

APPENDIX 4

PALAEONTOLOGICAL REPORT (by D. J. TAYLOR, SYDNEY)

27 side wall cores were examined between 1250' and 3611', but no fauna was found in any of these samples. Ditch cutting samples were examined at 20' intervals (sometimes at 10' intervals) between 450' and 1200' and after that at 50' intervals to 3000'. Despite sporadically intense down-hole contamination, at least 3 biostratigraphic horizons were recognised down to 1200'. Below 1200' no new fauna was reported and the section below 1200' is believed to be barren of foraminifera. Fauna above 450' were highly contaminated and rather confusing and have been ignored. The distribution chart lists grains (including fauna) retained in a 78 μ screen.

Some of the planktonic foraminifera, present as obvious contaminants, down to 1200', are indicative of the Pliocene. Such species as *Globotalia inflata*, *G. crassiformis* and *G. tosaensis* were recorded. This suggests Pliocene sediment at or near the surface Ross Creek-1, but the presence of Pliocene at a height of 500' above sea level is anomalous for the weak Pliocene transgression into southern Australia. However the possibility of laboratory contamination has been eliminated.

In the Ross Creek sequence, the fauna at 450' is no younger than early Miocene because of the presence of *Globigerina woodi connecta* and the total absence of the ultimate members of the *Orbulina* lineage (even as contaminants). Between 450' and 500' the fauna is no older than Zone H (basal Miocene). The environment was near-shore with deposition probably on the inner continental shelf. The percentage of planktonic foraminifera increased rapidly upwards (from 5% to 20%) between 500' and 450', reflecting the peak in sealevel rise at the top of the early Miocene.

No Oligocene planktonic foraminifera were identified and foraminifera were extremely rare between 500' and 740' where the sediment was dominantly quartz sand. The Oligocene may have been represented by a non-marine facies or, more likely, there was an Oligocene hiatus.

A distinct fauna, with late Eocene planktonic components, was recognised at 740'. The association of *Globigerina pseudoampliapertura*, *G. linaperta*, *G. angioroides*, *Globigerapsis index* and *Chiloguembelina cubensis* is suggestive of Zone L (Taylor, REF. 1). This very thin horizon is the only one that contains a late Eocene fauna in the sequence. The sediment is silty and weakly calcareous in contrast to the high percentage carbonate sediment of Zone L in the coastal Eocene enclaves within the Otway Ranges (e.g Browns Creek - Carter, REF. 2) where the silty sediment is older (i.e. Zone N). The environment was close shore with the presence of turritellid gastropods suggesting a tidal flat. This late Eocene fauna is a short lived, marginal expression of the peak, of the late Eocene transgressive pulse which declined in the succeeding Zone K.

Only contaminants were found between 750' and 1100' which probably represents late to early Eocene deltaic sands. Between 1100' and 1200' there are rare

benthonic foraminifera, representing species described by McGowran (REF. 3) from the lower Eocene and Paleocene outcrops of the Otway Basin. Most of this fauna was associated probably with the "Rivernook" ingressive event at the base of the early Eocene (Taylor, REF. 1). The environment was lagoonal.

No fauna older than early Eocene was found.

The Ross Creek sequence is an extremely marginal one as the three marine events present represent only the transgressive maxima of Bock & Glenie's (REF. 4) transgressive-regressive cycles 2, 3 and 4.

REFERENCES

- REF. 1. TAYLOR, D. J., 1971. Foraminifera and the Cretaceous and Tertiary depositional history in the Otway Basin in Victoria. *Geol. Surv. South Aust. & Vict., Spec. Bull.*; 217-234.
- REF. 2. CARTER, A. N., 1958. Tertiary foraminifera from the Aire District, Victoria. *Geol. Surv. Vict., Bull.* 55.
- REF. 3. MCGOWRAN, B., 1965. Two Paleocene foraminiferal faunas from the Wangerrip Group, Pebble Point coastal section, western Victoria. *Proc. Roy. Soc. Vict.*, 79; 9-74.
- REF. 4. BOCK, P. E., & GLENIE, R. C., 1965. Late Cretaceous and Tertiary depositional cycles in south western Victoria. *Proc. Roy. Soc. Vict.*, 79; 153-163.