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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.

BUREAU OF MINERAL RESOURCES

GEOLOGY AND GEOPHYSICS.

RECORDS.

1956/22.

ACTIVITIES OF THE MICROPALAEONTOLOGY GROUP DURING 1955.

by

I. Crespin

CANBERRA. February, 1956.

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The year 1955 was a busy one for the Micropalaeontology Group with more than 5,500 samples being received for examination. A considerable portion of this material was submitted by private companies searching for oil in Western Australia, Queensland and New South Wales, such as West Australian Petroleum Pty. Ltd., Lucky Strike Drilling Company and Australian Oil and Gas Corporation; small collections came from Associated Freney Oil Fields in Western Australia. Geologists of the Bureau of Mineral Resources submitted samples from Western Australia, Northern Territory, western Queensland and New Guinea. Material was also examined from Victoria and Tasmania. Most of the collections received prompt attention with the result that thirty departmental Records which are listed below, were prepared.

Dr. F.M. Kicinski's resignation from the Bureau in January 1955 evolved much extra work upon the writer and D.J. Belford. However, with the excellent co-operation received by the writer from Mr. Belford and from Frank Hadzel, the technical assistant, there was little delay in giving prompt results.

The amount of work necessary in the preparation of the Records is by no means reflected in them. Much time is involved in sorting, washing, and making thin section of the samples, searching for micro-fossils in the residues, and in determining hundreds of species, many of which occur rarely or are not described in literature. Nearly all slides, both assemblage and thin sections from these collections have been labelled, registered and catalogued for future reference. Furthermore, certain individual species have been placed on individual slides in the reference collection of species of Australian Foraminifera, which now includes more than 1,000 slides. Approximately 12,000 slides are now present in the collection of microfossils which is almost equal to the number available before the fire in which more than 3,000 slides were lost.

Because of pressure of routine work, little time has been available for research. The writer has commenced a monograph on the Permian Foraminifera of Australia and so far has recorded more than 120 species including new genera and new species. The outstanding feature of this investigation is the abundance of tests of calcareous foraminifera of the family Lagenidae and it is hoped that with these discoveries, it will be possible to use the foraminifera more frequently in the correlation of the Permian rocks of Australia.

During the investigation of cores and cuttings from the Giralia No.1 Well, Carnarvon Basin, the discovery was made of what is possibly a new genus of endothyrid foraminifera. At first it was thought that this form, of which one hundred tests were found between the depths of 3,115 feet and 3,225 feet in the bore, belonged to the fusulinids, but with the assistance of D.J. Belford and of Dr. M.L. Thompson of the University of Towa, who is an authority on endothyrid foraminifera, a complicated structure has been worked out which is unlike that of the true fusulinids. Further information is awaited from Dr. Thompson.

In February the writer attended the spudding in of the Kurrajong Heights Well, put down by Australian Oil and Gas Corporation. In May she visited Portland, western Victoria in company with Dr. Boutakoff and Mr. Spencer Jones of the Geological Survey of Victoria, to collect further material from the Tertiary deposits in the area. The previous collection which was being examined for

inclusion in Dr. Boutakoff's report on the Portland area, was destroyed in the Bureau fire. Her paper entitled "A Bibliography of Australian Foraminifera" appeared in the April issue of "Micropaleontology", a new publication by the Department of Micropaleontology, American Museum of Natural History, New York, and appreciation of it has come from micropalaeontologists from all parts of the world. Another paper entitled "Distribution of Lower Cretaceous Foraminifera in Bores in the Great Artesian Basin, Northern New South Wales" was published in the last issue of the Journal of the Royal Society of New South Wales.

D.J. Belford was an official representative of the Bureau at the meeting of the Australian and New Zealand Association for the Advancement of Science held in Melbourne in August. He took part in the pre-sessional field trip to Tertiary localities in western Victoria and visited those around Melbourne. He presented a paper on the "Upper Cretaceous Microfaunas of Australia". When possible Mr. Belford has given much time to the study of the Upper Cretaceous foraminifera of Western Australia. His work on the Murchison River material collected during the 1954 field season, has yielded valuable results and he is now able to make a close correlation of the faunas at Gin Gin and in the Murchison River and Giralia areas, at the same time referring them to Upper Cretaceous faunas of Europe. This work is based primarily on the study of the important Upper Cretaceous genus Globotruncana. He is preparing a paper for publication on the Upper Cretaceous foraminifera of the Murchison River area.

