

PE990860

BHP 7/2

# INTERPRETATIVE

PALYNOLOGY OF SNAPPER -3 AND

REVIEW OF SNAPPER -1 AND -2

by

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Palyn. Rept. 1970/33

July 1970.

## INTRODUCTION

Samples from Snapper -3 were received on a routine basis for analysis during January 1970. They have been studied with a view to aiding correlations between wells on the Snapper structure, and as part of regional studies, particularly concerning the T. lilliei/L. balmei Zone boundary and the dinoflagellate content of the N. goniatus Zone.

The following report briefly summarizes data obtained from Snapper -3 by July 1970.

Some of the data obtained from Snapper -3 necessitated modification to views expressed about Snapper -1 and Snapper -2 in previous reports. Consequently data from the earlier wells have also been reviewed and correlations between them expressed graphically in the attached diagram.

Previous palynological reports concerning the Snapper well include: 1969/1, 1969/11, 1969/13, 1970/21.

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SUMMARY OF DETERMINATIONS  
SNAPPER -3

Sample	Depth (ft)	Age	Zone
swc 16	4206	Late Eocene	<u>N. asperus</u> ( <u>O. dictyoplokus</u> )
" 15	4220	"	"
" 12	4522	Eocene undiff.	<u>N. asperus</u>
" 11	4582	"	"
" 10	4594	"	"
" 9	4598	"	"
" 6	4705	"	<u>P. asperopolus</u>
" 4	4842	?Early Eocene	<u>P. asperopolus/u. M. diversus</u> ( <u>Wetzeliella undiff.</u> )
" 58	5970	Paleocene	<u>L. balmei</u>
" 57	6306	"	"
" 55	6950	"	"
" 54	7274	"	"
" 47	8750	"	"
" 45	8934	"	"
" 40	9378	"	"
" 34	9948	"	"
" 31	10012	U. Cretaceous	<u>T. lilliei</u>
" 17	10056	"	"
" 10	10253	"	"
" 3	10409	"	Undiff.

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COMMENT ON SNAPPER -3

Both divisions of the N. goniatus Zone are well represented in Snapper -3. The samples are grouped into two: the upper, from immediately below the Miocene probably represent the O. dictyoplokus Zone, the dinoflagellate zone detected by L.E. Stover within the N. asperus spore-pollen zone (see palyn. rept. 1970/28 in prep.). Whether or not the underlying D. extensa dinoflagellate zone is present at Snapper -3 remains unknown in view of the gap between the upper sample group and the lower with very few dinoflagellates.

The P. asperopolus Zone is well represented at 4705' with a 10% abundance of P. asperopolus and P. pachyopolus. The sidewall core at 4842' carries a high proportion of T. harrisii relative to Nothofagidites and to be consistent with previous determinations should be at the base of the asperopolus Zone or the top of the M. diversus Zone. The few dinoflagellates from this horizon are consistent with those in the Flounder Formation (Palyn. Rept. 1970/2) but are insufficient to indicate which zone is represented (Palyn.Rept.1970/21).

The sample gap between 4842 and 5970 feet precludes accurate determination of the diversus/balmei boundary.

Allocation of the sidewall core 9948 feet to the balmei Zone and 10,012 feet to the lilliei Zone provides a relatively precise determination of the top of the lilliei Zone. This is based on criteria used at e.g. Barracouta and Tuna to identify the change between zones. If modifications to this choice appear necessary, the boundary should be lowered rather than raised.

The residue obtained from 10,409 feet was insufficient to determine whether the stratum at that depth should be referred to the T. lilliei or N. senectus Zone.

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## CORRELATION BETWEEN SNAPPER 1, 2 AND 3

Sampled horizons in Snapper 1, 2 and 3 and the zones to which they are allocated are plotted in the attached figure.

N. goniatus Zone

The P. asperopolus Subzone of the N. goniatus Zone is represented by two samples in each well. The lower of each pair displays the high proportion of T. harrisii relative to Nothofagidites and the upper in a P. asperopolus/pachypolus count of 5-10%.

