
Ridgeway Quarry

Highlights

Ridgeway Quarry is the best exposure of the Crawshaw Sandstone in a facies thought to be generated by low-sinuosity rivers.

Introduction

A quarry at the end of Crich Lane [SK 358 514], 1 km east of Ambergate, 4 km north of Belper, Derbyshire, shows the topmost Millstone Grit and lowermost Coal Measures, as developed in the southern part of the Notts–Derbyshire Coalfield. The geology has been described by Smart and Frost (1968), Guion (1971) and Frost and Smart (1979), and a log is provided by Guion and Fielding (1988).

Description

Lithostratigraphy

The exposed sequence here is about 34 m thick (Figure 10.4) and (Figure 10.5). At the base is about 1 m of medium to fine-grained sandstone with ripple-lamination, belonging to the Rough Rock Formation. These are overlain by a 10 m thick, coarsening-upwards interval of shales and siltstones. The lower part of this unit consists of dark, marine shales, which in turn are overlain by contorted shales, and then siltstones with burrows.

The rest of the succession belongs to the Crawshaw Sandstone Formation. It consists mainly of coarse-grained, cross-bedded sandstones, with a thin siltstone band containing plant remains about 2 m above the base. Guion (1971) has interpreted the Crawshaw Sandstone here as being the remains of transverse bars in low sinuosity rivers. The cross-bedding is planar to very broadly curved, and the set-size appears to diminish up the section. Palaeocurrent directions seem to be towards the Edale Gulf to the north-west.

Biostratigraphy

The marine strata between the Rough Rock and Crawshaw Sandstone has only yielded inarticulate brachiopods and fish scales. It is assumed to be the Subcrenatum Marine Band in a marginal-marine facies (*Lingula facies sensu* Calver, 1968), marking the base of the Westphalian Series. The Subcrenatum Marine Band in this part of Derbyshire is normally in this facies (despite the map given by Calver, 1968, fig. 6). This has caused major problems with identifying it in the area and thus of distinguishing the Rough Rock and Crawshaw Sandstone (Taylor and Howitt, 1965).

The plant fossils from the lower part of the Crawshaw Sandstone are very fragmentary and difficult to identify. However, during a visit to the site in 1985, the author found fragments of the pteridosperm frond *Karinopteris acuta* (Brongniart) Boersma, which is restricted to the upper *Pecopteris aspera* and the *Lyginopteris hoeninghausii* zones (middle Marsdenian to upper Langsettian).

Interpretation

The Crawshaw Sandstone is a major unit of arenaceous strata found over large areas of the south-eastern part of the Central Province. It has been studied in detail by Guion (1971) who interpreted it in terms of three discrete delta complexes, extending into the Edale Gulf (Figure 10.6). Two of the complexes are mainly represented by the deposits of low-sinuosity distributary channels, while the third is represented by delta-front deposits (see discussion below on Stannington Ruffs). Ridgeway Quarry is one of the best sites for showing the sedimentological features of the first of these facies, in particular the distinctive nature of the cross-bedding. It is also one of the few sites where the sandstones

can be seen in relation to the Subcrenatum Marine Band, albeit in a facies lacking the index ammonoid. These two factors together make Ridgeway Quarry uniquely important for understanding the sedimentology and stratigraphical position of this formation.

The Crawshaw Sandstone is important as being the last of the major Millstone Grit style of delta complexes to be seen in the Central Province/Pennine Basin. It is also of considerable economic significance, being responsible for some 70% of the oil production in the East Midlands Coalfield.

Similar slumping immediately above the Subcrenatum Marine Band has been identified elsewhere in the southern part of the Central Province, such as at Little Don, and the Goyt Syncline (Francis, 1967). It has also been recognized immediately above the Subcrenatum Marine Band on the South Crop of the South Wales Coalfield (e.g. Tenby–Saundersfoot Coast — see Chapter 4), which in turn has been correlated with the generation of the Farewell Rock on the North Crop of that coalfield. The distribution of this slumping all seems to point to tectonic movement in the earliest Langsettian, probably located somewhere within the Wales–Brabant Barrier. Whether it can be related to the formation of the immediately overlying Crawshaw Rock sandstones is for the moment a matter of speculation.

