

## Earliest multicellular life? Claimed 1.5 billion years earlier than previously thought

Shaun Doyle

Once again, a fossil find has rewritten the evolutionary origins story, or so we're told. Over 250 fossils, supposedly 2.1 billion years (Ga) old have been found in Gabon, in western Africa. The big surprise for evolutionists is their size: they are in the scale of centimetres long, getting as long as 12 cm. One report states that the discovery of the Gabon fossils "moves the cursor of the origin of multicellular life back by 1.5 billion years."<sup>1</sup>

Is this true? Or are the reports playing fast and loose with terms such as 'multicellular life', and muddying the waters in which multicelled life supposedly evolved? As is often the case, the actual research tells a much less convincing story.<sup>2,3</sup>

### Stratigraphy and age

These fossils are claimed to be about 2.1 Ga old, roughly 1.5 Ga older than the lowermost Cambrian. They are embedded in the sedimentary Franceville formation near Gabon in western Africa, which outcrops over 35,000 km<sup>2</sup> and has a maximum depth of about 2,000 m (figure 1). The fossils were found closer to the top of the formation in finer-grained layers than those that occur underneath, and have an estimated density at the quarry in which they were found of 40 fossils/m<sup>2</sup>.<sup>4</sup>

Such a large sedimentary formation (figure 1) with hints of volcanism is likely to be catastrophically laid down, possibly during the Inundatory stage of the Flood according to Walker's model<sup>5</sup> and Oard's diagnostic criteria.<sup>6</sup> The sedimentary layering and large area suggests the Franceville formation is much too large to be pre-Flood or post-Flood, (see below for creationist

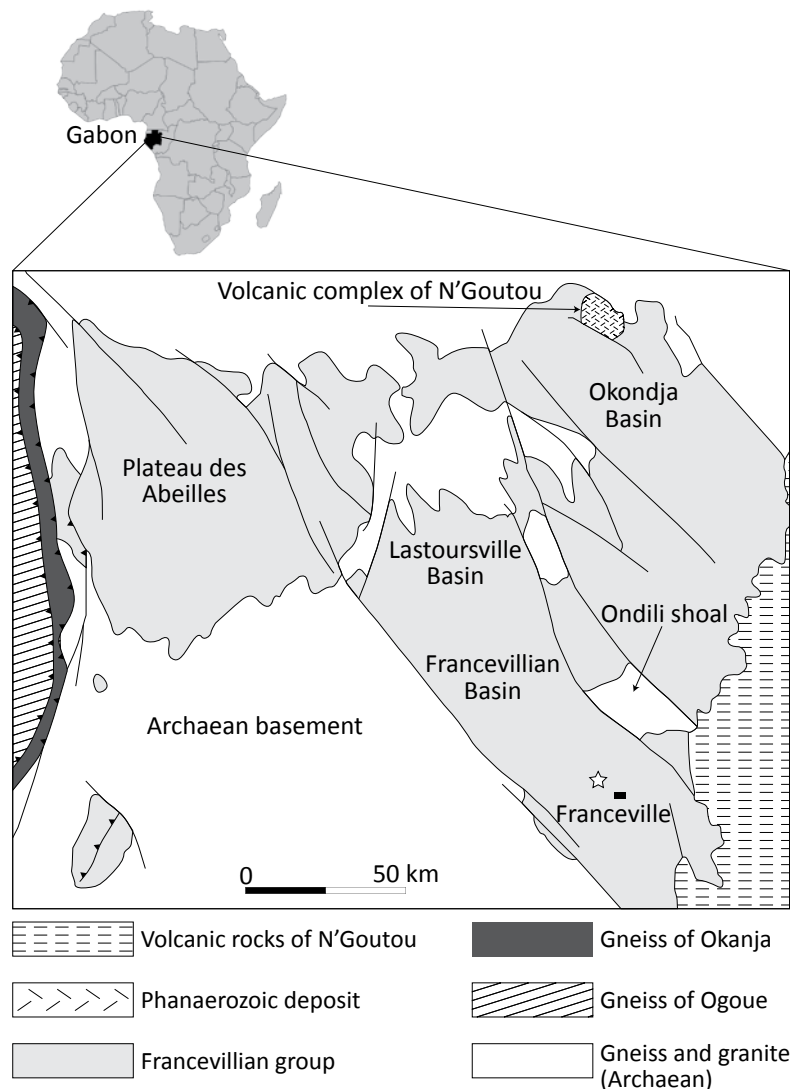
issues surrounding the interpretation of Precambrian fossils).

