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1963/30

PROBABLE RADIOLARIA FROM THE LOWER CRETACEOUS BEJAH BEDS, GIBSON DESERT, WESTERN AUSTRALIA

by

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CONTENTS

SUMMARY

Eight outcrop samples from the Gibson Desert, Western Australia, were examined for Foraminifera and Radiolaria. Six of the samples did not yield any recognisable fossils and two, from the Bejah Beds, contained organic remains, which in thin sections, appeared similar to Lithocyclia exilis Hinde, 1893. Hinde considered this form to be a new species of Radiolaria but this is questioned because the identifications were based on thin sections only.

INTRODUCTION

Eight outcrop samples collected by A.T. Wells in 1962 from the Gibson Desert, Western Australia, were examined for Foraminifera and Radiolaria. Three samples (C4, W1 and W5) were washed and thin sections made of the other five (B1, B2, B3, H2 and H3-1). The washed samples, too soft for thin sectioning, could not be broken down sufficiently to release any possible Radiolaria if present.

Figure 1 shows the localities where the samples were collected. Stratigraphy of the area is discussed by Wells (1963, in preparation).

OBSERVATIONS

Sample C4, a friable sandstone from an unnamed formation of possible Jurassic age, was unfossiliferous.

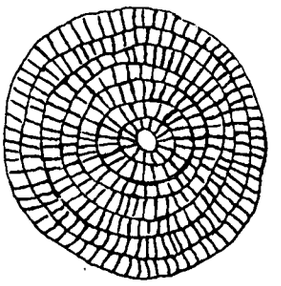
Sample B2, a siltstone from the Paterson Formation, did not contain any recognisable fossils.

Samples B1, H2 and W5 are siltstone and W1 is claystone from the Bejah Beds. No fossils were found in these samples.

Sample B3, a porcellanite, and sample H3-1, a siltstone, from the Bejah Beds contain forms similar to Lithocyclia exilis Hinde, 1893, recognised in thin sections.

DISCUSSION

Lithocyclia exilis was originally described from thin sections of a rock from Fanny Bay, Darwin, with a similar lithology to those examined from the Gibson Desert. Similar forms have also been observed in thin sections of a porcellanite from Larrakeyah Quarry, Darwin, which contains Belemnite impressions indicating an uppermost Albian or Lower Cenomanian age (Whitehouse, 1926). Dr. Crespin identified L. exilis in thin sections of samples from the Bejah Beds, Canning Basin, and regarded it "as representing the topmost part of the Lower Cretaceous and probably equivalent of the Albian Stage" (Veevers and Wells, 1961, p. 169). Skwarko (1962, 1963), however, gave an Aptian age for the Bejah Beds, based on the Pelecypods Pseudavicula anomala (Moore), 1870, Modiolus tatei (Etheridge Jnr.), 1902 and "Macrocallista" plana (Moore), 1870, etc.. From these recorded occurrences the form referred to L. exilis has a stratigraphical range from Aptian to uppermost Albian or Lower Cenomanian.



M(P)/8

Figure 1

Lithocyclia exilis Hinde, 1893. R5171, Bejah Beds, Canning Basin, Western Australia; showing concentric circles and radial "spokes" (from camera lucida drawing; for clarity, only one layer shown) X160.

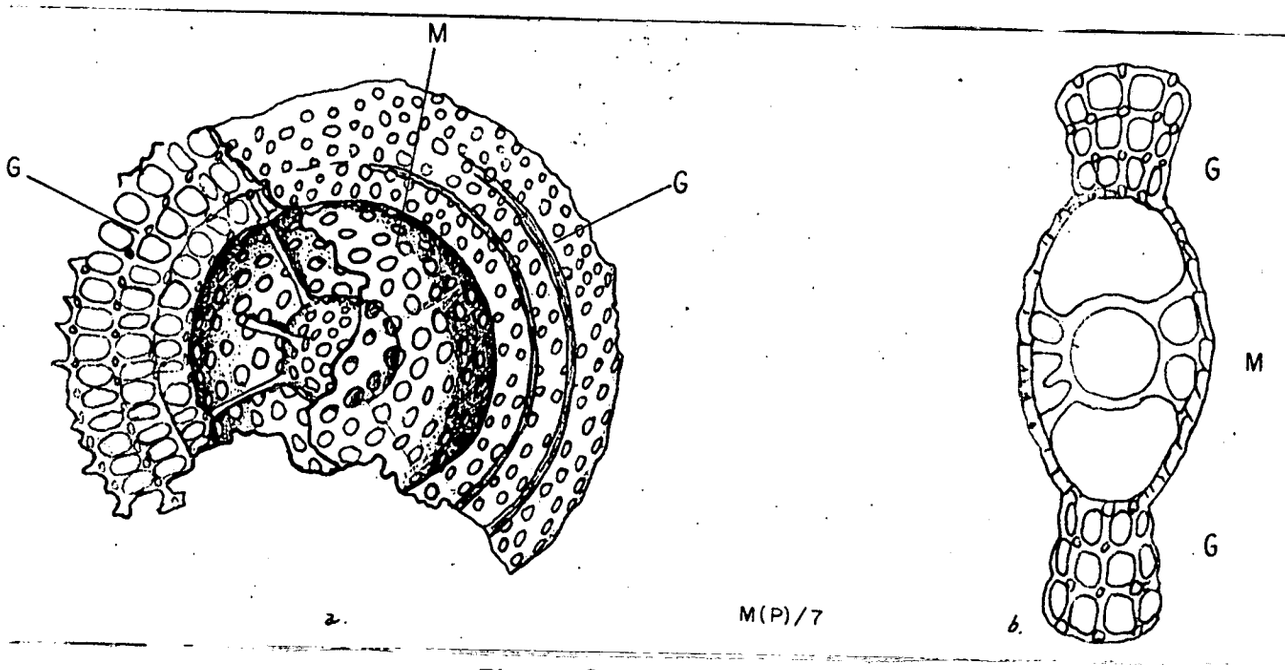


Figure 2

Lithocyclia lenticula Haeckel, 1886.

