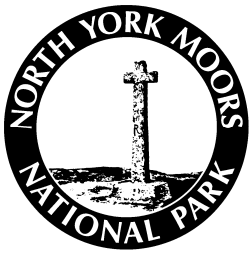
North East Yorkshire Mesolithic Project

Archaeological Evaluation

Farndale

North Yorkshire

Summer 2009



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March 2010

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with contributions from Allan Hall, Jim Innes and Peter Rowe

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Summary

This report describes the methodology and results of an archaeological evaluation undertaken by Tees Archaeology Research and Fieldwork Section at Farndale, North Yorkshire. The fieldwork was undertaken in July 2009 as part of an English Heritage funded partnership project between Tees Archaeology and the North York Moors National Park Authority researching the Mesolithic in north east Yorkshire.

The site is in a prominent location on the edge of a steep valley, and has been previously identified as a site of potential settlement due to the presence of lithic scatters. It was evaluated using a programme of shovel pitting followed by targeted test pitting.

Several features were identified including a low cairn, a gully terminus or pit and a small pit or scoop, as well as well-defined concentrations of flint, provisionally characterised as late Mesolithic, across the area. Environmental samples produced little plant macrofossil material and no material suitable for AMS dating.

Acknowledgements

The project was funded by English Heritage, the North York Moors National Park Authority and Tees Archaeology.

Fieldwork was carried out by Rachel Grahame (Project Officer), Aaron Goode (Field Officer), and David Errickson (Site Assistant) of Tees Archaeology, and by volunteers Joanne Burrell, Howard Carr, John Carss, Mike Dixon, Pat Hadley, John Hinchliffe, Siriol Hinchcliffe, Arthur Hoggett, Ron Huckle, Steve Jennings, Adam Mead, John Piprani, Alan Simkins, Rob Stewart, John Watson and Rob Western. Assistance was also given by staff of the North York Moors National Park Authority, particularly Mags Waughman (Archaeological Conservation Officer).

Grateful thanks go to the owner of the Rosedale and Westerdale estates for allowing us access to their land, and to the estate staff for their assistance, particularly Anne-Louise Willans, the estates manager, and Jimmy Brough, the head keeper.

1. Introduction

An archaeological evaluation of land at Farndale, North Yorkshire (Figure 1) was undertaken by Tees Archaeology Research and Fieldwork Section during July 2009 as part of an English Heritage funded partnership project between Tees Archaeology and the North York Moors National Park Authority researching the Mesolithic in north east Yorkshire. The fieldwork was carried out by Rachel Grahame (Project Officer), Aaron Goode (Field Officer) and Dave Errickson (Site Assistant), assisted by a total of sixteen volunteers.

The North East Yorkshire Mesolithic Project consists of a phased programme of research intended to increase our understanding of the nature of Mesolithic occupation in north east Yorkshire (Daniels 2008). Existing sites are known primarily from flint scatters rather than systematic excavation, and little paleoenvironmental research in the area has been carried out on archaeological sites.

Phase 1 of the project was carried out in 2006 (Waughman 2006) and consisted of a review of known sites and existing collections of lithics within the study area, resulting in the identification of six zones of Mesolithic occupation:

Zone 1 - low-lying areas in the Tees valley. These include the former lake basin at Seamer Carrs and sites alongside the river Tees and the former course of the Leven at Levensdale

Zone 2 - lowland locations in prominent positions, principally overlooking the Tees estuary and what would have been the coastal plain in the Mesolithic. Typical locations are those on the Eston and Upleatham hills and down the coast at Goldsborough

Zone 3 - the lower-lying northern and eastern fringes of the present moorland block where sites are often on broad ridges with panoramic views, with sites such as Simon Howe, Mauley Cross and Brown Hill.

Zone 4 - prominent locations on the edge of steep valley and scarp slopes. These include Highcliff Nab, the northern edge of Urra Moor, sites on the western escarpment of the Hambleton Hills and Bransdale Ridge.

Zone 5 - the upper reaches of streams in high moorland in locations such as White Gill, Parci Gill on West Bilsdale Moor and Butter Beck on Egton High Moor.

Zone 6 - high moorland spring head basins. Typical sites include Ousegill Head, Peat Moss, Glaisdale Moor and Westerdale Head.

Phase 2 of the project was then designed to evaluate a number of these sites and zones of activity (Daniels 2008). Evaluation in 2008 focussed on two areas in Zone 2, Upleatham and Goldsborough (Grahame *et al* 2008). These were considered to be the most promising of the lowland locations with prolific assemblages which include a variety of artefact types, as well as both Mesolithic and later items.

At Upleatham, the flint assemblage demonstrates occupation from at least the late Mesolithic (and possibly early Mesolithic) through to later prehistory. In addition several features were identified: a large ditch, probably an enclosure ditch, a pit and a hearth. Pottery finds indicate that these are all likely to date to the Late Bronze Age or Pre-Roman Iron Age.

At Goldsborough, the shovel pitting produced a very mixed flint assemblage, but two ditches, probably enclosure ditches, were identified. Flint finds indicate that one of these dates to the Mesolithic or early Neolithic.

Evaluation in 2009 was intended to be carried out at three sites, Farndale in Zone 4, and Peat Moss on Wetherhouse Moor and Osmotherley Stones on Snilesworth Moor in Zone 6. Unfortunately, delays in obtaining permissions from Natural England meant that the first two weeks of fieldwork, scheduled to take place at Peat Moss, had to be cancelled. It is hoped to evaluate this site in summer 2010. At Osmotherley Stones, the estate would not allow access during the summer due to concerns for the welfare of the grouse population.

