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MICROPALAEONTOLOGY OF A.A.O. NO. 8 BORE, KARUMBA,
NORTH QUEENSLAND

by

Irene Crespin

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Cores and cuttings from Associated Australian Oilfields Company's No. 8 Bore, Karumba, North Queensland, were submitted for micropalaeontological examination by the company. A.A.O. No. 8 Bore Karumba is situated at Lat. 17°24'02"S, Long. 148°52'24"E. It is 3 miles north-north-east of Karumba township and about 25 miles north-north-west of Normanton, on the Gulf of Carpentaria. It was drilled to the depth of 2,363 feet. Cuttings were taken from every ten feet down to the depth of 2,360 feet and cores at the following depths: 1,315'7"-1,316'7", 1,318'6"-1,319', 1,319'5"-1,319'9³/₄", 1,321'1"-1,321'8¹/₂", 2,191'-2,191'7", 2,194'-2,194'5" and 2,363 feet (bottom of the bore). Foraminifera of Pleistocene to Recent age were found in calcareous sandstone down to 100 feet. Lower Cretaceous species were present in grey siltstone from 1,321 feet down to 2,272 feet. The assemblage from 1,321 feet down to 1,668 feet is dominated by the planktonic form Globigerina planispira Tappan; it has been found in only one surface sample in the Lower Cretaceous of Queensland. The assemblage below 1,668 feet is represented in deposits referable to the Roma Formation.

Detailed Description of Samples

Except where indicated all descriptions relate to cuttings.

50 feet Cream, shelly calcareous sandstone with a few foraminifera.

Elphidium craticulatum (F. and M.)
Rotalia schroeteriana Parker and Jones

100 feet Yellowish sandstone with a few foraminifera.

Rotalia schroeteriana

200 - 205 feet Hematitic material. ?laterite

205 - 283 feet Friable creamish siltstone. No fossils.

283 - 299 feet Friable, ochreous to whitish siltstone. No fossils.

299 - 1193 feet Grey siltstone and carbonaceous glauconitic siltstone.

1193 - 1300 feet Grey siltstone with gypsum. Inoceramus prisms, and fragments of fish remains.

- CORE. 1315'7"-1316'7" Dark greenish grey, very fine grained siltstone with a few fish remains and carbonaceous fragments.
- CORE. 1318'6"-1319' Dark greenish grey, very fine-grained siltstone with a few fish remains.
- CORE. 1319'5"-1319'9 $\frac{3}{4}$ " Dark greenish grey very fine-grained siltstone with a few fish remains.
- CORE. 1321'1"-1321'8 $\frac{1}{2}$ " Very fine-grained siltstone, with foraminifera rare and fish fragments.

Globigerina planispira Tappan

1330 - 1396 feet Dark grey fine-grained siltstone with some gypsum.

1396-1404 feet Dark grey fine-grained siltstone with foraminifera rare and some gypsum.

Globigerina planispira

1404-1495 feet Dark grey fine grained siltstone. No foraminifera.

1495-1504 feet Dark grey siltstone with small foraminifera and fragments of fish remains.

Globigerina planispira

1504-1548 feet Dark grey siltstone with small foraminifera and Inoceramus prisms

Globigerina planispira

1548-1557 feet Dark grey siltstone with small foraminifera, indeterminate radiolaria and Inoceramus prisms

Globigerina planispira

1557-1577 feet Dark grey siltstone with small foraminifera and Inoceramus prisms

Globigerina planispira

1577-1587 feet Dark grey siltstone with small foraminifera and Inoceramus prisms

Globigerina planispira
Robulus sp.

1587-1599 feet Dark grey siltstone with abundant Inoceramus prisms.

1599-1668 feet Dark grey siltstone with small foraminifera, pyritic replacements of radiolaria, and Inoceramus prisms.

Foraminifera: Globigerina planispira Tappan
Neobulimina minima Tappan

Radiolaria: Cenosphaera sp.
Porodiscus sp.

1668-1698 feet Dark grey siltstone with small foraminifera chiefly calcareous tests, arenaceous forms crushed.

Globigerina planispira Tappan
Haplophragmoides spp.
Lagena laevis
Lenticulina spp.
Pseudoglandulina sp.
Valvulineria infracretacea Crespin

1698-1707 feet Dark grey siltstone with numerous foraminifera chiefly arenaceous tests, indeterminate radiolaria and Inoceramus prisms (possibly caving).

Ammobaculites fisheri Crespin
Ammobaculites minimus Crespin
Anomalina mawsoni Crespin
Globigerina planispira Tappan
Haplophragmoides dickinsoni Crespin
Haplophragmoides sp.
Pelosina sp.
Spiroplectammina edgelli Crespin
Spiroplectammina cf. cushmani Crespin
Trochammina raggatti Crespin
Verneuilina howchini Crespin

1707-1788 feet Dark grey siltstone with some glauconite, a few crushed tests of arenaceous foraminifera and indeterminate shell fragments. No prisms of Inoceramus were present.

1788-1800 feet Dark grey siltstone with foraminifera chiefly arenaceous forms indeterminate radiolaria but Inoceramus prisms absent.

