Palaeoecology Research Services

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# Assessment of biological remains recovered from samples from an earthwork in Wray Wood, Boston Spa, West Yorkshire

by

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**Summary**

*Two sediment samples from deposits encountered during excavations of an earthwork in Wray Wood, Boston Spa, West Yorkshire, were submitted to PRS for an investigation of their content of biological remains. Soil samples were taken from the fills of a 'comma-shaped' feature excavated during the 2004 phase of the works. It was thought that this could be a medieval 'sheepwash' being similar in form to such features located at sites in the Cotswolds.*

*The material examined clearly demonstrated the presence of significant assemblages of well-preserved plant, insect and other invertebrate remains in waterlogged deposits filling the earthwork. Preservation of the remains was excellent and the assemblages indicated a body of clear and still, rather shaded (though the canopy was not so dense as to prevent an undergrowth of shrubs), freshwater.*

*Since it has been suggested that the feature may have functioned as a 'sheepwash', a particular focus of the investigations was to see whether the fill contained ectoparasites of sheep. None were identified, though this does not rule out the possibility that this feature was a 'sheepwash'—while in use, it would most likely have been kept relatively clear of silt and debris, with the fills accumulating once it was no longer being utilised.*

*Further analysis of the remains would provide detailed environmental information. The excellent preservation of the plant and invertebrate remains, together with the rarity of the type of feature studied, make a strong case for the full analysis of these assemblages and subsequent publication of the results.*

**KEYWORDS**: WRAY WOOD EARTHWORK; BOSTON SPA; WEST YORKSHIRE; ASSESSMENT; MEDIEVAL; PLANT REMAINS; INVERTEBRATE REMAINS; ?'SHEEPWASH'

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# Assessment of biological remains recovered from samples from an earthwork in Wray Wood, Boston Spa, West Yorkshire

## Introduction

Archaeological excavations were carried out on an earthwork in Wray Wood by the Boston Spa and District Community Archaeology Group. Five trenches were dug over several seasons between 2001 and 2004.

Soil samples were taken from the fills of a 'comma-shaped' feature excavated during the 2004 phase of the work (Trench 5). It was thought that this could be a medieval 'sheepwash' being similar in form to such features located at sites in the Cotswolds.

Two sediment samples were submitted to Palaeoecology Research Services Ltd (PRS), County Durham, UK, for an investigation of their bioarchaeological potential.

## Methods

The sediment samples were inspected and their lithologies were recorded, using a standard *pro forma*, prior to processing. The samples were processed, broadly following the techniques of Kenward *et al*. (1980; 1986) for the recovery of plant and invertebrate macrofossils. Prior to processing, the samples were disaggregated in water for 24 hours or more and their volumes recorded in a waterlogged state.

Plant remains in the processed sample fractions (residues and flots) were recorded briefly by 'scanning' using a low-power microscope, identifiable taxa and other components being listed on paper. Nomenclature for plant taxa follows Stace (1997). The residues were primarily of uncharred organic remains (preserved by anoxic waterlogging) and recorded wet.

The flots were stored in alcohol and examined for insect remains using a low-power microscope. Other remains present in the flots were also noted in brief.

## Results

The results are presented in stratigraphic order (lowermost first). Archaeological information, provided by the excavator, is given in square brackets. A brief summary of the processing method and an estimate of the remaining volume of unprocessed sediment follows (in round brackets) after the sample numbers.

**Context D4e** [sediment sealed within the limestone lining of the earthwork]
Sample 55/T (5 kg/5.8 litres sieved to 300 microns with paraffin flotation; no unprocessed sediment remains)

The sample contained a large proportion of waterlogged organic matter in a very good state of preservation. It consisted of wood (mainly twigs), leaf fragments, buds and bud scales of oak (*Quercus*) and other tree species, moss stems and leaves. 'Seeds' and other plant remains of the following taxa were noted: nuts of sedge (*Carex*), oogonia of muskgrass (*Chara*), nut shells of hazel (*Corylus avellana* L.), stones of hawthorn (*Crataegus monogyna* Jacq.), caryopses of heath-grass (*Danthonia decumbens* (L.) DC.) and other species of the grass family (Poaceae), achenes of tormentil (*Potentilla erecta* (L.) Raeusch.), stones of sloe (*Prunus spinosa* L.), acorns (*Quercus*), achenes of crowfoot (*Ranunculus* subg. *Batrachium*) and buttercup (*Ranunculus* subg. *Ranunculus*), achenes of rose (*Rosa*), pips of blackberry (*Rubus fruticosus* L. agg.) and achenes of horned pondweed (*Zannichellia palustris* L.).

Remains of invertebrates were abundant and indicated aquatic conditions. Ostracods and water flea (chiefly *Daphnia* with small numbers of *Ceriodaphnia*) ephippia (resting eggs) were extremely numerous. Insect remains were excellently preserved and included beetles, ants, parasitic wasps, bugs, aphids, flies and fly puparia. Mites were common and there were several earthworm egg capsules. There were also a few small pinkish fragments (of undisaggregated ?clay).

At least fourteen aquatic beetle taxa including *Haliplus* sp., *Helophorus* spp., *Ochthebius* spp., *Hydrobius fuscipes* (L.), ?*Coelostoma orbiculare* (Fabricius), *Limnebius* spp., *Hydraena testacea* and *Hydraena britteni* Joy, were identified. Overall, the impression was of a still, clear, rather shady, pool. A number of waterside taxa were represented, some being moss dwellers. There was a diverse group of plant feeding insects, with *Apion* spp. and various weevils being particularly well represented. The bugs present included several species of froghopper (Auchenorhyncha spp.).

