Fossil embryos deep in the fossil record

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Fossilized embryos and cells, believed from metazoans, are being found in the early fossil record; from an evolutionary viewpoint this is surprising. A sizeable body of literature has already built up on the subject since the mid 1990s.

Embryos even from the Late Neoproterozoic in China!

Embryos have been found in 'old' rocks on four continents, especially in Siberia, Nevada, Australia and China. They have been discovered in sedimentary rocks of even Late Neoproterozoic age, assuming the evolutionary geological column[1] (figure 1). The Neoproterozoic is the period, so called, between 1 billion and 550 million years ago. This discovery was in the Doushantuo Formation, Guizhou Province, southwest China and shows Metazoan diversity 40 million years *before* the beginning of the Cambrian![2,3]

'In addition, a large number of embryos display a variety of developmental patterns and different morphological types, implying that metazoans may have been *diverse 40 million years before the Cambrian* [emphasis mine].'[4]

Raff *et al.*[5] analyzed 162 embryos in different but early stages of embryonic development. These embryos were of large size compared to modern embryos, but size has been ruled out as causing their unusual preservation. They were still encased in a fertilization envelope that likely preserved them during fossilization. Other fossils of sponges, cnidarians, acritarchs and possibly bilaterians have also been found in this formation.[4,6]

Some scientists have recently challenged the identification of the Neoproterozoic fossils, claiming instead that they are giant sulfur bacteria.[7] The challenge is likely motivated by the problems caused by the existence of such animal embryos so early in the rock record.[8] Although some observations support this new idea, other data are contrary to the bacteria hypothesis.[9] For instance, the suggested bacteria have not been shown to undergo more than three rounds of cell division, while the Doushantuo Formation fossils have undergone at least 7 rounds of cell division. Furthermore, the fossils are found in an enveloping membrane, which is rare in this type of bacteria. The location of vacuoles in the cells are also anomalous, if the cells are from bacteria. Finally, the cells show preserved nuclei, unlike bacteria.

Even more recently, Chinese scientists have vindicated the embryonic origin of these fossils, and shown that they are not giant bacteria.[6] They have discovered embryos within eukaryotic architarchs, a metazoan animal. Other features of the fossils support the embryo interpretation. It is interesting that the architarchs are even found 30 m above what are believed to be glaciogenic rocks, from a time, supposedly, when the earth was totally covered in ice.

Modern features

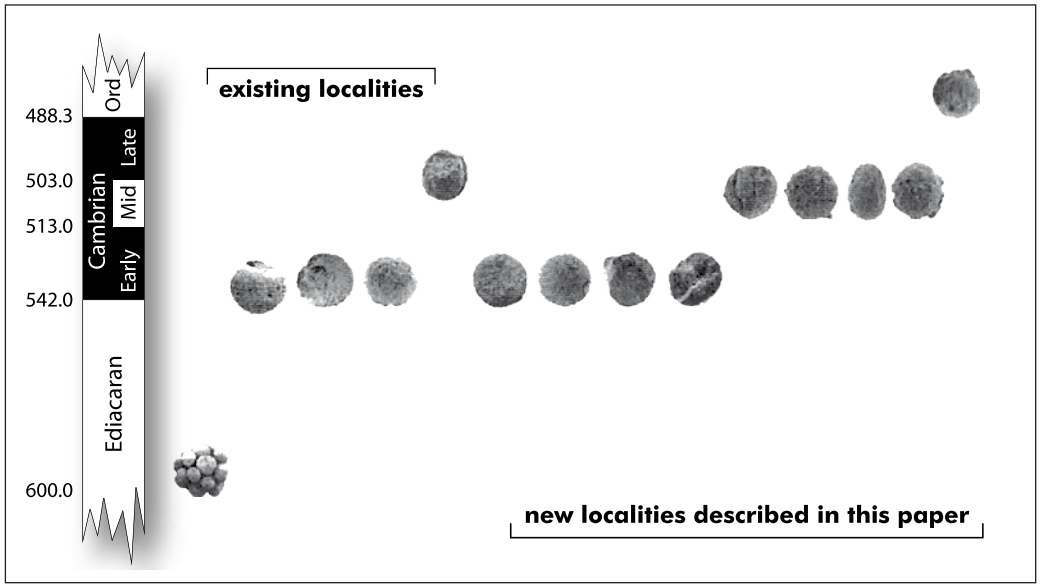
The Late Neoproterozoic embryos from China are complex and display some modern features:

