ASSESSMENT OF SOIL MICROMORPHOLOGY OF FEATURE FILLS FROM PERRY OAKS

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This assessment is for the purpose of recommending which soil micromorphology samples taken from the main Perry Oaks (WPR98) and Northern Taxiway (GA199) sites should see further processing and interpretation. The final report will be combined the micromorphology results from the T5 excavations and will be presented in volume 2 of this series.

No remains of buried soils were present on site, largely due to the absence of upstanding monuments or covering alluvium. This has meant that geoarchaeological work has had to focus on feature fill characterisation in order to develop an understanding of landscape. In soil micromorphology in this part of Britain there is little precedent for studying an entire landscape from feature fills, but the present author is currently involved in several research projects aimed at characterising fills on Neolithic ritual sites, and this line of enquiry shows promise for understanding site and landscape history in the absence of the more standard types of deposits usually addressed. In order to develop a history from feature fills it is necessary to analyse and interpret fills from a number of different phases of the sites. For this reason, sampling focused on the ditch systems, gullies and cursus ditches dating from the Neolithic to the Romano-British period.

Following on from the site visits made, the background information gathered to date, and discussions with Martin Bates, Mike Allen and Stuart Needham, the following contexts from the Perry Oaks site are considered to be priorities for micromorphological analytical work (see Table 1):

The cursus ditch fills – although shallow, some potential is shown in the cursus ditch fills, which have the possibility of reflecting Neolithic landscape and land use. The ditches present two different profiles - both have 2 horizons visible in the field, but the one closest to the alluvium has what appears to be a B horizon. This is probably related to later processes; possibly the extent/depth of original covering alluvium has resulted in increased clay in the lower ditch, with the later different profile development seen once the fills became stabilised (?). This is interesting because no other published accounts of the two ditches excavated at other points along the cursus describe any obvious differences between their fills (O'Connell 1990; Cotton 1990). Three samples were taken by the author, and these should be interpreted in comparison with the bulk samples taken by M. Bates regarding their sedimentary history. For this reason soil samples were taken from the same locations.
SAMPLE NUMBERS RECOMMENDED FOR PROCESSING - 1029 from cut 153023, from the northern end of the eastern cursus ditch. The upper 2-3 cm of the section as recorded by M. Bates is probably missing from this sample (to be confirmed upon thin sectioning). 1066 and 1067, (series 1065), from the western cursus ditch, from cut 149006.

The Bronze Age wells/watering holes/deep pits – samples were taken by the author from the lower fills in Bronze Age pit 425013 regarding Bronze Age

landscape/land use indicators, for comparison to other environmental samples from these same fills. This will also be co-ordinated with the work of Martin Bates. It was decided to sample from the basal fills as these may contain some soil deposited in them from which to discuss land use and the appearance of the landscape. At the very least, in the absence of such deposits, some information on fill deposition should be forthcoming for comparison to other environmental samples. The samples will also be fitted in to any possible sequence that might result.
SAMPLE NUMBERS RECOMMENDED FOR PROCESSING – 1087 [125039], 1088 & 1089 [125043]

The alluvial sequence – regarding the possibility of tying in the sequence here with that developed at Runnymede (unpublished) by S. Limbrey and S. Needham (S. Needham, pers. comm.), it was recommended that the alluvial sequence be studied micromorphologically in tandem with the sedimentological work. Regarding this sequence, S. Needham mentions a high power flooding event overlying the later Neolithic material at Runnymede. This may be visible in Martin Bates' work (if represented in particle size) or through detailed micromorphological observation for possible truncation horizons. In this regard, the production of some of the samples taken by the unit for soil micromorphology should be processed and analysed. I am assuming that these samples come from the Perry Oaks site due to their sample numbering. One sample series would probably suffice for useful comparative information to the bulk analyses. The choice of series or exact sample numbers depends on further specific details of contexts sampled and reason for sampling, and should be co-ordinated with other environmental work.
ONE SAMPLE SERIES IS RECOMMENDED FOR PROCESSING

Early Bronze Age ditch – one sample has been taken through the diagonal ditch (cut 132003) from the same location as M. Bates' analyses. This forms part of a group of samples aimed at addressing land use and landscape appearance through remnant soil materials that may survive in ditch fills, as well as providing comparative evidence for the sedimentary analyses. In addition, there is a small possibility that this group (with at least one profile from contexts from each of the periods identified) might form a sequence over time, allowing landscape history to be explored.
SAMPLE NUMBER RECOMMENDED FOR PROCESSING - 1030, diagonal ditch, cut 132003, (probably lost upper 2 cm).

