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**RECORDS:**

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## MICROPALAEONTOLOGICAL EXAMINATION OF OUTCROP SAMPLES FROM BOUGAINVILLE T.P.N.G.

by

G.R.J. Terpstra



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C O N T E N T S



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# MICROPALAEONTOLOGICAL EXAMINATION OF OUTCROP SAMPLES FROM

# BOUGAINVILLE T.P.N.G.

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## SUMMARY

Miocene and Lower Miocene faunas have been observed in samples of outcropping limestones from Bougainville and Buka Islands.

## INTRODUCTION

Thirty eight samples collected by Messrs. D.H. Blake, Y. Miezites and F.S. Chong from outcrops of limestone on Bougainville and Buka Islands have been examined for microfissils. The location of the samples is shown on Fig. 1.

Details of the results of the examination are given below.

## OBSERVATIONS

| SPECIMEN NO. | MAP NO. | |
|---|---|---|
| 65490001 A | (SB/56-8) | Sohano Limestone. |
| | | Specimen from Base of 45 foot limtstone Cliff. Sohano Island (Echinoid Spines, Corals, Siphonodosaria sp, Discorbis sp, Miliolina sp. |
| | | No age determination. |
| 65490001 B | (SB/56-8) | Sohano Limestone. |
| | | Specimen from middle part of 45 foot cliff of limestone. Sohano Island. Echinoid Spines, corals, Cristellaria sp. |
| | | No age determination. |
| 65490009 A | (SB/56-8) | Sohano Limestone |
| | | Specimen taken from the base of a 300 foot cliff at Iltopan, Buka Island. Lamellibranchiata sp, Bryozoa sp., Algae sp, Globigerina sp Miliolina sp; "Linderina" sp. Quinqueluculina sp. Textularia sp. |
| | | Age probably Lower Miocene. |
| 65490009 B | (SB/56-8) | Sohano Limestone. |
| | | Specimen taken 12 foot above present day sea level. Same locality, as previous specimen. Corals, Algae sp. Amphistegina sp. |
| | | No age determination. |

| SPECIMEN NO. | MAP NO. | |
|---|---|---|
| 65490009 C | (SB/56-8) | Sohano Limestone.<br><br>Specimen taken from cliff face 50 foot above present sea level. Same locality, as previous specimens. Echinoid spines, Bryozoa sp. Amphistegina sp, Quinqueloculina sp.<br><br>No age determination. |
| 65490009 D | (SB/56-8) | Sohano Limestone.<br><br>Specimen taken from the top of the cliff. Same locality, as previous specimen. Echinoid spines, Mollusca, Algae sp, Coral, Globigerina sp Quinqueloculina sp.<br><br>No age determination. |
| 65490011 | (SB/56-8) | Sohano Limestone.<br><br>Specimen collected from limestone quarry on Buka Island. Coral, Bryozoa sp. No foraminifera.<br><br>No age determination. |
| 65490014 | (SB/56-8) | Sohano Limestone.<br><br>Specimen from entrance of Taema Caves Lonahan, east coast of Buka Island. Mollusca sp, Bryozoa sp, Algae sp, Echinoid Spines, Amphistegina sp, Golbigerina sp, Quinqueloculina sp., Textularia sp.<br><br>No age determination. |
| 65490141 | (SB/56-12) | Kieta Volcanics.<br><br>Limestone pebbles in conglomerate, near Iwi plantation, Bougainville Island. Lepidocyclina sp, "Linderina" sp<br><br>Age Lower Miocene. |
| 65490193 | (SB/56-12) | Keriaka Limestone.<br><br>Cape Moltke, Bougainville Island. No foraminifera.<br><br>No age determination. |
| 65490194 | (SB/56-12) | Keriaka Limestone.<br><br>Cape Moltke, Bougainville Island. Coral, Flosculinella sp.<br><br>Age Miocene probably Lower Miocene. |
| 65490195 | (SB/56-12) | Keriaka Limestone.<br><br>Four miles south of Cape Moltke, Bougainville Island. Coral, Echinoid spines, Ostracod sp, Haplophragmoides sp.<br><br>No age determination. |

