MANOR HOUSE FARM, RUFFORD, LANCASHIRE

Palaeoenvironmental Assessment

Oxford Archaeology North

March 2006

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Issue No: 2006/503
OA North Job No: L9383
NGR: SD 4632 1564

Document Title: **MANOR HOUSE FARM, RUFFORD, LANCASHIRE**

Document Type: **Palaeoenvironmental Assessment**

Client Name: **Stephen Baldwin**

Issue Number: **503**
OA Job Number: L9383

National Grid Reference: SD 4632 1564

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SUMMARY

Oxford Archaeology North (OA North) was commissioned by Stephen Baldwin (Archaeological Consultant), acting as an agent on behalf of Mr and Mrs V Fitzel, to undertake a programme of environmental sampling and assessment of peat deposits at Manor House Farm, Rufford (NGR SD 4632 1564). The land was proposed for redevelopment as a boating marinar, which would have included the removal of the area of peat. The work was carried out following the recommendations of the English Heritage scientific advisor for the North West, Sue Stallibrass.

The peat deposits were contained in a small hollow alongside the Rufford branch of the Leeds-Liverpool canal, and reached depths of up to 2.5m (Baldwin 2003). Rufford is situated on the south western stretch of the Lancashire coastal plain, which is known for its 1-5m thick coversand, the Shirdley Hill Sand. Previous research carried out has shown that the sand is often associated with complex sequences of marine/perimarine clay and silt and terrestrial peat (Tooley 1978; McAllister *et al* 2004; Tooley *et al* 2004; Wilson and Bateman 2004). This sequence has been associated with changes in Late Glacial and Holocene relative sea level change and prehistoric human exploitation and the main objectives of the investigation was to assess the deposits for their potential of providing a record of environmental change in the area.

An Environmental Specialist from OA North visited the site in April 2004 and sampled the peat deposit using a series of monolith tins. An exposed section of the deposits revealed a roughly 2.5m deep section of peat, overlying a deposit of sand (Shirdley Hill Sand?). A band of clay was visible, roughly 0.80m from the surface, which may be related to localised flooding.

In total, 12 sub-samples were taken from observed lithological units within the peat deposit and prepared for pollen analysis. In addition, 15 sub-samples were extracted from the monoliths in order to assess the plant macrofossil content and lithology of the peat. Material suitable for obtaining two radiocarbon dates was taken to provide a chronological framework with which to assess the palaeoenvironmental data. The first came from near the base of the peat to determine the date at which the peat began to develop, and the second from near the surface,

The assessment of the pollen and macrofossils from Rufford has shown that the peat contains a record of landscape changes determined, in part, by prehistoric human activity. Given the evidence for early cultivation in the area and the proximity of Rufford to important sites of previous palaeoenvironmental research, it is recommended that further palaeoenvironmental analysis be carried out on the peat deposits to compliment earlier work in the area.

ACKNOWLEDGEMENTS

OA North would like to thank Stephen Baldwin and Mr and Mrs Fitzel for commissioning the report, and their co-operation and assistance during the fieldwork. Thanks also to Sue Stallibrass for visiting the site and for recommending the programme of work.

The fieldwork was undertaken by Denise Druce with the assistance of Francis Claxton. Francis also sub-sampled the monoliths and carried out the pollen preparations, and Denise carried out the palaeoenvironmental assessment and wrote the report. Elizabeth Huckerby assisted in the managing of the project, and both Elizabeth and Alan Lupton edited the report.

1. INTRODUCTION

1.1 CIRCUMSTANCES OF THE PROJECT

1.1.1 Following proposals for the redevelopment of land at Manor House Farm, Rufford (NGR SD 4632 1564) Stephen Baldwin (Archaeological Consultant), acting as an agent on behalf of Mr and Mrs V Fitzel, requested that Oxford Archaeology North (OA North) submit costings for a programme of palaeoenvironmental sampling and assessment. This was implemented following the recommendations of the English Heritage regional scientific advisor for the North West, Sue Stallibrass.

1.1.2 The land was proposed for redevelopment as a boating marinar, which would have included the removal of up to 2.5m peat from a small hollow alongside the Rufford branch of the Leeds-Liverpool canal (Baldwin 2003).

1.1.3 During the removal of the deposits an exposed section revealed *c* 2.5m of peat, overlying a deposit of sand. A band of clay was visible, roughly 0.80m from the surface, which may be related to localised flooding.

