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U.R. 1964/72

BIOSTRATIGRAPHY HEYWOOD NO.10 CORE SECTION

At the request of Frome-Broken Hill Co. Pty. Ltd., I have completely re-examined the Heywood No.10 section below 2,500 feet. I selected 3 samples from every core between 2,500 feet and 4,809 feet. Eight thin section of foraminiferal tests were cut to substantiate identifications. A draft copy of my biostratatigraphic log is attached for the interval from 2,500 feet to 5383½ feet.

The section above 2,500 feet was not examined as this section has been dealt with in detail by Reed (Cornell University M.Sc. Thesis and 1965). Reed found a continuous Tertiary sequence, extending from 1,228 feet to 191 feet which could be placed within Faunal Units 4 to 11 in Carter's (1958) scheme. Cores (at 1,315 to 1,355 feet) within the Nelson Formation contained sparse faunas which Reed considered to be Faunal Unit 4 with a possibility of Faunal Unit 3. Reed found no fauna between 1,355 feet and 2,500 feet.

Below 2,500 feet the highest fauna is that at 2,741 to 2,760 feet where Haplophragmoides cf. paupera and H. cf. incisa are recorded. This species association is typical of the Eocene and is not known in the Paleocene as is shown by Taylor (1965). No further fauna is recorded till 3,473 feet where H. paupera and Martinottiella stainforthii are present. The former species is a component of Taylor's (l.c.) "Paleocene Haplorhragmoides fauna" whilst the latter is always associated with Paleocene species in Victoria (Taylor, manuscript) and has apparently the same distribution in Peru (Weiss, 1955). The core at 3,899 to 3,910 feet contains another typically Paleocene arenaceous fauna including M. stainforthii and Ammobaculites midwayensis. The first calcareous fauna appears at 3,993 feet, and this contains the planktonic elements Chiloguembelina trinitatensis and Globigerina cf. eagensis which are characteristic of the Rivernook fauna according to McGowran (1965) who places this fauna within the upper Paleocene. This horizon would be the correlate of the 1,000 foot level within the La Trobe

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No. 1 bore (Taylor, manuscript). The core between 4,114 feet and 4,124 feet contains a rich fauna diagnostic of the Pebble Point fauna which McGowran (l.c.) considers to be middle Paleocene. The presence of Haggatella sp. nov. and a particular morphotype of Globorotalia chapmani is of significance. It is of interest that the Pebble Point fauna is richly developed in the Dilwyn Clay (= Dartmoor) lithology. But similar occurrences are now being found around Casterton and in the Parish of Kanawinka (north west of Casterton) in drilled sections. The Paleocene is present to at least 4,343 feet where a core contains Haplophragmoides conplana -ta and Martinottiella Stainforthii. It is possible that this fauna represents the oldest marine Paleocene sediments in Australia. McGowran (1965) considers that the Pebble Point fauna is the oldest marine Paleocene but this/is some 200 feet below a definite Pebble Point fauna. Heywood sample

As Taylor (1964) reports the first Upper Cretaceous fauna was recorded in cuttings at 4,700 feet. The interval between 4,343 and 4,700 feet is barren of foraminifera. This "barren interval" between the uppermost Cretaceous and the lowermost Tertiary is present throughout coastal western Victoria (Taylor, l.c.)

Consideration must be given to the Tertiary section below the base of the Nelson Formation (at 1,373 feet) to the lowest Tertiary fauna at 4,343 feet. Is a thickness of 2,970 feet excessive for sediments of Paleocene and Eocene age? In the case of the Paleocene we must consider the La Trobe No. 1 bore where Taylor (manuscript) reports the highest marine Paleocene fauna at 678 feet whilst Mr. J. Douglas (Vict. Geol. Survey) and Mr. W. Harris (South Aust. Geol. Survey) agree that the core at 1,531 feet contains lower Tertiary micro-flora. Thus there is over 800 feet of Paleocene sediments in La Trobe No. 1 which is towards the margin of the Otway Basin. In Heywood No. 10 we have a proven thickness of 870 feet of Paleocene sediments. It follows that there is 2,000 feet of Eocene sediment in the bore. Unfortunately most of this sediment is barren of foraminifera. However, within the

