

## **Plant macrofossils from waterlogged Bronze Age palaeochannels of the River Trent at Shardlow, Derbyshire.**

Angela Monckton June 12<sup>th</sup> 2000 (ULAS Report No. 2000-71)

### **Plant macrofossils**

#### **Introduction**

Waterlogged deposits were investigated in order to provide detailed information about the ancient environment by the analysis of pollen, insect and plant macrofossil remains. Plant macrofossils are likely to be derived from near the water course, so together with the insect remains may be used to define the local conditions and vegetation. This information will be considered with that from the pollen which may be derived from both nearby and further afield, in order to contribute to conclusions about the wider area surrounding the site. The plant macrofossils were analysed and provided evidence of the wetland and waterside vegetation, with some areas of open grassland together with stands of alder trees suggested by remains in the later sample.

#### **The samples analysed**

The samples taken for plant macrofossils were from the same deposits sampled for insect remains. Two of the samples from Face 1 were submitted for this analysis; a sample from Section 9 context 0040 from the silty peat at the base of the section dated to *c.*3750 BP, and a sample from Section 11 context 0050 from the organic rich unit higher up the profile but about 9 metres away from the previous sample. This sample was assumed to be later in date than the base of Section 9 and to date to before *c.*2680 BP at the top of Section 9.

#### **Methods**

Subsamples of 500 mls of each of the selected samples were soaked in water and washed over into a 0.2mm mesh sieve. The residue was sorted with a stereo-microscope at x10-20 magnification and then remains identified by comparison with reference material in the Department of Archaeology, University of Leicester. James Greig of Birmingham University kindly helped with the identification of some of the seeds. Plant remains were listed with reference Stace (1991) and remains are seeds in the broad sense unless otherwise stated (table 1). The plants were listed in their most usual modern habitats, however this is only a guide to interpretation as some can occur in a number of habitats and these may have been different in the past.

#### **Results**

**Section 9, context 0040 (*c.*1800 BC):** This sample contained remains of club-rush (*Schoenoplectus tabernaemontani*), determined by James Greig, which together with rushes (*Juncus* sp) and sedges (*Carex* spp) indicated marshy conditions probably at the waterside. Other waterside plants included water-pepper (*Polygonum hydropiper*) and water-dropwort (*Oenanthe aquatica*). Water plants included duckweed (*Lemna* sp) and pondweed (*Potamogeton* sp) which require permanent water. Areas of slow-flowing or standing water were also suggested by water-plantain (*Alisma plantago-aquatica*) which grows in slow-flowing water, stonewort (*Chara* sp) which grows in clear still water, while crowfoot (*Ranunculus* subgen. *Batrachium*) which has floating leaves grows in shallow water.

Land plants included those of open damp ground represented by buttercup (*Ranunculus* subgen. *Ranunculus*) and water-blinks (*Montia fontana* ssp *fontana*). Plants of open disturbed ground are relatively abundant represented particularly by goosefoots (*Chenopodium* spp.) and docks (*Rumex* sp.) together with grasses (Poaceae). Wood or scrub was poorly represented by only one seed of alder (*Alnus glutinosa*) and one seed of hawthorn (*Crataegus* sp).

**Section 11, context 0050 (*- c.*730 BC):** This sample contained abundant remains of alder including seeds and catkins, other plants of wood or scrub included elder (*Sambucus nigra*) and hazel (*Corylus avellana*) identified from a nutshell fragment. A seed of bugle (*Ajuga reptans*) which is a flowering plant of woodland added to the evidence for wooded vegetation. Land plants of open ground were also found, those of damp ground included ragged robin (*Lychnis flos-cuculi*) and buttercups, a few seeds of nettle (*Urtica dioica*) which is a nitrophilous plant were found, and plants of open disturbed or arable land such as goosefoots, docks and chickweed (*Stellaria*

*media*) were relatively numerous. Silverweed (*Potentilla anserina*) was present and this grows on sandy ground often at waysides. In this sample the waterside plants included gypsywort (*Lycopus europaeus*) and water plants were also present particularly crowfoot which suggested the presence of slow-flowing shallow water.

