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**An evaluation of biological remains from excavations at
Messingham, North Lincolnshire (site code: BFM97)**

by

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Summary

Samples of sediment from two contexts (probably equivalent) and one small monolith from deposits excavated at Messingham, North Lincolnshire, were submitted for an evaluation of their potential for bioarchaeological analysis.

The deposits contained an impoverished flora and fauna indicating periglacial conditions and are probably contemporaneous with those reported by Buckland (1982) from a nearby site.

Keywords: MESSINGHAM; NORTH LINCOLNSHIRE; EVALUATION; PLANT REMAINS; POLLEN; INVERTEBRATE REMAINS; PERIGLACIAL

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Introduction

Excavation of four trenches at Messingham, North Lincolnshire undertaken in September/October 1997 by Humber Archaeology Partnership revealed deposits of sand and peat.

Methods

Four samples of sediment ('GBAs' *sensu* Dobney *et al.* 1992) representing two contexts and one small monolith were submitted. The samples were inspected in the laboratory and their lithologies were recorded using a standard *pro forma*—for the purposes of this, and all subsequent investigations, the three samples from Context 4 were considered as one sample. Subsamples of 2 kg were taken for extraction of macrofossil remains, following procedures of Kenward *et al.* (1980; 1986).

Plant and invertebrate macrofossils were examined from the residues, washovers and flots resulting from processing.

To provide a brief indication of the pollen assemblage present in the two samples a truncated pollen preparation was performed. Samples were boiled in 10% NaOH solution for 10 minutes and passed through a 180 micron sieve. The samples were subsequently resieved using a 10 micron mesh, which allows fine organic and clay particles to be removed whilst retaining the pollen on the sieve. Safranin stain was applied to the pollen and subsamples were mounted on slides in water.

None of the samples were deemed suitable for examination for the eggs of parasitic nematodes.

Artefacts were removed from the residues to be returned to the excavator.

Results

The results of the investigations are presented by trench with information provided by the excavator in brackets

Macrofossils

Trench A

Context 4 [Peat]

Samples 1,2 and 3/T (2 kg paraffin flotation)

A highly humified, dark brown to black detritus peat rich in wood fragments. The peat oxidised quickly when exposed to air and produced a slightly sulphurous odour. Close examination revealed a bedding plane structure with intermittent layers rich in fine sand and silt. Wood fragments were frequently concentrated in distinct horizons. The peat fragments were coated in coarse sand originating from adjacent stratigraphic units. A few larger pieces of detritus mud and peat appeared to grade into principally inorganic sediment. Even the most organic horizons still contained a significant quantity of coarse quartz sand.

Washover and flot samples were analysed separately and yielded rare fragments of *Drepanocladus* spp. moss and two- and three-sided sedge nutlets (*Carex* spp.).

The flot in particular contained charred nutlets and herbaceous stems, whereas the majority of sedge nutlets occurring in the other two fractions were not burnt. The flot also contained a moderately rich insect assemblage essentially similar in character to

that recorded by Buckland (1982) including *Diachila arctica* Gyll., *Helophorus sibiricus* Mots. and *Pycnoglypta lurida* (Gyll.), cold climate indicator species no longer recorded from Britain. *Arpedium brachypterum* (Grav.) and *Olophorum fuscum* (Grav.) were abundant.

This sample produced a large residue dominated by herbaceous rootlets and the fen moss species *Scorpidium scorpioides* (Hedw.). Although most of the herbaceous material was highly humified a small fraction of the sample could be clearly distinguished as sedge (*Carex* spp.) rootlets. A significant proportion of amorphous organic matter remained after the sieving process. Both wood and charcoal fragments (to 4 mm) were common throughout the sample.

Monolith tin sample from Trench A

The base of the monolith tin sequence was composed of coarse quartz sand with some silt, which graded into a silty organic mud with occasional sand grains. Overlying the mud was highly humified wood layer (fragments up to 10 mm) contained within an amorphous peat matrix. Several two-sided sedge nutlets (*Carex* spp.) were noted from this horizon. The wood layer also contained a limited number of charcoal fragments (to 5 mm). The peat overlying the wood layer was very humified and black in colour. Degraded herbaceous rootlets were common and a slight increase in the quantity of sedge nutlets was noted.

Trench B

Context 8 [Peat within Context 7 a silver sand]
Sample 8/T (2 kg paraffin flotation)

A very humified detritus peat (H8/9 on the Von Post 10 point scale) containing some visible rootlets and wood fragments. The matrix was smooth and had a 'greasy' texture. Fine sand and silt occurred intermittently throughout the peat fragments, which were frequently coated by coarser sand.

