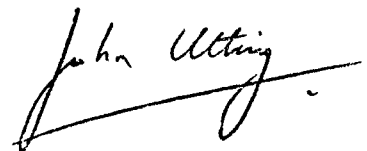


PALYNOLOGY OF THE INTERVAL  
FROM 2700 TO 4290 FEET  
OF THE PANARCTIC TENN.  
ROBERT HARBOUR K07 WELL

OPEN FILE  
DOSSIER PUBLIC  
593  
Geological Survey  
Commission Géologique  
Ottawa

This document was produced  
by scanning the original publication.  
Ce document a été produit par  
numérisation de la publication originale.

Author: INRS-Pétrole/JU/1m 13.06.78  
Addressee: Department of Supply  
& Services, Ottawa  
Reference: Limit Meso-Palaeozoic



## INTRODUCTION

The well is situated on north Cameron Island in the Canadian Arctic Islands, latitude  $76^{\circ}36'32.2''$  N, longitude  $104^{\circ}02'14.1''$  W. The interval from 2700 to 4290 feet was investigated in an attempt to determine more precisely firstly whether Triassic rocks are present in the well, and secondly if they are present, then where approximately is the Permo/Triassic boundary?

The samples studied had previously been processed by Robertson Research (North America) Ltd. One slide was investigated from each composite sample the latter representing a combination of cuttings from a 90 foot interval. Also available during the course of the study was Exploration Report No. 167 (1977) by G. Dolby and R.J. Price of Robertson Research (North America) Ltd; this report deals with the palynology and micro-palaeontology of the complete well.

## ASSEMBLAGES RECORDED

The samples from 960 feet to 2690 feet were found by previous workers to be lacking in either palynomorphs or micro-fossils (Dolby and Price, op. cit.). The first palynologically productive sample down-hole investigated in the present report was at 2700 - 2790 feet, but in this sample palynomorphs, although well preserved, are rare; as they are also at 2800 - 2890 feet. The first sample which contains fairly abundant fossils occurs at 2900 - 2990 feet and fairly good assemblages occur throughout the remainder of the section studied, although fossils are rare in certain samples.

The forms identified are shown on figure 1, and illustrations of selected specimens are shown on plates 1 - 6. The assemblages comprise three main groups of palynomorphs firstly, in situ pollen and spores, secondly, in situ acritarchs and thirdly, reworked spores. The colour

*staplirii*, *Vesicaspora* sp., *V. ovata*, *Neoraistrickia* cf. *N. ramosa*, *Decussatisporites* sp. and *Vittatina cincinnata*. The last two mentioned forms are represented by single specimens at the 4000 - 4090 foot level. Acritarchs present from 3000 to 4290 feet include *Micrhystridium setasessitante*, *M. breve* M. cf. *M. fragile*, *M. sp.* H. Jansonius 1962, *M. stellatum*, *Veryhachium* sp., *Veryhachium* cf. *V. irregulare*, ? *Lophozonodiacrodium* sp., ? *Cymatiosphaera* sp. and *Deunffia unispinosa*.

#### AGE OF ASSEMBLAGES

1. The presence of occasional specimens of *Vittatina striata* and *Vittatina minima* from the 3000 foot level downwards suggests the presence of Permian rocks rather than Triassic. *Vittatina* is probably one of the more useful stratigraphic indicators of Pre-Triassic rocks in Europe (see for example Pattison, Smith and Warrington, 1973, p. 253). The lack of this form in the overlying samples is significant although the value of this negative evidence is reduced by the scarcity of fossils in the 2700 to 2890 interval.
2. The presence of *Taeniaesporites novimundi* and *Taeniaesporites gracilis* in the upper most productive samples of the well and their absence below the 3000 - 3090 foot level represents a significant feature of the assemblages which may be interpreted as indicating the presence of either Upper Permian or Triassic rocks. These forms were reported from the Lower Triassic of the Peace River area by Jansonius 1962, but not from underlying sediments to which he attributed a Leonard-Guadalupean age. However he pointed out that he had observed *Taeniaesporites novimundi* in the Upper Permian of England and its presence was also recorded by Clarke 1965 from the British Upper Permian (Zechstein). Similarly this form, along with *T. gracilis* and also species of *Vittatina* have been observed by the present writer in rocks thought to be from the Upper Permian in the Drake Point D-68 well on Melville Island of Arctic Canada. Thus