| SPECIMEN NO. | MAP NO. | |
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| 65491002 c | (SB/56-8) | Buka Volcanics.<br><br>Limestone boulder in conglomerate, Madehas Island. No foraminifera.<br><br>No age determination. |
| 65491060 | (SB/56-8) | ?Keriaka Limestone.<br><br>Large boulder in stream bed, Uruai River, Bougainville Island. No foraminifera.<br><br>No age determination. |
| 65491120 | (SB/56-12) | Keriaka Limestone.<br><br>Specimen from boulder on hillside near Boira, Bougainville Island Mollusca sp., Algae sp., Lepidocyclina (Nephrolepidina) sp. Lepidocyclina (Eulepidina)sp. Amphistegina sp, ?Heterostegina sp.<br><br>Age Lower Miocene Tertiary "e" stage. |
| 65491123 | (SB/56-12) | Keriaka Limestone.<br><br>Specimen from boulder on hill side near Boira, Bougainville Island.Algae sp, Globigerina sp, Amphistegina sp, Operculina sp, Lepidocyclina (Eulepidina) sp, Spiroclypeus sp. Lepidocyclina sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491124 A | (SB/56-12) | Keriaka Limestone.<br><br>Specimen taken near base of limestone overlying Kieta Volcanics. West of Boira, Bougainville Island. Echinoid spines, Algae sp., Amphistegina sp, Operculina sp, Lepidocyclina sp, Lepidocyclina (Eulepidina) sp, Spiroclypeus sp.<br><br>Age Lower Miocene, Tertairy "e" stage. |
| 65491140 | (SB/56-12) | Keriaka Limestone.<br><br>Large boulder of limestone in the southern bank of the Laruma River, Bougainville Island. Coral, Algae sp., Globigerina sp, Nodosaria sp., Sorites sp.,<br><br>No age determination. |
| 65491191 | (SB/56-12) | Keriaka Limestone.<br><br>Limestone outcrop from a ridge at Mantai Mission, Bougainville Island Coral, Algae sp., Dentalina sp., Lepidocyclina sp.<br><br>Age Miocene ?Tertiary "e" stage. |

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| 65491192 A | (SB/56-12) | Keriaka Limestone.<br><br>Limestone boulder (brecciated) at the top of a ridge, near Mantai Mission, Bougainville Island. Amphistegina sp., Operculina sp, Lepidocyclina (Eulepidina) sp, Lepidocyclina sp., Miogypsinoides sp. Spiroclypeus sp., Algae sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491192 B | (SB/56-12) | Keriaka Limestone.<br><br>Same Locality as Specimen A. Algae sp Operculina sp. Lepidocyclina (Eulepidina) sp., Miogypsinoides sp., Spiroclypeus sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491193 | (SB/56-12) | Keriaka Limestone.<br><br>Isolated limestone outcrop covered by more recent volcanic deposits. One mile east of Mantai Mission, Bougainville Island, Algae sp. Amphistegina sp., Operculina sp. Quinqueloculina sp., Lepidocyclina sp., Miogypsina sp. Lepidocyclina ? (Eulepidina) sp.,<br><br>Age Miocene, ?Tertiary "e" stage. |
| 95491199 | (SB/56-12) | Keriaka Limestone.<br><br>Isolated limestone outcrop overlying Kieta Volcanics near Karpani village Bougainville Island. Coral, Algae sp., Lepidocyclina (Eulepidina) sp Lepidocyclina sp., Miogypsinoides sp.<br><br>Age Lower Miocene Tertairy "e" stage. |
| 65491200 | (SB/56-12) | Keriaka Limestone.<br><br>Large limestone boulder near the base of a limestone cliff, North of Korpani village, Bougainville Island. Coral, no foraminifera.<br><br>No age determination. |
| 65491201 A | (SB/56-12) | ?Keriaka Limestone<br><br>Specimen of limestone from outcrop overlying Kieta Volcanics, North of Korpani village, Bougainville Island. Coral, no foraminifera.<br><br>No age determination. |
| 65491201 B | (SB/56-12) | ?Keriaka Limestone.<br><br>Specimen of Limestone from outcrop overlying Kieta volcanics, north of Korpani village Bougainville Island. Spiroclypeus sp. Amphistegina sp. Lepidocyclina sp., Algae sp, Bryozoa sp.<br><br>Age Lower Miocene Tertiary "e" stage. |

