GIPPSLAND BASIN.

PALYNOLOGY REPORT

CRETACEOUS SEDIMENTS IN EMPEROR NO. 1

by

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SUMMARY

Palynology of Emperor No.1, 5980-6466 ft:

5980 ft	Tricolporites lillei Zone; Late Cretaceous, late Campanian -Maastrichtian; non-marine.
6030-6108 ft	Clavifera triplex Zone; Late Cretaceous, Turonian-Coniacian, non-marine.
6311 ft	Sparse assemblage, zone not determined; probably Early Cretaceous with significant recycling from the Triassic.
6403-6446 ft	Cyclosporites hughesii Subzone, upper unit; Early Cretaceous, Barremian-Aptian; non-marine with some recycling from the Triassic,

These data indicate that the Latrobe Valley Group extends down to at least 6108 ft; an hiatus, representing the time interval Coniacian-late Campanian occurs within the group between 5980 ft and 6030 ft. The underlying Strzelecki Group was encountered between 6403 ft and 6446 ft and sediments at 6311 ft may also be within that group. An hiatus of Aptian-Tutonian duration intervenes between the Latrobe Valley and Strzelecki Groups.

INTRODUCTION

Palynofloras from six sidewall cores between 5980 ft and 6446 ft in Emperor No.1, offshore Gippsland Basin, have been investigated to determine age relationships of the sequence and to assess whether one or more hiatuses occur within the Latrobe valley Group and the underlying Strzelecki-like facies.

Palynological zonation of the Late Cretaceous is in terms of the integrated Dettmann & Playford (1969) and Stover & Evans (1973) schemes (Fig. 1); for the Early Cretaceous, Dettmann & Douglas' (1976) zonation is used (Fig. 2). The latter was founded for the Otway Basin, but is equally applicable to the Gippsland Basin sequence. Species identified and their distribution within the sequence are tabulated in Table 1.

DISCUSSION

From slides and residues provided, palynological contents of samples are discussed in ascending stratigraphic order. Neither kerogen typing nor thermal maturation assessments were attempted since the residues have been subjected to oxidising reagents which renders dispersed organic matter unsuitable for meaningful kerogen/maturation analyses.

6446 ft, 6403 ft

The two samples yielded 'mixed' Early Cretaceous/Triassic assemblages and the interpretation presented here assumes Triassic recycling into the Early Cretaceous; species restricted to the Late Cretaceous or younger sediments were not observed. Amongst the Early Cretaceous taxa, Dictyotosporites speciosus, Cyclosporites hughesii, and Foraminisporis asymmetricus, all occurring in the upper sample, accord reference to the upper unit of the Cyclosporites hughesii Subzone (see Fig. 2). Accordingly, the sediments are interpreted to be within the Strzelecki Group and are of Barremian-Aptian age. The lower sample contains F. asymmetricus that likewise indicates an age no older than Barremian-Aptian within the C. hughesii Subzone upper unit.

The presence of occasional Late Triassic palynomorphs indicates that source sediments include erosion products of Late Triassic sequences, the nearest known outcrops and subcrops of which occur to the south, in Tasmania.

The occurrence of algal microfossils (leiosphaerids) of prasinophycean affinity indicates deposition in a land-based, possibly fluvial environment.

6311 ft

The sparse assemblage contains more common Triassic taxa together with Cretaceous species. The majority of the latter are long ranging within the Early and mid Cretaceous, but the assemblage is more consistent with those of Early

Cretaceous age. Leiosphaerids occur infrequently and desposition in a terrestrial situation is indicated with source sediments derived, at least in part, from Triassic strata.

6030 ft, 6108 ft

Both samples contain moderately diverse assemblages. The presence in each of Phyllocladidites mawsonii, Triorites minor and Clavifera triplex confirm attribution to the Clavifera triplex Zone of Turonian-Coniacian age (Fig. 1). The section is thus younger than as determined previously by Esso (Appendicisporites distocarinatus Zone, Cenomanian) and is equivalent in age to subcrops of the Latrobe Valley Group in deeper areas of the basin.

Rare Permian remanié palynomorphs, frequent leiosphaerids and occasional fungal spores occur in the assemblages. Deposition of the rainforest detritus in a non-marine situation with at least some source sediments derived from Permian sediments is indicated.

5980 ft

A varied assemblage of spores and pollen amongst which indices of the Tricolporites lillei Zone occur, is represented in the residue from 5980 ft. A latest Cretaceous, Campanian-Maastrichtian, age is indicated. Occasional Botryococcus and an abundance of land plant material indicates deposition in a non-marine swamp environment.

