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**Assessment of plant and invertebrate remains
from the Appletree Section, Cumbria**

by Allan Hall

Summary

Three samples of deposits associated with the 'turf wall' and its associated ditch at Appletree were examined for their content of plant (and, in passing, invertebrate) remains. Two samples from the turf wall proved to contain very few remains other than charcoal; the sample from the basal fill of the Vallum ditch gave a much larger assemblage indicating the bulk of the organic component of the deposit to have been a peaty soil, probably originally turves.

Keywords: ROMAN; HADRIAN'S WALL; TURF WALL; TURVES; MACROFOSSIL PLANT REMAINS; INSECT REMAINS

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Introduction

The 'Appletree Section' near Birdoswald, Cumbria was opened by A. J. Wilmott (English Heritage) in August 1999 for the decennial Hadrian's Wall Pilgrimage and exposed a series of deposits representing the turf wall, the fills of the ditch to the north of this wall, the Vallum ditch to the south, and various other earthworks.

Samples of up to 10 litres of sediment were collected by AH during the excavation for the investigation of turves within the turf wall, as part of an English Heritage-funded project to study archaeological turves; an opportunity was also taken to examine material from one of the basal fills of the turf wall ditch which, in the field, appeared likely also to contain turves. In the event, the ditch fill proved to contain considerable quantities of insect remains and these were kindly examined briefly by Harry Kenward.

Methods

Subsamples of 3 kg were taken from three of the samples collected:

- (i) lowermost peaty layer in turf wall (?OGS), Context 53 (sampled from floor of section), Sample 903
- (ii) combined material from basal peaty layer (?OGS) and turves above, Contexts 52+53, Sample 906; from section of turf wall between monoliths TWS1 and TWS2 sampled for pollen analysis by Dr James Wells
- (iii) basal peaty fill of ditch N of turf wall, Context 45, Sample 902

The laboratory descriptions of the sediments were as follows:

902: mixture primarily of light reddish-brown clay, mid grey-brown humic clay silt and black humic silt or amorphous organic sediment; crumbly (working plastic);

903: palest brown to light brown to dark brown to almost black slightly brittle to crumbly, variably humic sandy silt, sometimes slightly indurated

906: as 903

All three subsamples were soaked in water and subjected to gentle manual disaggregation. The resulting residues were sieved into several fractions (smallest mesh 0.3 mm) and examined for plant remains (and other components) under a binocular microscope. The abundance of remains was scored on a semi-quantitative scale from 1 (one or a few fragments or individuals) to 4 (abundant, a major component of the whole subsample). Selected remains, especially insects, were extracted for further examination. The residues were then boiled gently with a little sodium carbonate to facilitate further breakdown of the peaty sediment. The residues were re-examined using sieves as before.

Results

Table 1 lists the plant remains and other components recorded from the samples, together with their abundance scores.

Notes on the nature of the residues

Sample 902: Some lumps of peaty material were examined prior to disaggregation; they were found to comprise slightly silty/sandy, but basically very well humified organic material with ?ancient rootlets and some other vegetative fragments.

The initial disaggregation resulted in a large

residue mainly of pellets of amorphous organic sediment, with sand and some clasts of clay and a little gravel; also noted were some woody roots which might be penecontemporaneous, e.g. roots growing into peaty deposit from above before being deposited en bloc into the ditch. Some plant material appeared to have become dry and not to have fully wetted during processing (this is unlikely to be a function of the long period of sample storage of nearly one year, however).

There was a modest range of identifiable plant remains of which the more abundant were nutlets of sedges (of more than two kinds), and of *Sagittaria* (mostly rather well preserved), as well as shoots of the moss *Ceratodon purpureus* (again, usually well preserved, with rhizoids—root-like structures—attached, and in some cases the remains of perichaetial leaves indicating material which had been fruiting). Most of the plant material, however, was somewhat worn, especially the mosses (other than *C. purpureus*).

With regard to insect remains, Harry Kenward reports (pers. comm.) that the rather large assemblage of beetles was typical of what might be found in poor rough grazing land. It included *Geotrupes* and *Aphodius* dung beetles, some ground beetles and larval apices of click beetles ('wireworms'). The state of preservation of the remains varied, consistent with an origin in turves (where there is typically a mixture of old, partly decayed, specimens and fresh corpses).

Disaggregation following treatment with dilute sodium carbonate produced a much smaller residue in which the coarser (>2 mm) material consisted of woody root fragments.

