Vicarage Moss

Highlights

This site shows one of the best developed kettle hole complexes in Wales. These depressions, formed by the melting of glacier ice caught up in glacial and fluvioglacial sediments, are typical of many developed towards the end of the Late Devensian glaciation in north-east Wales.

Introduction

Vicarage Moss is one of the best developed examples of a kettle hole complex in Wales. The features here are representative of many developed throughout the Wrexham area on the landform known as the 'Wrexham delta terrace'; they were probably formed towards the close of the Late Devensian glaciation by the melting of buried ice. The features have been described in numerous publications (for example, Wedd *et al*. 1928; Peake 1961; Poole and Whiteman 1961; Francis 1978; Dunkley 1981; Wilson *et al.,* 1982; Thomas 1985). The features have been mapped and described in relationship to soil development in the Wrexham area by Lea and Thompson (1978).

Description

Kettle holes are depressions formed by the melting of ice masses which were formerly buried within glacial sediments. Those at Vicarage Moss [SJ 360 540] lie in the eastern part of the Wrexham delta terrace, an extensive area composed largely of sands, gravels and fine-grained cliamicts. The site comprises one very large and two subsidiary kettle holes. The largest forms a deep basin occupied by mire vegetation and open-water which extend across the floor of the kettle hole for some 200m. Of the smaller subsidiary kettle holes, one contains a boggy floor but the other has no appreciable sediment infill. Other, even smaller, hollows with intervening ridges and mounds occur within the site. The main basin mire is exceptionally well defined by the junction of the surrounding steep, well drained gravel slopes. The vegetation of the main moss is dominated by bog moss, cotton grass and cranberry.

Interpretation

Wedd *et al.* (1928) showed that the Wrexham area had been affected by two major ice streams, one coming from the west (Welsh ice) and one from the north (Irish Sea ice). They divided the drift succession of the area into a tripartite sequence of Lower Boulder Clay, Middle Sands and Upper Boulder Clay. They argued that this sequence was formed in a single ice advance and retreat episode, during which the Middle Sands had been deposited by meltwater from the retreating Welsh ice draining eastwards into a large lake impounded by the Irish Sea ice to the north. According to Wedd et *al.,* this built the Wrexham delta terrace, and they noted that the complex kame and kettle topography on parts of its surface had been produced during the waning phase of the glacial episode, during 'Late-Glacial' conditions.

Peake (1961) argued that the terrace was built up by meltwater draining south from both the retreating Welsh ice and Irish sea ice margins, to form a 'composite prograding delta', on the edge of a lake occupying the Cheshire lowlands. She noted that the prominent series of large kettle holes and mounds south of Gresford, including Vicarage Moss, could represent a previous ice-stand. Peake (1961, 1979, 1981) has also argued that Irish Sea till overlying sands and gravels in the terrace in the Llay area of north-east Wrexham was distinct from the Upper Boulder Clay described by Wedd et *al.* (1928). This till, she suggested represented a separate ice advance, termed the Llay readvance.

Other workers, however, have suggested that the terrace was not in fact produced by deltaic processes. Poole and Whiteman (1961), for example, considered that the feature represented part of an end-moraine extending from Wrexham across the Cheshire-Shropshire lowland towards Ellesmere. The outer edge of the terrace was therefore seen as an ice-contact slope to the rear of Irish Sea outwash spreading westwards. This view has also been supported by Worsley (1970). Poole and Whiteman further suggested that the 'billowy, hummocky topography with occasional kettle-holes' was

extremely characteristic of such morainic drift.

Similarly, Francis (1978) has suggested that the 'delta terrace' was not formed by deltaic processes, but as a subaerial fan supplied by glacial outwash. The well developed kettle-holed surface was believed to imply deposition in contact with ice; a view upheld by Dunkley (1981) and Wilson et *al.* (1982).

Most recently, however, Thomas (1985) has argued that the previous models do not explain adequately the variety of depositional conditions observed in the area in boreholes and in more recently exposed gravel workings such as those at Marford and Singret quarries. Thus, he considered that the Wrexham delta terrace could not be regarded as either a simple 'lake-delta' or as a simple 'alluvial fan', but rather as a much more complex and diachronous feature showing evidence for a variety of sedimentary environments, including ice-front, debris-flow, alluvial fan, sandur and proglacial and ice-contact lakes formed at the margin of the stagnating Irish Sea ice-sheet (Thomas 1985). He envisaged that the kettle holes south of Gresford and at Vicarage Moss had formed part of a complex dead ice topography at the retreating ice margin.

In demonstrating that considerable lateral and vertical variation occurs in the deposits of the terrace, Thomas concluded that the complexity was consistent with a period of oscillating ice-marginal conditions during the Late Devensian accompanied by the formation of ice-front outwash fans and short-lived lake basins.

Viewed against the extremely complex Late Pleistocene evolution of north-east Wales, the kettle holes at Vicarage Moss and elsewhere on the surface of the Wrexham delta terrace (see also Chapter 2) assume considerable importance in elaborating the nature and sequence of Late Pleistocene events in the area. The features at Vicarage Moss are representative of many developed in the sands and gravels of the Wrexham area and were probably formed towards the close of the Late Devensian glaciation by the melting of buried ice. They are classic examples of the kettle hole landform.

Conclusions

Vicarage Moss shows outstanding examples of kettle hole landforms. These are representative of numerous similar features in the Wrexham area. They contain peat deposits which can provide important information about climatic change at the end of the last ice age.

References