Evaluation therefore went ahead at a single site at Farndale. There is a small collection of flint from Farndale East Head consisting of four microlithic rods, 1 microburin and 22 pieces of waste including a high proportion of blades, held by the Scarborough Museum (Waughman 2006). Volunteers working with the North York Moors National Park had also been collecting large quantities of flint from two paths running northeast-southwest across the plateau edge.

2. Aims and Objectives

The primary aim of the evaluation was to identify those locations with the greatest potential to provide new evidence through detailed excavation, particularly through the identification of features, and the recovery of palaeoenvironmental evidence and material suitable for radiocarbon dating.

This corresponds to Phase 2 objective 3:

> To evaluate by field investigation a typical area within Zone 4 (prominent locations at the top of steep slopes) in order to identify areas of surviving stratigraphy and features, and where possible identify differences between this and other upland zones of activity. (Daniels 2008, 16)

and also contributes to Phase 2 objectives 6 and 7:

> Where possible, to obtain palaeoenvironmental samples and material suitable for radiocarbon dating from sites evaluated under 2-4, and identify deposits which preserve plant macrofossil and invertebrate remains. Key contexts for dating will be hearths and peat deposits containing or sealing archaeological remains. (Daniels 2008, 16)
>
> To identify sites with the greatest potential to provide detailed new data through excavation and palaeoenvironmental sampling in order to satisfy the project aims based on information gathered through steps 2-6. (Daniels 2008, 17)

The involvement of volunteers in the project also contributed to Phase 2 objective 1:

> To increase general awareness of the Mesolithic within the project area. (Daniels 2008, 16)

The results of the evaluation will form part of a permanent archive of the site. The archive will be held by Tees Archaeology under the site code MPF09.

3. Methodology

The following methodology was specified for the evaluation:

> The first season will include 20 days in the field and the second 30 days. Activity will comprise either initial investigation by fieldwalking at 5m intervals, bagging and surveying each find individually as far as is reasonable. Where fieldwalking is not possible investigation will be by augering/shovel-pitting based initially on a 10m grid, reducing the interval to 5m or 2m where lithics are found in order to pinpoint possible concentrations and identify their extent. This will be followed by more targeted test pitting using hand dug trenches 2m x 2m. The latter may be extended in order to clarify features of specific interest. All spoil from these pits will be dry sieved through a 6mm mesh to recover small artefacts and archaeozoological material, although on many sites animal bone is unlikely to be preserved except in charred form or within waterlogged deposits. If the test pit spoil is very sandy (particularly for the upland sites) the mesh size may be decreased to improve artefact recovery. (Daniels 2008, 19)

This comprised Year 3 tasks 4.2, 4.3, 4.4 and 4.5:

> Task 4.2 Site visits to identify exact areas to investigate. Rapid walkover will be used to identify any areas of current erosion where flints are exposed.
>
> Task 4.3 Auger/shovel pit on a grid over an area of c.900 square metres centred on known (or previously recorded) location of lithic scatter. The initial interval will be every 10m, unless the exact location of a recorded lithic scatter is known to a greater accuracy, but will be reduced where lithics are found. This is to try and pinpoint any additional sites in the immediate area and to identify the extent of the lithic scatter(s).
>
> Task 4.4 Test pitting/trial trenching to investigate concentrations of flint. Test pits to be hand dug, 2m square and deposits to be dry sieved through a 6mm mesh. Bulk sampling of buried soils, hearth deposits and other features. The test pits will be extended as necessary to clarify features of interest.
>
> Task 4.5 Take monoliths samples or core samples from nearest suitable deposits. (Daniels 2008, 22-3)

Shovel pitting was the primary means of investigation, and the application of this methodology was much more successful than at Upleatham and Goldsborough the previous year. The fieldwork season was once again compromised by the poor weather.

The shovel pits and test pits were each given a unique number within two separate sequences. They were excavated by hand through the peat and mineral soil until natural clay or sandstone bedrock was reached. The basal part of the peat and all of the mineral soil from the shovel pits and test pits was dry sieved through a 6mm mesh.

Where features were located, subsequent excavation and recording was undertaken following the methodology set out in Tees Archaeology Research and Fieldwork Section's recording manual. Sections within each test pit were drawn at a scale of 1:10 and plans were drawn at a scale of 1:20. Deposits were recorded using pro forma context recording sheets. A photographic record of the investigations was compiled using SLR cameras and 35mm black and white print film and 10m pixel high quality jpeg digital images. All photographs include a graduated metric scale. The photographic record forms part of the project archive.

The location of each shovel pit and test pit was surveyed using a Topcon Total Station working from three survey stations using a local grid. The three survey stations were then located using a handheld Trimble GEO-XM GPS unit, giving the following coordinates:

Station	Easting	Northing	Height AOD	Accuracy
A	464899	500910	359	0.7m
B	464864	500870	355.5	0.7m
C	465059	500794	363.3	1.2m

The survey data has been located by rotating it with reference to a bearing taken from Station A to the Bilsdale Transmitting Station on Bilsdale West Moor, and then manually adjusting its position for a 'best fit' with the acquired coordinates, resulting in the following coordinates:

Station	Easting	error	Northing	error
A	464900.1	+1.1m	500907.1	-2.9m
B	464864.3	+0.3m	500872.7	+2.7m
C	465055.7	-3.3m	500794.3	+0.3m

Site levels have not yet been corrected from the arbitrary values ascribed to the survey stations during fieldwork.

The project was given the site code MPF09 for **M**esolithic **P**roject **F**arndale 20**09**.

4. Results

4.1 Introduction

The Farndale study area is located on Farndale Moor on the northeast side of the northern end of Farndale, the steep-sided valley of the River Dove, which cuts into the central part of the North York Moors in a northwesterley direction from the south. It sits on a small spur projecting from the edge of the plateau with spring head basins to the northwest and southeast (Figure 1).

