University of Leicester

Archaeological Services

An Archaeological Excavation Birmingham City University, Eastside Campus, Banbury Street, Birmingham NGR: SP 0768 8698 centre

Tim Higgins and Vicki Score

ULAS Report No 2009-071.

An Archaeological Excavation

Birmingham City University, Eastside Campus,

Banbury Street, Birmingham

NGR: SP 0768 8698 (centre)

Tim Higgins and Vicki Score

with contributions by
Angela Monckton, James Greig, Dave Smith, Debbie Sawday, Graham Morgan, Heidi Addison, Lynden Cooper and Alice Forward

For: ARUP/ Birmingham City University

Checked by

Signed:  **Date**: 29-05-2009

Name: Vicki Score

Approved by

Signed:  **Date**: 29-05-2009

Name: Patrick Clay

University of Leicester

Archaeological Services

University Rd., Leicester, LE1 7RH

Tel: (0116) 2522848 Fax: (0116) 2522614

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Tim Higgins and Vicki Score

Summary

University of Leicester Archaeological Services (ULAS) was commissioned to undertake archaeological excavations in advance of a proposed new campus development at Banbury Street in Birmingham (centred on NGR SP0768 8698). The work was commissioned by ARUP on behalf of Birmingham City University (BCU) and was undertaken between September and November 2008.

The site is located in the Eastside area of Birmingham City centre. Previous desk-top surveys had identified that the area lay within Little Park, a medieval deer park and remained undeveloped open land until the 18th century despite the expansion of the town to the west. By the 19th century the roads had been laid out and from then on development at the site was rapid with residential premises making way for industrial structures.

Despite truncation from cellars, the earlier evaluation of the site found an organic rich peaty deposit and possible prehistoric made-made features although no cultural material was recovered. Environmental analysis of the samples taken from these trenches revealed the deposit to be prehistoric, possibly dating to around 7,000-3,000 years BP. These results suggested that the area had significant potential for providing information on the environment within central Birmingham as well as the impact of early prehistoric communities on their environment. A programme of archaeological work comprising open area excavation and environmental sampling was therefore requested by the Planning Archaeologist for Birmingham City Council to further investigate the deposits.

The open area excavations targeted the best preserved organic clay deposits. After augering of the sediments and sampling for insects, plant macrofossils and pollen, the organic layers were removed to look at the potential features identified during the evaluation. All of the features investigated proved to be natural, probably hollows from tree roots.

Several layers of organic clay were identified. Although the results for the insect and plant macrofossil analysis were poor, the pollen analysis produced good results. The earliest layer produced pollen dominated by birch and pine with sedges and moss spores possibly indicating boggy areas and suggesting a Boreal date. Two radiocarbon dates were obtained of 10985 ±80 BP (13080-12830 Cal BP) and 9185 ±65 BP (10520-10230 Cal BP). While the very early date may be an anomaly, the presence of rue and mugwort could suggest that the very earliest deposits are Late Glacial in date. The later radiocarbon date is consistent with the pollen and the presence of two flints that could be Late Upper Palaeolithic or Early Mesolithic.

Radiocarbon analysis was undertaken on a pine charcoal horizon above this layer. This produced a date of 9140 ±60 BP (10490-10200 Cal BP) suggesting a burning event across this area during this period. The records of herbs in the pollen could

also indicate a response to burning. Whether this was a deliberate attempt at clearance or the result of a natural fire is unknown although the flints from the clay below suggest that there was human activity in this area during the Late Upper Palaeolithic - Early Mesolithic period.

The lack of suitable material for dating means that no further radiocarbon dates were obtained, however pollen from the organic clays above this burning event indicate these layers were forming from around 8,000-7,000 BP. There are no further prehistoric deposits on the site – immediately above the Mesolithic layers lie 18th - 19th century deposits and features suggesting that the post-medieval activity has truncated the organic deposits below.

This site has produced significant results including information on the environment for the Late Upper Palaeolithic to Early Mesolithic. This includes evidence for human activity and possibly manipulation of the local environment. The survival of the organic clays on this site suggests that even where later development within Birmingham City has truncated areas to some depth, significant environmental data might still be preserved. Such data is invaluable in allowing insights into the prehistoric environment and the impact of human communities upon them. It is possible therefore that evidence of this nature may survive elsewhere within the city centre.

1. Introduction

University of Leicester Archaeological Services was commissioned to undertake archaeological excavations at the BCU Eastside Campus, at Banbury Street, Birmingham. The work was commissioned by ARUP on behalf of BCU in advance of proposed new campus development.

The site is located in the Eastside area of Birmingham City centre and comprises two areas of land either side of Banbury Street (centered on NGR SP0768 8698; Figs 1 and 2). Evaluations by Birmingham Archaeology in 2008 indicated that despite significant truncation by 19th and 20th century buildings, organic clays had survived beneath the modern structures. Environmental analysis found that the clays contained pollen and beetle remains suggesting a possible date of between c. 7000-3000 years BP (Gearey 2008, 11). Possible features were also identified cut into the natural clays suggesting prehistoric activity (Mann 2008, 12).

The findings of the evaluations suggested that the area had significant potential for providing information on the environment within central Birmingham as well as the impact of early prehistoric communities on their environment. A programme of archaeological work comprising open area excavation and environmental sampling was therefore recommended by the Planning Archaeologist for Birmingham City Council to further investigate the deposits (BCC 2008).

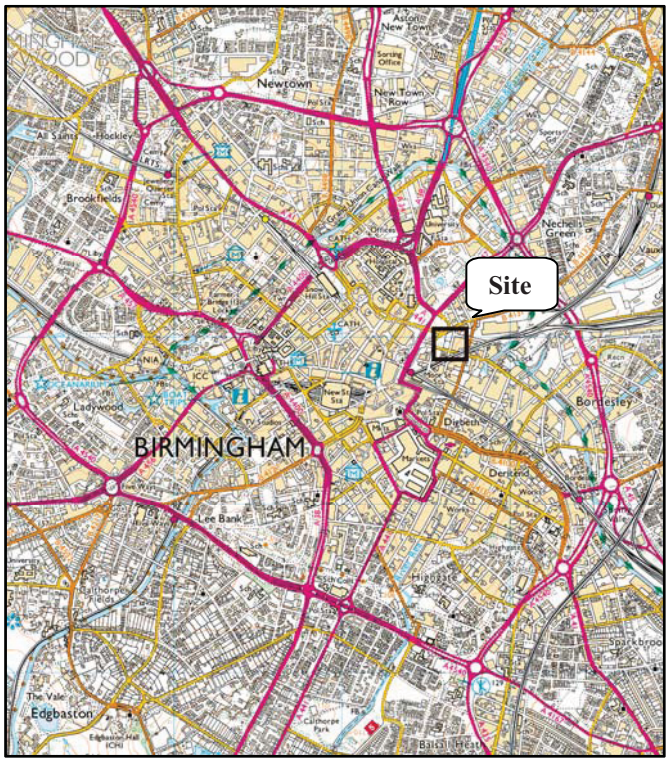


Figure 1: Location plan of site.

Archaeological work was undertaken by University of Leicester Archaeological Services (ULAS) in September – November 2008 on two areas. An assessment was carried out (Higgins 2008) on the archaeological and environmental data to determine what further investigations needed to be undertaken.

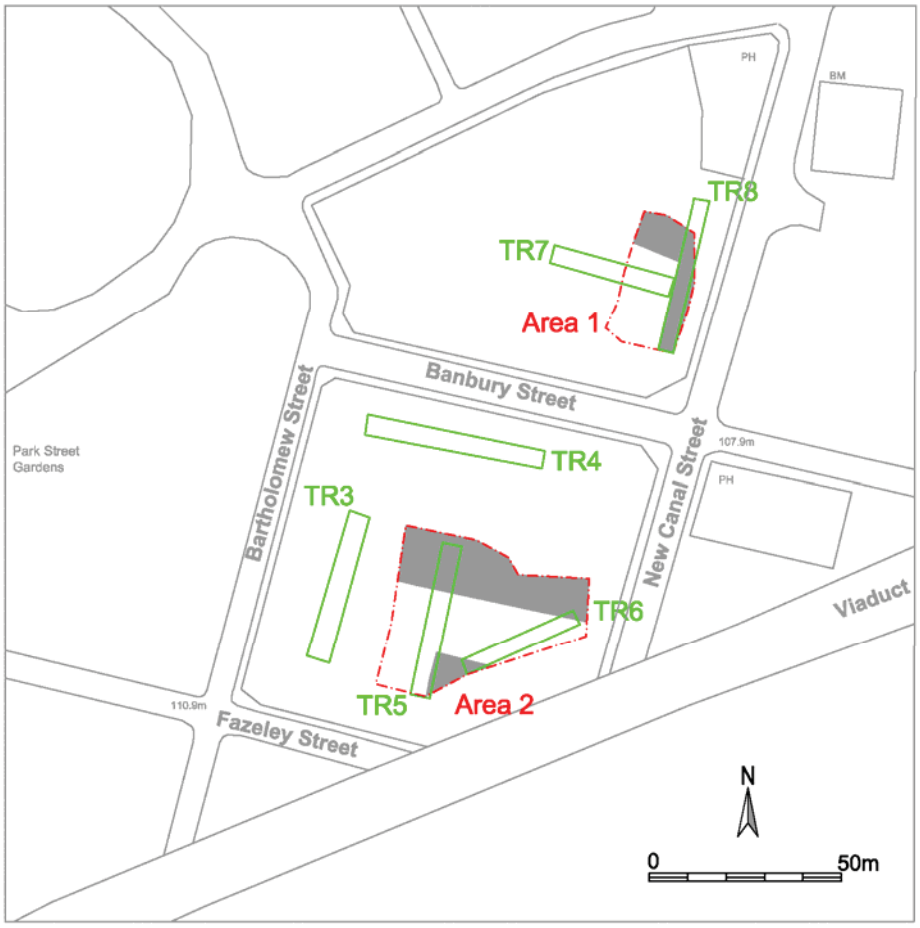


Figure 2: Location of the Area excavations (outlined in red) and previous evaluation trenches (green). Cellars and Modern disturbance are shaded in grey.

2. Site Description, Topography and Geology

The development site lies within the Eastside area of Birmingham City centre *c.* 800m east of St Philip's Cathedral, bounded by Bartholomew Street to the west, Duddeston Row to the north, New Canal Street to the east and the railway to the south-east (Figs 1 and 2). The two excavation areas lay either side of Banbury Street on rough grassed open spaces. The north-east corner of the site lies at a height of approximately 109.5m AOD falling slightly to the south and east.

Much of Birmingham City centre lies on a narrow sandstone ridge that runs north-east to south-west from Sutton Coldfield across to the Lickey Hills. A geological fault runs through the city centre just east of St. Martin's church and the Bullring (Hodder

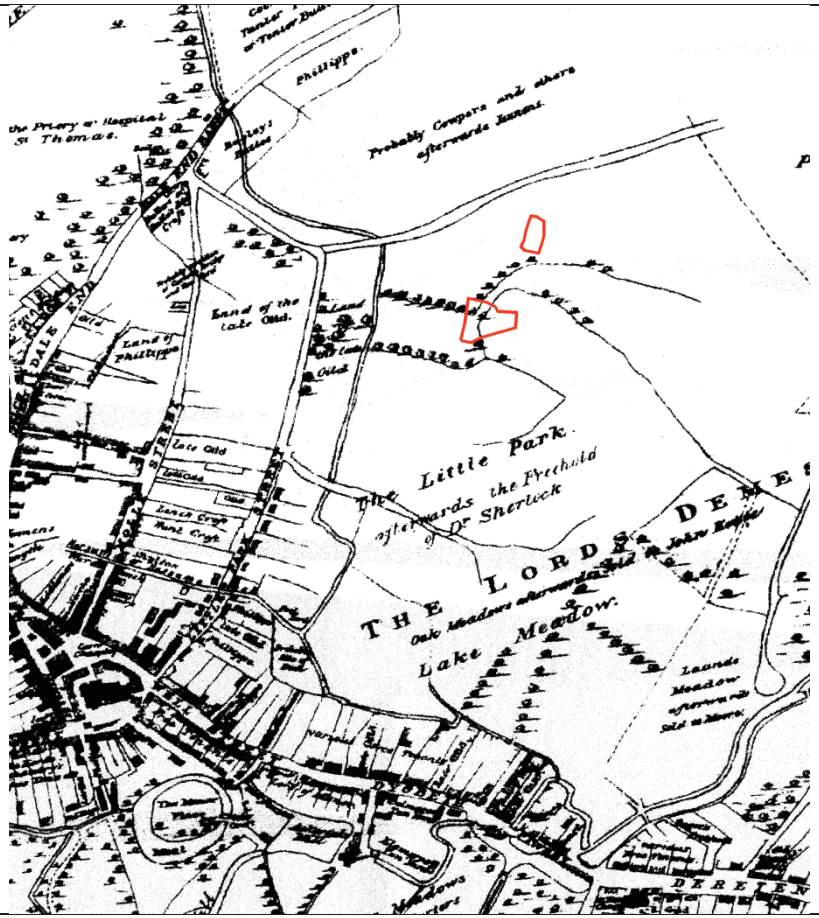
2004), separating the sandstone from the Mercia mudstone to the east (Fig. 3). Springs rise all along the fault line and the water flows down slope from the sandstone ridge to eventually join the river Rea (Buteux 2003). The development site lies at the base of the ridge where the slope levels out on the edge of the floodplain of the River Rea. Although within Birmingham itself the river has been canalised and diverted, a band of alluvium lies not far to the east. Within the excavation areas the Bromsgrove Sandstone is overlain with sand and gravel drift deposits.

Figure 3: Geology showing the site in relation to the fault line and the band of alluvium to the east.

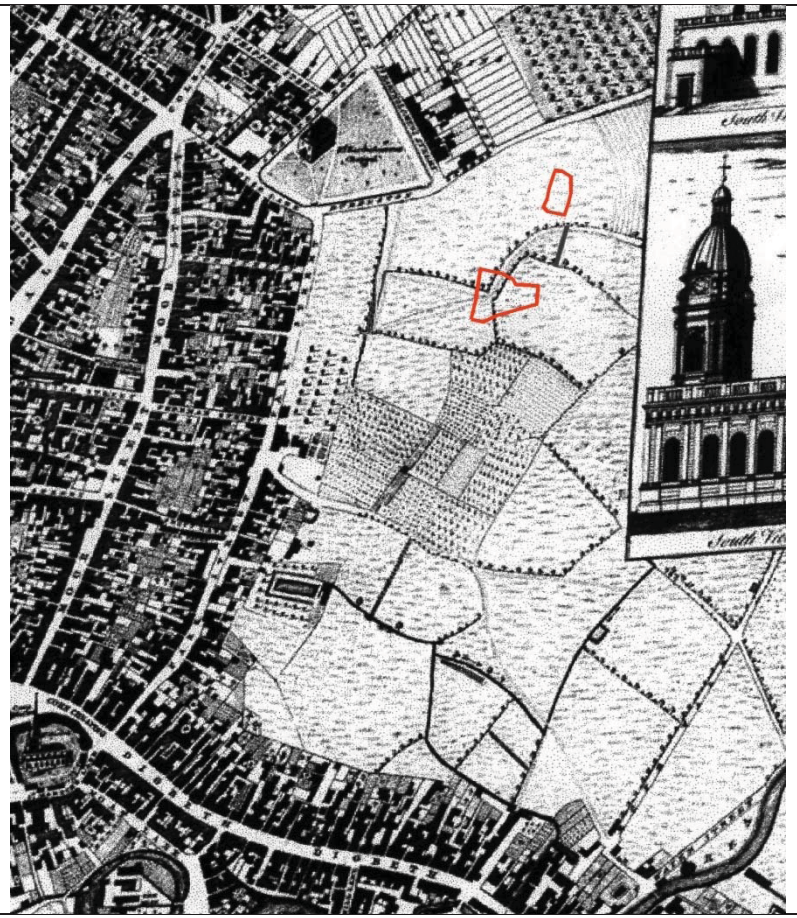
3. Historical and Archaeological Background

A desk-based assessment undertaken by Birmingham Archaeology (Tyler 2008) established that the site lay outside the medieval town of Birmingham. Early maps show that the site lay within the bounds of Little Park (Fig. 4). Little Park (or Over Park) had its origins as a medieval deer park and was separated from the town by a boundary ditch, possibly a watercourse. This was recorded during excavations for the Bull Ring at the turn of the 20th century (Buteux 2003, 25). The park remained undeveloped and is shown as open land until the 18th century (Fig. 4), despite the expansion of the town to the west.

