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Geological Survey of Victoria

PALYNOLOGICAL EXAMINATION OF GSV BORE
MYARING 2, OTWAY BASIN, VICTORIA

by V ARCHER

UNPUBLISHED REPORT 1986/51

COPIES

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Victoria**

INTRODUCTION

Nine core samples from GSV Myaring 2 were examined for palynological age determinations. The bore is located on the Casterton 1:100 000 map sheet at AMG Coordinates N5814162.1, E525988.2, and was completed in 1971.

There appears to be some discrepancy between the coring intervals recorded in the drillers report and actual core material labelled as Myaring 2 (Walker 1984). Cores which are assumed to be erroneous are not included in the palynological analysis.

The spore-pollen zonation scheme of Dettmann and Playford 1969 is used as a basis for the zone determinations. Dinoflagellate range data comes from various sources, including the dinoflagellate and spore-pollen zonation scheme of Partridge, Helby and Stover (unpublished).

The samples provided poor to good yields of palynomorph assemblages with generally good preservation. Samples identified as Late Cretaceous contain a low number of dinoflagellates, indicating a marginal marine or brackish environment. Species of green algae including Botryococcus braunii are recorded in some samples.

Reworked early Cretaceous species are frequent in the Late Cretaceous assemblages, with rare Permian species recorded from both the Late Cretaceous and Early Cretaceous assemblages. The presence of a taeniate disaccate species at 166.1 - 171.9m indicates that sediments of at least Stage 2 age (Permian) have been reworked.

Results

a Depth: 166.1 - 171.9m (545 - 564 ft)

Spore-pollen Zone: Middle T pachyexinus Zone to T lilliei Zone.

Age: Senonian; middle Coniacian to Campanian.

Comments: A high yield of spores and pollen and a low proportion of dinoflagellates was obtained from this interval. The presence of the dinoflagellate species C tripartita, D nelsonense and I cretacea are indicative of a middle Coniacian to Campanian age. Associated spores and pollen indicate that the assemblage ranges from the lower part of the T pachyexinus Zone (the presence of L ohaieniss) and may extend into the N senectus Zone, although the upper limit is confused by downhole contamination/cavings. Based on the dinoflagellate ranges, the assemblage would fall within the range mid Coniacian to Campanian.

b Depth: 228 - 229.2m (748 - 752 ft)

Spore-pollen Zone: C triplex Zone to lower T pachyexinus Zone.

Age: early Turonian to middle Coniacian.

Comments: The dinoflagellate assemblage differs from that at 166.1 - 171.9m, and mainly longer ranging species are recorded. The presence of C compactum restricts the younger limit to the Santonian. The presence of the spore C triplex indicates that the assemblage is no older than the C triplex Zone, and based on the absence of the younger dinoflagellate assemblage, a probable range is from the C triplex to lower T pachyexinus Zones.

c Depth: 296 - 297.2m (971 - 975 ft)

Spore-pollen Zone: C paradoxa Zone.

Age: Middle Albian.

Comments: A moderate yield of spores and pollen which indicate a C paradoxa Zone assemblage is present at this interval.

d Depth: 357.2 - 365.2m (1172 - 1198 ft)

Spore-pollen Zone: Middle T pachyexinus Zone to T lilliei Zone.

Age: Senonian; middle Coniacian to Campanian.

Comments: A similar assemblage of dinoflagellates to that at 166.1 - 171.9m occurs at this depth. Associated spore-pollen species indicate an assemblage representative of the T pachyexinus Zone, with no index fossils for the N senectus Zone being recorded. The range of Zones given is based on the ranges of the dinoflagellate species present.

e Depth: 418.2 - 424m (1372 - 1391 ft)

Spore-pollen Zone: middle T pachyexinus Zone to T lilliei Zone.

Age: Senonian, middle Coniacian to Campanian.

Comments: An assemblage of dinoflagellates similar to 166.1 - 171.9m and 357.2 - 365.2m was recorded from this interval. Downhole contamination/cavings are apparent in the assemblage, but the range of Zones indicated for the dinoflagellate species is middle Coniacian to Campanian.

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f Depth: 478.6 - 481.3m (1570 - 1579 ft)

Spore-pollen Zone: Upper A distocarinatus Zone.

