30	1461		2.95	dark slightly organic clay silt
WP30	1467		?	?
WP30	1464		3.0	dark organic silt
Column	2			
WP30	1472		?	slightly organic brown silty loam
WP30	1473		5.3	dark organic silty clay
WP30	1474		20.5	dark organic silty clay
WP30	1475		2.6	very stoney clay

Table 2 — Minimum Number of Individuals

WHARRAM PERCY POND INSECTS	SW Column			Column 1				Column 2			
	SW79 0-9	SW75 33-36	SW72 55-75	1461	1467	1464	1465	1472	1473	1474	1475
DERMAPTERA											
Forficula auricularia (L.)	2	8	4	2	13	2	7	1	1	9	2
TRICHOPTERA											
Gen. et spp. indet.	-	-	-	-	-	-	-	8	6	10	-
COLEOPTERA											
CARABIDAE											
Carabus nemoralis Mull.	-	-	-	-	-	-	-	-	-	1	1
Notiophilus biguttatus (F.)	-	-	-	-	-	1	-	-	-	-	-
Bembidion lampros (Herbst)	-	-	-	-	-	-	-	-	-	1	-
B. bipunctatum (L.)	-	-	-	-	-	-	-	-	-	1	-
B. doris (Panz.)	-	-	-	-	-	-	-	-	-	1	-
B. unicolor Chaud.	-	-	-	-	-	-	-	-	-	1	-
Bembidion spp.	-	-	-	-	-	-	-	1	-	-	1
Pterostichus cupreus (L.)	-	-	-	-	-	-	-	-	-	1	-
P. melanarius (Ill.)	-	-	-	-	-	-	-	-	-	1	-
Calathus fuscipes (Goeze)	-	-	-	-	-	-	-	-	-	-	1
Harpalus sp.	-	-	-	-	-	-	-	-	-	-	1
DYTISCIDAE											
Agabus bipustulatus (L.)	-	-	-	-	-	-	-	-	-	1	-
Colymbetes fuscus (L.)	-	-	-	-	-	-	1	-	1	1	1
HYDROPHILIDAE											
Helophorus aquaticus (L.)	-	1	-	-	-	1	1	1	-	12	2
H. brevipalpis Bed.	-	2	-	-	-	-	-	1	6	90	7
H. grandis (Ill.)	-	-	-	-	-	-	-	-	-	3	-
H. nubilus F.	1	2	-	-	3	4	2	1	-	5	3
Cercyon sp.	-	-	-	-	-	-	-	1	-	-	-
Megasternum obscurum (Marsh.)	1	-	-	-	-	2	2	2	1	4	1
Cryptopleurum minutum (F.)	-	-	-	-	-	-	-	1	-	-	-
Hydrobius fuscipes (L.)	-	-	-	-	-	-	-	-	-	1	-
Anacaena sp.	-	-	-	-	-	-	-	-	-	-	1