> 'Furthermore, the embryos are relatively complex and resemble those of modern bilaterians such as annelids and mollusks, but existed tens of millions of years before the Cambrian explosion.'[10]

The embryos display polar lobes, asymmetrical bulges that allow bilaterian embryos to form different tissues as adults; these are common in many modern mollusks.[4] The observations rule out an inorganic origin and suggest the embryos are from the same organism.[10] Cell division is asynchronous, a feature common in modern embryos:

> 'Asynchronous cell division is common in modern embryos, implying that sophisticated mechanisms for differential cell division timing and embryonic cell lineage differentiation evolved before 551 million years ago.'[11]

These findings show that, from an evolutionary viewpoint sophisticated



From Donoghue *et al.* ref. 1

The stratigraphic distribution of embryos from China, Siberia, northern Australia and Nevada. (From Donohue *et al.*,[1] p. 236).

processes of cell division evolved well before the Cambrian 'explosion of life'. This poses many problems for an evolutionary framework.

Embryos also from the Cambrian and Early Ordovician

Embryos are also found in the Cambrian and Early Ordovician, but for some strange reason are missing above the Early Ordovician. Except for the Early Cambrian, the embryos are of one type. Most of the eggs have been phosphatized, but one locality in China reports silicified embryos and/or eggs from the middle Cambrian.[12,13] Researchers are wondering if some systematic preservational bias is the reason only one type was found.

There are modern features also associated with these embryos.[14] Furthermore, it had been assumed in metazoan evolution that 'direct developers' evolved late in geological history from 'indirect developers'. However, all the embryos found from the Neoproterozoic to the Early Ordovician are direct developers.[1] So, not only is this evolutionary idea wrong, but a variety of embryonic development patterns must have existed early in the fossil record although indirect developers have not yet been found.

Embryos a surprise to evolutionists

These embryos in such 'old' strata are a big surprise to evolutionists:

> 'Despite the perceived vanishing probability of embryo fossilization, embryos of early metazoans have begun to be recovered from rocks of Cambrian … and late Neoproterozoic age …'[15]

A web article on the late Proterozoic discovery stated: 'Until only recently, many paleontologists doubted claims that fossilized embryos hundreds of millions of years old could exist.'[3] Furthermore, researchers are perplexed that phosphatization could occur so rapidly:

> 'Anyone who works with marine embryos would consider preservation for sufficient time for mineralization via phosphatization unlikely, given the seeming fragility of such embryos.'[14]

Modern taphonomic research indicates that embryos of marine organisms should decay in a matter of hours, but preservation can be extended for a month or two if the embryos are still in the fertilization sack and the environment is reducing.[5] Of course, the embryo cannot live in a reducing environment (they need oxygen), so reducing conditions must have occurred quickly after death. Rapid death also helps preserve the embryos, but they still need to be buried rapidly.

Evolutionary implications

The fossilized embryos shatter some ideas about evolution. Not only have certain cellular processes been pushed way back in time, but also there does not appear to be any evolution seen in these embryos, since many cellular processes, including some modern features, go clear back to the beginning of the fossil record. These embryos demonstrate that complex metazoans have been around since at least the Neoproterozoic and that from an evolutionary point of view their origins go back even further. Thus, the origin of animals is firmly based on nothing, and a huge evolutionary mystery: 'The origin of animals is almost as much a mystery as the origin of life itself.'[16]

It is interesting that researchers assumed that fossil preservation before the Cambrian was due to lack of hard parts,[10] but now they have found *embryos 40 million years before the Cambrian*. These embryos should cause the argument from a lack of hard parts to go into dormancy, except for the fact that other evolutionary explanations do not make sense either.

What does it mean for the Creation-Flood model?

