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The Carboniferous sequence in the Gloucester-Myall Lake area, New South Wales

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ABSTRACT

The stratigraphic succession of formations in the Myall district comprises in ascending order the Bunyah Beds, Wallanbah Formation, Kataway Mudstone, Boolambayte Formation (new names), Nerong Volcanics (Engel, 1962), Booti Booti Sandstone, Yagon Siltstone, Koolanock Sandstone, Muirs Creek Conglomerate (new names) and Alum Mountain Volcanics (Engel, 1962). The units range in age from possibly Devonian to possibly Permian, most being Carboniferous. The Mograni (new name), Tugrabakh (Voisey, 1940) and Mayers Flat Limestones (new name) are members of the Wallanbah Formation. The Violet Hill Volcanics (new name) is a member of the Yagon Siltstone. The Burdekins Gap Basalt Member and Lakes Road Rhyolite are members of the Alum Mountain Volcanics.

Environments of deposition range from nonmarine (Nerong Volcanics, Alum Mountain Volcanics, Muirs Creek Conglomerate, upper part of Koolanock Sandstone) through shallow marine (Booti Booti Sandstone, lower part of Koolanock Sandstone, calcareous parts of Wallanbah Formation) to deep marine (most other units). Facies relationships indicate a progressive deepening of the sedimentary environment to the east throughout most of the Carboniferous sequence. The Tournaisian sequence is readily correlated with a similar sequence in the Rocky Creek and Belvue Synclines. Higher units are correlated with sequences at Gloucester (Campbell & McKelvey, 1972) and Booral (Campbell, 1962).

INTRODUCTION

The sequence of strata exposed in a belt between Gloucester and Myall Lake (Fig. 2) ranges in age from possibly Devonian to Permian. It represents the only known complete Carboniferous sequence in the eastern part of the Hunter-Myall province. In addition the sequence is mostly marine, contrasting with other known sections in N.S.W., where nonmarine rocks make up a considerable part of the section. The purpose of this paper is to define the previously poorly-known stratigraphy and briefly to describe facies relationships within formations and their significance.

PREVIOUS LITERATURE

Engel (1966) has reviewed earlier work on the Myall area. Prior to this, the geology of the area was poorly known. Engel mapped the southern part of the Myall area, defined a number of formations (shown in Fig. 1) and listed fossil faunas. Suters (1972) used these formations in preparing a geological map of the area between Gloucester, the Manning River and the coast. He also listed fossil faunas.

Crane (1975) mapped the area between Gloucester and the coast and described the conodont faunas from the Tournaisian and late Visean-early Namurian sequences. Hunt (1975) mapped the Myall Syncline with an emphasis on the biostratigraphy of the Upper Carboniferous sequence.

Roberts, Hunt & Thompson (1976) described the biostratigraphy of the fossiliferous Upper Carboniferous sequence, utilizing the stratigraphy defined in this paper.

GEOLOGY

The geology of the Myall area is shown in Figure 2. The area is at the end of the New England fold belt, within Zone A of Leitch (1974). This area is characterized by a series of north-northwesterly trending folds, which have been faulted by similarly trending faults, many with major displacements. Directions of movement along the faults are not known.

Folds vary from the broad Myall Syncline centred near Bulahdelah to the tight, almost isoclinal folds near Wallanbah. A major belt of overturned strata extends from near Bungwahl northwestward to just past Coolongolook. Evidence for this overturning is biostratigraphical—the sequence of formations and brachiopod faunas is reversed when compared with that of the surrounding area. Exposures are too poor to obtain evidence of overturning from sedimentary structures. The belt of overturned strata is part of a complexly faulted, tightly folded area.

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