Nottingham Castle, Nottingham, Nottinghamshire

[SK 569 394]

Potential GCR site

Introduction

The cliffs beneath Nottingham Castle form the type locality for the Nottingham Castle Formation and expose 25 m of coarse- and medium-grained sandstones, with scattered pebbles and intraformational mudstone clasts. The sediments show good examples of cross-bedding, with individual cross-bedded sets approximately 2 m thick. This formation is also well-exposed in the nearby public house 'The Trip to Jerusalem' where the cross-bedding structures can be examined in three dimensions.

The geology of the Nottingham area has been described by many authors, including Aveline (1861, 1880), Hull (1869, pp. 53–4), Irving (1874), Shipman (1881), Lamplugh *et al.* (1908), Smith (1910, 1912), Sherlock (1911), Swinnerton (1918), Elliott (1961), and Taylor (1968, 1974), all of whom include descriptions of the Nottingham Castle locality.

Description

The Nottingham Castle Formation, formerly the 'Bunter Pebble Beds', outcrops in Nottingham and the surrounding area. Exposures are generally man-made, and include road and railway cuttings, as well as storage rooms, cellars and dwellings carved into the rock (Aveline, 1861, 1880). At Nottingham Castle, the type locality for the formation, approximately 25 m of sediments are best exposed on the eastern and southern sides of the Castle Rock and are traceable along Castle Boulevard (Taylor, 1968).

The sediments range from unconsolidated mixtures of sand and pebbles, to hard conglomerate, and are buff, yellow, brown or reddish in colour; the sandstone is medium to coarse, with angular grains. The small, well-rounded pebbles are composed of reworked Devonian and Cambrian quartzites, with some Carboniferous Limestone and Permian dolomite and large intraformational mudstone clasts (Taylor, 1968). The sandstones are arranged in thick units of cross-bedded sets, each approximately 2 m thick, separated by hierarchical bounding surfaces, with few joints (Aveline, 1861, 1880; Lamplugh *et al.,* 1908; Taylor, 1968). The fore-sets indicate transport towards the south-east.

North and west of Nottingham the Nottingham Castle Formation consists of unconsolidated mixtures of sand and pebbles (Aveline, 1861, 1880). The formation is unfossiliferous. Bands of argillaceous sediment occur in the formation, for example at Barbers Hill Quarry, near Mansfield [SK 565 538].

Interpretation

The Nottingham Castle Formation was deposited under terrestrial conditions. The coarse-grained sandstones, with scattered pebbles, pebble strings and cross-bedding, indicate deposition in braided rivers and streams, and from sheet floods in a major system of incised channels and alluvial fans feeding eastwards from the Pennine upland area and into the SNSB.

Conclusions

The Lower Triassic sediments in the crags below Nottingham Castle consist of yellow and buff sandstones with pebbles and reworked mud clasts. Many fine examples of cross-bedding are preserved at this locality. This is the type location for the Nottingham Castle Formation, which has been interpreted as the deposits of a major system of alluvial fans. This is a key stratigraphical and sedimentological site near the western margin of the Southern North Sea Basin.

References