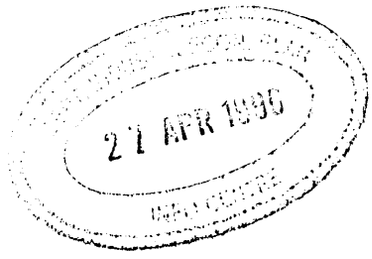

PALYNOLOGY OF FOUR OUTCROP SAMPLES, OTWAY BASIN, VICTORIA

By:

ROGER MORGAN

UNPUBLISHED REPORT 1990/4

INTRODUCTION

Four samples were submitted by S Tickell of the Basin Studies Section to Roger Morgan for palynological examination.

Sample A is from a coastal cliff located above the first point northwest of Rotten Point. It is a brown carbonaceous clay containing forams visible to the naked eye and plant fragments. The underlying beds are clean sand and a pebble bed belonging to the Rotten Point Sand. The sample itself is probably the basal portion of the Johanna River Sand. It has been incorrectly assigned to the Rotten Point Sand in this report.

Sample B is Johanna River Sand from a coastal cliff at Castle Cove. It is a brown carbonaceous clayey sand which directly overlies the Eumeralla Formation.

Sample C is from a road cutting on the Great Ocean Road. It is a pale brown, slightly carbonaceous clay which is in the form of thin lenses in a sequence of predominantly clean sands at the base of the Tertiary sequence.

Sample D is a brown carbonaceous clay containing leaf impressions. It occurs at the base of a coastal cliff at Sentinel Rock.

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I INTRODUCTION

Steven Tickell of the DITR submitted four outcrop samples from the Otway Basin for palynology. The raw data is presented as Appendix I and allows assignment of the samples to the palynological zones. The zonation is that of Partridge (1976) and is shown on figure 1.

	AGE		SPORE - POLLEN ZONES	DINOFLAGELLATE ZONES
Early Tertiary	Early Oligocene		P. tuberculatus	
	Late Eocene		upper N. asperus	P. comatum
			middle N. asperus	V. extensa
	Middle Eocene		lower N. asperus	D. heterophlycta
				W. echinosuturata
	Early Eocene		P. asperopolus	W. edwardsii
				W. thompsonae
			upper M. diversus	W. ornata
				W. waipawaensis
			middle M. diversus	
			lower M. diversus	W. hyperacantha
	Paleocene		upper L. balmei	A. homomorpha
			lower L. balmei	E. crassitabulata
				T. evittii
Late Cretaceous	Maastrichtian		T. longus	M. druggii
	Campanian		T. illiei	I.korojonense
			N. senectus	X. australis
	Santonian		T. pachyexinus	N. aceras
				I. cretaceum
				O. porifera
	Coniacian		C. triplex	
	Turonian			C. striatoconus
	Cenomanian		A. distocarinatus	P. infusorioides
Early Cretaceous	Albian	Late	P. pannosus	
		Middle	upper C. paradoxa	
			lower C. paradoxa	
		Early	C. striatus	
	Aptian		upper C. hughesi	
			lower C. hughesi	
	Barremian		F. wonthaggiensis	
	Hauterivian			
	Valanginian		upper C. australiensis	
	Berriasian		lower C. australiensis	
Juras.	Tithonian		R. watherooensis	

FIGURE 1 ZONATION FRAMEWORK

II DISCUSSION

A "Rotten Point Sand" YC 083053

The sample is dominated by abundant and diverse spores and pollen. Haloragacidites harrisii is dominant, with common Proteacidites and frequent Nothofagidites flemingii. Assignment to the upper Malvacipollis diversus Zone is indicated at the base by oldest Myrtaceidites tenuis and at the top by youngest M. tenuis, Periporopollenites demarcatus and Proteacidites ornatus without P. asperopolus. Other age significant taxa include Anacolosidites acutullus, Intratriporopollenites notabilis, Malvacipollis diversus, Spinizonocolpites prominatus and Triporopollenites ambiguus.

The only dinoflagellate seen was extremely rare Cordosphaeridium inodes, suggesting a marginally marine environment.

These features are normally seen in the Johanna River Sand, not the usually Paleocene Rotten Point Sand.

B Johanna River Sand YC 108044

This sample contains abundant and diverse spores and pollen with rare very low diversity dinoflagellates. Nothofagidites spp dominate the assemblage with subordinate Cyathidites. Assignment to the lower N. asperus Zone is indicated at the base by dominant Nothofagidites especially N. falcatus and N. deminutus, and at the top on youngest Proteacidites reticulatus. Other age significant taxa include Proteacidites asperopolus, P. pachypolus, Santalumidites cainozoicus and Triporopollenites ambiguus. Cretaceous reworking is minor.

Amongst the dinoflagellates, rare Deflandrea heterophlycta and Corrudinium incompositum indicate the correlative D. heterophlycta Zone.

Dinoflagellates are extremely rare and the acritarch Paralecaniella indentata is prominent. High diversity and content of spores and pollen indicate very nearshore marine environments.

