APPENDIX X b.

PALYNOLOGICAL REPORT ON SHELL PECTEN 1A WELL, 3735 FEET AND 3908 FEET

by

Dr. M.E. Dettmann

In an attempt to locate the Cretaceous/Tertiary boundary in Shell Pecten 1 well, two samples were submitted by Shell Development (Australia) Pty. Ltd. om 3735 feet and 3908 feet. In a previous study Dettmann (1967a,b) indicated at samples between 4044 feet and 9305 feet are of Cretaceous age, ranging from e Lower Cretaceous (Upper Aptian or older) to the Upper Cretaceous (Senonian and ter).

The samples investigated in the present study were processed according to e method outlined by Dettmann (1967b); i.e. they were first treated with cold drofluoric acid followed by mineral separation using zinc bromide. The residues re then examined and the preservation details of the contained microfossils corded (Table 1). Specific analysis of the spores, pollen grains, and micro-lankton contained in the samples was carried out after the residues were subjected additional treatment with Schulze solution for ½ hour, followed by brief immersion ½% ammonium hydroxide.

Both samples yielded fair to good concentrations of well preserved spore-llen-microplankton suites. As discussed below, the sample from 3908 feet is of permost Cretaceous age (Senonian or later) and that from 3735 feet is of latest etaceous or earliest Tertiary age.

MICROFLORAL CONTENT AND AGE OF SAMPLES

35 feet

The following well preserved spores, pollen grains, and microplankton cur in the sediment:

ores:
- Cyathidites minor Couper
- Camarozonosporites amplus (Stanley)
- C. sp.
- Gleicheniidites circinidites (Cookson)
- Kraeuselisporites pappilatus Harris
- Stereisporites antiquasporites (Wilson & Webster)

llen:
- Dacrydiumites balmei Cookson
- D. florinii Cookson & Pike
- Dilwynites tuberculatus Harris
- Liliacidites sp.
- Nothofagidites emarcidus (Cookson)
- N. senectus Dettmann & Playford
- Phyllocladidites mawsonii Cookson
- Podocarpidites ellipticus Cookson
- P. exiguus Harris
- Proteacidites cf. adenanthoides Cookson
- P. parvus Cookson
- P. cf. rectomarginis Cookson
- P. reticuloscabratus Harris
- P. subscabratus Couper
- P. scaboratus Couper
- Tricolpites gillii Cookson
- T. lillei Couper
- Triorites edwardsii Cookson & Pike
- aff. T. edwardsii

croplankton:
- Deflandrea baleri Deflandre & Cookson
- D. pellicida Cookson & Eisenack
- Epe[illegible]

anid:
- Aequitriradites spinulosus - Lower Cretaceous
- Neoraistrickia sp. - Permian

The spore-pollen suite shows certain characteristics of Dettmann and Playford's (1968) Senonian and later Nothofagidites Microflora and of Harris's (1965) Middle Paleocene Triorites edwardsii Assemblage. The presence of Nothofagidites senectus together with a single specimen of Tricolpites lillei is suggestive of a late Cretaceous age. However, several forms which are hitherto known as typically Tertiary in origin are also represented in the sample; these include Dacrydiumites balmei, Dilwynites tuberculatus, and the proteaceous types referred to Proteacidites parvus, P. reticuloscabratus, and P. cf. rectomarginus.

The microplankton suite includes Deflandrea pellucida which ranges from uppermost Cretaceous to Lower Tertiary (Evans 1966) and D. bakeri which is thought to be indicative of a Tertiary age.

Collectively, therefore, the microfloral evidence favours a lowermost Tertiary age, or possibly a horizon within the uppermost Cretaceous.

3908 feet

The well preserved microflora obtained from the sample includes abundant spores and pollen grains and rare microplankton. Species identified include:

Spores:
- Cyathidites minor Couper
- C. splendens Harris
- Camarozonosporites amplus (Stanley)
- C. bullatus Harris
- Gleicheniidites circinidites (Cookson)
- Laevigatosporites major (Cookson)
- L. ovatus Wilson & Webster
- Lycopodiumsporites austroclavatidites (Cookson)
- Stereisporites antiquasporites (Wilson & Webster)

Pollen:
- Cycadopites sp.
- Dacrydiumites florinii Cookson & Pike
- Microcachryidites antarcticus Cookson
- Nothofagidites senectus Dettmann & Playford
- Phyllocladidites mawsonii Cookson
- Polyporina fragilis Harris
- Podosporites microsaccatus (Couper)
- Podocarpidites exiguus Harris
- P. ellipticus Cookson
- Proteacidites amolosexinus Dettmann & Playford
- P. cf. adenanthoides Cookson
- P. scaboratus Couper
- P. subscabratus Couper
- Tricolpites gillii Cookson
- T. lillei Couper
- T. pachyexinus Couper
- T. sabulosus Dettmann & Playford
- Triorites edwardsii Cookson & Pike
- aff. T. edwardsii

Microplankton:
- Deflandrea sp.
- cf. Eisenackia sp.
- Trichodinium sp.

Remanie:
- Nuskoisporites sp. - Permian

The sample yielded a spore-pollen assemblage conformable with the Nothofagidites Microflora and is thus considered to be of uppermost Cretaceous age. The rare microplankton recovered appear to be undescribed forms.

REFERENCES

Dettmann, M.E. 1967a. Preliminary palynological report on Shell Pecten 1-A well. Unpubl. report submitted to Shell Development (Australia) Pty. Ltd. 27/6/67.

Dettmann, M.E. 1967b. Palynological report on Shell Pecten 1-A well, 4044 feet - 9305 feet. Unpubl. report submitted to Shell Development (Australia) Pty. Ltd. 30/8/67.

Dettmann, M.E. and Playford, G. 1968. Palynology of the Australian Cretaceous - a review. A.N.U. Press, Canberra (in press).

Evans, P.R. 1966. Mesozoic stratigraphic palynology of the Otway Basin. Rec. Bur. Min. Resour. Geol. Geophys. Aust. 1966/69 (unpubl.).

Harris, W.K. 1965. Basal Tertiary microfloras from the Princetown area, Victoria, Australia. Palaeontographica 115B, 75-106.

4th September, 1967.

Mary E. Dettmann,
Department of Geology,
University of Queensland,
St. Lucia, Queensland.