Two sites were initially identified as having potential (Figure 2) on the basis of flints collected by volunteers from two paths running northeast-southwest from the plateau to the valley bottom, one to the northwest at NZ64860089 (Area A) and one to the southeast at NZ65030072 (Area C). A third site between these two was chosen because it was lacking in vegetation and seemed topographically suited to settlement, being a large level area on the edge of the plateau at NZ65030079 (Area B). The geomorphology of the area consists of sandstone overlain in places by a pale yellow clay.

Fieldwork was carried out from the 20 July to the 31 July, during which period approximately a fifth of the time was lost to bad weather. A total of thirteen volunteers were scheduled to take part in the project and an additional three volunteers were gained during the course of the project. One volunteer who had only committed to one week of the project elected to extend their participation to both weeks. In total, 86 volunteer days were contributed to the project.

A total of 132 shovel pits (c. 0.30m square) and 10 test pits (generally c. 1m square) were excavated across the three sites. In Area A, shovel pits were put in at 10m intervals on either side of the path, then at 5m and 2.5m intervals to identify suitable areas for test pits. In Areas B and C shovel pits were put in at 5m intervals. The siting of shovel pits was

to some extent influenced by the maturity of the vegetation, as it proved difficult to excavate in areas where the heather was very high.

The peat which forms the modern ground surface was generally 0.05m-0.10m deep and was removed as a block to expose the mineral soil below. The bases of the peat blocks were examined for flint and the mineral soil, generally 0.05-0.20m deep, was then excavated and sieved through a 6mm mesh. Excavation was halted when the natural substratum, either sandstone bedrock or a pale yellow clay, was reached. The mineral soil was found to occasionally have small sandstone fragments within it. Scatters of flint were found in well defined discrete concentrations, with shovel pits containing large numbers of flints flanked 10m or 5m away by shovel pits containing only one or two. The flint tended to be found primarily in the interface between the peat and the mineral soil, though flints were also found spread throughout the mineral soil in most shovel pits.

4.2 Area A (Figure 3)

In Area A (shovel pits 100s and 200s, 62 shovel pits and 3 test pits) iron pan was often found at the base of the mineral soil, and the natural substratum was generally bedrock. One area with a concentration of flint was identified on the edge of the scarp, and was investigated with two test pits (**1** and **2**). These were excavated in spits and the location of each find recorded on a plan. In both test pits, most of the flint was found at the interface between the peat [1.1, 2.1] and the mineral soil [1.2, 2.2], which overlay a layer of weathered sandstone [1.3, 2.3]. Test pit 1 (Figure 5) contained two large sandstone fragments and a large amount of flint, and test pit 2 (Figures 6 and 7) also contained a large amount of flint, but neither exposed any cut features.

Approximately 20m to the southwest, shovel pit 225 was found to contain a stone feature and was expanded to create test pit **3** (Figure 8). This was excavated in spits and the location of each find recorded on a plan (Figures 9 and 10). Following the removal of the peat [3.1], this exposed a layer of sandstone fragments [3.3] lying within the mineral soil [3.2, 3.4] and on top of the sandstone [3.5]. The sandstone fragments ranged in size from 0.05m to 0.25m and were interpreted as a low cairn. A large amount of flint was recovered, some of it found amongst and below the stones of the cairn.

Further down the slope to the southwest, a large number of flints were found in shovel pit 227, but here the usually homogenous mineral soil was replaced by a series of darker brown layers (0.25m deep in total) thought to be material washed down the hillside into a natural hollow. The natural substratum was a light yellow white clay which was augered and found to be 0.37m deep.

4.3 Area B (Figure 4)

In Area B (shovel pits 300s, 32 shovel pits and 3 test pits), there was occasionally a layer of sandstone fragments between the peat and the mineral soil, and the natural substratum was generally clay. Two areas with concentrations of flint were identified and test pit **4** (Figure 14) was targeted at one of these. Below the peat [4.1] and within the mineral soil [4.2] was a cluster of small sandstone fragments [4.3] on top of the natural clay [4.4] in the southwest corner of the test pit, but no other features were seen.

Shovel pit 308 was found to contain a cut feature so was expanded to become test pit **5** (Figure 11). The feature was partially excavated and proved to be an oval pit or the terminus of a gully [5.9] cut into the natural clay [5.10], and deliberately backfilled with redeposited clay [5.6-5.8]. This appeared to have been left exposed long enough to become vegetated [5.5] before the feature became completely silted up [5.4] and was sealed by a possible occupation deposit [5.3] and the mineral soil [5.2]. The fills contained

a large amount of flint, and a column sample was taken of the sequence of fills within the feature.

Shovel pit 331 was found to contain a stone feature, so was expanded to become test pit **6** (Figure 12), a couple of metres to the south of test pit 4. Below the peat [6.1] and within the mineral soil [6.2] was a roughly linear arrangement of sandstone fragments aligned northeast-southwest [6.3] on top of the natural clay [6.4]. The stones were interpreted as a possible surface, although the varying levels might suggest an upstanding structure.

4.4 Area C (Figure 4)

In Area C (shovel pits 400s and 500s, 38 shovel pits and 4 test pits), there was generally a lower quantity of flint found than in the other areas. The natural substratum was generally clay. Shovel pit 400 was found to contain a cut feature and so was expanded to 0.60m square. The narrow linear feature was aligned approximately northwest-southeast and was 0.10m wide and 0.12m deep with a square profile. It cut through the mineral soil into the natural clay and was interpreted as a modern wheel rut.