Frank Hadzel continued his excellent work in the laboratory where he undertakes the preparation of samples for subsequent micro-examination. When the opportunity is available he is assisting the writer in the preparation of her work on the Permian Foraminifera in the drawing of specimens. The workmanship in these drawings is very excellent and nearly two hundred will be required for illustration.

Professor Alan Wood of the University College, Aberystwyth, Wales, who is carrying out research on the wall structure of foraminifera, spent three weeks here examining the collection of Australian Foraminifera. He expressed amazement at the magnificient development of Lagenid foraminifera in the Permian rocks of Australia which he regarded as unique.

Mr. Leo Stach from Taiwan, visited us in June and had discussions on Indo-Pacific Tertiary problems.

ACTIVITIES UNDERTAKEN AND THEIR RESULTS

Some large collections of rock samples were examined during 1955. The Lucky Strike Drilling Company submitted 1,200 samples of cuttings from Cherwell No.1 Well, Maryborough, Queensland covering 8,000 feet of drilling, and 809 samples from the Susan River Well, in the same area, covering 8,069 feet of drilling. The majority of these samples were examined because the subsurface stratigraphy in the region of Maryborough had not previously been studied. Lower Cretaceous foraminifera, characteristic of the assemblage found in the deposits of the Great Artesian Basin were found in samples from both bores. They were more common in the Cherwell Bore where they persisted from 1,385 feet down to the depth of 5,605 feet. It is understood that Lower Cretaceous macro-fossils were discovered by Dr. Dorothy Hill at still greater depth. This thickness of Lower Cretaceous sediments in the area was unexpected.

Seventeen cores and 368 sample of cuttings, covering 4,750 feet of drilling, were submitted by Australian Oil and Gas Corporation from their well at Kurrajong Heights, New South Wales. Foraminifera were not found until the depth of 4,760 feet. These were of Permian age and similar to the species recorded from the Victoria Pass section.

Considerable work was undertaken on behalf of West Australian Petroleum Pty. Ltd., chiefly on material from the Carnarvon

Basin. Many Tertiary limestones from the Cape Range and Rough Range Anticlines were examined in hope of solving some of the problems relating to formational boundaries. The examination of cuttings and cores from Cape Range No.1 Test Well, which were received during 1955 is now in progress, but individual cores from beds immediately below the Birdrong Formation have been examined from time to time. The exact age of the beds between 3,300 feet and 5,585 feet is still controversial. The Ammonites which have been examined by Dr. Arkell of Cambridge and which were not well preserved, suggest that the formation is probably uppermost Jurassic or what Arkell calls Neo-Tithonian. The foraminifera which are common and fairly well preserved, have many Lower Cretaceous affinities and as yet no described Jurassic species have been identified. It is probable that a few new species of Lenticulina, a common genus in the Jurassic and Lower Cretaceous, are present. Available evidence indicated that the beds are either basal Lower Cretaceous (Neocomian) or represent a passage between the basal Lower Cretaceous and the uppermost Jurassic. Should the latter prove to be the case, there is no major disagreement with Arkell.

Sixty-six cores and 392 samples of cuttings were examined from Giralia No.1 Well, Carnarvon Basin. This was the first bore in the Carnarvon Basin from which a representative suite of cores was submitted for examination. The first core was taken at the depth of 280 feet and the last, No. 77, at 4,082-4, 087 feet. An excellent section of subsurface stratigraphy in the Giralia area was obtained and a thickness of more than 3,700 feet of Permian sediments was proved. An interesting feature of the foraminiferal assemblage found in Core No.66 at 3,115-3, 120 feet and in Core No.67 at 3,220-3, 225 feet in the bore was the number of species which are closely related to species described from the Pennsylvanian (Upper Carboniferous) of Texas, U.S.A. These species were associated with forms characteristic of the beds of the Callytharra Formation throughout the Carnarvon Basin. With further collections from outcrops in the Basin, it is possible that some of these species may be found, so that a more complete correlation of the fauna in the bore and that found in surface deposits of the Callytharra Formation can be obtained.

The examination of cores from two bores on Dirk Hartog Island, off Shark Bay, Western Australia, gave evidence of an extension westwards of deposits of Lower Tertiary (Palaeocene) and Upper Cretaceous (Maestrichtian) age. Beds of Palaeocene and Maestrichtian age have not been recorded in outcrop in the Carnarvon Basin, south of the Giralia area.