### ENVIRONMENT OF DEPOSITION

The presence of fairly abundant acritarchs in the samples suggests the influence of marine conditions from 2700-90 to 4200-90 feet. However in view of the abundance of pollen and spores and reworked Devonian material it seems likely that the depositional area was no great distance from land. Also the fact that the Devonian spores are brown in colour rather than dark brown to black suggests that the Devonian rocks were not subjected to any significant metamorphism previous to their erosion.

### CONCLUSIONS

From the palynological data it is not possible to make any confident conclusions concerning the presence or absence of Triassic rocks in the upper part of the well. It is possible that the suggestion made by previous workers (Dolby and Price) that the top-most fossiliferous samples are of Triassic age is correct although this conclusion relies heavily on the negative evidence that *Vittatina* is absent in samples which, with the exception of one sample, contain very few fossils. It would seem reasonable therefore to tentatively attribute the 2700 to 2990 feet interval a Triassic (?) age on the understanding that the evidence for such an age on palynological data alone is not strong and that the possibility of these rocks being Upper Permian cannot completely be eliminated.

The significance of the appearance of new forms in the 4000 - 4090 foot sample is not yet certain (single specimens only) but they may indicate the presence of a boundary between stratigraphic stages is located in this vicinity.

PLATES 1 - 6

All figures X500  
unless otherwise stated

PLATE 2

- |     |                                     |                  |
|-----|-------------------------------------|------------------|
| 1.  | <i>Striatoabietites duivenii</i>    | 2900 - 2990 feet |
| 2.  | " "                                 | 3000 - 3090 feet |
| 3.  | <i>Striatopodocarpites</i> sp.      | 2900 - 2990 feet |
| 4.  | <i>Striatopodocarpites communis</i> | 3000 - 3090 feet |
| 5.  | " "                                 | " " "            |
| 6.  | <i>Protohaploxylinus</i> sp. A      | 3300 - 3390 feet |
| 7.  | " "                                 | 3500 - 3590 feet |
| 8.  | <i>Protohaploxylinus</i> sp. B      | 2900 - 2990 feet |
| 9.  | " "                                 | " " "            |
| 10. | <i>Protohaploxylinus limpidus</i>   | 3300 - 3390 feet |
| 11. | <i>Vestigisporites</i> sp.          | 3400 - 3490 feet |
| 12. | <i>Striatoabietites</i> sp.         | 3500 - 3590 feet |

PLATE 4

1.	<i>Vittatina striata</i>	3800 - 3890 feet
2.	" "	3500 - 3590 feet
3.	" "	3300 - 3390 feet
4.	" "	3400 - 3490 feet
5.	" "	3800 - 3890 feet
6.	" "	4000 - 4090 feet
7.	<i>Vittatina saccifer</i>	3700 - 3790 feet
8.	<i>Vittatina cincinnata</i>	4000 - 4090 feet
9.	<i>Vittatina</i> sp. B	4200 - 4290 feet
10.	<i>Equisetosporites steevesii</i>	2900 - 2990 feet
11.	" "	3000 - 3090 feet
12.	" "	2800 - 2890 feet
13.	" "	3200 - 3290 feet
14.	" "	4000 - 4090 feet
15.	<i>Equisetosporites scottii</i>	3000 - 3090 feet
16.	" "	3500 - 3590 feet