With the construction of the canals at the end of the 18th century development began in earnest. By 1810, Canal Street, Banbury Street and Bartholomew Road had been laid out. From then on development at the site was rapid and by 1828 the area was fully occupied by residential and light industrial structures. The railway arrived in the late 1830s exploiting the Rea Valley as a natural transport corridor into Birmingham (Tyler 2008, 6).



1750 map of Birmingham (Bradford).



Hill and Bickley's 1890 map showing how Birmingham may have looked in 1553.

Figure 4: Early maps showing the study area as open land (approximate excavation areas outlined in red).

The later 19th and 20th centuries saw the gradual shift away from residential use in favour of industrial and commercial development, with trade directories indicating that carriage and railway lamp manufacture, blacksmithing, tinplate working, brush making, pattern making, fish curing, bottle washing, iron founding, coal dealing and scale making were all being undertaken in the area (Tyler 2008, 7). Cultivation layers and features of medieval and post-medieval date have been found during excavations at Freeman Street along with evidence for pottery manufacture while 18th century cultivation layers were also noted during evaluation of Curzon Street Goods Yard (Mann, 2008, 1-2). Towards the western side of the site, previous work carried out by ULAS in 2007 suggests that the north-south boundary ditch defining the western extent of the park, (which was believed to have followed the western boundary of the present site), may have been truncated or in fact lie further to the west within the area of the Park Street Gardens (Richards 2007). Post-medieval cultivation soils were also found to the west of the site.

The burial ground of St Martin's to the west was transformed into Park Street Gardens; work there has suggested that the burials were restricted west of a ditch within the gardens (Tyler 2008, 2).

The most recent structures that occupied the development area included 2/3 storey industrial structures (including zinc die-casting, engineering and metal finishing businesses) of mostly late 19th and 20th-century date; all the buildings were demolished before archaeological work began on the site.

2008 Evaluations

During April and May 2008, Birmingham Archaeology was commissioned to undertake evaluations on the site at Banbury Street comprising eight trenches spread across the area (Mann 2008; Fig. 2). The depth of the modern overburden and the truncation by later cellar and foundations along the road frontages of Banbury Street and Bartholomew Street, suggested that it was unlikely that significant archaeological features would have survived in these areas. However, to the east of the site, organic peat-like deposits survived beneath the modern truncation and features were identified in the natural gravel beneath it. Samples from the deposits demonstrated the presence of paleoenvironmental data including beetles and pollen and indicated the possibility for preservation of organic material e.g. wooden objects or structural remains. Pollen samples were analysed suggesting an early – mid Holocene date between 3000 and 7000 years ago (Gearey 2008). Although the majority of the features appeared man-made in origin, no cultural material was recovered from within them (Mann 2008, 12).

The majority of the post-medieval brick wall foundations and cellars uncovered across the site probably relate to those structures first seen in the early 19th century maps of Birmingham. The cellars fronting on to New Canal Street are likely to represent the row of terraced houses shown on the 1st edition Ordnance Survey map. These were still present as standing structures on the 1937 Ordnance Survey map when the majority of the other residential properties within the site had been superseded by industrial buildings.

4. Aims and Objectives

The principal aims of the excavations were:

- To fully investigate the archaeological features and deposits on the site and date and interpret them
- To sample and analyse palaeoecological remains (including pollen, plant macrofossils and beetles) from the 'peaty'/organic clay deposits and from the features under it and to date the 'peaty' deposit and the features by radiocarbon assay.
- To recover and analyse remains of the past environmental conditions from any other suitable deposits revealed by the excavation.
- To relate the archaeological and palaeoenvironmental information from the site to that found on other sites.

A further objective of the project was to attempt to understand the formation processes that have led to the deposit of the organic clays and what the insect, plant and pollen remains could inform us about the local environment in this part of Birmingham and the impact of the human society on it.

5. Methodology

Two large open areas were excavated (Fig. 2). The 19th – 20th century overburden in both areas was removed under archaeological supervision by 360º machine down to a depth of approximately 1.5m. The remaining overburden was then carefully removed in level spits with a flat bladed ditching bucket down to the uppermost level of the organic deposits. Subsequent cleaning and excavation of this level was undertaken by hand. Both areas were stepped with sections sloped to allow safe access to the archaeological deposits.

Once the organic clays had been exposed in both areas, the stratigraphic sequence was recorded and a gridded auger survey was carried out to provide a model of the subsurface morphology and determine the deepest areas of organic remains. Environmental specialists supervised the sampling of the organic clay deposits for analysis of pollen, beetles and plant macrofossils. The environmental specialists also advised on the retention of further suitable sections of organic clays during the excavations and undertook to identify suitable material from the samples for radiocarbon dating.

Following the completion of the recording and sampling, the organic clay was removed by machine to examine the features in the natural substratum. A good proportion (approximately 70%) of the features visible was sample excavated. Further samples were taken from features under the guidance of the environmental archaeologists (Fig. 5).

Sampling strategy

The sampling strategy was devised following visits to the site by the environmental archaeologists. The deepest section in Area 1 was sampled by taking a monolith column for pollen analysis (Fig. 5) with adjacent samples for plant macrofossils and similar larger samples for insect remains from the main layers adjacent to the column were also taken. Samples were also recovered from a section in Area 2 (Figs 18 and 19).

Samples from pollen column 1, and the base of the section in Area 2 were assessed during the excavation for the presence of plant macrofossils and seeds suitable for radiocarbon dating. None was found, although charcoal fragments were present in most of the layers (Greig below). In view of this more samples were taken from the lowest layers in the best preserved natural features.

Additional samples were taken from both Areas 1 and 2, from the lower layers of the sediment in the natural features. Charcoal deposits of uncertain date were also sampled, mainly from Area 2. Preserved wood was also sampled although this comprised predominantly roots which could have been intrusive from later trees. The samples are listed below.

Area 1

- Column 1, pollen monolith, 250 mm deep.
- Column 1, Plant macrofossil samples: 4 samples.
- Column 1, Insect remains samples: 4 samples
- Column 1, charcoal layer: 1 sample
- Natural features, pollen and plant macrofossil samples, 3 samples
- Natural features, insect remains, 3 samples.

Area 2

- Section 2.1, pollen and plant macrofossil samples, 4 samples.
- Natural features, pollen and plant macrofossil samples 3 samples.
- Natural features, insect remains samples, 3 samples.
- Charcoal layers, 3 samples.
- Wood samples, 3 samples

Figure 5: Samples being taken from Area 1

6. Auger Survey

The modern overburden lay at varying depths throughout the site ranging from approximately 1.5 to 1.8m. This directly overlay the organic clays suggesting that the modern development had truncated the area thereby removing all traces of any deposits later than the prehistoric period.

The levels at which the natural substratum was found in both the evaluation trenches and excavation areas within the development site reflected a very general slope from west to east. The highest point at which natural deposits were encountered was found to the west within evaluation Trench 3 (109.76m AOD) and the lowest points were recorded in the south of the site in Area 2 (106.19mAOD) and the north-east corner of the site within Trench 8 (106.51m AOD).

These two low levels in the north-east and south-west were divided by a ridge that extended eastward at a level of 108.08m AOD (Trench 4). The excavation areas appear to have been located within two natural depressions on either side of this ridge (Figs 6 – 8). The location of these two hollows in low-lying areas may have caused the surface to be prone to water-logging as the surface water ran off the ridge into these areas.

The results of the auger survey are shown in Table 1 and Figs. 6-8.

Table 1: Results of auger Survey across both areas.

Auger	Top of disturbed soil after machine excavation	Depth of mixed disturbed soil	Upper highly organic clay level	Lower organic clay level	Total organic clay depth	Natural Level
A.1.1			107.12m	106.91m	0.40m	106.72m
A.1.2	107.19m	0.60m	modern truncation			Not reached
A.1.3	107.12m	0.23m	modern truncation			Not reached
A.1.4	107.22m	0.15m	107.07m	106.88m	0.25m	106.82m
A.1.5	excavated		107.09m	107.03m	0.20m	106.89m
A.1.6	excavated		106.99m	106.93m	0.28m	106.71m
A.1.7	excavated		107.20m	107.07m	0.40m	106.80m
A.1.8	excavated		107.40m	107.30m	0.17m	107.23m
A.1.9	107.43m	0.20m	modern truncation			107.23m
A.1.10	107.60	0.11m	107.49m	107.34m	0.26m	107.23m
A.1.11	excavated		107.43m	107.29m	0.17m	107.26m
A.1.12	excavated		107.32m	107.25m	0.15m	107.17m
A1.13	excavated		107.23m	107.17m	0.17m	107.06m
A1.14	excavated		107.27m	107.05m	0.22m	107.05m
A.2.1	excavated		107.47m	107.36m	0.31m	107.16m
A.2.2	excavated			107.27m	0.16m	107.11m
A.2.3	excavated			107.41m	0.12m	107.29m
A.2.4	excavated		107.25m	107.12m	0.32m	106.93m
A.2.5	excavated			107.16m	0.14m	107.02m
A.2.6	excavated		107.45m	107.41m	0.16m	107.29m
A.2.7	107.29m	0.12m	107.17m	106.98m	0.26m	106.91m

Auger	Top of disturbed soil after machine excavation	Depth of mixed disturbed soil	Upper highly organic clay level	Lower organic clay level	Total organic clay depth	Natural Level
A.2.8	excavated		107.15m	107.03m	0.25m	106.90m
A.2.9	excavated		106.79m	106.59m	0.26m	106.53m
A.2.10	excavated		106.62m	106.46m	0.20m	106.42m
A.2.11	106.75m	0.08m		106.67m	0.06m	106.61m
A.2.12	106.68m		106.60m	106.53m	0.12m	106.48m
A.2.13	excavated		106.50m	106.33m	0.25m	106.25m
A2.14	excavated		106.50m	106.35m	0.31m	106.19m

Within Area 1 the natural substratum appeared slightly undulating with shallow peaks and troughs. The highest level was recorded in the north-west corner at 107.23m AOD with the lowest point at 106.71m AOD in the south-east corner. Organic clay sediments had accumulated to fill the shallow hollows with an overall depth of between 0.03m and 0.27m. Overlying these sediments was another layer of dark grey organic clay with a depth of between 0.06m and 0.21m.

In Area 2 the auger survey suggests that the natural level sloped downwards from the north-west corner of Area 2 from a depth of 107.29m AOD to the south-east corner where it was 106.19m deep AOD. Overlying the natural was an undulating layer of organic clay sediments with a depth of between 0.04m and 0.20m. Overlying this layer was a dark grey organic clay sediment with a minimum depth 0f 0.04m and a maximum depth of 0.20m.

The upper dark grey organic clays were truncated and disturbed. Subsequent excavations suggest that this truncation dated from the 18th century onwards.

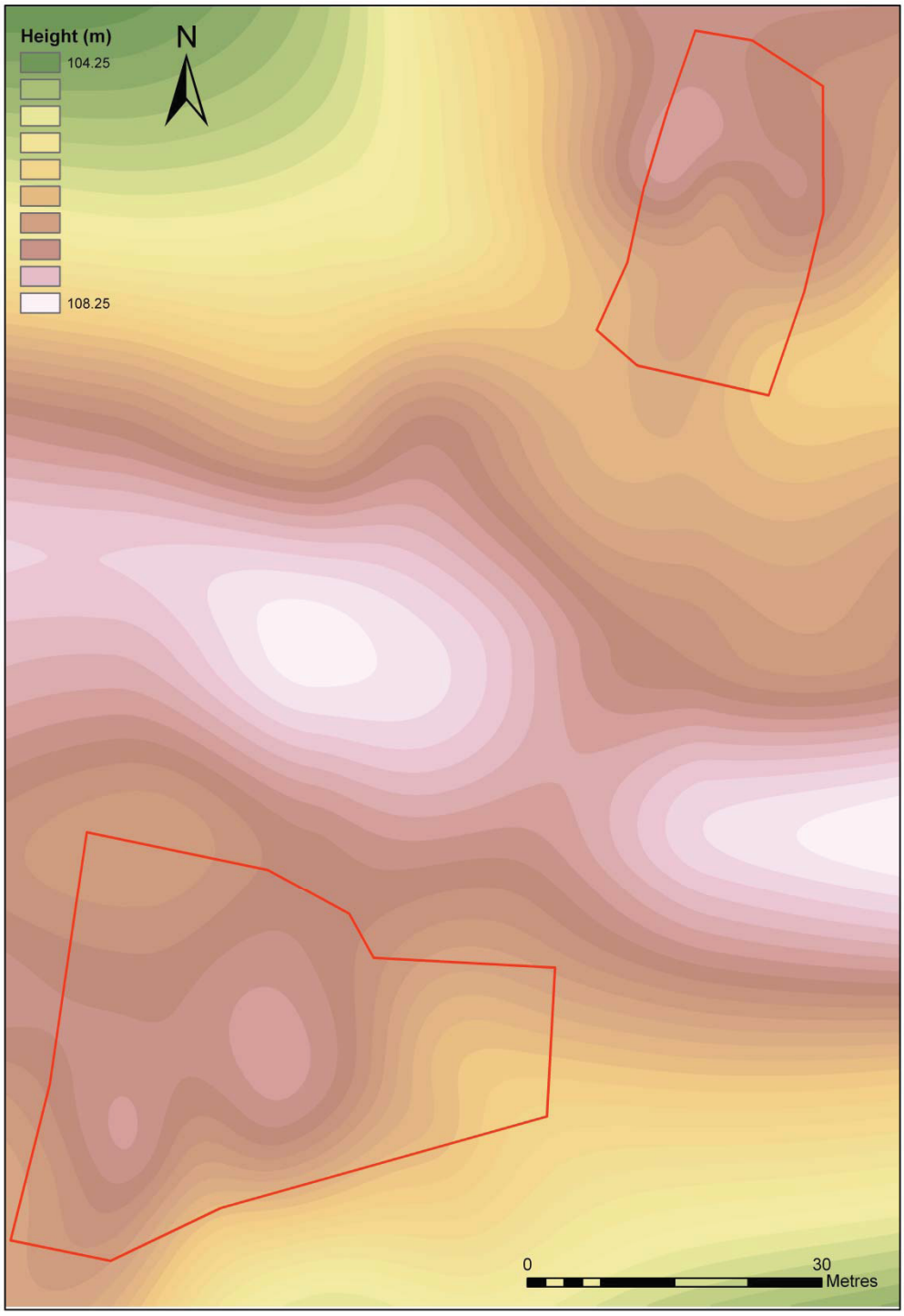


Figure 6: Interpolated model showing the natural substratum across the excavation areas based on levels obtained from the auger survey and from the evaluation trenches.

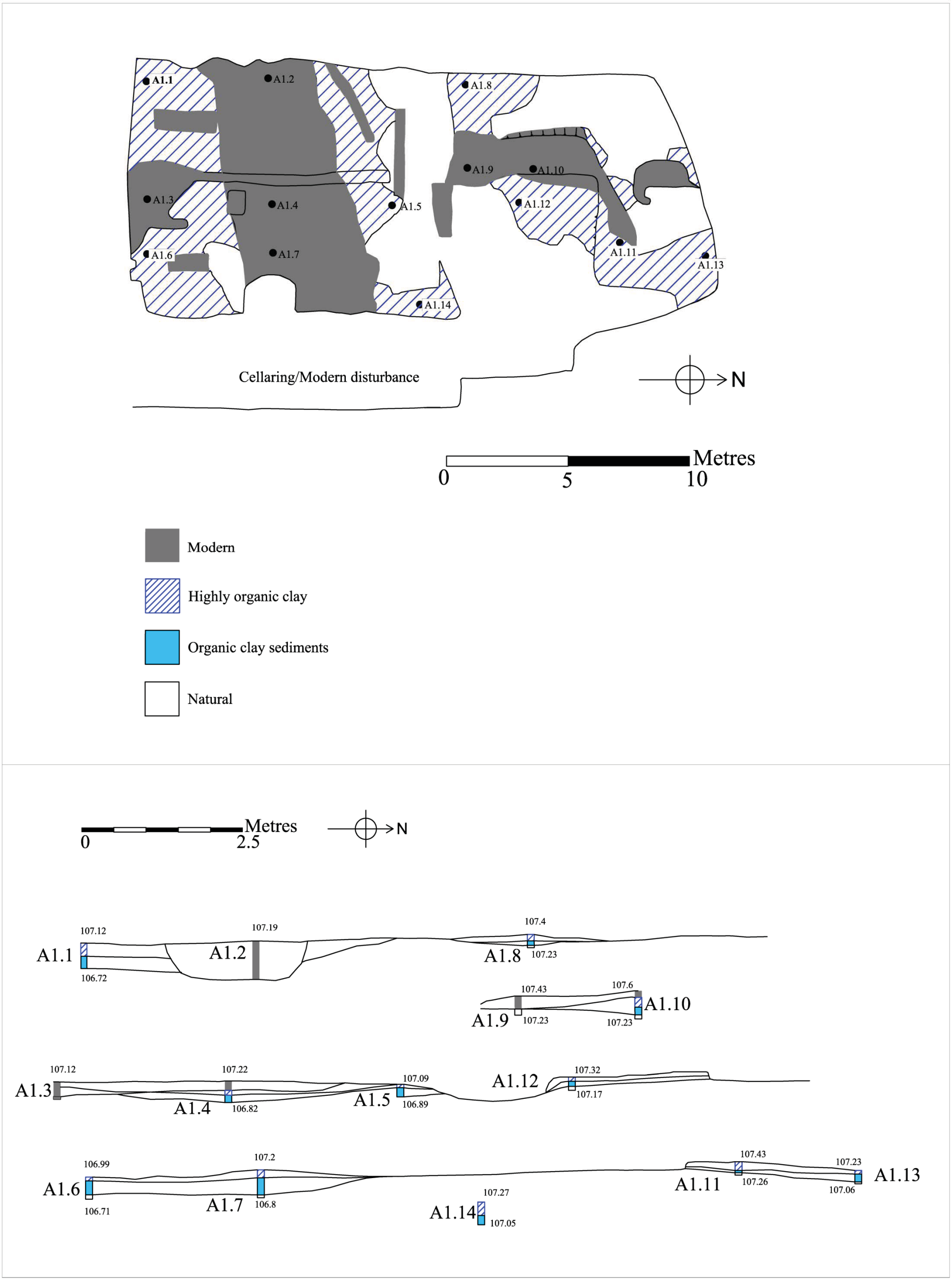


Figure 7: Area 1 - Auger survey results.