## **Discussion**

Both samples show that standing or slow-flowing water conditions prevailed with a variety of waterside vegetation, there was more evidence of marshy conditions at the waterside in the base of Section 9. Open vegetation is represented in both samples including damp grassy vegetation with indications of arable or disturbed ground also present in both samples. However the samples differ; in the lower sample from Section 9 the land plants were dominated by plants of open ground, particularly those of disturbed ground together with grasses and some plants of grassland. This indicated a cleared environment with little evidence of woody vegetation near the water course. The upper sample from Section 11 contained abundant alder, a tree which is tolerant of waterlogging (Ingrouille 1995), with hazel and hawthorn and bugle as a woodland flower. This indicated a wooded area at the waterside although there are also plants of open, disturbed or arable ground which suggested human activity in the area rather than cultivation which is likely to have been on drier ground. There is no evidence for the extent of the wooded area which may be only a small stand of alder at the waterside, the plant macrofossils probably representing the local vegetation which also included disturbed open ground. In comparison with the pollen data there is agreement with the lower sample from Section 9, with the exception of the lack of evidence for oak and other trees which are probably at some distance from the waterside, as would be expected for trees less tolerant of waterlogging. However, although alder and birch replace oak higher up the pollen profile there is no suggestion of alder carr in either the pollen or insect data which suggested that the alder remains in Section 11 represent restricted areas of alder at the waterside.

Other sites in the Trent valley of Bronze Age date with palaeochannel deposits include Willow Farm at Castle Donington dating from c.3300-2900 BP and Hemington Quarry dating from c.2900-2750 BP both have evidence from insect remains of slow-flowing water throughout and for the presence of grassland, probably used as pasture (Smith in Ripper, Beamish, unpublished). The former has evidence of alder from plant macrofossils but not in abundance. In contrast palaeochannels from two small catchments in Leicestershire show the early mixed deciduous woodland with lime trees succeeded by mixed alder woodland by 1000 BC. These Bronze Age deposits at Kirby Muxloe date from c.3775-2400 BP and Croft from c.3360-1960 BP. Evidence of a cleared landscape of grassland was found in the Iron Age, although at Croft there was some evidence of temporary regeneration of alder in the Late Iron Age-Early Roman period (Brown et al in Cooper unpublished, Smith and Roseff et al in prep.). Both these sites show fast-flowing water at the base of the channels followed by slow-flowing water higher in the profiles.

## **Conclusions**

A sample from the base of Section 9 showed the presence of grassy open vegetation in the area with evidence of disturbance possibly from human activity, there were marshy areas at the waterside with slow-flowing water in the channel. A later sample from Section 11 contained abundant remains of alder with a few other woody plants which was thought to represent a local stand of alder at the waterside, perhaps coinciding with the change in the trees represented in the pollen profile of Section 9. Evidence of open disturbed ground was also present and areas of shallow water in the channel.

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**Table 1: Plant macrofossils from Palaeochannel Face 1, Shardlow, Derbyshire.**