CONCLUSIONS

Palynofloras represented in sediments between 5980 ft and 6446 ft indicate that:

1) the section between 5980 ft to at least 6108 ft is equivalent in age to the Latrobe Valley Group.

2) an hiatus exists within this section between 5980 ft and 6030 ft, intervening between the T. lillei (5980 ft) and C. triplex (6030-6108 ft) Zones. This hiatus represents the time interval Coniacian to at least Campanian occupied by the Tricolpites pachyexinus and Nothofagidites senectus Zones (see Fig. 1).

3) providing all palynomorphs in assemblages at 6403 ft and 6446 ft are not recycled, the enclosing sediments are within the upper part of the C. hughesii Subzone (Barremian-Aptian) and hence equivalents of the Strzelecki Group. If this is true, then an hiatus occurs within the section between 6108 ft and 6430 ft. This hiatus is of Aptian to Turonian duration.

4) the sample from 6311 ft is possibly of Early Cretaceous (Barremian-Aptian) age, but may be as young as the Turonian. Source sediments of this and the underlying Strzelecki Group samples include erosion products of Triassic sequences.

REFERENCES

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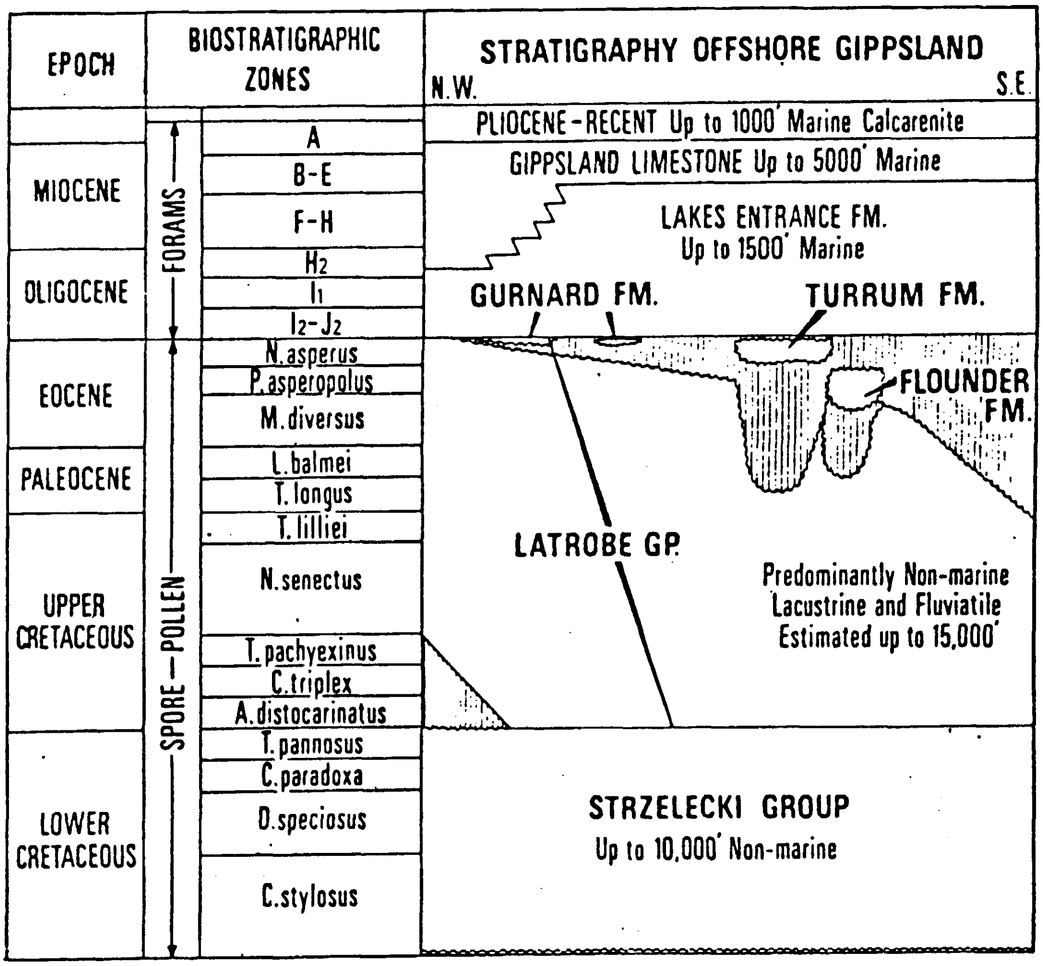
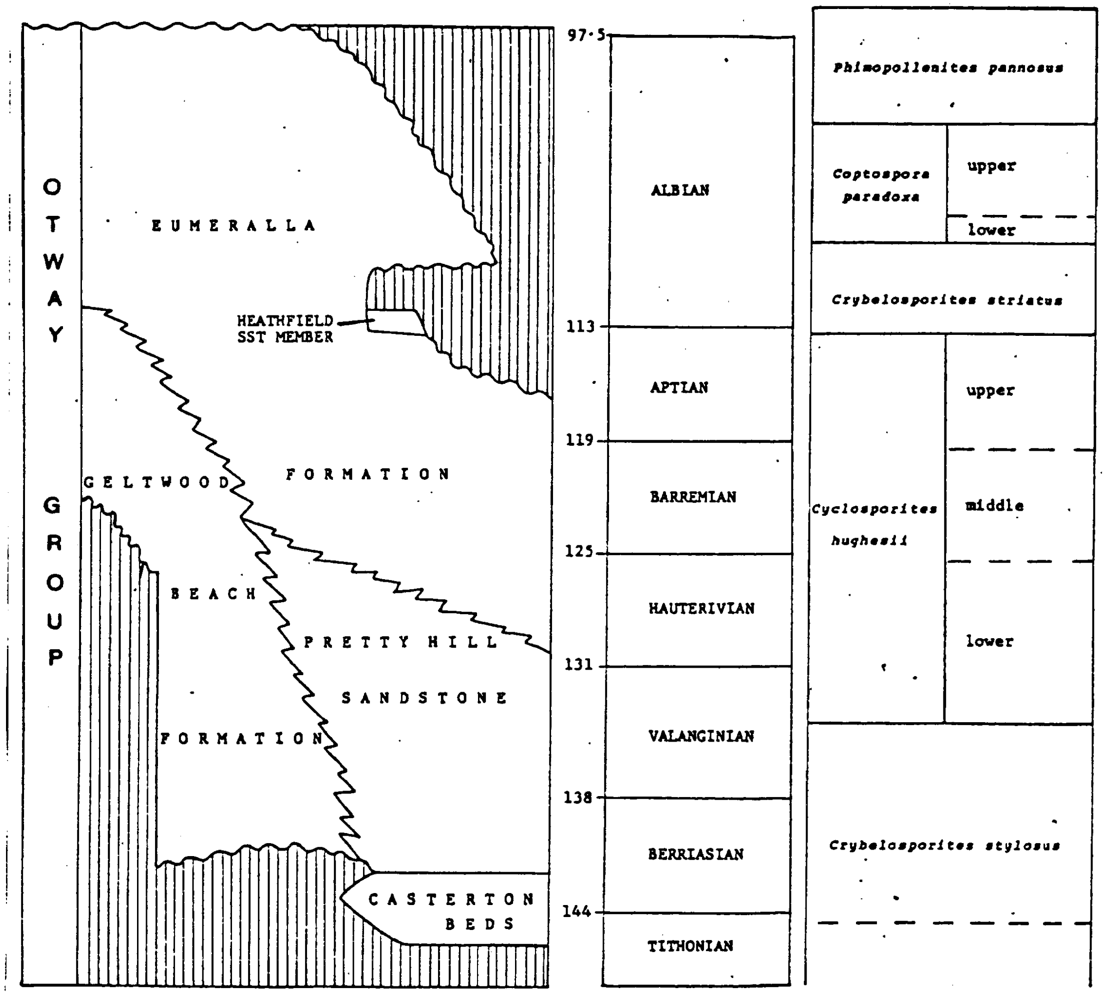


after Stover & Evans (1973)

FIG. 1. Lithostratigraphic/biostratigraphic relationships, Cretaceous-Tertiary, Gippsland Basin.



adapted and updated from Dettmann & Douglas (1976)

FIG. 2. Lithostratigraphic/biostratigraphic relationships, Early Cretaceous, Otway Basin.