Age: Late Cenomanian to ? early Turonian.

Comments: A low yield of palynomorphs was obtained from this interval, with the dinoflagellate species present suggesting a range from the Albian to Cenomanian, and spore-pollen species suggesting an older limit of the upper A distocarinatus Zone, based on the presence of Proteacidites spp.

g Depth: 601.8 - 603.1m (1974 - 1978 ft)

Spore-pollen Zone: C paradoxa Zone.

Age: Middle Albian.

Comments: An assemblage of spores and pollen indicative of the C paradoxa Zone were obtained from this interval, with the yield being low. Evidence of rare Tertiary contamination is present.

h Depth: 699.5 - 671.7m

Spore-pollen Zone: C paradoxa Zone to ? P pannosus Zone.

Age: Middle Albian to ? early Cenomanian.

Comments: Spores and pollen present at this interval suggest a range C paradoxa to ? P pannosus Zones, but there is evidence of down hole cavings/contamination in a greater degree than sample at 601.8 - 603.1m, making definition of the younger limit difficult. There are a number of Tricolpites spp. present which were not recorded at 601.8 - 603.1m. The presence of C cuniefornis may be an indication that the older limit of the assemblage is further restricted to the top of the C paradoxa Zone, although downhole contamination cannot be discounted. The range given is based on the range of C paradoxa.

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1 Depth: 703.7 - 704.6m

Spore-pollen Zone: C paradox Zone.

Age: Middle Albian.

Comments: A low yield of spores which indicate a C paradoxa Zone assemblage occur at this interval.

DISCUSSION

A summary of the results is as follows:

Depth (m)	Spore-pollen Zone
166.1 - 171.9 Zones.	Middle <u>T pachyexinus</u> - ? <u>T lilliei</u>
228 - 229.2	<u>C triplex</u> - lower <u>T pachyexinus</u> Zones.
296 - 297.2	<u>C paradoxa</u> Zone.
357.2 - 365.2	Middle <u>T pachyexinus</u> - ? <u>T lilliei</u> Zones.
418.2 - 424	"
478.6 - 481.3	Upper <u>A distocarinatus</u> Zone.
601.8 - 603.1	<u>C paradoxa</u> Zone.
699.5 - 671.7	<u>C paradoxa</u> Zone - ? <u>P pannosus</u> Zone.
703.7 - 704.6	<u>C paradoxa</u> Zone.

The palynological zone determinations appear to lend support to the theory that the lithological sequence in Myaring 2 may represent a thrust fault (G Holdgate, pers. comm.). There is an apparent repetition of the Late Cretaceous/Early Cretaceous sequence and the C paradoxa Zone determination made at 296 - 297.2m conforms with apparent Otway Group sediments as determined from the wireline log data. Downhole contamination/cavings make the zone identifications less precise, but there does not appear to be any evidence that the cores are out of sequence.

REFERENCES

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DETMANN, M. E. & PLAYFORD, G., 1969. Palynology of the Australian Cretaceous - a review; in Stratigraphy and Palaeontology: Essays in honour of Dorothy Hill (K.S.W Campbell Ed). A.N.U. Press, Canberra.

WALKER, G., 1984. Data on deep drilling by DME within the Casterton 1:100 000 map sheet. Geol. Surv. Vict. Unpub. Rept. 1984/34.

SPECIES LIST

Depth (m)