Bronze Age field ditches - one profile was taken through the Bronze Age field ditches, through the ditch that Martin Bates sampled in Area B. It is not expected that this profile will necessarily give particularly informative or conclusive evidence regarding Bronze Age landscape (although this is possible), but it does have the same basic potential as the shallow cursus ditches, and will at least provide useful comparative material as discussed above. Recent work along the Thames valley system suggests many BA field systems are related to pastoral activities (Yates 1999), despite the lack of investigation into land use on the sites of these systems themselves. There are now at least 4 'ard mark' sites in central London on the floodplain itself (Wolseley St., Lafone St., Phoenix Wharf (Bates and Minkin 1999) and Hockton St. (recently under excavation by Preconstruction Archaeology)), some of which appear to date to the Bronze Age. The ditch fills at Perry Oaks present an opportunity to assess the field system for land use. If useful

information results in this regard, Perry Oaks could prove to be an important site regarding the relationship of land-use types to Bronze Age field systems in the region.
SAMPLE NUMBERS RECOMMENDED FOR PROCESSING - 1083, 1084, 1085 (series 1082), taken from cut 148014.

Remnant profiles – one location was found which showed a ditch cut into brickearth, where substantial brickearth remains in section above the present-day level of the site. This location was sampled by M. Bates for soil micromorphological analysis, and it is recommended that these samples be processed as comparative background samples.
SAMPLE NUMBERS RECOMMENDED FOR PROCESSING -1076, 1077, 1078 (series 1075), taken from cut 107090. 1076 – upper fill of ditch (123066); lower fill of ditch (107091). 1077 – ditch lower fill; cut (107090); brickearth. 1078 – ditch lower fill; cut; brickearth (mostly brickearth).

Iron Age ditches/gullies; Romano-British ditches/pits - in tandem with M. Bates' sampling, one or two profiles were recommended to be taken through Iron Age and Romano-British features. Regarding the Iron Age gullies, it would be interesting to do in-depth assessment of gully fills, as they might be informative regarding the history of the central blocked-out area in comparison to field system plots outside. Some samples were taken from pits and wells by the unit (see Table 2), and if any of these come from Iron Age and Romano-British deposits, I would recommend processing a small number for comparison to each other and to the Bronze Age ditches.

Table 1 Specific samples from the Perry Oaks site recommended for further processing at this stage

Sample No.	Context No.	Field description
WPR 1023	146050	LBEI pit, Section no. 646006, View 3052, 0.37-0.45m rel. depth
WPR 1024	146052	LBEI pit, Section no. 646006, View 3052, 0.6-0.68m rel. depth
WPR 1029	154022	Cursus ditch fill from the northern end of the eastern cursus ditch. The upper 2-3 cm of the profile as recorded by M. Bates is probably missing from the sample (to be confirmed upon thin sectioning). Section no. 653004
WPR 1030	132004	Early Bronze Age ditch (diagonal across site), probably lost upper 2 cm. Section no. 632001
WPR 1066A	149007	Cursus ditch fill, from the western cursus ditch, Section no. 649002
WPR 1066B	149007	Cursus ditch fill, from the western cursus ditch, Section no. 649002
WPR 1067	149008	Cursus ditch fill, from the western cursus ditch, Section no. 649002
WPR 1076	123066	Upper and lower fills of ditch/ring gully in brickearth, Section no. 623022, 0-0.15m rel. depth
WPR 1077	107091	Lower fill and cut of ditch/ring gully in brickearth; and brickearth 'natural', Section no. 623022, 0.15-0.30m rel. depth
WPR 1078	107090	As 1077, but mostly the brickearth, Section no. 623022, 0.15-0.30m rel. depth
WPR 1083A	148014	Bronze Age field system ditch, Section no. 648002, upper rel. depth
WPR 1083B	148014	Bronze Age field system ditch, Section no. 648002, upper rel. depth
WPR 1084	148014	Bronze Age field system ditch, Section no. 648002, mid rel. depth
WPR 1085	148014	Bronze Age field system ditch, Section no. 648002
WPR 1087	125039	Bronze Age watering hole, Section no. 627004
WPR 1088	125043	Bronze Age watering hole, Section no. 627004
WPR 1089	125043	Bronze Age watering hole, Section no. 627004

Other samples recommended for selection for processing:
- one series through the palaeochannel
- samples from Iron Age and Romano-British contexts, if any are listed in Table 2

Other samples – several samples were taken by the unit (see Table 2). It is assumed that all samples with a number starting with a 5 are from the Northern Taxiway site, and that all others are from Perry Oaks. No information was provided to the author as to the dates or detailed context descriptions of most of these samples, or reason for sampling, and it is thus not possible to recommend specifically which of these samples should be processed in any detail at this time. However, in addition to the notes made above regarding palaeochannel samples and possible Iron Age and Romano-British contexts sampled, I would recommend that all three of the samples from the possible pyre at the Northern Taxiway site (5037-5039, section 715011) be processed. Soil micromorphology is a proven method for identifying the microscopic components of sediments, and much work on burnt contexts has been carried out (e.g. Gé *et. al*. 1993). Thin section analysis should determine the components of the possible pyre, thereby helping in its interpretation. In addition, the ditch samples taken (5041, 5043-5044) could prove interesting in comparison to the Perry Oaks material.