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| 65491202 | (SB/56-12) | Keriaka Limestone.<br><br>Specimen of Limestone from outcrop overlying Kieta Volcanics north of Korpani village Bougainville Island.<br>"Linderina" sp, Spiroclypeus sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491220 | (SB/56-12) | Keriaka Limestone.<br><br>Sample taken from outcrop in stream 5 miles east of Sisivi, Bougainville Island.<br>No foraminifera.<br><br>No age determination. |
| 65491220 B | (SB/56/12) | Keriaka Limestone.<br><br>Stratified limestone in cliff section, on track midway between Siroripaia and Beteriopaia, Bougainville Island.<br>Coral, Echinoid spines, Mollusca, Amphistegina sp Lepidocyclina sp, Miogypsina sp, Miogypsinoides sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491222 | (SB/56-12) | Keriaka Limestone.<br><br>Stratified limestone in stream bed, west of Siroripaia, Bougainville Island.<br>Coral, Algae sp Mollusca, Lepidocyclina (Nephrolepidina) sp., Lepidocyclina (Eulepidina) sp, Spiroclypeus sp, Miogypsina sp., Miogypsinoides sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491227 | (SB/56-12) | Keriaka Limestone.<br><br>Specimen from a limestone cliff section in stream bed of the Wakunai River, west of Siroripora, Bougainville Island.<br>Coral, Algae sp, Echinoid spines, Quinqueloculina sp. Textularia sp, Miogypsinoides sp.<br><br>Age Lower Miocene Tertiary "e" stage. |
| 65491236 | (SB/56-8) | Keriaka Limestone.<br><br>Isolated limestone outcrop in Wakunai River, Bougainville Island.<br>Algae sp., Echinoid spines, Amphistegina sp, Globigerina sp., Quinqueloculina sp, Lepidocyclina sp., Miogypsinoides sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |

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| 65491237 | (SB/56-8) | Keriaka Limestone.<br><br>Specimen from isolated outcrop in Wakunai River, Bougainville Island.<br>Coral, Amphistegina sp., ?"Linderina" sp., Lepidocyclina (Eulepidina)sp., Lepidocyclina sp., Miogypsina sp., Miogypsinoides sp. Spiroclypeus sp.<br><br>Age Lower Miocene, Tertiary "e" stage. |
| 65491238 | (SB/56-8) | Keriaka Limestone.<br><br>Specimen from the base of a 40 foot limestone (stratified)cliff. Wakunai River, Bougainville Island.<br>Coral, Algae sp., Lepidocyclina sp., Miogypsina sp., Miogypsinoides sp., Spiroclypeus sp..<br><br>Age Lower Miocene Tertiary "e" stage. |
| 227-2 | — | Kieta Volcanics (Collected by G.Speight C.S.I.R.O.).<br><br>Buff coloured siltstone. Few indeterminable cast of ?Foraminifera.<br><br>No age determination. |
| 262-2 | (SB/56-12) | ?Kieta Volcanics.<br><br>Flat lying sediments overlying andesite lava, Kangu Hill, Bougainville Island.<br>No Foraminifera.<br><br>No age determination. |

## CONCLUSIONS

The samples of limestone outcrops submitted can be divided into two groups. Firstly those containing an assemblage of foraminifera indicating a Lower Miocene Tertiary "e" stage age, secondly those containing a few undiagnostic specimens, or no foraminifera at all. No age determinations can be given to the latter but on account of geological observations they are believed to be mostly Pleistocene age.

No microfossils have been observed indicating the presence of rocks older than Lower Miocene.

The duration of the Tertiary "e" stage is about four to five million years. The environment of deposition of the rocks representing this stratigraphical unit as it appears to be on account of the occurrences of corals, algae and larger Foraminifera is suggestive of shallow marine conditions in tropical to subtropical seas in the near neighbourhood of reefs.

The Keriaka Limestone was formed during the Tertiary "e" stage, a period of about four to five million years. The occurrences of corals, algae and larger Foraminifera is suggestive that it was formed under shallow marine conditions in tropical to sub-tropical seas in the near neighbourhood of reefs.

The algae present are mainly encrusting forms such as Lithothamnium and Lithophyllum.

The assemblages of larger foraminifera indicating Lower Miocene are typical ones and similar assemblages are known from other areas, including:-

The Melinau Limestone (Upper Te beds). Sarawak (Adams 1965); the Nasai and Suloga Limestones, Woodlark Island Papua, (Terpstra 1964) and The San Jorge fauna, British Solomon Islands,(Coleman, 1962, 1963).