PLATE 6

## Reworked spores

1.	<i>Stenozonotriletes</i> sp.	4000 - 4090 feet
2.	<i>Pustulatisporites</i> sp.	4000 - 4090 feet
3.	<i>Convolutispora</i> sp. B	2800 - 2890 feet
4.	<i>Lycospora noctuina</i>	2900 - 2990 feet
5.	<i>Spelaeotriletes</i> sp.	3000 - 3090 feet
6.	<i>Cyclogranisporites</i> sp.	3400 - 3490 feet
7.	Spore type 1	3500 - 3590 feet
8.	Spore type 2	3800 - 3890 feet
9.	<i>Lophozonotriletes</i> sp.	2900 - 2990 feet
10.	" "	4000 - 4090 feet
11.	<i>Ancyrospora</i> sp.	3800 - 3890 feet
12.	<i>Cyclogranisporites</i> sp.	2900 - 2990 feet
13.	<i>Punctatisporites</i> sp.	2800 - 2890 feet
14.	<i>Spinozonotriletes</i> sp.	4100 - 4190 feet
15.	<i>Convolutispora</i> sp. A	3800 - 3890 feet
16.	<i>Leiotriletes</i> sp.	3500 - 3590 feet
17.	<i>Spinozonotriletes</i> sp.	3000 - 3090 feet