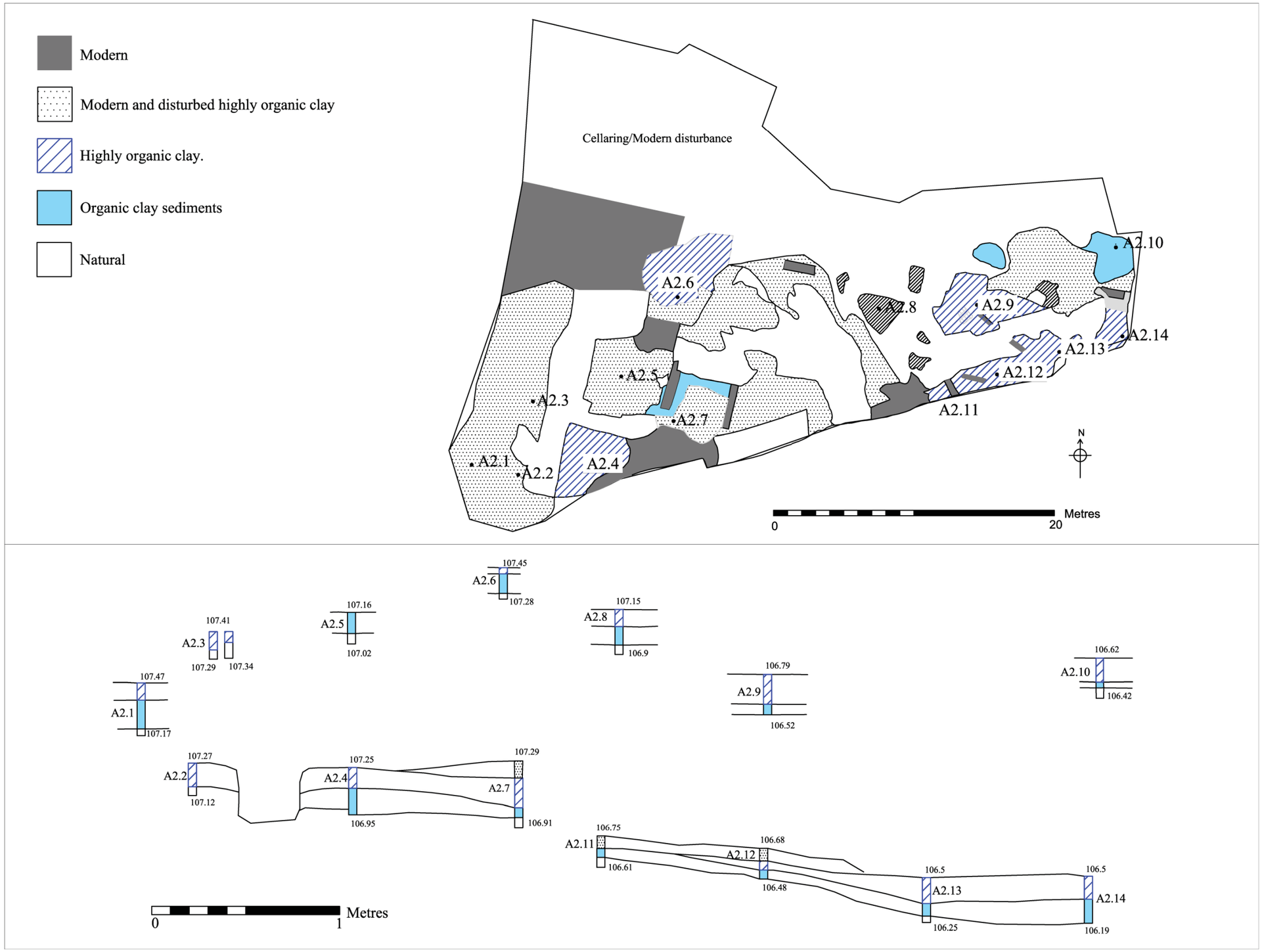


Figure 8: Area 2 – Auger survey results.

7. Excavation Results

Area 1 (Fig. 12)

The combination of machine and hand excavations exposed the underlying natural substratum, which consisted of pale yellowish-grey sands mixed with clay and small to medium pebbles (Fig. 9). The auger survey suggested that the natural topography within Area 1 was undulating with a slightly higher area to the north (Fig. 6). Although the natural substratum comprised sands and gravel and did drain freely when first exposed, observations during the excavations suggested that it became relatively impermeable after compaction with water being retained in puddles on the surface. The stratigraphy is described below is illustrated in Figs 11-12 and in a composite drawing showing the stratigraphy and data (Fig. 17).

The natural substratum was sealed by a grey organic clay sediment layer approximately 0.03m – 0.27m thick (contexts 201, 105 and 106) which appeared to be at its deepest within the hollows. Lenses and horizons of iron panning suggested that the clay had been subjected to fluctuations from a rising water table. Close examination of the layer revealed a slight organic fibrous element and on this basis the peat-like deposit identified in the evaluation report was re-classified by the environmental specialist as organic clay (Monckton and Greig pers. comms). The plant macrofossil sample taken produced remains including unidentifiable organic debris such as wood, roots, bark and tree leaf but no seeds. The pollen analysis of the sample produced a more positive result suggesting flora comprised mostly of *Betula* (birch) and *Pinus* (pine), with *Poaceae* (grasses) *Corylus* (hazel) and *Cyperaceae* (sedges). *Querus* (oak), *Alnus* (alder) and *Ulmus* (elm) were also detected. The birch and pine suggest a possible Pre-boreal date (Pollen Zone IV) 10,200 – 9,500 BP although the latter suggests a later Boreal date is more likely (Pollen Zone V) of *c.* 9,000 BP. This lower horizon produced no insect remains (Smith below). A flint artefact was retrieved from this layer (context 201). This was a distal fragment of a secondary blade that could date from as early as the Late Upper Palaeolithic period or possibly the early Mesolithic (Cooper below).

The underlying substratum appeared to be cut by various features originally identified in the evaluation trenches. Sample excavation of a number of these potential features revealed them to be highly irregular in plan with undulating sides and bases, and no associated artefacts, indicating natural origins. It seems most likely that these were natural features, probably natural hollows, tree roots or possibly animal burrows (Fig. 10). The features appear to have been filled with either grey clay sediment or dark grey highly organic sediments. Radiocarbon analysis of organic debris retrieved from one of these features in Area 2 suggests a date of 10986 ±80, BP (13080-12830 Cal BP) (Chapter 8 below), much earlier than that suggested by the Pollen analysis. It may be, however, that this date is an anomaly as a second date was obtained from this context of 9185 ±65 BP (10520-10230 Cal BP). Again this is earlier than might be expected from some of the pollen, such as lime, oak and alder, but is consistent with the evidence for birch and pine pollen and the flint from the layer.

In Area 1 the lower clay was sealed by a consistent horizon 0.02m thick of charcoal and soot (context 107). Examination of the charcoal identified partly burnt pine wood fragments (Morgan below). The pine wood fragments were deemed suitable for C14

dating with the result suggesting a date of 9140 ±60 BP (10490-10200 Cal BP). The presence of pine is consistent with a Late Upper Palaeolithic/Early Mesolithic date.

Figure 9: Area 1 being excavated.

Figure 10: Excavated section of feature 186.

Overlying the horizon of charcoal was another layer of organic clay 0.10m thick (context 104). Above this was a highly organic sediment 0.17m deep (context 103), sealing context 104 below. Although plant macrofossil analysis found organic remains of wood, roots and leaves, these were unidentifiable to any particular species. Although the sample taken from this layer did produce some insect remains these were found to be small in size and fairly unspecific in terms of the type of landscape they might represent (see Smith below). The pollen analysis of the layer, however, proved to be much more informative with *Alnus* (alder), *Corylus* (hazel), *Betula* (birch), and *Tilia* (lime) and possible *Quercus* (oak), together with a few herbs being present. This suggests a possible Mesolithic date (pollen period VIIa, Alantic) from 8,000-7,000 BP and indicates damp local alder woodland with oak and lime. Heathers and plantain might suggest open areas of woodland, possibly connected with human activity (Greig below). During the excavations, observation of the upper organic deposit had noted some well-preserved roots penetrating the layer and frequent deposits of what were thought to be strips of birch bark.

Overlying the organic clays was a mixed layer (context 102) of greyish-brown silty clays mixed with sand and charcoal which was up to 0.50m deep in places. This layer was cut by a ditch running east to west (context 206). The ditch was approximately 2.60m wide and 1.10m deep and the fill (context 204) contained greyish-brown silty clay mixed with occasional pebbles, pottery sherds, brick/tile and iron slag. The pottery sherds and tile suggested that ditch dated to the 18th century (see Sawday below). This feature and the underlying layer was sealed by an accumulation of modern overburden (context 205) and cut by various brick and concrete wall foundations and several service trenches.

Figure 11: Detail of the stratigraphy of the organic clays in Area 1.

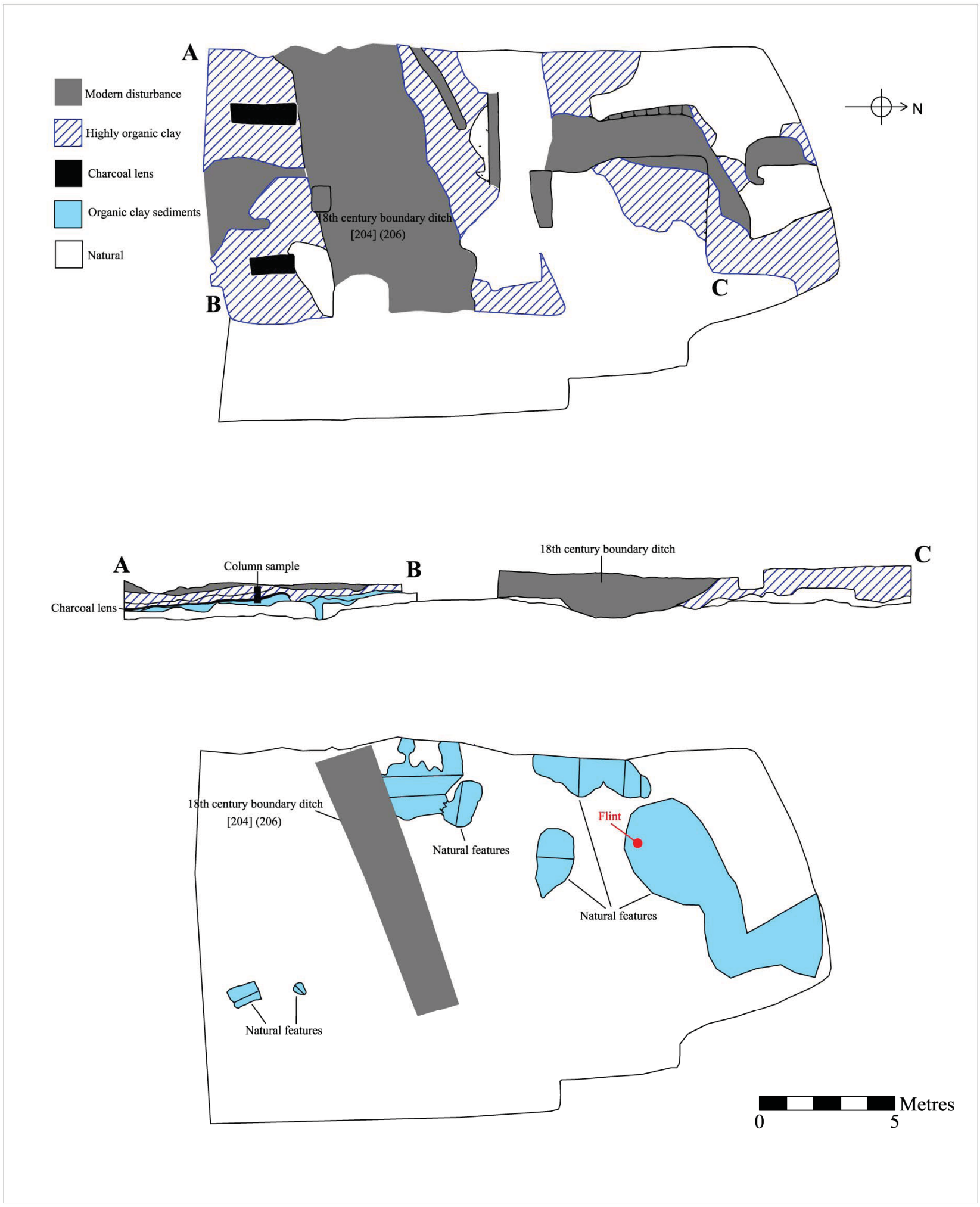


Figure 12: Area 1- Plan of organic deposits after machining (top) and natural features after removal of organic deposits.

Area 2 (Fig. 15)

The natural substratum exposed in this excavation area was a similar pale yellowish-grey sands mixed with clay and small to medium pebbles, seen in Area 1. The underlying natural topography in Area 2 appeared to undulate with shallow troughs and peaks detected during the auger survey (Fig. 13). The stratigraphy described below is illustrated in Figs 15-16 and in a composite drawing showing the stratigraphy and data (Fig. 17).

Figure 13: Area 2 being excavated

As with Area 1, the underlying sands and gravels contained a number of silt filled hollows that had been identified in the evaluation as possible cut features. The open area excavation showed them to be highly irregular in plan with undulating sides and bases, with no associated artefacts. Like those in Area 1, these are likely to be natural in origin, probably tree roots and features or possible animal burrows (Fig. 14).

Feature 136

Feature 150

Figure 14: Excavated sections of features in Area 2.

Sealing the natural sands and gravels was a pale grey clay silt layer 0.10m thick (contexts 195, 196 and 203) which appeared to be at its deepest within the natural trough features. This clay layer was similar to contexts 201 and 106 overlying the natural substratum seen in Area 1, and appeared to have been subjected to the same fluctuations of rising water table as it also contained horizons of iron panning. The layer had an organic content but again the environmental samples produced only positive results for the pollen with little survival of either insects or plant macrofossils (see Greig below). Some of the pollen was identified as *Thalictrum* (rue) and *Artemisia* (mugwort) which could suggest a Late-glacial date and perhaps represent weeds growing in cleared areas. The other pollen however, contained *Betula* (Birch), *Pinus* (Pine) *Corylus* (Hazel), *Querus* (Oak) and *Tilia* (Lime) which all suggests a Boreal date as more likely. There was also evidence for grasses (*Poaceae*), sedges (*Cyperaceae*) and moss spores which Greig suggests could be evidence for boggy ground.

A flint artefact was retrieved from this layer (context 203). This was a large tertiary blade used as knife and then converted to a burin tool. This could date from as early as the Late Upper Palaeolithic period into the early Mesolithic period.

Above this layer was a slightly darker greyish silty clay layer *c.* 0.10m thick with organic content and charcoal flecks (context 193 and 199). The pollen analysis of this context produced evidence of mostly *Betula* (Birch), *Pinus* (Pine), *Corylus* (Hazel) and with some *Querus* (Oak), *Ulmus* (Elm), *Alnus* (Alder) and *Tilia* (Lime). The pollen sample also indicated the presence of *Poaccae* (grasses) and *Cyperaceae* (sedges) and suggested a date similar to the lowest deposit in Area 1 (Pre-Boreal – Boreal).