A larger number of sandstone fragments were found than in other areas: in shovel pit 402, a layer of flat stones was found on top of the natural clay, and shovel pits 419 and 420 contained large sandstone fragments sitting in or on the clay. Test pit **7** (Figure 15), targeted at a flint scatter, also contained a scatter of sandstone fragments in the southeast corner, lying within the mineral soil [7.2] and extending into the peat above [7.1] and the natural clay below [7.3], but these did not seem to form a coherent structure. Test pit **8** (Figure 13) was also targeted at a flint scatter, and exposed a narrow linear feature aligned approximately northwest-southeast, 0.20m wide and 0.06m deep with a shallow U-shaped profile [8.5]. This was filled with a mixture of peat, mineral soil and small stones [8.4] and cut through the mineral soil [8.2] into the natural clay [8.3]. It was interpreted as a wheel rut, less recent than that in shovel pit 400, and probably related to a track shown on the First Edition Ordnance Survey map of 1857 (Yorkshire 044).

Shovel pits 500, 501 and 502 also contained sandstone fragments within the mineral soil, and shovel pit 510 exposed a large triangular sandstone block 0.45m long, 0.37 wide and 0.13m thick sitting on the natural clay. Shovel pit 514 (Figure 16) was found to contain a large amount of flint and a cut feature and so was expanded to 0.60m x 0.46m. The feature was a small, shallow (0.48m x 0.31m x 0.04m) oval pit cut into the natural clay, and filled by a mixture of peat and mineral soil containing burnt sandstone, suggesting a modern origin: however it was sealed by the mineral soil. Test pits **9** and **10** were targeted at flint scatters and contained a typical sequence of peat [9.1, 10.1, 10.2], mineral soil [9.2, 10.3] and natural clay [9.3, 10.4], but did not contain any features.

5. Lithic Assessment *Peter Rowe*

5.1 Introduction

The assemblage consists of approximately 2000 flint artefacts excavated during shovel and test pitting and includes material recovered from samples.

This document provides a rapid visual assessment of the entire assemblage with further examination of a sample of the material to provide a basic characterisation and to make recommendations for further analysis.

5.2 Rapid visual inspection

The material has been subject to a rapid visual inspection. The purpose of this exercise was to check that worked material was present, provide a summary of the principal components, make an initial characterisation of the raw material and to comment on the chronological variability of the collection.

The inspection demonstrated that the majority of the assemblage is the product of deliberate knapping. Natural pieces are all but absent.

The principal components of the assemblage are angular debitage, blades or blade fragments and burnt fragments. There appears to be a high proportion of smaller knapping debris and chips with cores and large flakes being rarer. This suggests that flint pebbles and nodules were reduced to more easily portable blade cores elsewhere.

Worked pieces are relatively rare. Narrow blade microliths and microlithic rods were noted as the principal tool type. These are all late or very late Mesolithic in date. They fit well with the range of blades and blade cores noted above. Earlier and later chronologically diagnostic pieces are absent.

The raw material is almost entirely composed of light brown translucent flint. Variations are rare with an extremely limited amount of amber/yellow and red/pink pieces. These account for less 1% of the total assemblage. The limited variability in the choice of raw material supports the theory that the assemblage has a limited chronological range. The source of the flint is likely to be a discrete local glacial or source. Other stone types with good fracture qualities such as chert, quartz and agate are absent.

5.3 Assessment of sample

The lithics from Area A were chosen as a sample for further assessment. They represent approximately 30% of the entire assemblage.

The material was removed from its packaging, examined by eye and sorted into broad categories as detailed in Table 1 below. No measurements, cataloguing or microscopic analysis were carried out at this stage.

Shovel or Test Pit	*Microlith*	*Microburin*	*Core*	*Blade or blade frag.*	*Flake or flake frag.*	*Chip*	*Angular Waste*	*Burnt frag.*	*Total*
SP 113	0	0	0	0	0	0	1	0	**1**
SP 114	0	0	0	0	1	0	0	0	**1**
SP 115	0	0	0	1	0	0	1	0	**2**
SP 120	2	0	0	2	0	0	0	0	**4**
SP 121	0	0	0	0	0	0	1	0	**1**
SP 203	0	0	0	0	0	0	0	1	**1**
SP 206	0	0	0	0	0	1	0	0	**1**
SP 209	0	0	0	3	2	3	6	0	**14**
SP 211	0	0	0	2	0	0	0	0	**2**
SP 214	0	0	0	1	0	0	0	0	**1**
SP 218	0	0	1	0	0	0	2	0	**3**
SP 220	0	0	0	0	0	0	2	0	**2**
SP 221	0	0	0	1	0	4	6	0	**11**
SP 224	0	0	0	1	0	1	0	0	**2**
SP 225	0	0	1	12	8	4	13	8	**46**
SP 227	3	0	0	3	3	0	1	1	**11**

Shovel or Test Pit	*Microlith*	*Microburin*	*Core*	*Blade or blade frag.*	*Flake or flake frag.*	*Chip*	*Angular Waste*	*Burnt frag.*	*Total*
SP 227 ext.	0	0	0	2	0	0	4	0	**6**
SP 228	0	0	0	0	1	0	0	1	**2**
SP 232	1	1	0	2	0	3	8	8	**24**
SP 234	0	0	0	1	0	0	0	0	**1**
SP 235	0	0	0	4	4	4	0	3	**15**
SP 236	1	0	0	0	0	0	2	4	**7**
SP 237	0	0	0	0	0	0	4	0	**4**
SP 238	0	0	0	1	0	0	0	0	**1**
TP 1	2	0	2	28	18	22	37	21	**130**
TP 2	3	2	3	29	9	15	47	59	**167**
TP 3	2	0	1	36	29	7	57	12	**144**
Total	**14**	**3**	**8**	**129**	**75**	**64**	**192**	**118**	**603**

Table 1: Summary of assessed shovel & test pits

This confirms the results of the rapid visual inspection, i.e. that small fragments of angular debitage and blades and blade fragments make up the majority of the material and that finished tool types are scarce. Burnt fragments are also present in significant numbers. Natural pieces were absent.