These features are normally seen in the Johanna River Sand especially as seen at Castle Cove and inland.

C "Rotten Point Sand" : Great Ocean Road : YC 106059
This sample is extremely lean and cannot be confidently assigned. Rare elements include Nothofagidites spp (including N. falcata) and Santalumidites cainozoicus. Their co-occurance suggests the lower to middle N. asperus Zone, similar to B above. However, the yield is so extremely poor that contamination cannot be totally excluded.

The asperus Zone usually occurs in the Johanna River Sand, not the Paleocene Rotten Point Sand.

D Sentinel Rock Clay
This sample is dominated by Cyathidites, Matonisporites and Dictyophyllidites spp. The presence of Acaciapollenites myriosporites, Compositae (Tubulifloridae) and Chenopodipollis and the total absence of Nothofagidites indicates a Plio-Pleistocene age.

Absence of marine species indicates non-marine environments.

III CONCLUSIONS

The Johanna River Sand sample provides no surprises, being marginally marine and of middle Eocene age. The two Rotten Point Sand samples appear to be wrongly assigned, and should perhaps also be considered as Johanna River Sand. The Sentinal Rock Clay is clearly a non-marine Plio-Pleistocene deposit.

IV REFERENCES

Partridge, AD (1976) The geological expression of eustacy in the early Tertiary of the Gippsland Basin. Aust Pet Explor Assoc J 16 : 73-79

PALYNOLOGY OF 4 OUTCROP SAMPLES, OTWAY BASIN, VICTORIA

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C L I E N T: Geological Survey of Victoria

W E L L: 4 outcrop samples

F I E L D / A R E A: Otway basin

A N A L Y S T: Roger Morgan D A T E : April '90

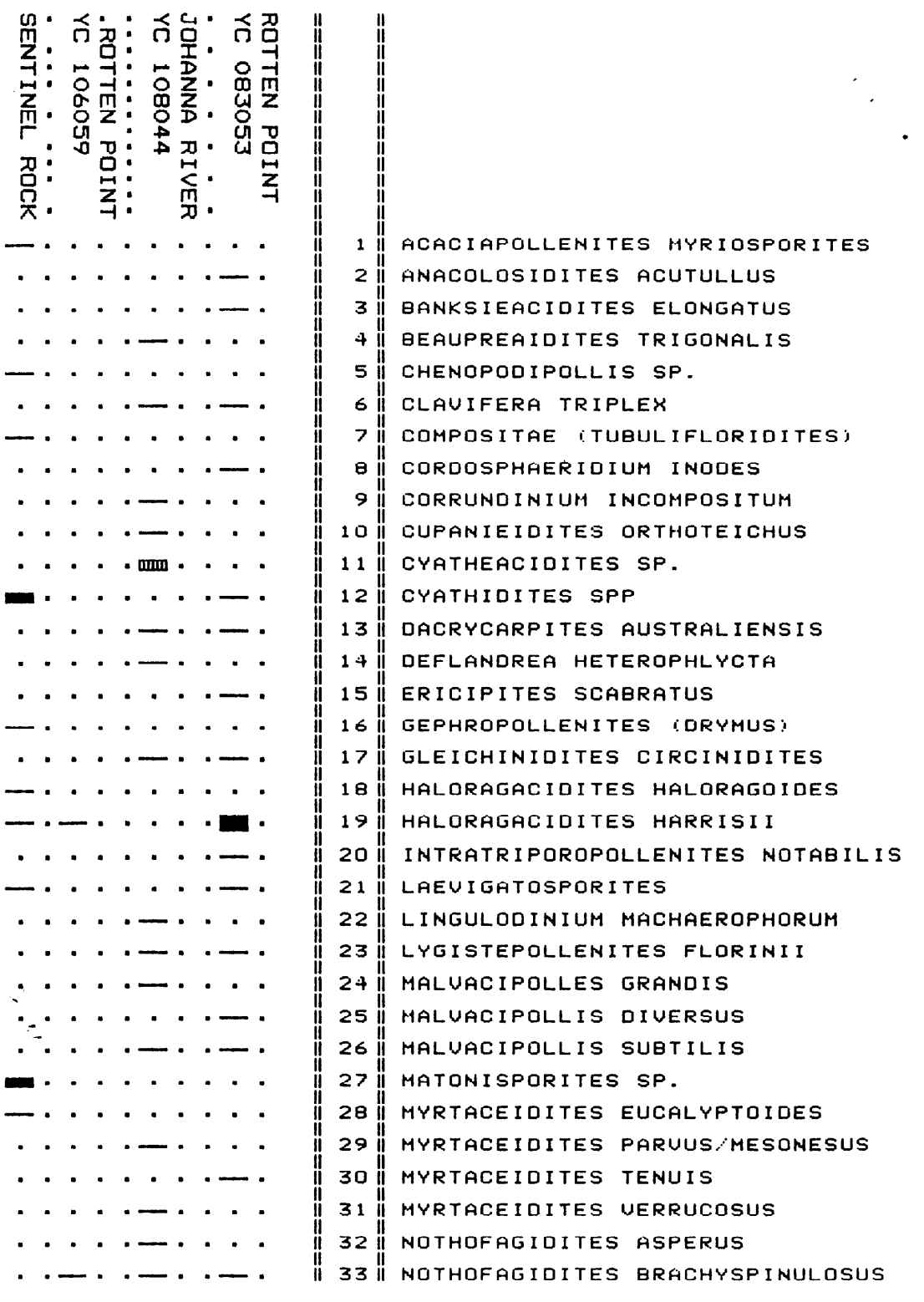
N O T E S:

RANGE CHART OF GRAPHIC ABUNDANCES BY ALPHABETICAL ORDER

Key to Symbols

= Very Rare
= Rare
= Few
= Common
= Abundant

? = Questionably Present
. = Not Present


SENTINEL ROCK
YC 106059
ROTTEN POINT
YC 108044
JOHANNA RIVER
YC 083053
ROTTEN POINT
1 ACACIAPOLLENITES MYRIOSPORITES
2 ANACOLOSIDITES ACUTULLUS
3 BANKSIEACIDITES ELONGATUS
4 BEAUPREAIDITES TRIGONALIS
5 CHENOPODIPOLLIS SP.
6 CLAVIFERA TRIPLEX
7 COMPOSITAE (TUBULIFLORIDITES)
8 CORDOSPHAERIDIUM INODES
9 CORRUNDINIUM INCOMPOSITUM
10 CUPANIEIDITES ORTHOTEICHUS
11 CYATHEACIDITES SP.
12 CYATHIDITES SPP
13 DACRYCARPITES AUSTRALIENSIS
14 DEFLANDREA HETEROPHLYCTA
15 ERICIPITES SCABRATUS
16 GEPHROPOLLENITES (DRYMUS)
17 GLEICHINIDITES CIRCINIDITES
18 HALORAGACIDITES HALORAGOIDES
19 HALORAGACIDITES HARRISII
20 INTRATRIPOROPOLLENITES NOTABILIS
21 LAEVIGATOSPORITES
22 LINGULODINIUM MACHAEROPHORUM
23 LYGISTEPOLLENITES FLORINII
24 MALVACIPOLLES GRANDIS
25 MALVACIPOLLIS DIVERSUS
26 MALVACIPOLLIS SUBTILIS
27 MATONISPORITES SP.
28 MYRTACEIDITES EUCALYPTOIDES
29 MYRTACEIDITES PARVUS/MESONESUS
30 MYRTACEIDITES TENUIS
31 MYRTACEIDITES VERRUCOSUS
32 NOTHOFAGIDITES ASPERUS
33 NOTHOFAGIDITES BRACHYSPINULOSUS

	34 NOTHOFAGIDITES DEMINUTUS	35 NOTHOFAGIDITES EMARCIDUS/HETERUS	36 NOTHOFAGIDITES FALCATUS	37 NOTHOFAGIDITES FLEMINGII	38 OPERCULODINIUM CENTROCARPUM	39 PARALECANIELLA INDENTATA	40 PERIPOROPOLLENITES DEMARCATUS	41 PERIPOROPOLLENITES POLYORATUS	42 PERIPOROPOLLENITES VESICUS	43 PHYLLOCLADIDITES MAWSONII	44 POLYCOLPITES ESOBALTEUS	45 PROTEACIDITES ANNULARIS	46 PROTEACIDITES ASPEROPOLUS	47 PROTEACIDITES GRANDIS	48 PROTEACIDITES INCURVATUS	49 PROTEACIDITES LEIGHTONII	50 PROTEACIDITES ORNATUS	51 PROTEACIDITES PACHYPOLUS	52 PROTEACIDITES PSEUDOMOIDES	53 PROTEACIDITES RETICULATUS	54 PROTEACIDITES SPP.	55 SANTALUMIDITES CAINOZOICUS	56 SPINIFERITES FURCATUM/RAMOSUS	57 SPINOZONOCOLPITES PROMINATUS	58 STERIESPORITES (TRIPUNCTISPORIS) PUNCT	59 STERIESPORITES ANTIQUASPORITES	60 TRICOLPITES SP.	61 TRICOLPORITES ESTOUTUS	62 TRIPOROPOLLENITES AMBIGUUS	63 VERRUCATOSPORITES SPP.	64 VERRUCOSISPORITES KOPUKUENSIS
ROTTEN POINT YC 083053	.	.	.	▤	.	.	│	│	.	.	│	.	?	□	□	│	│	?	│	.	.	.	.	│	│	.	.	.	│	.	│
JOHANNA RIVER YC 108044	▤	■	▤	.	│	□	│	.	│	│	.	│	│	.	│	│	.	□	.	│	.	│	│	.	│	│	.	│	│	.	│
.ROTTEN POINT YC 106059	│	■	│	.	.	.	.	.	.	│	.	.	.	.	.	.	.	.	.	.	.	│	.	.	.	.	.	.	.	.	.
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