Ammobaculites fisheri
Ammobaculites sp.
Haplophragmoides raggatti
Globigerina planispira (rare)

1800-1895 feet Dark grey siltstone with a few arenaceous foraminifera.

1895-1907 feet Dark grey siltstone with foraminifera.

Ammobaculites sp. (large and crushed)
Ammobaculites fisheri
Epistomina australiensis Crespin
Globigerina planispira
Robulus gunderbookaensis (Crespin)
Robulus sp.
Spiroplectammina cushmani
Spiroplectammina edgelli
Valvulineria infracretacea

1907-1953 feet Grey to dark grey siltstone with arenaceous and calcareous foraminifera and ostracoda (rare)

Ammobaculites fisheri
Ammodiscus cretaceus
Bathysiphon sp.
Bigenerina lobelichi
Haplophragmoides sp.
Haplophragmoides concavus
Globigerina planispira (rare)
Robulus warregoensis
Spiroplectammina edgelli
Valvulineria infracretacea

1953-1997 feet Dark grey siltstone with minute foraminifera

Ammobaculoides romaensis Crespin
Ammobaculites fisheri
Anomaliba mawsoni
Globigerina planispira
Haplophragmoides sp.
Neobulimina minima
Valvulineria infracretacea

1997-2027 feet Dark grey siltstone with foraminifera.

Ammobaculites fisheri
Ammobaculoides romaensis
Epistomina australiensis
Haplophragmoides sp.
Lenticulina australiensis Crespin
Robulus sp.
Spiroplectammina edgelli

2027-2087 feet Dark grey siltstone with numerous foraminifera and indeterminate radiolaria.

Ammodiscus cf. cretaceus (Reuss)
Ammobaculites fisheri
Anomalina mawsoni
Ammobaculoides romaensis
Haplophragmoides sp.
Hyperammina sp.
Lenticulina sp.
Marginulinopsis sp.
Pelosina lagenoides Crespin
Robulus cf. warregoensis Crespin
Siphonotextularia sp.
Spiroplectammina cushmani
Textularia cf. annacooraensis Crespin
Trochammina raggatti
Valvulineria infracretacea

2087-2105 feet Dark grey siltstone with foraminifera

Bigenerina loeblichii Crespin
Haplophragmoides globosa Lozo
Spiroplectammina cushmani
Verneulinoides cf. schizea (Cushman and Alexander)

2105-2193 feet Dark grey siltstone with small foraminifera, chiefly arenaceous tests.

Ammobaculites minimus
Haplophragmoides sp.
Hyperammina sp.
Neobulimina minima
Pelosina lagenoides
Spiroplectammina cushmani
Robulus sp.
Textularia sp.

CORE. 2191'-2191'7"

Hard dense dark grey fine-grained siltstone with bands of glauconitic sandstone and abundant minute foraminifera, the arenaceous tests chiefly crushed.

Globigerina planispira (abundant)
Neobulimina minima (few)
Patellina sp. (rare)
Patellina cf. lagenoides (rare)
Robulus warregoensis (rare)

CORE. 2194'-2194'5"

Hard dark grey fine-grained siltstone with numerous foraminifera, especially calcareous forms, indeterminate ostracoda and fragments of thin-shelled pelecypoda.

Buliminella nannina (common)
Globulina exserta (Berthlin)
Lagena laevis
Lenticulina australiensis
Lenticulina spp. (common)
Neobulimina minima (common)
Robulus sp. (common)
Saracenaria sp.
Trochamnina raggatti
Trochamnina parvula Crespin

2193-2203 feet

Dark grey siltstone with small foraminifera and fragments of fish remains.

Ammobaculites minimus
Buliminella nannina
Globigerina planispira
Lenticulina sp.
Pseudoglandulina aff. scotti Tappan
Valvulineria infracretacea

2203-2272 feet

Grey to dark grey siltstone with foraminifera chiefly calcareous with some tests minute, and ostracoda.

Ammobaculites fisheri
cf. Ammobaculites
Ammobaculoides pitmani Crespin
Anomalina mawsoni
Epistomina australiensis
Haplophragmoides spp.
Marginulinopsis australis
Robulus warregoensis
Spiroplectammina cushmani
Spiroplectammina edgelli
Verneuilina howchini

2272-2360 feet

Grey siltstone and glauconite sandstone. No foraminifera.

2363 feet

Basement rock.

