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# INTERPRETATIVE

PALYNOLOGY OF THE FLOUNDER FIELD

GIPPSLAND BASIN

by

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## INTRODUCTION

Palyn. Rept. 1969/9 detailed evidence from the Flounder 1 - 3 wells relating in particular to the nature of fossil assemblages in the "channel fill". Considerable modifications had to be made to the MS and only the correlation diagram was issued. Subsequently, Stover in Palyn. Rept. 1970/2 described the dinoflagellates from the upper M. diversus Zone and modified the original zonation based on these fossils, without altering the essential correlation pattern.

Subsequently wells have been drilled through and to the side of the "Flounder channel" (Trevally, Batfish and Tuna-3) and problems of correlation in the region particularly to the north of Flounder have been raised. The main questions have been:

1. The extension and internal characteristics of the "Flounder channel".
2. The degree of erosion into the L. balmei Zone effected by the channel.
3. The position of the top of the T. lilliei Zone.

The following summary of data from the Flounder field contributes to these questions. A summary of the correlations thus indicated between Tuna-Batfish-Flounder and Trevally will be incorporated in Palyn. Rept. 1970/32.

## OBSERVATIONS

The zones to which the samples are ascribed are listed in Table 1. Both pollen and dinoflagellate zones (within the upper M. diversus Zone) are listed.

Flounder-2, swc 6492 feet is regarded as Oligocene, but according to its depth should have been cut from pre-Oligocene strata and is thought to be incorrectly labelled.

The Early Eocene age for the upper M. diversus - basal P. asperopolus "channel fill" sequence is fully discussed in Palyn. Rept. 1970/2 and needs no repetition here.

## COMMENT

The best position within the spore-pollen zone scheme for the "channel fill" is still in doubt. It is certainly no older than the upper M. diversus Zone and is certainly no younger than the P. asperopolus Zone. Doubt remains of its position within the range uppermost M. diversus - basal P. asperopolus. This is due to the presence only in small numbers of P. asperopolus and P. pachyopolus, although the count rises to 4.5% at 6830 feet in Flounder-3 and 5% at 6890 and 7093 feet in Flounder -2, and to the greater proportion of T. Larrissi relative to Nothofagidites over most of the sequence in all three wells. Thus, it is probably best to regard the channel fill as deposited during a period commencing within the time of the upper M. diversus and continuing into the P. asperopolus Zone. The latter ratio appears to be diagnostic of the base of the P. asperopolus Zone in wells further to the west.

The dinoflagellate zones within the "channel fill" are defined in Palyn. Rept. 1970/2. Their extension across the Flounder field is graphically presented in the attached diagram. They parallel the four zones originally illustrated in Palyn. Rept. 1969/9.

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TABLE I ZONATION SUMMARY

| Age & Zone  | Flounder  |  |  |
|---|---|--|--|
|   | <u>1</u>  | <u>2</u>   | <u>3</u>   |
| Lower Eocene <u>P. asperopolus</u> - Upper <u>M. diversus</u> |   |  |  |
| Indeterminate   |   | s.6492<br>s.6595   | s.6555<br>s.6578<br>s.6580   |
| <u>W. edwardsii</u>   | c.6419<br>u.6700<br>u.6750<br>u.6800<br>u.6850  | s.6743   |  |
| <u>W. thompsonae</u>  | u.6900<br>u.6960<br>u.7000<br>u.7050  | s.6844<br>s.6890<br>s.6930<br>c.6964-84<br>s.7093                                      | s.6637<br>s.6680<br>s.6730   |
| <u>W. brachycysta</u>   | c.7187<br>c.7211  | s.7207<br>s.7333<br>s.7480   | s.6780<br>s.6830<br>s.6880<br>s.6930<br>s.6980<br>s.7028<br>s.7080                     |
| <u>W. parva</u>   |   |  | s.7130<br>s.7180<br>s.7210<br>s.7230<br>s.7280   |
| Paleocene <u>L. balmei</u>                                    | s.7485<br>s.7668<br>s.7786<br>s.7838<br>c.8115<br>s.8192<br>s.8207<br>s.8426<br>s.8452<br>s.8595<br>c.8775-97<br>s.9114<br>c.9498-528 | u.7560<br>u.7640<br>u.7710<br>s.8099<br>s.8149<br>c.8242<br>s.8520<br>s.9200<br>s.9300 | s.7472<br>s.7506<br>s.7562<br>s.7608<br>c.8350<br>c.8361<br>c.8370<br>c.8374<br>c.8379 |
| Indeterminate   |   | s.9822   |  |
| Upper Cretaceous <u>T. lilliei</u>                            |   | s.9942<br>c.10395-405  |  |
| <u>N. senectus</u>  | c.11113-58<br>s.11222<br>c.11334-56<br>c.11675<br>c.11700   |  |  |

c= core: s = sidewall core: u = cuttings. Depths in feet

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The main difference between the old and new schemes lies in recognition of the W. parva and W. brachycysta Zones in preference to the W. "waipawaensis" and "B. septatum" Zones. Nevertheless the distribution of the zones suggests a prograding attitude to sediments filling the channel.

In considering the mode in which fill was deposited within the channel, note should be taken that the relative abundance of dinoflagellates in Flounder-3 changes radically in apparently repetitive sequences from a flood where the fossils comprise about 80% of the assemblage to lesser proportions. Each sequence extends over an interval of about 200 feet. There are exceptions to this generalization but the nature of the statistics on which these comments are based does not warrant more rigorous analysis. Whether or not similarly repetitive sequences were intersected by Flounder-1 and -2 cannot be ascertained because of the spacing and type of sample available. These changing abundances could be construed as a further indication of the clinoform mode of deposition within the channel, each unit being about 200 feet thick at the location of Flounder-3. Each flood of fossils could represent a deepening of the channel to a maximum of 200 feet and the increase in relative pollen content could represent an increase in the amount of terrigenous material silting up the channel.

Occurrences of pelagic foraminifera do not coincide with the greatest abundances of dinoflagellates. At Flounder-3, the foraminifera occur in what appears to be a more stable period of dinoflagellate production. Perhaps stability of depositional conditions, rather than mere depth of water contributed to the growth and preservation of the foraminifera.

The position of the base of the channel depicted in the attached diagram is chosen because of relative ages of Flounder-2, 7480 feet (upper M. diversus ) and Flounder -3, 7472 feet (L. balmei) and because of possible log correlations at about these depths.

There is no evidence of the presence of the lower M. diversus Zone at Flounder, contrary to assertions made in Palyn. Rept. 1969/9.

The L. balmei Zone has yielded dinoflagellates at several levels. Their identification and correlative significance has yet to be determined.

The relatively uniformly layered sequence through the L. balmei Zone in contrast to the diversus Zone permits numerous good log correlations between the wells within the sequence. Consequently, although Flounder-1, 7485 feet contained an indeterminate assemblage, it is assigned to the balmei Zone because of correlation of this horizon into the balmei Zone in Flounder-3.

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