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1956/64

FORAMINIFERA FROM ASSOCIATED FRENEY OILFIELDS NERRIMA

No. 1 EXPLORATION WELL, FITZROY BASIN.

WESTERN AUSTRALIA

by

IRENE CRESPIN

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INTRODUCTION

Thirteen cores and numerous cuttings from Nerrima No. 1 Exploration Well, Fitzroy Basin, were submitted by Associated Freney Oilfields N.L. for micropalaeontological examination. The cores were taken at 1560-1580' (No. 1), 2173-2190' (No. 2), 2700-2710' (No. 3), 3237-3247' (No. 4), 3776-3786' (No. 5), 4270-4280' (No. 6), 4795-4805' (No. 7), 5260-5270' (No. 8), 5780-5785' (No. 9), 6287-6302' (No. 10), 7083-7095' (No. 14), 7529-7536' (No. 15), 7985-7990' (No. 16), 8145-8158' (No. 18), and 9053-9055' (No. 19). Cuttings were taken at approximately every five feet from 45 feet down to 7,905 feet. At least 113 brown paper bags containing cuttings had to be discarded because it was impossible to determine the depths which were written on these bags in pencil. More adequate labelling should be used to identify samples.

All cores samples were crushed and washed for micro-examination. The washings of cuttings from 45 feet down to 995 feet were made at close intervals. The depths of the lithological changes indicated in the report on the bore by the Company's geologist (W.G. Hill, 1955) have, for the most part, corresponded with those found in the cuttings. However, the statement by Hill that "the dark grey to greyish black soft micaceous siltstone" extends from 0 to 990 feet is not confirmed by the cuttings. The first sample received was taken at the depth of 45 feet, the lithology being ochreous micaceous siltstone. Similar material was found at 50 feet. The cuttings at 60 feet consisted of grey bryozoal limestone, commonly ironstained, in which the bryozoal fragments were well preserved. The dark grey micaceous siltstone was met with at 65 feet and continued down to 990 feet. A striking sample was present at 30 feet where the finest washings consisted entirely of flakes of dark mica.

DESCRIPTION OF THE SAMPLES

45 feet Ochreous micaceous siltstone with foraminifera and ostracoda.

Foraminifera : Ammodiscus nitidus Parr
Dentalina sp.
Hyperammina sp.
Flectospira (new genus MS.)

50 feet Ochreous micaceous siltstone with foraminifera and ostracoda.

Foraminifera : Ammodiscus nitidus Parr
Thursammina sp.

60 feet Greyish bryozoal limestone with some iron-staining and well preserved fragments of bryozoa and indeterminate encrusting foraminifera.

65-75 feet Dark grey micaceous siltstone. No foraminifera.

80 feet Dark grey micaceous siltstone. The fine washings consist entirely of mica flakes with several tests of calcareous foraminifera (Nodosaria sp.1)

95 feet Dark grey micaceous siltstone. No foraminifera.

110 feet Light grey and dark grey micaceous, sandy siltstone with foraminifera and indeterminate ostracoda.

Foraminifera : Ammodiscus nitidus Parr
Glomospira adhaerens Parr
Hyperamminoides acicula Parr

115 feet Dark grey micaceous siltstone. No foraminifera but indeterminate ostracoda.

125 feet Dark grey micaceous siltstone, with a few foraminifera (Nodosaria sp.2)

130-140 feet Dark grey and light grey micaceous siltstone. No foraminifera.

150 feet Dark grey and light grey micaceous siltstone with foraminifera.

Foraminifera : Ammodiscus nitidus Parr (several tests)
Dentalina sp.
Paemmosphaera pusilla Parr
Pelosina hemisphaerica Chapman & Howchin

160-335 feet Dark grey and light grey micaceous siltstone. No foraminifera.

365 feet Dark grey and light grey micaceous siltstone with a few foraminifera (Thurammina sp. nov.)

380 feet Dark grey and light grey micaceous siltstone with a few carbonaceous fragments and foraminifera.

Foraminifera : Hyperamminoides acicula Parr
Nodosaria sp.
Thurammina sp. nov.
New genus (aff. Hyperammina)

390 feet Dark grey and light grey micaceous siltstone with numerous foraminifera and a few ostracoda.

Foraminifera : Ammodiscus nitidus Parr
Calciternella sp.
Nodosaria sp.
Pelosina hemisphaerica Chapman and Howchin
Thurammina sp. nov. (common)
New genus (aff. Hyperammina)

400 feet Dark grey and light grey micaceous siltstone with a few foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Dentalina sp.

435 feet Dark grey to light grey micaceous siltstone with a few foraminifera.

