

PALEONTOLOGICAL REPORTREPORT ON TERTIARY STRATIGRAPHY FROM
SOUTH-WEST BAIRNSDALE NO. 1 WELL

by

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Rotary cuttings samples have been examined from 30' to 1420' in Arco-Woodside's Southwest Bairnsdale No. 1 Well. No cores were cut in this interval, thus because of contamination the boundaries given cannot be considered exact and the maximum error is probably -30'.

The stratigraphy, based on foraminiferal content, is outlined below in drilled order. Unless otherwise stated, all rock units and stage names are those used by Carter (1963).

30 - 200 feet:

Unfossiliferous sands. These are probably Pliocene - Pleistocene in age and may represent the Lake Wellington Formation and/or the Haunted Hill Gravels.

200 - 280 feet:

Fossiliferous sands and clays, with an abundant fauna of large Foraminifera including Elphidium imperatrix, Massilina lapidigera, and Triloculina tricultrata. This fauna is typical of the upper Miocene Tambo River Formation. Millioids predominate (90% to 99%) the foraminiferal fauna which suggests a shallow water (probably shoreline) environment.

280 - 550 feet:

The top of the Gippsland Limestone is at 280 feet. The fauna between 280 feet and 550 feet contains planktonic elements, including Orbulina universa, which are typical of the Bairnsdalian Stage and of the Bairnsdale Limestone Member. A high proportion of millioids and lagenids are noted. This proportion is unusually high for the Bairnsdale Limestone, and a near shore environment is suggested.

530 - 650 feet:

The first drilled appearances of Planorbulinella plana and Globoquadrina dehiscons were noted in this interval. The highest appearances of these species in the Gippsland Limestone is recorded in the Wuk Wuk Marls.

650 - 1040 feet:

The first drilled appearance of Astrononion centroplax is noted at 650 feet. This would approximate to the top of the Longfordian Stage, which is represented by the Longford Limestone, the basal member of the Gippsland Limestone.

1040 - 1240 feet:

There is a marked faunal change at 1040 feet. The planktonic fauna is still abundant, but is predominated by globigerinids of the Globigerina ouachitaensis - G. bulloides group. Globigerinoides spp. are absent. The benthonic fauna includes Astrononion centroplax, Calcarina mackayi, Lamarkina glencoensis, Crespinina kingscotensis and Sherbonina atkinsoni. The latter two species are confined to the Janjukian whilst the other species, including the globigerinids, are typical of the Janjukian. Therefore the faunal change at 1040 feet suggests the top of the Janjukian stage in this well. This interval is lithologically similar to the Lakes Entrance Formation.

1240 - 1415 feet:

At 1240 feet, Globigerina linaporta is present. This is a pre-Janjukian species and does not range above Faunal Unit 3 (Carter, 1959). Carter (1963) does not record it from the Gippsland nor does he record any other species which do not range above Faunal Unit 4. At 1260 feet G. linaporta is present with the Eocene Benthonic species, Anomalina westraliensis, Cibicides umbonifer and Guembelina rugosa. This fauna is definitely Upper Eocene in age and probably represents Faunal Unit 3 as the planktonic elements of Faunal Units 1 and 2 are not present.

1415 feet to T.D.:

Refer to reports by Talent and Bell.

Comments on Stratigraphy:

The major item of stratigraphic interest in this section is the positive identification of Upper Eocene sediments overlying the Lower Carboniferous sandstone at 1415 feet. These Upper Eocene sediments comprise sands and gravels and are marine in the top 60 feet (the top being at 1240). Because of cutting contamination it is not known if marine conditions extend below 1300 feet, although sedimentation appears to be continuous. The sediments are similar to the lowest Tertiary sediments in the Lakes Entrance sub-surface sections in which Crespin (1943) found Foraminifera. She regarded the gravels to be pre-Janjukian (i.e. Anglesian) and to be the equivalent of the Latrobe Valley Coal Measures. Boutakoff (1954) adheres to this view and refers to these sediments as the "Colquhoun Gravels". Carter (1963) agrees with Boutakoff but regards Crespin's Foraminifera as being drilling contamination. Carter's view is justified as most of the species listed by Crespin are Miocene (post Janjukian).

It is concluded that the interval from 1240 feet to 1415 feet in Southwest Bairnsdale No. 1 Well is a distinct rock unit and that it represents the "Colquhoun Gravels" in the Lakes Entrance area. This conclusion is supported by the distinct faunal content which represents Faunal Unit 3. The fauna at the base of the overlying unit (the Lakes Entrance Formation) represents Faunal Unit 5. The "Colquhoun Gravels" are of the order of 60 feet thick under Lakes Entrance. The proximity to the Lower Carboniferous sandstones may account for the thicker development (175 feet) in the Southwest Bairnsdale section.

Both the base and top of the Lakes Entrance Formation are clear lithologically and closely corresponds with the paleontological determinations. The top is marked by the change from an arenaceous/argillaceous sequence to a calcareous sequence. This agrees with the type section at Lakes Entrance. But in the central and western part of the basin the change is more transitional so that the top of the Lakes Entrance Formation is difficult to pick on lithology alone. The greensand member of this Formation is not developed.

The Gippsland Limestone is not well developed. The Glencoe Limestone Members appear to be absent on paleontological grounds.

It is suggested that Tertiary marine sedimentation in this section took place close to the northern margin of the Gippsland Basin. This is supported by the palaeoecology of the Gippsland Limestone: the distinct boundary between the Lakes Entrance Formation and the Gippsland Limestone which agrees with the boundary between the Janjukian and Longfordian (as at Lakes Entrance); and the presence of the "Colquhoun Gravels" which are absent from the central, deeper parts of the basin.

The marine Tertiary sequence in Southwest Bairnsdale No. 1 well is tabulated below. (Depths quoted are drilled depths).

Depth ft.	Faunal Units (Carter) 1959)	Australian Tertiary Stages Carter, 1969	Rock Units (Carter, 1962)	
			Formation	Member
30-200			Lake Wellington or Haunted Hills Gravels	
200-230		Mitchellian	Tambo River	
230-550	11	Bairnsdalian	Gippsland Limestone	Bairnsdale Limestone
550-650	10	Balcombian		Wuk Wuk Marls
** 650-1040	8-6	Longfordian		Longford Limestone
1040-1240	5	Janjukian	Lakes Entrance	
1240-1415	3	Johannian	"Colquhoun Gravels"	

** Note absence of Batesfordian Stage and apparent absence of Glencoe Limestone.

References :

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- Crespin, I. 1943 The stratigraphy of the Tertiary marine rocks in the Gippsland, Victoria. Min. Resourc. Surv., Aust., Palaeont. Bull. 4.

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