Beetles associated with herbivore dung were rather more common than in Sample 53/T (see below). Several species of *Aphodius* and a dor beetle *Geotrupes* were represented. There was a small component of mould feeders (Lathridiicae sp, and *Cryptophagus* sp.). Other beetles noted included the snail feeding *Silpha atrata* L. and a small chafer *Phyllopertha horticola* (L.). Ants were common. No ectoparasites of sheep or other domestic animals were recovered.

There were also some remains of freshwater snails and bivalves, including an apex fragment of a planorbid and a few valves of *Pisidium*/*Sphaerium* sp(?p)., and a single small succineid (indicative of waterside vegetation).

**Context D4** [sediment from immediately above the limestone lining of the earthwork]
Sample 53/T (5 kg/4.3 litres sieved to 300 microns with paraffin flotation; no unprocessed sediment remains)

As in the previous sample, the preservation of the waterlogged plant remains was excellent. It contained uncharred twigs, leaf fragments, bark, buds and bud scales of oak and other tree species, and stems and leaves of mosses. Numerous 'seeds' and other plant remains were again present, including fruits and seeds of field maple (*Acer campestre* L.), achenes of thistle (*Carduus/Cirsium*), nuts of sedge, nut shells of hazel, stones of hawthorn, an entire cupule of beech (*Fagus sylvatica* L.), caryopses of heath-grass, achenes of hawkbit (*Leontodon*), nutlets of selfheal (*Prunella*), achenes of crowfoot and buttercup, achenes of rose, prickles of rose or bramble (*Rosa/Rubus*), and pips of dewberry (*Rubus caesius* L.).

Remains of invertebrates were, again, abundant and excellently preserved. They consisted of ostracods, water fleas, a substantial beetle assemblage, ants, parasitic wasps, bugs, aphids, flies and fly puparia, earthworm egg capsules and mites.

The range of invertebrates present indicated that the feature held water. The strong aquatic component included the water beetles *Haliplus* sp., *Agabus bipustulatus* (L.), *Ochthebius* sp., *Hydrobius fuscipes*, *Limnebius* spp., *Helophorus* spp., and *Hydraena* ?*britteni*. Together they indicate still clear water, in a somewhat shaded pool. Ostracod crustaceans and ephippia of water fleas (as in the previous sample, chiefly *Daphnia* with small numbers of *Ceriodaphnia*) were extremely numerous, and water boatmen (Corixidae) were common. Other taxa were typical of waterside habitats. Weevils, halticine leaf beetles and bugs that would have fed on local plants, shrubs and trees were common.

A few individuals of at least three species of *Aphodius* were represented. *Aphodius* are beetles found in large numbers in and around herbivore dung. Those represented here probably came from grazing land nearby, although some species are attracted to foul plant material. The only other beetle suggesting the presence of foul decomposing matter was *Cryptopleurum minutum* (Fabricius). Beetles found on mouldy or mildewed material (Lathridiidae sp., *Cryptophagus* spp.) were subjectively more common than taxa associated with foul matter. Other decomposer taxa present were generalists and not indicative of any particular habitat.

Other beetles identified were *Silpha atrata*, and *Staphylinus olens* (the 'devil's coach horse'). Ants were strikingly common, but no ectoparasites were recovered.

Two unidentified fragments of land snail (two different species) were also noted.

## Discussion and statement of potential

The plant remains in the two samples derive largely from two types of habitat, namely freshwater and woodland. Muskgrass (*Chara*), crowfoot (*Ranunculus* subg. *Batrachium*), and horned pondweed (*Zannichellia palustris* L.) all occur in slow flowing or standing water, and probably grew inside the feature or were transported there in the water used to supply it. The large number of remains of trees and shrubs indicated that the feature was surrounded by woodland, as the site still is today. The tree canopy was not particularly dense, allowing the development of various species of shrubs in the undergrowth. Some taxa of open habitats (e.g. heath-grass – *Danthonia decumbens* (L.) DC., tormentil – *Potentilla erecta* (L.) Raeusch. and selfheal – *Prunella*) may derive from clearings in the forest, or perhaps arrived in animal dung—many seeds and fruits survive passage through

the intestinal tract of sheep, for example (see Simao Neto *et al*. (1987)).

No remains of crop plants were found implying that no activities associated with plant food production took place in the immediate vicinity. Some of the wild fruits present (hazel nut, sloe, blackberry, dewberry and rose hip) might have been collected for human consumption, but given the context it seems more likely that they fell directly from the surrounding trees and shrubs.

Only a small subsample of the material could be recorded within the constraints of an assessment. A complete analysis would certainly produce a longer list of plant species, and allow a more accurate environmental reconstruction.

The material examined clearly demonstrates the presence of abundant well-preserved insects and other invertebrates in waterlogged deposits filling the earthwork. Preservation of remains was excellent and the assemblages corroborated the evidence from the plant remains, indicating a body of clear and still, rather shaded, freshwater. Further analysis of the remains would provide detailed environmental information, particularly on the local vegetation.

Since it has been suggested that the feature may have functioned as a 'sheepwash', a particular focus of the investigations was to see whether the fill contained ectoparasites of sheep (lice, keds and ticks). None were identified, though this does not rule out the possibility that this feature was a 'sheepwash'—while in use, it would most likely have been kept relatively clear of silt and debris, with the fills accumulating once it was no longer being utilised.

## Recommendations

The excellent preservation of the plant and invertebrate remains, together with the rarity of the type of feature studied, make a strong case for the full analysis of these assemblages and subsequent publication of the results.

## Retention and disposal

All of the extracted remains from the processed samples should be retained for the present.

## Archive

All relevant material is currently stored by Palaeoecology Research Services (Unit 8, Dabble Duck Industrial Estate, Shildon, County Durham), along with paper and electronic records pertaining to the work described here.

## Acknowledgements

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