The worked pieces from the sample are all microliths of narrow blade variety, with some being very narrow at 3mm or less in width. Rods, scalene triangles and backed pieces are all present. Three examples of the use of the microburin technique were noted.

5.4 Conclusion

This is a regionally important collection of worked flint. It is unusual as it was collected from a relatively small area in a significant concentration. The chronologically diagnostic elements are late or very late Mesolithic and the assemblage appears to be uncontaminated by later material.

The collection includes a very limited range of tool types, namely microliths. Other standard components of the Mesolithic tool kit such as scrapers, burins, and piercers appear to be absent. This is echoed by the knapping debris which largely consists of blade fragments and well reduced blade cores geared towards the production of microliths. Closer examination will reveal the extent of secondary working and use wear on the blade and flake components of the assemblage. This may shed light on the full range of activities other than hunting that obviously took place at or near to the site. The assemblage can be compared to other contemporary regional and local sites of the period such as White Gill (Radley 1969; Hayes 1988), Mauley Cross (Radley 1969; Hayes 1988) and Ousegill Head (Hayes 1988).

5.5 Proposal for analysis

The material is worthy of further analysis including a full catalogue and report.

It is proposed that the work will take the following format: -

i. Catalogue and quantify flints from the excavation using Microsoft Excel. The following variables will be catalogued:-

1 raw material type (e.g. flint, chert, agate)

2 raw material colour
3 percentage of cortex
4 cortex type (e.g. reduced, chalky)
5 percentage and patina colour
6 type of artefact (e.g. flake, blade, core)
7 interpretation (e.g. scraper, arrowhead)
8 period
9 maximum dimensions
10 method of knapping (e.g. hard hammer percussion)
11 whether burnt
12 whether damaged

ii. Produce draft report using Microsoft Word to include:-

- *Assessment of raw material and post depositional factors*
- *Comment on flint technology and reduction sequence*
- *Classification and assessment of tool types and usage*
- *Comment on chronologically diagnostic pieces with reference to site phasing, context data.*
- *Discussion of the potential of the assemblage for further work such as refitting experiments.*
- *Comparative analysis at the regional level to find other examples of similar sites and compare artefact morphology and technology. The assemblage needs to be set into its regional context through a detailed search for available published comparanda.*

iii. Recommendations and captions for illustration.

6. Environmental Samples

6.1 Assessment of macrofossil plant remains from excavations at Farndale, N. Yorkshire (sitecode MPF09)

Allan Hall
Department of Archaeology, University of York

A series of four samples of sediment from pit/gully fills of putative Mesolithic date were submitted by Tees Archaeology for an assessment of their content of plant macrofossil remains and in order to secure material for dating by radiocarbon assay.

Subsamples of known weight and volume from the four samples were processed using warm water and a sieve with a mesh size of 0.3 mm. In the event, all the samples proved to be rich in clay and treatment involved soaking overnight using a dilute solution of sodium pyrophosphate. This treatment was repeated two or three times to fully disaggregate the sediment and even then some clay pellets remained.

Once disaggregated, a ‘washover’ of less dense material was taken from the residues and both fractions dried in an oven at about 40C. The washovers were resieved and examined using a low-power binocular microscope; the residues were examined by eye.

The approximate volume of each fraction was also recorded. All records of plant remains and other components of the two fractions were entered to a dedicated database on a PC.

The results of the assessment are presented in Appendix 1.

All of the samples yielded small amounts of charred plant material but none was felt suitable for dating. The small fragments of oak could not be reliably assumed to have come from twig wood rather than from larger branches and so would not necessarily produce useful dates. The ?heather material may well have come from peat which was already of some antiquity at the point of charring.

The deposits do not therefore offer much prospect of useful further study either for the archaeobotanical content or as a source of plant material for dating.

6.2 Pollen analysis at Farndale Moor. North York Moors project phase 2

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In support of the excavation on Farndale Moor, two sediment profiles were assessed palynologically, twenty-four pollen levels being analysed in all. Fifty centimetres of sediment were recovered from an archaeological context (Farndale Moor TP5) on the excavated site and fifty centimetres of amorphous peat was collected from the edge of the moorland peat blanket 100m to the north-west of the site. This peat profile is designated Farndale Moor. Pollen samples were prepared using standard techniques and at least 300 land pollen grains were counted at each level. The stratigraphy at each profile is shown on the pollen diagrams.

Farndale Moor TP5

The results from profile TP5 are shown in Appendix 2, as percentages of total land pollen. The section comprised organic silty clay resting upon a silty organic layer and then upon a stiff pebbly clay below 40 cm depth. The upper eleven cms were a well humified peat similar to that across most of the site and its environs. Eight samples were prepared, but pollen was not preserved in that at 22cm. Three pollen zones are recognised.

Zone A (26, 32, 34 and 36cm)
Dominated by *Corylus* (hazel) pollen with lower frequencies for *Calluna* (heather) and *Alnus* (alder). Some Poaceae (grass) pollen occurs with a few grains of *Plantago lanceolata* (ribwort plantain). *Polypodium* (polypody) ferns are common. Microscopic charcoal particles are common at 36cm.

Zone B (10 and 16cm)
Calluna increases through the zone while *Corylus* slowly declines in frequency. *Alnus* percentages are unchanged. *Polypodium* values are much reduced from the previous zone.

