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COMMONWEALTH OF AUSTRALIA.

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GEOLOGY AND GEOPHYSICS.

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RECORDS.

No. 1955/114

MICROPALAEONTOLOGY OF CORES FROM DIRK HARTOG NO. 1 BORE  
WESTERN AUSTRALIA

by I. Crespin and D. J. Belford

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Six cores from Dirk Hartog No. 1 Bore were received from the West Australian Petroleum Pty. Ltd. for micropalaeontological examination. The cores were taken at the following depths: Core No. 6 at 350-360 feet, Core No. 7 at 400-408 feet, Core No. 10 at 450-460 feet, Core No. 11 at 500-510 feet, Core No. 13 at 551-554 feet and Core No. 14 at 700-710 feet. Cores 6, 10, 11, 13 and 14 consisted of chalky white, bryozoal calcarenite; Core No. 7 showed dolomitic bryozoal limestone with patches of flint. The foraminifera in the calcarenites were not well preserved but evidence indicates that the beds are of Lower Tertiary age. A detailed microfaunal description of each core is given below.

Core 6 - 355-360 feet

Angulogerina spp.  
Cibicides umbonifer Parr  
Cibicides spp.  
Cassidulina inconspicua Hussey  
Cassidulina spp.  
Crespinella sp. nov.  
Discorbis sp. aff. bertheloti (d'Orb)  
Eponides repandus (F. & M.)  
Eponides toulmini (Brotzen) (common)  
Elphidium sp.  
Globigerina mexicana (Cushman)  
Globorotalia cf. wilcoxensis Cushman & Ponton  
Globorotalia cf. scitula (Brady)  
Gyroldina soldanii (d'Orb)  
Heronallenia cf. pusilla Parr  
Lagena sulcata (W. & J.)  
Lenticulina sp.  
Listerella victoriensis Cushman  
Operculina sp.  
Osangularia sp. nov.  
Pullenia bulloides d'Orb

Core 7 - 400-410 feet

Hard, dolomitic limestone with a little bryozoa and with patches of grey flint. No determinable foraminifera were present.

Core 10 - 450-460 feet

Cibicides pseudoconvexus Parr (common)  
Cibicides umbonifer Parr  
Cibicides sp.  
Asterocyclina sp. (fragments)  
Elphidium sp.  
Globigerina cf. bulloides d'Orb  
Globulina sp.  
Gyroldina sp.  
Guttulina problema d'Orb  
Sigmoidella cf. elegantissima (d'Orb)  
Stenatorbina torrei (Cushman & Bermudez)  
Textularia sp.

Core 11 - 500-510 feet

Asterocyclina spp. (small and common)  
Cibicides pseudoconvexus Parr  
Globorotalia wilcoxensis Cushman  
Sigmamorphina sp.  
Sigmoidella cf. elegantissima (d'Orb)  
Stenatorbina torrei (Cushman and Bermudez)

Core 13 - 551-554 feet

Cibicides sp.  
Elphidium sp.  
Eponides sp.  
Globorotalia crassata Cushman  
Osangularia sp.  
Stenatorbina torrei (Cushman & Bermudez)  
Osangularia sp.

Core 14 - 700-710 feet

Asterigerina sp.  
Alabamina cf. tenuimarginata (Chapman, Parr & Collins)  
Cibicides sp.  
Disorbis assulatus Cushman  
Gavellinella sp.  
Globoteralia membranacea (Shren)  
Globorotalia wilcoxensis Cushman & Ponton  
Quinqueloculina sp.  
Textularia sp.

Note on the foraminiferal assemblage in the Cores

Although the foraminifera are not well preserved, several interesting species have been recognised which assist in giving an age determination for the bryozoal calcarenites from Dirk Hartog No. 1 Bore.

In Core No. 6 at 355-360 feet, several fairly well preserved tests of Eponides toulmini Brotzen are present. This species was recorded as E. boueana (d'Orb) by Toulmin from the Lower Eocene of Alabama. Brotzen described it as a new species in his work on the Paleocene of Sweden. It is also present in the Upper Eocene of Port Warlunga, South Australia and in the Upper Eocene deposits along the Victorian coast. Specimens from the South Australian locality were sent by one of us (I.C.) a few years ago to the late Mrs. H. J. Plummer who identified them as Eponides toulmini.

Species of Angulogerina are also present in Core No. 6 and are similar to undescribed forms from the Port Warlunga and Maslin Beach deposits, South Australia and from the Victorian Upper Eocene deposits.

Cibicides unbonifer and C. pseudoconvexus described by Parr from the King's Park Bore, Perth, are present in Cores Nos. 6, 10 and 11. The latter species is common in Core 10 at 450-460 feet.

A new species of Crespinella occurs in Core No. 6. This undescribed form was found in the Merlinleigh Sandstone near Merlinleigh Homestead, Carnarvon Basin, which is Eocene in age. It is common in the Maslin Beach deposits near Adelaide and in subsurface material of Upper Eocene age examined from excavations for water on the Nullarbor Plains.

Stomatorbina torrai, described by Cushman and Bermudez from the Middle Eocene of Cuba, is found in Cores 10, 11 and 13. It is widely distributed in the Upper Eocene deposits of Western Australia and southern Australia.

The genus Globorotalia is represented by G. wilcoxensis, G. crassata and G. membranacea. These species have been recognised in Cores 13 and 14 with a probable test of G. wilcoxensis in Core 11. These species are characteristic of the Lower Tertiary and are recorded from the Paleocene deposits of the Carnarvon Basin, in the Pirie and Wadara Calcareenites.

Globigerina mexicana which was described by Cushman from the Upper Eocene of Mexico, is present in Core 6. This species is well represented in the Upper Eocene deposits around Perth, in the Carnarvon Basin and in south-eastern Australia.

However, the most important genus present is Asterocyclina which is represented by many small tests especially in Core 11. It is not present in Cores 13 and 14. This genus is typically Middle to Upper Eocene and is not recorded from the Lower Eocene.

Based on the available foraminiferal evidence, the bryozoal calcarenites of Cores 6, 7, 10 and 11, with the numerous tests of Asterocyclina, are regarded as the equivalent in age of the Giralda Calcareenite and Merlinleigh Sandstone and are Middle to Upper Eocene in age. Because of the absence of Asterocyclina and with the presence of Globorotalia crassata and G. membranacea, the calcarenites of Cores 13 and 14 appear to be somewhat older than Cores 6, 7, 10 and 11 and may represent the top of the Paleocene. They may be the equivalent of either the Pirie or Wadara Calcareenites of the Carnarvon Basin.