A consistent dark charcoal horizon (context 208) 0.02m thick was identified similar to the charcoal horizon in Area 1 (context 107). These two layers are thought to be the same deposit and may represent a single episode involving the burning of the area. The radiocarbon dates for (107) suggest that this might have taken place sometime around 10490-10200 Cal BP.

The sequence and type of layers observed above the charcoal horizon were very similar to those recorded in Area 1. An organic layer (context 207) 0.10m thick, comprising grey clay sealed the charcoal horizon below. This in turn lay beneath a highly organic dark greyish layer up to 0.20m deep (context 192). Although no environmental samples were taken directly from these deposits the likelihood is that they probably date to a similar period as context 103 in Area 1 which fell into the Atlantic period (pollen period VIIa), dating from *c.* 8000-7000 BP.

Figure 15: Area 2- Plan of organic deposits after machining (top) and natural features after removal of organic deposits.

The highly organic layers in Area 2 were sealed by a layer of brown clay mixed with flecks of orange brown sand approximately 0.20m deep (contexts 172, 191, 165). The pottery sherds and tile found within this area suggest a post medieval date of the 17th – 18th century (Sawday below). This layer was cut by a ditch orientated north to south, and pits (contexts 130, 132 and 135). These contained a mixed fill with pottery sherds suggesting an 18th to 19th century date. The ditch was sealed under a modern layer consisting of greyish brown clays 1.00m deep, which was truncated by various modern brick and concrete foundations.

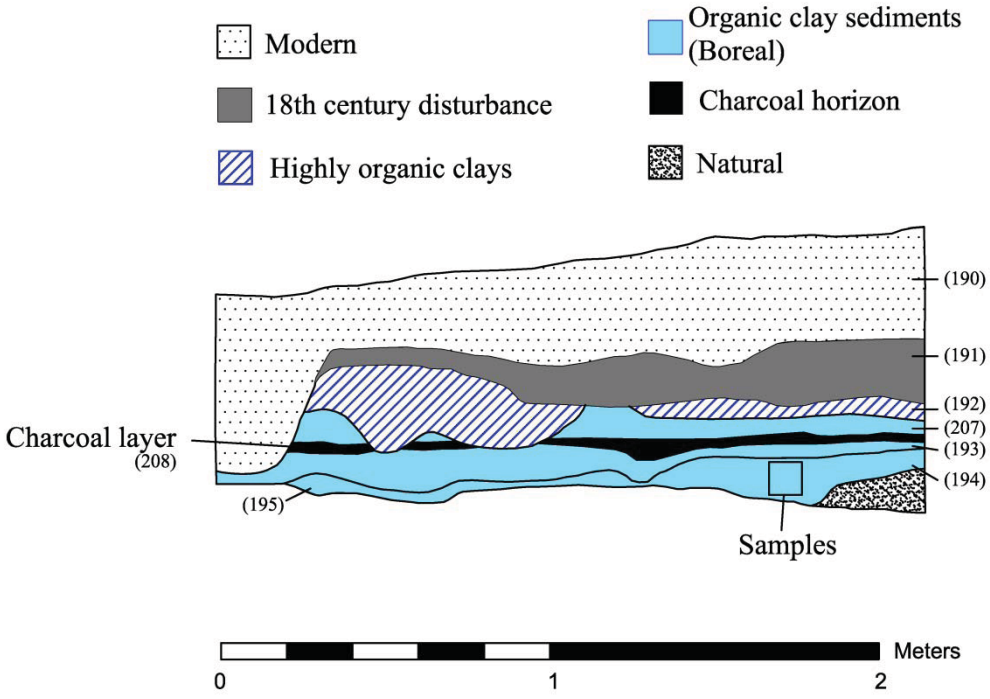


Figure 16: Area 2- Section through organic deposits (location on Fig.15).

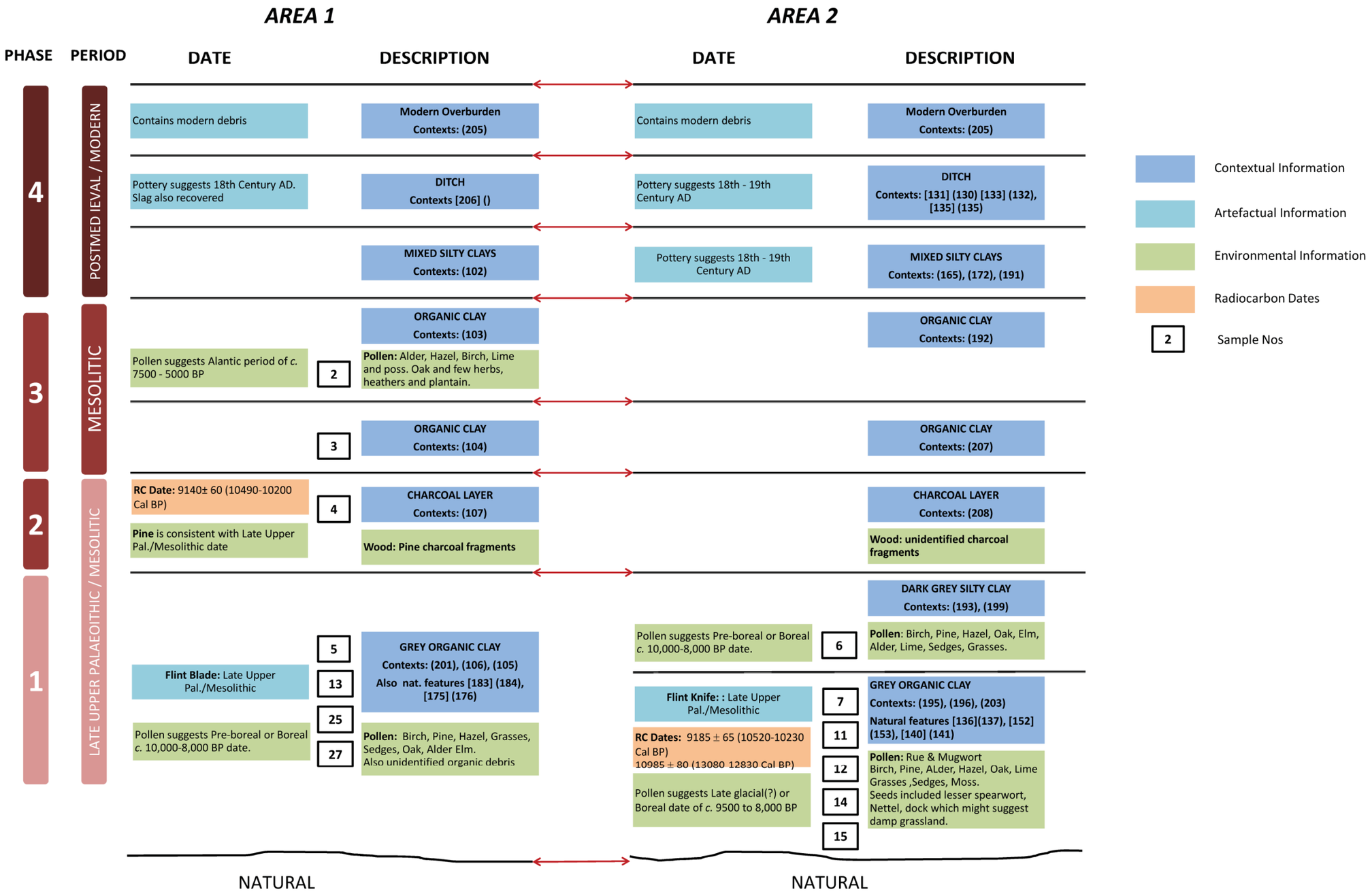


Figure 17: Composite section showing stratigraphy, radiocarbon dates and environmental, artefactual and contextual data from both areas.

8. Radiocarbon Dating

Introduction

Finding material suitable for radiocarbon dating proved to be problematic. Seeds from land plants were only available in sufficient numbers from the base of the organic clay (Water plants are not suitable for radiocarbon dating as they can take carbon as dissolved ancient carbonates, such as from limestone, directly from the water which gives a false early date (the hard water effect), whereas land plants take carbon dioxide direct from the atmosphere). Further material was therefore processed in order to obtain a suitable number of seeds from one of the natural hollows that were sampled (Sample 14).

Dating the later material further up the column proved to be a greater problem. Although organic detritus was present it was unidentifiable and could contain both water plants and root material which would compromise the date. The charcoal fragments from the material were also difficult to identify and could represent root material and therefore be much later in date than the layers in which they were recovered. It was finally decided to submit some of the very small fragments of unidentified charcoal again from the lower organic clay layer and from the later pine charcoal horizon possibly from a clearance fire in Area 1 (context 107).

Sample	Context	Sample Description	Pollen Date
Ua-37896 (Sample 14A)	Area 2: [136] (137) Base of organic clay - natural hollow/tree root.	Macro fossils of *Rumex sp*. (seeds) *Urtica dioica* (seed), *Glyceria*, *Poaceae* small *Stellaria* (seed), *Ranunculus flammua*, Populus bud, woody scale.	Possible Pre-boreal date (Pollen Zone IV) - Boreal date (Pollen Zone V)
Ua-37897 (Sample 14B)	Area 2: [136] (137) Base of organic clay - natural hollow/tree root	Small fragments of unidentified charcoal from plant macro sample.	Possible Pre-boreal date (Pollen Zone IV) or Boreal date (Pollen Zone V)
Ua-37371 (Sample 4)	Area 1: (107) Charcoal horizon in Area 1. The sample was taken from a column through an organic clay deposit or buried soil above a probable glaciated surface	Charcoal *Pinus sp.* (Pine)	The charcoal horizon was thought to be in or sealing a lower organic clay with Possible Pre-boreal date (Pollen Zone IV) or Boreal date (Pollen Zone V)

Results

All samples were processed by the Ångström Laboratory, Uppsal University, Sweden January – May 2009.

Pre-treatment of charcoal and similar materials - Göran Posssnert and Maud Söderman

1. Visible root-fibres are removed.
2. 1 % HCl is added, the mixture is heated and kept for 8-10 hours just below the boiling point (carbonates are removed).
3. 1 % NaOH is added; the mixture is heated and kept for 8-10 hours just below the boiling point. The insoluble fraction, referred to as INS, is mainly consisting of the original organic material, and should therefore give the most reliable age.
4. The soluble part is precipitated by addition of concentrated HCl. The precipitate, which mainly consists of humics, is washed, dried and referred to as fraction SOL. Influence of contaminants could be obtained from the SOL fraction.
5. Macrofossil samples have been treated with 0.5 % NaOH in 60°C for 1 hour.
6. Prior to the accelerator measurement, the washed and dried material pH 4, is combusted to CO_2 and converted to graphite using a Fe-catalyst reaction.
7. The age of fraction INS has been measured in the present investigation.

A correction corresponding to δ 13C=-26,5‰ vs. PDB has been done

The dates were calibrated using OxCal v4.1i (Bronk Ramsey 2005) using the 2004 calibration curve. The dates obtained and their calibrated ages are shown in Table 2 and Figs. 18-19.

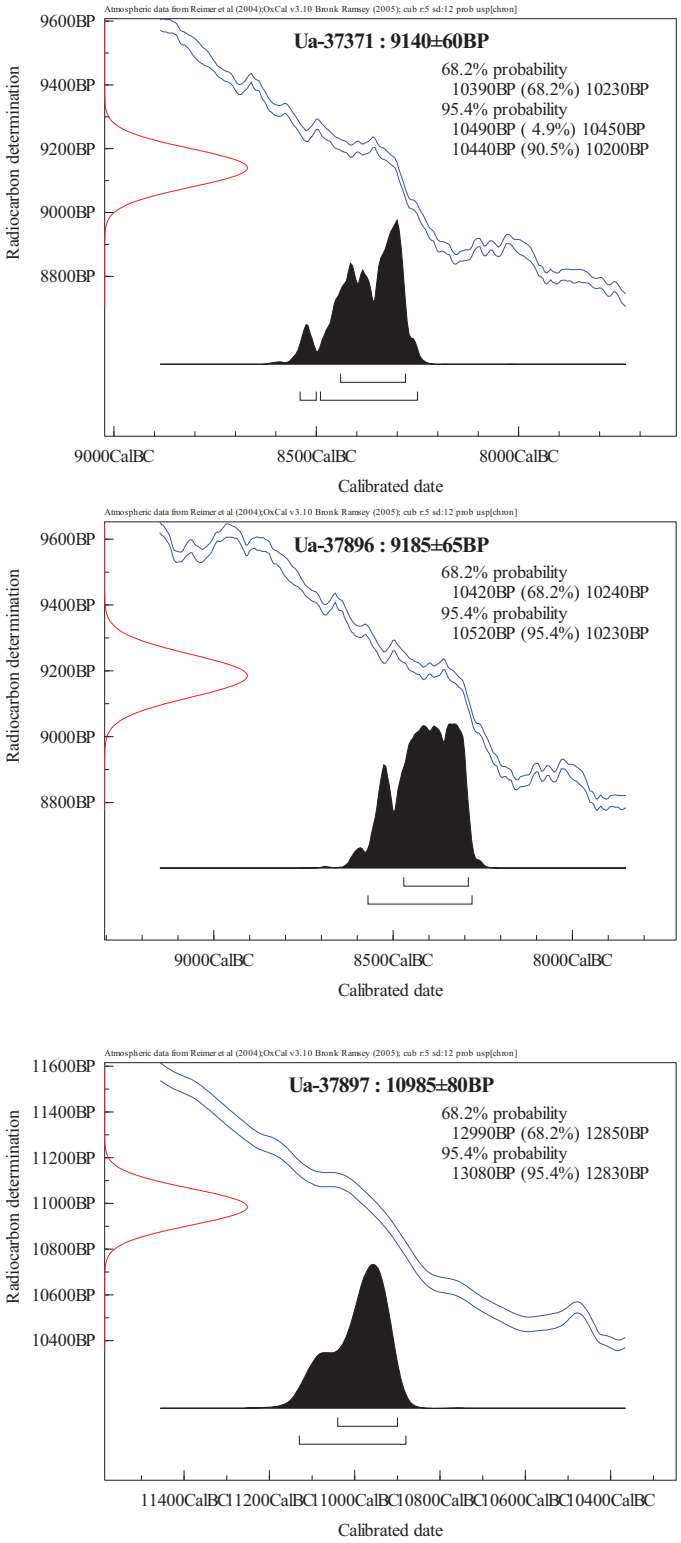


Figure 18: Radiocarbon dates from the site (calibrated using OxCal v4.1i)

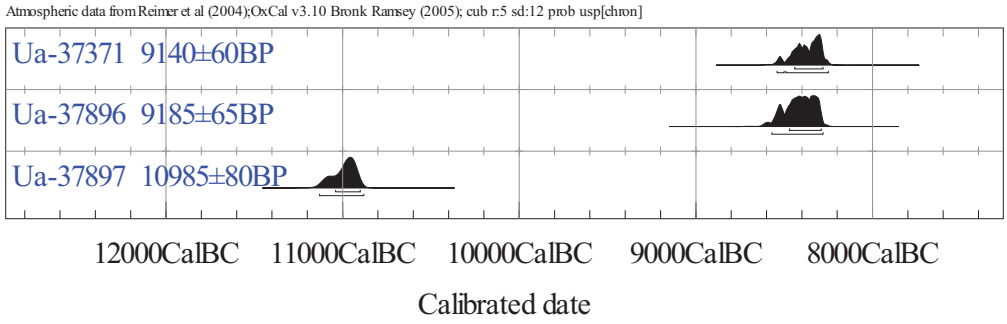


Figure 19: Multiplot of radiocarbon dates (calibrated using OxCal v4.4i)

Table 2: List of Radiocarbon dates obtained.

Laboratory Code	Sample type	Radiocarbon Age (BP)	Date 95.4% (Cal BP)	Possible Pollen Date
Ua-37371	Pine Charcoal	9140± 60	10490-10200 Cal BP	-
Ua-37896	Seeds	9185 ± 65	10520-10230 Cal BP	9,500 to 8,000 BP
Ua-37897	Unidentified Charcoal	10985 ± 80	13080-12830 Cal BP	9,500 to 8,000 BP

Discussion

Although there are only a small number of radiocarbon dates, two are consistent with each other. The lowest horizon of the organic clay (immediately above the natural substratum) produced a possible Pre-boreal – Boreal date (approximately 9,500 to 8,000 BP). Two radiocarbon dates were obtained for this layer, one of 9185 ±65 BP (10520-10230 Cal BP) and the other 10985 ± 80 BP (13080-12830 Cal BP). The later date (from seeds) is consistent with the Boreal date indicated by the pollen results.

