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A NEW OCCURRENCE OF PROTEROZOIC "JELLYFISH" FROM THE KIMBERLEY REGION, WESTERN AUSTRALIA.

by

D. Dunnet

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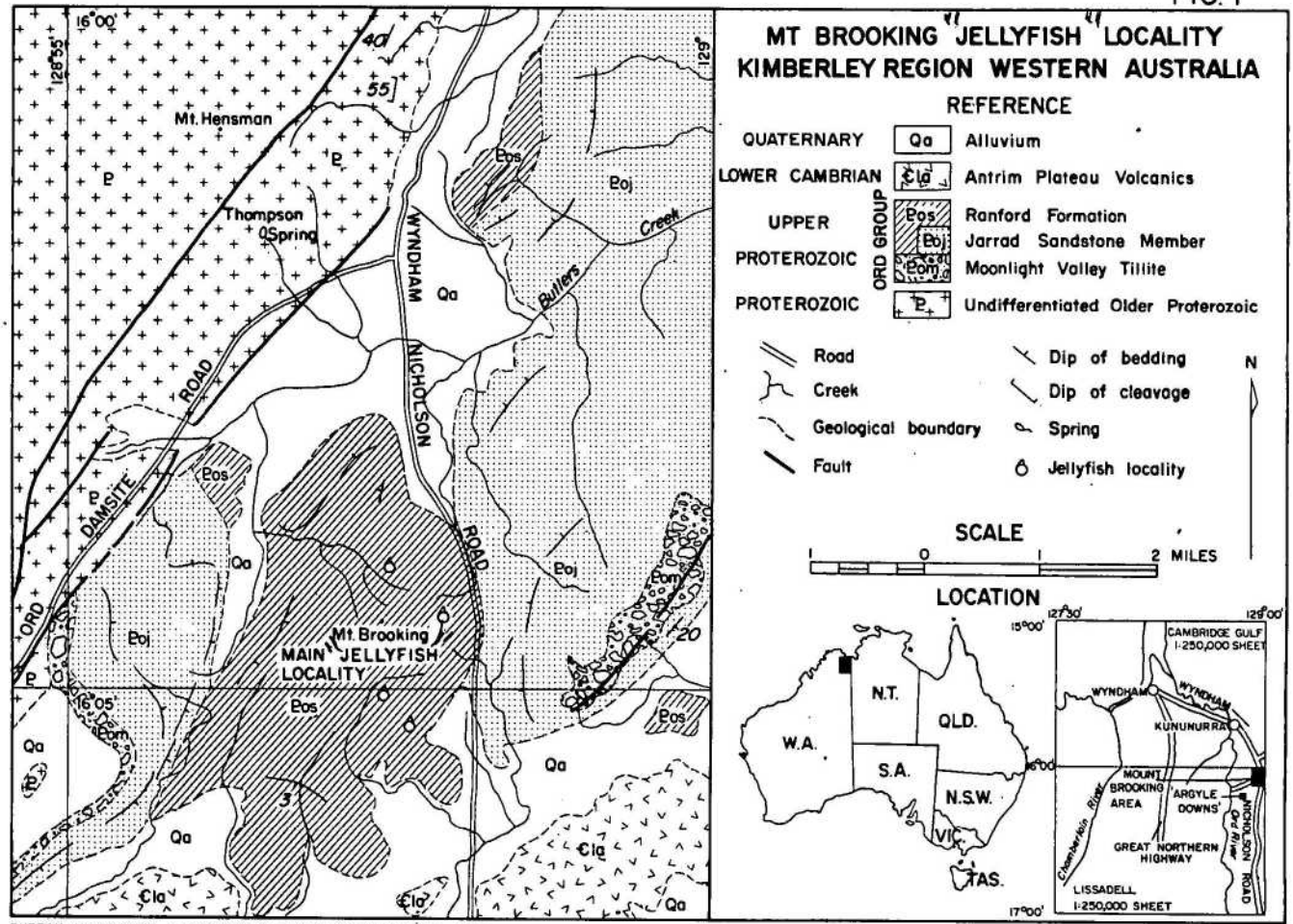
FIG. 1



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A NEW OCCURRENCE OF PROTEROZOIC "JELLYFISH" FROM THE KIMBERLEY REGION WESTERN AUSTRALIA

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SUMMARY

Objects which look like fossil jellyfish have been found in late Upper Proterozoic rocks of the Kimberley Region of Western Australia. The "jellyfish" are abundant and particularly well preserved; on preliminary investigation the fauna appears to include several new forms together with forms similar to the Ediacara Fauna of South Australia.