TABLE 1 PALYNOMORPH DISTRIBUTION

COMPANY: LASMO ENERGY AUSTRALIA LTD. Sheet No. 1 of 3

WELL: ESSO EMPEROR NO. 1 BASIN: GIPPSLAND

Sample type	S	S	S	S	S	S
Palynomorph / Depth	6446 ft	6403 ft	6311 ft	6108 ft	6030 ft	5980 ft
CRYPTOGAM SPORES:						
Cicatricosisporites australiensis	x	x	x			
Lycopodiumsporites austroclavatidites	x	x	x		x	x
Foraminisporis asymmetricus	x	x	x	x		
Cyathidites australis/minor	x	x	x	x	x	x
Baculatisporites comaumensis	x	x	x	x	x	
Neoraistrickia truncata	x		x		x	
Stereisporites antiquasporites	x	x	x	x	x	x
Leptolepidites verrucatus		x	x			
Ceratosporites equalis		x			x	
Leptolepidites major		x				
Cyclosporites hughesii		x				
Dictyotosporites speciosus		x				
Lycopodiumsporites reticulumsporites		x				
L. eminulus		x		x		
Dictyophyllidites crenatus		x		x		
Aequitriradites spinulosus		x				
Reticulatisporites pudens		x				
Matonisporites cooksoniae		x				
Lycopodiumsporites facetus		x				
Foraminisporis wonthaggiensis		x		x	x	
Gleicheniidites circinidites			x	x	x	
Lycopodiumsporites circolumenus			x			
Laevigatosporites ovatus				x	x	x
Concavissimisporites sp.				x		
Perotrilites laceratus				x	x	
Lycopodiacidites sp.					x	
Clavifera triplex				x	x	
Foveogleicheniidites confossus					x	
Densoisporites velatus					x	
Laevigatosporites major						x
Camarazonosporites amplus						x
Verrucatosporites speciosus						x

Sample type: S = Sidewall core; C = Conventional core; D = Ditch cuttings.

TABLE 1 PALYNOMORPH DISTRIBUTION

COMPANY: LASMO ENERGY AUSTRALIA LTD.

Sheet No. 2 of 3

WELL: ESSO EMPEROR NO. 1 BASIN: GIPPSLAND

Sample type	S	S	S	S	S	S
Palynomorph / Depth	6446 ft	6403 ft	6311 ft	6108 ft	6030 ft	5980 ft
GYMNOSPERMOUS POLLEN:						
Araucariacites australis	x	x	x	x	x	x
Alisporites grandis	x	x	x			
Podocarpidites ellipticus	x	x	x	x	x	x
Microcachryidites antarcticus	x	x	x	x	x	x
Alisporites similis		x	x			
Cycadopites nitidus		x	x	x		x
Classopollis classoides			x			
Phyllocladidites mawsonii				x	x	x
Vitreisporites pallidus					x	
Hoegisporis sp.					x	
Trisaccites micropterus						x
Lygistepollenites florinii						x
L. balmei						x
Phyllocladidites verrucatus						x
ANGIOSPERMOUS POLLEN:						
Tricolpites spp.				x	x	
Nyssapollenites cf. lanosus				x		
Phimopollenites pannosus					x	
Australopollis sp.					x	
Triorites minor				x	x	
Nothofagidites senectus						x
N. endurus						x
Tricolpites gillii						x
Triporopollenites sectilis						x
Gambierina edwardsii						x
Cranwellipollis subpalisadus						x
C. palisadus						x
Tricolporites lillei						x
ALGAL MICROFOSSILS:						
Leiosphaeridiae spp.	x	x	x		x	
Amosopollis cruciformis					x	
Botryococcus sp.						x

Sample type: S = Sidewall core; C = Conventional core; D = Ditch cuttings.

TABLE 1 PALYNOMORPH DISTRIBUTION

COMPANY: LASMO ENERGY AUSTRALIA LTD. Sheeet No. 3 of 3

WELL: ESSO EMPEROR No. 1 BASIN: GIPPSLAND

Sample type	S	S	S	S	S	S
Palynomorph \ Depth	6446 ft	6403 ft	6311 ft	6108 ft	6030 ft	5980 ft
PERMIAN & TRIASSIC REMANIE:						
Lundbladisporites denmeadii	x					
Duplexisporites gyratus		x				
Aratrisporites flexibilis		x	x			
Aratrisporites spp.		x	x			
Neoraistrickia taylorii		x	x			
Punctatosporites walkomii		x	x			
Striatites spp.		x	x			
Rogalskaisporites spp.			x			
Pseudoreticulatisporites pseudoreticulatus					x	

Sample type: S = Sidewall core; C = Conventional core; D = Ditch cuttings.