The overlying N. asperus Subzone is thickest in Snapper -3 where at the top of the zone species representing the O. dictyoplokus dinoflagellate zone are present in greensand. Stover (Palyn. Rept. 1970/21) tentatively referred main cores from Snapper -1 at 4105 and 4122 feet to the O. dictyoplokus Zone. If correct the dictyoplokus Zone extends into the quartzose sandstone portion of the asperus Subzone. Stover tentatively referred Snapper -2, 4232 feet to the D. extensa dinoflagellate Zone. Although the dinoflagellates are not abundant, based on Stover's determinations, it is apparent that most of the N. asperus Zone represents the D. extensa and O. dictyoplokus Zones at Snapper.

M. diversus Zone

Poorly represented by samples in any of the Snapper wells. Abundant dinoflagellates from Snapper -1 4586 feet, in the upper M. diversus Zone are indicative of the W. thompsonae dinoflagellate zone, as seen in the Flounder Formation (Palyn. Repts. 1970/2; 1970/21). The vertical extension of the thompsonae Zone at Snapper is unknown: only the core sample from Snapper -1, 4614 feet underlay the dinoflagellate horizon, but unfortunately was barren. Furthermore a large gap occurs between the upper and lower diversus Zone samples in Snapper -1 and -2 so that the transition from one subdivision to the next cannot be determined with useful accuracy.

L. balmei Zone

Assemblages indicative of the top of the L. balmei Zone are present in the highest samples referable to that zone in each well, and there is no reason to suppose other than continuous deposition occurred from balmei into lower diversus time.

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The zone is well represented by samples: all require more detailed study if subdivision of the zone is to be attempted. Dinoflagellates are generally absent from the Zone, although rare specimens were observed in Snapper -2 at 6608 feet.

The base of the balmei Zone is taken to the deepest occurrence of Tripunctisporis sp. prior to a rise in abundance of Nothofagidites spp.

#### T. lilliei Zone

On current means of definition, the top of the T. lilliei Zone is relatively accurately located in Snapper -3 between 9948 and 10012 feet. This is at a greater depth than in Snapper -1 and -2, explicable in terms of the fault between the -1 and -3 wells.

#### General

Re-examination of samples from Snapper-1 and -2 showed that choice of the top of the lilliei Zone needed to be lowered in those wells. In the -2 well the boundary appears to lie between 8620 and 8736 feet, but if quantitative data are taken into account to accord with data from Snapper -3, a boundary between 8736 and 8910 feet in Snapper -2 might be a better choice. This indicates a throw of about 1200 feet on the fault between Snapper -1 and -3 at the level of the top of the T. lilliei Zone. As there is about 350 feet difference in structural elevation between the top of the diversus Zone in these wells, about 850 feet of this throw developed during balmei and diversus time. Comparison of logs indicates that little of this throw developed during deposition of the M. diversus Zone.

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BASIN GIPPSLAND

DATE 19

WELL NAME SNAPPER - 3

ELEVATION +31 feet

AGE	PALYNOLOGIC ZONES	HIGHEST DATA					LOWEST DATA				
		Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
EOCENE	<u>P. tuberculatus</u>										
	<u>U. N. asperus</u>										
	<u>M. N. asperus</u>										
	<u>L. N. asperus</u>	4206	0				4598	1			
	<u>P. asperopolus</u>	4705	1				4842	1			
	<u>U. M. diversus</u>										
	<u>M. M. diversus</u>										
	<u>L. M. diversus</u>										
PALEOCENE	<u>U. L. balmei</u>	5970	1				6806	1			
	<u>L. L. balmei</u>	6950	2				7274	1			
	<u>T. longus</u>	8750	2				9948	2			
LATE CRETACEOUS	<u>T. lilliei</u>	10012	2				10253				
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
	<u>C. distocarin.</u>										
	<u>T. pannosus</u>										
EARLY CRETACEOUS											
PRE-CRETACEOUS											

COMMENTS:

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- RATINGS: 0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.  
 1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.  
 2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.  
 3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spore and pollen or microplankton, or both.  
 4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATA RECORDED BY: LES/ADP DATE June 1971; Dec. 1971

DATA REVISED BY: ADP DATE Jan. 1975.

