Scrooby Top Quarry, Nottinghamshire

[SK 652 890]

Introduction

Scrooby Top Quarry is a working quarry with exposures of the Nottingham Castle Formation parallel to river channel direction. Medium to coarse pebbly sandstones show cross-bedding characteristic of transverse burial bars. Large-scale foresets show very low inclinations, and these represent complex accretionary bar forms. Sediment transport was to the north. Together with the exposures at the nearby Styrrup Quarry (see above), it affords a three-dimensional insight into the deposits of large rivers of Early Triassic age.

Scrooby Top Quarry has not been described in detail in the literature, but much of the geology and features of the Nottingham Castle Formation are comparable with those seen in Styrrup Quarry (see site report, above).

Description

Sections in this working quarry are some 20 m high, and over 100 m in lateral extent (Figure 3.48). Cross-stratified sets are typically 1–2 m thick, indicate transport towards the north-east and are separated by sub-horizontal erosion surfaces. In places, as the faces are worked, excellent sections showing the lateral transition from foreset bedding to horizontal bedding are revealed (Figure 3.48). Six cross-bedded sets have been identified (Figure 3.48), each representing a bar that migrated parallel to the section face. Successive bar deposits are separated by sub-horizontal erosional bounding surfaces. Deposits of bars 1 and 2, at the base of the succession, are characterized by low-angle cross-bedding; those of bars 3, 4, and 6 are dominated by tabular cross-bedding. The bar 5 deposits are thinner than the others and were substantially cut out by erosion prior to deposition of bar 6; they are exposed more obliquely to the palaeoflow direction and exhibit flat bedding and low-angle cross-bedding.

The medium- to coarse-grained sandstones contain abundant extraformational pebbles up to 20 mm in diameter, and larger infra-formational mudstone clasts. The pebbles occur as basal lags, but are aligned parallel to the cross-bedding foresets and concentrated in small scour pockets.

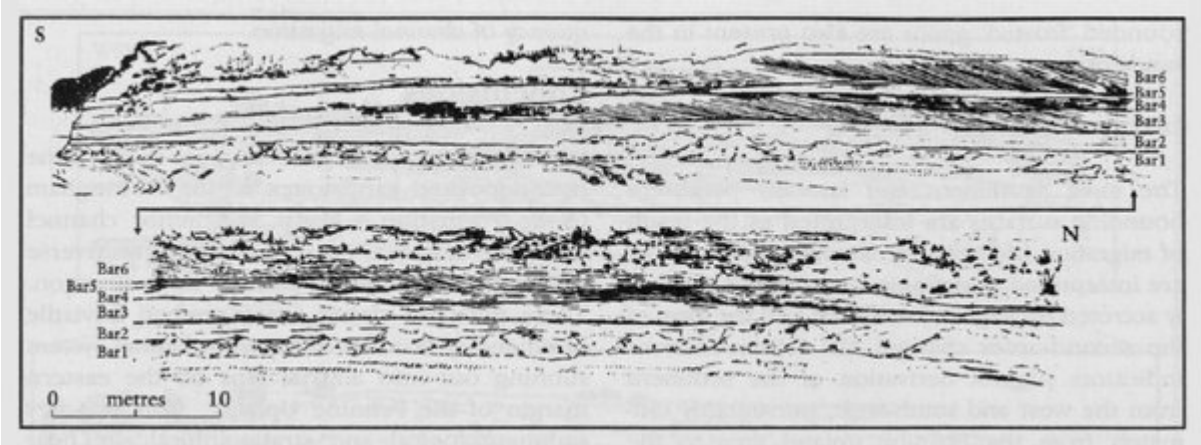
Interpretation

The Scrooby Top Quarry sections expose deposits of up to six successive major transverse bars that migrated north-eastwards. Each bar unit overlies a sub-horizontal erosional surface, and its top is truncated by that below the subsequent bar. Extraformational pebbles suggest derivation from the uplifted Palaeozoic uplands of the Pennine region, and infra-formational clasts (mudstone flakes) hint at the tops of bars or at overbank (vertical accretion) deposits that have been eroded away. The nature of the rivers, the depositional cycles, and the missing low-energy portions of those cycles, are discussed in the Styrrup Quarry GCR account (see above).

Conclusions

Scrooby Top Quarry offers good sections in the Nottingham Castle Formation, showing all the features seen at its type locality at Nottingham Castle [SK 569 394], but in fresher and more accessible exposure. The principal distinction is that the sections are parallel to the direction of flow compared to those at Styrrup Quarry, which are transverse to the flow direction. As a working quarry, Scrooby Top Quarry offers the best opportunity to see fresh sections through the Nottingham Castle Formation and is a key site for understanding Triassic river system dynamics and the palaeogeography of eastern England and the margin of the Southern North Sea Basin.

References



(Figure 3.48) Field sketches of the Triassic channel systems in the Nottingham Castle Formation at Scrooby Top Quarry. Major erosional bounding surfaces are shown in bold, and six successive bar systems are distinguished. Based on unpublished work by S. D. Burley.