The date from the charcoal however, suggests an earlier date in the Late Glacial than that suggested from the pollen. Between thirteen to eleven thousand years ago the Midlands was under relatively open steppe conditions although trees were present towards the end of the period, and dwarf trees such as willow and juniper may have been present earlier (McNabb, 2006). The 2004 calibration curve extends back quite accurately to 26,000 years BP, using dendrochronologically-dated tree ring samples between 0 - 12400 cal BP (Reimer 2004).

This particularly early date may represent an anomaly. Although the charcoal was obtained from the same sediment as the seeds, charcoal does not decay and could have been redeposited (Greig below). It could therefore represent older residual material, always a risk when dating charcoal in sediments. However, it is perhaps significant that the pollen analysis identified the presence of *Thalictrum* (rue) and *Artemisia* (mugwort) which could suggest the Late-glacial period, although these could also represent weeds growing in cleared areas

(Greig below). It is also possible that pollen, may have been introduced into the layer, perhaps through cracks in the sediment as it dried in summer, or from other disturbances. The charcoal fragments were also collected from throughout the context and it might be that they represent a date from the lowest level of the deposits. Although the seeds dated nearly 2000 years later are from the same layer, this deposit could also have accumulated over a significant period of time. Evidence for the Late Glacial has been seen previously in Birmingham; a layer of peat was exposed during excavations for the Wholesale Markets producing insects suited to the cold climates of around 11,000 BP (Osborne 1980).

Although there is no date from the pollen for the charcoal horizon, it is stratigraphically later than the organic clay described above and earlier than another organic clay horizon above it with a suggested pollen date from 8000-7000 BP. The radiocarbon date of 9140 ±60 BP (10490-10200 Cal BP) would fit with this. This date is very similar to that obtained from the seeds in the earlier clay layer increasing the likelihood of the dates being accurate. Radiocarbon dates for pine charcoal are known from other sites in the area. The dates from pine charcoal from Spong Hill, Norfolk (8280 ±80 BP (HAR-7063), 8259 ±90 BP (HAR-7025), 8150 ±90 BP (HAR-2903) are later than the Birmingham dates, but dates from Bixley, Norfolk (8990 ±100 BP), also for pine charcoal are very similar (Murphy 2002).

The results from the earliest organic clay horizon would therefore suggest a date from the Late Upper Palaeolithic to the Early Mesolithic transition (although the base of the deposits in Area 2 might have their origins in the Late Glacial period), with the burning layer also within this period. This is consistent with the two flints recovered from this layer and most of the pollen results.

9. The archaeobotanical material (pollen and plant macrofossils) - James Greig

Summary

The samples contained practically no identifiable plant macrofossils. There was very little identifiable organic material suitable for radiocarbon dating; however the samples tested for pollen contained sufficient material to provide an idea of the date of the deposits and their environment.

Objectives

Plant remains were investigated to obtain further evidence for the interpretation of the site, and suitable material for radiocarbon dating.

Samples

From Area 1, a 25 cm monolith was taken for a pollen sequence, and eight bulk samples for macrofossils, numbered 1-5, 25, 27 and 26. From Area 2, a further five bulk samples, numbered 6, 7, 25, 27 and 29 were collected. Eight samples were assessed for macrofossils and dating potential. Four pollen samples were prepared and assessment counts made with full counts done on three of these and two samples from the monolith. The samples from the sections from both areas are shown on Figs 20 – 21.

Laboratory work

Plant macrofossils

Subsamples of 50-150 ml sediment from each of the eight macrofossil samples were measured out. They were broken down in water, and the lighter, organic, fraction washed over to separate it from the inorganic material, and caught in a 700 µm sieve. The washover was further cleaned and sieved, then sorted in water under a x10 stereo microscope. The results are given in Table 3 below.

Pollen analysis

Pollen samples were processed using the standard method; about 1 cm^3 subsamples were dispersed in dilute NaOH and filtered through a 70µm mesh to remove coarse material. The finer organic part of the sample was concentrated by swirl separation on a shallow dish. Fine material was removed by filtration on a 10µm mesh. The material was acetolysed to remove cellulose, stained with safranin and mounted on microscope slides in glycerol jelly. Counting was done with a Leitz Dialux microscope, using the writer's reference collection. The pollen results are given in Table 4 below.

Figure 20: Column sample from Area 1. Context numbers are in brackets and sample numbers in squares. The pollen monolith tin is 0.25m.

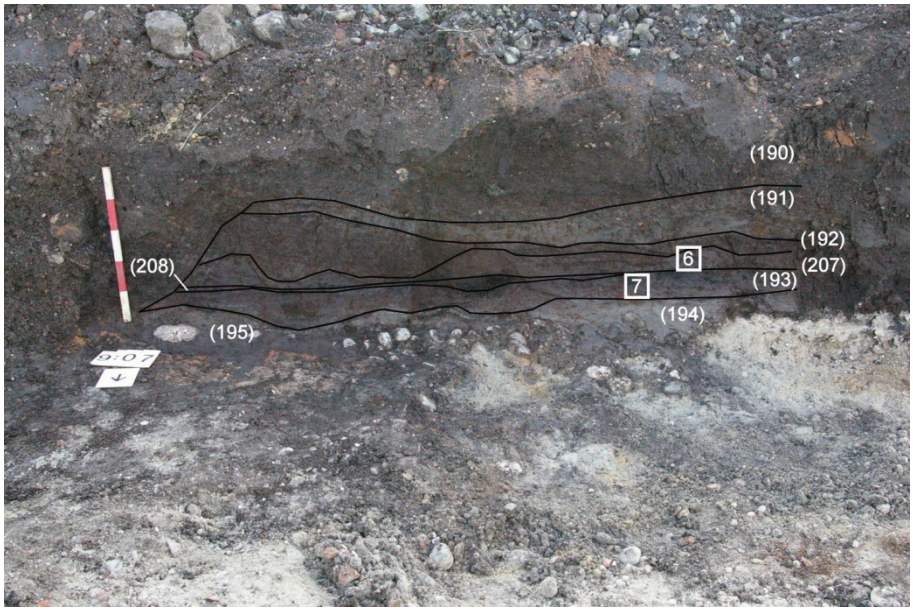


Figure 21: Sample section from Area 21. Context numbers are in brackets and sample numbers in squares. Scale 0.5m.

Results

1. Plant macrofossils (Table 3)

All the macrofossil samples were generally similar in that the sediment was highly organic, with some silt and sand, but only about 25 ml of organic remains were caught on the sieve per sample, which amounted to a single petri dish full of coarser material for sorting. The content of this were predominantly unidentifiable organic debris, among which there were occasional remains of what appeared to be wood, roots or bark, and some possible tree leaf remains, coarser and more resistant to decay than those of most herbs. Some tree bud scales were also seen. Some of this material was collected for radiocarbon dating, although it cannot be identified exactly, and could be from roots of a different date to the sediment. Only sample 14 contained identifiable plant remains such as tree bud scales including possible *Populus* (poplar), and seeds of *Ranunculus flammula* (lesser spearwort), *Urtica dioica* (nettle), *Rumex* sp. (dock) and small grasses. Most of these would grow in grassland, probably damp. It is quite unusual for such organic material to contain practically no seeds. A radiocarbon date was obtained from the seeds (Ua-37896 9185±65 BP, 10520-10230 Cal BP). Charcoal was noticed during the excavation, and the sieved fractions all had carbon in some form, whether as charcoal or carbon spheres which may be from soot. The charcoal was gathered for dating from sample 14, and although it is likely to be of the same age as the sediment, as it does not decay it could have been redeposited. The date from this is Ua-37897 10985±80 BP, 13080-12830 Cal BP).

2. Pollen (Table 4)

The six samples were assessed for pollen, four from the top and bottom of the pollen monolith from Area 1, and two from the base clay and the layer above it from Area 2 (Samples 6 and 7), to see if pollen was present and if any changes were evident between the lower and upper layers. All samples contained large amounts of pollen together with some spores and charcoal fragments, and in a generally good state of preservation, with just a few corroded grains. Test counts of about 100 grains were made, to give a general idea of the content, and one sample was also scanned for further grains. Further counting has been done on three of the samples to bring the pollen sums to above 200, allowing meaningful calculations of the percentages of the various taxa. The monolith samples from area 1 have been drawn up as an outline pollen diagram (Fig. 22).

The outline pollen diagram shows a broad change from mainly *Pinus* (pine) and *Betula* (birch) at the bottom to mainly *Alnus* (alder), *Betula* and *Corylus* (hazel) at the top, with a range of other trees present such as *Quercus* (oak), *Ulmus* (elm) and *Tilia* (lime). This is part of the normal vegetation sequence showing the development of woodlands during the Holocene and it looks fairly consistent with the normal pattern of events.

The lower sample (24 cm) from Area 1 (sample 5, context 105) contained mostly *Betula* (birch) 27%, *Pinus* (pine) 25%, Poaceae (grasses) 17%, *Corylus* (hazel) 11% and Cyperaceae (sedges) 6%. It shows features of the pollen Zone IV Pre-boreal in the birch, pine and herbs, and also some features of Zone V Boreal from around 9000 BP, with the appearance of *Quercus* (oak), (around 9000 BP), *Alnus* (alder) (8000-7500 BP) and *Ulmus* (elm) (9000-9500 BP). The dates of appearance are from Birks (1989), the traditional pollen zones from Godwin (1975). *Tilia*, *Quercus* and *Alnus* rise around 8000 BP at Wilden Marsh, Worcestershire, according to Brown (1988).

Birch and pine may have persisted on the sands and gravels of the Birmingham area after they had been displaced elsewhere by broadleaved woodlands, and they could be a feature of

the local vegetation in a Boreal assemblage (see discussion, below). The radiocarbon date of around 10,000 BP from near the base of the column in Area 2 is earlier than might be expected from some of the pollen records, such as lime, oak and alder. Associated charcoal dated rather earlier, could possibly represent older residual material, which is always a risk when dating charcoal in sediments. This is a Late-glacial age which is not reflected by the pollen spectra, which includes many trees such as alder which arrived considerably later than this. The dates of *c.* 10,000 BP from both seeds and charcoal seem most likely to represent the true age of most of the sediment and its archaeology as they are very similar and the pollen record at least partly agrees with this. It is easy to see how some later material, especially pollen, could have become added to this sediment, for example through cracks as the sediment dried in summer, as well as from other disturbance discussed below, which could explain the earlier than usual appearance of some trees such as alder, oak and lime. The earlier date may illustrate the problems of dating small amounts of charcoal and the risk of intrusive material affecting the result.

The upper sample (6, context 193) from Area 2 contained mainly *Betula* (birch) 33%, *Pinus* (pine) 29%, *Corylus* (hazel) 16%, Poaceae (grasses) 6% and Cyperaceae (sedges) 5%, with some *Quercus*, *Ulmus*, *Alnus* and *Tilia*. The spectrum is similar to that from lower Area 1, with high pine and low alder so it appears to be Pre-boreal to Boreal in age, as above.

The lower sample (7, context 194) from Area 2 contained mainly *Betula* (birch) 31%, Poaceae (grasses) 21%, Cyperaceae (sedges) 11%, *Alnus* (alder) 10%, and *Pinus* (pine) and *Corylus* (hazel) 7% each. *Quercus* (oak) and *Tilia* (lime) are two other Boreal elements, while others such as *Thalictrum* (rue) and *Artemisia* (mugwort) might even suggest the Late-glacial, unless they represent weeds growing in cleared areas. Area 2 is therefore harder to understand, having features of rather different periods together in the same sample. The deposit itself seems to have been boggy, as suggested by large numbers of *Sphagnum* moss spores and the pollen of Cyperaceae (sedges etc.). This is as expected in an organic sediment.

The upper sample (1 cm) from Area 1 (sample 2, context 103) mainly contained, in decreasing order, *Alnus* (alder), *Corylus* (hazel) and *Betula* (birch), with *Tilia* (lime) and possible *Quercus* (oak), together with rather a small selection of herbs. It shows a stage of developed damp alder woodland, probably local, and woods with oak and lime. Lime starts to rise at 7500-7000 BP (Birks 1989) and although the pollen is under-represented, it was a much more important part of the woodland away from the alder carr growing around bogs than its modest pollen records would seem to suggest (Greig 1982). Ericales (heathers) were present and also with a single grain of *Plantago lanceolata* (ribwort plantain), and together with records from a number of other herbs, these could represent open areas in the woods, just possibly connected with human activity. This spectrum would therefore seem to fit best with the Atlantic period VIIa dating from *c.*7,000-8,000 BP in the Godwin scheme (Godwin 1975).

All samples contained tiny pieces of charcoal and carbon spheres, indicating fires, either natural or made by humans, during the time covered by the sediments. There are also records of herbs such as Poaceae, Cyperaceae, and various smaller records of herbs such as Cichorioidae and Compositae Tubuliflorae *Artemisia* (wormwood) and *Plantago lanceolata* (plantain). Some of these would reflect the natural herb vegetation, especially around the boggy area, but they could also be a response to disturbance and burning of the local woodlands, presumably by Mesolithic people. This disturbance could possibly have affected the sediments too, for example if trees were uprooted, or if the wet areas were used as water

holes, the sediments could have become mixed, redeposited or otherwise disturbed, which could explain the slightly anomalous results, particularly of Area 2, Sample [7]. It is also easy to imagine disturbance and redeposition of such small deposits, as for example the exposure of prehistoric burnt mounds by erosion of streams in Birmingham (Barfield and Hodder 1981).

The almost total absence of seeds, and also beetle remains, while the pollen content and preservation was so good, is puzzling. Possible explanations could be that the area was mostly wooded, and so few seeds were deposited compared with a rich herb flora, but then *Alnus* was shown to have been present from the pollen and its seeds and catkins normally preserve well. Possibly the sediment was either disturbed or partly decayed, perhaps because it is only a thin layer in non-waterlogged sand and gravel, to the point where the organic remains mostly became decayed into fine organic debris that went through the sieve, while allowing enough pollen to remain for a good record.

Correlation with other sites

The results are consistent with those obtained from the evaluation. All of those samples came from features excavated from the base of the evaluation trenches – i.e. from the lowest organic clay horizon. They included the presence of *Pinus sylvestris* (Scots Pine), *Betula* (birch), *Corylus* (hazel), *Ulmus* (elm), *Quercus* (oak), *Alnus glutinosa* (alder) and *Tilia* (lime). Herbs were also recorded suggesting a relatively open herb-rich understorey with species such as sedges, marsh valerian, honeysuckle and tall herbs of the pink family suggesting damp woodlands (Gearey 2008).

These organic deposits overlying gravel appear quite similar to deposits reported from sites in the Smithfield market area of Birmingham, at Moat Row and Bromsgrove Street which were studied for their insect remains by Peter Osborne (Osborne 1980). He thought that these were representative of late Zone II or Zone III of 11,000 years ago, thus apparently earlier than the ones in the present study.

Another site in the midlands, and on sandy soils is Hartlebury Common, near Stourport, Worcestershire (Brown 1984). In the pollen diagram, the beginning of Zone RP3, Boreal to early Atlantic period, still has high *Pinus* and *Betula*, at the point at which *Alnus*, *Ulmus*, *Quercus* and *Tilia* all appear. The large amount of Coryloid at Hartlebury could be from *Myrica* (bog myrtle) as well as from *Corylus*, and could explain this abundance compared with the modest amounts of Corylus found at Birmingham. These results seem very similar to the pollen spectra obtained from this site and may provide the explanation of the high *Pinus* and *Betula* together with thermophilous trees.

An extensive study in Ireland shows evidence of fire disturbance of woodland, and use of wetlands which started about seven centuries later, *c.* 8400 BP (Mighall et al 2008). Although they do not exclude natural fires caused by lightning, the authors consider the likelihood that fire was used by Mesolithic people to manage the landscape there to their advantage. Another parallel is the presence of charcoal in varying amounts throughout the Mizen sequence, showing that fire was used over a very long time in the Mesolithic, going into the Neolithic. The Birmingham site also had charcoal present in many parts of the sequence. Mesolithic activity has been studied in such areas as the North York Moors and on Dartmoor, but this may be because evidence has been well preserved in the peat deposits there, in contrast with lowland sites like Birmingham which have been much disturbed by later

occupation as well as having less favourable conditions for preservation of biological remains.