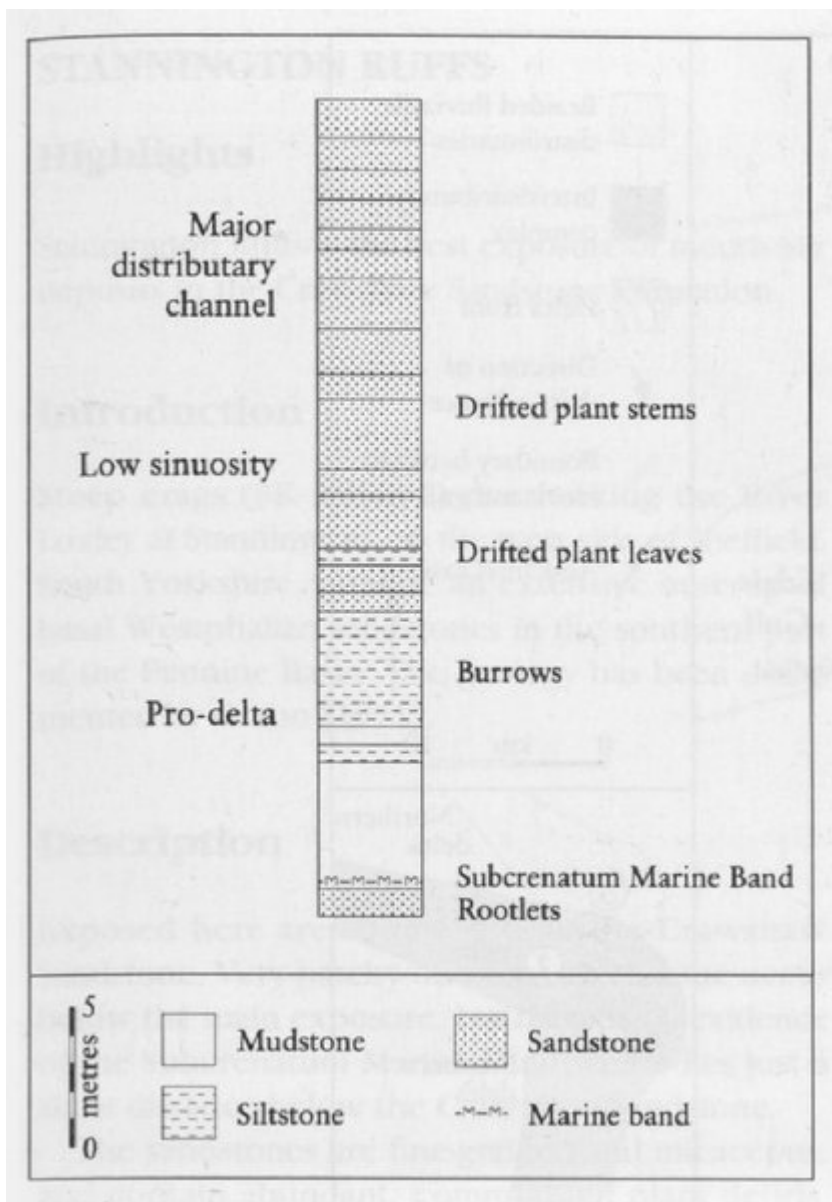
Conclusions

Ridgeway Quarry is an important exposure of sandstones known as the Crawshaw Rock, about 315 million years old. It lies at the very base of the Coal Measures in the Pennine Basin. The rocks seen here probably represent sands deposited by low-sinuosity rivers.