BASIN GIBBSLAND BASIN

BY David TAYLOR

Form P 193 3/71

12/19

WELL NAME SNAPPER -3

DATE 22 April 1971 ELEV. +31'

**Foram Zones**

		Highest Data	Quality	2 Way Time	Lowest Data	Quality	2 Way Time
MIOCENE	A	Alternate					
	B	Alternate					
	C	2550	1		2550	1	
		Alternate					
	D	2700	1		3350	3	
	D1	Alternate					
	D2	3400	0		3600	0	
		Alternate					
	E	3700	3		3850	3	
		Alternate	3750	0			
	F	3910	0		3910	0	
		Alternate					
OLIGOCENE	G	4010	0		4130	0	
		Alternate					
	H1	Alternate					
	H2	Alternate					
	I1	Alternate					
	I2	Alternate					
	J1	Alternate					
	J2	Alternate					
EOC.	K	Alternate					
	Pre K						

**COMMENTS:**

Note: If highest or lowest data is a 3 or 4, then an alternate 0, 1, 2 highest or lowest data will be filled in if control is available.

If a sample cannot be interpreted to be one zone, as apart from the other, no entry should be made.

- 0 SWC or Core - Complete assemblage (very high confidence).
- 1 SWC or Core - Almost complete assemblage (high confidence).
- 2 SWC or Core - Close to zone change but able to interpret (low confidence).
- 3 Cuttings - Complete assemblage (low confidence).
- 4 Cuttings - Incomplete assemblage, next to uninterpretable or SWC with depth suspicion (very low confidence).

Date Revised \_\_\_\_\_

By \_\_\_\_\_



SECTION

CIPPSLAND

DATE

WELL NAME

SNAPPER -3

ELEVATION

+ 51 feet

11/7

AGE	PALYNOLOGIC ZONES	HIGHEST DATA				LOWEST DATA					
		Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time	Preferred Depth	Rtg.	Alternate Depth	Rtg.	2 way time
MIOC.	<u>T. bellus</u>										
	<u>P. tuberculatus</u>										
ECCENE	<u>U. N. asperus</u>										
	<u>L. N. asperus</u>	4206 <sup>0175</sup>	0			1075	4598 <sup>607</sup>	1			1158
	<u>P. asperopolus</u>	4705 <sup>0574</sup>	1			1178	4842 <sup>607</sup>	1			1206
	<u>U. M. diversus</u>										
	<u>L. M. diversus</u>										
PALEO-GENE	<u>L. balnei</u>	5970 <sup>6754</sup>	1			1937	7274 <sup>7642</sup>	1			1677
	<u>T. longus</u>	8750 <sup>7713</sup>	2			1917	9948 <sup>8117</sup>	1			2037
LATE CRETACEOUS	<u>T. lilliei</u>	10012 <sup>8751</sup>	1			2096	10253 <sup>8977</sup>	1			2130
	<u>N. senectus</u>										
	<u>C. trip./T.pach.</u>										
	<u>C. distocarin.</u>										
	<u>T. pannesus</u>										
EARLY CRETACEOUS	<u>C. paradoxa</u>										
	<u>C. striatus</u>										
	<u>U. C. hughesii</u>										
	<u>L. C. hughesii</u>										
	<u>C. stylosus</u>										
Pre-Cretaceous											

COMMENTS: Probable M. diversus interval not sampled.

L. N. asperus at 4206' assigned to "A" subdivision

T.D. 10526 (2-176)

- RATINGS: 0; SWC or CORE, EXCELLENT CONFIDENCE, assemblage with zone species of spores, pollen and microplankton.
- 1; SWC or CORE, GOOD CONFIDENCE, assemblage with zone species of spores and pollen or microplankton.
- 2; SWC or CORE, POOR CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.
- 3; CUTTINGS, FAIR CONFIDENCE, assemblage with zone species of either spores and pollen or microplankton, or both.
- 4; CUTTINGS, NO CONFIDENCE, assemblage with non-diagnostic spores, pollen and/or microplankton.

NOTE: If a sample cannot be assigned to one particular zone, then no entry should be made. Also, if an entry is given a 3 or 4 confidence rating, an alternate depth with a better confidence rating should be entered, if possible.

DATE RECORDED BY: L.E.S./ A.B.P.

DATE June 1971

DATA REVISED BY: Corrected L.E.S.

DATE Dec. 1971