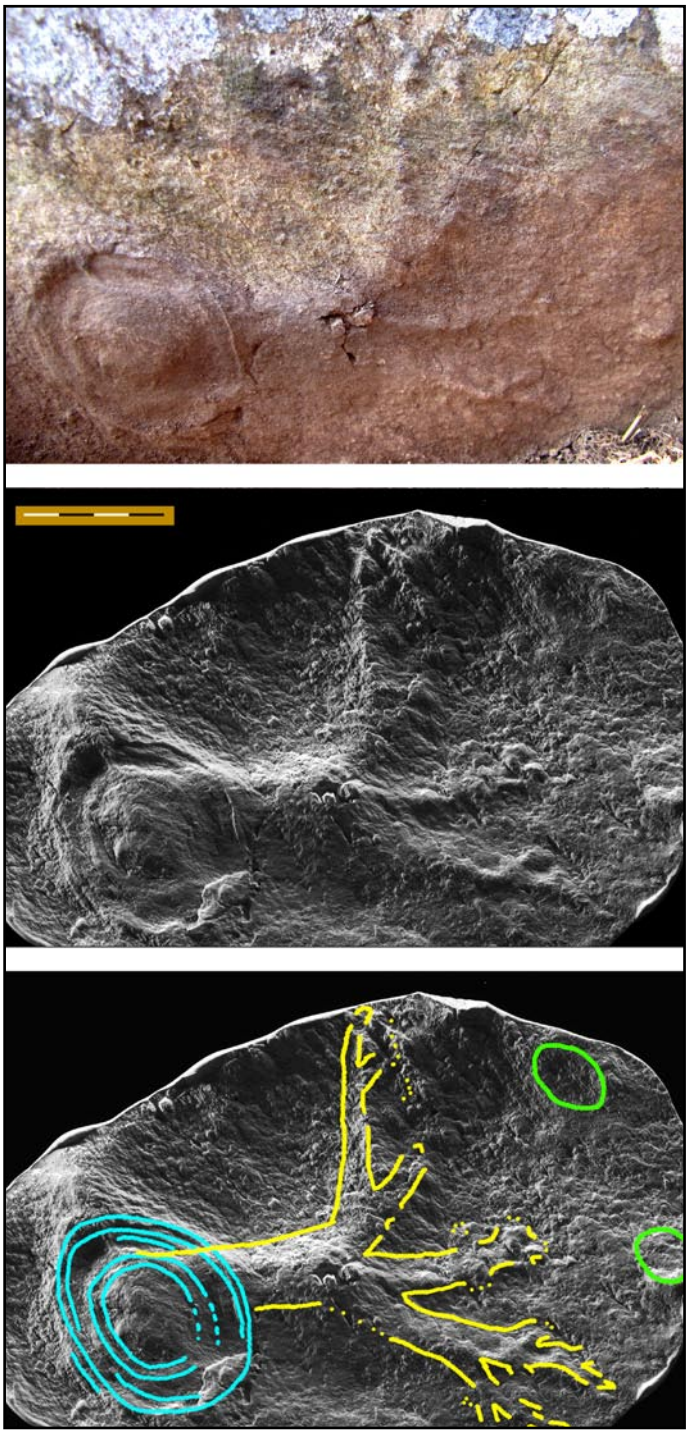
REPORT

An Ediacaran fossil from a new bedding plane in Charnwood Forest

Bedding planes at a number of localities in Charnwood Forest have been examined over the last two years, and in May 2012 a new fossil-bearing bedding plane was found. It occurs within the Bradgate Formation on the eastern limb of the Charnwood anticline, at a stratigraphical horizon comparable to the Memorial Crags locality, in Bradgate Park, from which the frondose form *Bradgatia linfordensis* was first described (Boynton and Ford, 1995). The volcaniclastic sediments that form this small outcrop show the same type of layering between fine-grained and coarser beds as occurs at the Memorial Crags horizon, consistent with deposition from distal-facies turbidites.

The specimen consists of a multi-ringed ovoid disc with an emerging robust stem that divides into a fan of four distinct, asymmetrically-distributed branches. Further distal branching can also be seen, though this is clearer in some parts of the specimen than in others. Were the specimen orientated in presumed life position with the disc at the bottom, the branches would take the overall form of an inverted triangle. The disc, which is assumed to represent the holdfast of the organism, measures 57x 48 mm. The outermost ring of the disc is distinctly prominent and the interior shows further concentric rings with the central portion of the disc being raised in a three-dimensional effect. The stem, whose lower border is indistinct, has a width of about 13 mm and extends some 25 mm beyond the holdfast margin before the branches emerge from it. The four first-order branches range between about 25 and 40 mm in length. Overall, the specimen has a length of 142 mm and its fan of branches reaches a width of 124 mm measured perpendicular to the stem. The immediate surrounding area of the bedding plane has a coarse lumpy appearance that is probably due to co-existent microbial matting, the presence of which is thought to bind together and thus preserve this organism. Beyond the reaches of the branches there are a further two poorly-preserved discoid specimens, each 20 mm across (on the right in the images).

When compared to other recorded Ediacaran fossils, this specimen bears most similarity to those of the *Primocandelabrum* genus first described from the Bonavista Peninsula, Newfoundland (Hofmann *et al*., 2004). Their species, *P. hiemaloranum*, includes ray-like appendages radiating from the disc, which the new specimen does not have; it is notable that this is also the case for other specimens from Charnwood Forest (Wilby *et al*., 2011). Other specimens related to *P. hiemaloranum* are distinguished by their lack of radiating structures from the disc; these were referred to collectively as *Primocandelabrum* sp., and were noted to have a higher ratio of frond width to frond length than *P. hiemaloranum* (Hofmann *et al*., 2004). The present specimen's relative dimensions are suggestive of this category too. Its branches show higher-order subdivisions but do not attain the frondose appearance seen in some *Primocandelabrum* specimens; this appears to be a reflection of the degree of preservation.



Images of the fossil, all at the same scale.
Top: Field photograph of the fossil.
Middle: Enhanced image of cast, created from two images lit from different directions, with bar scale in centimetres.
Bottom: Annotated image with sketched outline to pick out the main features and also the two adjacent discoid forms.

On-going work by the British Geological Survey has already demonstrated a range of different forms from Charnwood Forest, all showing degrees of resemblance to *Primocandelabrum* but with enough variety within them to suggest an underlying range of as-yet-undescribed taxa (Wilby *et al*., 2011). This work may, in time, clarify the taxonomic status of the current fossil find.

Time of year, day and light conditions are everything when it comes to locating the low-relief fossil specimens in Charnwood Forest; strong, low-angle sunlight striking obliquely across the bedding plane is ideal. Depending on the orientation of the outcrop, this may occur at both extremes of the day and what is revealed may well show significant differences between dusk and dawn. As this new example shows only too clearly, there may be other impressive specimens waiting to be found. Furthermore, surfaces that have been examined many times but not formally moulded could still be worthy of further research. Since the discovery of this fossil, the author has located two faint multi-ringed discs in excess of 90 mm diameter on a nearby older bedding plane. The surface had previously been examined repeatedly, but, under optimum lighting conditions one day, a disc became obvious from some distance. Later that day, the same specimen became almost impossible to identify at close range under a different angle of the sun.

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References

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