TERRACE GRAVELS OF THE BRISTOL AVON - NEW EXPOSURES

Simon Carpenter

In 2004, I was invited by Wessex Water to undertake a geological investigation and watching brief to record and document the geology of a rural rising main (pipeline) in the vicinity of the Newton St Loe Site of Special Scientific Interest (SSSI) at National Grid Reference ST715657.

The Bath Combined Sewer Overflow (CSO) Project commenced on the ground with the excavation of a 5 metre deep trench to install a rural rising main between Bath and Saltford. The trench in the vicinity of the Newton St Loe SSSI exposed terrace gravels of Pleistocene age.

Geological context The Pleistocene in Britain

During the Pleistocene the south west was subjected to a number of glacial and interglacial episodes. As the ice sheets waxed and waned during the Pleistocene Period, so the sea level fell and rose. Rivers like the Avon responded; at glacial times they were rejuvenated to cut downwards, but when the sea level rose again as the ice melted they became leisurely and swampy, and deposited spreads of silt and sand. This history is preserved in a succession of terraces; there are three of these terraces in the River Avon Valley. The first terrace gravels fill the valley bottom, including the buried channel and are aggraded up to about 3m above the present alluvium surface. The second terrace occurs between Avonmouth and Bathampton with a surface ranging from 9 to 15 m above the alluvium. At the former Victoria Pit, Twerton, Bath, the third terrace, with a base at about 42m above OD and 24m above the alluvium, is composed mainly of local Jurassic rocks. It occurs again at Bathampton, where all three terraces are found. The Victoria Pit gravels contained the bones of temperate animals, such as the straight-tusked elephant and red deer, and cold forms, such as mammoth and woolly rhinoceros.

The Newton St Loe SSSI

The area covered by the Newton St Loe SSSI is important as it represents one of the remaining and accessible exposures of the fossiliferous second terrace of the Bristol Avon. It forms part of a network of sites within the Avon lowlands that allows the history of early glaciation within the south west of England to be established. Much larger expanses of the second terrace occur at Kelston and Saltford and between Twerton and Bathampton.

The Watching Brief exposure

The excavated trench in the vicinity of the Newton St Loe SSSI showed Pleistocene fluvial gravels resting on an uneven surface (scour-and-fill structures), of Upper Triassic Mercia mudstones to a depth of approximately 4 5 m. The contact between the mudstones and gravels was very variable in nature. Generally, the undulating contact was well defined and distinct. The trough cross bedding is consistent with the gravels having been laid down by a braided river, flowing across a frozen land surface - a fluvial style usually associated with cold stage sedimentation. The fluvial deposits vary considerably in size and lateral extent. Large lenticles of sand and fine silts are interbedded with coarse gravels. The provenance of these gravels is complex and they contain material from South Wales and Midland sources. The finer sediments probably represent the remnants of bars and spits where slower river currents favoured their deposition and preservation.

Conclusions

The Bath CSO Project provided an opportunity to examine and record a Pleistocene river terrace exposure in the immediate vicinity of the Newton St Loe SSSI and to document its relationship with the solid geology, here represented by rocks of Upper Triassic age (Mercia Mudstone Group). Although no mammal bones were recovered from the gravels, it seems likely, from previous records, that they do occur, but infrequently.

A detailed report containing photographs and detailed stratigraphic logs has been deposited with Wessex Water, Bath & North East Somerset Council, Bristol Museum and the British Geological Survey.

Photograph looking west towards Saltford. The pipe trench has been excavated and exposed fine river silts overlying Upper Triassic mudstones