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# Ricklow Quarry and Monyash Quarry, Derbyshire

[SK 165 662] and [SK 149 677]

## Introduction

The disused Riddow Quarry is situated 1.5 km ESE of the village of Monyash, where Ricidow Dale joins Lathkill Dale [SK 165 662]. The site also includes exposures on either side of Ricklow Dale, to the north of the quarry, and on the northern side of Lathkill Dale [SK 169 660]. Monyash Quarry (also disused and sometimes known as 'Bricks Quarry') lies to the east side of the Monyash to Taddington road 1.2 km north of Monyash [SK 149 677]. Together, these sites offer the best exposures of late Brigantian facies in the interior of the Derbyshire Platform, including two developments of carbonate mud-mound facies, coarse crinoidal limestones and dark-coloured bedded limestones. The sites are described by Adams (1980) and Gutteridge (1983, 1990a, 1991b, 1995).

## Description

### Ricklow Quarry

The strata exposed at this site include the top of the Monsal Dale Limestones and the lower part of the Eyam Limestones as re-defined by Gutteridge (1991b). Adams (1980) described the succession at Ricklow Quarry and in the surrounding dale sides in terms of three main facies: a buildup-core facies, a flank facies and a basin-fill facies. The buildup-core and flank facies together form the 'reef facies' of previous workers and are shown on [British] Geological Survey maps of the area (Institute of Geological Sciences, 1977b, 1978). Subdivisions of these facies are possible and have been mapped in detail by Gutteridge (1983).

The buildup-core facies consists of lenticular bodies of massive, pale-coloured, fine-grained limestone. These are now described as mud-mounds (e.g. Gutteridge, 1995). Although carbonate mud is the dominant component, there are abundant spar-filled cavities and a distinctive fauna similar to that described from other late Dinantian carbonate mud buildups, such as those at Wirksworth (Timms, 1978; and see National Stone Centre GCR site report, this chapter) and in the Craven Reef-Belt (Mundy, 1980a; see Chapter 5). Brachiopods are the dominant element of the macrofauna and occur in 'pockets' up to 0.5 m across and 0.3 m high (Gutteridge, 1983, 1990a). Large brachiopods such as dictyoclostoids and echinoconchoids are preserved in life position at the base of pockets and are succeeded by smaller types such as *Avonia*, *Aliteria* and the most common species throughout the buildups, *Balanoconcha* '*Girtyella*' *saccula* (Gutteridge, 1983, 1990a). Other important elements of the fauna are fenestrate bryozoans and fragmented crinoids. The significance of the macrofauna has been discussed by Gutteridge (1990a). The buildup-core facies is best seen in the crags on the east side of Ricklow Dale immediately north of the quarry and in the crags on the north side of Lathkill Dale [SK 1685 6600] (Figure 7.15).

The flank beds consist of coarsely crinoidal limestones banked up against the buildup-core facies and show depositional dips away from the core. The inter-buildup flank facies shows evidence of subaerial exposure in the form of a discontinuous laminar calcrete at its contact with the succeeding basin-fill facies, and the presence of rhizocretions and alveolar texture in its top 0.3 m (Adams, 1980). The buildup-core also shows cement and other textures indicative of subaerial exposure and vadose meteoric diagenesis (Gutteridge, 1983).

The basin-fill facies post-dating the buildup facies consists of dark-coloured, sometimes cherry, well-bedded wackestones and packstones. Initially, in the depressions between the buildup-core facies, there are wackestones with an impoverished fauna of molluscs and calcareous algae and some fenestral fabrics. These give way to more laterally extensive bioclastic wackestones and packstones with a diverse fauna including *Gigantoproductus*.

### Monyash Quarry

Monyash Quarry provides exposures entirely in the Eyam Limestones as defined by Gutteridge (1991b). A succession about 22 m thick is exposed on two levels with a break between. The lower part of the quarry shows bedded dark-coloured limestones consisting of a lower molluscan wackestone facies and an upper gigantoproductid packstone. These are thought to correlate with the basin-fill facies at Ricklow Quarry (Gutteridge, 1983). After a poorly exposed interval, the upper part of the quarry shows a transition from dark-coloured packstones to pale-coloured cross-stratified crinoidal grainstones. Gutteridge (1989b) recorded damage to gigantoproductid brachiopods from this locality, which he attributed to shark predation. A tabular and lens-shaped carbonate mud-mound up to 1.5 m thick occurs within the crinoidal limestones. Details of the succession at this site are summarized in (Figure 7.16).

