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PALAEONTOLOGICAL EXAMINATION OF SAMPLES FROM DELHI-SANTOS MORNINGTON ISLAND NO.1 WELL, CARPENTARIA BASIN, QUEENSLAND.

by

G.R.J. Terpstra and P.R.Evans.

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CONTENTS

SUMMARY:

Micropalaeontological and palynological examinations of cores and cuttings from Delhi-Santos Mornington Island No.1 Well have been carried out to observe the distribution of microfossils in the Cretaceous of the well, situated in the Carpentaria Basin. Microfaunas of Lower Cretaceous aspect are present at depths below 450 feet. Cretaceous spores, pollens and microplankton were observed at 310 feet and below. Spores and pollens at 110 feet could be Mesozoic, but the sample is regarded for the present as Tertiary or Recent in age. Five divisions of the spore and microplankton sequence are tentatively made and correlated with A.A.O.8 (Karumba) - the nearest well on the mainland to Mornington Island - and Conorada Ooroonoo No.1. The correlate of the Winton Formation is marine at Mornington Island and contains micro-plankton that suggest the top of the section may be of Cenomanian age; this has not been encountered south of the Euroka Ridge.

FOREWORD:

Delhi Australian Petroleum Ltd. and Santos Limited drilled two exploratory wells on Mornington Island, in the Gulf of Carpentaria in 1961. Mornington Island No.1 Well was spudded in on 22nd May, 1961, and abandoned as a dry hole at 2764 feet in granite on 5th June, 1961 (Harrison, Greer & Gibson, 1961). Palaeontological examination of this well was undertaken by the authors in February 1962, the results of which are appended to the well completion report. The following notes are derived from those original reports. Where additional facts that affect certain aspects of interpretation are now available, attention is directed to the sources of that information in footnotes.

MICROPALAEONTOLOGICAL EXAMINATION BY G.R.J.TERPSTRA

Introduction:

Samples of cores 1 (450-460 feet) to 7 (2542-2552 feet) and of cuttings at intervals of about 50 feet between the depths of 10 and 2764 feet have been examined.

Dr.I.Crespin has helped in the identification of some of the species of foraminifera, especially those which will appear in her forthcoming paper on the Lower Cretaceous of Australia (Crespin, 1962): her assistance is gratefully acknowledged. The Ostracoda mentioned in the text were examined by P.J.Jones.

Faunal Descriptions:

The faunal contents of the samples examined are given below. Reference has been made to the composite log of the well completion report for the lithology of the cuttings. Plate 1 shows the distribution of the species in the cores and cuttings.

Cuttings 10-750 feet: No foraminifera.

Core 1. 450-460 feet:

Six samples from this core have been examined. They were taken from the following levels:

450 feet - Sandstone
Shell remains, fish teeth, ostracoda.

452 feet - Grey shale slightly carbonaceous

Haplophragmoides sp.A. Crespin M.S.1962
Lenticulina sp.
Lenticulina cf. australiensis Crespin 1953
Ostracoda sp.
Radiolaria sp.
Trochammina aff.depressa Lozo 1944
Verneuilinoides kansasensis Loeblich and Tappan 1950

454 feet - Grey shale

Haplophragmoides sp.
Haplophragmoides cf. dickinsoni Crespin 1953
Lenticulina cf. australiensis Crespin 1953
Robulus gunderbookaensis Crespin 1944
Verneuilinoides kansasensis Loeblich and Tappan 1950

456 feet - Grey shale

Haplophragmoides sp.A. Crespin M.S.1962
Ostracoda sp.
Saracenaria sp.
Trochammina sp.
Verneuilinoides kansasensis Loeblich and Tappan 1950

458 feet - Sandstone
No foraminifera

460 feet - Sandstone
No foraminifera

Cutting 650-660 feet
Few shell remains.

Cutting 800-810 feet
Cibicides sp.
Lagena sp.