	Section Number	9	11	
	Depth	Base	Middle	
<b>AQUATIC</b>				
<i>Ranunculus</i> subgen <i>Batrachium</i>		2	39	Crowfoot
<i>Rorippa</i> sp		1	-	Water-cress
<i>Myriophyllum</i> sp.		1	-	Water-millfoil
<i>Alisma plantago-aquatica</i> L.		2	6	Water-plantain
<i>Potamogeton</i> sp.		1	2	Pondweed
<i>Lemna</i> sp.		3	-	Duckweed
<i>Chara</i> sp.		4	-	Stonewort
<b>MARSH OR WETLAND</b>				
<i>Juncus</i> spp.		6	6	Rushes
<i>Schoenoplectus tabernaemontani</i> C. Gmelin		7	-	Grey Club-rush
<b>WATERSIDE</b>				
<i>Stellaria</i> cf <i>palustris</i> Retz.		-	2	Marsh Stitchwort
<i>Polygonum hydropiper</i> (L.) Spach.		1	5	Water-pepper
<i>Rumex hydrolapathum</i> Hudson		1	10	Water Dock
cf <i>Berula erecta</i> (Hudson) Cov.		1	-	Lesser Water-parsnip
<i>Oenanthe aquatica</i> (L.) Poiret		1	3	Water-dropwort
<i>Lycopus europaeus</i> L.		-	1	Gipsywort
<i>Mentha aquatica</i> L.		1	1	Water Mint
<b>WOOD OR SCRUB</b>				
<i>Alnus glutinosa</i> (L.) Gaertner		1	97	Alder
<i>Alnus</i> sp catkins		-	3	Alder
<i>Corylus avellana</i> L.		-	1	Hazel
<i>Crataegus</i> sp.		1	-	Hawthorn
<i>Ajuga reptans</i> L.		-	1	Bugle
<i>Sambucus nigra</i> L.			+	Elder
<b>DAMP OR WET GROUND</b>				
<i>Ranunculus acris/repens/bulbosus</i>		7	9	Buttercup
<i>Ranunculus</i> sp		-	7	Buttercup
<i>Urtica dioica</i> L.		-	3	Common Nettle
<i>Montia fontana</i> ssp <i>fontana</i> L.		2	-	Blinks
<i>Lychnis flos-cuculi</i> L.		-	2	Ragged-Robin
<i>Stachys</i> sp		-	1	Woundworts
<i>Galeopsis tetrahit</i> L.		1	-	Hemp-nettle
<i>Mentha</i> sp.		3	1	Mint
<i>Cirsium</i> cf <i>palustre</i> (L.) Scop.		1	2	Marsh Thistle
<i>Eleocharis</i> sp.		-	1	Spike-rush
<i>Carex</i> subgen <i>Vignea</i>		2	2	Sedge
<i>Carex</i> subgen <i>Carex</i>		6	5	Sedge
<i>Carex</i> spp		3	-	Sedge
Bryophyta		+	+	Mosses
<b>OPEN DISTURBED GROUND</b>				
<i>Chenopodium album</i> L.		4	2	Fat-hen
<i>Chenopodium</i> sp		8	4	Goosefoots
<i>Atriplex</i> sp.		1	5	Orache
<i>Stellaria media</i> L. Villars		1	12	Chickweed
<i>Stellaria</i> sp.		-	3	Stitchwort
<i>Cerastium</i> sp		2	-	Mouse-ears
<i>Polygonum</i> sp		2	-	Knotweed
<i>Persicaria maculosa</i> Gray		1	-	Redshank
<i>Polygonum aviculare</i> L.		1	-	Knotgrass
<i>Rumex</i> sp		2	14	Dock
<i>Rumex acetosella</i> L.		2	-	Sheep's Sorrel
<i>Potentilla anserina</i> L.		-	1	Silverweed
<i>Aphanes arvensis</i> L.		1	2	Parsley-piert

	<b>Section Number</b>	<b>9</b>	<b>11</b>	
<i>Solanum nigrum</i> L.		-	2	Black Nightshade
<i>Sonchus arvensis</i> L.		4	-	Perennial Sow-thistle
GRASSLAND				
<i>Leontodon autumnalis</i> L.		1	-	Autumn Hawkbit
Poaceae		12	-	Grasses
UNCLASSIFIED				
<i>Myosotis</i> sp.		14	-	Forget-me-not
<i>Brassica</i> sp.		-	2	Cabbage family
cf Sporangia		6	3	
Indetermined seeds		9	8	
Stem fragments monocot		++	+	
Bud scales		+	++	
Woody fragments		-	++	
Total		130	268	
Sample size		0.5kg	0.5kg	
Proportion sorted		all	50%	

Key: + = present, ++ = abundant. Remains are seeds in the broad sense unless stated.

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