Foraminifera : Paemmosphaera pusilla Parr
Thurammina sp. nov.
New genus (aff. Hyperammina)

465 feet Dark grey to light grey micaceous siltstone with a few foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Thurammina sp. nov.
New genus (aff. Hyperammina)

470 feet Dark grey to light grey micaceous siltstone with foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Hyperamminoides acicula Parr
Nodosaria sp. 3
Helosina hemisphaerica Chapman and Howchin
Thurammina sp. nov.
Streblospira (new genus US.)
New genus (aff. Hyperammina)

480 feet Dark grey to light grey micaceous siltstone with foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Hyperamminoides sp.
Nodosaria sp. 3
Helosina hemisphaerica Chapman and Howchin
Thurammina sp. nov.
New genus (aff. Hyperammina)

490 feet Dark grey to light grey micaceous siltstone with foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Calcitornella stephensi (Howchin)
Reinitzina triangularis Chapman and Howchin
Nodosaria sp.
Plummerinella sp. nov.
Streblospira (new genus US.)
New genus (aff. Hyperammina)

505 feet Dark grey to light grey micaceous siltstone with few foraminifera (new genus aff. Hyperammina)

595 feet Dark grey to light grey micaceous siltstone with few foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Hyperamminoides acicula Parr
New genus (aff. Hyperammina)

690 feet Dark grey to light grey micaceous siltstone with a few foraminifera.

Foraminifera : Ammodiscus nitidus Parr
Hyperamminoides acicula Parr

695-990 feet Dark grey to light grey micaceous siltstone. No foraminifera.

995 feet Pale grey, unfossiliferous, micaceous sandstone.

1495 feet Dark grey, unfossiliferous, micaceous siltstone interbedded with pale grey micaceous siltstone.

1560-1960 feet (Core 1) Light and dark grey, unfossiliferous siltstone.

1990 feet Coarse, white, unfossiliferous sandstone and grey micaceous siltstone.

2025-2070 feet Coarse, white, unfossiliferous sandstone and grey micaceous siltstone.

2105 feet Grey unfossiliferous sandstone and silicified siltstone with subangular to rounded quartz grains.

2165 feet Greyish unfossiliferous sandstone.

2173-2190 feet (Core 2) White to grey unfossiliferous sandstone.

2390 feet White unfossiliferous sandstone.

2700-2710 feet (Core 3) Greyish unfossiliferous sandstone.

3237-3247 feet (Core 4) Sandstone with fine irregular veins of carbonaceous material.

3415 feet Dark and light grey unfossiliferous sandstone.

3776-3786 feet (Core 5) Grey unfossiliferous sandstone with fine irregular veins of carbonaceous material.

3940 feet Unfossiliferous quartz sandstone interbedded with fine grey siltstone.

4185 feet Grey sandstone with greyish siliceous siltstone containing subangular to rounded quartz grains.

4270-4280 feet (Core 6) Coarse greyish, unfossiliferous sandstone.

4795-4805 feet (Core 7) Greyish, unfossiliferous sandstone.

4920 feet Unfossiliferous quartz sandstone interbedded with grey siliceous siltstone containing subangular to rounded quartz grains.

5260-5270 feet (Core 8) Finely bedded unfossiliferous sandstone.

5375 feet (Core 9) Hard dark grey unfossiliferous siliceous siltstone with subangular to rounded quartz grains.

6287-6302 feet (Core 10) Hard, dark grey, unfossiliferous sandstone and light grey sandstone.

7083-7095 feet (Core 14) Hard unfossiliferous sandstone.

7529-7536 feet (Core 15) Hard, dark and light grey unfossiliferous sandstone.

7985-7990 feet (Core 16) Light and dark grey unfossiliferous sandstone with pebbles.

8145-8158 feet (Core 18) Light and dark grey unfossiliferous sandstone with pebbles.

9053-9055 feet (Core 19) Hard, dark grey sandstone.

NOTES ON THE FORAMINIFERA

It is suggested that the ochreous, micaceous siltstone from 45 feet to 50 feet, the bryozoal limestone at 60 feet and the dark and light grey, micaceous siltstone from 65 feet down to 990 feet are referable to the Noonkanbah Formation of the Fitzroy Basin. Microfossils are present down to 690 feet but the beds below that depth down to 990 feet are unfossiliferous. A distinct lithological change was noted in the cuttings at 995 feet, where greyish unfossiliferous sandstone was present. This lithology is apparently typical of the Poole Sandstone. The Company's report suggested that the Nura Nura Member may be represented by the silicified siltstone between 2,100 feet and 2,155 feet. Several cuttings were examined within this interval but all were unfossiliferous. All cores and cuttings below 2,155 feet down to the last core (Core 19) at 9,053-9,055 feet, are unfossiliferous.

An interesting suite of Permian foraminifera was found in the cuttings from 45 feet down to 690 feet, and in the cuttings below 60 feet there appeared to be little contamination of species. The ironstained tests from the ochreous beds at 45 to 50 feet were occasionally noted.

There is a small group of species in cuttings at 45 feet and 50 feet. The most important of these is a test of a new genus Plectospira MS., at 45 feet. This genus has been previously recorded only in beds equivalent of the Artinskian Byro Group in West Australian Petroleum Company's Giralia Bore, Carnarvon Basin.