A single caryopsis of the heath grass, *Danthonia* and a pinnule (frond) fragment of bracken, *Pteridium*, were the only additions to the list, though a modest number of beetle remains were also released by this additional processing.

Sample 903: the small to moderate-sized residue of about 400 cm³, consisted mostly of undisaggregated humic silt/amorphous peat and

clay, with about 150 cm³ of sand with a little gravel. There were some angular pieces of charcoal up to 10 mm, and moderate numbers of *Cenococcum* (soil fungus) sclerotia (resting bodies). After boiling with alkali, a much smaller residue was obtained of which the largest fractions were sand and charcoal. There were a very few poorly preserved insects of no interpretative value.

Sample 906: This sample was soaked for several days prior to the initial disaggregation in water. The small residue which was mostly of sand also contained quite a lot of charcoal and some *Cenococcum* sclerotia, but no other remains apart from two rather fresh-looking (presumably modern) grass caryopses.

Discussion

The samples from the turf wall failed to provide firm evidence for the nature of the vegetation growing on the turves at the time they were cut. In this respect they do not provide any corroborative evidence to add to that from pollen analysis of the same deposits (Wells 2000).

The presence of modest amounts of charcoal from branch or trunk wood in both the samples from the turf wall is perhaps unexpected. The most likely explanation for its occurrence here is that it formed during the burning of brushwood cleared from land in the vicinity of the wall during its construction, becoming incorporated into the earthwork because the fires had been lit on turves which were subsequently cut and placed into the turf wall.

Taken overall, the list of plant taxa from the ditch fill sample is not inconsistent with acid grassland vegetation existing in the area of the site today (and the nature of the insect remains seems consistent with this). If the biological remains represent material derived from turves, they indicate that areas of cropped turf were, indeed, established by this time—though it might be argued that (unless the turves had been brought from some distance) such vegetation must have been established locally in order for turves to be

cut at all—one could hardly cut usable turves from an area of woodland, scrub or arable land, for example!

One feature of the turf wall ditch fill assemblage was the presence of moderate quantities of the moss *Ceratodon purpureus*. This species is common in a variety of unshaded habitats—on bare soil (especially on heathland, but also on fallow land), walls, and rotten wood; Watson (1968, 155) notes that ‘it is a conspicuous plant in its typical state in spring, when patches of bare ground or burnt heathland are often purple with the countless setae [the stalks bearing spore capsules] of fruiting *Ceratodon*.’ Certainly it has been noted in the succession following burning on lowland heaths and commons, for example in Middlesex (Richards 1928) and Surrey (Summerhayes and Williams 1926), typically at a stage after the ash left from bonfires has become leached. It seems reasonable to suggest that disturbance to the acid grassland/heathland in the area caused by the builders of the turf wall led to the establishment of such patches of *Ceratodon* which were subsequently incorporated into the monument and thereafter fell with turves from the walls decay into the ditch below.

The much better state of preservation of plant remains in the ditch fill sample is perhaps merely a function of the greater degree of waterlogging in that feature; the turves in the turf wall, though retaining some micro-stratigraphic integrity (the humic and bleached layers had seemingly undergone very little mixing over the centuries), their raised position within the turf wall bank had led to decay of all but the most resistant materials.

Prospects for future work

Further analysis of the deposits from the turf wall does not appear to be worthwhile. However, a proper study of the plant and invertebrate remains from the ditch fills (and from the organic deposits in the fills of the Vallum ditch, not examined in this investigation) should be made in order to characterise the deposits more fully and to explore the history of their formation in relation to the life and decay of the turf wall, and in particular to

elucidate the nature of the vegetation in those areas from which turves were obtained. Parallel studies of plant and invertebrate macrofossils are seen as imperative to maximise the value of the results.

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Table 1. Plant remains and other components in the samples from the Appletree Section. All material was uncharred unless otherwise indicated. Key: ab.—abundance score.