With sophisticated cellular processes found so early, the embryo fossil record clearly favours creation. Furthermore, rapid burial and fossilization would be expected in the Flood. A sudden reducing environment may not be needed. Furthermore, the Flood was not that long ago, so any post-deposition effects after fossilization would be minimal. On the other hand, would embryos experience destructive post-burial changes in the assumed evolutionary time of over 500 million years? Even if the embryos could be fossilized rapidly in an evolutionary scenario, would the embryos remain unaltered in all that time? It is probable that a short timescale is required for their preservation, which is what the Creation-Flood model provides.

The embryos also bring up a few questions for the Flood model. The fact that very few body fossils are preserved in the Neoproterozoic rocks is even more of an evolutionary mystery, but could the lack of preservation be due to the violence of the Flood mechanism? How would we explain the lack of embryos 'younger' than the early Ordovician?

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Big birdosaur blues: new fossil creates problems for dino-to-bird evolution

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The media has recently been buzzing with the latest claims of a dino-to-bird missing link, a 1,400-kg so-called 'bird-like dinosaur' from China dubbed *Gigantoraptor erlianensis* (meaning 'giant thief from Erlian'[a city in Inner Mongolia in China]).[1,2] However, perusing the report in *Nature*[3] reveals that *Gigantoraptor* seems to confuse evolutionists more than confirm dino-to-bird evolution.

First, the sheer size of *Gigantoraptor* presents a problem for the orthodox dino-to-bird story, which the researchers themselves admit:[3]

> 'Interestingly, the comparatively less "bird-like" species of most coelurosaurian sub-groups, such as of Alvarezsauroidea, Troodontidae and Dromaeosauridae, are in general larger in size than the more "bird-like" species of each clade, unlike the situation in the Oviraptorosauria where the gigantic *Gigantoraptor* independently evolved many "bird-like" features absent in its smaller relatives.'[4]

In most dinosaur lineages alleged to be closely related to birds, the smaller dinosaurs tend to have more birdlike features.[5] However, *Gigantoraptor* reverses this trend. It exhibits more birdlike characteristics than either *Caudipteryx zoui* or *Protarchaeopteryx robusta*, two of its supposed closest relatives, yet it is 300 times larger than either of them (figure 1).[6] This is explained by invoking homoplasy,[7] which is a poor contingency plan to common descent used by evolutionists to when common descent fails.[8]

Gigantoraptor has been portrayed as a dinosaur with feathers, both by the researchers[3] and the media.[1,2] Xu *et al.* even go so far as to say that their feathers were used for protecting eggs during brooding.[3,7] However, their reasons for believing that *Gigantoraptor* had feathers are nothing more than speculation because no feathers were found with the fossil. Note, *no feathers were found!*

They assume *Gigantoraptor* had feathers because its apparent closest relatives, *Caudipteryx* and *Protarchaeopteryx*, appear to have feathers.[5] However, the status of these two fossils as *dinosaurs* is disputed. Some believe them to be flightless birds based on the feathers and other anatomical evidence.[9–11] However, *Gigantoraptor* appears to have more birdlike features than even *Caudipteryx* and *Protarchaeopteryx*:

> '*Gigantoraptor* has oroportionally the longest forelimb among oviraptorosaurs, a manus resembling basal eumaniraptorans, birdlike hind limbs, and many other advanced features.'[6]

This means it may in fact be a bird, in which case one would expect it to have feathers without having to postulate feathered dinosaurs. Therefore, to assume that they are feathered dinosaurs in order to prove they had feathers is not only begging the question, it also ignores other possible paths to the same conclusion.

However, no amount of speculative reasoning will prove that *Gigantoraptor* had feathers. Even though *Gigantoraptor* is said to be a close relative of *Caudipteryx* and *Protarchaeopteryx*, it would still have been about 300 times their size, and it possesses many other unique features that set it apart from them both.[3] Therefore, unless we actually find a *Gigantoraptor* fossil *with feathers attached* we cannot know if it had feathers and all claims that it did are mere speculation.

Moreover, *Gigantoraptor* doesn't fit the evolutionary timeline for dino-to-bird evolution. *Gigantoraptor* was found in strata 'dated' as Upper Cretaceous (85–65 Ma ago),[3] but *Archaeopteryx*, which is a recognizable bird, is dated at about 150 Ma; and *Confuciusornis*, a beaked bird, supposedly existed 135Ma ago. Therefore, *Gigantoraptor* can't be