Mellor Archaeological Site

Geological Setting

By Frederick M Broadhurst and I Morven Simpson

A. The most important reference to the geology of the site is:-
Taylor, B J, Price, R H, and Trotter, F M 1963. Geology of the country around Stockport and Knutsford. Memoir of the Geological Survey of Great Britain
This memoir relates to Sheet 98 (Stockport) of the Geological Survey at the scale of 1:50,000. Sheet SJ 98 NE of the Geological Survey, at the scale of 1:10,560, covers the geology of the site in more detail.

B. Beneath the soil at the archaeological site is a layer of clay material containing pebbles and blocks of a great variety of rock types. This material, known as Boulder Clay, was less than a metre thick at the few localities on the site seen by us. Amongst the rock types represented are many which occur locally in natural rock exposures, quarries etc. However, there are also rock types quite different from the 'local' rocks, and which are referred to as 'erratics'. The range of rock types among the erratics suggests a provenance in the Lake District and, possibly, southern Scotland. Their presence at Mellor (and elsewhere in the district) is explained by the action of ice transport and deposition during the last of the Pleistocene glaciations, which ended approximately 10,000 years ago. A sample of rock specimens from the site has been identified as follows:-

1. Eskdale Granite. A coarse-grained granite. Lake District.
2. Ennerdale Granophyre, A fine-grained variety of granite. Lake District.
3. A volcanic tuff (consolidated ash) from the Borrowdale Volcanic Group of the Lake District.
4. Andesite. Lava from the Borrowdale Volcanic group of the Lake District.
5. ? rhyolite (a microscope section needed for confirmation). This is a silica-rich lava of a type common in the Lake District.
6. Coarse-grained sandstone (often referred to as 'grit') similar to many of the 'local' rocks.
7. Fine-grained sandstone similar to many of the 'local' rocks.
8. A fine-grained silica-rich sandstone with fossilised roots. Known as ganister. Such rocks are fossil soils and frequently underlie coal seams. In this area one seam in particular is noted for its associated ganister and is known, appropriately, as the Ganister Seam. It is also known as the Lower Foot Seam.
9. Ganister found in trench number 10. Note the well-preserved rootlet structure.
10. Coal.
11. Pebbles composed of quartzite, ie a rock where the predominant mineral is quartz. These pebbles are distinctive because of their purplish hue and are probably derived from Triassic pebble beds, over which the ice flowed.

C. Beneath the Boulder Clay at the archaeological site the excavations have revealed a sandstone, known locally as the Woodhead Hill Rock, (equivalent to the Crawshaw Sandstone of areas to the south and east). This sandstone is of late Carboniferous age

(about 315 million years in age). To be precise, it is the lowest sandstone development in the Westphalian A succession of the area. Where it can be examined at outcrop, or in boreholes, the features (grain size, sedimentary structures, fossil content, etc) of this sandstone indicate deposition in an extensive river system on a delta top. The features of the sandstone exposed in the excavations at Mellor are quite consistent with this interpretation.

Of some interest is the sandstone exposed in Trench 10. Here part of the sandstone exposure consisted of loose sand, where the natural cement had been removed from the rock. The sandstone, generally, is cemented by silica, which is resistant to weathering processes. However, the cement is sometimes (as in one part of Trench 10) a ferroan calcite (calcium carbonate with iron). This calcite is taken into solution by ground water and the original sand grains of the sandstone released.

The Woodhead Hill Rock forms the summit area of the hill at the archaeological site and is tilted at approximately 10 degrees to the west. The sandstone strata are underlain by rocks with a large amount of consolidated clay in them, forming a succession of clayrocks and siltstones. Rocks such as these are generally impermeable to water flow so tend to act as 'damp-proof' courses. The base of the well to the north of the Old Vicarage probably lies at or close to the junction between the sandstone (above) and clayrocks (below).

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