

PALYNOLOGY OF TASMANIAN MINES DEPARTMENT SUB-BASALT DRILLING PROGRAMME
HOLE-1

BY

ROGER MORGAN (CONSULTANT)

INTRODUCTION

Three samples were submitted by Peter Baillie for age dating. The first two (274.2m and 276.0m) were grey shale from shale interbeds between basalts but the deepest (308.5m) was an orange sand filling a cavern within the Ordovician Gordon Limestone.

The zonation used is that of Stover and Partridge (1973) and Stover and Evans (1973) as modified by Partridge (1976) and shown in Figure 1. Raw data is given in an Appendix.

PALYNOSTRATIGRAPHY

: 274.2m (CORE)-276.0m (CORE) : upper N. asperus Zone : latest Eocene-earliest Oligocene : non-marine lacustrine : immature

These two samples are dominated by trilete spores with Cyathidites spp. and Ischyosporites gremius very common, and Nothofagidites spp. frequent but subordinate. Abundant leaf debris was seen in both samples. Pollen and spore diversity is low, and these samples are assigned to the upper Nothofagidites asperus Zone by containing Periporopollenites vesicus and common Nothofagidites spp. without older or younger indicators. The upper N. asperus Zone spans the Eocene-Oligocene boundary and is of latest Eocene to earliest Oligocene age.

MM YEARS	EPOCH	SERIES	PLANKTONIC FORAMINIFERAL ZONATIONS			PALYNOLOGICAL ZONATIONS		
			CENOZOIC AFTER STAINFORTH et. al. 1975		BLOW, 1969 BERGGREN, 1971	BASS STRAIT TAYLOR 1966	DINOFLAGELLATE ASSEMBLAGE ZONES	SPORE - POLLEN ASSEMBLAGE ZONES
			CRETACEOUS AFTER VAN HINTE 1972					
35	OLIGOCENE	EARLY	<i>Cassigerinella chipolensis</i>	P.19	J.1	<i>Operculodinium</i> spp.	PROTEACIDITES TUBERCULATUS	
			<i>Pseudohastigerina mica</i>	P.18				J.2
40	EOCENE	LATE	<i>Globorotalia cerroazulensis</i> (sensu lato)	P.17	K	<i>Phthanoperidinium coreoides</i>	UPPER NOTHOFAGIDITES ASPERUS	
			<i>Globigerinatheka semiinvoluta</i>	P.16				
45		MIDDLE	<i>Truncorotaloides rohi</i>	P.14		<i>Deflandrea heterophylcta</i>	NOTHOFAGIDITES GONIATUS	MIDDLE NOTHOFAGIDITES ASPERUS
			<i>Orbulinoides beckmanni</i>	P.13				
	<i>Globorotalia lehneri</i>		P.12					
	<i>Globigerinatheka subconglobata</i>		P.11					
50	EARLY	<i>Hantkenina aragonensis</i>	P.10	(<i>Wetziella echinosuturata</i>)	NOTHOFAGIDITES GONIATUS	LOWER NOTHOFAGIDITES ASPERUS		
		<i>Globorotalia pentacamerata</i>	P.9	<i>Wetziella edwardsii</i>				
		<i>Globorotalia aragonensis</i>	P.8	<i>Wetziella thompsonae</i>				
		<i>Globorotalia formosa formosa</i>	P.7	<i>Wetziella ornata</i>				
55	LATE	<i>Globorotalia subbotinae</i>	b.	<i>Wetziella waipawaensis</i>	NOTHOFAGIDITES GONIATUS	UPPER MALVACIPOLLIS DIVERSUS		
		<i>Globorotalia velascoensis</i>	P.6	<i>Wetziella hyperacantha</i>				
		<i>Globorotalia pseudomenardii</i>	a.	<i>Wetziella homomorpha</i>				
		<i>Globorotalia pseudomenardii</i>	P.5	<i>Wetziella homomorpha</i>				
60	MIDDLE	<i>Globorotalia pusilla pusilla</i>	P.3	<i>Eisenackia crassitabulata</i>	NOTHOFAGIDITES GONIATUS	UPPER LYGISTEPOLLENITES BALMEI		
		<i>Globorotalia angulata</i>	P.2	<i>Eisenackia crassitabulata</i>				
		<i>Globorotalia uncinata</i>		<i>Eisenackia crassitabulata</i>				
		<i>Globorotalia trinidadensis</i>	P.1	<i>Trithyrodinium evittii</i>				
<i>Globorotalia pseudobulloides</i>	<i>Trithyrodinium evittii</i>							
65	LATE CRETACEOUS	MAASTRICHTIAN	<i>Globotruncanella mayaroensis</i>	c.	a.	<i>Deflandrea druggii</i>	TRICOLPITES LONGUS	
			<i>Globotruncana contusa</i>					
		<i>Globotruncana stuarti</i>						
		<i>Globotruncana gansseri</i>						
70	EARLY	<i>Globotruncana scutilla</i>	b.	a.	BASE OF DINOFLAGELLATE SEQUENCE	TRICOLPORITES LILLIEI		
		<i>Globotruncana calcarata</i>						
		<i>Globotruncana subspinosa</i>						
		<i>Globotruncana stuartiformis</i>						

Figure 1 Zonation Framework (from Partridge 1976)

Lacustrine environments are indicated by the presence of the non-marine dinoflagellate Saeptodinium tasmaniense (common at 276.0m) and the freshwater alga Botryococcus. S. tasmaniense was described from mudstones interbedded with basalts near Mt. Bischoff in northwestern Tasmania by Harris (1973).