Core No.2 929-939 feet

Three samples from this core have been examined. They were taken from the following levels:

929 feet - Grey shale
No foraminifera

933 feet - Grey shale
Globigerina planispira Tappan 1940
Neobulimina minima Tappan 1940

939 feet - Grey shale
Neobulimina minima Tappan 1940

Cutting 1050-1060 feet
Inoceramus prisms

Core No.3 1112-1122 feet

Three samples from this core have been examined. They were taken from the following levels:

1112 feet - Grey shale
Progonocythere cf. concentricum (Reuss)
Krithe sp.
Radiolaria sp.

1118 feet - Grey shale
Robulus sp.

1122 feet - Grey silty shale
Robulus sp.
Trochammina sp.

Cutting 1300-1310 feet
Ammobaculites sp.
Haplopragmoides sp.
Haplophragmoides sp.A Crespin M.S.1962
Trochammina minuta Crespin 1953
Verneuilinoides sp.

Cutting 1350-1360 feet

Ostracoda sp.
Trochammina sp.

Core No.4 1600-1610 feet

Three samples from this core have been examined. They were taken from the following levels:

1600 feet - Dark grey micaceous silty shale.

Globigerina planispira Tappan 1940
Trochammina sp.

1606 feet - Dark grey micaceous silty shale

Globigerina planispira Tappan 1940
Haplophragmoides sp.A. Crespin M.S.1962
Trochammina aff.depressa Lozo 1944
Shell remains

Cutting 1610 - 1620 feet

Dark grey silty shale
No foraminifera

Cutting 1800-1810 feet

Globigerina planispira Tappan 1940(Common)

Cutting 1850-1860 feet

Dictyomitra cf.australis Hinde
Globigerina planispira Tappan 1940(Common)
Textularia cf.anacooraensis Crespin 1953

Cutting 1900-1910 feet

Globigerina planispira Tappan 1940(Common)
Trochammina sp.

Core No.5 1913-1923 feet

Four samples from this core have been examined. They were taken from the following levels:

1913 feet - Grey shale

Globigerina planispira Tappan 1940
Miliammina sp.
Trochammina aff.depressa Lozo 1944
Fish teeth
Inoceramus prisms

1917 feet - Grey shale

Globigerina planispira Tappan 1940
Miliammina sp.
Trochammina sp.
Inoceramus prisms

1921 feet - Grey shale

Globigerina planispira Tappan 1940
Lenticulina sp.

1923 feet - Grey silty shale

Inoceramus prisms

Cutting 1950-1960 feet

Ammobaculites minimus Crespin 1953
Dictyomitra cf. australis Hinde
Globigerina planispira Tappan 1940
Trochammina aff.depressa Lozo 1944
Trochammina raggatti Crespin 1944
(juvenile spec.).

Cutting 2000-2010 feet

Ammobaculites sp.
Ammodiscus glabratus (Cushman & Jarvis 1928)
Globigerina planispira Tappan 1940
Trochammina sp.
Verneuilina howchina Crespin 1953.

Cutting 2050-2060 feet

Ammobaculites sp.
Ammobaculites fisheri Crespin 1953
Ammobaculites minimus Crespin 1953
Globigerina planispira Tappan 1940
Trochammina aff. depressa Lozo 1944
Verneuilina howchini Crespin 1953

Cutting 2100-2110 feet

Ammobaculites erectus sp.nov. Crespin M.S. 1962
Bathysiphon sp.
Globigerina planispira Tappan 1940
Haplophragmoides gigas Cushman 1927
Robulus sp.
Spiroplectammina edgelli Crespin 1953
Trochammina sp.

Cutting 2150-2160 feet

Ammobaculites minimus Crespin 1953
Epistomina australiensis Crespin 1953
Globigerina planispira Tappan 1940
Marginulina jonesi Reuss 1862
Pseudoglandulina sp.
Trochammina sp.

Cutting 2200-2210 feet

Ammobaculites minimus Crespin 1953
Ammodiscus glabratus (Cushman & Jarvis 1928)
Haplophragmoides gigas Cushman 1927
Trochammina sp.
Ostracoda sp.
Shell remains.

Cutting 2250-2260 feet

Ammobaculites fisheri Crespin 1953
Ammobaculites minimus Crespin 1953
Globigerina planispira Tappan 1940
Haplophragmoides sp.
Hyperammina sp.
Lenticulina sp.
Spiroplectammina sp.