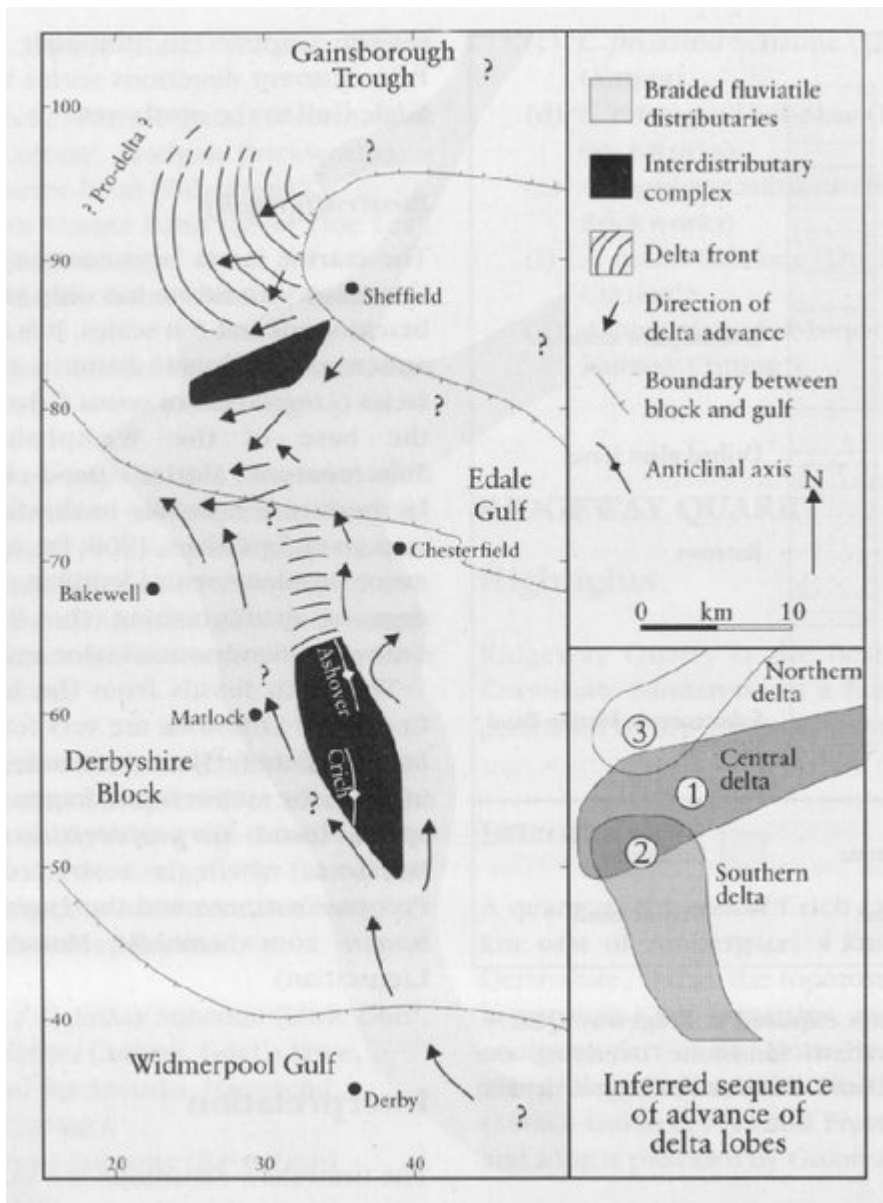
References



(Figure 10.4) Crawshaw Sandstone overlying the Subcrenatum Marine Band at Ridgeway Quarry. (Photo: C.J. Cleal.)



(Figure 10.5) Section exposed at Ridgeway Quarry, showing the Crawshaw Sandstone overlying the Subcrenatum Marine Band. Based on Guion and Fielding (1988, fig. 13.9a).



(Figure 10.6) Generalized depositional patterns for the Crawshaw Sandstone Formation. Based on Guion (1971).