Context 45, Sample 902

Taxon	parts	ab.	notes
<i>Pteridium aquilinum</i> (L.) Kuhn (bracken)	pinnule fragment(s)	1	very decayed
cf. <i>Alnus glutinosa</i> (L.) Gaertner (?alder)	charcoal	1	max size 10 mm
cf. <i>Quercus</i> sp(p). (?oaks)	charcoal	1	max size 10 mm
<i>Rumex</i> sp(p). (docks)	perianth(s)/perianth segment(s)	1	
<i>Caltha palustris</i> L. (marsh marigold)	seed(s)	1	
<i>Ranunculus</i> Section <i>Ranunculus</i> (meadow/creeping/bulbous buttercup)	achene(s)	1	rather worn
<i>R. flammula</i> L. (lesser spearwort)	achene(s)	1	
<i>Rubus</i> cf. <i>idaeus</i> L. (?raspberry)	seed(s)	1	a single fragment
<i>Potentilla</i> cf. <i>erecta</i> (L.) Rauschel (?tormentil)	achene(s)	2	
<i>Viola</i> sp(p). (violets/pansies, etc.)	seed(s)	1	a single fragment
<i>Erica tetralix</i> L. (cross-leaved heath)	charred leaf/leaves	1	a single specimen
<i>Calluna vulgaris</i> (L.) Hull (heather, ling)	flower(s)	1	very worn
	shoot tip(s)	1	
cf. <i>Calluna vulgaris</i>	charred root and/or basal twig fragment(s)	1	
cf. <i>Veronica</i> sp(p). (?speedwells, etc.)	seed(s)	1	
<i>Juncus bufonius</i> L. (toad rush)	seed(s)	1	rather worn
cf. <i>Luzula</i> sp(p). (?woodrushes)	seed(s)	1	very decayed
<i>Danthonia decumbens</i> (L.) DC. in Lam. & DC. (heath grass)	caryopsis/es	1	
Gramineae (grasses)	leaf fragment(s)	1	modern
	uncharred caryopsis/es	1	
	uncharred culm fragment(s)	1	?modern
<i>Scirpus setaceus</i> L. (bristle club-rush)	nutlet(s)	1	fragment(s) only
cf. <i>Eleocharis</i> sp(p). (?spike-rushes)	nutlet(s)	1	very decayed
<i>Carex</i> sp(p). (sedges)	nutlet(s)	3	
Mosses			
<i>Polytrichum</i> sp(p).	leaves/leaf-bases and/or shoot fragment(s)	1	
<i>Ceratodon purpureus</i> (Hedw.) Brid.	leaves and/or shoot fragment(s)	2	
<i>Aulacomnium palustre</i> (Hedw.) Sch waegr.	leaves and/or shoot fragment(s)	1	
<i>Thuidium tamariscinum</i> (Hedw.) Br. Eur.	leaves and/or shoot fragment(s)	1	
<i>Hylocomium splendens</i> (Hedw.) Br. Eur.	leaves and/or shoot fragment(s)	1	

Context 53, Sample 903

Taxon	parts	ab.	notes
cf. <i>Corylus avellana</i> L. (?hazel)	charcoal	1	max size 10 mm
cf. <i>Calluna vulgaris</i> (?heather, ling)	charred root and/or basal twig fragment(s)	1	max size 5 mm
<i>Juncus bufonius</i> (toad rush)	seed(s)	1	very worn
Gramineae (grasses)	uncharred caryopsis/es	1	?modern
<i>Carex</i> sp(p). (sedges)	charred nutlet(s)	1	a single fragment

Context 53+52, Sample 906

Taxon	parts	ab.	notes
cf. <i>Alnus glutinosa</i> (L.) Gaertner (?alder)	charcoal	1	max size 10 mm
<i>Quercus</i> sp(p). (oak)	charcoal	1	max size 10 mm
cf. Pomoideae (? <i>Crataegus</i> / <i>Malus</i> / <i>Pyrus</i> / <i>Sorbus</i>)	charcoal	1	max size 10 mm
Gramineae (grasses)	waterlogged caryopsis/es	1	modern

Other remains recorded in the samples:

<i>Sample</i>	<i>902</i>	<i>903</i>	<i>906</i>
Item	ab. notes	ab. notes	ab. notes
Cenococcum (sclerotia)	1	2 mostly <1 mm	2
Pre-Quaternary megaspores	1	-	-
beetles	2	1	-
charcoal	1 max size 10 mm	2 max size 10 mm	2 max size 15 mm
charred moss	1	1	1
coal	1 max size 10 mm	1 max size 10 mm	-
earthworm egg capsules	1	-	1
?earthworm egg capsules	-	2	2
fly puparia	1	1	-
gravel	1 max size 25 mm	1 max size 5 mm	-
herbaceous detritus	1	-	-
mites	-	1	-
moss (leafless stems)	1	-	-
part-burnt wood	-	1 max size 5 mm	-
root bark/epidermis fragments	1	-	-
root moulds (min)	-	1	1
root/rhizome fragments	1	-	-
root/rootlet fragments	2	1	1 ?modern
sand	2	2	2
twig fragments (charred)	1 max size 5 mm	-	-
woody root fragments	2 max size 30 mm	1	-