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INTERPRETATIVE

A PALYNOLOGICAL ANALYSIS OF FLYING FISH-1, GIPPSLAND BASIN

by

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INTRODUCTION

Twenty-one cutting samples were collected from the Victorian Mines Department's core store and processed for palynology. Recovery was quite good and stratigraphic assignment could be made with confidence to all but one sample.

Zones and lithological/facies subdivison of the basal Lakes Entrance Formation and the Latrobe Groups are summarised below. All samples are summarised in Table 1 and each occurrence of the individual species is tabulated in the distribution charts.

SUMMARY

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Zone	. Depth (Feet)
P. tuberculatus	3560 '- 3570'
Lower N. asperus P. asperpolus	3900'-4410' 4650'-5210'
	UNCONFORMITY
Upper <u>L. balmei</u> Lower <u>L. balmei</u> <u>T. longus</u>	5330'-5620' 5750'-5910' 6000'-6520' T.D.
	<u>P. tuberculatus</u> Lower <u>N. asperus</u> <u>P. asperpolus</u> Upper <u>L. balmei</u> Lower <u>L. balmei</u>

GEOLOGICAL COMMENTS

1. The post-Eocene section immediately above the Latrobe is composed of shales and siltstones that grade upward into the more typical marl and limey lithology above 2500'. This more clastic sedimentation at the base of the <u>P. tuberculatus</u> zone is considered due to the more shoreward position of this well.

2. Another indication of the shoreward position is the large number of coal beds and stringers interbedded with the coarse sands of the Latrobe section.

- 3. Latrobe lithology extends throughout the Eocene sediments. The younger section (<u>N. asperus</u> zone) is not separated into the lithologically distinct glauconitic sandstone (Gurnard Formation) that is found in many of the more "seaward" wells.
- 4. Only one major unconformity is apparent. This cuts out all of the zones between the <u>P. asperpolus</u> zone and the Upper <u>L. balmei</u> zone, most of the Early Eocene time. This break in sedimentation is located somewhere in the unsampled interval between 5210' and 5330'.
- 5. Upper and Middle <u>N</u>. <u>asperus</u> sediments were not recognised, however, these zones are known to be quite thin in the wells where they have been found and there is a large sample gap between the last sample with <u>P</u>. <u>tuberculatus</u> at 3570' and the next sample, which contains Lower <u>N</u>. <u>asperus</u> fossils, from 3900'. Therefore, it is not possible, under the present circumstances, to determine if the Upper and Middle <u>N</u>. <u>asperus</u> zones are missing, due either to non-deposition or deposited and subsequently removed; or if indeed these beds are present but are less than 330' in thickness. The presence of a specimen of <u>Triorites magnificus</u>, the index for the Middle <u>N</u>. <u>asperus</u> zone, as a mud contaminant in the sample from 5610'-5620', suggests that some younger part of the <u>N</u>. <u>asperus</u> zone is present in the well section.

DISCUSSION OF ZONES

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The presence and distribution of individual species is presented in the distribution sheets. The basis for zonation of this well is discussed below.

Tricolpites longus zone : 6000'-6520' (T.D.)

In addition to the nominate species, which was present in almost all of the samples from this section, the regular and present occurrence of such forms as <u>Triporopollenites sectilis</u>, <u>Proteacidites clinei</u> and <u>Proteacidites reticuloconcavus</u> also suggest basal <u>L</u>. <u>balmei</u> or lower.

Lower Lygistepollenites balmei zone : 5750'-5910'

Frequent and consistent occurrences of <u>L</u>. <u>balmei</u> combined with the presence of <u>Australopollis</u> <u>obscurus</u> and <u>Proteacidites</u> <u>angularus</u> and the lack of index forms from higher in the section indicate that samples from this section come from the Lower <u>L</u>. <u>balmei</u> zone.

