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The Cambrian Explosion Remains an Enigma for Organic Evolution:

The Ediacaran Fauna: Much Ado About Ancient Lichens?

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According to the conventional evolutionary-uniformitarian time scale of Earth history, multicellular organisms first appeared in abundance about 550 million years ago, in the "Big Bang of Evolution," the Cambrian explosion. But (again, according to the conventional time scale) a handful of odd multicellular organisms existed before the astonishing explosion of new forms in the Cambrian. These organisms, from the so-called Ediacaran fauna, named after the town of Ediacara in southern Australia where their fossil remains were discovered in 1947, are said to be 600 million years old. Figure 1 shows one well-known Ediacaran form, Dickinsonia.¹

Now a novel interpretation of these puzzling fossils is generating considerable controversy within the paleontological community. Some scientists (notably the German paleontologist Adolf Seilacher and Harvard's Stephen Jay Gould) have suggested that the Ediacaran fauna--known also as the Vendozoa or Vendobionta (from the Vendian geological period in which they occur)--were "failed experiments" in the evolution of multicellular animals. Unlike the Cambrian organisms, these odd designs left no ancestors.² But the novel interpretation, from University of Oregon paleontologist Gregory Retallack, suggests that the Ediacaran fossils weren't animals at all. Rather, they were probably lichens.³

Retallack rests his case on some strange features of the Ediacaran fossils. "An outstanding anomaly of Ediacaran fossil," he notes, "is the surprising relief of their impressions in quartz-rich sandstones buried to depths of about 5 km [kilometers]." If the

fossils were soft-bodied animals, however, as they are usually interpreted, one wouldn't expect such relief--the fossils should have been squashed quite flat by the weight of sediment overlying them. But Ediacaran fossils, Retallack observes, "were as compaction resistant as some kinds of fossil tree trunks!" If the Ediacaran forms were not animals, therefore, but lichens composed of sturdy molecules like chitin, their resistance to compaction would be much easier to explain.⁴

Furthermore, Ediacaran organisms could be quite large: up to 1 meter across, in some instances. Retallack argues that this large size is compatible with a sessile (permanently attached) organism which gained its nutrition via symbiosis with photosynthetic organisms. (The "animal" interpretation of the forms, on the other hand, had no good explanation for how the organisms fed.) And other evidence for the lichen interpretation can be found in the growth patterns and microscopic structure of the fossils.

What are the implications of this new interpretation? If accepted, it will make the Cambrian Big Bang of animals all the more puzzling for evolutionists, by removing any possibility that the Ediacaran forms were ancestral to the Cambrian invertebrates (already in doubt, according to Seilacher, Gould, and others). Commenting on the puzzling status of the Ediacaran (Vendian) fossils, the Russian paleontologist Mikhail Fedonkin writes:

We are now in the situation Charles Darwin found himself in about 150 years ago. He was puzzled by the absence of the ancestors of the Cambrian invertebrates, considering this fact as a strong argument against his theory of gradualistic evolution of species. We do not know the ancestors of the Vendian fauna as well, and like the Cambrian biota it appeared suddenly in a "complete state."⁵

NOTES

¹Bruce Runnegar, "Evolution of the Earliest Animals," in *Major Events in the History of Life*, ed. J.W. Schopf (Boston: Jones and Bartlett, 1992), pp. 65- 93.

²Adolf Seilacher, "Vendozoa: Organismic construction in the Proterozoic biosphere," *Lethaia*, 22 (1989): 229-239.

³Gregory J. Retallack, "Were the Ediacaran fossils lichens?" *Paleobiology*, 20 (1994): 523-544.

⁴*Ibid*, p. 523.

⁵Mikhail Fedonkin, "Vendian body fossils and trace fossils," in S. Bengtson, ed., *Early Life on Earth*. Nobel Symposium No. 84 (New York: Columbia University Press, 1993), pp. 370-388; p. 388.

Topics: Cambrian explosion, amazing but true, evidence against evolution, anti-evolution, sudden appearance theories, Creationary viewpoint, antievolution, origin of phyla, special Creation