The volume of the Franceville formation as a whole, along with the fine sedimentary layers evidenced especially in the upper, fossil-bearing layers of the formation suggest that catastrophic burial is a better explanation than slow deltaic inundation.<sup>6</sup>

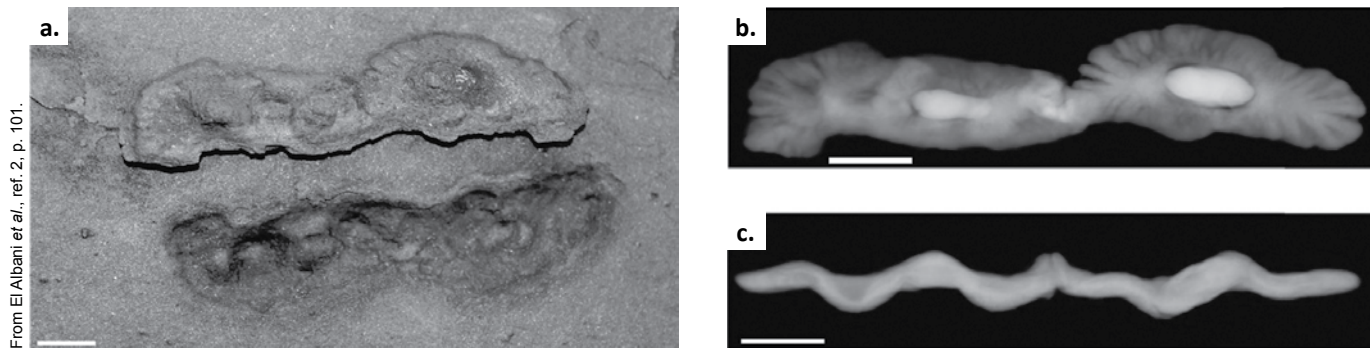
### What are these fossils?

There is a lot of confusion around what these fossils actually are. El Albani *et al.* say that the folded radial structure evidenced in the fossils (figure 2) is too complex for mere

inorganic processes.<sup>7</sup> Moreover, the fossils displayed consistently higher organic carbon (as determined by the  $\delta^{13}\text{C}$  content) than the surrounding sediment, suggesting the fossils were originally organic. The surrounding sediment is also rich in organic carbon, and contains evidence of eukaryotic organisms as well, which may mean the Gabon fossils themselves are eukaryotic.<sup>7</sup> El Albani *et al.* say that the Gabon assemblage is most likely fossilized colonial organisms, and are thus evidence of multicellular life.<sup>8</sup> But what exactly do they mean by 'multicellular life'?



**Figure 1.** Geologic setting showing the extent of the Franceville formation in Gabon. The fossils were found near Franceville (marked by star). Note the stratigraphic setting and massive size of the Franceville formation, which suggests it was deposited early in the global Flood rather than more gradually in a deltaic environment, as the researchers propose. (After El Albani *et al.*, ref. 2, p. 100.)



**Figure 2.** One of the macrofossil specimens. **a.** Top shows lower side of the fossil. Bottom is its impression in the black shale. **b.** CT virtual reconstruction of fossil. **c.** Virtual section close to central part of fossil. Scale bars, 1.0 cm. Based on the fossil's appearance and geochemical analysis, the researchers suggest a biogenic origin for the fossils. Note, however, the simplicity of the structures, which look like unicellular colonies rather than true multicellular life.

