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Site visit to Sutton Common, South Yorkshire, and pre-assessment of soils and sediments for geoarchaeological analysis

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Introduction

Excavations at Sutton Common were carried out during September 1999 by the Centre for Wetland Archaeology (CWA), University of Hull, under the supervision of Henry Chapman and the direction of Robert Van de Noort. The site is located south of Askern, in South Yorkshire (SE563122) and includes two scheduled prehistoric enclosures separated by the now completely drained palaeochannel of the Hampole Beck, Enclosure A being to the east and Enclosure B to the west of the palaeochannel. During the 1980s and 1990s the land was cultivated and affected by drainage measures. This has probably influenced, to different extents in different parts of the area, organic preservation of archaeological materials.

Timber palisades in Enclosure A were ascribed to the early Iron Age (Van der Noort and Chapman, 1999). As described by the site supervisor, previous excavations had revealed that occupation occurred in two phases, Phase 1 during the construction of the timber palisade surrounding Enclosure A, and Phase 2 referring to the later construction of banks and ditches. There appeared to be a period of abandonment and peat deposition between the two phases. A number of hypotheses have been made concerning the period between the two phases and the reasons for abandonment after Phase 1.

The aims of recent studies and of recommended research by the CWA included monitoring the effects of re-wetting, and archaeological investigations in desiccated areas. The excavation in September 1999 was aimed at investigating the archaeological features of Enclosure A, the preservation of organic materials, a causeway and post alignment joining Enclosures A and B, and a possible bridge at the entrance of enclosure A, establishing the phasing of materials from the palaeochannel, and removing a track which blocked water flow in the enclosures.

Such investigations were also aimed at the preparation of an updated project design including a statement of potential for analysis and further excavations in Enclosure A.

At the time of the visit, the excavation included ten 30 x 3 m trenches within Enclosure A: Trenches D10, E11, F10, F12, G11, H10, I9, I11, J10 and K9, and a larger trench at the entrance of Enclosure A.

Geoarchaeological issues and aims

Post holes in several trenches still contained timbers. In Trench D10, four wooden stakes linearly arranged and inserted into apparently similar material displayed different degrees of preservation. In other trenches, such as Trench I11 and J10, holes containing preserved stakes, also contained material of uncertain nature. Other features interpreted as possible post-holes did not contain wood but the upper parts of their fills were interspersed with grey sediments apparently different from all other sediments represented on the site.

In Trench I9, organic-rich non-peaty deposits pre-dated peat deposition and what was defined by the excavator a stone wall of Phase 2.

Thus, the main aims of the geoarchaeological work are:

- investigating whether materials stratigraphically attributed to Phase 1, represented particularly within Trenches D10, F10 (and subordinately in other small trenches) were buried paleosols; understanding their relationship with other contexts and the relationship of the constituents of the possible paleosols.

- investigating the nature of sediment/soil material collapsed into some of the post-holes containing timbers; establishing whether such materials consisted of paleosols of Phase 1, or more recent materials or other materials of Phase 1.

- investigating the nature of the organic-rich non-peaty deposits, and the over- and under-lying deposits of Trench I9.

- establishing the nature of the grey sediments found above and around a possible post-hole of Trench E11.

Methods

Local soils were observed and partly described. In order to investigate whether some of the deposits represented in a number of trenches were buried paleosols or not, two representative sections in Trench F10 (Section F) and Trench D10 (Pit D) were investigated and described, with a provisional designation of soil horizons and their relative boundaries. Selected sediments and soils, suggested by the excavators to be possible remains of ancient paleosols of Phase 1 collapsed into post holes, were also investigated and partly described (Trenches I11 and J10). Undisturbed samples of the possible buried soils and of the surrounding, overlying and underlying deposits were collected using Kubiena boxes, and replicated with loose samples in plastic bags.

Undisturbed samples of the non-peaty organic-rich material and over- and under-lying deposits in Trench I9, as well as a representative sample of some sediments associated with posthole-like features and seemingly containing ash (Trench E11) were also collected.

The samples collected are listed in Table 1.

Preliminary results

Preliminary field observations suggested that the materials from the sampled profile in Pit D in Trench D-10 could include the following succession, from top to bottom:

Ap horizon: Modern plough soil, with sharp regular boundary with horizon below;

2Ab horizon: Part of, or total upper horizon of buried soil profile. Clear irregular (with pockets and undulations) boundary with horizon below.