Description of Occurrence

During the 1963 regional mapping of the Kimberley region of Western Australia by the Bureau of Mineral Resources and the Geological Survey of Western Australia, abundant, well-preserved objects, similar to fossil jellyfish, of Upper Proterozoic age were found by the author.

The fossil locality is 70 miles south east of Wyndham, near the Wyndham-Nicholson road, 3.2 miles south of the Ord Damsite turnoff at longitude approximately 128° 58'E, and latitude approximately 16°05'S. (Locality map, fig. 1). The "jellyfish" are exposed at numerous localities on the surface of the Mount Brooking Plateau, but are most abundant on the eastern scarp above the road. The best locality found to date (Plate 1) is situated along the northern margin of a promontory, jutting out to the east of the main plateau.

The stratigraphy of the area has been detailed by Dow, Gemuts, Plumb and Dunnet (1964) and Dow and Gemuts (in prep.). The "jellyfish" occur in the Ranford Formation, the upper unit of the Ord Group. The Ord Group lies with strong angular unconformity on older Proterozoic rocks and is overlain unconformably by Lower Cambrian Antrim Plateau Volcanics. To the south in the Albert Edward Range, the Group is overlain by the Albert Edward Group of Upper Proterozoic age. The Ord Group sequence at Mount Brooking is as follows:

Estimated thickness in feet	Lithology	Formation
150	Laminated and thinly bedded siltstone and fine-grained micaceous quartz sandstone. Distinctive red and white to buff coloured in upper part. Argyle Downs Zebra-stone in lower part. "Jellyfish" appear to be restricted to upper part of the exposed Formation.	Ranford Formation
10-30	Red-brown ferruginous fine-grained quartz greywacke.	
200	White to mauve claystone, siltstone and shale, some micaceous siltstone and fine-grained kaolinitic sandstone.	Johnny Cake Shale Member
350	Massive red-brown ferruginous quartz greywacke with high silt matrix content and mud pellets.	Jarrad Sandstone Member
2-10	Laminated pink dolomite	Moonlight Valley
150	Tillite	Tillite

The Ranford Formation is over 1000 feet thick in the type area, compared with a maximum of 750 feet in the Mount Brooking area. A considerable part of the Formation may have been removed by erosion.

The Ranford Formation includes the well-known Argyle Downs Zebra-stone or Ribbonstone as described by Larcombe (1926), Blatchford (1927), and Hobson (1930). The Zebra-stone consists of a white silty rock containing irregular red bands and elliptical rods, which Hobson suggested were the result of differential leaching. Red siltstones at the "jellyfish" locality contain white spots and spheres up to 1 cm in diameter. These rocks superficially resemble the Zebra-stone, and the spots are thought to be leached organic material. A number of the "jellyfish" are white in a dark red or purple rock. At Mount Brooking the "jellyfish" are most abundant in a zone about 100 feet above the main Zebra-stone beds. "Jellyfish" have not been found at the main Zebra-stone locality near Argyle Downs homestead, where the Zebra-stone is apparently the highest part of the exposed Ranford Formation.

The sequence at Mount Brooking dips shallowly east-wards in a broad syncline, and dips do not exceed 10°.

The age of the sequence at Mount Brooking is late Upper Proterozoic. It is overlain unconformably by probable Lower Cambrian Antrim Plateau Volcanics, and overlies with strong unconformity rocks of older Proterozoic ages. Preliminary radiometric dating of illite from the Johnny Cake Shale Member of the Ranford Formation in the Moonlight Valley area, 70 miles to the south, indicates a late Upper Proterozoic age.

The fauna consists of circular objects which, because of their resemblance to the Ediacara forms described by Sprigg (1947) have been termed 'jellyfish'. The "jellyfish" are found over most of the Mount Brooking plateau; an area of at least 1½ square miles. They are not restricted to a single stratum but occur throughout at least 20 feet of section, and possibly much more.

