North Seaspray - 1

APPENDIX NO. 4.

PALEONTOLOGICAL REPORTS

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REPORT ON FAUNA FROM NORTH SEASPRAY NO. 1.

by

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Cores 1 to 5 (350 feet), and rotary cutting samples to 2700 feet have been examined from Arco-Woodside's North Seaspray No. 1 Well.

The stratigraphy, based on foraminiferal content, is outlined below in drilled order. All lithological units and stage names are those used and defined by Carter (1962).

0 - 270 feet : This interval comprised mainly sand. No Foraminifera or other marine fossils were found. These sands are probably Pliocene - Pleistocene in age and may represent the Lake Wellington Formation and/or the Haunted Hill gravels.

270 - 620 feet: From 270 feet to 512 feet the Foraminifera are abundant and specimens are large in size. The species present include Elphidium imperatrix, E.crassatum, E. parri, Rotalia beccarri, Valvulineria kalimnensis, Globigerinoides conglobata and Triloculina tricultrata. This fauna is typical of the Jemmy's Point Formation which represents the Kalimnan Stage of Pliocene age.

From 512 to 590 feet the fauna is smaller and contains no diagnostic species. This may represent the Mitchelian Stage and thus the sediment is the equivalent of the Tambo River Formation. However, Carter (loc. cit.) states it is difficult to separate the Jemmy's Point Formation from the Tambo River Formation in drilled sections.

From 590 to 620 feet coarse sand was present which contained no fauna.

620 - 850 feet : This interval comprises the top of the

calcareous section which contained abundant benthonic and planktonic Foraminifera. The individual specimens were small in size. Orbulina universa was present. This interval contains the Baimsdalian Stage (middle Miocene) and represents the Baimsdale Limestone which is the highest member of the Gippsland Limestone.

850 - 1000 feet : The first appearances of Notoretalia mioclathra, Amphistigina lessonii, and Operculina victoriensis. N.mioclathra does not occur above the Balcombian Stage whilst the other two species are typical of the Wuk Wuk Marls (Balcombian Stage).

1000 - 1400 feet : Contains abundant larger foraminiferal fauna including Lepidocyclina howchini, Gypsina howchini, Cycloclypeus victoriensis, Amphistigena lessonii and Operculina victoriensis which is typical of the Batesfordian Stage. Thus this interval probably represents the Glencoe Limestone. But the boundary between the Glencoe Limestone and the Wuk Wuk Limestone cannot be accurately designated on rotary cuttings.

1400 - 1700 feet : The first appearance of Astrononion centroplax was noted at 1400 feet. This species does not range above the Longfordian Stage. This interval is the equivalent of the Longford Limestone although it contains mainly silts.

1700 - 1940 feet : Lithologically similar to the preceding interval but contains Victoriella conoidea (Victoriella "plecto") which is the characteristic species of the Janjukian Stage. Therefore the sediment is the equivalent of the Lakes Entrance Formation.

1940 - 3504 feet : Brown coal fragments were first noted at 1940 feet. No new species of Foraminifera were present in rotary cutting samples and specimens which were isolated are believed to be contamination. Cores Nos. 1 to 5 are within this interval and no fossils were found in the samples examined.

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Comments on Stratigraphy :

Nothing can be said regarding the basal Tertiary and pre-Tertiary portion of the section because of absence of fauna. The marine Tertiary sequence commenced with the Lakes Entrance formation. The greensand member of this Formation is absent in this section, but it is also absent in other sections from the central part of the basin. In this well the thickness of the Lakes Entrance Formation is consistent with that of other sections in the central part of the basin (e.g. Wellington Park No. 1). The boundary between the Lakes Entrance Formation and the Longford Limestone is not lithologically finite, as the basal part of the Longford Limestone is represented by a silt facies in the central part of the basin as well as to the west in the Woodside area. Thus the boundary placed at 1700 feet is a biostratigraphic one and corresponds with the boundary between the Janjukian and Longfordian Stages.

There is no apparent break between the argillaceous sequence (Lakes Entrance Formation and in part the Longford equivalent) and the calcareous sequence (Gippsland Limestone). However, there appears to be a break in marine sedimentation at 620 feet at the top of the Gippsland Limestone (= Bairnsdale Limestone Member). From 620 to 590 feet no samples contain Foraminifera and the sands are believed to be of non marine origin. Also the Mitchellian (represented in the Gippsland area by the Tambo River Formation) is not clearly recognisable between the top of definite Bairnsdalian at 620 feet and the base of typical Kalimnan at 512 feet. Carter (1962) states that the Tambo River Formation is conformable with the top of the underlying Gippsland Limestone in outcrop on the northern bank of the Tambo River near the northern margin of the Gippsland Basin. It is suggested that, as this Well is situated on a structural high, the Tertiary structural movement took place in the late Miocene and early Pliocene; that is after the deposition of the Jemmy's Point Formation. There is no suggestion that this movement took place lower in the Tertiary, before the Tertiary marine transgression) e.g. the Lakes Entrance Formation).

The Marine Tertiary sequence in North Seaspray No. 1 46/54 is tabulated below. (Depths quoted are drilled depths taken from the kelly bushing which was 88 feet above sea level).

Depth	Faunal Units (Carter 1959)	Australian Stages (Carter, 1959)	Formation	Rock Units (Carter, 1962) Member
to 270'			Lake Wellington or Haunted Hills Gravels	
270' to 512'		Kalimnan	Jemmy's Point	
512' to 620'		? Mitchellian	? Tambo River	
620' to 850'	11	Bairnsdalian	GIPPSLAND LIMESTONE	Bairnsdale Limestone
850' to 1000'		Balcombian		Wuk Wuk Marls
1000' to 1400'	9	Batesfordian		Glencoe Limestone
1400' to 1700'	8 to 6	Longfordian		Longford Limestone
1700' to 1940'	5	Janjukian	LAKES ENTRANCE	

(Signed) D. J. TAYLOR - Geologist.
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References :

Carter, A.N. 1959 - Guide Foraminifera of the Tertiary Stages in Victoria. Vic. Mining & Geol. J.6. (3), 48-54.

Carter, A.N. 1962 - Tertiary Foraminifera from the Gippsland, Victoria and their stratigraphic significance. Geol. Surv. Vict., Memoir (in press)