

PALYNOLOGY OF CORE SAMPLES FROM YANGERY No.1, LAANG No.1, BELFAST No.4,  
HEYWOOD No.10, NARRAWATURK No.2, PORTLAND No.3, LATROBE No.1, AND  
ECKLIN No.3, BORES

Core samples recovered from several Mines Department of Victoria bores sunk in the Otway Basin form the basis of the present study. The deposits examined are from the following bore sequences: Yangery No.1, Laang No.1, Belfast No.4, Heywood No.10, Narrawaturk No.2, Portland No.3, Latrobe No.1, and Ecklin No.3. These sequences include both marine and non-marine sediments which range in age from Lower Cretaceous to Tertiary.

YANGERY No.1 BORE

Fair concentrations of well preserved spores and pollen were obtained from the lowest horizons examined (3379-4330 feet). The two samples from between these levels contain Dictyotosporites speciosus Cookson & Dettmann in association Crybelosporites striatus (Cookson & Dettmann) and thus their microfloras are clearly conformable with the younger (Aptian) category of the Speciosus Assemblage. Comparable associations were recovered from several other Mines Department of Victoria bores examined previously (1964a) viz: Carpendit No.1 between 1474 and 1478 feet and Tandarook No.1 between 2015 and 2028 feet.

The core sample from 3193-208 feet in Yangery No.1 was found to be devoid of plant microfossils, whilst the stratigraphically higher sample from 3016-31 feet contains a well preserved microflora assignable to the Aptian-Albian Paradoxa Assemblage. Stratigraphically important species include Coptospora paradoxa (Cookson & Dettmann), C. striata Dettmann, and Concavissimisporites penolaensis Dettmann which suggest correlation of the sample with horizons at 3858-75 feet in Mepunga No.7 bore.

All of the three succeeding samples examined contain poorly preserved microfloras in which cf. Gleicheniidites sp. is present. As such the microfloras conform with Assemblage III of Upper Cretaceous age. Moreover, cores

AQ and AP contain microplankton which facilitate more precise age determination. Core AQ (2863-67 feet) yielded Gonyaulax edwardsi Cookson & Eisenack and Odontochitina operculata Deflandre which suggest a Cenomanian-Lower Turonian age and indicate correlation with Port Campbell No.4 well between 4894 and 4914 feet and equivalents of the latter sequence (see Dettmann 1964b). Core AP (2712-19 feet) contains Deflandre cretacea Cookson, Amphidiadoma denticulata Cookson & Eisenack, Deflandrea victoriensis Cookson & Manum, and Hexagonifera vermiculata Cookson & Eisenack, an association indicative of a Turonian-Senonian age (see also Douglas 1961, p.6). Comparable microplankton suites occur in several of the Port Campbell wells and Flaxmans No.1 well (see Dettmann 1964c,d)

#### LAANG No.1 BORE

The two lower samples (between 3869 and 4094 feet) contain well preserved spores and pollen including Coptospora paradoxa, the index of the Aptian-Albian Paradoxa Assemblage. Thus these horizons may be considered correlatives of Yangery No.1 bore at 3016-31 feet.

The other sample examined (3532-46 feet) provided sparse numbers of microfossils including the microplankton Hystriosphæridium heteracanthum Deflandre & Cookson and Deflandrea victoriensis. These species indicate that Assemblage III is represented in the sediments, and suggest a correlation with Yangery No.1 bore at 2712-19 feet.

#### BELFAST No.4 BORE

Only a few poorly preserved plant microfossils were extracted from the sample from 5501-21 feet. Moreover, none of the species observed is stratigraphically significant except that they confirm an Upper Mesozoic age. Succeeding horizons between 5344-54 feet contain poorly preserved specimens

of Cicatricosisporites pseudotripartitus (Bolkhovitina) and Foraminisporis asymmetricus (Cookson & Dettmann) which indicate that the Aptian-Albian Paradoxa Assemblage is probably represented at these levels. The sample from 5065-73 feet was devoid of plant microfossils, whilst a diverse assemblage of spores, pollen, and microplankton is present in the sample from 3561-65 feet. These include Nothofagus spp. and the microplankton Xenikoon australis Cookson & Eisenack suggesting that the horizons are uppermost Cretaceous or Lower Tertiary in age. A Tertiary dating is favoured since Douglas (1961) reports Tertiary species of Deflandrea from a deposit at 4074-76 feet. This author also reports Upper Cretaceous microplankton from lower in the sequence (4285-4655 feet). Cookson and Eisenack ((1961) assigned a Senonian age to part of this interval (4492-4652 feet).

HEYWOOD No.10 BORE

The lowest horizons examined (4920-5383 feet) yielded cf. Gleicheniidites sp. together with microplankton including Deflandrea cretacea, Odontochitina cribropoda Deflandre & Cookson, and Hexagonifera vermiculata. These associations conform with Assemblage III and indicate correlation of the sediments with beds between 2712-19 feet in Yangery No.1 bore. This evidence supports Douglas' (1961) contention that beds between 5171-84 feet in Heywood No.10 bore and between 2712-19 feet in Yangery No.1 bore are equivalents. Stratigraphically higher beds (4809-22 feet) contain cf. Gleicheniidites sp. together with Nelsoniella aceras Cookson & Eisenack (see also Douglas 1961) indicating a Senonian or later age. These sediments also contain Lower Cretaceous remanié fossils including Dictyotosporites speciosus.

The upper sample (4688-95 feet) contains cf. Gleicheniidites sp. and an abundance of angiosperms including Nothofagus together with Xenikoon

australis. Thus, this interval is probably uppermost Cretaceous or Lower Tertiary in age.

NARRAWATURK No.2 BORE

With the exception of the deposit from 5147-50 feet, which is barren, all samples examined yielded Nothofagus spp. and Hystrichosphaeridium spp. Moreover, the sample from 5327-36 feet provided Nelsoniella aceras which suggests a late Upper Cretaceous age. Higher in the sequence (4715-30 feet) Triorites edwardsii Cookson & Pike makes its appearance indicating conformity of the microflora with Microflora B of Cookson (1954). This microflora is believed to indicate a late Upper Cretaceous or early Tertiary age (see Evans 1962) and was recorded (Dettmann 1964a) from Cooriejong No.1 bore at 1535-54 feet.

PORTLAND No.3 BORE

The lower sample (5467-76 feet) did not yield plant microfossils whilst the upper sample (5278-86 feet) provided poorly preserved spores, pollen grains, and microplankton. These include cf. Gleicheniidites sp., Nothofagus, and Hystrichosphaeridium spp. which suggest a late Upper Cretaceous age.

LATROBE No.1 BORE

Samples from 1735-39 feet and 1627-31 feet contain cf. Gleicheniidites sp. and Deflandrea cretacea. The presence of these species indicate that Assemblage III is represented at these levels which may thus be correlated with Yangery No.1 bore at 2712-19 feet and Heywood No.10 bore at 5380-85 feet. The upper sample (1400-15 feet) yielded abundant Nothofagus suggesting a late Upper Cretaceous or Tertiary age.

ECKLIN No.3 BORE

No plant microfossils were obtained from the lowest sample examined. The succeeding deposit (2474-99 feet) yielded poor concentrations of poorly preserved plant microfossils. These include Cyclosporites hughesi (Cookson

& Dettmann) and Kraeuselisporites linearis (Cookson & Dettmann) both of which are known in the Stylosus Assemblage and the older category of the Speciosus Assemblage. On this basis the sample may be regarded as Lower Cretaceous (Aptian or older) in age. The upper sample (2142-44 feet) contains abundant Nothofagus suggesting a late Cretaceous or Tertiary age.

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