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MICROPALAEONTOLOGICAL EXAMINATION OF ROCK SAMPLES FROM THE NORTH FLINDERS RANGE AREA, SOUTH AUSTRALIA

by

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Micropalaeontological Examination of Rock Samples from the North Flinders Range Area, South Australia.

Report No. 1948/3.

A preliminary report on some of the samples from this collection received from Frome-Broken Hill Co. Pty. Ltd. on November 26th 1947, was submitted on December 4th. The present report gives a detailed description of all samples received, together with some stratigraphical notes.

Mt. Yerila Area.

No. 50 (not listed but included in collection). Brown to dark brown siltstone having a concoidal fracture, and containing minute radiolaria.

No. 52 Brown, fine-grained, calcareous sandstone, with grains of green glauconite, some carbonaceous fragments, a few arenaceous foraminifera and radiolaria.

Foraminifera: cf. Haplophragmoides
cf. Ammobaculites

Radiolaria: Cenosphaera
Dictyomitra

No. 66 Fawnish to grey calcareous shale with minute radiolaria.

No. 67 Buff coloured to brownish shale with arenaceous foraminifera.

Foraminifera: cf. Haplophragmoides
Trochammina sp.

No. 68 Brown calcareous sandstone, with a little carbonaceous material, a few arenaceous foraminifera indeterminate, small radiolaria, fragments of molluscan shells and ostracoda.

Radiolaria: Cenosphaera

No. 69 Brown impure limestone with small foraminifera and radiolaria.

Foraminifera: Globigerina cf. trilobus

Radiolaria: Cenosphaera
Dictyomitra

No. 70 Fine grained, buff to ochreous shale with foraminifera.

Foraminifera: Trochammina raggatti

No. 76 Brownish to bluish grey, fine grained, calcareous sandstone, with grains of green glauconite, glauconitic replacement of tests of small hyaline foraminifera and ostracoda, also radiolaria.

Foraminifera: cf. Lagena

Radiolaria: Cenosphaera
Dictyomitra

Petermorra Creek Area.

No. 102 Ochreous shale with numerous broken tests of arenaceous foraminifera.

Foraminifera: Ammobaculites sp.
Spiroplectammina cushmani
Spiroplectammina sp.

Bigenerina sp.
Bathysiphon sp.
Trochammina raggatti
cf. Trochammina

No. 113. Fine sandstone with limonitic particles and numerous arenaceou foraminifera, chiefly poorly preserved.

Foraminifera: Haplophragmoides chapmani,
Haplophragmoides sp.
Bathysiphon sp.
Ammobaculites sp.
Spiroplectammina cushmani (common)
Trochammina sp.

No. 114. Similar to No. 113, with arenaceous foraminifera common but not well preserved.

Foraminifera: Ammodiscus sp.,
Haplophragmoides chapmani
Haplophragmoides sp.
Ammobaculites sp.
Spiroplectammina cushmani
cf. Arenobulimina
Trochammina cf. parvula.

No. 115. Limonitic particles, clay and quartz grains with poorly preserved foraminifera.

Foraminifera: Haplophragmoides chapmani (common)
Pelosina sp.
Reophax sp.
Spiroplectammina cushmani
cf. Gaudryinella
Cibicides sp.

No. 116. Limonitic particles and fragments of gypsum with foraminifera rare.

Foraminifera: Ammodiscus sp.
Haplophragmoides chapmani

No. 118. Dark grey carbonaceous shale with fragments of lighter coloured shale and a few foraminifera.

Foraminifera: Textularia sp.
Marginulina sp.
Cibicides sp.

No. 122. Limonitic shale with arenaceous foraminifera, poorly preserved.

Foraminifera: Pelosina sp.
Haplophragmoides chapmani
Ammobaculites sp.
Spiroplectammina cf. cushmani
Spiroplectammina sp.

No. 125. Grey, carbonaceous shale with foraminifera (hyaline forms) and ostracoda.

Foraminifera: Lenticulina gunderbookaensis
Lenticulina nuda
Lenticulina sp.
Lenticulina subcretacea
Marginulina sp.

Ostracoda: Bythocypris sp.

No. 130. cf. Pseudavicula

No. 131. Panope maccoyi (Moore).

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Notes on the samples

All rocks in this collection are considered to be of Lower Cretaceous age. The majority of them contain a microfauna which is characteristic of the Lower Cretaceous deposits throughout the Great Artesian Basin.

The rocks can be divided into two groups based on the microfaunal content.

(1) Hard calcareous sandstones and shales, and siltstone containing radiolaria.

(2) Friable sandstones and shales containing foraminifera.

(1) The samples referred to in this group are restricted to the Twelve Springs-Mt. Yerila area and are represented by Nos. 50, 52, 66, 69, 76 and 79. All the rocks are hard and the microfossils have been determined from thin sections. Radiolaria of the Spumellarian type are present in all specimens other than No. 79 which is a limestone and in which no definite micro-fossil were recognised. In most cases the fine delicate structures of the radiolaria had been replaced by silica. Consequently specific determination is impossible. The commonest genus is Cenosphaera.

Radiolaria are frequently found in the Lower Cretaceous sediments in Australia and in many localities in Northern Australia, these minute forms are so abundant that the rocks have the lithological characters of radiolarites and porcellanites. Samples No. 50 which, by the way, is not listed as being forwarded for examination, and which is described as a siltstone, shows a tendency towards the porcellanite type of rock, an added feature being its conchoidal fracture. Radiolaria are found associated with foraminifera in bores in the Great Artesian Basin and in Northwest Australia.

(2) Samples included in this group come principally from the Petermorra River area (Nos. 102, 113, 114, 115, 118, 122 and 125) with two samples (Nos. 67 and 70) from the Twelve Springs-Mt. Yerila area. Foraminifera are common in many of the samples but are poorly preserved.

Four features are present in these samples which are characteristic of the Lower Cretaceous sediments examined from bores in the Great Artesian Basin.

a. The predominance of arenaceous forms of foraminifera over hyaline ones.

b. The crushed nature of the foraminiferal tests.

c. The comparatively small number of species.

d. The association of foraminifera with carbonaceous material.

Arenaceous forms are dominant in all but one sample, No.125, in which all recorded genera are hyaline.

The occurrence of Lower Cretaceous foraminifera in the surface deposits in the Northern Flinders Range area is of particular interest for previously they have been recorded only from bore samples in this portion of the Great Artesian Basin. In a bore drilled at Yandama Creek, about 80 miles southeast of Petermorra Creek, foraminifera were first encountered at 832 feet and were recorded at various depths down to 1,513 feet, the last sample received for examination. In the Coonana Bore, 25 miles northeast of Yandama Creek Bore, and which was drilled to 2,830 feet, foraminifera were recorded from 868 feet down to 1,607 feet. To the west of the Northern Flinders Range Area, in the Marree Bore, which was 380 feet deep, abundant foraminifera were present from the first sample immediately below the surface, down to 360 feet, while in Goyder's Lagoon Bore about 200 miles to the north of the area, which reached the depth of 4,850 feet, foraminifera were

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recorded between the depths of 4,300 feet and 4,500 feet.

It would be of considerable interest to know the relationship of the radiolaria-bearing rocks to the foraminiferal ones as this is the first occurrence when the two types have been discovered adjacent to one another. This relationship would be shown in samples Nos. 66, 67 and 70, No. 66 containing radiolaria and Nos. 67 and 70, foraminifera.

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