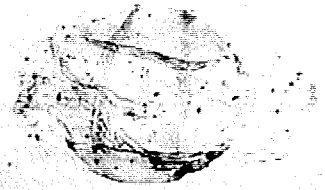
PLATE I



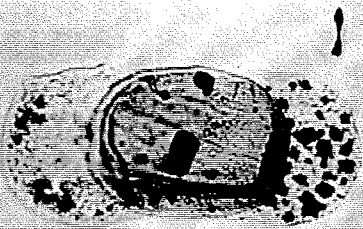
1



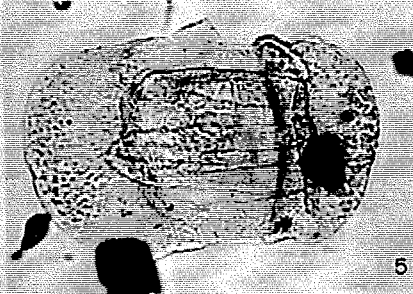
2



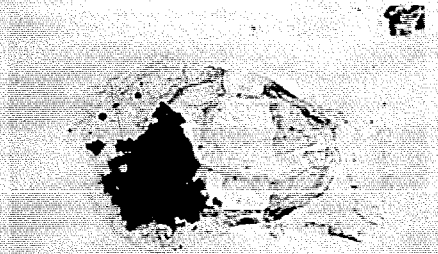
3



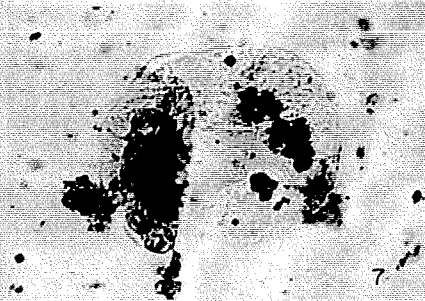
4



5



6



7



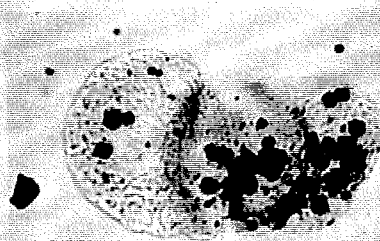
8



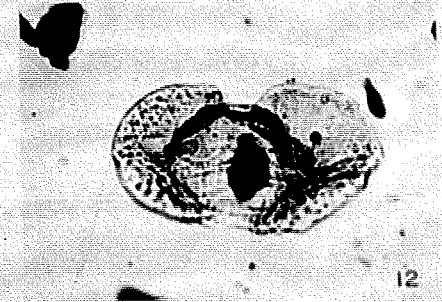
9



10



11



12

PLATE 2

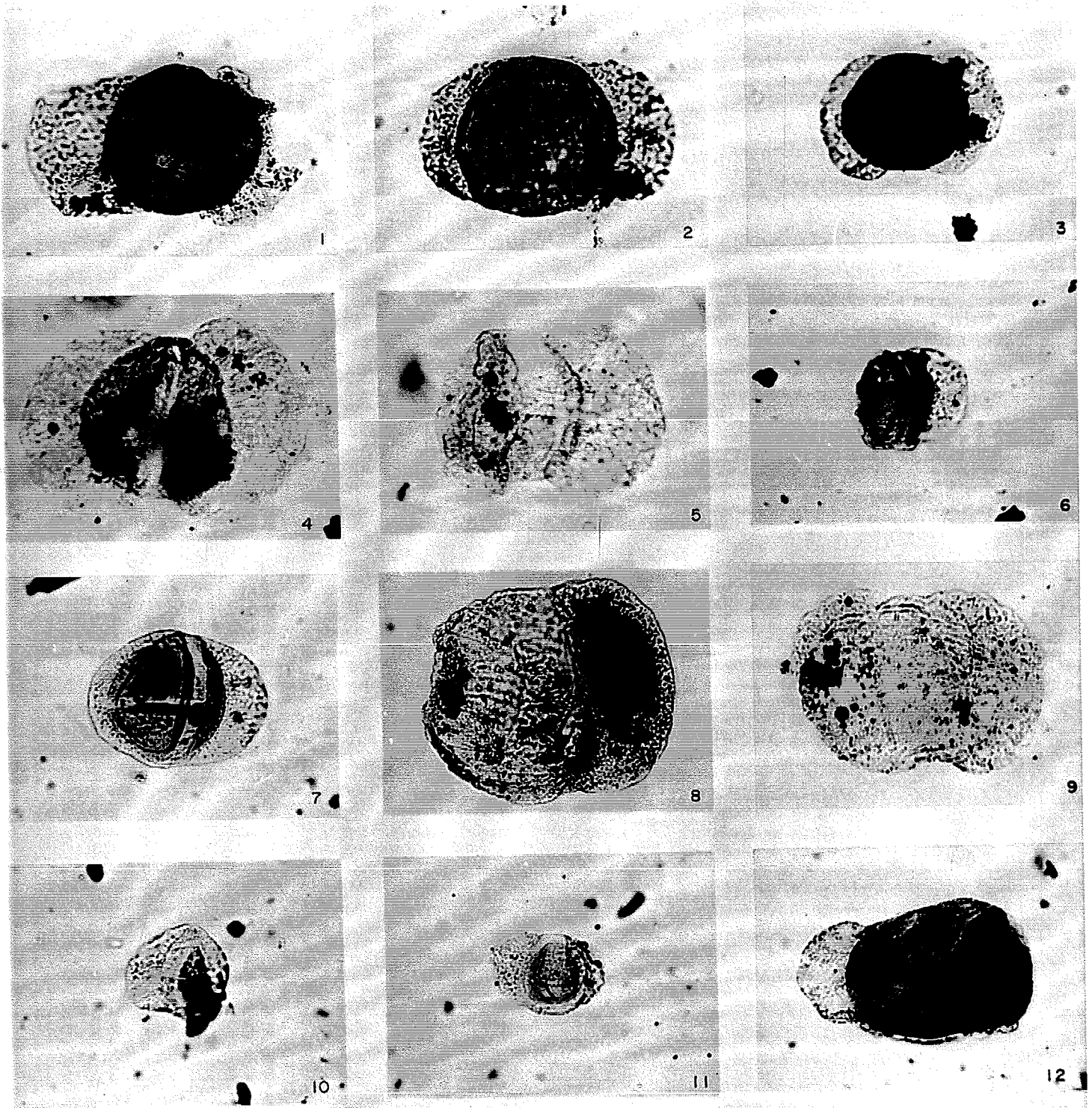


PLATE 3