Core No.6 2297-2307 feet

Two samples from this core have been examined. They were taken from the following levels:

2297 feet - Dark grey shale.

Ammobaculites erectus sp.nov. Crespin M.S. 1962
Ammobaculites fisheri Crespin 1953
Ammobaculites fragmentarius Cushman 1927
Ammobaculites irregulariformis Bartenstein & Brand 1951
Ammobaculites minimus Crespin 1953
Ammobaculites subcretaceous Cushman & Alexander 1930
Flabellammina alexanderi Cushman 1928
Haplophragmoides sp.
Haplophragmoides chapmani Crespin 1944
Haplophragmoides cushmani Leeblich & Tappan 1946
Haplophragmoides gigas Cushman 1927
Hyperammina sp.
Rhabdammina sp.
Reophax sp.
Reophas sp.B. Crespin M.S. 1962
Reophax deckeri Tappan 1940
Saccammina sp.
Saccammina alexanderi (Leeblich & Tappan)1950
Saccammina globosa sp.nov. Crespin M.S. 1962
Textularia cf. wilgunyaensis sp.nov. Crespin M.S. 1962
Trochammina sp.
Verneuilina howchini Crespin 1953
Verneuilineides asperulus sp.nov. Crespin 1962.

2299 feet - Dark grey shale.

Ammobaculites erectus sp.nov. Crespin M.S. 1962
Ammobaculites cf. exertus sp.nov. Crespin M.S. 1962
Ammobaculites fisheri Crespin 1953
Ammobaculites subcretaceous Cushman & Alexander 1930
Ammodiscus glabratus (Cushman & Jarvis) 1928
Bathysiphon sp.
Haplophragmoides gigas Cushman 1927
Hyperammina sp.
Miliammina sp.
Pelesina lagenoides Crespin 1953
Robulus gunderbookaensis (Crespin) 1944
Shell remains
Trochammina aff. depressa Lozo 1944
Verneuilina howchini Crespin 1953
Verneuilinoides asperulus sp.nov. Crespin M.S. 1962.

Cutting 2300 - 2310 feet

Ammobaculites sp.
Ammobaculites erectus sp.nov. Crespin M.S. 1962
Ammodiscus glabratus (Cushman & Jarvis) 1928

Epistomina australiensis Crespin 1953
Globulina lacrima (Reuss) cf.var canadensis Mellon & Wall 1956
Haplophragmoides sp.
Hyperammina sp.
Pelosina lagenoides Crespin 1953
Robulus sp.
Trochammina raggatti Crespin 1944

Cutting 2350-2360 feet

Ammobaculites sp.
Ammobaculites erectus sp.nov.Crespin
Ammodiscus glabratus (Cushman & Jarvis) 1928
Bathysiphon sp.
Globigerina planispira Tappan 1940
Spiroplectammina edgelli Crespin 1953
Trochammina sp.
Valvulineria infracretacea Crespin 1953

Cutting 2400-2410 feet

Ammobaculites minimus Crespin 1953
Epistomina australiensis Crespin 1953
Robulus gunderbookaensis (Crespin)1944
Trochammina aff.depressa Lozo 1944
Trochammina minuta Crespin 1953
Valvulineria infracretacea Crespin 1953

Cutting 2450-2460 feet

Ammobaculites sp.
Ammobaculites succintus sp.nov.Crespin M.S.1962
Verneuilina howchini Crespin 1953

Cutting 2500-2510 feet

Ammobaculites erectus sp.nov.Crespin M.S.1962
Ammobaculites minimus Crespin 1953
Globigerina planispira Tappan 1940
Spiroplectammina edgelli Crespin 1953
Trochammina sp.
Valvulineria infracretacea Crespin 1953
Verneuilinoides sp.

Core No.7 2542-2552 feet

Four samples from this core were examined. They were taken from the following levels:

2542 feet - Sandstone
No foraminifera

2546 feet - Shale and siltstone
Textularia cf.anacooraensis Crespin 1953
Trochammina sp.