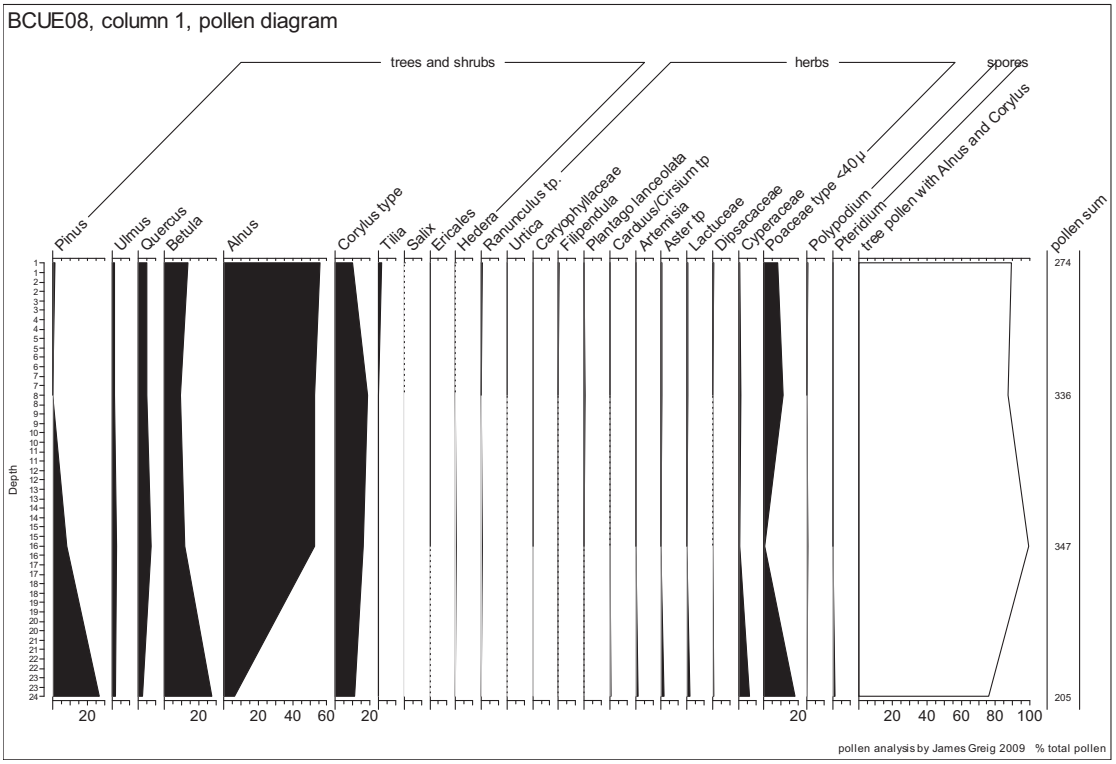


Figure 22: Pollen diagram.

Acknowledgements

Thanks to Angela Monckton for help with fieldwork and sampling.

Table 3: Macrofossil results

Sample	Context	Amount	Results: sediment; content; potential
2	(103)	50 ml	Fine organic material, some woody, charcoal and charred material; no beetles or seeds. Limited potential for dating or analysis
4	(107)	50 ml	Organic sediment with silt, clay and sand; fine organic material with charcoal and carbon spheres. No seeds or beetles. Limited potential for dating or analysis
5	(105)	50 ml	Organic sediment with silt and fine sand; fine organic debris with some charcoal and carbon spheres. No charcoal, beetles or seeds. Limited potential for dating or analysis
6	(193)	50 ml	Very organic sediment; fine organic material with charcoal and carbon spheres. No seeds or beetles, plenty of pollen. Limited potential for dating or analysis.
7			plenty of pollen
12	[152] (153)	150 ml	Organic sediment; woody and organic content with leaf-like remains, charcoal, carbon spheres. No seeds or beetles. Limited potential for dating or analysis.
14	[136] (137)	350 ml	Organic sediment; organic remains include tree bud scales including possible *Populus* (poplar), and seeds; 3 *Ranunculus flammula*, 1 *Urtica dioica*, 1 *Rumex* sp. and 6 small grass; 2 insect remains. Charcoal present. Material collected for dating (charcoal and seeds).
25	[183] (184)	125 ml	Organic sediment, some sand; fine organic content with charcoal and *Daphnia*. No seeds or beetles. Limited potential for dating or analysis
27	[175] (176a)	140 ml	Organic sediment, some sand. Organic content, some woody. Charred remains as well as charcoal. No seeds or beetles. Limited potential for dating or analysis.

Table 4: Pollen and spores, order of taxa according to Kent (1992), percentages of pollen given in brackets

Sample	**Mono 1 cm**	**Mono 24 cm**	**Sample 6**	**Sample 7**
Sphagnum		54	31	288
Pteridium	1	3		
Filicales			1	1
Pinus	1	54 (25)	68 (29)	15 (7)
Ranunculus	1	1 (+)		
Thalictrum				1 (+)
Ulmus		3 (1)	5 (2)	
Urtica	1			
Quercus	1	5 (2)	5 (2)	4 (2)
Betula	5	57 (27)	78 (33)	68 (31)
Alnus	28	13 (6)	10 (4)	22 (10)
Corylus	5	23 (11)	38 (16)	15 (7)
Caryophyllaceae	1	1 (+)		1 (+)
Tilia	1		1 (+)	+
cf. *Salix*			1 (+)	4 (2)
Ericaceae			1 (+)	1 (+)
cf. *Filipendula*	1			1 (+)
cf. *Fraxinus*			1 (+)	
Campanulaceae				1 (+)
cf. Rubiaceae				1 (+)
Valerianaceae				+
Dipsacaceae		1 (+)	+	
Cirsium type		1 (+)		
Cichorioidae	1		1 (+)	1 (+)
Artemisia	1	3 (1)		7 (3)
Compositae Tubuliflorae	1	3 (1)		6 (3)
Cyperaceae	1	13 (6)	11 (5)	24 (11)
Poaceae	3	37 (17)	13 (6)	45 (21)
Total Pollen	**52**	**215**	**233**	**217**

10. Insect Remains - David Smith

Introduction

This report discusses the nature of the insect fauna from a series of samples from the full excavation of the site carried out by ULAS in September - November 2008. The site consisted of a number of shallow features with organic fills overlying gravel which is probably of Pleistocene age. During the excavations of the site environmental samples were taken for the recovery of insect remains, which were investigated to obtain further evidence for the interpretation of the site, and suitable material for radiocarbon dating. The work described below was undertaken as part of the assessment of the site. Due to the limited potential of the insect remains, no further work has been carried out.

Samples

Three of the samples come from a continuous column of samples cut through the charcoal containing organic clay layer in Area 1 which covered the features on site (Col 1 samples 2, 3 and 5). The second set of samples (11, 13 and 15) came from the organic clay in the hollows left by the tree throws that underlay the clay horizon on site. The samples from the sections from both areas are shown on Figs 20 – 21. For details of the assessment see Smith in Higgins 2009.

Methodology

The samples were processed using the standard method of paraffin flotation as outlined by Kenward *et al* (1980). The weights and volumes of the individual samples are included in Table 4. Insect remains were sorted from the flot and examined under a low-power binocular microscope. The system for 'scanning' faunas as outlined by Kenward *et al*. (1985) was followed in this assessment.

The insect taxa recovered from the flots are listed in Table 4. The taxonomy used for the Coleoptera (beetles) follows that of Lucht (1987).

The numbers of individual insects present is estimated using the following scale: + = 1-2 individuals ++ = 2-5 individuals +++ = 5-10 individuals ++++ = 10+ individuals +++++ = 20+ individuals.

Results

Only three of the samples examined (Samples 2 and 3 (contexts 103 and 104) from the column in Area 1 and sample 13 (context 137) in Area 2) produced insect remains. The faunas are in general quite small and fairly unspecific in terms of the type of landscape it may represent. This is similar to the results from the evaluations where only a small number of insects were identified, with nothing to indicate specific climates or environments (Gearey 2008). The size of the faunas recovered also may mean that they are not representative.

There are hints that these deposits may be associated with rough ground and grassland. This is indicated by the presence of the Sitona 'clover weevil' in sample 13 and the 'garden chaffer' *Phylopertha horticola*. There is also a suggestion, that the organic clay which overlies the site may be associated with reed beds, since the 'reed beetle' *Plateumaris braccata*, recovered in sample 1 from the column in area 1 is only associated with common reed (*Phragmites australis* (Cav.) Trin ex Steud.)).

There are, however, no indicators for the presence of trees or woodland except for a single individual of the 'common woodworm' *Anobium punctatum* recovered in Sample 13 in from Area 2. There are also no indications for the presence of settlement waste.

Discussion

It is clear from the assessment that these insect faunas, and any remaining sampled material, have a limited potential for insect analysis. This is unfortunate since with the exception of the single Late Glacial insect fauna from the Smithfield Market site (Osborne 1981), and a recent assessment on the Digbeth Cold Store site (Smith 2008), there have been no other insect faunas recovered from the material which is believed to be Early- or Mid-Holocene in date from Birmingham. Unfortunately, the insects recovered have a very limited role to play in interpreting this site or supporting any conclusions derived from the pollen analysis.

Table 5: Assessment results for the insect remains from Eastside, Birmingham

Sample No.	**1**	**2**	**13**
Context	Column 1	Column 1	(137)
Processed Weight (kg.)	5	6	5
Processed Volume (L.)	10	7	9
COLEOPTERA			
Carabidae			
Nebria spp.			1
Bembidion spp.			
Trechus spp.			
Pterostichus spp.			
Hydraenidae			
Ochthebius spp.			1
Helophorus spp.		1	
Hydrophilidae			
Cercyon spp.			
Staphylinidae			
Lesteva spp.			
Oxytelus spp.		1	1
Olophrum spp.			1
Stenus spp.			1
Lathrobium spp.			1
Philonthus spp.			1
Tachyphorus spp.			
Aleocharinae Gen. & spp. Indet.	1		1
Elateridae			
Agriotes spp.		1	
Anobiidae			
Anobium punctatum (Geer)			1
Scarabaeidae			
Aphodius spp.			
Phyllopertha horticola (L.)			
Chyrsomelidae			
Plateumaris braccata (Scop.)	1		
Cuculionidae			
Sitona spp.			1
Notaris acridulus (L.)			1
Mecinus spp.		1	

\+ = 1-2 individuals ++ = 2-5 individuals +++ = 5-10 individual

11. Charcoal Identification – Graham Morgan.

Introduction

Charcoal was noted in most of the organic deposits from the site. However, only the charcoal from Sample [4], context 107 was large enough for identification (Table 5).

Table 6: Charcoal identification

Sample No	Context	Dia.	Rings	Age	Spec.
4	(107)	10	36	36	pine charcoal and par-burnt wood
4 (column)	(107)				as above with wood fragments

Results

The presence of resin ducts shows that this sample is not yew or juniper. The presence of pine, *Pinus* species, is unusual in lowland England after the Mesolithic and before the 16th century AD. The charcoal is therefore likely to be Mesolithic or earlier in origin.

12. Lithics – Lyndon Cooper

Introduction

Two flints were recovered from the excavations, both from natural features containing the lower organic clay deposits overlying the natural substratum (Table 7, Fig. 23). Their location is shown on Figs 12 and 15.

Table 7: Description of Lithics

Context	Description
Area 1 (201)	SF1. Distal fragment of a secondary blade. Fine quality smoky brown semi-translucent flint with very thin skin of cortex (very similar to material used at the Bradgate Park Late Upper Palaeolithic site (Cooper 2002)).
Area 2 (203)	SF2. A multi-purpose tool. A large tertiary blade was partly retouched on one side. The lower 38mm was not retouched but has signs of utilisation (ie continuous line of small removals that probably occurred with use as a knife or such-like). The retouched blade had snapped and the distal fragment was converted to a burin (on a break). The burin shows signs of use. Fine quality grey brown flint with olive and grey inclusions.

Figure 23: Lithics from the lower organic clay (Left: 1, Right: 2)

Neither piece is diagnostic in terms of chronology, but they both may be as early as the Late Upper Palaeolithic. This is consistent with the dates from the pollen analysis, which indicates a Pre-boreal or Boreal date of 11500 - 8000 BP date, and the radiocarbon dates of this horizon. The flints provide some, albeit limited, dating evidence for the site and together with similar material from other excavations, could provide a useful assemblage of material for future analysis.

13. Post-Roman material – Deborah Sawday

A total of 55 sherds weighing 2898g was recovered from the excavations. Ten sherds were from excavated features; the remainder and the bulk of the material was recovered from the mixed soils and overburden overlying the prehistoric organic clays. Twelve fragments of ceramic building material (10 from excavated features) were also recovered weighing 723g. One glass bottle and four clay pipe fragments were found in the overburden.

The pottery was catalogued with reference to the Warwickshire Medieval and Post Medieval Pottery Type Series (1988). These and the other finds listed below are all post-medieval and/or modern in date.

Discussion

All of the excavated features containing post-Roman material cut through the mixed soils overlying the prehistoric organic clays or from features beneath the modern buildings. The pottery suggests that these features are likely to be 18th century in date. The 18th-century maps of the area show the land as open with orchards and with a series of tree lined boundaries at least two of which fall within the excavated Area 2 (Tyler 2008). The excavated ditches containing the 18th century pottery may well be related to these boundary features.

The finds from the excavations matched those recovered during the 2007 evaluations which recovered mostly 18-19th century pottery, 18-19th century tile, clay pipe fragments including a bowl from Trench 1 dating to the late 18th – early 19th century and a dark green wine bottle

of later 17th century date. Other objects recovered from the evaluations included 20th century tile fragments, a number of modern glass bottles, slate, a 19th century metal sign, animal bone fragments and shell fragments including some used in the process of Button making (Macey-Bracken 2008, 8).

Table 8: Post Roman finds from the excavations.

Context	Fabric/Ware	Nos.	Weight	Comments
POTTERY				
[131] (130) - ditch	SLPW04 – Trailed	2	73	Press moulded, pie crust rim, yellow and brown over light buff body, c.1640-c.1740.
[131] (130) - ditch	MANG – Manganese Mottled ware	1	14	Cup handle, c.1680-c.1780
[133] (132) - pit	MGW – Modern Glazed ware	1	3	Scalloped dish rim, transfer printed under glaze, refined white earthenware – modern.
[135] (134) - pit	TGE – Tin Glazed Earthenware	1	38	Late 17th – 18th C. – hollow ware base
[135] (134) - pit	MB – Midlands Blackware	3	204	18th century, includes bowl rim
(164) - overburden	MB – Midland Blackware	4	745	Jar rim & base, glazed internally.
(164) - overburden	CRW– Cream ware	3	103	Jar rim, body & base fragments – some decorated, c.1750-c.1810
(164) - overburden	MGW – Modern Glazed ware;	13	318	Refined white earthenwares, some transfer printed under glaze, flat & hollow wares, modern.
(165) – mixed soils	MBO1 Midland Blackware	2	48	Hollow ware base & body, c.1580-1650
(165) – mixed soils	MBO2 – Midland Blackware	2	89	Hollow ware base & body, c.1580-1700
(165) – mixed soils	STE – Stoneware	1	81	Brown Salt Glazed - ?18th C+.
(165) – mixed soils	EA – Unclassified Earthenwares	6	257	Post Medieval/Modern
[206] (204) - ditch	MBO2	1		Abraded hollow ware base, ?18th C, fine jar rim/
[206] (204) - ditch	SLPW04	1		Press moulded body
(205) - overburden	MBO2	4	154	Fine & coarse hollow wares
(205) - overburden	SLPW04	1	110	Press moulded dish, pie crust rim, dark slip interior and under a, sub rounded patch of yellow clay. – 18th C
(205) - overburden	MGW	6	131	Refined white earthenwares, modern
(205) - overburden	STE – Stoneware	1	530	Complete Stoneware ginger beer, rim designed for a cork stopper transfer printed under glaze 'fermented stone beer' H. Barton, Birmingham, modern.
(205) - overburden	STE	2		Base & lower body of 2 ginger beers, transfer printed under glaze

Context	Fabric/Ware	Nos.	Weight	Comments
				'Austin's Birmingham' – modern.
GLASS				
(205) - overburden	Bottle glass			Small bottle, complete with tall neck, sheared rim and cork, Victorian
CLAY PIPE				
(164) - overburden	China Clay	3		Tobacco pipe stems
(165) – mixed soils	China clay	1		Tobacco pipe stem
CERAMIC BUILDING MATERIAL				
[131] (130) - ditch	EA – Earthenware	1	95	Brick
[131] (130) - ditch	EA	1	133	Flat Roof Tile – moulded and sanded underneath, ?post med
[133] (132) - pit	EA	1	18	Brick or tile ?modern
[135] (134) - pit	EA	2	198	Brick, ?post med.
(165) – mixed soils	EA	1	50	Flat roof tile, moulded and sanded underneath, ?post med
(165) – mixed soils	EA	1	15	Fired clay
[206] (204) - ditch	EA	3	113	Brick – post med/modern
[206] (204) - ditch	EA	2	101	Flat roof tile, moulded and sanded underneath, ?post med

14. Industrial Residue –Heidi Addison

Iron slag (1210 g) of was recovered from the excavations, all from within an 18th century ditch (204). The industrial residue may provide some evidence of post-medieval or modern industrial activity on the site, and together with similar material from the evaluation excavations, could provide a useful assemblage of material for possible future studies from this part of the post-medieval town.

