

EXCURSION

Carbonate mud mounds in Ricklow and Lathkill Dales

Leader: Peter Gutteridge

Wednesday 24th July 2002

The aim of this excursion was to demonstrate the structure of a group of carbonate mud mounds at the top of the Monsal Dale Limestones in Ricklow Quarry and adjacent parts of Ricklow and Lathkill Dales, and to examine the succession around the Monsal Dale and Eyam Limestones boundary at the western end of Lathkill Dale. The party met at the lay-by where the B5055 crosses Lathkill Dale, east of Monyash (SK157664). The contact between the Monsal Dale and Eyam Limestones is exposed at about the level of the lay-by and can be seen on either side of the dale (Fig. 1). The lower part of the Eyam Limestones is exposed on the north side of Lathkill Dale in a section about 200 m long along the B5055. Here, the Eyam Limestones consist of bioclast wackestone passing upwards into bioclast packstone with scattered gigantoproductid brachiopods; no carbonate mud mounds are present in the succession at this point. The party walked about 1 km down Lathkill Dale to a view point opposite Ricklow Quarry on the south side of the dale (SK163660). From here the complex of carbonate mud mounds can be seen in all their three dimensional glory.

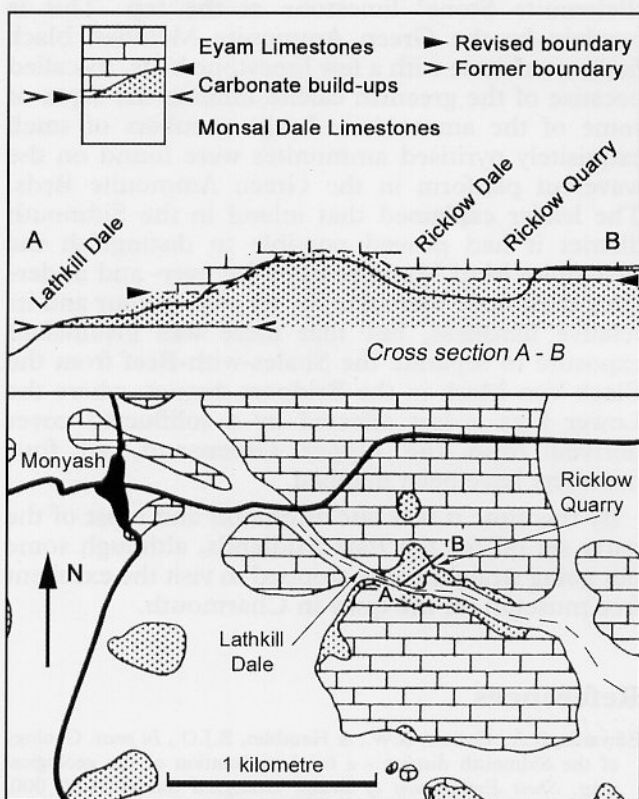


Figure 1. Geological sketch map and section of the upper part of Lathkill Dale and Ricklow Quarry (modified from Gutteridge, 1991).

Crossing back to the north side of Lathkill Dale the party climbed up a carbonate mud mound. This was a mounded feature on the Dinantian sea floor composed mainly of carbonate mud with scattered fenestrate, fan-shaped, bryozoans and pockets of brachiopods and bivalves preserved in their growth position. Proceeding over the crest of the carbonate mud mound into Ricklow Dale, the flanking beds that represent the margins of the carbonate mud mound can be seen along the sides of the dale. The flank beds dip by some 20° away from the cores and pass laterally into flat-bedded densely crinoidal limestone in the main part of Ricklow Quarry. This shows that the carbonate mud mounds were surrounded by dense forests of large crinoids. The top of the carbonate mud mounds and equivalent limestones are covered by a calcrete showing that they were subaerially-exposed soon after deposition (Adams, 1980). The limestones overlying the carbonate mud mounds seen in the road section are also exposed in Ricklow Quarry. These are bioclast wackestone and gigantoproductid packstone that were deposited during re-flooding of the carbonate mud mounds after exposure that were seen in the road section at the head of Lathkill Dale. Examining the initial stages of the carbonate mud mound's growth on the way back to Lathkill Dale involved some painfully rough walking over steep slopes covered in tussock grass and boulders hidden beneath vegetation. This shows that the carbonate mud mound started as a number of low relief tabular mud mounds a few tens of metres across. These amalgamated and expanded to form the fewer, larger cores at the head of Lathkill Dale and Ricklow Quarry.

Thanks to Ben Labarr, warden of the Lathkill Dale National Nature Reserve for granting permission to go off the public footpaths.

References

- Adams, A.E., 1980. Calcrete profiles in the Eyam Limestone (Carboniferous) of Derbyshire: petrology and regional significance. *Sedimentology*, 27, 651-660.
Gutteridge, P., 1991. Revision of the Monsal Dale/Eyam Limestones boundary (Dinantian) in Derbyshire. *Mercian Geologist*, 12, 71-78.