2550 feet - Sandstone and shale
No foraminifera

2552 feet - Shale

Ammobaculites sp.
Miliammina sproulei Nauss var. gigantea Mellon & Wall 1956
Rheophax sp.
Textularia cf. anacooraensis Crespin 1953
Trochammina sp.
Verneuillinoides sp.

Cutting 2610-2620 feet

No foraminifera

Cutting 2650-2660 feet

No foraminifera

Cutting 2700-2710 feet

No foraminifera

Cutting 2760-2764 feet

No foraminifera

STRATIGRAPHY

The faunal content of the samples examined show clearly that the beds penetrated from 450 feet downwards are marine. Accepting the formation identifications by Harrison, Greer and Gibson (1961), it means that the lower part of the Winton Formation was deposited in a shallow marine environment. From a comparison with previous work, the majority of the species identified indicate a Lower Cretaceous age.

Selected cuttings from Mornington Island No.2 have been examined by **A.Lloyd.** Lower Cretaceous species occur in that well from 700 feet. The top of this occurrence compares with the highest appearance (450 feet) of such species in Mornington Island No.1, although this merely indicates a facies correlation. No other faunal correlation between the two wells is apparent from the present studies.

PALYNOLOGICAL EXAMINATION BY P.R.EVANS

Introduction:

A palynological examination of the Mesozoic of Delhi-Santos Mornington Island No.1 Well has been carried out to:

i) compare its fossil distribution with that in Conorada Ooroonoo No.1 well (Evans, 1961a) and thereby;

ii) estimate the relative age of the well section;

iii) determine the facies which it represents;

iv) compare the section with that encountered in A.A.O. 8 (Karumba), the nearest well on the mainland to Mornington Island.

Sixteen samples of cores and cuttings from Mornington Island No.1 and twenty from A.A.O. 8 (Karumba) were taken from the depths listed in Appendix 1 (p.13).

A complete record of all species has not been made, but attention was directed to those apparently key forms which have already been noted in Ooroonoo No.1 and other wells in the Great Artesian Basin. The distribution of these and certain assemblage components is illustrated in Plate 2 together with the resultant tentative correlations with A.A.O. 8 (Karumba) and Ooroonoo No.1.

Results:

The samples from Mornington Island No.1 may be divided (see Plate 2) on the following bases:

Cretaceous

1. Core 7 (2544 feet) contained abundant spores and microplankton including: (spores) Ischyosporites punctatus, Dictyotosporites speciosus, Cicatricosisporites cooksonii, (microplankton) Dingodinium cerviculum, Micrhystridium sp.1 Pterospermopsis sp.1

D. cerviculum and Micrhystridium sp.1 characterized a basal marine Cretaceous zone in Ooroonoo No.1 and were found also in A.A.O. 8 (Karumba) core 2 (2191 feet).

D. cerviculum was observed in cuttings below these cores in both Mornington Island No.1 and A.A.O. No.8 (Karumba), but the presence of probable cavings containing Odontochitina operculata (not yet identified in cores below the D. cerviculum horizon) prevents evaluation of their true age.(*)

2. Core 5 (1923 feet) to core 6 (2297 feet) contained few microfossils but abundant organic matter which was not removed by the standard processing technique. Rare Odontochitina operculata and Chlamydophorella nyei were identified in core 5.

Similar characteristics were observed between 1590 and 2100 feet in A.A.O. No.8 (Karumba). The equivalent horizon in Ooroonoo No.1 cannot be recognised with certainty: O. operculata was present in core 9 (1882-1892 feet), D. cerviculum in core 11 (228-2298 feet): the intervening core 10 (2086-2096 feet), which lacked both these species, but yielded an excess of organic debris, may therefore

(*) See relationship in St.Andrew's Bore, Julia Creek (Evans, 1962a).

represent the required section. Admittedly the presence of amorphous organic matter is a lithological rather than a palaeontological character but it appears consistently in the same stratigraphic position. A comparably nondescript horizon has been recognized above the D. cerviculum beds as far distant as Buckabie No.1 and Cabawin No.1 Wells (*).

3. 1510 to 1720 feet contained, in contrast to the underlying unit, abundant microfossils with common Diconodinium spp., incl. D. multispina, specimens of Micrhystridium sp. 2 and Odontochitina operculata. Pseudoceratium turneri was present at 1710 - 1720 feet.