15. Discussion

Central Birmingham is built on part of narrow sandstone ridge and natural fault line that stretches from the Lickley Hills in the southwest to Sutton Coalfield in the northeast. The excavation areas occupied a location towards the base of this ridge that falls sharply towards Digbeth and the valley of the River Rea. The levels at which the natural substratum was found in both the evaluation trenches and excavation areas generally reflected this slope from west to east. The levels at which natural substratum was found in the excavations suggested a ridge or spur dividing the two excavation areas which were located within two natural depressions either side of this ridge. The location of these areas on low-lying ground at the base of a slope may have caused the environment to be prone to waterlogging from natural surface run off. Although the natural substrata comprised sands and gravels classified as glacial drift (British Geological Survey of Great Britain, Sheet 168, Birmingham) and thought to be free draining, observations during the excavations suggest it has some clay content. It was also observed that these local sands and gravels appeared to become impermeable once they had been compacted.

The results of the auger survey indicate that the natural sands and gravels in both areas comprised an undulating surface of shallow peaks and troughs. These local topographical factors may have caused this area to be susceptible to a rising water table as the natural overland flow of water drained downslope to pool in the natural shallow troughs and basins.

The excavations produced a good stratified sequence of organic clays overlying the natural sands and gravels. Although suitable dating material was difficult to come by the evidence from the pollen, the radiocarbon dates and the contextual and artefactual evidence has allowed a possible phasing of the stratigraphy to be suggested.

Phase 1: Late Upper Palaeolithic to Early Mesolithic

The earliest deposits comprised organic clays overlying the natural sands and gravels. The local glacial drift sands and gravels were probably more susceptible to fluvial erosion and sediments may have been washed downslope by overland flow and collected within the natural hollows found in the two excavation areas along with organic clay sediments. Although the location of the site and its present day natural topography suggests that it would not be prone to waterlogged conditions, it does border a floodplain environment to the east and fluvial deposition of sediments could stem from River Rea. As the natural hollows filled with organic clay sediment it was likely that the local environment became more impermeable probably causing the further instances or periods of water-logging. The results of the pollen analysis appear to confirm this with instances of sedges and moss spores detected within these clay sediments lying immediately above the natural deposits suggesting a boggy environment (Greig above).

A series of natural features were recorded in both areas. Although these had originally been thought to represent cut features, sample excavation proved that they were irregular in plan with undulating sides and bases, indicating a natural origin, probably large tree roots features or possibly animal burrows, filled with the same organic clay that overlay them. Most of the natural features identified appear to be within the lower organic clay layers.

Radiocarbon analysis of organic debris retrieved from one of these tree root features produced two differing dates of 10,985 ± 80 BP (13080-12830 Cal BP) from a sample of charcoal and 9185 ± 65 BP (10520-10230 Cal BP) from seeds.

Greig suggests that the dominance of Birch and Pine in the pollen record indicates a Pre-boreal environment (Pollen Zone IV). However the appearance of other elements such as oak, alder, elm and lime indicates a more likely Boreal date (Pollen Zone V) and that the presence of pine and birch could be a local anomaly as these species favour the local sands and gravel and may have persisted into this period, although Greig has discussed how the later pollen might have become incorporated into earlier deposits. Pollen analysis from the fill of a later prehistoric palaeochannel in north Birmingham suggested that here pine woodlands persisted into the later Neolithic period before giving way to alder carr (Tetlow et al in press).

The radiocarbon date from the seeds in this deposit would fit a date in the Boreal. However, the earlier radiocarbon date suggests a Late Glacial date as does the presence of *Thalictrum* (rue) and *Artemisia* (mugwort) in Area 2 (although these could also indicate weeds growing in open areas). It is possible that this represents the very lowest (and earliest) part of the deposit with the seeds dating the upper levels although this seems unlikely. Late Glacial deposits were found during excavations for the Wholesale Markets in Birmingham where insects suited to the cold climates of around 11,000 BP were found (Osbourne 1980).

The environmental data of the English Midlands in early prehistoric period contained mixed woodland known as wild wood (Greig 2007) and the pollen from this site might therefore suggest prehistoric woodlands with local boggy areas (indicated by the presence of mosses and sedges) and damp grasslands. The possible tree root features could be physical evidence of the birch and pine tree woodland.

The pollen in these grey silts also contained fairly high percentages of grasses and sedges. The rue and mugwort might indicate a possible open woodland canopy which may have resulted from clearance (Greig above). In these same early deposits two flint artefacts of possible Late Upper Palaeolithic or Early Mesolithic period where recovered which indicates the presence of hunter-gatherers in these early prehistoric woodlands.

The earliest pale clay sediments were sealed with slightly more organic clay which the pollen results also suggest are Pre-boreal to Boreal age deposits. The pollens indicates the continuation of woodland dominated by birch and pine with some hazel, oak, alder, elm and lime, grasses and sedges also present (Greig above). It is noticeable that charcoal and/or carbon spheres were noted in both these early deposits suggesting that burning was taking place during this period, although whether this was deliberate burning associated with attempts to clear areas or natural woodland fires is unknown.

Phase 2: Early Mesolithic

These Boreal/Pre-boreal deposits were sealed by a charcoal horizon spreading across both areas. Some of the wood from Area 1 was identified as Pine. Radiocarbon analysis dates the layer to 9140 ± 60 BP (10490-10200 Cal BP) and the pollen from a layer above it suggests an Atlantic period date (dating from *c.* 8,000-7,000BP) (Greig above). This charcoal layer appears to represent a significant episode of burning across the site. Evidence for the use of fire to create forest clearances has been widely reported as a possible strategy for encouraging browsing conditions for deer (Myers 2007, 28). This charcoal layer could possibly be evidence of clearance of the local woodland by Late Upper Palaeolithic or Early Mesolithic communities, although a natural event may be equally possible.

The perceived wisdom regarding Mesolithic hunter gatherers has changed from the idea that they had only a minimal influence on existing Holocene forests to suggesting significant and lasting impacts upon the development of vegetation and woodlands (Innes and Blackford 2003). In addition to the charcoal horizon found in this layer all of the samples studied contained tiny pieces of charcoal and carbon spheres. Records of grasses, sedges could also indicate clearances and the presence of herb pollen might be a response to clearance. However, widespread Mesolithic clearances are still disputed and other reasons have been suggested including natural fires caused by lighting, camp fires and the burning of dead or fallen timbers or other forms of anthropogenic fire management (Brown 1997).

Recent palynological analyses, supplemented by other environmental data such as charcoal data from the North York Moors, has shown that throughout the Mesolithic period, woodlands were subject to periodic disturbance (Innes and Blackford 2003; Zvelebil 1994; Simmons, 1996). It is thought that the pollen evidence suggests the creation of localised breaks in tree cover or thinning of the forest matrix. The clearances are seen as offering resource procurement opportunities, particularly of game animals, though possibly also of edible plants (Davis et al 2005). Another primary motivation may have been to keep paths open and create a buffer against woodland around rest sites (Davis et al 2005).

Mesolithic activity within Boreal woodland is evidenced elsewhere. At Spong Hill, Caistor St Edmunds and Bixley, Norfolk peri-glacial features and hollows filled with charcoal rich sands occasionally containing Mesolithic flints have been recorded (Murphy 2002). The pine charcoal from Spong Hill has been dated (8150 ±100 BP, 8259 ±90 BP and 8280 ±90 BP). These dates are later than the Birmingham charcoal layer, although a date from pine charcoal at Bixley gave a date of 8990 ±100 BP which is closer to the 9140±60 BP date obtained from Birmingham.

In addition to the Late Upper Palaeolithic/early Mesolithic flints found during the excavations, other flint tools and waste flakes from the Mesolithic have been found within Birmingham area indicating a presence by human communities during this period (although these are usually late in date). The lithics have generally been found close to streams or known wetlands such as Little Bracebridge Pool in Sutton Park and Manorial Wood Sutton Coldfield (Hodder 2004). Large collections of Mesolithic flints have been found just outside Birmingham at Bourne Pool near Loaches Banks (Gould and Gathercole 1958, Saville 1974), Wishaw Hall Farm (Trevarthen 2008) and Sandwell Priory (Saville 1991). The possible fire clearance events found within the Eastside deposits could represent further evidence of the presence of Mesolithic people, adapting their environment to their own needs.

Phase 3: Mesolithic

The highly organic upper layers found at the top of the sequence have a suggested Atlantic period date (7000 to 8000 BP). The pollen analysis suggests by this time the local vegetation was a possible mixed woodland dominated by alder trees, hazel and birch with lime and possible oak (Greig above). Analysis shows that these deposits also contained charcoal indicating that burning (either natural or man-made) may have continued into this period, although no artefacts were recovered from these layers or features identified to indicate the presence of human communities during this period. It would appear that any later deposits have been truncated by the post-medieval / modern buildings.

Phase 4: Post-medieval – modern

No evidence was recorded for the medieval period. As the area was known to lie within 'Little Park', a deer park of medieval origin, and remained undeveloped until the late 18th century (Tyler 2008), it is not surprising that there were no features or artefacts of this date. The presence of 18th century features cutting into the upper organic deposits would imply that deposits of this date might also have been destroyed by later development of the site.

There was no evidence for medieval or post medieval cultivation during either the excavations or the evaluations. However, in the upper organic layer well-preserved tree roots were recorded. The roots appeared to have penetrated the layers from a higher level, an interpretation reinforced by the fact that they were generally in a good state of preservation. These roots may therefore represent trees from more recent periods perhaps from the medieval deer park.

Sealing the organic deposits was a modern layer consisting of greyish-brown silty clays mixed with sand and charcoal, occasional pottery sherds and tile fragments. The earliest pottery identified was Midland Blackware dating from the 16th century onwards, but found with other pottery dating to the 18th century (Sawday above).

Within both areas, ditches and refuse pits were found cutting the mixed soil layers below. The pottery sherds found within these features suggest an 18th-century date. Late 18th century maps show that the open fields on the east side of the area were subdivided series of tree lined boundaries (Fig. 4). It is possible that the ditches found during these excavations may be related to these boundaries.

The boundary ditches and pits were sealed by a thick greyish-brown clay deposit containing 18th to early 19th pottery sherds as well as other modern materials. This layer was cut horizontally by various wall foundations, brick cellars and service trenches. These features all probably relate to the 19th – 20th century development of the site.

Conclusions

The site has produced significant evidence for a prehistoric wooded environment dominated by birch and pine during the Boreal period. The presence of mosses and sedges indicates that there could have been local boggy areas and damp grasslands. The excavation areas lie on the edge of the river floodplain and at the base of the sandstone ridge. Locally the two excavation areas lay in depressions either side of a ridge running east to west. The low-lying nature of the land may have caused the environment to be prone to waterlogging from natural surface run off. It was also noticed that the sands and gravels became compacted and impermeable relatively easily which may have contributed to the waterlogging.

The presence of human activity is attested by the presence of two flints of possible Late upper Palaeolithic – Mesolithic date within these deposits. The presence of charcoal throughout the sequence suggested that burning occurred during the period and a significant layer of pine charcoal indicates a widespread burning event across the whole area. Whether this was a deliberate attempt at clearance by Early Mesolithic communities or the result of natural fires is unknown. This was followed by a mixed woodland environment in the Mesolithic period. No further artefacts recording human activity were recovered from the upper deposits and

this lack of anthropogenic indicators suggests that any deposits of the Neolithic period onwards had been truncated by the post-medieval development of the site.

The survival of the organic clays on this site suggests that even where later development within Birmingham City has truncated areas to some depth, significant environmental data might still be preserved. Such information is invaluable in allowing insights into the prehistoric environment and the impact of human communities upon them. Significantly this site has shown that evidence of this nature may survive elsewhere within the City centre.

16. Archive and Publication

The full site archive includes all artefactual and/ or ecofactual remains recovered from the site. The documentary archive comprises:

- 106 Context records
- 11 Site plan and section drawing sheets
- 3 Context indices sheets A4 pages
- 3 Photo index sheets A4 pages
- 1 Drawing index sheet A4 page
- 2 level indices sheets A4 pages
- 2 Sample index Sheets A4 pages
- 32 Environmental Sample record sheets A4 pages
- 5 monochrome 36 exp. Films
- 180 digital photographs (jpegs)
- N4Ce survey files
- TurboCad Drawings

The site archive will be prepared according to guidelines set down in Appendix 3 of the Management of Archaeology Projects (English Heritage, 1991), the Guidelines for the Preparation of Excavation Archives for Long-term Storage (UKIC, 1990) and Standards in the Museum Care of Archaeological collections (Museum and Art Galleries Commission, 1992). Finds and the paper archive will be deposited with Birmingham Museum and Art Gallery.

The site archive will be held by Birmingham City Council Museums. A summary of the work will be published in relevant local and periodic journals in due course.

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Tim Higgins and Vicki Score
University of Leicester Archaeological Services
University of Leicester
University Road
Leicester LE1 7RH
Tel: 0116 252 2848
Email: th31@le.ac.uk; vp23@le.ac.uk
21-07-2009

APPENDIX 1: Oasis Record

INFORMATION REQUIRED	
Project Name	An Archaeological Excavation BCU Eastside Campus, Banbury Street, Birmingham (NGR SP 0768 8698) centre
Project Type	Excavation
Project Manager	Vicki Score
Project Supervisor	Tim Higgins
Previous/Future work	Previous work: Desk base assessment, Evaluation
Current Land Use	Vacant Plot
Development Type	New Campus development
Reason for Investigation	PPG16
Position in the Planning Process	Pre-planning enquiry
Site Co ordinates	NGR: SP 0768 8698
Start/end dates of field work	September November 2008
Archive Recipient	Birmingham City Council
Study Area	*c*. 1.69ha

APPENDIX 2: Context List

Context List

Phase 1: Late Upper Palaeolithic to Early Mesolithic
Phase 2: Early Mesolithic
Phase 3: Mesolithic
Phase 4: Post Medieval
Phase 5: Modern

Area 1						
Cont No.	**Cut No.**	**Area 1**	**Type**	**Description**	**Below**	**Phase**
100	101	Area 1	fill	Fill modern cut. Highly organic dark brown clay mixed with frequenr rounded pebbles. Same as 204.		Phase 4
101	101	Area 1	cut	Cut modern feature. A linear feature or ditch running west to east with gradual sloping sides breaking gradually in to a broad rounded base. The ditch was 2.10m wie and 0.65m deep. Same as 206	100	Phase 5
102		Area 1	layer	Modern Layer. Disturbed dark grayish brown organic clays mixed with brick and tile and charcoal flecks.		Phase 5
103	102	Area 1	layer	Mid Brown Peat layer. Highly organic dark greyish brown clay. Buried layer organic clay		Phase 3
104		Area 1	layer	Dark Brown highly organic layer of dark grayish clay mixed with occasional charcoal fleck and 0.10m to 0.20m thick. Buried layer organic clay	103	Phase 2
105		Area 1	layer	Very dark clay layer highly organic 0.08m deep. Buried organic clay layer.	104	Phase 1
106		Area 1	layer	Pale grey clay sediment. A silty clay sediment which was leached and had iron panning horizons, suggesting a fluctuating water table. Some fibrous organic content.	105	Phase 1
107		Area 1	layer	Charcoal lense/layer. A consistent horizon charcoal and soot and found within the pale grey clays.	104	Phase 2
173	173	Area 1	cut	Tree bowl or animal burrow cut. Irregular oval shape cut with gradual sloping sides breaking into undulating base. 1.55m long 1.00m wide 0.18m deep	174	Phase 1
174	173	Area 1	fill	Tree bowl animal burrow fill. Very dark greyish highly organic clay.		Phase 1
175	175	Area 1	cut	Remnant large tree bowl and root. Irregular linear shape with shallow gradual sloping sides and broad rounded base. Excavated section 3.00m wide and 0.16m deep	176	Phase 1
176	175	Area 1	fill	Fill tree bowl and root. Very dark grey organic clay.		Phase 1
177		Area 1		Tree bowl cut. Irregular shape feature with no sides and undulating base. Possible base of tree root feature or spread.		Phase 1
178		Area 1		Tree bowl fill. Dark grey highly organic feature,		Phase 1
179	179	Area 1	cut	Small tree bowl root or animal burrow. Irregular oval bowl shape with shallow very steep sides breaking sharply into undulating base. 0.54m long, 0.38m wide, 0.17m deep	180	Phase 1
180	179	Area 1	fill	Fill tree bowl root animal burrow. dark greyish highly organic clay		Phase 1
181	182	Area 1	cut	Modern east west linear cut or ditch. A regular linear cut with gradual sloping sides that break into rounded base. The excavated section measured 0.10m deep and 0.55m wide. The same cut as 206 and 101.	182	Phase 4
182	181	Area 1	fill	Fill modern feature. A dark grayish loamy clay fill mixed with frequent pebbles. It was littered with frequent charcoal flecks, occasional brick , iron slag fragmen and pottery sherds		Phase 4
183	183	Area 1	cut	Tree bowl cut. Irregular oval shape with fairly steep sides and flat base. 2.50m long, 1.30m wide, 0.50m deep	184	Phase 1
184	183	Area 1	fill	Fill tree bowl feature. dark grey organic clay		Phase 1
185		Area 1	layer	Clay layer/fill. Dark grayish brown highly organic clay layer or fill of cut 187		Phase 1
186	186	Area 1	cut	Cut tree bowl feature. Irregular oval shape cut gradual sloping sides breaking into rounded base. Abroad shallow scoop 2.50m wide 0.36m deep. The truncated remnants tree bowl or animal burrow	187	Phase 1
187	186	Area		Fill tree bowl feature. Dark greyish clay sediment silt fill.	185	Phase