### Evidence for the evolution of multicellularity?

The Gabon fossils have been hailed as multicellular life.<sup>1,9,10</sup> The researchers have shown, capably I believe, that they have found true organic macrofossils. However, these fossils would be considered unimportant if it wasn't for the age assigned to them and that they are called 'multicellular organisms' because of their size. This creates excitement because, at first look, it seems to make the unsightly problems of the Ediacaran and Cambrian 'explosions' of multicellular diversity less of a problem for evolutionists. With over a billion more years to work with, early animal evolution sounds more plausible. However, as Donoghue and Antcliffe point out, defining multicellularity is a tricky business:

"Multicellularity represents one of the principal thresholds in evolutionary history. This threshold has been exceeded tens of times, perhaps because much of the requisite molecular machinery to facilitate cell-cell coordination is a shared primitive feature of living organisms, but also because some definitions of multicellularity encompass everything from simple bacterial colonies to badgers. Stricter definitions of multicellularity are met in far fewer instances."<sup>11</sup>

This ambiguity creates confusion: when people ordinarily think of multicellular organisms, they

think of animals, plants, and fungi. Therefore, to hear that "multicellularity has evolved tens of times" gives the false impression that it is a simple transition. Moreover, equating the cellular coordination of unicellular life<sup>12</sup> or the Gabon fossils to those in the Cambrian is misleading because there is a vast difference in the 'multicellularity' of the organisms these two fossil groups represent:

"Although the fossils are macroscopic, they do not seem to represent anything other than the basic type of multicellularity, which occurs earlier in time in the form of stromatolites."<sup>13</sup>

The stromatolites referred to are fossils of algal mats that look very much like living algal mats in remote locations.

There is a fundamental difference between unicellular colonies, such as what the Gabon fossils most likely represent,<sup>14</sup> and true multicellularity such as we find in animals, plants and fungi. Multicellularity as found in these latter organisms has four essential characteristics:<sup>15</sup>

1. Genetic sameness throughout the cellular population to ensure every cell 'plays by the same rules'.
2. Physical cohesion between the cells such that separating some cells causes severe injury or death to the organism.
3. Intercellular coordination mediated through a cellular differentiation program for the development of

the single cell zygote into a full-fledged multicellular individual.

4. Repair and maintenance strategies, of which serial cell differentiation is the primary method, that work to maintain bodily integrity and control cellular selection throughout the life of the organism.

Moreover, cells and organisms that don't possess true multicellularity cannot decouple totipotency<sup>16</sup> and immortality<sup>17</sup> because they don't already possess a full cellular differentiation program. And there is a fundamental conflict between cell-level and organism-level selection because competition for survival between individual cells is incompatible with the intercellular co-dependence of true multicellularity. All of these problems combined render the evolution of true multicellularity essentially impossible because of the extreme improbability of achieving all of the parameters at once.<sup>18</sup>

Unicellular colonial organisms, like Western Australia's cyanobacterial mats which are living stromatolites, show communication and coordination. However, like such colonies, there is no evidence of cell differentiation, such as different tissue structures, in the Gabon fossils. Since cellular differentiation is the cornerstone of true multicellularity,<sup>19</sup> the Gabon fossils remain mere colonial organisms and provide no evidence for the evolution of true multicellularity.

### Problems with the timing of the fossils

In spite of all the confusion about multicellularity and whether or not the Gabon fossils show its evolution, Donoghue and Antcliffe claim:

“It was Darwin’s view that absence of organisms in these early intervals of Earth’s history would prove his theory of biological evolution wrong. The discovery and continuing elucidation of the Precambrian fossil record has met Darwin’s predictions on the extent and structure of evolutionary history.”<sup>13</sup>

In contrast to this gross overstatement of significance, the researchers only discussed some *superficial* similarity to one *dubious* Ediacaran fossil. This is as close as the researchers get to positing any *concrete* evolutionary links between the Gabon fossils and multicellular life. The obvious implication of the *superficial* similarity to a *dubious* Ediacaran fossil is that the researchers do not believe the Gabon fossils are ancestors of the Ediacaran biota. Therefore, we are still no closer to identifying the putative ancestors of the Ediacaran or Cambrian biota.