No comparable abundance of Diconodinium was observed in A.A.O. 8 (Karumba) although a swarm of Gonyaulacidae, mainly Gonyaulax edwardsi was present at 1400 and 1450 feet and Micrhystridium sp. 2 was discovered at 1530 feet. O. operculata, P. turneri and a generally greater abundance of microplankton first appeared in core 9 (1882 - 1892 feet) in Ooroonoo No.1.

4. Core 2 (929 feet) to 1320 feet was marked by the continued presence of Cicatricosisporites cooksonii and a varying content of microplankton.

C. cooksonii was only seen as high as core 1 (1315-1318 feet) in A.A.O. 8 (Karumba) and core 5 (1038 - 1048 feet) in Ooroonoo No.1. The range of Callialasporites dampieri has a similar upper limit in Mornington Island No.1 to C. cooksonii and was present at 550 feet at Karumba.

5. 310 to 720 feet was typified by the presence of Trilobosporites trioreticulatus (overlapping the range of C. cooksonii in core 2, 929 feet), a steadily increasing abundance of "Polypodiaceaesporites" sp. and rare tetracolpate pollens (310 - 320 feet only). (+)

Similar features were observed within and above core 4 (836 - 846 feet) in Ooroonoo No.1, and at 550 feet in A.A.O. No.8 (Karumba) (less the angiosperm pollens).

Mornington Island No.1 differs from the other wells by the presence of microplankton such as Micrhystridium spp. Cyclonephelium sp., Pterospermopsis sp. 2 throughout this higher horizon. Gonyaulax sp. was very common in core 1 (450 - 460 feet), while Ascodinium parvum was present between 310 and 520 feet.
A. parvum was not detected in A.A.O. 8 (Karumba).

(*) Examined in greater detail in St. Andrew's Bore (loc.cit.)

(+) Angiospermous pollens have been recorded high in the Winton Formation in Phillip's - Sunray Cothalow No.1 Well (de Jersey & Paten, 1962).

While no specific comment is offered on the stages of the Cretaceous represented by these divisions of Mornington Island No.1, the presence in the highest division of the well of A.parvum, which was initially described from the Upper Gearle Siltstone of the Carnarvon Basin (Cookson & Eisenack, 1958) and has appeared briefly in the Waarre Formation of the Otway Basin (Evans, 1961b), seems to indicate that possibly the Cenomanian but nothing younger is represented. This would confirm by lateral correlation into the non-marine beds of the Winton Formation the estimate previously made for the age of that formation (Evans, 1961a) of part Albian, part Cenomanian.

(?) Tertiary - Recent

The cuttings from 110-120 feet contained very rare spores and pollens including Cyathidites australis, Gleicheniidites circinidites, Classopollis torosus, Podocarpidites grandis. A Cretaceous age could be suggested because the forms observed occur in the Mesozoic and apparently no angiosperm pollens were present. However, in view of the lithological evidence, it is probably better to regard the age of this horizon as Tertiary - Recent (Harrison, Greer & Gibson, 1961). If the spores are of Cretaceous origin they might have been reworked.

Relation of Palynological and Lithological Correlations

Although the formation names used by Harrison, Greer & Gibson (1961) in Mornington Island No.1 and for their correlations of well sections around the Carpentaria Basin do not include those previously applied by Laing (1960) to the same sequence, the company terminology is applied here to simplify discussion.

1. The Blythesdale Group of Mornington Island No.1 includes the Dingodinium cerviculum - Micrhystridium sp.1 beds and is thus marine in origin. It is not known whether these species range into the Roma Formation at Mornington Island although they were observed in that formation in A.A.O. 8 (Karumba) and in Ooroonoo No.1 where, as in all other wells examined in the Eromanga and Surat Basins, it was confined to the base of the Roma (or lower Wilgunya) Formation and has not been observed in the underlying Blythesdale Group. The

Blythesdale Group may, therefore, be somewhat younger at Mornington Island, but the plankton could be merely a reflection of marine facies and their presence a demonstration of the downward extension of the range of these zone fossils.