		1				1
188	188	Area 1		Cut tree bowl feature. Irregular oval shape feature gradual sloping sides and undulating broad base. Feature measured 1.43m long, 1.34m wide, and 0.20m deep.	189	Phase 1
189	188	Area 1		Fill of tree bowl feature. Grey clay sediment silt fill.		Phase 1
200		Area 1	layer	Dark greyish brown highly organic clay.		Phase 3
201		Area 1	layer	Greyish brown organic clay sediment layer. Mixed with orange brown horizons of iron pan. A Upper Paleolithic or Mesolithic flint found within this deposit.	200	Phase 1
202		Area 1	layer	Pale yellowish grey sandy silt layer. A mixed natural layer.	201	Phase 1
204		Area 2	Fill	Fill Post Med or Modern ditch Highly organic dark brown clay mixed with frequenr rounded pebbles. Same as 100.	205	Phase 4
205		Area 2	layer	Modern overburden. Dark greyish brown clay mixed with modern pottery, brick and glass.		Phase 5
206		Area 2	cut	Post Med or Modern east west linear cut or ditch. A regular linear cut with gradual sloping sides that break into rounded base. The excavated section measured 0.10m deep and 0.55m wide. The same cut as 101 and 181.	204	Phase 4

Area 2

Cont No.	Cut No.	Area	Type	Description	Below	Phase
108	110	Area 2	fill	Fill of tree bowl root feature. A dark grey silty clay mixed with occasional pebble		Phase 1
109	110	Area 2	fill	Fill of tree bowl root feature. Light grey silty clay sediment.	108	Phase 1
110	110	Area 2	cut	Cut tree bowl root or animal feature. Very irregular shape with steep sloping sides with uneven base and pitted. The excavated section measured 2.00m long, 1.40m wide, 0.20m deep	109	Phase 1
111		Area 2	layer	Charcoal deposit. A horizon of charcoal and soot found during machine strip excavation		Phase 2
112		Area 2	layer	Charcoal deposit. A horizon of charcoal and soot found during the machine strip excavation		Phase 2
113		Area 2	layer	Charcoal deposit. A horizon of charcoal and soot found during the machine strip excavation.		Phase 2
114	115	Area 2	fill	Tree bowl feature fill. Very dark highly organic clay fill		Phase 1
115	115	Area 2	cut	Tree bowl cut. A section of possible tree bowl feature exposed during excavations. The feature had gradual sloping sides and undulating base. The section measured 0.90m long, 0.80m wide and 0.45m deep	114	Phase 1
116	117	Area 2	fill	Tree bowl fill. Light grey organic clay sediment mixed with pebbles		Phase 1
117	117	Area 2	fill	Tree bowl cut. Irregular linear shape with steep sides, with irregular sloping and pitted base. The linear frature created by root branch burrowing into the natural gravels.	116	Phase 1
118	119	Area 2	fill	Tree bowl fill. Grey sandy silt clay sediment mixed with occasional pebble.		Phase 1
119	119	Area 2	cut	Tree bowl fill. A section excavated into tree bowl feature that steep sides that beak gradually into rounded base. The excavated section measured 0.80m long o.60m wide and 0.20m deep.	118	Phase 1
120	121	Area 2		Tree bowl fill. A grey sandy silty clay ediment mixed with occasional pebble.		Phase 1
121	121	Area 2	cut	Cut of tree bowl feature. Irregular linear shapr feature with irregular sides and rounded undulating base. The root branch burrowing in to natural sands and gravels.	120	Phase 1
122	123	Area 2	fill	Fill tree bowl feature. Very dark highly organic clay.		Phase 1
123	123	Area 2	cut	Cut tree bowl feature. Irregular bowl shape feature with gradual sloping sides and broad undulating base. The feature measured 0.60m long, 0.40m wide and 0.25m deep.	122	Phase 1
124	125	Area 2	fill	Fill tree bowl feature. Dark grey highly organic clay fill.		Phase 1
125	125	Area 2	cut	Cut tree bowl feature. Irregular oval shape feature with gradual sloping sides and undulating base. The feature measured 1.70m long, 1.60m wide, 0.12m deep.	124	Phase 1
126	127	Area 2	fill	Fill tree bowl feature. Grey sandy clay fill mixed with frequent small and large pebbles.		Phase 1
127	127	Area 2	cut	Cut of tree bowl feature. A semi circular arc shaped linear feature, with steep sloping sides and narrow rounded base. Segments excavated across feature measured 0.54m wide and 0.20m deep .	126	Phase 1
128	129	Area	fill	Fill of tree bowl feature. Grey sandy clay mixed with pebbles and had		Phase

		2		excavated width of 0.74m and depth 0.28m.		1
129	129	Area 2	cut	Cut of tree bowl feature. Irregular oval shape with steep sides and broad flat base. The section excavated was 0.74m wide and 0.28m deep.	128	Phase 1
130	131	Area 2	fill	Post Med to Modern pit or ditch fill. dark grey highly organic clay mixed with occasional small pebble. Refuse pits with occasional pottery sherd, brick/tile fragments		Phase 4
131	131	Area 2	cut	Truncated remnant of pit. A oval shape pit with gradual sloping sides that breaks sharply into broad flat base. The pit measured 1.60m long, 1.16m wide and 0.11m deep	130	Phase 4
132	133	Area 2	fill	Pit feature. Dark grey organic clay mixed with rounded pebbles. The pit also contained occasional pottery sherd and brick/tile fragments.		Phase 5
133	133	Area 2	cut	Truncated remnants of a ditch feature. A linear feature running north to south with shallow gradual sloping sides and broad rounded base. The excavated section measured 1.10m wide and 0.20m deep.	132	Phase 5
134	135	Area 2	fill	Post med to modern pit feature. A greyish brown organic clay mixed with frequent pebbles. The pit contained occasional pottery sherd and brick/tile fragments.		Phase 4
135	135	Area 2	cut	Truncated oval shape pit with steep sloping sides and broad flat base. The excavated section measured 0.95m wide and 0.48m deep.	134	Phase 4
136	136	Area 2	cut	Natural depression cut. A very large irregular oval shaped feature with radiating linear branches. The feature had shallow gradual sloping sides and broad undulating base. The excavated segment was 2.90m long, 1.35m wide and 0.10m deep. Remnants of tree bowl stump feature with roots branching outwards.	137	Phase 1
137	136	Area 2	fill	Fill natural feature or tree bowl roots. A very dark grey highly organic clay.		Phase 1
138	138	Area 2	cut	Cut tree bowl feature. Irregular oval shape feature with steep sloping sides, with rounded undulating base. The excavated section measured 0.70m wide and 0.20m deep.	139	Phase 1
139	138	Area 2	fill	Fill tree bowl feature. A dark greyish highly organic clay mixed with the occasional pebble.		Phase 1
140	140	Area 2	cut	Cut tree bowl feature. Irregular linear shape feature with gradual sloping sides. The linear feature sharp sloping sides and narrow base and may represent root action of trees or animal burrow. The excavated section measured 2.00m wide and 0.26m deep	141	Phase 1
141	140	Area 2	fill	Fill of tree bowl feature. A very dark grey high organic clay.		Phase 1
142	142	Area 2	cut	Cut tree bowl feature. A irregular oval shape with fairly steep sides and rounded base. The feature measured 1.10m long, 0.48m wide and 0.20m deep.	143	Phase 1
143	142	Area 2	fill	Fill of tree bowl feature. A very dark grey highly organic clay.		Phase1
144	144	Area 2	cut	Cut of tree bowl feature. Irregular linear full extent unknown. Gradual shallow sloping sides breaking into a rounded base and the excavated section measured 3.80m wide and 0.48m deep.	145	Phase 1
145	144	Area 2	fill	Light grayish clay sediment mixed with the occasional pebble. Fill of tree root feature.		Phase 1
146	146	Area 2	cut	Cut tree bowl feature. Irregular linear feature with shallow gradual sloping sides and broad undulating base. The excavated section measured 1.90m wide and 0.05m deep.	147	Phase 1
147	146	Area 2	fill	Fill tree bowl feature. Pale grey clay silty sediment fill of tree bowl root.		Phase 1
148	148	Area 2	cut	Cut tree bowl feature. A broad linear with slight curve or arc. The feature had steep sloping sides and a flat undulating base with narrow groove on the west side. The excavated section measured 1.15m wide and 0.29m deep.	149	Phase 1
149	148	Area 2	fill	Fill of tree bowl feature. A grey clay sediment.		Phase 1
150	150	Area 2	cut	Irregular oval shape feature with shallow gradual sloping sides breaking into flat slightly undulating base. The feature measured 0.90m diameter and 0.10m deep.	151	Phase 1
151	150	Area 2	fill	A dark greyish brown highly organic clay fill.		Phase 1
152	152	Area 2	cut	Tree root feature. Irregular linear cut slightly arch or semi circular. Steep sloping sides breaking sharply into flat base on north side of the feature. The south side the base narrow deep groove. Excavated section 0.55m wide 0.38m deep.	153	Phase 1
153	152	Area 2	fill	Tree root feature. dark grayish plastic organic clay, mixed with occasional pebble.		Phase 1
154	154	Area 2	cut	The truncated remnants of ditch running north-east to south-west direction. The ditch had gradual sloping sides and broad flatish base. The excavated section measured 1.42m wide 0.64m deep. Truncated by brick wall foundations. Same as cut 154	155	Phase 4
155	154	Area	fill	The fill of ditch. A dirty mixed greyish brown organic clay mixed with		Phase

		2		occasional brick.		4
156	156	Area 2	cut	The truncated remnants ditch feature same as cut 154. The excavated section had steep sloping sides and rounded base and measured 0.70m wide and 0.20m.	157	Phase 4
157	156	Area 2	fill	The fill of ditch. The ditch fill comprised dark brown organic clay mixed with orange brown sandy clay flecks and occasional rounded pebble.		Phase 4
158	158	Area 2	cut	Tree root feature. Irregular linear feature with shallow gradual sloping sides with broad undulating base running north-east to south-west. The excavated feature was 2.85m wide and 0.20m deep.	159	Phase 1
159	158	Area 2	fill	Tree root feature. Dark greyish brown organic clay mixed with flecks of brown clay.		Phase 1
160	160	Area 2	cut	Tree root feature. Irregular oval shape possible tree bowl feature with fairly steep sides and undulating base. The feature measured 1.18m long, 0.80m deep and 0.18m deep.	161	Phase 1
161	160	Area 2	fill	Tree root feature. A dark greyish brown organic clay sediment.		Phase 1
162	162	Area 2	cut	Tree root feature. Irregular linear feature with gradual sloping sides and broad rounded base. The excavated feature measured 1.30m wide and 0.15m deep	163	Phase 1
163	162	Area 2	fill	Tree root feature. Dark grayish organic clay sediment mixed with flecks of brown clay. Remnant tree bowl or animal burrow.		Phase 1
164	164	Area 2	layer	Modern layer. Dark greyish brown organic clay mixed with small pebbles and occasional flecks of orange clay sand. The layer contained pottery sherds 18th to 19th Century. Clay pipe stems and fire clay. Same as context 190.		Phase 5
165		Area 2	layer	Post medieval layer. Greyish brown organic clay mixed with orange brown sand flecks. Same as context 191. Pottery sherds16th to 17th century		Phase 4
166	144	Area 2	fill	A light greyish clay sediment mixed with the occasional pebble. Fill of tree root feature. Same as context 145. Disturbed post med or modern layer	167	Phase 1
167		Area 2	layer	Layer of dark grayish organic clay mixed orange brown flecks of sandy clay. Disturbed post med or modern layer.	168	Phase 4
168		Area 2	layer	Layer of dark greyish highly organic clay mixed with charcoal flecks.	169	Phase 4
169		Area 2	layer	Modern layer of dark greyish organic clay mixed with orange brown flecks clay	171	Phase 4
170		Area 2	layer	Modern layer Dark brown clay mixed with abundant orange brown clay flecks	172	Phase 4
171		Area 2	layer	Layer of dark greyish clay orange brown sandy clay flecks	170	Phase 4
172		Area 2	layer	Layer of dark clay mixed with orange sandy clay flecks. Disturbed modern layer		Phase 5
173	173	Area 2	cut	Tree root feature. Irregular oval shape feature with gradual sloping sides and undulating base. The feature measured 1.55m long and 1.00m wide and 0.18m deep.	174	Phase 1
174	173	Area 2	fill	Tree root feature. Very dark greyish organic clay.		Phase 1
175	175	Area 2	cut	Large tree bowl feature. Irregular linear shape feature with gradual sloping sides with a broad rounded base with grooves. The excavated section measured 3.00m wide and 0.16m deep.	176	Phase 1
176	175	Area 2	fill	Large tree bowl feature fill. Very dark greyish organic clay.		Phase 1
177		Area 2		Tree bowl cut. irregular shape feature with no sides and undulating base. Possible base of tree root feature or spread.		Phase 1
178		Area 2		Tree bowl fill. Dark grey highly organic feature,		Phase 1
179	179	Area 2	cut	Tree bowl feature or animal burrow. Irregular oval shape feature with steep sides and undulating base. The feature measured 0.54m long, 0.30m wide and 0.17m deep.	180	Phase 1
180	179	Area 2	fill	Tree bowl fill. A dark grey organic clay.		Phase 1
190		Area 2	layer	Dark greyish brown organic clay mixed with small pebbles and occasional flecks of orange clay sand. The layer contained pottery sherds 18th to 19th Century. Clay pipe stems and fire clay. Same as context 164.		Phase 5
191		Area 2	layer	Post medieval layer. Greyish brown organic clay mixed with orange brown sand flecks. Same as context 165. Pottery sherds 16th to 17th century	190	Phase 4
192		Area 2	layer	Pale grey organic clay layer. Mixed with brown flecks of sand and orange brown clay.	191	Phase 3
193		Area 2	layer	Grey organic clay sediment layer mixed with charcoal flecks.	208	Phase 1
194		Area	layer	Pale grey organic clay sediment mixed with orange soil horizon of iron	193	Phase

		2		pan.		1
195		Area 2	layer	Pale grey clay sediment with horizons of orange iron panning.	193	Phase 1
196		Area 2	layer	Tree stump deposit. Same as 197		Phase 3
197		Area 2	layer	Buried soils highly organic clay. A very dark greyish organic clay mixed strips bark and thought to be from birch tree		Phase 3
198		Area 2	layer	Highly organic charcoal rich clay horizon.	197	Phase 2
199		Area 2	layer	Grey organic clay layer mixed with orange brown iron pan horizons.	198	Phase 1
203		Area 2	layer	Pale greyish sandy organic clay sediment mixed with occasional pebble. A Upper Paleolithic or Mesolithic flint found within this deposit.	199	Phase 1
207		Area 2	layer	Grey organic clay clay sediment layer	192	Phase 2
208		Area 2	layer	A horizon of charcoal rich clay.	207	Phase 2

Contact Details

Richard Buckley or Patrick Clay
University of Leicester Archaeological Services (ULAS)
University of Leicester,
University Road,
Leicester LE1 7RH

T: +44 (0)116 252 2848
F: +44 (0)116 252 2614
E: ulas@le.ac.uk
w: www.le.ac.uk/ulas

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