At 80 feet, in the fine washings composed almost entirely of mica flakes, are several tests of a new species of Nodosaria which is well represented in the deposits of the Artinskian Bulgadoo Shale of the Carnarvon Basin and in the Freney Kimberley Oil Company's Herrima No. 1 Bore, Fitzroy Basin (Grespin, 1940, 1941), at the depth of 129 feet, where it is associated with an assemblage of species characteristic of the beds of the Artinskian Callytharra Formation of the Carnarvon Basin, such as Geinitzina triangularis and Calcitornella stephensi.

At 125 feet another new species of Nodosaria was noted, which is common at Callytharra Springs, the type locality for the Callytharra Formation. It occurs also in the Freney Kimberley Oil Company No. 1 Bore, Herrima.

At 365 feet, a new species of Thureamina was present and tests of this form were common at 390 feet. It was well represented in the Freney Kimberley Herrima Bore at 129 feet and is found in the type section for the Noonkanbah Formation at Bruton's Yard, in the Kimberleys. It also occurs in beds of the Byro Group in the Wandagee area, Carnarvon Basin.

At 380 feet, another new genus allied to Hyperamina was first met with. The lowest stratigraphical record in the present bore is at 595 feet. This form seems to have a limited stratigraphical range, and may be valuable for correlation especially in the Herrima area, where it occurs commonly in the Freney Kimberley Herrima Bore at 129 feet.

A broken specimen of Calcitornella was found at 390 feet and a well preserved specimen of C. stephensi occurred at 490 feet, where it was associated with another typical species of the Callytharra Formation, Geinitzina triangularis. C. stephensi has been recorded from several localities in the Kimberleys which represent the upper part of the Noonkanbah Formation.

Probably the most interesting discovery amongst the foraminifera was that of two species of the new genus Streblospira MS. at 470, 480 and 490 feet in the bore. This genus was first met with in the Giralia Bore where it is represented by one species and occurs associated with a typical Callytharra assemblage. However, the two species of the genus found in the Associated Freney Bore at Herrima seem to be restricted to the Noonkanbah Formation. In the cores from Freney Kimberley Herrima Bore these species are present at 129 feet and they also occur at the same stratigraphical horizon in BMR. No. 1 Bore, Jurgurra Creek, 46 miles to the south-west, at 490-494 feet.

A feature of the foraminiferal assemblage in the AFO Herrima No. 1, is the absence of the numerous tests of the calcareous genus Fronicularia and of the few tests of Geinitzina triangularis and Calcitornella stephensi, which were found in the Freney Kimberley Bore at 129 feet and also in BMR. No. 1 Bore, Jurgurra Creek at 490-494 feet. The hard, dark grey siltstone which contained these assemblages in those two bores was not observed in the cuttings in the present bore.

SUMMARY

A detailed study now being undertaken by the writer of the Permian foraminifera of Australia will make it possible to determine the stratigraphical range of many species, especially the calcareous forms which have previously been regarded as restricted to certain formations. This especially applies to forms such as Geinitzina triangularis and Calcitornella stephensi which in the Carnarvon Basin appear to be restricted to the Gallytherra Formation. However, work on bores in the Fitzroy Basin suggest that these forms are present in the stratigraphically higher Noonkanbah Formation and therefore, have a longer stratigraphical range than previously considered. Excluding these two species, there seems to be a fairly definite correlation of the microfauna of the Noonkanbah Formation of the Fitzroy Basin with that of the Byro Group of the Carnarvon Basin.

It is also hoped that, when the micro-examination of samples from BMR. No. 1 Bore, Jurgurra Creek, is completed, it may be possible to identify foraminiferal zone within the Noonkanbah Formation. Based on information available from the Associated Freney Oilfields Bore at Nerrima, five fossiliferous zones and one unfossiliferous zone are suggested.

1. Zone containing Electospira gen.nov. and Nodosaria sp.1 occurring from 45 feet down to 75 feet.
2. Zone containing no restricted species, occurring from 110 feet down to 335 feet.
3. Zone containing a new species of Thuremnina and the new genus with affinities with Hyperamnina and an almost complete absence of calcareous species, occurring from 365 feet down to 465 feet.
4. Zone containing two new species of Streblospira gen.nov. occurring from 470 feet down to 490 feet.
5. Zone containing a few arenaceous forms including new genus with affinities with Hyperamnina, occurring from 505 feet down to 690 feet.
6. Unfossiliferous beds from 695 feet down to 990 feet, probably representing the base of the Noonkanbah Formation.

The occurrence of the two new species of Streblospira gen.nov. in the Associated Freney Oilfields Bore at Nerrima, at depths of 470, 480 and 490 feet, and at 129 feet in the Freney Kimberley Oil Company Bore about 2 miles to the east, suggests either that the latter bore is structurally higher or that a fault exists between the two bores.

REFERENCES

- Crespin, I., 1940-1941. Departmental Reports on samples from No. 1 Bore, Nerrima, Kimberley Area, Western Australia.
- Hill, M.G., 1955. Nerrima No. 1 Exploration Well. Final Report for Associated Freney Oilfields N.L. (Unpublished).