1.2 PALAEOENVIRONMENTAL EVIDENCE

1.2.1 Rufford is situated on the southwestern stretch of the Lancashire coastal plain, which is known for its 1-5m thick coversand, the Shirdley Hill Sand. Previous research at Downholland Moss SD 3208, Mere Sands Wood SD 446159, and Martin Mere SD 4170 1483, has shown that the sand is often associated with a complex sequence of marine/perimarine clay/silt and terrestrial peat (Tooley 1978; McAllister *et al* 2004; Tooley *et al* 2004; Wilson and Bateman 2004). The complex sequence has been associated with changes in Late Glacial and Holocene relative sea level change and prehistoric human exploitation.

2. METHODOLOGY

2.1 FIELDWORK AND SAMPLING

2.1.1 An Environmental Specialist from OA North visited the site and sampled the peat deposit using a series of monolith tins. An exposed section of the deposits revealed a *c* 2.5m deep section of peat, overlying a deposit of sand (possible Shirdley Hill Sand). A band of clay was recorded *c* 0.80m from the surface, which may be related to localised flooding. In total, seven overlapping monolith tins were taken, and these were double wrapped and taken back to the laboratory at the OA North offices.

2.2 LABORATORY PROCEDURES

2.2.1 Sub-Sampling: The monoliths were cleaned and described and twelve sub-samples were taken for the assessment of pollen, and sixteen for the assessment of plant macrofossils. The depths from ground surface of both sets of sub-samples are shown in the result tables in *Appendices 1* and *2*. Both the pollen and plant macrofossil samples were taken from observed lithological units within the peat in order to identify any corresponding changes in vegetation around the site during its development. In addition to the palaeoenvironmental sub-sampling, two samples were taken for radiocarbon dating.

2.2.2 Palynological Methodology: The samples were prepared for pollen using standard procedures (Faegri and Iverson 1989) and mounted in silicone oil, two exotic (*Lycopodium*) spore tablets were added to each sample to provide a standard counting reference and to determine pollen concentrations. The pollen slides were examined with an Olympus BH-2 microscope using x400 magnification routinely and x1000 for critical identifications. Counting was carried out over two cover slips and continued until a sum of at least one hundred land pollen grains was reached. Pollen identification was carried out using the standard keys of Faegri and Iverson (1989) and Moore *et al* (1991), and the reference collection held at Oxford Archaeology North. Cereal-type grains were not differentiated into types at this stage. Microscopic charcoal fragments were quantified where present, and the presence/absence of diatoms was also noted. Plant nomenclature follows Stace (1991).

2.2.3 Plant Macrofossil Methodology: Fifteen 0.05m samples were taken from the monolith tins in order to assess the assemblages of plant macrofossils. The samples were hand-floated onto a 250µm mesh and examined under a binocular microscope in order to determine the nature of the peat.

2.2.4 Radiocarbon Dating: Material for two radiocarbon dates was taken from the Rufford profile in order to provide a chronological framework in which the data could be discussed. The first sample was taken from near the base of the peat at 1.85-1.87m depth below the present ground surface. The second sample was taken from near the surface of the profile, at 0.42-0.44m depth

(the peat above this appeared to be disturbed and thus unsuitable for dating). The samples were submitted to Dr Gordan Cook at Scottish Universities Environmental Research Laboratory (SUERC) for Accelerator Mass Spectrometry (A.M.S.) dating.

2.3 ARCHIVE

2.3.1 A full professional archive has been compiled in accordance with the current IFA and English Heritage guidelines (English Heritage 1991).

3. RESULTS & DISCUSSION

3.1 PALYNOLOGY

3.1.1 The results of the pollen counts are shown in *Appendix 1* where actual pollen counts are given and charcoal fragments are shown as a scale of abundance. All of the sub-samples, apart from the lowest at 2.46m depth, were very abundant in pollen where counts of at least 100 pollen grains were reached within ten traverses of the pollen slides. The pollen was well preserved in the upper four samples (0.20-0.81m depth) and of mixed preservation at 0.89-1.89m depth. The lowest two samples contained pollen that was poorly preserved.

