

MOLONG ANTICLINORIUM SUCCESSION BENEATH THE NARRAGAL LIMESTONE

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The Silurian System of the northern Molong Rise has been re-examined where well displayed between Neurea and Mumbil. The Mumbil Group, forming the upper part of the sequence, comprises the dolomitic Narragal Limestone and the overlying Barnby Hills Shale. The succession beneath the Narragal Limestone can no longer be regarded as an Ordovician to Early Silurian single formation (Oakdale Formation) lacking major breaks. Ordovician and Silurian strata are separated by an Early-Middle Silurian hiatus, possibly marked by slight angular unconformity. The Ordovician sequence is divided into two new formations, the andesitic Cypress Hill Volcanics and the overlying Mona Vale Siltstone, comprising the Oakdale Group. Silurian strata have been excluded from the Oakdale Group and are placed in three new formations. In ascending order these are the Wylinga Formation, which is rich in thinly bedded limestone, the andesitic Warderie Volcanics and the Catombal Park Formation, which contains acid volcanics and calcareous sediments. These three formations make up the Dripstone Group, whose richly fossiliferous members contain a coelenterate fauna which may be of widespread biostratigraphic value within the Lachlan Fold Belt.

THE CUGA BURGA VOLCANICS – A LOWER DEVONIAN VOLCANIC PILE

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The structure and stratigraphy of marine volcanic pedestals of a basaltic composition take on a distinct general form as proposed by Jones (1966). Quiet effusive pillow lava piles form the foundations of the volcanic pedestals. The emergent phase is characterized by tuff and breccia cappings. Sheet lava and flow-foot breccia record the effusion of lava in air whereas the subaqueous breccias arenites and lutites form an encircling sedimentary apron. The sedimentary apron volumetrically contains more material than the lava pile.

The Cuga Burga Volcanics near Wellington, NSW, consist of a basal unit of aphyric pillow lavas and pillow lava breccias that are conformably overlain by a sequence of volcanic breccias limestone breccias arenites and lutites deposited subaqueously and overlain by subaerial lava flows, tuffs and breccias which are limited to the west of the area. The formation reaches a maximum measured thickness of nearly 1000 m. The subaqueous deposits occur in all parts of the

area and show a decrease in grain size and bedding thickness to the east and an easterly dipping sea floor is inferred for the Wellington area during the Lower Devonian.

The aphyric pillow lavas and pillow lava breccias constitute basal pillow lava piles recording effusion of lava in water preceding emergence. They represent the subaqueous foundations of a marine volcanic pedestal. The subaerial lavas and tuffs record lava effusion after emergence. The huge thicknesses of subaqueous volcanic breccias, limestone breccias, arenites and lutites represent the sedimentary apron of a marine volcanic pedestal and by far outweigh the other rock types in volume.

The Cuga Burga Volcanics conformably overlie the Barnby Hills Shale and are overlain conformably by the Garra Formation, Tolga Calcarene, Dunmoogin Formation, Nubrigyn Formation and the Cunningham Formation and are unconformably overlain by the Catombal Group.

The Cuga Burga Volcanics have an Upper Pridolian to Lower Gedinnian age and are inferred to have been deposited over a period of 5 to 10 million years. New and accurate age controls for cessation of the Cuga Burga Volcanics at the Lower Gedinnian to Upper Gedinnian boundary, has come from a detailed investigation of conodont faunas from the overlying formations.

The chemical composition of the lavas in the Cuga Burga Volcanics is similar to modern day High-K Andesite to Shoshonite associations. Rocks with similar chemical compositions are found in New Guinea and Fiji. They appear to occur in the final stages of a magmatic sequence and do not always appear to be generated above active Benioff zones.

THE GEOMETRY OF THE GOWAN GREEN OVERFOLD AND ITS RELATIONSHIP TO THE REGIONAL DEFORMATIONAL HISTORY

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The Gowan Green Overfold southwest of Mumbil (Fig. 1), is a downward-facing antiformal syncline (Fig. 2) which is anomalous in the regional upward-facing structures of the Molong anticlinorial zone. Extending north from the overfold for 20 km is a discontinuous belt of overturned beds offset by faults (Figs. 1 and 3; Russel, 1975). The overfold and the overturned beds can be interpreted as a single coherent structure (Fig. 4) with an original strike length of 20 km and a width of 11 km.

Eastward syntaphral movement of the sedimentary cover on the Molong High followed late Early to Medial Devonian uplift while sustained gravity gliding formed the inverted limb now exposed in the overfold. Differential eastward movement accommodated by tear faulting has resulted in an alternation