2. It was noted at Ooroonoo No.1 how Odontochitina operculata, which first appeared just below the Toolebuc Member of the Wilgunya Formation, marked an upper division of the marine beds. A similar relationship exists in Mornington Island No.1 and A.A.O. 8 (Karumba) with the "Fishscale Zone" and Kamileroi Limestone. Likewise the Toolebuc Member and the "Fishscale Zone" are related to a general increase in abundance in microplankton, although this increase is emphasized at Mornington Island and Karumba more than elsewhere. (*).

3. The tops of the ranges of Cicatricosisporites cooksonii and Callialasporites dampieri occurring conveniently close to the base of the Winton Formation on Ooroonoo No.1 denote the approximate time equivalent to this formation base at Mornington Island and Karumba. However, the uppermost stage of the Cretaceous thus defined in these wells is distinguishable at Mornington Island and Karumba by the presence of microplankton which have not been found at Ooroonoo or elsewhere in the Great Artesian Basin. A considerably greater marine microfossil content throughout these Cretaceous sections in the Carpentaria Basin seems to distinguish that basin from the Eromanga Basin to the south of the Euroka Ridge.

(*) Compare relative abundances in the St.Andrew's Bore.

APPENDIX 1.

a) Samples of Mornington Island No.1 were taken from:

			(+)
Cuttings	110 - 120	feet	MFP 1778
"	310 - 320	"	MFP 1779
Core 1	450 - 460	" (450 feet)	MFP 1780
Cuttings	510 - 520	"	MFP 1781
"	710 - 720	"	MFP 1782
Core 2	929 - 939	" (929 feet)	MFP 1783
" 3	1112 -1122	"(1112 feet)	MFP 1784
Cuttings	1310 -1320	"	MFP 1785
"	1510 -1520	"	MFP 1786
Core 4	1600 -1610	"(1604 feet)	MFP 1787
Cuttings	1710 -1720	"	MFP 1788
Core 5	1913 -1923	"(1923 feet)	MFP 1789
Cuttings	2110 -2120	"	MFP 1790
Core 6	2297 -2307	"(2297 feet)	MFP 1791
Core 7	2542 -2552	"(2544 feet)	MFP 1792
Cuttings	2710 -2720	"	MFP 1793

b) Samples of A.A.O. No.8 (Karumba) well were taken from:

Cuttings	360	feet	MFP 1339 +
"	550	"	MFP 1340
"	750	"	MFP 1341
"	950	"	MFP 1342
"	1150	"	MFP 1343
Core	1315 ft.7 in.-1318	feet	MFP 1344
Cuttings	1400	feet	MFP 1383
"	1450	"	MFP 1384
"	1530	"	MFP 1345
"	1590	"	MFP 1385
"	1670	"	MFP 1386
"	1750	"	MFP 1346
"	1810	"	MFP 1387
"	1850	"	MFP 1388
"	1950	"	MFP 1347
"	2000	""	MFP 1389
"	2100	"	MFP 1390
Core 2	2191	"	MFP 1348
Cuttings	2305	"	MFP 1349
"	2355	"	MFP 1350

(+) Registered sample numbers in B.M.R. palynological collection.

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PLATE I

MICROFOSSIL DISTRIBUTION: DELHI-SANTOS MORNINGTON ISLAND Nº 1

Formation	Sample
Wirton Formation 182-827	Core 1 450-460
	Cuttings 650-810
Tambo Formation 827 - 1854 "Fishscale Zone" 1795-1854	Core 2 929-939
	Cuttings 1050-1060
	Core 3 1112-1122
	Cuttings 1300-1360
	Core 4 1600-1610
	Cuttings 1610-1910
Roma Formation 1854 - 2524	Core 5 1913-1923
	Cuttings 1950-2260
	Core 6 2297-2299
	Cuttings 2300-2510
Blythesdale Group 2524-2725	Core 7 2542-2552
	Cuttings 2610-2764