3.1.2 Pollen of *Alnus* (alder) and *Corylus* (hazel/myrica gale) dominate the tree/shrub assemblages in most of the samples; however there is a temporary reduction in *Corylus* pollen at 1.43m depth. In addition, *Salix* (willow) is well represented at 0.54m to 1.00m depth, and at 0.54m depth is the dominant tree species within the pollen assemblage. *Betula* (birch) is also present throughout the sequence and *Quercus* (oak) pollen is present at 0.39-1.58m depth. Other tree/shrub species, such as *Ulmus* (elm), *Tilia* (lime), and *Pinus*/Pinaceae (pine family) are also present but are represented by less than three grains.

3.1.3 The presence of a relatively high number of herbaceous pollen grains of, primarily, Poaceae (grass) Cyperaceae (sedge) and *Ranunculus*-type (buttercup) pollen suggests that the woodland around the site was open. It is also possible that the latter two were growing on the bog surface. A significant reduction in tree pollen occurs at the very top of the sequence (0.20m depth), which is accompanied by a significant rise in Poaceae (grass) pollen.

4.1.2 The preliminary identification and persistence of *Cerealia* (cereal-type) pollen at and above 1.00m depth is very interesting, and if proven, may signify cultivation in the area. The presence of *Plantago lanceolata* (ribwort plantain) at 0.89m and 0.54m depth also suggests an increase in disturbance at these levels, possibly related to pastoral activity.

3.2 PEAT LITHOLOGY

3.2.1 The preliminary results of the plant macrofossil assessment are given in *Appendix 2* and indicate a number of broad lithological changes. Indeterminate monocotyledonous fragments and *Phragmites* remains were present below 0.98m depth, which suggests that the peat developed in a reed swamp environment for much of the time. However, above 0.92m depth wood fragments are also recorded in the peat, which suggests either the encroachment of woodland onto the site, or, alternatively, the in wash of detritus. Increased clay deposition is recorded in a number of the samples (0.04m, 0.18m, 1.17m, 1.91m depth) which may represent increased flooding at these levels.

3.3 RADIOCARBON DATING

3.3.1 The results of the radiocarbon dates taken from the peat profile from Rufford are given in Table 1 below.

Depth m	Radiocarbon Age BP	Laboratory Code	2-sigma Calibrated Date BC
0.42-0.44	3055 ± 35	SUERC-6453	1420-1210
1.85-1.87	5530 ± 40	SUERC-6457	4460-4250

Table 1: Results of the Radiocarbon Determinations from Rufford

3.3.2 The radiocarbon dates suggest that the peat at Rufford started to develop in the Late Mesolithic, at 4460-4250 Cal BC (SUERC-6457). The date taken from near the top of the peat indicates that the surface is Middle Bronze Age, and dated to 1420-1210 Cal BC (SUERC-6453). The pollen record from Rufford, therefore, spans *c* 3000 years and encompasses the early-mid prehistoric period.

5. CONCLUSION AND RECOMMENDATIONS

5.1 The assessment of the pollen and macrofossils from Rufford has shown that the peat contains a record of landscape changes determined in part by prehistoric human activity. Given the proximity of Rufford to Downholland Moss SD 3208, Mere Sands Wood SD 446159, and Martin Mere SD 4170 1483, (Tooley 1978, McAllister *et al* 2004, Tooley *et al* 2004, Wilson and Bateman 2004), where sequences have been associated with changes in Late Glacial and Holocene relative sea level change and prehistoric human exploitation, it is recommended that further work is carried out on the peat deposits from Rufford. Early (pre-elm decline) records of cereal pollen and associated ruderal plants has been noted at Downholland Moss (SD3208) (Tooley *et al* 2004), and Martin Mere (SD4114) (McAllister *et al* 2004), and it is possible that the deposits at Rufford record the same regional trend. However, it is only through further analysis of the pollen that this can be established with any certainty.

5.2 It is only through much more detailed analysis of the palaeoenvironmental record at Rufford that a true understanding of the vegetation changes of the site can be established. The assessment has shown that the landscape changes at Rufford are, in part, attributed to anthropogenic activity. Given the importance of the site in its regional context, plus the evidence for early cereal cultivation in the area it is recommended that more detailed analysis be carried out. It is recommended, therefore, that 11 of the sub-samples included in this assessment should be taken to full analysis, and that a further 24 pollen samples, concentrated at stratigraphic/pollen boundaries, are also analysed. This sort of analysis should provide a relatively detailed account of the palaeoenvironmental history of the site in a regional context.