Zone C (6cm)
Calluna dominates the assemblage with all other taxa except Poaceae greatly reduced in frequency. A wider variety of open ground herbs occurs, including a grass grain of cereal type.

Discussion

The extremely low *Ulmus* (elm) pollen frequencies and virtual absence of pollen of major woodland trees like *Quercus* (oak) indicate an age for this profile well after the elm pollen decline that occurred in this area about 5000 radiocarbon years ago (BP). Some *Tilia* (lime) pollen occurs but that tree's pollen is very resistant to corrosion and so is

differentially preserved. The local vegetation appears to have been a hazel-alder scrub with grassy heath areas. Heather becomes more important as the top of the profile is approached until the vegetation represented by the upper sample is similar to that around the site at the present day: heather moor with rough grassland. As this profile clearly postdates the Mesolithic period, no further samples were prepared. It is possible that the sediments in this profile may represent reworking from older deposits upslope, capped by recent organic deposits.

Farndale Moor

The results of assessment of the peat monolith from the edge of Farndale Moor not far from the excavation are shown in Appendix 2. Two zones are recognised based on the interpretation that an *Ulmus* decline occurs between 89 and 90 cms, although the elm curve is low because of the high frequencies of *Alnus*, particularly in the lower part of the diagram, of over 60% of tree pollen. Without radiocarbon support this cannot be certain, but *Plantago lanceolata* begins at that level and a high peak of *Betula* occurs, both often present at elm decline horizons.

Zone A (90-104 cm)
High woodland tree and shrub frequencies, particularly *Alnus*, but also *Quercus*, *Betula* and *Corylus*. Low levels of Poaceae and other herbaceous pollen occur but there are no signs of significant forest disturbance.

Zone B (76-89 cm)
Ulmus percentages decline although a few later levels show isolated peak values. In the lowest level of the zone some removal of *Alnus* and *Quercus* occurs, with a high *Betula* peak. Later in the zone *Corylus*, *Calluna* and Poaceae rise to high values. *Pteridium* (bracken) and *Potentilla*-type (cinquefoil) also increase towards the end of the zone. Micro-charcoal frequencies increase. A range of fungal spores is recorded in this later phase.

Discussion

A considerable degree of forest opening takes place late in zone B, although agricultural indicators like *Plantago lanceolata* and cereal-type pollen are hardly present. Clearings with heather and grass became common within the previously fully wooded environment. This woodland recession is likely to be Neolithic in age if the *Ulmus* decline is correctly identified at the zone A-B boundary, and coincides with micro-charcoal particles in the stratigraphy. There is no evidence of human activity in zone A, with wooded conditions dominant and alder probably abundant in the stream head areas around the site. Almost no micro-charcoal occurs and herb pollen is confined to wetland types. The evidence is useful for the general vegetation history at the end of the Mesolithic period but there is no evidence of Mesolithic influence on the environment.

7. Discussion

This year's fieldwork at Farndale has confirmed that there are well-defined concentrations of flint, provisionally characterised as late Mesolithic, across the area. In addition a number of features were identified including a low cairn (test pit 3), a gully terminus or pit (test pit 5) and a small pit or scoop (shovel pit 514), lying below or within the mineral soil. These features all seem likely to be at least prehistoric, with modern features being confined to the wheel ruts in shovel pit 400, probably modern, and test pit 8, perhaps 19th or earlier 20th century.

The presence of sandstone blocks and fragments overlying the natural clay in several areas (test pits 1, 4, 6 and 7, shovel pits 402, 419, 420, 500, 501, 502 and 510), although

not forming any identifiable structures, is difficult to explain as a natural phenomenon. These are undoubtedly derived from the sandstone bedrock, but their relationship with the clay is problematic: some human intervention is necessary unless there is a natural process by which the clay could have formed below them. Further specialist input is required to resolve this issue.

Farndale has been confirmed as a site with high potential for finding archaeological evidence of Mesolithic settlement and related structures, and should be considered for further investigation in the future. The methodological approach of the project was demonstrated to be effective in locating concentrations of flint, and will be continued at sites to be investigated in 2010.

Unfortunately environmental samples from the site produced little in the way of charred plant remains and no material suitable for AMS dating. Analysis of the pollen from the column sample taken of the sequence of fills within gully [5.9] in test pit 5 indicates that this feature postdates the Mesolithic period: analysis of the lithic assemblage from this feature is required in order to clarify the likely date of this feature.

It is recommended that geophysical survey should be carried out at the site in order to gain a picture of the nature and extent of the features.