2Eb horizon: Bleached horizon of buried podzol-like soil. Gradual to clear boundary with horizon below, with pockets shallower or deeper than their width.

2Bb horizon: Buried B horizon, possibly spodic horizon of buried podzol or podzol-like soil.

Section F of Trench F10 also included a regular succession of horizons, but here the sequence was interrupted by a more recent feature including limestone boulders surrounded and overlain by dark grey and black deposits. The feature was tentatively interpreted by the excavators as modern. The succession of horizons where the section was not affected (or only lightly affected) by the modern feature, can be summarized as including, from top to bottom:

- A thin black layer;
- 2Eb horizon: Eluvial bleached horizon of buried podzol-like soil. Possibly truncated;
- 2Bb horizon: Buried B horizon, possibly spodic horizon of buried podzol or podzol-like soil.

Where the section was affected by the ?modern feature, dark grey and black sediments were inter-layered within materials from the buried E horizon or between the buried E and buried B horizons.

In the south-facing side of Trench I9, near the stone wall of Phase 2, a thin black layer of material, similar to the thin black layer of Section F, pre-dated the wall (on the basis of Henry Chapman's stratigraphic designation) and a thin layer of peat.

Such thin black layer overlay a succession of two horizons, preliminarily interpreted as a buried A horizon overlying a buried E horizon. Both A and E horizons here were very similar to the buried E and A horizons of the successions of Section F and Pit D.

The post hole fills investigated in Trenches I11 and J10 contained *in situ* wood with other dark material in their central part, together with mineral-rich deposits, similar to local B horizons. It was unclear whether parts of E horizons were also represented inside the holes. Local soils immediately adjacent to the post holes were characterized by a lighter colour.

'Haloes' of lighter soil colour also characterized the soils surrounding the four wood stakes arranged in a row within Trench D10.

Discussion, statement of potential and recommendations

An hypothesis for the interpretation of the sequences in Pit D of Trench D10 is that the materials in the pit represent a buried soil profile which, on the basis of the excavator's stratigraphic interpretation, can be attributed to Phase 1. The profile seemed complete or almost complete. If any truncation occurred, it did not affected the entire A horizon but only its upper part. The soil type was a podzol or a podzol-like soil, very acidic and subject to leaching and movement of particles through the profile. As podzol profiles may or may not have an organic or peaty topsoil above their A horizon, it was not clear whether and to what extent the profile was truncated above the buried A horizon.

Both on-site consultation with Dr Jane Bunting and laboratory observations at the EAU suggested that the thin black layer overlying the possible 2Eb-2Bb horizon sequence in section F (Trench 10) consisted of charred wood. Microscopic observations showed that charred twigs were mineralized by iron oxides (possibly haematite). Similarly to Pit D, the sequence of Section F also seemed to represent a buried soil, though here the buried upper A horizon was missing. The profile seemed to have been truncated, with the thin charred layer covering its upper part along the truncation

level.

Regardless of the depth of truncation, however, field observations for both soils of Pit D and Section F strongly suggested that the materials represented buried paleosols.

It is likely that the succession pre-dating the stone wall of Phase 1 in Trench I9 also represented a sequence similar to that of the undisturbed part of Section F. Furthermore, the thin black layer overlaying the possible A-E horizon succession of Phase 1 in Trench I9 was very similar to the charred material of the thin black layer overlying the buried A-E horizon succession in Section F. A tentative interpretation of some deposits in the middle part of the same Trench I9 is that the succession includes charred material, probably mixed with uncharred organic-rich sediments and overlying a buried E horizon. Such interpretation, however, is provisional and needs full confirmation through micromorphological analysis.

Though the evidence described needs further investigation through laboratory analysis, similarities were observed between the sequences of Pit D, Section F and Trench I9, all including a succession of the type A-E-B buried horizons, often truncated and covered by charred wood in a position corresponding to the upper and final deposits of the sequences of Phase 1. Such evidence prompts the question of whether soil truncation or end of soil development in the final stages of Phase 1 were caused by fire, at least in the area between Trenches F10 and I9, or perhaps even elsewhere. It is hoped that further excavations, in a larger area, particularly between Trenches F10 and I9, will help to answer this question.

