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MICROPALAEONTOLOGICAL EXAMINATION OF ROCK SAMPLES FROM THE  
DESERT BASIN AND BONAPARTE GULF BASIN COLLECTED BY  
DR. FRANK REEVES

by

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MICROPALAEONTOLOGICAL EXAMINATION OF ROCK SAMPLES  
FROM THE DESERT BASIN AND BONAPARTE GULF BASIN  
COLLECTED BY DR. FRANK REEVES.

Report No. 1947/61.

No. 1. 9 miles N60E of Callewa Station on southwest  
margin of the Desert Basin.

Green and pinkish siltstones containing fine, angular quartz grains, round bodies resembling radiolaria and fine siliceous spicules, in a chalky groundmass.

Dr. Reeves places these rocks at the base of the Permian. Lithologically they are similar to a rock type which is common in the Lower Cretaceous throughout Northern Western Australia and Northern Territory.

No. 2. Sturts Creek Station. Northeast margin  
of Desert Basin.

Fine grained siltstone. No organisms are present to indicate an age for these rocks.

No. 135. Northeast end of Mt. Septimus.

(1) Light brownish, sandy crystalline limestone, with fragments of corals, crinoid stems and ossicles and brachiopod shells.

(2) Grey crystalline limestone, with calcareous algae fairly common (cf. Girvanella), radiolaria (Spumellarian type), foraminifera (Lagenammia sp.) and fragments of crinoid ossicles and stems and brachiopoda.

(3) Grey crystalline limestone, with foraminifera (Lagenammia sp. Paeumospaera cf. excerpta Dunn), numerous fragments of bryozoa, many zoecia of Fenestellid type infilled with calcite, and sections of valves of ostracoda.

(4) Fawnish crystalline limestone, with oolitic structures containing rhombs of calcite and calcareous algae (cf. Girvanella); also present are radiolaria (cf. Cenosphaera), crinoid ossicles and section of a large ostracod (cf. Bairdia).

(5) Grey crystalline limestone in which recrystallisation has destroyed the structure of the majority of fossils present. Forms recognised are foraminifera (cf. Lagenammia), radiolaria (cf. Cenosphaera), corals, crinoid ossicles, bryozoa and ostracoda.

No. 155. Northeast end of Pinecombe Range. 10 miles  
N15W. of Milligan Lagoon.

Siliceous limestone. No microfossils present.

No evidence as to age is present in this rock.

No. 157. Laguna road crossing of Sandy Creek. 28 miles  
by road south of Laguna Station.

Calcareous sandstone. No microfossils.

No evidence as to age is present in this rock.

No.175 Windmill on Laguna Road 12 miles east of  
Mt. Spring.

Pawnish, oolitic, crystalline limestone, with numerous ovoid to irregular ovoid bodies, some composed of calcareous algae (cf. Girvanella, and genus indeterminate), and others containing radiolaria (cf. Cenosphaera); also present are foraminifera (Psammospaera sp., cf. Sorosphaera), crinoid ossicles and ostracoda (cf. Bairdia).

No.188 (on bag) or No.189 (in list). 5 miles east of  
road crossing on Laguna Road, and 23 miles south-  
west of Laguna Station.

Ochreous siliceous limestone. No determinable fossils.

No.185. 4 miles southeast of Winbing Station.

(1) Dense buff coloured crystalline limestone with numerous radiolaria (Spumellarians, cf. Cenosphaera), and a few foraminifera (cf. Lagenanina, Psammospaera sp.).

(2) Oolitic crystalline limestone, similar to No.175 with numerous oolitic structures, the central portion consisting mainly of calcareous algae (cf. Girvanella); also present are a few radiolaria and crinoid ossicles.

(3) Crystalline limestone similar to No.185 (4), with oolitic structures containing rhombs of calcite, calcareous algae and radiolaria. Crinoid ossicles also present in matrix.

No.206. 6 miles southwest of Mt. Sentiung.

(1) Ochreous limestone with fragments of bryozoa, crinoid plates and ossicles, and numerous broken valves of ostracoda.

(2) Calcareous sandstone, with siliceous sponge spicules, small radiolaria, fragments of bryozoa and numerous fine angular quartz grains.

No.209. 4 miles southwest of Mt. Sentiung, and 3 miles  
northeast of Trig. Station HJ.15.

Cream to yellowish sandy crystalline limestone, with fine angular quartz grains and fossils almost entirely altered through recrystallisation. Crinoid ossicles are the only recognisable forms.

No.211. On 8 Mile Creek east of Mt. Cecil.

(1) Dark ochreous sandy, crystalline limestone, similar to No.209, but with fossils fragments less abundant.

(2) Dark Buff coloured sandstone. No fossils.

No.212 Burt Range near Trig. Station HJ.15.

Nos.(1),(2) and (3) represent the lower, middle and upper beds in the Burt Range Section.

