
Ladcastle and Den Quarries

Highlights

Ladcastle and Den Quarries is the best available exposure showing a succession of channel-fills in the Kinderscout Grit, demonstrating that they are the result of large-scale bedform migration.

Introduction

Disused quarries [SD 994 059] on the west side of the Huddersfield Manchester railway line at Upper-mill, 8 km east of Oldham, Greater Manchester, provide extensive exposures in the lower member of the Kinderscout Grit Formation. The geology is described by McCabe (1975).

Description

Exposed is a sequence about 30 m thick, consisting primarily of coarse sandstones. Three main facies are recognizable. The most distinctive are sandstones showing the 'giant cross beds' as defined by McCabe (1975, 1977), up to 12 m thick. Of particular interest here is the presence of small, internal cross-beds (intrasets of Collinson, 1968), suggesting current flow up, down and along the foreset slopes.

These cross-bedded units are associated with more massive, coarse-grained, more pebbly sandstones. They mostly underlie the 'giant cross beds' facies with a sharp, near horizontal contact, but sometimes the two pass laterally into one another. McCabe (1975) interprets them as trough deposits of large bedforms, with the change from the 'giant cross beds' facies representing a readjustment to changes in water flow.

The third facies are fine sandstones and siltstones, with parallel and ripple lamination. They are thought to be overbank and crevasse-splay deposits formed between the distributary channels.

According to McCabe (1975), the sequence can be interpreted in terms of the successive erosion and infilling of four separate channels. In each case, the infill follows the same general pattern. At the base of the channel is a unit of massive, coarse-grained sandstone, which is overlain by an interval of sandstones showing the 'giant cross beds'. This in turn is overlain by a unit of inter-channel deposits, the top of which is marked by an erosion surface.

Interpretation

This site clearly has to be seen in the same context as Derby Delf (see above). The 'giant cross beds' are not as well developed as at Derby Delf, where they are more than 34 m thick. Also, the undulatory bedded sandstones, representing the deposits of the bar spurs, are not visible here. However, the inter-channel deposits, not seen at Derby Delf, are well preserved. Furthermore, instead of part of just one channel-fill being present, as in most other exposures of these strata, a succession of four discrete channel-fills can be identified. This is important for confirming that they were formed by large-scale bedform migration, in this case probably migrating transverse bars in a large, braided river system (McCabe, 1975, 1977), rather than delta-lobe deposits as previously thought.

Conclusions

Ladcastle and Den Quarries is an important site for showing depositional structure within the Kinderscout Grit. It confirms that these rocks are the remains of large river deposits, formed about 318 million years ago.

[References](#)