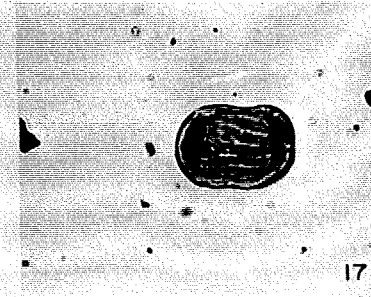
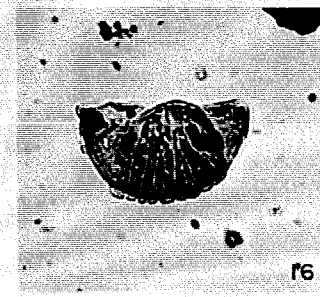
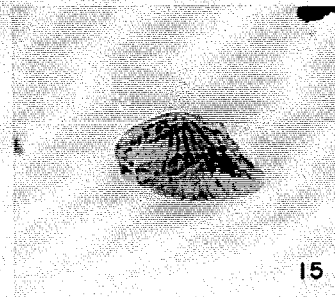
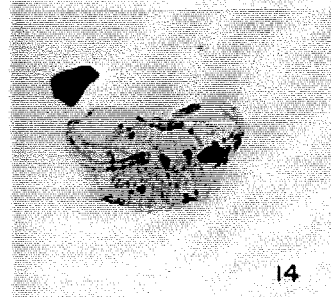
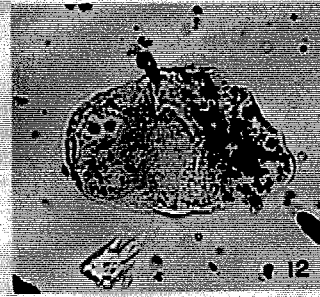
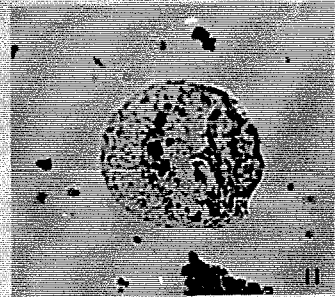
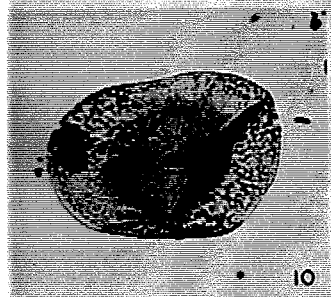
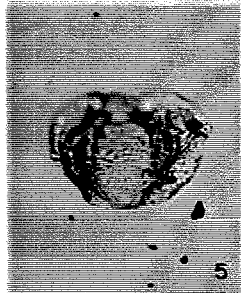
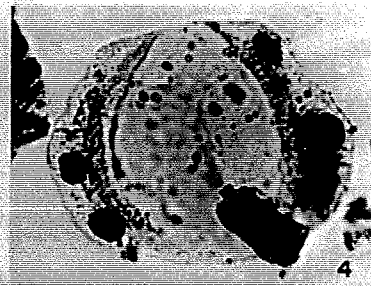
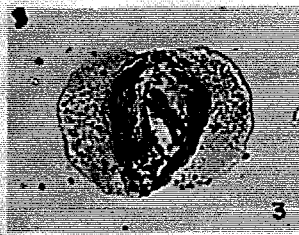
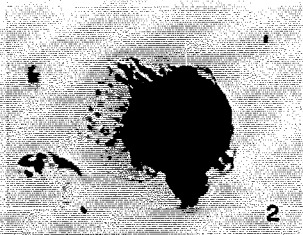


