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THE MICROPALAEONTOLOGY OF CORES NOS.66 AND 67 FROM GIRALIA NO.I WELL, CARNARVON BASIN, WESTERN AUSTRALIA

by

I. Crespin.

The Micropalaeontology of Cores Nos.66 and 67 from Giralia No.1 Well, Carnarvon Basin, Western Australia

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Two cores, Nos.66 and 67, from Giralia No.1 Well, were submitted by West Australian Petroleum Pty.Ltd. for micropalaeontological examination. Core No.66 was taken between the depths of 3,115 feet and 3,120 feet, 20 inches of this core being submitted and Core No.67 came from between 3,220 feet and 3,240 feet, 50 inches being received. The rock in both cores was very hard, but the residue after crushing and boiling in petrol, was found to contain a rich and interesting microfauna, including radiolaria, foraminifera, fragments of bryozoa and ostracoda. The general assemblage is similar to that found in rocks of the Callytharra Formation (Lower Permian) throughout the Carnarvon Basin.

The outstanding features of this assemblage, however, are (1) the discovery of undoubted Fusulines for the first time in the Permian rocks of Australia and (2) the first record as far as is known, of radiolaria in the Permian of Western Australia.

The microfaunal list in each core is as follows:

Core No.66 (3,115-3,120 feet)

Radiolaria: Cenosphaera sp.

Foraminifera:

Ammodiscus nitidus Parr
Apertinella grahamensis (Harlton)
Calcitornella stephensi (Howchin)
cf. Earlandia
Frondicularia woodwardi Howchin
Geinitzina triangularis Chapman and Howchin
Geinitzina sp.nov. (striate)
Glomospira simplex Harlton
Haplophragmoides sp.nov. (small)
Hemigordius schlumbergeri Howchin
Hyperamminoides cf. acicula Parr
Lingulina sp.nov. (aff. L.subacuta Gumbel)
Nodosaria irwinensis Howchin
Nodosaria sp.nov.
Pseudostaffella sp.nov. (common)
Spirillina sp.nov. (aff.S.concavocenvexa Galloway and Ryniker)
Orthovertella protea Cushman and Waters
Tetrataxis conica Ehrenberg
Tetrataxis scutella Cushman and Waters
Tolypammina undulata Parr
Trepeilopsis grandis (Cushman and Waters)
Genus indeterminate

Ostracoda:

Amphissites cf.centronotus (Ulrich & Bassler)
Bairdia cf.crassa Harlton
Bairdia cf. granireticulata Harlton
Bairdia nyei Crespin
Bairdia sp.nov.
Healdia chapmani Crespin
Healdia parallela Kellett
Healdia sp.

Core No.67 (3,220-3,240 feet)

Foraminifera:

Ammodiscus nitidus Parr

Agathammina cf.protea Cushamn & Waters
Calcitornella elongata Cushman & Waters
Calcitornella stephensi (Howchin)
cf.Earlandia
Geinitzina triangularis Chapman & Howchin
Geinitzina sp.nov. (striate)
Haplophragmoides sp.nov.
Hyperammina cf.clavatula Howchin
Hyperammina elegantissima Plummer
Hyperamminoides sp.nov.
Nodosaria irwinensis Howchin
Pseudostaffella sp.nov.
Tolypammina undulata Parr
Trepeilopsis grandis (Cushman & Waters)
Trochammina pulvillus Crespin & Parr
Thuramminoides sphaeroidalis Plummer
Genus indeterminate

Ostracoda:

Bairdia aff. attenuata Girty
Cavellina cf.laevissima Bradfield
Healdia chapmani Crespin
Healdia parallela Kellett
Healdia sp.
Microcheilinella cf.inflata Kellett
Microcheilinella sp.

Notes on the Microfauna.

1. Radiolaria.

Numerous tests of the Spumellarian genus Cenosphaera are present in Core No.66 at 3,115-3,120 feet. Unfortunately radiolaria in Palaeozoic rocks give no assistance in determining the age of the beds. However, this record from Giralia No.1 Well is the first from the Permian of Western Australia, the only other record being from eastern Australia, when the writer discovered radiolarian tests in the Hutton Creek Bore, Queensland at 4,458 feet (Crespin, 1944)

2. Ostracoda.

The ostracoda are represented by some well preserved valves and by many crushed ones. Species include Bairdia nyei and Healdia chapmani described by the writer from the Lower Permian of eastern Australia (Crespin, 1945). Other recognizable genera show close specific affinities with forms described from the Lower Permian and Pennsylvanian of America.

3. Foraminifera.

By far the most important group of microfossils present in the two cores from Giralia No.1 Well are the foraminifera. The majority of species recognised are to be found in rocks of the Callytharra Formation (Lower Permian) in the Carnarvon Basin. They are also present in beds of equivalent age at Fossil Cliff, Irwin River and in the Nura Nura Limestone of the Kimberleys. The characteristic species include Calcitornella stephensi, Geinitzina triangularis, Frondicularia woodwardi, Hemigordius schlumbergeri, Nodosaria irwinensis and Trepeilpopsis grandis. Beautifully preserved specimens of Geinitzina triangularis are present in Core No.67; Trepeilopsis grandis is also common in that core and Calcitornella stephensi

is found encrusting many fragments of bryozoa in both cores.

The most important result of the micro-examination, however, has been the discovery of an undoubted form of the family Fusulinidae in both cores. It is represented by at least 30 specimens in the portion of Core No.66 that was examined. The form is exceedingly small and belongs to the genus Pseudostaffella a genus created by Thompson (1942) for the group of minute Fusulines formerly included in the genus Staffella Ozawa 1925. It was first thought that these specimens belonged to Staffella but further investigation has revealed that they are referable to Pseudostaffella. The Carnarvon Basin specimens have all the characteristic of that genus as given in the description of the genotype Pseudostaffella needhami. However they are smaller than the genotype which has a maximum length of 0.55 mm. The Western Australian form has a maximum length of 0.30 mm., the majority of tests being less than this. There seems little doubt that it is a new species which may prove to have important zonal value in the Permian of Western Australia. The genus Pseudostaffella has a stratigraphic range from basal Pennsylvanian to Permian in America.

Another important form present in Core No.66 is Tetrataxis conica which is represented by nine well-preserved specimens. This species is well known from the Pennsylvanian of America and was described from the Carboniferous of Russia. The genus Tetrataxis, outside Australia, is almost completely restricted to Carboniferous deposits. The only other record of T.conica in Australia was made in 1936 from a deposit of Callytharra Limestone on Bidgemai Property, Wyndham Gap, Carnarvon Basin.

Another interesting form present in both cores is referred to in the faunal lists as "Genus indeterminate". Fragments of tests are common but so far the exact relationship of it to any described genus has yet to be proved. It seems to have some relationship with the genus Hyperammina.

References

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