

Re-evaluation of the holotype *Cyclomedusa cliffi* from the Precambrian in Cliffe Hill Quarry

Precambrian rocks in Cliffe Hill Quarry, near Markfield in the Charnwood Forest of Leicestershire, have over the years yielded numerous fossils, including the discs and fronds of *Cyclomedusa cliffi*. During several visits to the quarry by the author and Leicester Museum geologists Andy Mathieson and Mike Jones in the 1970s (when access was unrestricted), a number of both large and small discs were revealed on steeply dipping bedding planes of the north face of the quarry. Further specimens were found on a large block lying at the foot of the quarry face, and this was subsequently broken up by the quarry so that three out of the five large discs on it were retrieved (Boynton, 1978; Boynton & Ford 1995). One of these discs became the holotype *Cyclomedusa cliffi* (Fig. 1).

Five other specimens in Leicester Museum have now been re-examined, along with a number of black-and-white photographs and transparencies from the author's and the Museum's collections. The following details can therefore be discussed.

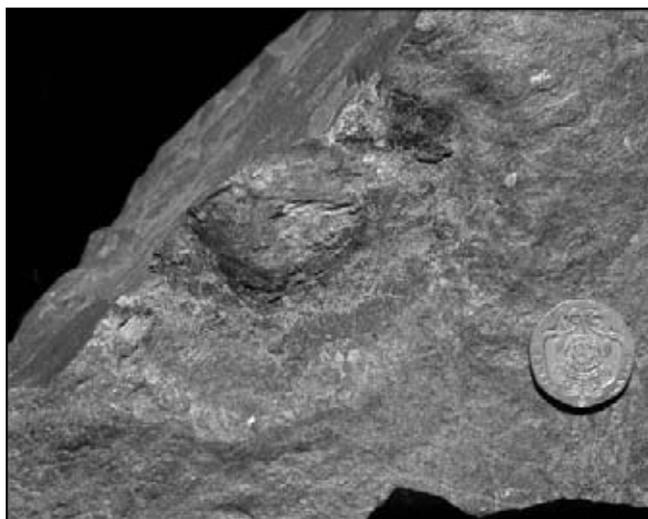


Figure 1. The holotype *Cyclomedusa cliffi* Boynton & Ford 1994. This was described as an ovoid medusoid impression, characterised by a raised, oval, central boss and an irregular outer margin, in an incomplete ovoid disc 150 x 120 mm. Within the outer margin a concentric flat area 2 mm wide surrounds a slightly depressed area 20 mm wide. The centre of the disc has a raised convex boss 30 x 22 mm across.

Leicester Museum specimen 0730.1993



Figure 2. A slightly ovoid disc with an outer irregular raised ring, with a small asymmetrically placed boss and a knotted stem emerging from it. Leicester Museum specimen 342.1970/71.

Palaeontology

The fossils from Cliffe Hill Quarry are described alongside their photographs. Most scales are given by a 20 pence coin, which is 20 mm in diameter.

The fossil fauna from the Bradgate Formation at Cliffe Hill Quarry appears to be far more varied than



Figure 3. An almost circular disc with a wider, flat, outer ring and a large, irregular boss, with a knotted stem emerging to the right and then bifurcating. Scale is given by the lens cap 50 mm across.

Leicester Museum transparency 47210/11.

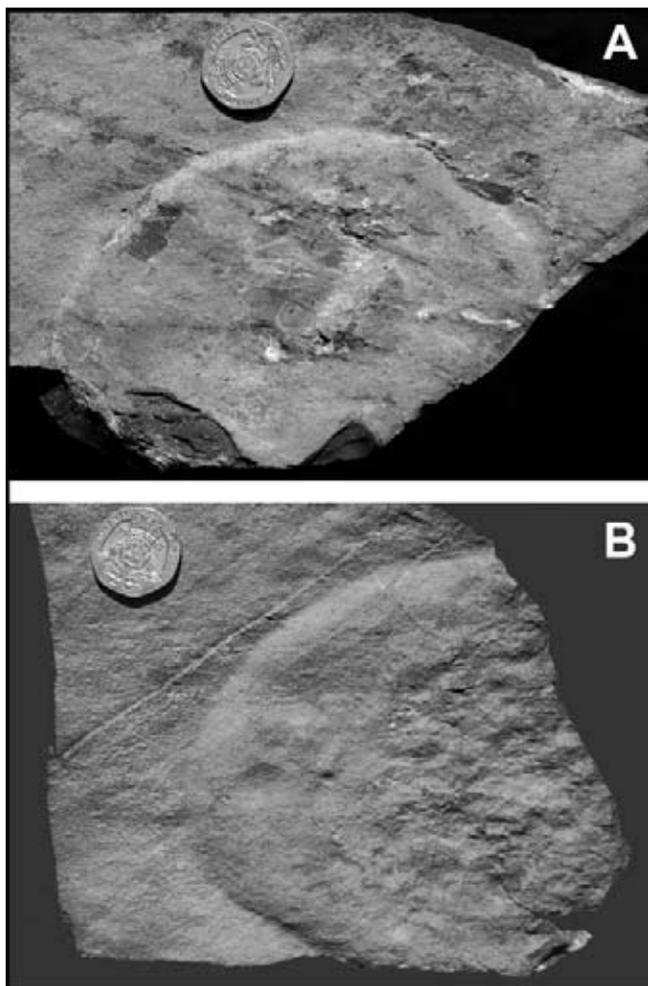


Figure 4. Two ovoid discs from the under-surface of one of the bedding planes.

