

## **DOLOMITISATION, DEDOLOMITISATION AND CALCIFICATION IN THE TRIASSIC (?) MERAPOH LIMESTONE**

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The Triassic(?) Merapoh Limestone exposed at the abandoned Modal Quarry in the Gua Panjang Hills is composed of a lower sequence of interbedded silicified shale and crinoidal wackestone, gradually being replaced upwards by peloidal packstone and skeletal packstone-grainstone. The top of this bed is scalloped, strongly burrowed and bioturbated and, in places, pass laterally into crinoidal grainstone. Capping this sequence is an extensive but discontinuous laminated crust and caliche surface. Resting on this surface are pockets of intraformational breccia consisting of clasts of strongly dolomitised wackestone rare algal boundstone and skeletal fragments set in a matrix of crinoidal wackestone. An algal boundstone bed of variable thickness (0.5-3.0 m) overlies this breccia or the laminated surface directly, which is in turn overlain by a thick sequence of oolitic-peloidal packstone-grainstone grading upsequence into well-sorted oolitic grainstone. Above this is a very thick (>20 m) massive algal boundstone which is generally inaccessible.

This sequence is interpreted as a series of cyclic sedimentation beginning with a marine drowning phase of an emergent surface. This is followed by the deposition of a shoaling-upwards sequence, culminating in another emergent phase.

Early diagenetic changes in these rocks are reflected by the change in the ensuing diagenetic realm. Rim Mg-calcites cements (now neomorphosed) predominate in the grainstone facies.

Large-scale dissolution and microfracturing due to collapse indicate suggest an early change of the marine sediment to a freshwater environment. Penecontemporaneous dolomitisation predominantly affected the burrow-fillings and also resulted in the encrustation of particle and fracture surfaces by minute, inclusion-rich stubby dolospars. Subsequent sparry calcite forms the next generation of cement, followed by large coarse, euhedral, often zoned dolomites.

The remaining pore space were filled through the competitive growth of coarse radial fibrous calcite and coarse ferroan dolomite (saddle dolomite). This competitive growth also resulted in the corrosion of the margins and replacement of both the dolomite and the calcite, imparting dedolomitised fabrics in the rocks. This late diagenetic process is envisaged to have occurred under a higher temperature condition, from waters of variable chemistry.