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Upper Lygistcgepollenites balmei zone : 5330'-5620'

The top of this zone is well marked by the first occurrence of the index species, Lygistegepollenites balmei. Both <u>P. annularis</u> and <u>P. grandis</u> extend downward to a depth of 5620'. These forms, which do not occur below the Upper <u>L. balmei</u> zone, are considered as indicative that the enclosing sediments are not stratigraphically lower than the upper part of the <u>L. balmei</u> zone. Additional evidence for this stratigraphic placement of these samples is that <u>Proteacidites angularus</u>, a Lower <u>L. balmei</u> marker, occurs regularly in all of the samples below this section, but is not found in this interval.

Proteacidites asperpolus zone : 4650'-5210'

The common occurrence of <u>P</u>. asperpolus throughout this section demonstrates that these sediments are no older than <u>P</u>. asperpolus zone. The scattered but consistent recurrence of such species as <u>P</u>. grandis, <u>S</u>. prominatus and <u>M</u>. tenuis restricts these beds below the <u>N</u>. asperus zone.

Lower Nothofagus asperus zone : 3900'-4410'

Forms such as <u>N</u>. asperus, <u>P</u>. recavus and <u>P</u>. refleius demonstrate that this part of the section is in the <u>N</u>. asperus zone. At the same time, the occurrence of <u>S</u>. prominatus and <u>P</u>. clarus shows that these sediments are not stratigraphically higher than the lower part of the zone.

Proteacidites tuberculatus zone : 3570'

The one sample taken above 3900' contained both <u>Cyathidites anularus</u> and <u>Pyxidinopsis pontus</u>, both of which are characteristic of the <u>P. tuberculatus</u> zone of the Oligo-Miocene.

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Table 1: SUMMARY OF PALEONOLOGICAL ANALYSIS, FLYING FISH-1, GIPPSLAND BASIN

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SAMPLE	DEPTH (m)	DEPTH (ft.)	ZONE	AGE	CONFIDENCE RATING	YIELD	DIVERSITY	COMMENTS
Ctngs	1085-88	3560-70	P. tuberculatus	Oligo-Miocene	3	Fair	Moderate	<u>C. annulatus</u>
n	1189-92	3900-10	Lower N. asperus	Middle Eocene	3	Good	Moderate	1
1)	1210-13	3970-80	Indeterminate	-	-	Very Low	Very Poor	Coal
н	1253-56	4110-20	Lower N. asperus	Middle Eocene	3	Good	High	Coal
u	1301-04	4270-80	Lower N. asperus	Middle Eocene	3	Good	High	Coal
n	1341-44	4400-10	Lower N. asperus	Middle Eocene	3	Good	High	Coal
u .	1417-20	4650-60	P. asperopolis	Middle Eocene	3	Good	High	Coal
11	1472-75	4830-40	P. asperopolis	Middle Eocene	3	Good	High	
u	1512015	4960-70	P. asperopolis	Middle Eocene	3	Good	High	. · ·
u	1542-45	5060-70	P. asperopolis	Middle Eocene	3	Good	High	
u	1585-88	5200-10	P. asperopolis	Middle Eocene	3	Good	High _	· · ·
81	1625-28	5330-40	Upper L. balmei	Upper Paleocene	· 3	Good	Moderate	•
11	1661-64	5450-60	Upper L. balmei	Upper Paleocene	· 3	Good	Moderate	Coal
u	1710-13	5610-20	Upper L. balmei	Upper Paleocene	· 3	Good	High	Coal
11	1753-56	5750-60	Lower L. balmei	Upper Paleocene	3	Fair	Moderate	Coal
*1	1798-1801	5900-10	Lower <u>L. balmei</u>	Upper Paleocene	3	Fair	Moderate	
. 11	1829-32	6000-10	T. longus	Lower Paleocene	3	Good	Moderate	
u	1853-56	6080-90	T. longus	Lower Paleocene	3	Fair	Moderate	
11	1899-1902	6230-40	T. longus	Lower Paleocene	3	Fair	Moderate	
u	1917-20	6290-6300	T. longus	Lower Paleocene	3	Good	Moderate	• • •
84	1884-87	6510-20	T. longus	Lower Paleocene	3	Fair	Moderate	-