Stratigraphical and Faunal Notes

A summary of the age, limiting depths and lithology of the cores and cuttings from A.A.O. No. 8 Bore, Karumba, is as follows:

Age	Limiting depths in feet	Lithology
Pleistocene to Recent	50- 200	Calcareous sandstone with foraminifera and indeterminate mollusca
? Tertiary	200- 205	Hematitic material, ?laterite
? Cretaceous	205- 299	Ochreous to whitish siltstone, unfossiliferous
Lower Cretaceous	299-1193	Grey siltstone with some carbonaceous material and occasional fish remains
	1193-1300	Grey siltstone with gypsum, and <u>Inoceramus</u> prisms
	1300-1668	Dark grey siltstone with <u>Globigerina planispira</u> and other small foraminifera; <u>Inoceramus</u> prisms abundant at 1587-1599 feet.
	1668-2272	Grey to dark grey siltstone with arenaceous and many minute calcareous foraminifera. No <u>Inoceramus</u> . Thin-shelled indeterminate pelecypoda in core at 2191'-2191'7". <u>G.planispira</u> also common in this store.
	2272-2360	Grey siltstone and glauconitic sandstone. No foraminifera.
Palaeozoic	2363	Basement rock

The calcareous sandstone from 50 to 200 feet contained typical Pleistocene to Recent warm, shallow water foraminifera, Rotalia schroeteriana and Elphidium craticulatum, which are found in tropical waters around the northern coast of Australia and in the coastal deposits in that region.

The sample from 200-205 feet probably represents laterite and may be of Tertiary age.

The ochreous to whitish siltstone from 205-299 feet is unfossiliferous; the age is uncertain.

The bore entered the typical Lower Cretaceous sediments of the Great Artesian Basin at 299 feet, these beds persisting with little lithological change down to 2,360 feet. They consisted of grey to dark grey siltstone down to 2,272 feet, the majority of the samples containing foraminifera. From 2,272 feet down to 2,360 feet, the grey siltstones were interbedded with glauconitic sandstone and were unfossiliferous.

The bore reached basement at 2,363 feet.

Many of the foraminifera listed above are widely distributed in the Lower Cretaceous deposits of the Great Artesian Basin. Arenaceous species such as Ammobaculites fisheri, A. minima, Ammobaculoides pitmani, A. romaensis, Bigenerina loeblichii, Pelosina lagenoides, Spiroplectammina cushmani, S. edgelli, Trochammina raggatti and Verneuillina howchini and the calcareous species Anomalina mawsoni, Epistomina australiensis, Marginulinopsis australis, Lenticulina australiensis, Robulus warregoensis and Valvulineria infracretacea were described by the writer from either surface deposits in the Roma area, where they were associated with Ammonites of Aptian age, or from subsurface deposits throughout the Great Artesian Basin as far west of Roma as Marree, South Australia. (Crespin, 1953, 1955). Globigerina planispira, Neobulimina minima and Buliminella nannina were described by Tappan from the Lower Cretaceous Grayson Formation of Texas, which is equivalent of the Upper Albian (Tappan, 1940, 1943; Loeblich and Tappan, 1949). All three species are known to range throughout the Albian in America.

The most striking feature of the Lower Cretaceous microfauna of the siltstones in the Karumba Bore is the persistent occurrence of the planktonic foraminifer, Globigerina planispira, which is present in nearly all samples from 1,321 feet down to 2,223 feet, with numerous tests in a core taken at 2,191 feet to 2,181 feet 7 inches. From its first appearance in a core at 1,321 feet 1 inch to 1,321 feet 8½ inches down to 1,668 feet where one other calcareous species Neobulimina minima was recognised, G. planispira is associated with numerous prisms of Inoceramus. Globigerina is indicative of open sea conditions and Inoceramus occurs very abundantly in deposits rich in planktonic foraminifera in beds of Upper Cretaceous age in Western Australia, which were laid down in an epi-continental sea. The association of G. planispira and Inoceramus down to 1,668 feet in the Karumba Bore suggests that deposition of the beds in the northern part of the Great Artesian Basin was under epi-continental conditions.

From 1,668 feet down to 2,272 feet, arenaceous tests are associated with G. planispira and other small calcareous foraminifera; Inoceramus prisms disappear. The micro-fauna of the beds in the vicinity of Roma and in the southern and western parts of the Great Artesian Basin is dominated by arenaceous foraminifera, suggesting that the deposits were laid down not very far off shore in a bay or gulf in moderately shallow and possibly cool water. The association of these forms with the planktonic G. planispira and other small calcareous species suggests that the beds in the Karumba Bore from 1,668 feet down to 2,272 feet were deposited in a bay not very far off shore.

Until recently few tests of G. planispira had been found in the Lower Cretaceous sediments of the Great Artesian Basin. Of these only one occurrence was from surface outcrop. This was at a locality 34 miles from Barcaldine on the Barcaldine-Aramac road, Central Queensland. However, during recent investigations in the northern part of the Basin, in the Cape York Peninsula area, the species has been found in some abundance in the FBH, Wyabba No. 1 Bore, Core 2 at 1,694 feet and in cuttings at 2,000 feet. It was also present in ZCL. Weipa No. 1 Bore, Core 2 at 998-1005 feet.

Carbonaceous fragments so common in surface and subsurface sediments in the vicinity of Roma and elsewhere in the Great Artesian Basin, were seldom noted in sediments in the Karumba Bore.

The fact that G. planispira has been found so rarely in surface sediments in the Lower Cretaceous of Queensland makes correlation of the subsurface assemblages in which it is prominent difficult. Only field work can prove whether these open sea deposits are a facies change of the Aptian Roma beds of the central

and southern part of the Great Artesian Basin or whether they are stratigraphically higher in the Lower Cretaceous and equivalent of the Albian.

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