PLATE 4

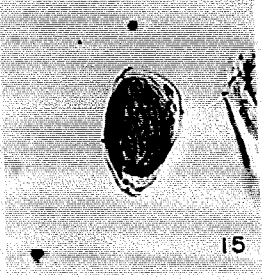
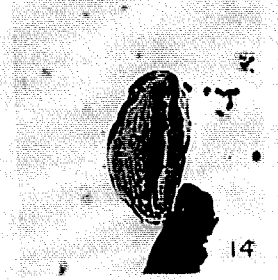
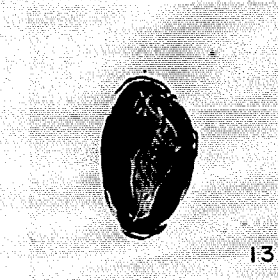
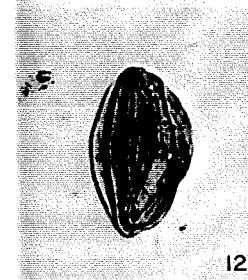
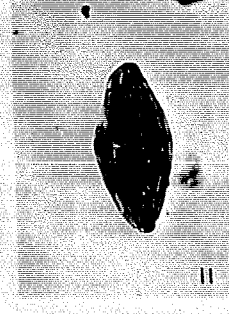
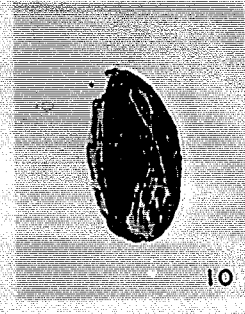
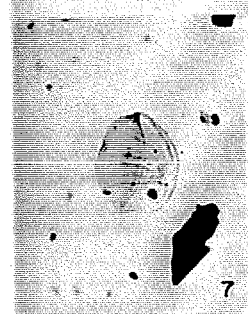
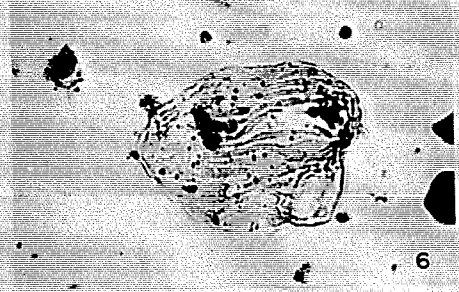
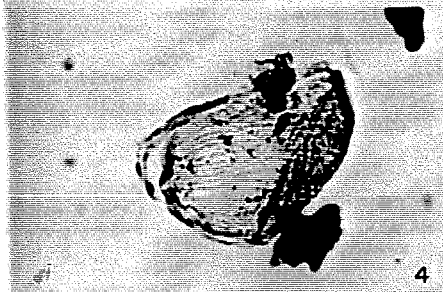
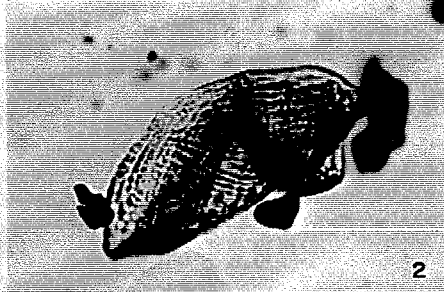
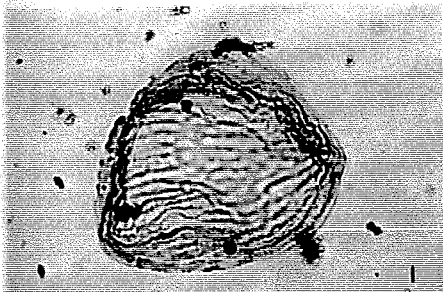
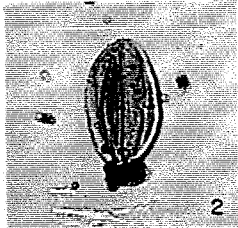