	166.1 - 171.9	228 - 229.2	296 - 297.2	357.2 - 365.2	418.2 - 424	478.6 - 481.3	601.8 - 603.1	699.5 - 671.7	703.7 - 704.6
Aequitriradites spinulosus				+					
A verrucosus			+						
Alisporites grandis			+	+					+
A similis			+	+			+	+	+
Amosopollis cruciformis	+	+	+	+	+	+			
Appendicisporites distocarinatus		RWC?							
Araucariacites australis				+					+
Australopollis obscurus	+			+	+				
Baculatisporites comaumensis						+			
Balmeisporites holodictyus	RWC	RWC			RWC		+	+	
B tridictyus	RWC								
Callialasporites dampieri						RWC			
Ceratosporites equalis									
Cicatricosisporites australensis			+	+	+			+	+
C cuneiformis								+	
C ludbrookii		+	+						
Classopollis classoides							+		+
C sp	+								+
Clavifera triplex	+	+		+	+				+
Contignisporites sp			+						
Coptospora paradoxa			+		RWC		+	+	+
Crybelosporites striatus			+		+			+	+
Cyathidites australis	+		+	+			+		
Cyathidites minor			+	+			+		
Dictyotosporites filiosus									+
cf Densiosporites vellatus					RWC				
Ericipites sp					+				
Foraminisporis asymmetricus			+					+	
Gambierina rudata			+		+				
Ginkgocycadophytus nitidus			+	+	+		+	+	
Gleicheniidites circinidites	+	+		+	+	+			
Haloragacidites harrisii	C			C	C		C		
Laevigatosporites ovatus				+		+			
L major		+			+				
Latrosporites amplus	+				+				
L ohaiensis	+				+				
Leptolepidites verrucatus			+						
Lygistepollenites florinii						+			
Lycopodiumsporties spp.		+					+	+	+
Microcachyridites antarctius	+			+		+	+	+	+
Neoraistrickia truncatus		+			+				
Nothofagidites emarcidus	C				C			C	
Osmundacidites wellmanii		+		+		+	+	+	+

	166.1 - 171.9	228 - 229.2	290 - 297.2	357.2 - 365.2	418.2 - 424	478.6 - 481.3	601.8 - 603.1	699.5 - 671.7	703.7 - 704.6
<i>Parasaccites gondwanensis</i>	RWP	RWP		RWP	RWP				
<i>Phimopollenites pannosus</i>					+	+		+	
<i>Phyllocladidites mawsonii</i>				+	+				
<i>Pilosisporites notensis</i>	RWC			RWC	RWC				
<i>Podocarpidites</i> spp.	+	+		+	+	+	+	+	+
<i>Podosporites microsaccatus</i>					+			+	
<i>Potoniesporites</i> sp.					RWP			RWP	
<i>Proteacidites</i> spp.	+				+	+			
<i>Stereisporites antiquasporites</i>			+						+
<i>S 'tripunctisporis'</i>				+					
cf. <i>Striatoableites</i> sp.	RWP								
cf. <i>Tricolpites gillii</i>	+				+				
<i>T pachyexinus</i>					+	+		C?	
<i>T</i> spp.					+	+		C?	
<i>Tricolporites</i> spp.		+							
<i>Triorites minor</i>					+				
<i>Trilites tuberculiformis</i>					+				
<i>Trilobosporites tribotrys</i>		RWC							
<i>Triporoletes radiatus</i>				+					
<i>T reticulatus</i>			+	+					+
<i>T simplex</i>				+					
cf. <i>Velosisporites triquetrus</i>							+		
ALGAE									
<i>Botryococcus braunii</i>				+	+				
<i>Palambages</i> spp.	+			+	+			+	
<i>Schizosporis</i> spp.	+			+	+	+			
DINOFLAGELLATES									
<i>Canningia rotundata</i>					+	+			
<i>Chatangiella tripartita</i>	+			+					
<i>Cleistosphaeridium ancoriferum</i>		+							
<i>C</i> sp.					+				
<i>Cyclonephelium compactum</i>		+							
<i>C distinctum</i>				+	+				
<i>Dinogymnium nelsonense</i>	+			+	+				
<i>Heterosphaeridium heteracanthum</i>	+			+	+				
<i>Hystrichosphaeridium</i> sp.		+		+	+				
<i>Isabelidinium acuminata</i>				+	+				
<i>I cretaceum</i>	+				+				

	166.1 - 171.9								
		228 - 229.2							
			296 - 297.2						
				357.2 - 365.2					
					418.2 - 424				
						478.6 - 481.3			
							601.8 - 603.1		
								699.5 - 671.7	
									703.7 - 704.6
I korojonense				+	+				
Leberidocysta chlamydata				+	+				
Nelsoniella tuberculata									
Odontochitina operculata		+							
O sp.									
Spiniferites ramosus		+							
S sp.									
Wallodinium sp.									

Definitions

RWP: Reworked Permian

RWC: Reworked Early Cretaceous

C: Contamination/cavings