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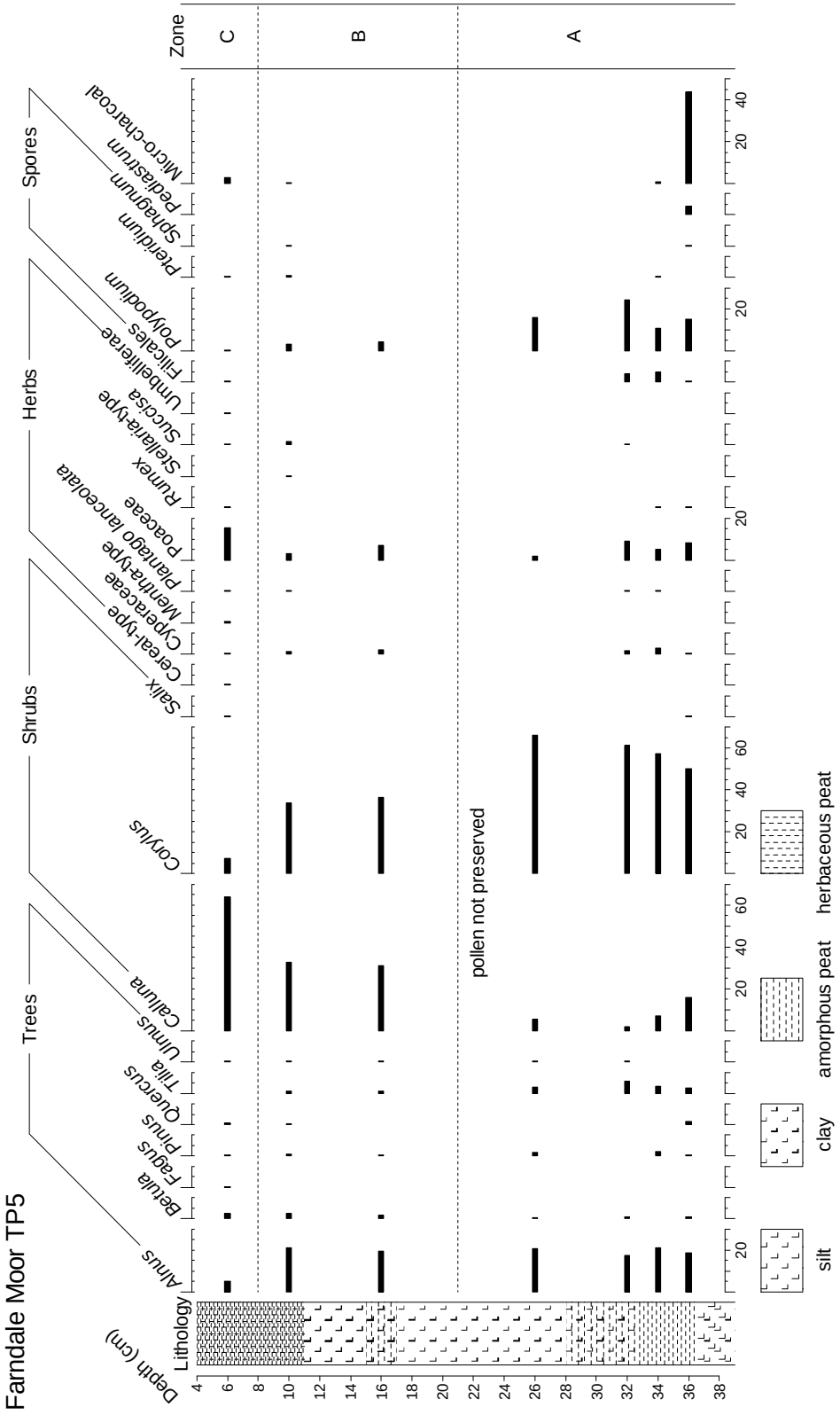
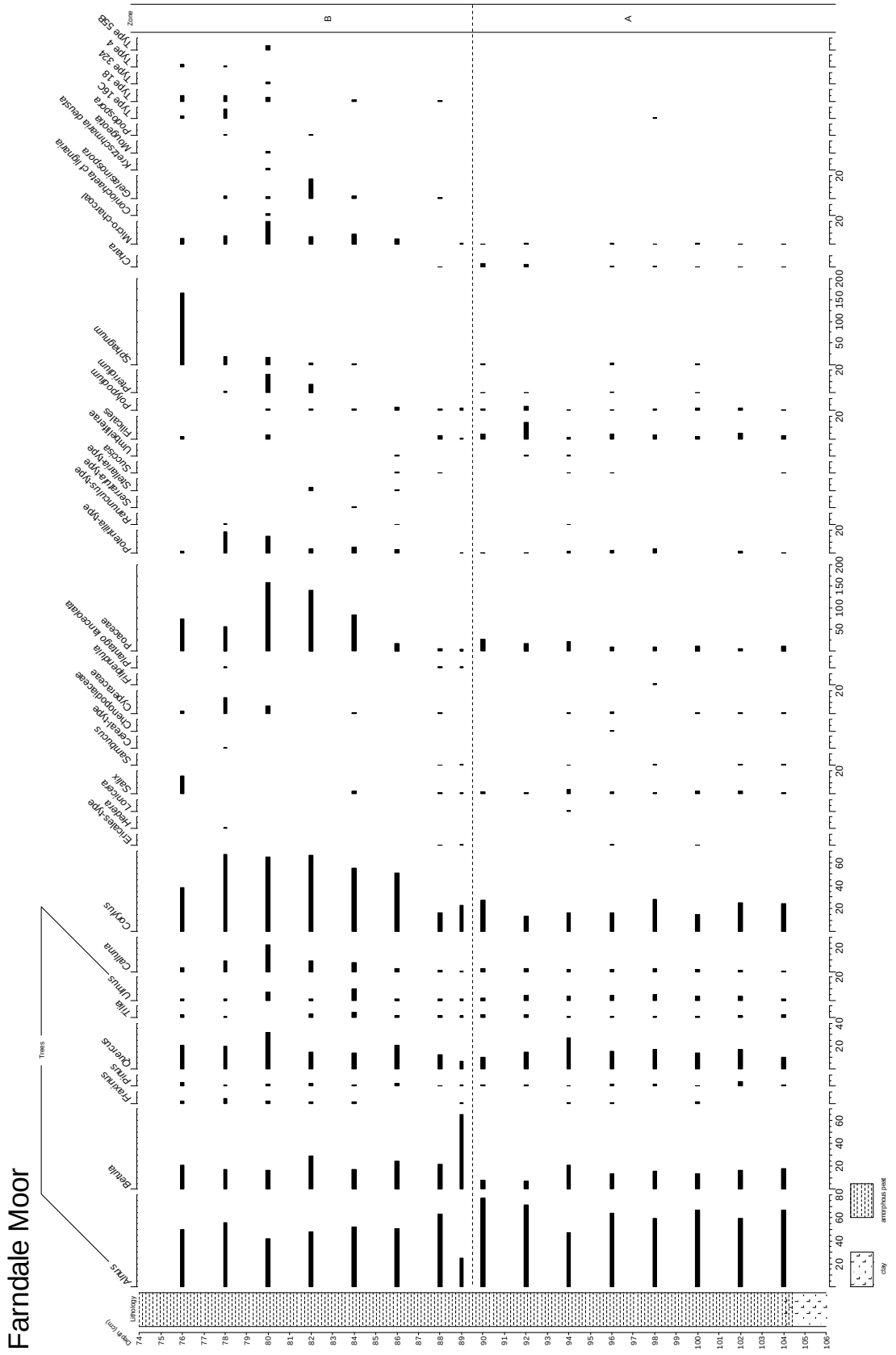
Appendix 1