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A	ZONES	Preferred Depth	Rtg	Alternate Depth	Rtg	Two Way Time	Preferred Depth	Rtg	Alternate Depth	Rig	Two Way Time
-	T. pleistocenicus				1						
ш	M. lipsis										
NEOGENE	C. bifurcatus				ŀ						
NEO	T. bellus										
	P. tuberculatus	3560'	3				3570'	3		·	
	Upper N. asperus	1									
	Mid N. asperus										
щ	Lower N. asperus.	3910'	3				4410'	3	•		
den Gen	P. asperopolus	4650'	3				5210'	3			
PALEOGENE	Upper M. diversus	,									
PA	Mid M. diversus										
	Lower M. diversus	1									
	Upper L. balmei	5330'	3				5620'	3			
	Lower L. balmei	5750'	3				5910'	3			
	T. longus	600'	3				6520'	3			
Snot	T. lilliei			, 							
ACE	N. senectus										
CRETACEOUS	U. T. pachyexinus								· · ·		
	L. T. pachyexinus										·
LATE	C. triplex			۶.							
	A. distocarinatus								1		
	C. paradoxus								٤		
CRET.	C. striatus						·		+		
1 1	F. asymmetricus										
EARLY	F. wonthaggiensis						•				
EA	C. australiensis										
	PRE-CRETACEOUS										

PALYNOLOGY DATA SHEET

COMMENTS:

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Stratigraphy entirely from cuttings. All depths in feet

CONFIDENCE 0: SWC or Core, Excellent Confidence, assemblage with zone species of spores, pollen and microplankton. RATING: 1: SWC or Core, Good Confidence, assemblage with zone species of spores and pollen or microplankton. SWC or Core, Poor Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton. 2: Cuttings, Fair Confidence, assemblage with zone species of either spores and pollen or microplankton, 3: or both. 4: Cuttings, No Confidence, assemblage with non-diagnostic spores, pollen and/or microplankton. If an entry is given a 3 or 4 confidence rating, an alternative depth with a better confidence rating should be NOTE: entered, if possible. If a sample cannot be assigned to one particular zone, then no entry should be made, unless a range of zones is given where the highest possible limit will appear in one zone and the lowest possible limit in another. DATA RECORDED BY: H.E. STACY DATE: SEPTE

DATA	REVISED	BY:

DATE:

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*C=core; S=sidewall core; T=cuttings.

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	PALYNOMORPHS	3560-70	3900-10	3970-80	4110-20	4270-80	4400-10	4650-60	4830-40	4960-70	5060-70	5200-10	5330-40	5440-50	5610	5750-60	5900-10	6000-10	6080-90	6230-40	6290-300	6510-20							
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,	M. hypolaenoides																			-									
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	N. emarcidus/heterus N. endurus	\lor				4			4	4				\sim	\leq		4					-							
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*C=core; S=sidewall core; T= cutrings.

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P. tuberculatus		<u> </u>					_												-									
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P. xestoformis (Prot.)		1																			-							
Q. brossus	f																						-		-	1		
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R. stellatus	t	<u> </u>																										
R. mallatus	1							-				\square																
R. trophus	1	1																					<u> </u>					
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S. digitatoides	1																											
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S. punctatus												•						\square										<u> </u>
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T, securus	ļ	ļ	ļ			<u> </u>																						├
T. confessus (C3)															1		\leq		~	<				├	-			
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T. magnificus (P3)	1	 		ļ		 	 							\swarrow					<u> </u>				<u> </u>		╂	<u> </u>		–
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*C=core; S=sidewall core; T=cuttings.

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Well Name _____FLYING FISH-1

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+C=core; S=sidewall core; T= cuttings.