Another important result was the discovery of Upper Cretaceous (Santonian) assemblages in the Warroora No.1 and in Grierson No.3 Wells, extending the known occurrence of these beds, in the Carnarvon Basin considerably to the north of the Murchison River area, where they outcrop.

Another discovery of importance was made in the core at the depth of 1,569-1,579 feet from Rough Range No.5 Well. Species of Globotruncana indicative of Cenomanian age (basal Upper Cretaceous) occurred in the upper part of the Gearle Siltstone, giving a definite age for this formation. This is the only record of Cenomanian Globotruncana in Western Australia.

RECORDS PREPARED BY THE MICROPALAEONTOLOGY SECTION DURING 1955

Irene Crespin

Notes on a Lepidocyclina-bearing rock from Cebu, Philippines. Records No. 1955/4.

Micropalaeontology of specimens from the Salt Lake Anticlines, Carnarvon Basin, Western Australia. Records No. 1955/14.

Micropalaeontological examination of Bore Cores from Stamford Main No.2 Colliery, near Coongewai, New South Wales. Records No. 1955/19.

Lower Cretaceous Microfossils from Cherwell No.1 Well, Maryborough, Queensland. Records No. 1955/32.

Fossiliferous Limestone from Menapi Bay, Cape Vogel Peninsula, Papua. Records No. 1955/39.

Foraminiferal Limestones from Rough Range, Carnarvon Basin, Western Australia. Records No. 1955/48.

Micropalaeontological Examination of samples of Miocene Limestone from the Western District, Victoria. Records No. 1955/57.

The Micropalaeontology of cores Nos. 66 and 67 from Giralia No.1 Well, Carnarvon Basin, Western Australia. Records No. 1955/69.

Micropalaeontological Examination of rocks from the south end of Cape Range Structure, Western Australia. Records No.1955/71.

Fossiliferous rocks from the Cape Range Structure, Western Australia. Records No. 1955/77.

Lower Cretaceous Microfossils from L.S.D. No.2 Well, Susan River near Maryborough, Queensland. Records No. 1955/81.

Micropalaeontological Examination of samples from Australian Oil and Gas Well No.1, Kurrajong Heights, New South Wales. Records No. 1955/85.

Micropalaeontological examination of five samples from Fraser River, No. 8-1 Structure Hole, Dampier Land, Western Australia. Records No. 1955/86.

Micropalaeontology of Pliocene Deposits at Portland, Western Victoria. Records No. 1955/87.

Micropalaeontological examination of samples from the Cook Bore, Nullarbor Plains, South Australia. Records No. 1955/100.

Preliminary report on the Micropalaeontology and Stratigraphy of Giralia No.1 Test Bore, Carnarvon Basin, Western Australia. Records No. 1955/115.

Irene Crespin and D.J. Belford.

Foraminifera from the Upper Sepik River, Western New Guinea. Records No. 1955/46.

Foraminifera in Cores from Cape Range No.1 Bore, Carnarvon Basin, Western Australia. Records No. 1955/50.

A Further Collection of Limestones from Rough Range Structure, Carnarvon Basin, Western Australia. Records No. 1955/92.

Micropalaeontological Examination of rock samples from the Cape Vogel area, Papua. Records No. 1955/96.

Micropalaeontology of cores from Dirk Hartog No. 1 Bore, Western Australia. Records No. 1955/114.

Irene Crespin and J.M. Dickins

Fossiliferous Rocks from the Cloncurry District, Queensland. Records No. 1955/13.

D.J. Belford

Cretaceous Micropalaeontology, Murchison River area, Western Australia. Records No. 1955/27.

Micropalaeontological Examination of samples from Grierson No.3, Structure Hole, Carnarvon Basin, Western Australia. Records No. 1955/90.

Micropalaeontological Examination of samples from Grierson No.1; Rough Range No.4, Rough Range No.5, Rough Range No.8 and Cape Range No.2 Wells, Carnarvon Basin, Western Australia. Records No. 1955/103.

Micropalaeontological examination of further cores from Dirk Hartog No.1 Structure Hole, Western Australia. Records No. 1955/117.

Micropalaeontological Examination of samples from Warroora No.1 Well, Carnarvon Basin, Western Australia. Records No. 1955/119.

F.M. Kicinski

Note on the occurrence of some Tertiary Larger foraminifera on Bougainville Island (Solomon Islands). Records No. 1955/8.

Micropalaeontological Examination of rock samples from Buna-Kokoda Area, Eastern Papua. Records No. 1955/9.