The foraminifer Linderina recorded in a few samples as "Linderina" sp, is probably a different species from the one occurring in the Eocene. It has been recorded from Miocene deposits, on Borneo; Pemba Island; Zanzibar; and New Guinea. Kicinski, (1951, 1955).

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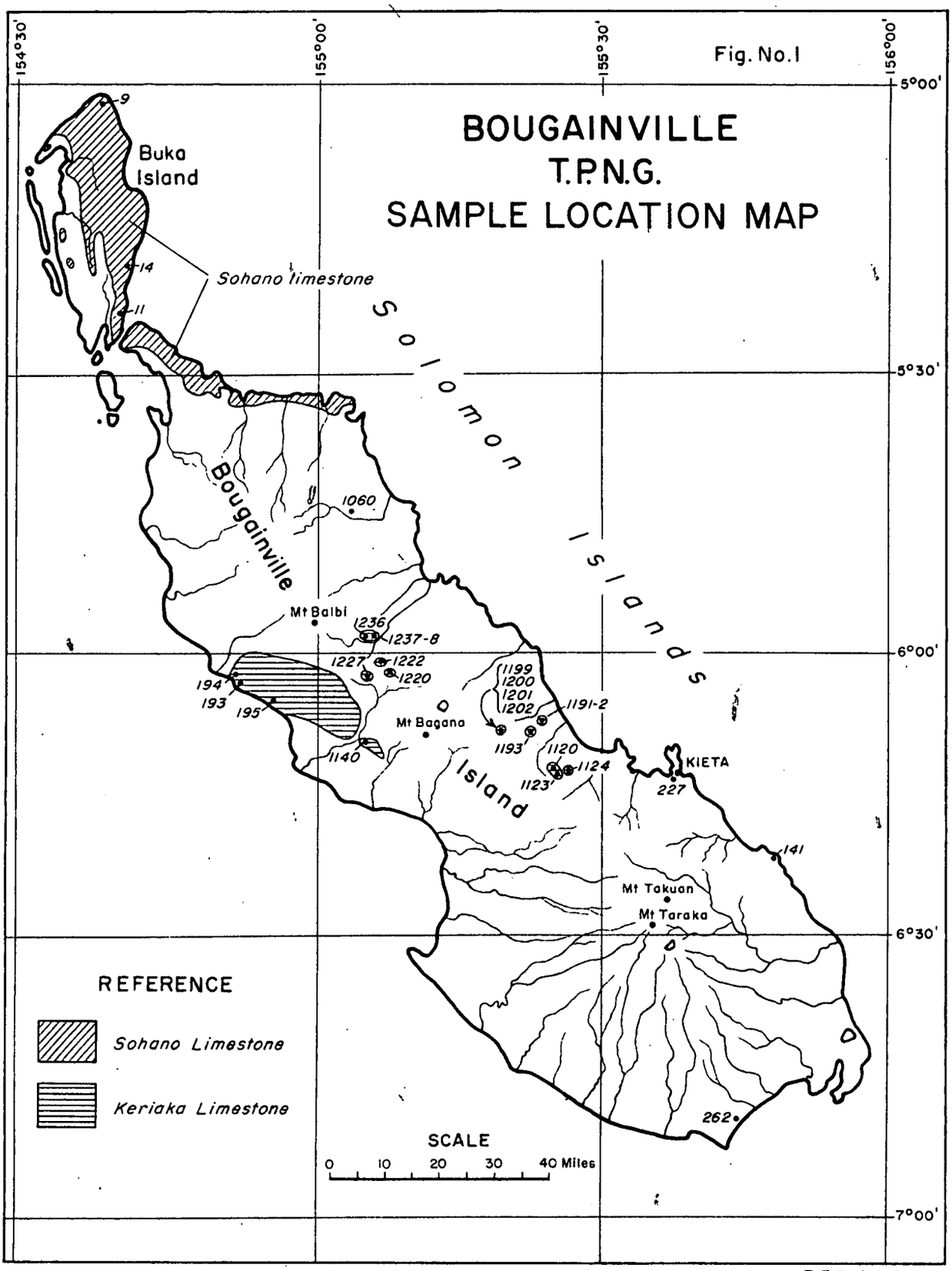


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