Again, all the above hypotheses need to be confirmed through a detailed macro-morphological description of the samples collected and through micro-morphological or microscopic analysis. In order to investigate vegetation and land use prior to peat deposition, it seems fundamental that pollen analysis from the pre-peat layers is carried out, both in Trench I9 and in the stratigraphically correlated deposits. It is important that further geoarchaeological and palynological studies are carried out on the same or stratigraphically correlatable samples of the pre-peat sequences. Both analyses will also help to broaden the interpretations.

In order to understand the nature of the material within the post-holes of Trenches I11 and J10, it is necessary to carry out a macro- and micromorphological description of the available samples. In particular, in order to understand whether the dark material and mineral-rich deposits in the central part of the holes consisted of parts of a paleosol of Phase 1 collapsed into the holes, it will be necessary to compare such deposits with the deposits of Pit D and Section F. The lighter haloes in the soil immediately adjacent to the post holes could probably have resulted from iron depletion, or by the presence of different material deliberately lain around the post.

An interpretation of the nature of the lighter colour of local soils surrounding the four wood stakes arranged in a row in Trench D10 is not included in the aims of this investigation, and detailed studies on issues related to preservation/decay of the stakes and other materials are object of other investigations by James Cheetham, research student at the University of Hull.

A summary of the recommended analysis is described in Table 1.

Retention

All samples collected are retained at the EAU, University of York, in cool dark storage conditions.

Archive

All material relating to the work reported here, including papers and photographs, is currently stored at the EAU, University of York.

Acknowledgements

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References

Van der Noort, R and Chapman, H. (1999) *Archaeological investigations and evaluation at the earthworks on Sutton Common, Norton, South Yorkshire. Project design 17 August, 1999*. Hull: Centre for Wetland Archaeology.

Table 1. Geoarchaeological samples collected

Sample	Trench	Notes	Recommendations
I91	I9	Kubiena box. South facing. South of Phase 2 stone wall. Includes a possible A/E horizon transition below a charred layer, in turn below a modern Ap.	Thin section recommended.
I92	I9	Kubiena box. Central part of trench, south of Phase 2 stone wall. Includes possible transition between a charred ?A horizon and an E horizon underneath it.	Thin section recommended.
I93	I9	Undisturbed lump. From central part of trench, south of Phase 2 stone wall. Includes a buried ?A horizon.	Thin section recommended.
F102	F10	Kubiena box. At 30-41 cm. Includes traces of B and E horizons, charred layers mixed with fragments of the ?B horizon.	Thin section recommended.
F101	F10	Kubiena box. At 30-40 cm (left side of pit). Includes a transition between modern soils, ?Eb and ?bB horizons.	Thin section recommended.
F10bE	F10	Loose sample in plastic bag. ?E horizon	Macro-morphology recommended. No thin section.
F10bl	F10	Loose sample in plastic bag.Black/dark possibly charred plant material mainly above E horizon.	Macro-morphology and microscopic observations recommended. No thin section.
F10m	F10	Loose sample in plastic bag. Modern soil.	Macro-morphology recommended. No thin section.
F10dg	F10	Loose sample in plastic bag. Dark grey, possibly burnt material.	Macro-morphology and microscopic observation recommended. No thin section.
F10bs	F10	Loose sample in plastic bag. Buried ?B horizon.	Macro-morphology recommended. No thin section.

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Table 1 (continued)

E11	E11	Undisturbed lump. Grey ?burnt material from top of feature.	Macro-morphology and thin section recommended.
D101	D10	Kubiena box. At 19-29 cm. Includes Ap-bA-bE and possibly some bBs horizons.	Thin section recommended.
D102	D10	Kubiena box. At 28-38 cm. Includes bE-bB horizons with roots and Fe accumulation.	Thin section recommended.
D103	D10	Kubiena box. At 32-42 cm. Includes bB horizon only	Thin section recommended.
D103l	D10	Loose sample in plastic bag. Darker parts of buried Ab horizon passing to E with a few parts of the Ap horizon.	Macro-morphology. No thin section.
D10E	D10	Loose sample in plastic bag. Lighter-coloured parts of E horizon and parts of overlying ?bA horizon	Macro-morphology. No thin section.
D10A	D10	Loose sample in plastic bag. Ap horizon.	Macro-morphology. No thin section.
D10B	D10	Loose sample in plastic bag. B horizon	Macro-morphology. No thin section