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upper Eocene there is a tendency of facies change from marine to marginal marine non-marine across western Victoria from Port Campbell to Heywood, Nelson, Dartmoor and Casterton. The upper Eocene, in the Port Campbell area is represented by organic marls and limestones which would be deposited at a slower rate than the silts and sands further to the west. It is noted that the lower to middle Eocene is always represented by marginal marine to non-marine silts and sands and never by marine sediments in western Victoria.

Frome-Broken Hill geologists suggest that part of the Heywood No. 10 section is repeated by faulting. Be that as it may, but biostratigraphic evidence does not lend support to such a contention. Furthermore, if the Heywood No. 10 section is effected by faulting, then so must be the Nelson bore section where Baker & Cookson (1955) consider that the Tertiary section extends to at least 4,250 feet, and that the Tertiary sands and silts are thicker than those in Heywood No. 10.

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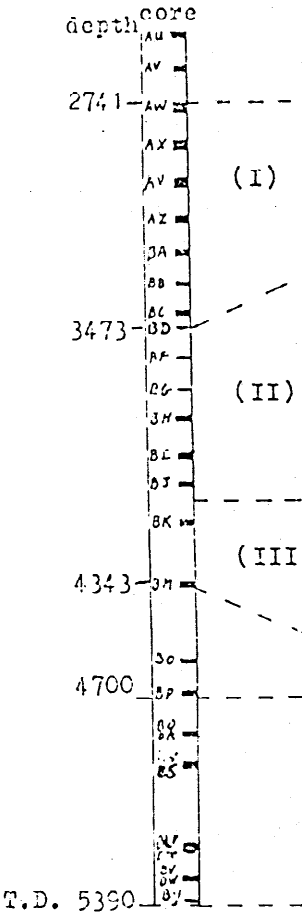
LITHOSTRATIGRAPHIC LOG - HEYWOOD No.10 BORE.

(datum = + 100')

Section to 2500 feet examined and [illegible] by Reed (1965). Marine fauna as to [illegible]. Core AI & AJ poor faunas of Faunal Unit 4 (Janjukian) or possibly F.U.3.

No faunas found between 1355 & 2741 feet.



Sporadic Eocene Haplophragmoides assemblages of Taylor (1965).
Probably EOCENE from below 1355 feet

Highest PALEOCENE in Core BD with Paleocene Haplophragmoides assemblage and Trimosina stainforthii. Similar faunas in [illegible] & BL.
First open marine development in [illegible] planktonic species Chiloguembelina trinitatensis & Globigerina eocenica. [illegible] upper Paleocene - Rivernook fauna.

Middle PALEOCENE Pebble Point fauna [illegible], including Baggatella sp. nov. in BK, but lithology is Dilwyn. In this section the middle Paleocene is better developed than to east. BK contains sparse Paleocene fauna.

No fauna found.

UPPER CRETACEOUS (Zonule A of Taylor, 1964) Sparse arenaceous faunas suggesting marginal marine conditions, though BX contains a fauna, including a belemnite (indet.), which indicates restricted marine conditions.

Scale 1" : 500'. "

COMMENTS:- (I) Would suggest nearly 3000 feet of Eocene sediments in section, which indicates a greater accumulation rate than in Port Campbell area where upper Eocene calcareous sediments are present.

(II) Marine ingressions within the upper Paleocene do not appear as numerous as in the east (e.g. La Trobe section). Rivernook fauna not [illegible] nor as rich as in La Trobe or outcrop (McGowran, 1965).

(III) Pebble Point fauna of McGowran (l.c.) is seldom present in sub surface section to the east, but is well developed in Heywood and to the northwest (Casterton area). The sparse fauna in core BK can be regarded as the oldest Paleocene fauna recorded in Victoria as it is 200 feet below definite Pebble Point.

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24-11-64.