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✓ PALYNOLOGICAL REPORT ON CRETACEOUS CORE SAMPLES FROM

F.B.H. FLAXMANS NO.1 WELL

Twenty seven core samples from between 11,528 feet and 5950 feet in F.B.H. Flaxmans No.1 Well include both marine and non-marine equivalents of the Otway Group and form the basis of the present report. The acid resistant microfossils (spores, pollen, and microplankton) obtained from the samples are compressed and those recovered from the stratigraphically lowest horizons are poorly preserved. Moreover, several of the cores (nos. 18, 19, 25, 26, 29, 31, 37) were either barren or yielded only extremely sparse microfloras. Nevertheless, the majority of the microfloras include one or more sufficiently well preserved species that are diagnostic of the Lower and Upper Cretaceous microfloras assemblages recorded by Dettmann (1963a,b,c; 1964) from marine and non-marine strata elsewhere in the Otway Basin.

Four, distinct microfloral assemblages occur successively in the Flaxmans No.1 Well deposits examined and include: the Speciosus and Paradoxa Assemblages of Dettmann (1963a) and Assemblages II and III of Dettmann (1964). The presence of these assemblages enables ? correlation of the Flaxmans beds with marine and non-marine Cretaceous strata in the Port Campbell wells and with non-marine Cretaceous outcrop and bore deposits at other localities in the Otway Basin. Furthermore, the microfloral evidence indicates that the horizons investigated from Flaxmans No.1 Well range in age from Aptian to Turonian/Senonian.

The distribution of selected spore, pollen, and microplankton species within the sequence in Flaxmans No.1 Well is recorded in Table 1.

Comments on this distribution and on the four microfloral assemblages identified in the Flaxmans sequence are presented below.

The Speciosus Assemblage: Core nos. 41-44 in the interval 10,801-11,528 feet contain poorly preserved microfloras conformable with the Speciosus Assemblage of Dettmann (1963a). Stratigraphically important species include Dictyotosporites speciosus Cookson & Dettmann, Pilosporites notensis Cookson & Dettmann, and Crybelosporites striatus (Cookson & Dettmann) which indicate that the younger (Aptian) microfloral category of the Speciosus Assemblage is represented in these beds. Equivalent microfloras have been recorded previously from the Barrabool Hills in the eastern portion of the basin and from Eumeralla No.1 between 6034 and 6702 feet, Penola No.1 between 2790 and 3000 feet, Robe No.1 between 3150 and 3500 feet, Comaum No.2 at 651 feet, and Beachport No.1 at 3946 feet in the western portion of the basin (see Dettmann 1963a, Tables 4,8; 1963b; 1963c; 1964). On microfloral evidence these deposits are older than the lowest horizons examined from the Port Campbell wells.

Core nos. 37-40 yielded microfloras not certainly identifiable with either the Speciosus or Paradoxa Assemblages. However, the presence of Dictyotosporites filiosus Dettmann together with Crybelosporites striatus in core 40 (10,492-502 feet) indicates correlation of this horizon with the following western Otway Basin deposits: Penola No.1 2790-98 feet, Robe No.1 3150 feet, Beachport No.1 3946 feet, and Eumeralla No.1 6242-52 feet.

The Paradoxa Assemblage: This assemblage was encountered in samples between 7473 and 9135 feet in Flaxmans No.1 Well. Microspore species

present include Coptospora paradoxa (Cookson & Dettmann), Trilobosporites trioreticulosus Cookson & Dettmann, Pilososporites grandis Dettmann, and Kraeuselisporites majus (Cookson & Dettmann). Microplankton make their first appearance in core 28 (7473-93 feet) and are represented by Gonyaulax edwardsi Cookson & Eisenack, Odontochitina operculata Deflandre, and Hystriichosphaeridium spp. These spore and plankton associations indicate that the sediments between 7473 and 9135 feet in Flaxmans No.1 Well range in age from Aptian to Albian. Microfloral assemblages of equivalent age occur in non-marine subsurface strata at Port Campbell (No.3 Well, 5526-30 feet), Beachport (No.1 Well, 2094-3670 feet) and at other localities listed by Dettmann (1963b, p.4).

