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A PALYNOLOGICAL REPORT ON ARCO-WOODSIDE DUCK BAY NO. 1 WELL

by

P.R. Evans and E.A. Hodgson

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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SUMMARY

Seven core samples from Duck Bay No.1 Well have been examined for spores and pollens. They indicate that, below a Tertiary sequence, the well penetrated lowermost Cretaceous or uppermost Jurassic sediments overlying altered olivine basalt, which in turn overlies a Lower Permian, non-marine sequence.

INTRODUCTION

Arco-Woodside Duck Bay No.1 Well was drilled during February 1964 at Latitude 37°56' 45" South, Longitude 147°39'36" East in the Gippsland Basin to a total depth of 4125 feet.

It was drilled to determine the Mesozoic sequence, especially basal Mesozoic, and to investigate the pre-Mesozoic section. Soon after the well was completed, Core 6 (3708 feet) was submitted by the company for palynological examination and was found to contain spores of Lower Permian age. This record outlines results obtained from an examination of further cores from the well to determine the limits of the Permian sequence (Plate 1).

OBSERVATIONS

Core 3 (2831 - 32 feet)

This sample, a fine-grained siltstone, contained many moderately well preserved microfossils.

Spores and Pollens

Sphagnumsporites sp.

Cyathidites spp.

Baculatisporites comaumensis (Cookson)

Neoraistrickia truncatus (Cookson)

Leptolepidites verrucatus Couper

Ischyosporites sp.

Lycopodiumsporites circolumenus Cookson and Dettmann

Lycopodiumsporites rosewoodensis de Jersey

Dictyotosporites sp. Cookson and Dettmann

Contignisporites cooksonii (Balme)

Murospora cf. florida (Balme)

Disaccites spp.

Podocarpidites sp.

Microcachyridites antarcticus Cookson

Tsugaepollenites segmentatus (Balme)

Classopollis torosus (Reissinger)

Ginkgocycadophytus sp.

Microplankton

Micrhystridium sp.

Gen.et sp. indet., cf. "form A" Cookson and Eisenack 1960.

The presence of Neoraistrickia truncatus, Lycopodiumsporites circolumenus and Dictyotosporites sp. indicates that this core is of uppermost Jurassic or lowermost Cretaceous age. The few specimens of Micrhystridium sp. observed in the sample suggest that it is of marine or brackish origin.

The sample was characterised by a great abundance of small (about 30 μ diameter) ring like bodies of uncertain origins which compare closely with "Form A" Cookson and Eisenack (1960). The Duck Bay specimens differ only in size from Cookson and Eisenack's forms which averaged 43-52 μ in diameter. Cookson and Eisenack found "Form A" in the Wrotham Park Sandstone of the Carpentaria Basin in Queensland, high in the Blythesdale Group at Oodnadatta, South Australia, and in the Birdrong Formation of the Carnarvon Basin, Western Australia. Each of these horizons is a precursor of widespread Aptian marine deposits and they are generally regarded as Lower Cretaceous in age. "Form A" has not yet been recorded from undoubtedly marine sediments and may, perhaps, be a brackish water indicator.

Core 4 (3197-99 feet) and Core 5 (3393-94 feet)

Samples of these cores were examined by Mr. W.D. Dallwitz who considered them to be an "altered olivine basalt" (pers.comm.). The presence of associated red-brown shales, indicated on the graphic log, suggests that the basalt was subaerially extruded.

Core 6 (3708 feet)

Leiotriletes directus Balme and Hennelly

Verrucosisporites cf. V. pseudoreticulatus Balme and
Hennelly

Nuskoisporites triangularis Mehta (relatively abundant)

Ginkgocycadophytus sp.

Striatiti spp.

The assemblage is of Permian age; probably Lower Permian in view of the abundance of Nuskoisporites triangularis.

Core 7 (3390-92 feet)

A few fragmentary specimens of Nuskoisporites triangularis, Leiotriletes directus and Granulatisporites micronodosus Balme and Hennelly were present in this sample and indicate that at this depth the well was still in Permian rocks.

An abundance of Nuskoisporites typifies the Lower Permian of the Murray Basin (Evans, 1962; Evans in Wright and Stuntz, 1963). In contrast to these Lower Permian rocks, no algae or acritarchs were observed in the Duck Bay Cores 6 and 7. The absence of these organisms suggests that the samples are probably of non-marine origin.