Context	Sample	Weight (kg)	Vol.(l)	Notes
5.4 (upper fill of gully 5.9)	1	4	2.12	Somewhat mottled mid-dark grey-brown, moist, crumbly, slightly stony silt, perhaps largely ash, with some angular stones to about 50 mm and some small modern rootlets. On washing, quite a lot of clasts of pale yellow to yellow-brown clay emerged, some to about 30-40 mm, mostly <15mm; there was quite a lot of fine charcoal, mostly rather silt-coated, and some small clasts of dark brown crumbly material which looked like very decayed peat, although the colour might have been more to do with iron than humin; the stone appeared to be a dark brown ironstone. A residue of about 450 cm^3 of stones and sand and washover of about 125 cm^3 were obtained, though the latter contained quite a lot of modern roots amongst the fine wood charcoal. On drying, the volume was some 70 cm^3. It consisted of a little oak (*Quercus*) charcoal to 10 mm, with traces of charred ?heather (cf. *Calluna vulgaris* (L.) Hull) root/twig and a modern heather seed capsule. The residue contained a few small (to 15 mm) flint flakes, returned to Tees Archaeology.
5.5 (fill of pit/gully 5.9)	2	4	2.1	Moist, mottled (light brown to dark brown), crumbly (working slightly plastic), ?slightly clay silt, perhaps ashy, with some angular stones. There was a washover of about 90 cm^3 of charcoal and modern roots and a residue of about 400 cm^3 of stones (to 50 mm), sand and pellets of undisaggregated clay. The residue also contained some coarse woody modern ?heather roots and other modern contaminants inc a ?bilberry (*Vaccinium myrtillus* L.) leaf. The washover yielded a little oak charcoal (to 10 mm, the larger fragments examined showing variation in growth, some having very narrow rings, some rather larger ones); there were also traces of modern contaminants (a beetle and a heather seed capsule) and a few flint flakes (to 20 mm).
5.6 (fill of pit/gully 5.9)	3	2	1	Dark grey-brown (locally with patches of pale yellow-brown), somewhat stony, crumbly, ?ashy, slightly clay silt; a large stone of about 600g left out at subsampling, leaving very little matrix in the bag. The residue (225 cm^3) comprised stones (to 75 mm) and unwashed clay pellets with a few flint flakes (to 15 mm). The washover (50 cm^3) contained modern roots and a little unidentifiable charcoal (to 10 mm). The presence of some charred ?heather root/twig fragments and a few fragments of charred herbaceous stem (all to 10mm) perhaps indicates the presence of debris from the burning of material like turves.

Context	Sample	Weight (kg)	Vol.(l)	Notes
514.4 ('burnt material' filling 514.3)	5	0.5	0.3	The whole sample was only 0.7 kg, of which 0.5 kg was processed; moist, mottled (light brown to dark grey-brown, crumbly (working plastic), slightly clay silt, with some small clasts of yellow clay, perhaps ashy. The small residue consisted of about 120 cm^3 of stones (to 25 mm), although in fact most of the material was unwashed clay pellets. The small washover of 20 cm^3 was nearly half by volume modern roots, the rest charcoal (to 15 mm), and at least the larger fragments were poorly grown oak. There were traces of modern leaves including Ericaceae. There were a few flint flakes (to 15 mm).

Appendix 2


Farndale Moor TP5
Depth (cm)
Lithology
Zone
C
B
A
Trees
Shrubs
Herbs
Spores
Alnus
Betula
Fagus
Pinus
Quercus
Tilia
Ulmus
Calluna
Corylus
Salix
Cereal-type
Cyperaceae
Menthia-type
Plantago lanceolata
Poaceae
Rumex
Stellaria-type
Succisa
Umbelliferae
Filicales
Polypodium
Pteridium
Sphagnum
Pediastrum
Micro-charcoal
pollen not preserved
silt
clay
amorphous peat
herbaceous peat


Farndale Moor
Trees
Depth (cm)
Lithology
Zone
B
A
Alnus
Betula
Fraxinus
Pinus
Quercus
Tilia
Ulmus
Calluna
Corylus
Empetrum
Hedera
Lonicera
Salix
Sambucus
Cerealia-type
Chenopodiaceae
Cyperaceae
Filipendula
Plantago lanceolata
Poaceae
Polemonium-type
Ranunculus-type
Serratula-type
Stellaria-type
Succisa
Umbelliferae
Filicales
Polypodium
Pteridium
Sphagnum
Cladocera
Micro-charcoal
Centrolabrea cf. lignaria
Gelasinospora
Kretzschmaria deusta
Monagrolaa
Podospora
Type 16C
Type 18
Type 324
Type 4
Type 539
amorphous peat
clay