5.3 In order to determine changes in the immediate vegetation of the site it is recommended that further plant macrofossil work is also carried out. Changes in the immediate vegetation of the site are likely to be related to local groundwater conditions, which may have altered due to changes in relative sea level and/or anthropogenic activity. It is recommended, therefore, that further analysis of the existing 16 plant macrofossil samples be carried out.

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APPENDIX 1: POLLEN ASSESSMENT RESULTS

Depth (m)	**0.20**	**0.39**	**0.54**	**0.81**	**0.89**	**1.00**	**1.23**	**1.43**	**1.58**	**1.89**	**2.00**	**2.46**
Preservation	Good	Good	Good	Good	Mixed	Mixed	Mixed	Mixed	Mixed	Mixed	Poor	Poor
Microscopic charcoal fragments	++++	++++	+	+	++	+++	+++	+++	++	++	++	++
Fungal remains				5								
Fungal spores indet				1								
Trees/Shrubs/Climbers												
Alnus	7	27	25	14	24	20	22	30	33	19	38	
Betula	2	3	7	9	9	7	8	4	2	1	3	
Corylus type	12	33	30	14	7	19	16	5	21	32	48	
Fagus?									2			
Fraxinus					2							
Ilex			1									
Pinaceae	1		1						1	1	3	
Pinus	1		1						1			
Quercus		5	8	4		4	5	1	4			
Tilia		1		1								
Salix		2	45	14	19	19			2			
Ulmus					1	3	1	1	1			
Total tree/shrub/climbers	**23**	**71**	**118**	**56**	**62**	**72**	**52**	**41**	**67**	**53**	**92**	**0**
Dwarf Shrub												
Ericaceae					1					1	1	
Calluna	3	13										
Crop Plants												
Cerealia	5	2		2		1						
Herbs												
Apiaceae				1								
Aster-type	1									2		
Brassicaceae	2					2	1	1	3			
Caryophyllaceae	1		1									
Cyperaceae	2	23	7	17	16	9	48	79	16	4	7	1
Fabaceae											1	
Filipendula		6	3							2		
Galium-type							2	1	1			
Hypericum sp			1									
Lotus sp		1										
Plantago lanceolata			1		1							
Poaceae	95	23	5	30	38	26	19	10	19	43	9	
Potentilla sp					1							
Primulaceae							3					
Ranunculus type	3	6	1	29	20	24	31	14	47	6	11	
Rumex sp	2		1									
Rosaceae	2		1	1		1			2	1		
Taraxacum-type		1										
Urtica sp				1								
Total herbs	**108**	**60**	**21**	**79**	**76**	**62**	**104**	**105**	**88**	**58**	**28**	**1**

Unknown/indet. pollen												
Broken grain		6	1	4	4	7	1	2	8	13	11	
Concealed grains			2					2				
Crumpled grains	3	3	1			5	5			9	17	1
Degraded	3	3	4	14	28	13	18		15	15	17	
Unknown herbs	2	3		1		3	2	1	2	2		
Ferns												
Polypodium						1	1		1		1	
Pteropsida (monolete)					1		1	3		7	6	
Pteropsida (trilete)			5	6	6	3			2	9	8	1
Mosses												
Sphagnum	3	8								2	2	
Aquatics												
Potamogeton	2						1		3			
Typha angustifolia/Sparganium			1								1	
Typha latifolia											1	
Total counted	**162**	**217**	**257**	**193**	**201**	**207**	**208**	**187**	**222**	**165**	**213**	**1**

APPENDIX 2: PEAT LITHOLOGY

Depth (m)	**Description**
0.04-0.09	Monocot peat (silt +)
0.18-0.23	Monocot peat with wood frag. (silt +, coal +)
0.37-0.42	Monocot peat with wood frag. (charcoal +)
0.52-0.57	Amorphous peat with monocot & wood frag.
0.78-0.83	Wood peat with monocot
0.97-0.92	Monocot peat with wood frag.
0.98-1.03	Monocot peat
1.17-1.22	Monocot peat (silt +)
1.23-1.25	Monocot peat
1.41-1.46	Monocot peat with Phragmites (charcoal +)
1.48-1.53	Phragmites peat
1.58-1.60	Amorphous peat with monocot & Phragmites
1.68-1.73	Phragmites peat
1.83-1.88	Amorphous peat with monocot & Phragmites
1.91-1.96	Monocot peat (silt/sand +)
1.98-2.03	Monocot peat with Phragmites

Monocot = monocotyledon fragments

+ = rare

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