Core 8 (4153-55 feet):

Barren

Core 9 (4215-17 feet)

Barren

COMMENTS

In view of these observations, the well section can probably be subdivided as in Plate 1.

The Lower Permian at Duck Bay is the first indication of the existence of beds of such age in the Gippsland Basin.

The age of the volcanics is indeterminate other than within the limits Lower Permian - Upper Jurassic.

The Mesozoic section is apparently the same age as the core samples from 7785 and 8862 feet in Woodside No.2 Well which were palynologically examined by Dettmann (1959) who considered them to be "pre-Albian (probably Neocomian-Aptian or possibly uppermost Jurassic (Cookson and Dettmann 1958))".

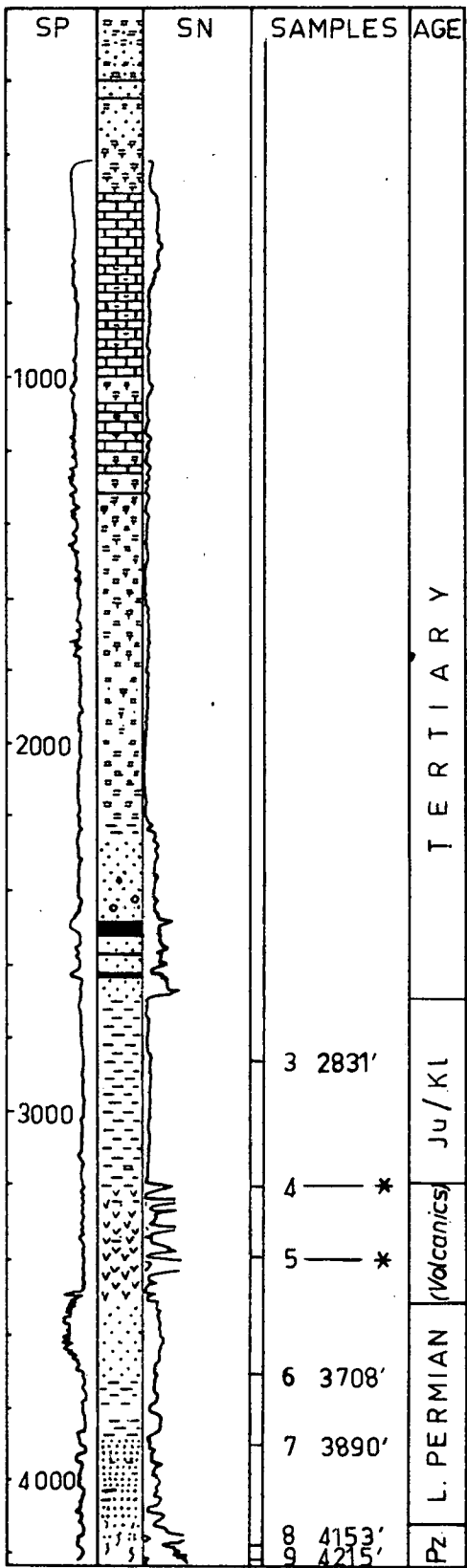
This is the first record of lowest Cretaceous-uppermost Jurassic sediments in Victoria to perhaps have marine or brackish connections. Webb (1961) considered that marine Cretaceous beds were penetrated by the Bengworden South No.1 (Holland's Landing) Well at a depth of 3949-4004 feet (T.D.) on the basis of foraminiferal evidence supplied by D.J. Taylor of the Victorian Mines Department. A sample from a depth of 3977 feet in this well, part of the material originally studied by Crespin (1941), was examined in the present investigation. No microplankton were observed in it and the spores which it contained indicate that it is probably younger than Core 3 of Duck Bay No.1 Well.

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ARCO-WOODSIDE DUCK BAY No.1 WELL

37° 56' 45" S
147° 39' 36" E
KB 79'
GL 68'



Reference

- Sandstone
- Siltstone
- Shale
- Claystone
- Marl
- Limestone
- Coal
- Conglomerate
- Slate
- Volcanics

* Petrologically examined by W.B. Dallwitz

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