Table 2 Other samples available for further soil micromorphological study

Sample Type	Sample No.	Context No.	Field description
Kubiena tin	947	125013	Water-hole, Section no. 627001, 0.12-0.42m rel. depth
Kubiena tin	1333	100000	Palaeochannel, Section no. 682007, 0.37-0.52m rel. depth
Kubiena tin	1334	182032	Palaeochannel, Section no. 682007, 0.72-0.88m rel. depth
Kubiena tin	1335	100000	Palaeochannel, Section no. 6820070.37-0.53m rel. depth
Kubiena tin	1336	182032	Palaeochannel, Section no. 682007, 0.65-0.8m rel. depth
Kubiena tin	1337	182028	Palaeochannel, Section no. 682007, 0.94-1.1m rel. depth
Kubiena tin	1359	100000	Palaeochannel, Section no. 682007, 0.27-0.43m rel. depth
Kubiena tin	1360	148215	Palaeochannel, Section no. 682007, 0.49-0.65m rel. depth
Kubiena tin	1361	148215	Palaeochannel, Section no. 682007, 0.68-0.84m rel. depth
Kubiena tin	1362	182040	Palaeochannel, Section no. 682007, 0.88-1.04m rel. depth
Kubiena tin	1363	182040	Palaeochannel, Section no. 682007, 1.07-1.23m rel. depth
Kubiena tin	1364	148214	Palaeochannel, Section no. 682007, 0.53-0.69m rel. depth
Kubiena tin	1365	148230	Palaeochannel, Section no. 682007, 0.79-0.95m rel. depth
Kubiena tin	1366	182040	Palaeochannel, Section no. 682007, 1.1-1.26m rel. depth
Kubiena tin	1383	124111	Well, Section no. 624014, 0.12-0.24m rel. depth
Kubiena tin	1384	123047	Well, Section no. 624014, 0.26-0.36m rel. depth
Kubiena tin	1385	123047	Well, Section no. 624014
Kubiena tin	1400	129118	Pit, Section no. 656057, view 3608
Kubiena tin	1509	100000	Palaeochannel, Section no. 682008, 0.23-0.39m rel. depth
Kubiena tin	1510	148214	Palaeochannel, Section no. 682008, 0.45-0.61m rel. depth
Kubiena tin	1511	182038	Palaeochannel, Section no. 682008, 0.68-0.84m rel. depth
Kubiena tin	5037	215043	pyre?, Section no. 715011
Kubiena tin	5038	215041	pyre?, Section no. 715011
Kubiena tin	5039	215040	pyre?, Section no. 715011
Kubiena tin	5041	215012	Ditch, Section no. 715001, 0.17-0.36m rel. depth
Kubiena tin	5042	215012	Deliberate backfill, Section no. 715001, 0.44-0.63m rel. depth
Kubiena tin	5043	215009	Ditch, Section no. 715001, 0.76-0.95m rel. depth
Kubiena tin	5044	215005	Ditch, Section no. 715001 0.98-1.09m rel. depth
Kubiena tin	5045	215002	Natural feature, Section no. 715001, 0.07-0.18m rel. depth
Kubiena tin	5049	212007	Ditch, Section no. 712002, 0.72-0.83 m rel. depth
Kubiena tin	5050	212007	Ditch, Section no. 712002, 0.91-1.02m rel. depth

All thin sections would be prepared and examined at the McBurney Laboratory, Department of Archaeology, University of Cambridge. The method used generally follows that described by Murphy (1986). For this project, the samples would be air dried, and then impregnated using a mixture of crystic polyester resin and acetone analar, with a catalyst of methylethylketoneperoxide, and held at a vacuum of 30 mm mercury for between 12-24 hours. After vacuuming, samples take six or more weeks to cure. Final curing involves heating at 70° C for 12 hours. The production of thin sections entails sawing the hardened block into slices, temporarily mounting these for grinding down to 20-30 μm, then permanently mounting and cover-slipping them. Orientation and sample number are noted at each stage. All thin sections would be described under plane-polarised (PPL), cross-polarised (CPL) and oblique incident reflected light (RL). The sections would be analysed at a mesoscopic level (x 1 - by naked eye with transmitted light) for the purpose of linking field observations with thin section units, and at low (x 20-x 200) and high (> x 200) magnifications (after Courty *et al.* 1989, 70, 72, 75). The thin sections would be described following the guidelines of Bullock *et al.* (1985) and Fitzpatrick (1993).

As stated above, the results of this analysis are to be combined with those from the T5 excavations and will be presented in Volume 2.

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