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WYOLA
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# DEPARTMENT OF MINES
# SOUTH AUSTRALIA

Pal. Rept. 6/72

GEOLOGICAL SURVEY
PALAEONTOLOGY SECTION

## MICROPALAEONTOLOGICAL REPORT ON SAMPLES FROM WYOLA 1:250 000 SHEET, EUCLA BASIN

by

J.M. LINDSAY

Assistant Senior Palaeontologist

Rept.Bk.No. 72/54

12th April, 1972.

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# MICROPALAEONTOLOGICAL REPORT ON SAMPLES FROM WYOLA 1:250 000 SHEET, EUCLA BASIN


## ABSTRACT

Two limestone samples from an area 80-105 km north of Cook, towards the northern margin of the Eucla Basin in South Australia, are identified as Nullarbor Limestone of ?late Lower and Middle Miocene age. The former, coarsely calcarenitic, has Marginopora and Austrotrillina; the latter, finely calcarenitic, has the Marginopora - Austrotrillina - Flosculinella association.


## INTRODUCTION

The only sample from WYOLA hitherto examined in the Palaeontology Section is F 48/66, 4/692/1, from Price, "Wyola Lakes", collected by J. Harrison. This was described by Ludbrook (1966) in the following terms: "Grey fine silty sandstone, micaceous, with abundant biotite and muscovite, fine quartz, tourmaline, chlorite, rare glauconite, feldspar, grey grains. There is no fossil evidence, but the lithology suggests Cretaceous age." Krieg (1970) did not map any Cretaceous units on WYOLA, but assigned apparently similar lithologies to Observatory Hill Beds, Middle - Upper Cambrian.

No samples of Tertiary units had been submitted previously from WYOLA for palaeontological examination, although Nullarbor Limestone was mapped over the southern third of WYOLA by Krieg (1970) from "photo-interpretation of aerial photographs and limited ground and helicopter reconnaissance."

Dr. H. Wopfner, Supervising Geologist, Petroleum Exploration Division, recently collected the two samples of limestone from WYOLA described herein and submitted them for identification and dating. Because of their tough and re-crystallized nature, the limestones were not crushed and washed for microfossils, but were examined microscopically on freshly-broken and moistened surfaces, which revealed many natural sections of identifiable foraminifera.

## DESCRIPTION OF SAMPLES

Sample F 85/72 (H.W. 420)

From WYOLA 1:250 000 Sheet, Chilbinga 1:63 360 Sheet, 13 km (8 ml) north of triangulation station NM/E/183, beside track from Cook to Wyola Lake, approx. 105 km (65 ml) north by west of Cook.

Bioclastic limestone; pale yellow, cream, pale red-brown; coarsely calcarenitic; considerably recrystallized, finely vuggy, with sparry calcite; quartz-bearing (very fine to coarse sand, silt); abundant foraminifera and common echinoid remains. Foraminifera include: Marginopora vertebralis Blainville (abundant); Austrotrillina howchini (Schlumberger) (rare), and other miliolids (Quinqueloculina, Triloculina, Sigmoilina, Pyrgo). This is Nullarbor Limestone.

M. vertebralis and A. howchini range concurrently from ~~early~~ Batesfordian to Bairnsdalian Australian Stages, i.e. late Lower to Middle Miocene. If the absence of Flosculinella bontangensis (Rutten) from this sample is stratigraphically significant (and not merely a facies effect) the age is narrowed down considerably to late Batesfordian Stage (cf. Lindsay, 1969), uppermost Te Letter Stage, late Lower Miocene (Adams, 1970).

Sample F 86/72 (H.W. 423)

WYOLA 1:250 000, Warldarie 1:63 360, 8 km (5 ml) south-southwest of triangulation station NM/E/183, beside track from Cook to Wyola Lake, approx. 80 km (50 ml) north-northwest of Cook.

Bioclastic limestone; pale grey, some darker grey-brown mottling; finely calcarenite; dense, considerably recrystallized; quartz-bearing (very fine to medium sand, silt); abundant foraminifera which include:

Marginopora vertebralis (common)
Austrotrillina howchini (frequent)
Flosculinella bontangensis (rare).

This is also Nullarbor Limestone.

The association of these three species (noted e.g. by Ludbrook, 1963) now suggests Balcombian Stage, near Orbulina datum (cf. Lindsay, 1969), and Lower Tf Letter Stage, Middle Miocene (Adams, 1970).

## CONCLUSIONS

1. Both samples are identified as Nullarbor Limestone.
2. Two lithological and microfaunal facies are represented by the two samples.

3. If the absence of Flosculinella bontangensis from F 85/72 is stratigraphically significant (and not merely a contemporaneous facies effect) it would suggest that F 85/72 is slightly older than F 86/72, viz. late Lower Miocene compared with Middle Miocene. The Nullarbor Limestone has been variously dated Lower Miocene (e.g. Ludbrook, 1963; Lowry, 1968), late Lower Miocene (Ludbrook, 1969), and late Lower to early Middle Miocene (Ludbrook, 1967). Present evidence supports the latter determination since the latest work by Adams (1970) now favours a Middle Miocene age (Orbulina Datum onwards) for Flosculinella bontangensis and for the upper part of the range of Austrotrillina howchini, in accord with the Lower/Middle Miocene boundary adopted by Blow (1969).

4. Further collection and palaeontological examination of fossiliferous rocks from WYOLA and other northern marginal areas of the Eucla Basin in South Australia is desirable

(i) to build up information on the stratigraphy and age of the Nullarbor Limestone,

(ii) to check whether the Colville Sandstone (Lowry, 1968) is present in South Australia as it is in Western Australia as a marginal lateral equivalent of the Nullarbor Limestone, and

(iii) to further document such marginal stratigraphic relationships as those described by Ludbrook (1961) from the Maralinga area.

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