## Interpretation

The succession at Ricklow Quarry was originally regarded as belonging entirely to the Eyam Limestones (e.g. Aitkenhead *et al.*, 1985). However, the recognition of a stratigraphical break between the buildup facies and the basin-fill facies (Adams, 1980; Gutteridge, 1983), which can be traced down to the top of the Monsal Dale Limestones, led Gutteridge (1991b) to propose that the buildup facies more properly belong to the Monsal Dale Limestones. The origin and development of Brigantian mud-mounds on the Derbyshire Platform has been discussed by Gutteridge (1995). The mud-mound at Ricklow falls into the category of Gutteridge's 'Group 1 mounds' occurring at the contact between the Monsal Dale Limestones and Eyam Limestones. It developed in shallow water in the interior of the platform and largely grew by lateral accretion. The tabular mound at Monyash Quarry represents one of Gutteridge's 'Group 2 mounds' and this developed wholly within the Eyam Limestones on the shallow part of an infra-platform ramp (Gutteridge, 1995).

Carbonate mud was produced *in situ* probably by microbial processes as with other Dinantian mud-dominated buildups. Crinoids colonized the surfaces of the buildups and accumulated as a flank facies banked up against the buildup cores. In the case of the mud-mound at Ricklow, soon after deposition a relative drop in sea level led to subaerial exposure and meteoric diagenesis. This resulted in the calcretization of flank deposits and the precipitation of a complex series of cements (Gutteridge, 1983). This shallowing event can be recognized elsewhere in Derbyshire at the Monsal Dale Limestones–Eyam Limestones boundary (Gutteridge, 1991b).

As sea level rose again, firstly a restricted tidal-flat and lagoonal facies was deposited around the still-exposed tops to the buildups. When they were finally submerged, subtidal limestones containing *Gigantoproductus* spread across the area.

Bioclastic, mainly crinoidal, sand shoals subsequently became established in the area, marking a change to higher energy conditions at the head of a shallow intra-platform ramp. At Monyash, small tabular mud-mounds developed in this facies.

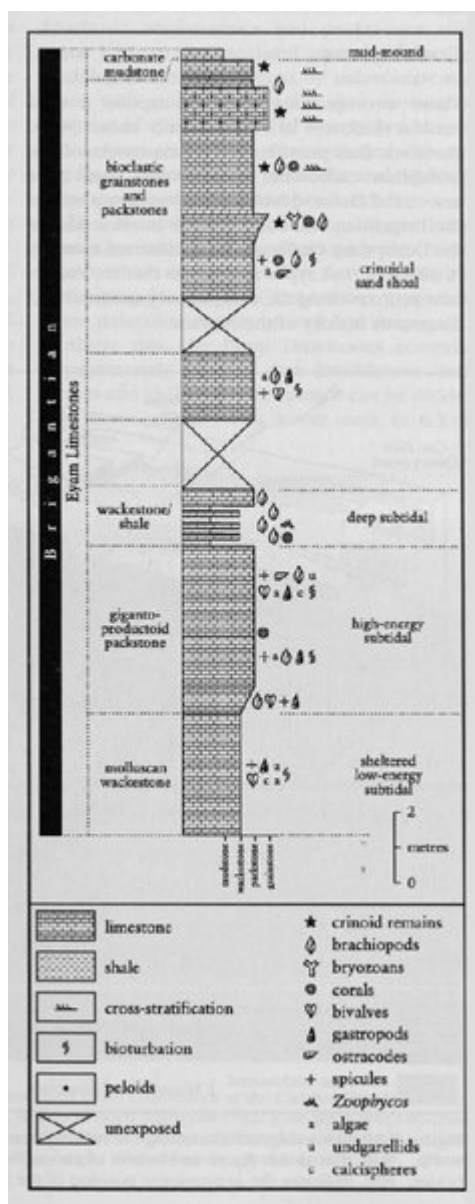
## Conclusions

These two quarries together expose a total vertical thickness of strata of only about 30 m. However, they provide the best exposures of late Dinantian carbonate mud-mounds and their associated facies, developed at two levels within the Brigantian succession in the interior part of the Derbyshire Platform. They illustrate a variety of different rock types and faunas that are important in unravelling the complex depositional and diagenetic history of the region.

## [References](#)



*(Figure 7.15) Development of late Dinantian (Brigantian) carbonate mud-mound at the top of the Monsal Dale Limestones in upper Lathkill Dale (Ricklow Quarry GCR site). The mud-mound forms a prominent crag (c. 8 m high) at the top of the valley side where the lateral transition from the mainly unbedded buildup-core facies (right) into flank facies (left) can be clearly seen. (Photo: P Gutteridge.)*



(Figure 7.16) Sedimentary log of the Eyam Limestones succession exposed at Monyash (Bricks) Quarry. After Gutteridge (1983).