Enochrus sp.	-	-	-	-	-	-	-	-	-	1	-
HISTERIDAE											
Acritus nigricornis (Hoff.)	-	-	-	-	-	-	-	-	-	-	1
HYDRAENIDAE											
Orchthebius minimus (F.)	-	1	-	-	-	-	-	-	3	17	2
Limnebius aluta (Bed.)	-	-	-	-	-	-	-	-	-	1	-
Limnebius spp.	-	-	-	-	1	-	-	-	1	7	2
SILPHIDAE											
Silpha atrata L.	-	-	-	-	-	-	1	-	-	-	-
Silpha sp.	-	-	-	-	-	-	-	1	-	-	1
STAPHYLINIDAE											
Micropeplus porcatus (Payk.)	-	-	-	-	-	-	-	-	-	-	1
M. staphylinoides (Marsh.)	-	-	-	-	-	-	-	-	-	1	-
Olophrum piceum (Gyll.)	-	-	-	-	-	-	-	-	-	1	-
Lesteva longoelytrata (Goeze)	-	1	-	-	-	-	-	-	4	20	-
Carpelimus or Thinobius spp.	-	-	-	-	-	-	-	-	4	13	2
Platystethus arenaris (Fourc.)	-	-	-	-	-	-	-	-	-	10	-
P. cornutus gp.	-	-	-	-	-	-	-	-	1	-	-
P. nitens (Sahlb.)	-	1	-	-	-	-	-	-	-	13	2
Anotylus mutator (Lohse)	-	-	-	-	-	-	-	-	-	10	-
A. nitidulus (Grav.)	1	2	-	-	-	-	-	-	10	54	4
A. rugosus (F.)	-	-	-	-	-	-	-	-	1	9	2
Anotylus sp.	-	-	-	-	-	-	-	1	-	-	-
Stenus spp.	-	4	-	1	2	1	2	1	1	6	1
Lathrobium sp.	-	1	-	-	-	-	-	-	-	2	1
Xantholinus linearis (Ol.)	1	-	-	1	2	1	1	-	-	4	-
Philonthus spp.	3	-	-	-	3	-	-	-	-	4	1
Tachinus signatus Grav.	-	-	-	-	-	-	-	1	-	2	-
Tachyporinae indet.	-	2	-	-	3	1	-	-	-	7	2
Drusilla canaliculata (F.)	-	1	-	-	-	-	-	-	-	-	-
Aleocharinae indet.	2	1	-	1	2	2	2	1	12	57	4
GEOTRUPIDAE											
Geotrupes sp.	-	-	-	-	-	-	-	-	-	1	1
SCARABAEIDAE											
Aphodius ater (Deg.)	-	-	-	-	-	-	-	-	-	1	-

A. rufipes (L.)	–	–	–	–	–	–	–	–	–	–	1
A. sphacelatus (Panz.)	–	–	–	–	–	–	–	–	–	–	2
Aphodius spp.	1	2	–	–	–	–	–	3	–	12	2
Serica brunnea (L.)	–	–	–	–	–	–	–	–	–	1	–
Phyllopertha horticola (L.)	–	–	–	–	–	–	–	–	–	–	1
SCIRTIDAE											
Gen.et spp. indet.	–	–	–	–	–	–	–	–	–	2	–
HETEROCERIDAE											
Heterocerus sp.	–	–	–	–	–	–	–	–	–	1	–
ELIMDAE											
Normandia nitens (Mull.)	–	–	–	–	–	–	–	–	–	–	1
Oulimnius troglodytes (Gyll.) or tuberculatus (Mull.)	–	–	–	–	–	–	–	–	–	1	–
ANOBIIDAE											
Anobium punctatum (Deg.)	–	–	–	–	–	–	–	–	–	–	1
CRYTOPHAGIDAE											
Cryptophagus sp.	–	–	–	–	–	–	–	–	–	2	–
LATHRIDIIDAE											
Corticarina sp.	1	–	–	–	–	–	–	–	–	–	–
CHRYSOMELIDAE											
Phyllotreta nigripes (F.)	–	–	–	–	–	–	–	–	–	6	–
Longitarsus spp.	2	2	–	–	–	–	–	–	–	15	5
Chaetocnema concinna (Marsh.)	–	–	–	–	–	–	–	–	–	3	–
C. confusa (Boh.) or hortensis (Fourc.)	–	2	–	–	–	1	–	–	–	–	–
APIONIDAE											
Apion spp.	–	1	–	–	–	–	–	–	–	1	1
CURCULIONIDAE											
Barynotus sp.	–	–	–	–	–	1	–	–	–	–	–
Sitona sp.	–	–	–	–	–	–	–	1	–	–	–
Ceutorynchus contractus (Marsh.)	–	1	–	–	–	–	–	–	–	3	5
Ceutorhynchus sp.	–	–	–	–	–	–	–	–	–	–	1
Total Coleoptera	13	27	–	3	16	15	12	17	45	412	66

HYMENOPTERA											
FORMICIDAE	-	-	5	1	7	-	14	1	6	29	2
PARASITICA	-	3	-	1	2	-	4	4	3	75	-
DIPTERA											
Chironomidae larval heads	-	-	-	-	-	-	-	+	+	+	-
Gen. et spp. indet	3	13	12	7	16	8	16	9	25	288	10