

Field notes and assessment of pollen from sediments associated with the ditch at Duffield Castle, Derbyshire (National monument 23334)

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Background

Duffield Castle (Grid reference: SK 343 440), Derbyshire, is a multi-period motte and bailey structure that dates back to shortly after the Norman conquest of AD 1066. The original timber structure was replaced by a stone keep *circa* AD 1177 which itself survived until demolition, probably after AD 1266; the site has since been used as farmland until the 1880s when the surrounding area was developed for housing. The stone built keep was a square tower, 30 x 28 m, making it one of the largest examples of its type in Britain (Williamson 1932, p111). The authors were invited to visit the site by Tom Cromwell (CAS) during an evaluation excavation of one part of the scheduled area which was subject to an outstanding outline planning permission. This area is situated to the south of the castle and incorporated the castle ditch. A machine and hand-cut trench was excavated across the outer half of the ditch area and the sedimentary sequence revealed was the focus of the present investigation.

Aim and objectives

The overall aim of the project is to characterise the archaeology on the site, in order that the Inspector of Ancient Monuments may make informed decisions regarding the granting of planning consent, and the requirement for any conditions attached to such consent. The specific objectives of the work presented here are to assess the potential of the ditch deposits to provide information about local environmental conditions in and around the ditch, the sequence of cutting and infilling (including any re-cutting) and the source of the infilling material.

Methodology

Exposed sections of sedimentary sequences were viewed in the field; these were supplemented by adjacent borehole investigations using a hand-held powered gouge auger. Three locations were cored and recorded in the field. Samples were returned, housed in the gouge chambers, to the AML for further recording and sampling for pollen analysis.

Stratigraphy

Of the three boreholes undertaken only one, borehole DC/2, was collected and sampled for pollen analysis. The stratigraphic sequence was recorded both in the field and in the laboratory. The laboratory sediment description is detailed below in Table 1. The depths shown in table 1 have been adjusted to account for sediment compaction as a result of the coring process; a compression gap of 16 cm at the top of the second metre of the core was recorded. The measured depths for 100 - 200 cm have, therefore, been corrected using the formula of Canti and Meddens (1998).

Table 1 Core DC/2 stratigraphical description

Depth (cm)	Sediment description	Adjusted depths
0-100	Not returned to the laboratory (see field notes)	
100-116	Compression gap	
116-150	Light creamy grey fine sandy silt + stone inclusions (mottled)	100-140
150-155	Light creamy grey silty fine sand	140-146
155-163	Light creamy grey silty fine sand with orange mottling	146-156
163-175	Transition - increasing mottling to grey/brown organic fine sandy silt	156-170
175-200	Light brown fine sandy silt (some organics?)	170-200
200-250	Brown sandy silt (organic) - homogenous	
250-290	Medium grey silty clay (stiff)	
290-400+	Dark grey silty clay	

Samples

Six samples were prepared for assessment for pollen from the thickest sediment sequence recorded in borehole 2; these were taken at the following (non-adjusted) levels: 117-118 cm, 133-134 cm, 182-183 cm, 228-229 cm, 270-271 cm and 320-321 cm.

Laboratory work

A sub-sample (1g wet weight) from each level was prepared by the author for pollen analysis using the methodology outlined in Barber (1976). This included treatment with HF and the adding of a *Lycopodium clavatum* spore tablet to each sample if pollen and/or charred particle concentrations needed to be calculated (see Stockmarr 1971). Each sample was mounted in silicone fluid to both prevent rapid decay of the pollen residue and to aid microscope analysis. The pollen were counted with a Leitz Dialux microscope, using Andrew (1990), Moore *et al.* (1989) and the Ancient Monuments Laboratory pollen reference collection for critical identifications. Ordinarily in pollen assessments a slide would be prepared for each sampled level and all would be counted to either a minimum of 100 grains of land pollen or all pollen in 10 traverses of the slide - whichever is first achieved. In this case it soon became clear that most samples were barren of pollen and, therefore, only 5 traverses of each slide was undertaken. Nomenclature follows Stace (1991).

Results

[N.B. All results detailed in the following sections are based on a limited amount of data produced during an assessment exercise. Any interpretation suggested here should be regarded as provisional pending more detailed analysis and should not be used in a final report except when no further analysis is undertaken].

The results of the assessment of pollen in the six prepared samples are detailed in Table 2 below.

Table 2 *Assessment for pollen for D/2*

Depth (cm)	Palynomorphs	Transects	Exotics*
117-118	Poaceae 4; Caryophyllaceae 1; Lactuceae 1; <i>Pteridium</i> 1.	5	33
133-134	Poaceae 1; <i>Plantago</i> undiff. 1; Pteridopsida (monolete) 2; <i>Polypodium</i> 1.	5	17
182-183	None	5	20
228-229	None	5	13
270-271	None	5	14
320-321	None	5	7

**Lycopodium clavatum*

The four lowermost samples are barren of palynomorphs. The pollen recorded in the uppermost two samples (133-134 and 117-118 cm) after five transects were too few to place any sensible interpretation on the assemblages, however, no arboreal species are recorded. The high exotic to palynomorph ratio indicates how low the pollen concentrations are in these samples.

Recommendations

An assessment of the pollen on six samples from different sedimentary horizons in the ditch that surrounds Duffield Castle proved to be unproductive. Only in the two uppermost samples were any palynomorphs recorded and these were not in high enough concentrations to warrant further investigation. Therefore, no further pollen analysis is recommended.

References

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