

LATE TRIASSIC ('RHAETIAN') AND JURASSIC
PALYNOSTRATIGRAPHY OF THE SURAT BASIN

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BIOGRAPHY

John McKellar joined the Geological Survey of Queensland in 1968. Since obtaining his B.Sc. from the University of Queensland in 1971, he has worked at the Survey as a palynologist where he has been involved with studies of various Late Palaeozoic to Mesozoic basins in Queensland. Currently, his main interests lie in the taxonomy and biostratigraphy of spore-pollen floras from the Jurassic of the Surat Basin. Data derived from this research project are also being used to provide the basis for a Ph.D. thesis at the University of Queensland. His work in the Jurassic is soon to be extended into the Eromanga Basin in order to service the stratigraphic drilling programme presently being undertaken there by the Survey.

SUMMARY

In the Jurassic of eastern Australia, the principal palynological zonation in use is that devised by Evans (1963, 1966). This scheme, which was based primarily on data derived from the Surat and Eromanga Basins, has been variously modified (eg. Burger, 1968; Burger & Senior, 1979) as new distribution data have become available. In the Surat Basin, the development of a more formal zonation has been limited to the Early Jurassic with the work of Reiser & Williams (1969). However, the zonations of de Jersey (1975, 1976), which are developed mainly for the sequence in the lower part of the Moreton Basin, also have application in the basal succession (Precipice Sandstone and Evergreen Formation) of the Surat Basin. They enable comparisons to be made between the two basins which demonstrate that deposition of the basal sediments of the Precipice Sandstone, at least in the Eddystone 1:250,000 Sheet area (northwestern Surat Basin), began in 'Rhaetian' (Late Triassic) times when the basal units of the Moreton Basin (Aberdare Conglomerate, Raceview Formation, and basal Helidon Sandstone) were laid down (McKellar, 1978). Deposition was then abruptly terminated and the early Liassic in the Surat Basin was characterised by a period of non-deposition and/or erosion. Subsequently, in the middle Liassic, accumulation of the Precipice Sandstone was reinitiated. This is comparable to the situation described by de Jersey (1976) in the Moreton Basin where a time-break occurs in the basal Helidon Sandstone. Within that unit, the magnitude of the hiatus increases westward and the 'Rhaetian' strata at its base are overlain by early to middle and middle Liassic strata, in respectively the Lowood-Walloon and (further west) in the Toowoomba areas.

In terms of the palynostratigraphic subdivision of the Jurassic of the Great Artesian Basin, progress has been hindered by the absence of detailed taxonomic studies of the spore-pollen floras, particularly those of Middle to Late Jurassic age. Moreover, the key to the development of a more refined palynological zonation rests principally with the succession in the Surat Basin, rather than

with the generally condensed and often incomplete sequences of the adjacent Eromanga Basin. It is to this end that research at the Geological Survey of Queensland is currently being directed.

Of particular significance, the preliminary data derived from these studies show that two biostratigraphically important genera, *Contignisporites* and *Cicatricosisporites* appear at considerably lower levels than previously recorded.

Contignisporites cooksonae, the index used in definition of palynological unit J5 (Evans, 1966), first occurs in the Eurombah Formation, well below its previously documented level of appearance in the upper part of the overlying Walloon Coal Measures.

On the other hand, specimens comparable with *Cicatricosisporites australiensis* first appear at approximately the same level in the basal Gubberamunda Sandstone as *Aequitriradites verrucosus*, the principal species used to define palynological unit J6 (Burger & Senior, 1979). Previously, *Cicatricosisporites* has not been recorded below the upper part of the overlying Orallo Formation and its appearance (primarily that of *C. australiensis*) has been used together with the appearances of several other species in the upper Orallo Formation - basal Mooga Sandstone to define the base of the *Murospora florida* Zone and the *C. australiensis* Subzone within it (Burger, 1973; Burger & Senior, 1979).

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