The residue, washover and flot fractions were dominated by amorphous organic matter, with frequent poorly preserved herbaceous rootlets. Moderate quantities of *Scorpidium scorpioides* were encountered in all three parts of the sample. The

residue was rich in small poorly preserved wood fragments (to 10mm). It also contained a moderate number of two- and three-sided sedge nutlets.

Within the washover fraction a limited number of rootlets were identified as *Carex* spp..

The flot contained fine fragments of many of the macrofossils found in the other two fractions. In addition there were significant numbers of two- and three-sided *Carex* spp. nutlets, *Thalictrum flavum* L. (meadow rue) fruits, fragments of root bark and, again, a moderately large insect assemblage similar to that recorded by Buckland (*op. cit.*).

Pollen

Samples 8/T and 1-3/T produced very similar pollen assemblages which were dominated by sedges (Cyperaceae) and the spores of non-*Sphagnum* mosses. The single furrowed spores of ferns were also frequently encountered. Most tree and shrub species were absent from the assemblage, however willow (*Salix*) pollen was noted infrequently. Both birch (*Betula*) and pine (*Pinus*) were represented by single grains. Other taxa in the assemblage include grasses (Poaceae) and *Filipendula* (dropwort).

Discussion and statement of potential

The three samples analysed for macrofossils suggest that sedge-dominated fen was well established at Messingham. The mosses that appear in the assemblage are typical of wet mud bottom or pool sites. Both *Drepanocladus* spp. and *Scorpidium scorpioides* can withstand low temperatures, including winter freezing, since the modern distribution of both taxa includes, Iceland, Greenland and many other high latitude or mountainous areas.

Although the range of fen herb species encountered in the samples is very small those that are present are typical of Late glacial sedge-dominated fen. Both common

meadow rue (*Thalictrum flavum*) and *Filipendula* frequently occur in Late glacial pollen assemblages.

The high degree of peat humification and the resultant poor preservation of wood prevented identification of the abundant fragments, but the pollen evidence suggests that *Salix* was the only arboreal taxon to be growing in the vicinity of the sampling site. The *Salix* pollen could be derived from the dwarf willow (*Salix herbacea* L.) which is common in tundra regions, although there is no macrofossil evidence to support this.

Buckland (1982) has interpreted the landscape at Messingham on the basis of the beetle fauna within the basal peat buried under extensive cover sands (excavation site approx. 2 km from that considered in this report). The beetle assemblage indicated an open landscape containing 'extensive *Carex*-dominated marsh, with some scrub willow and occasional semi-permanent pools' (Buckland 1982). Temperatures were low; Buckland suggests January averages of around -10°C and cold summers. The composition of the plant macrofossil, pollen and insect assemblages considered here suggest that the current deposits are a continuation of the same peat and can be similarly interpreted.

The very high degree of peat humification (H8/9) implies that the peat formed under conditions that were marginal for organic accumulation. It is unlikely that the deposits have suffered from significant secondary decomposition as a result of post-depositional exposure to air since the sample site is overlain by a great thickness of saturated cover sands. This high degree of humification may reflect a deposition regime in which the peat dried out significantly in late summer due to low

precipitation levels. The annual accumulation of peat may have been facilitated by winter freezing and by subsequent flooding during the spring thaw, which could have been more than sufficient to offset the effects of drying out in the late summer. Charred sedge nutlets, charcoal and burnt fragments of monocotyledon stem demonstrate the occurrence of fires within the local marsh vegetation. However, the macrofossil and pollen assemblages alone provide insufficient evidence to distinguish between fires ignited by lightning strikes on a dry fen surface and fires set by humans.

Recommendations

Although the biological evidence suggest and environment similar to that reconstructed by Buckland (1982), it is not possible to make a detailed comparison within the constraints of evaluation. Buckland pointed out that the presence of frequent intercalations of organic sediment within the sands at Messingham make it a good subject for studies of the abrupt climatic changes at the end of the last glaciation (see, for example, Lowe and Walker 1997).

Ideally, a detailed analysis of the insects at least should be made, and the deposits radiocarbon dated, but this would carry very substantial cost implications, not least because many of the identifications would be difficult (a substantial proportion of the fauna being high arctic or eastern in its present range).

Retention and disposal

All of the remaining samples should be retained for the present.

Archive

All extracted fossils from the test subsamples, and the residues and flots are currently stored in the Environmental Archaeology Unit, University of York, along with paper and electronic records pertaining to the work described here.

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