Moreover, these colonies are speculated to have gone extinct after the ‘Great Oxidation Event’ (GOE) that supposedly occurred between 2.4 and 2.0 Ga ago.<sup>20</sup> Despite the major problems with such a scenario,<sup>21,22</sup> how does it provide anything new or exciting for evolutionary history? At best it’s a failed evolutionary experiment that wasn’t successfully replicated for another 1.5 Ga. At worst it’s another independent explosion of multicellular diversity with no antecedent evidence, just like the so-called Ediacaran and Cambrian ‘explosions’.<sup>23</sup>

Finally, colonial organisms are a far cry from the intricate differentiation and body planning programs evident in the Cambrian fossils. Therefore we are left with fossils that have modern analogues, but with no links between something like colonial algae and

true multicellularity. Once again, the fossils appear fully formed, with no evidence of gradual transition. Far from substantiating Darwin’s claims about the fossil record, these fossils falsify them.<sup>24</sup>

### Creationist implications

Precambrian fossils have been as controversial among creationists as they have been among uniformitarian evolutionists, though for somewhat different reasons. Creationists have long debated over where to place the pre-Flood/Flood boundary in the rock record, and Precambrian fossils and organic carbon have been some of the key points of contention.<sup>25</sup> While these fossils may possibly be examples of macroscopic Creation Week fossils since they are most likely unicellular colonies and not *nephesh* life,<sup>26,27</sup> they still remain consistent with an Early Flood interpretation as outlined above.<sup>28</sup>

### Conclusion

These fossils superficially look impressive for evolution, but once you remove the equivocation around the ‘multicellularity’ they prove nothing. They end up creating more problems than they solve because they offer no links with other multicellular fossils, and are themselves a far cry from true multicellularity. However, whether these structures are true fossils or merely inorganic formations, they hardly present any problem for creationists. If fossils, then they present us with a class of organisms for which we have plenty of examples in the living world (prokaryotic colonial organisms) and we don’t need to postulate the multiple, independent rise of such coordinated complexity by chance. If the concretions are inorganic (which is a possibility<sup>10</sup>), then they obviously say nothing about evolution. Moreover, the Bible provides a much simpler explanation for the origin of such colonies than incomplete and problematic evolutionary speculations.

### References

1. Discovery of a complex, multicellular life from over two billion years ago, *Physorg.com*, 30 June 2010; [www.physorg.com/news197132216.html](http://www.physorg.com/news197132216.html), accessed 17 November 2010.
2. El Albani A., Bengtson S., Canfield D.E. *et al.*, Large colonial organisms with coordinated growth in oxygenated environments 2.1 Gyr, *Nature* **466**:100–104, 1 July 2010, doi:10.1038/nature09166.
3. Donoghue, P.C.J. and Antcliffe, J.B., Early life: origins of multicellularity, *Nature* **466**:41–42, 1 July 2010; doi:10.1038/466041a.
4. El Albani *et al.*, ref. 2, pp. 100–101.
5. Walker, T., A biblical geologic model; in: Walsh, R.E. (Ed.), *Proceedings of the Third International Conference on Creationism, Technical Symposium Sessions*, Creation Science Fellowship, Pittsburgh, PA, pp. 581–592, 1994; see also Walker, T., *Biblical Geology* 6 July 2010; [biblicalgeology.net/Model/Biblical-Geology.html](http://biblicalgeology.net/Model/Biblical-Geology.html).
6. Oard, M.J., Defining the Flood/post-Flood boundary in sedimentary rocks, *J. Creation* **21**(1):98–110, 2007; [creation.com/defining-the-flood-post-flood-boundary-in-sedimentary-rocks](http://creation.com/defining-the-flood-post-flood-boundary-in-sedimentary-rocks).
7. El Albani *et al.*, ref. 2, p. 102.
8. El Albani *et al.*, ref. 2, pp. 102, 103.
9. Complex, multicellular life from over two billion years ago discovered, *Science Daily*, 1 July 2010, [www.sciencedaily.com/releases/2010/06/100630171711.htm](http://www.sciencedaily.com/releases/2010/06/100630171711.htm), accessed 17 November 2010.
10. Maxman, A., Ancient microfossils unearthed in West Africa, *Nature news*, 30 June 2010; [www.nature.com/news/2010/100630/full/news.2010.323.html](http://www.nature.com/news/2010/100630/full/news.2010.323.html), accessed 17 November 2010.
11. Donoghue and Antcliffe, ref. 3, pp. 41–42.
12. Shapiro, J.A., Thinking about bacterial populations as multicellular organisms, *Annual Reviews Microbiology* **52**:81–104, 1998. The difference between multicellular and unicellular organisms is that unicellular organisms can still survive and reproduce without the aid of any other cells, whereas individual cells in a multicellular organism cannot.
13. Donoghue and Antcliffe, ref. 3, p. 42.
14. It makes little difference whether these are colonies of prokaryotes or unicellular eukaryotes because they are still *colonial* organisms, and as such are still a far cry from true multicellularity.
15. Doyle, S., Evolution of multicellularity: what is required? *J. Creation* **23**(1):5–7, 2009; [creation.com/multicellularity](http://creation.com/multicellularity).
16. *Totipotency* is the ability of a cell to reconstruct a whole organism.