A: a slightly convex ovoid disc with very little internal structure visible;

Leicester Museum specimen 487.1972/2.

B: an ovoid disc with a faint, wide, outer ring and irregular internal structure; there may be a faint trace of a stem emerging from the left side of the disc;

Leicester Museum specimen 487.1972/1.

was originally described (Boynton & Ford, 1995). It is probable that, with the discovery of two specimens each with stems emerging from a boss, the discs are not medusoids (as was originally thought), but are holdfasts of colonies of fronds, most of which are no longer preserved. They can be compared with *Charniodiscus concentricus*, which is widespread in the Ediacaran fauna. The disc with a faint bush-like mass of fronds emerging from it (Fig. 6) could be a new species of *Charniodiscus* sp., but as this specimen is no longer available for examination, no formal name is given here. There are certain similarities to a modern sea fan with anastomosing branches attached to a holdfast (Fig. 7). It is probable that some of the small discs are also holdfasts, but why they often occur in pairs is unknown. This suite of discs has not been found elsewhere in Charnian rocks.



Figure 5. Two adjacent, small discs, with that on the left in filled with dark green chlorite. These are on a bedding plane different from that containing the discs in Figure 4.

Specimen in the author's collection.

Sedimentation

The fossiliferous beds of the Bradgate Formation in Cliffe Hill Quarry consist of green to grey, parallel-laminated, volcanoclastic siltstones and mudstones (Carney & Pharaoh, 2000; Carney, 2005). These also show graded bedding, and probably represent a distal turbidite succession that is favourable to the preservation of fossils.

The strata of this fossil locality exhibit low-grade metamorphism, and are found about 150 m east of a small faulted intrusion of markfieldite of the South Charnian Diorites. The small discs show some impregnation by chlorite, which may have filled a hollow holdfast or may have replaced an internal structure. Mineralisation could have occurred at the same time as the intrusion, or during a later Acadian tectonic event, when cleavage, faulting and large scale anticlinal folding of the Charnian Supergroup took place.

Acknowledgements

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The fossiliferous bedding planes have long since been removed by quarrying, and access to Cliffe Hill Quarry is now very restricted, although may be possible with written permission from the Quarry Manager.

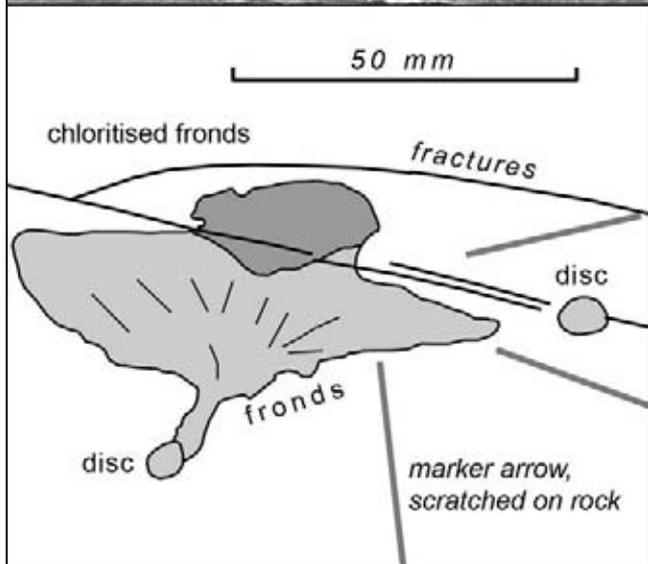


Figure 6. A colony of fronds on a thick knotted stem emerging from a disc; the upper part of the fronds is clouded by dark chlorite. The colony is about 100 mm high and 70 mm wide; it bears a resemblance to both *Charniodiscus concentricus* and to a modern sea fan (Figure 7). There is a second small disc on the same bedding plane. Photograph by the author in 1976, and interpretation. The bedding plane has since been lost in quarrying.

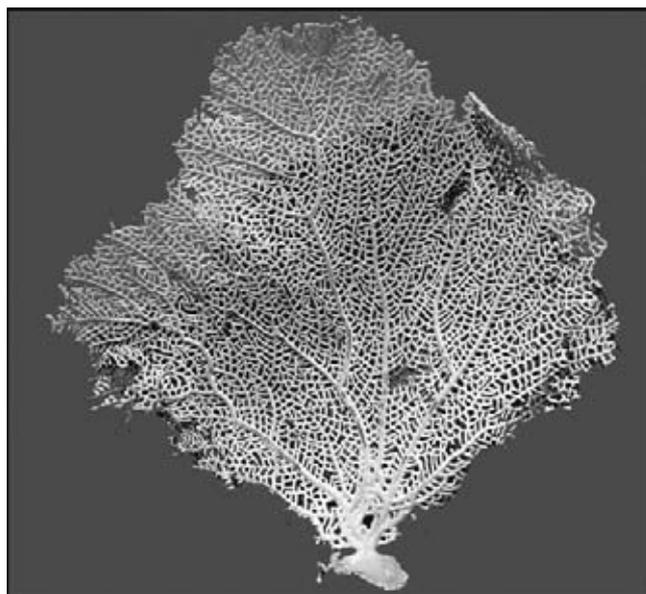


Figure 7. A modern sea fan, about 240mm across, for comparison with *Charniodiscus concentricus*.

References

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