(a) top view, partly cut away;
(b) vertical section through centre; showing medullary shell (M) and girdle (G) (after Haeckel, 1886, 18(3), Pl.36, fig.3,4). X400.

Hinde considered L. exilis to be a new species of Radiolaria, but as his determination was based only on thin sections, the validity of this species should be questioned. One cannot be absolutely sure that these forms are radiolarian sections until they have been positively identified as belonging to the Radiolaria. The specimens referred to Lithocyclia exilis by Hinde (1893) and Crespin (in Veevers and Wells, 1961) and the similar forms seen from the Gibson Desert and Larrakeyah Quarry, Darwin, bear a superficial resemblance to the figure of Lithocyclia (Moore, 1954, p. D84) but they do not show the same central structures. These specimens consist of concentric rings and radial "spokes" which extend to the centre (see fig. 1). The girdle of Lithocyclia is like this, but the rings and radial "spokes" only extend to the central medullary shell (see fig. 2). Free specimens of Lithocyclia examined from the Albian-Cenomanian Gearle Siltstone, Carnarvon Basin, have a very thin, flat girdle around a central spherical medullary shell. The chances of obtaining sections through the girdle of these specimens, typical of the genus, in random rock sections would be small, and because of their discoidal shape, there should be vertical, horizontal and oblique sections as well. The fact that the random sections are solely circular, rules out the possibility that these forms are species of Lithocyclia. It appears that they are spherical with numerous fine concentric spheres and radiating beams internally. If they belong to the Radiolaria, they do not come within the definition of the genus Lithocyclia (see Haeckel, 1887, v.18, pt.1, p.459 and v.18, pt.3, pl.36, fig. 3,4), but could belong to the Superfamily Caryosphaerinae Haeckel, 1882 (see Moore, 1954, p. D50).

CONCLUSIONS

Random sections of Foraminifera and Radiolaria as found in thin sections of rocks are not adequate for specific identifications, except in the case of larger Foraminifera, and those species of smaller Foraminifera and Radiolaria which have been studied in detail from numerous thin sections of individual specimens. It is considered, therefore, that these forms probably belong to the Radiolaria and are of doubtful value for correlation purposes until more accurate determinations can be made.

REFERENCES

CRESPIN, I., 1960 - Radiolaria in the Lower Cretaceous rocks of Australia. Int.geol.Cong. 21st Session, Norden, 4, 27-34.

HAECKEL, E., 1887 - Report on the scientific results of the exploring voyage of H.M.S. Challenger, 1873-76, Zoology, 18 (2, 3).

HINDE, G.J., 1893 - Note on a Radiolaria rock from Fanny Bay, Darwin, Australia. Quart.J.geol.Soc., Lond., 49, 221-226.

MOORE, R.C. (ed.), 1954 - Treatise on Invertebrate Palaeontology, Part D, Protista 3. Geol.Soc.Amer. and Univ. Kansas Press.

SKWARKO, S.K., 1962 - Notes on Australian Lower Cretaceous paleogeography. Bur.Min.Resour.Aust.Rec. 1962/11 (unpub.)

SKWARKO, S.K., 1963 - Mesozoic fossils from the Gibson Desert, Central Western Australia. Ibid., 1963/2 (unpub.)

WELLS, A.T., 1963 - Helicopter reconnaissance of the Gibson Desert, Western Australia. Bur.Min.Resour. Aust.Rec. (in preparation)

WHITEHOUSE, F.W., 1926 - The correlation of the marine Cretaceous deposits of Australia. Rep.Aust.Assoc.Adv. Sci., 43, 275-280.

Fig.3

124°30'

126°

24°

25°

26°

Woolnough Hills

W1

Alfred & Marie Ranges

C4

Buttes

Ryan

Mt. Cox

W5

MADLEY

WARRI

COBB

Young Ra.

B1

H3

Browne Ra.

Mt Beadell

H2

B3

Todd Ranges

Mt. Samuel

Mt. Charles

Baker Ra.

Bentley Hills

Spring Rocks

B2

HERBERT

BROWNE

BENTLEY

124°30'

126°

REFERENCE

- Cretaceous
- Jurassic (?)
- Permian
- Palaeozoic
- Precombrian
- Road
- Outcrop Boundaries
- 4

0 10 20 30 40 50 miles

SAMPLE LOCALITY MAP

GIBSON DESERT

Geology by A.T. Wells

Bureau of Mineral Resources, Geology and Geophysics Dec. 1962

To accompany Record No 1963/30

W 6a F.C.S