The main locality is characterized by an abundance of specimens of several different forms. At least five types were recognized in the field and a greater diversity may be expected on detailed examination. The various types include small (0.5 to 1.0 cm) star-shaped and strongly serrated forms and larger (1.0 to 10.0 cm) forms, with fine radial and concentric structure, and a wide, apparently structureless outer margin with a scalloped edge (Plate 2). The most prolific form has a subcircular shape, unscalloped margins, and a fine radial structure which, in some specimens, is divided by raised and depressed areas into six sectors (Plate 3). Several different species are probably included in this group; Dr. Öpik of the Bureau of Mineral Resources suggested that 'Cyclomedusa' could be a more non-committal term of reference for these objects. Several relatively structureless objects were also noted.

Some of the star-shaped forms resemble gypsum rosettes and the structureless forms could be the products of non-organic agents. However, the Cyclomedusa form is almost certainly of organic origin and because of the close association of the three forms, they are all thought to be organic.

As can be seen from Plates 2 and 3, the state of preservation is excellent. There has been no metamorphism and apparently little compaction; specimens have been preserved with slight flattening.

In the main locality specimens are so abundant that individual specimens overlap each other. (Plate 3). In some instances as many as 30

specimens were estimated to be present in a square foot of bedding surface, with specimens up to six deep.

No formal description has yet been made, but the material is at present being studied by palaeontologists of the Bureau of Mineral Resources. The fauna include some forms apparently resembling those from Ediacara in South Australia (Sprigg, 1947, 1949), and several new forms appear to be present (Öpik, verbal comm.). They bear no resemblance to the Forms found by Wade (1924) and described by Sprigg (1949) from rocks lower in the sequence near Mount John, 80 miles SSW of Mount Brooking. The possible organic origin of the Mount John forms is doubtful (Harrington & Moore, 1956). However "jellyfish" superficially similar to those from Mount Brooking have been found in rocks of probable Middle Cambrian age (Dow, et al., 1964). These specimens were collected four miles north-north-west of the Ord-Elvire River junction, 75 miles to the south of Mount Brooking. Two types were found, one of which (Plate 4) is similar to the fine radial and concentric form at Mount Brooking. The specimen illustrated in Plate 4 is smaller than average, and most of the individuals collected are between two and five centimetres across. These "jellyfish" are not as abundant as the Mount Brooking fauna.

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Plate 1 The main site of the Mt. Brooking "jellyfish," showing the scarp of the flat dipping Ranford Formation.

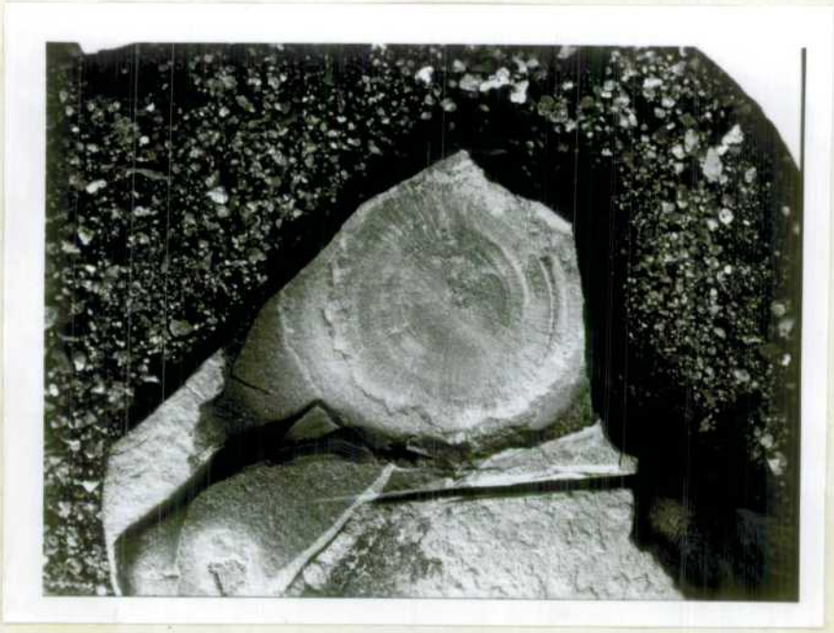

Plate 2 A single specimen of the larger "jellyfish," which were found up to 10 cms diameter. The fine radial and concentric structure and the scalloped structureless margin are clearly shown. (2X natural size). (Photograph by R. Mineotas, B.M.R.).

Plate 3 A profusion of the most abundant forms. The segmented form is on the lower left, an apparently structureless form on the lower right. (2X natural size). (Photograph by R. Mineotas, B.M.R.).

Plate 4 Fossil "jellyfish" from the Cambrian Elder Formation. (5X natural size).