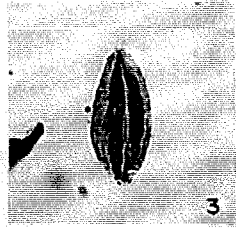
PLATE 5



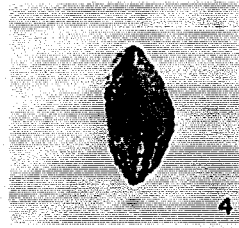
1



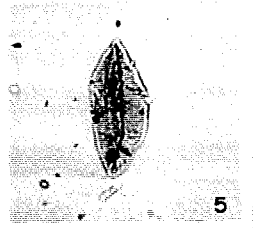
2



3



4



5



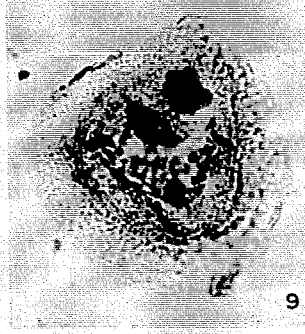
6



7



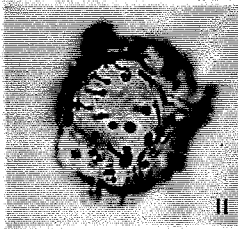
8



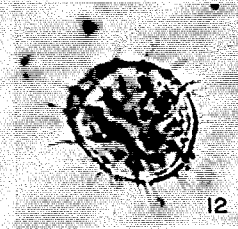
9



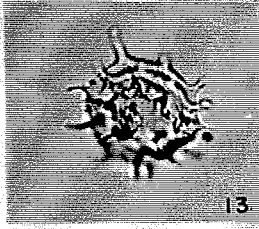
10



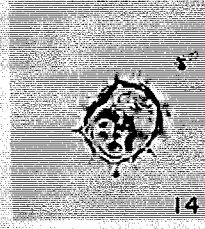
11



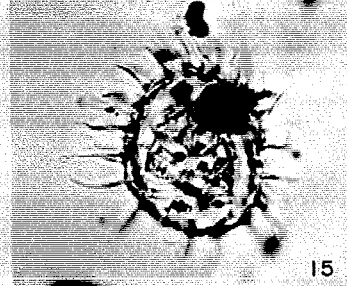
12



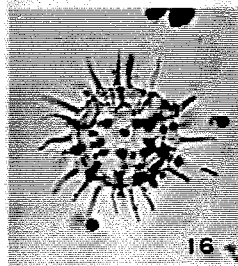
13



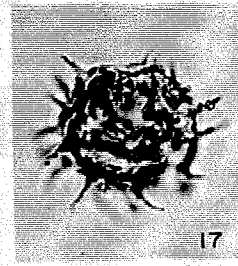
14



15



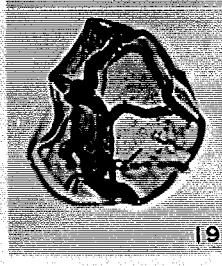
16



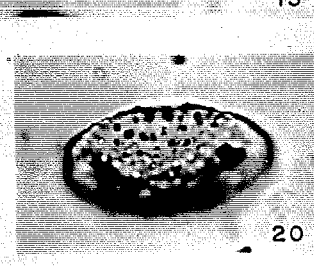
17



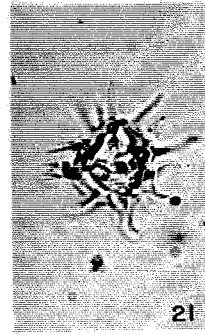
18



19



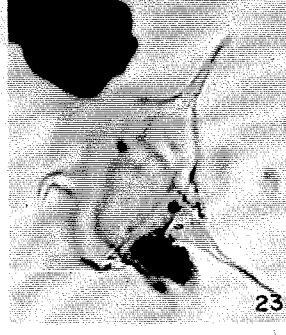
20



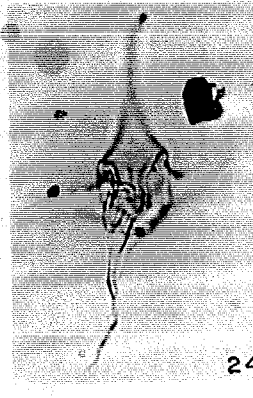
21



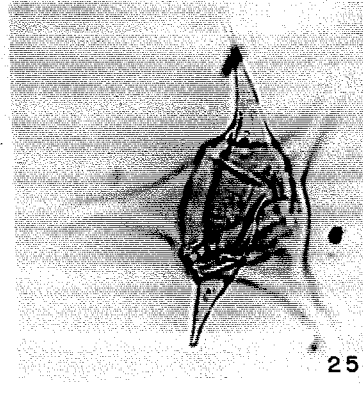
22



23



24



25

PLATE 6



1



2



3



4



5



6



7



8



9



10



11



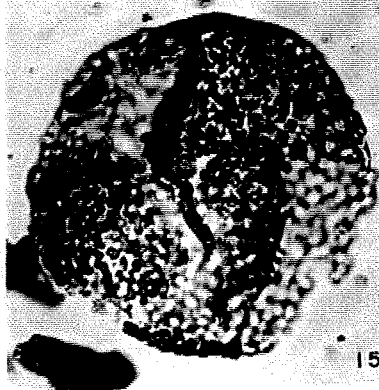
12



13



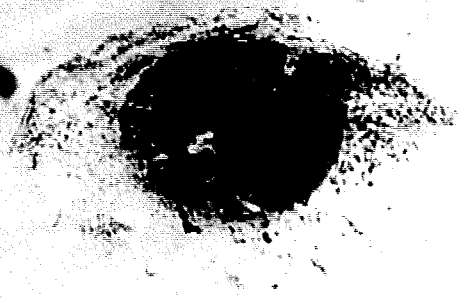
14



15



16



17