

81/29 (4p)

PALAEONTOLOGY REPORT NO 29/81

DATED: August 31, 1981

PROTEROZOIC "JELLYFISH" FROM THE MOUNT  
BROOKING AREA, LISSADELL SHEET, KIMBERLEY REGION

MATERIAL AND LOCALITIES:

Objects described as fossil "jellyfish" or "medusoids" with possible affinities with the Ediacara fauna, have been reported from the vicinity of Mount Brooking (128°58'E, 16°05'S), in the late Proterozoic Ranford Formation. Material has previously been described in an unpublished report by Dunnet (1965) and referred to by Dow and Gemuts (1969).

Two slabs containing jellyfish-like structures (from an unknown locality, but almost certainly from the vicinity of Mount Brooking) were examined and photographed in June 1981 at Djararu Gems Gift Shop, Kununurra. Another specimen, collected by Mr Leo Geidans of Minatome Pty was submitted to the Survey for examination. Sample F 5985 from the GSWA collection, a "medusoid" collected by H Butler from Butler's Creek, Lissadell map sheet (locality now flooded by Lake Argyll) was re-examined. The results of this study suggest an inorganic origin for these structures.

REPORT:

Dunnet (1965) recognized five forms of the structures which he considered to be various species of fossil medusoids. Three forms are present in the material recently examined; but only one shows any close resemblance to those illustrated by Dunnet.

Mr Geidan's sample and the larger slab at Djararu Gems contain disc-shaped structures 2 to 4 cm in diameter. The discs occur as depressions about 2 mm deep in a maroon siltstone. The discs and surrounding patches on the surface of the siltstone are cream-coloured, probably a result of leaching. The orientation of the specimens is not clear, but they probably occur on the lower bedding surfaces of the siltstone as moulds. The disc-shaped structures can be best examined as casts in plasticene where they form positive relief features.

Each disc consists of a series of petal-like structures which radiate from a central depression and which are separated by grooves. In some specimens more than one layer of petals occurs. The central area has a somewhat irregular outline, and is approximately 5 mm in diameter. The petal-shaped structures begin in this central area, but are not clearly visible until they cross the margin of this zone. At this point they are between 5 and 10 mm in width. The petals may be up to 15 mm long and widen gradually until they are approximately 8 to 12 mm from the centre of the discs. The petals are not always symmetrical, one side may be 2 to 3 mm longer than the other. The margin of the petal then forms an obtuse angle of approximately  $140^{\circ}$  and both margins taper towards each other, meeting at an angle of between  $30$  and  $45^{\circ}$ . These peaks give the disc a deeply serrated margin. The grooves separating the petals are very straight and appear as radiating ribs in the rock specimen. These grooves vary in thickness. They are usually less than 1 mm wide, but may be wider than 1 mm. The wider grooves taper at both ends. In the rock specimen the ribs are connected to the matrix. The grooves not only separate the petal-like structures, but also occur in the centre of the petals and are frequently connected to the apex of the petal. Some petals may have two or three grooves. In this case one groove terminates at the peak of the petal and the others along the outer edge of the petal.

A series of concentric grooves approximately 5 mm wide occur at varying distances from the centre of the disc. They occur as slight depressions in the petals but are not detected in the grooves.

The second type of disc-shaped structure is present as three discs and two small fragments on the surface of sample F 5985 and a single disc in the smaller of the samples at Djararu Gems. These discs are 2 cm or less in diameter and are generally poorly preserved. The margins of the discs are serrated but have smaller peaks (approximately 1 mm in height and width) than in the form described above. The discs have been distorted, probably by compaction and possibly by some slight shearing. The "ribs" are fewer and broader than in the first type, and some ribs are very broad near the central area and divide at approximately 5 mm from the central zone. Each disc is surrounded by a "flange" of smooth rock approximately 4 mm wide.

The third type of structure consists of a broken disc, approximately 6 cm in diameter and 1 mm in thickness, and occurs in sample F 5985. The sample is poorly preserved but resembles the specimen illustrated by Dunnet (1965, pl. 2). Radiating "ribs", a serrated margin and a smooth flange are present.

The second and third types of discs have several features in common with the first type and appear to be poorly preserved specimens of similar origin. An organic origin for the disc-shaped structures is unlikely. Jellyfish (Scyphomedusae) are characterized by tetramerous radial symmetry, a feature which can be clearly observed in specimens from the Ediacara fauna, but is lacking in the specimens from Mount Brooking. The petal-shaped structures are too angular and their edges are too straight for a biogenic origin to be feasible, and they take the form of rigid plates, rather than of gelatinous segments. The "ribs" are grooves infilled with matrix and are continuous with the matrix. Dunnet suggested that some of the specimens he examined were gypsum rosettes. In the better preserved discs examined in this report the radiating petals are almost certainly the moulds of gypsum or barite rosettes. The other specimens, including those illustrated by Dunnet are altered and poorly preserved specimens of similar structures and the following mechanism of formation is suggested:- A single petal was formed by a bladed crystal, or, in the case of petals with more than one groove, by crystal twins. The concentric grooves resulted from pauses during the growth of the crystals, and these and the grooves between crystal boundaries were infilled with matrix. Later solution resulted in the disintegration of the crystals, but the matrix remained. A secondary deposit of minerals (possibly silica) from solution occurred on areas of positive relief and resulted in a thickening of the "ribs". The "flange" is probably caused by conchoidal fracturing of the siltstone.

A similar origin seems probable for the specimens reported by Dunnet (1965) but this material has not been examined. There seems little likelihood that any of the material collected so far from the Ranford Formation is of organic origin and there is no evidence that <sup>it</sup> represents a fossil fauna similar to that of Ediacara.

REFERENCES:

- Dunnet, D., 1965, A new occurrence of Proterozoic "jellyfish" from the Kimberley region, Western Australia Bureau Mineral Resources Record 1965/134 (unpub.).
- DOW, D.B., and Gemuts, I., 1969, Geology of the Kimberley Region of Western Australia, The East Kimberley West. Australia Geol. Survey Bulletin 120, p.89-93.

K Grey  
Palaeontology Section

KG:RMW

Distribution: A Mory  
Djarara Gems Pty, Kununurra  
Mr L Gaidans, Minatome Pty Ltd  
11/81  
Bonaparte Gulf Basin File  
Pal. Lab File  
K Grey