Pale yellow spore colours indicate immaturity for hydrocarbon generation despite the proximity of the samples to basalts.

: 308.5m (CORE) : barren and therefore indeterminate

The orange colour of this sample is consistent with the fact that no organic matter was recovered. The sediment age can therefore not be determined.

CONCLUSIONS

The section overlying the Gordon Limestone is of latest Eocene to earliest Oligocene age and was probably deposited in or near freshwater lakes during a period of intermittent basalt lava flows. Deposition on mainland Tasmania is consistent with high standing sea levels of the time.

REFERENCES

- Harris, W.K. (1973) Tertiary non-marine dinoflagellate cyst assemblages from Australia Spec. Publ. geol. Soc. Austr., 4, 159-166
- Partridge, A.D. (1976) The geological expression of eustasy in the early Tertiary of the Gippsland Basin Aust. Pet. Explor. Assoc. J., 16 : 73-79
- Stover, L.E. and Evans, P.R. (1973) Upper Cretaceous-Eocene spore-pollen zonation, offshore Gippsland Basin, Australia. Spec. Publ. geol. Soc. Austr. 4 : 55-72

Stover, L.E. and Partridge, A.D. (1973) Tertiary and Late Cretaceous
spores and pollen from the Gippsland Basin, South-eastern
Australia Proc. R. Soc. Vict., 86 : 237-286

R Morgan.

Roger Morgan.

4th April, 1987.

TASDM SBDF#1

DESCRIPTION:

ALL DEPTHS IN METRES

CHECKLIST OF GRAPHIC ABUNDANCE BY LOWEST APPEARANCE

-  = Abundant
-  = Common
-  = Few
-  = Rare
-  = Very Rare
- ? = Questionably Present
- . = Not Present

Depth (m)	Species	Abundance
274.2 CORE	#SAEPTODINIUM TASMANIENSE*	
276.0 CORE	#BOTYOCOCOCUS*	
308.5 CORE	CYATHIDITES AUSTRALIS	
	DACRYCARPITES AUSTRALIENSIS	
	DICTYOPHYLLIDITES SPP.	
	DILWYNITES GRANULATUS	
	DILWYNITES TUBERCULATUS	
	FOVEOTRILETES BALTEUS	
	HALORAGACIDITES HARRISII	
	ISCHYOSPORITES GREMIUS	
	LAEVIGATOSPORITES	
	LYGISTEPOLLENITES FLORINII	
	MATONISPORITES ORNAMENTALIS	
	NOTHOFAGUS ASPERUS	
	NOTHOFAGUS BRACHYSPINULOSUS	
	NOTHOFAGUS EMARCIDUS/HETERUS	
	NOTHOFAGUS FLEMINGII	
	PERIPOROPOLLENITES VESICUS	
	PHYLLOCLADIDITES MAWSONII	
	STEREISPORITES ANTIQUISPORITES	
	VERRUCATOSPORITES SP.	
	VERRUCOSISPORITES CF. CRISTATUS	
	VERRUCOSISPORITES KOPUKUENSIS	
	MATONISPORITES ORNAMENTALIS CF	
	MICROFOVEOSPORITES	
	NOTHOFAGUS DEMINUTUS	
	PROTEACIDITES SPP.	
	RUGULATISPORITES MICRAULAXUS	

SPECIES LOCATION INDEX

Index numbers are the columns in which species appear.

INDEX NUMBER	SPECIES
1	#SAEPTODINIUM TASMANIENSE*
2	*BOTYOCOCCUS*
3	CYATHIDITES AUSTRALIS
4	DACRYCARPITES AUSTRALIENSIS
5	DICTYOPHYLLIDITES SPP.
6	DILWYNITES GRANULATUS
7	DILWYNITES TUBERCULATUS
8	FOVEOTRILETES BALTEUS
9	HALORAGACIDITES HARRISII
10	ISCHYOSPORITES GREMIUS
11	LAEVIGATOSPORITES
12	LYGISTEPOLLENITES FLORINII
13	MATONISPORITES ORNAMENTALIS
24	MATONISPORITES ORNAMENTALIS CF
25	MICROFOVEOSPORITES
14	NOTHOFAGUS ASPERUS
15	NOTHOFAGUS BRACHYSPINULOSUS
26	NOTHOFAGUS DEMINUTUS
16	NOTHOFAGUS EMARCIDUS/HETERUS
17	NOTHOFAGUS FLEMINGII
18	PERIFOROPOLLENITES VESICUS
19	PHYLLOCLADIDITES MAWSONII
27	PROTEACIDITES SPP.
28	RUGULATISPORITES MICRAULAXUS
20	STEREISPORITES ANTIQUISPORITES
21	VERRUCATOSPORITES SP.
22	VERRUCOSISPORITES CF. CRISTATUS
23	VERRUCOSISPORITES KOPUKUENSIS