Distribution of Species

Fossil Names

- Fish teeth
- Haplophragmoides sp. A.
- Lenticulina sp.
- Lenticulina cf. australiensis
- Ostracoda sp.
- Radiolaria sp.
- Trochammina aff. depressa
- Verneuilinoides kansasensis
- Haplophragmoides sp.
- Haplophragmoides cf. dickinsoni
- Robulus gunderbookaensis
- Saracenaria sp.
- Trochammina sp.
- Shell remains
- Cibicides sp.
- Lagena sp.
- Globigerina planispira
- Neobulimina minima
- Inoceramus prisms
- Robulus sp.
- Krithe sp.
- Progonocythere cf. concentricum
- Ammobaculites sp.
- Trochammina minuta
- Verneuilinoides sp.
- Dictyomitra cf. australis
- Textularia cf. anacooraensis
- Miliammina
- Ammobaculites minimus
- Trochammina raggatti
- Ammodiscus glabratus
- Verneuilina howchini
- Ammobaculites fisheri
- Ammobaculites erectus
- Bathysiphon sp.
- Haplophragmoides gigas
- Spiroplectammina edgelli
- Epistomina australiensis
- Marginulina jonesi
- Pseudoglandulina sp.
- Hyperammina sp.
- Spiroplectammina sp.
- Verneuilinoides asperulus
- Ammobaculites fragmentarius
- Ammobaculites irregulariformis
- Ammobaculites subcretaceous
- Flabellammina alexanderi
- Haplophragmoides chapmani
- Haplophragmoides cushmani
- Rhabdammina sp.
- Rheophax sp.
- Rheophax sp. B.
- Rheophax deckeri
- Saccammina sp.
- Saccammina alexanderi
- Saccammina globosa
- Textularia cf. wilgunyaensis
- Ammobaculites cf. exertus
- Pelosina lageniodes
- Globulina lacrima cf. var. canadensis
- Valvulineria infracretacea
- Ammobaculites succinctus
- Miliammina sproulei Nauss var. gigantea

Bureau of Mineral Resources, Geology and Geophysics. December, 1962.

To accompany Record Nº 1962/177

E 54/1/2
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PLATE 2

TENTATIVE PALYNOLOGICAL CORRELATION: CRETACEOUS OF MORNINGTON ISLAND-KARUMBA - OOROONOO

MORNINGTON ISLAND NO.1

A.A.O.8 (KARUMBA)

OOROONOO NO.1

DISTRIBUTION OF SELECTED SPECIES

DIVISIONS

5

4

3

2

1

Pilosisporites notensis
Lycopodiumsporites circumenus
Ischosporites punctatus
Dictyotosporites speciosus
Cicatricosisporites cooksonii
Calliadcsporites dampieri
Balmeisporites holodictyus
Cicatricosisporites australiensis
Trilobosporites triareticulatus
"Polypodiaceaesporites" sp.
TETRACOLPATE sp.

Dingodinium cerviculum
Micrhystridium sp.1
Pterospermopsis sp.1
Odontochitina operculata
Micrhystridium sp.2
Diconodinium spp.
Gonyaulax spp.
Ascodinium parvum
Pterospermopsis sp.2

WINTON FM.
827
1000
TAMBO FM. "Fishscale Zone"
1795
1854
2000
ROMA FM.
BLYTHE SANDSTONE
2524
2725
TD2764

RT 57

TERTIARY

marine

c.1
c.2
c.3
c.4
c.5
c.6
c.7

?

RT 20

129
1000
NORMANTON FM.
Kamileroi Lst.
1246
1300
BLACKDOWN FM.
Wrotham Park Sst.
2000
2279
2360
TD2364

c.1
c.2

non-marine

JURASSIC - CRETACEOUS

B A S E M E N T

RT 435

1000
1010
WINTON FM.
GUNYA FM.
Toolebuc Memb.
1805
1848
2000
2370
2460
LONGSIGHT SST.
"Transition Zone"
3000
3840
TD3852

c.1
c.2
c.3
c.4
c.5
c.6
c.7
c.8
c.9
c.10
c.11
c.12/13
c.14
c.15
c.16
c.17
c.18
c.19
c.20

REFERENCE

Mudstone
Shale
Siltstone
Sandstone
Conglomerate
Limestone
Igneous & Metamorphic

c Core
Cuttings

Fossil present
" common

To Accompany Record 1962/177

M/(S)/21