(1) Sandy, crystalline limestone with radiolaria (cf. Cenosphaera) numerous fine, siliceous sponge spicules (cf. Hexactinellida), crinoid plates and ossicles, and ostracoda (Bairdia sp., cf. Primitia).



(2) Similar to (1), with some calcareous algae, foraminifera (cf. Psammospira, cf. Ammodiscus), numerous siliceous sponge spicules (Hexactinellida) and shell fragments.

(3) Similar to (1) and (2), with foraminifera (cf. Saccammina) and numerous stout siliceous sponge spicules of various shapes (cf. Reniera).

No. 251. Coastal Cliffs at small boat landing, Darwin.

(1) Purplish siltstone, with traces of numerous radiolaria.

(2) Reddish, fine-grained sandstone with radiolaria.

These radiolarian rocks are Lower Cretaceous in age. They are common around Darwin and are widely distributed in Northwestern Australia and Northern Territory. The rock types vary from siltstones to porcellanites.

No. 262. Daly River Landing, 4 miles E. of Mt. Hayward.

(1) Reddish sandstone. No fossils.

(2) Greyish white calcareous sandstone. No fossils.

No evidence as to the age of these samples is available.

The Microfauna of the Devonian Rocks.

Samples referred to the Devonian are Nos. 135, 168 (or 169), 175, 185, 208, 209, 211 and 212. They consist of crystalline limestones, sandy crystalline limestones and calcareous sandstones.

As no previous microfaunal examination has been made of Devonian rocks in Northwestern and Northern Australia, no correlation of the present material with known Devonian occurrences elsewhere in the region can be carried out. All records of the microfossils have been made from thin sections of the rocks and consequently any specific determinations of recognised genera have not been attempted as the internal structures of all specimens have been lost through the recrystallisation of the limestones. Nevertheless, several fossil assemblages have been noted and these may be useful for purposes of correlation in future work in the area. These assemblages are as follows:-

a. Crinoid stems and ossicles, corals and brachiopoda in sandy crystalline limestone in No. 135 (1), 211 (1).

b. Calcareous algae, radiolaria, foraminifera, and crinoid ossicles in crystalline limestones e.g. 135(2), (4), 185(2).

c. Bryozoa, foraminifera and ostracoda in crystalline limestones, e.g. 135(3).

d. Sponge spicules, with radiolaria, crinoid ossicles and shell fragments in sandy, crystalline limestone e.g. 212(1,2,3).

e. Radiolaria and a few foraminifera in crystalline limestones e.g. 165 (1).

f. Oolitic structures containing calcareous algae, rhombs of calcite and ostracoda in crystalline limestone e.g. 135 (4), 175, 185 (3).

g. Numerous ostracoda with crinoids, e.g. 208 (1).

Comments of the Microfossils

(i) Calcareous algae. The majority of specimens are referred tentatively to Girvanella. Small tubes loosely arranged so as not to compress each other, which is characteristic of Girvanella, form the centre of many of the oolitic structures in some of the limestones.

(ii) Foraminifera. These microfossils are scarce in the limestones and only the following genera have been determined - cf. Ammodiscus, Psammospaera sp., P. cf. excavata Dunn, cf. Saccamina, Sorospaera sp. and Lagenamina sp. All forms are arenaceous and are recorded from the Devonian rocks in America.

(iii) Radiolaria. Radiolaria are present in the majority of the limestones and are very common in sample 185(1). All specimens are of the Spumellarian type, Canosphaera being the common genus. David recorded radiolaria from Devonian rocks in New South Wales.

(iv) Spongia. The most striking features of the limestones in sample 212 from the Burt Range Section, is the presence of numerous spicules which are referred to siliceous sponges. Those in specimens (1) and (2), which are from the base and middle portion of the section respectively, are delicate and fairly uniform in shape and are tentatively placed in the genus Hexactinellida, in which are included long, comparatively slender and gently tapering rays and which is found in the Lower Pennsylvanian of America. In specimen (3), which is the topmost bed in the section, the spicules are large and varied in shape and are tentatively referred to the genus Raniera. The Burt Range spicules compare closely with the Lower Pennsylvanian species R. arca Weller in which the spicules are smooth, cylindrical and curved and of variable size and form with blunt or tapering ends.

(v) Crinoidea. Although many specimens of crinoid ossicles and plates are present, it is impossible to determine them even generically.

(vi) Bryozoa. Numerous fragments of bryozoa are recorded in sample 135(3). Fenestellid forms predominate but generic determination is impossible.

(vii) Ostracoda. Sections of valves of ostracoda occur in many of the samples and are very common in specimens 208 (1). Generic determination is difficult but the genus Bairdia seems well represented. Chapman described an ostracodal limestone from the Devonian rocks at Taemus near Yass, New South Wales.

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