Assemblage II: Diagnostic components of Assemblage II (of Upper Albian-Cenomanian/Turonian age) have been identified in core 24 (6882-~~72~~⁷² feet) ⁶⁸⁸²⁻⁶⁹⁰² of Flaxmans No.1 Well. Stratigraphically lower samples (core nos. 25, 26) contain no diagnostic species, whilst core 27 (7200-20 feet) has yielded a diverse microflora which from the present investigation is not certainly identifiable with either the Paradoxa Assemblage or Assemblage II. However, Cookson and Balme (1962) record Amosopollis cruciformis Cookson & Balme from core 27; this record indicates that Assemblage II is in fact represented at 7200-20 feet.

Microplankton including Gonyaulax edwardsi, Odontochitina operculata, and Hystriichosphaeridium spp. occur in some of the Flaxmans deposits that contain Assemblage II. Similar but more diverse spore, pollen, and plankton suites referable to Assemblage II were identified in samples from the Port Campbell wells (No.1, 5700-5934 feet; No.2, 8096-8624 feet; No.3, 4781-4801 feet - see Dettmann 1964).

(1.22 (6871-77))

Assemblage III: The characteristic cf. Gleicheniidites sp. marks the first appearance of Assemblage III in core ~~81~~ ³² (8832-72 feet) of Flaxmans No.1 Well. This sample also contains high concentrations of angiospermous grains and microplankton. Cores 18-20 are either barren or have yielded no diagnostic species, whilst the only succeeding horizons examined (5950-6391 feet) contain more varied microfloras that include cf. Gleicheniidites sp. in association with the microplankton Odontochitina cribropoda Deflandre & Cookson, Deflandrea tripartita ^{= victoriensis} Cookson & Eisenack, D. cf. D. belfastensis Cookson & Eisenack, D. cretacea Cookson, Hexagonifera vermiculata Cookson & Eisenack, and H. glabra Cookson & Eisenack. Such an association is comparable to those encountered at the following depths in the Port Campbell wells: No.1 Well at 5225-33 feet, No.2 Well at 7403-09 feet, and No.3 Well at 4400-10 feet.

PERMIAN FOSSILS

Permian and Triassic spore and pollen species occur in Flaxmans No.1 Well core nos. 17, 27, 28, 33, and 39. These and previously recorded occurrences (Evans 1963, Dettmann 1963b,c; 1964) illustrate that Permian and Triassic types are widely dispersed in Upper Mesozoic sediments of the Otway Basin.

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	Microspores																					Mega-	Pollen	Microplankton	
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	spores			
c.16 5950-70'																									
c.17 6575-91'																									
c.18 6606-16'																									
c.19 6616-26'																									
c.20 6626-36'																									
c.21 6832-70'																									
c.22 6871-77'																									
c.24 6882-6902'																									
c.25 6902-13'																									
c.26 6982-7000'																									
c.27 7200-7220'																									
c.28 7473-93'																									
c.29 7648-66'																									
c.30 7864-70'																									
c.31 7966-78'																									
c.32 8139-50'																									
c.33 8150-61'																									
c.34 8470-86'																									
c.35 8884-96'																									
c.36 9123-35'																									
c.37 9499-9520'																									
c.38 9772-85'																									
c.39 10122-34'																									
c.40 10492-502'																									
c.41 10801-17'																									
c.42 11087-92'																									
c.43 11225-35'																									
c.44 11517-28'																									

Table 1. Distribution of selected spore, pollen, and microplankton species in core samples from the lower part of the Mesozoic sequence in F.B.H. Flaxmans No.1 Well.

+ - species present; cf - specimens similar to, but not identical with, a particular species; * - record of Cookson and Balme (1962).

species within the sequence in Flaxmans No.1 Well is recorded in Table 1.