17. *Immortality* is the capacity for never-ending cell division.
18. Michod, R.E., Nedelcu, A.M. and Roze, D., Cooperation and conflict in the evolution of individuality IV. Conflict mediation and evolvability in *Volvox carteri*, *BioSystems* 69:95–114, 2003.
19. Doyle, S., Serial cell differentiation: intricate system of design, *J. Creation* 22(2):6–8, 2008; creation.com/serial-cell-differentiation-intricate-system-of-design.
20. El Albani *et al.*, ref. 2, p. 101.
21. Tapp, B., Origin of oxygen more complex than imagined, *J. Creation* 21(2):3, 2007; creation.com/origin-of-oxygen-more-complex-than-imagined.
22. Snelling, A., The first atmosphere—geological evidences and their implications, *Creation* 3(4):46–52, 1980; creation.com/the-first-atmosphere-geological-evidences-and-their-implications.
23. Doyle, S., Ediacaran explosion, 5 March 2008, creation.com/ediacaran-explosion.
24. Doyle, S., Remarkable mammal hairs in amber? 22 June 2010, creation.com/mammal-hair-in-amber.
25. For a recent example, see the forum of four articles on Precambrian geology and the Bible: Froede Jr, C.R., Reed, J.K., Oard, M.J., Hunter, M.J., Dickens, H. and Snelling, A.A., *J. Creation* 22(3):40–50, 2008.
26. Dickens, H. and Snelling, A.A., Precambrian geology and the Bible: a harmony, *J. Creation* 22(1):65–72, 2008.
27. Dickens, H. and Snelling, A.A., Precambrian geology and the Bible, no dissonance or contradiction, *J. Creation* 22(3):47–50, 2008.
28. Oard, ref. 6, pp. 99–102.

## Shared mutations in the human and chimpanzee $\beta$ -globin pseudogenes is not evidence for a common ancestor

Bryan Anderson

Evolutionists have often postulated that there are ‘shared mutations’ in pseudogenes (supposedly defective genes) from different baramins (biblical kinds) and that this is conclusive evidence that the different baramins share a common ancestor. Consequently, this postulation appears to falsify biblical creation in favor of evolution. This argument is so convincing because a similar argument is used in other non-biological fields to prove a common source for two pieces of information. For example, two similar written articles can be compared to identify plagiarism, by searching for unusual spelling errors that appear in both articles. If unusual spelling errors are identified, this is compelling evidence that one of the authors has copied the other’s article, or that both of the authors have copied another author’s article.

Evolutionists have suggested that the  $\beta$ -globin pseudogenes in humans and chimpanzees contain shared mutations and they have used this idea to conclude humans and chimpanzees share a common ancestor.<sup>1</sup> Despite the recent discoveries that some pseudogenes actually have a function,<sup>2</sup> the apparent  $\beta$ -globin pseudogenes and their so-called shared mutations are still being used as evidence as evidence for a common ancestor for humans in chimpanzees in the current literature.<sup>3</sup> This conclusion is incompatible with biblical creation since the Bible says that humans and the ancestors of chimpanzees were created separately.

## Human and chimpanzee $\beta$ -globin gene clusters

Globin genes code for the predominate proteins in red blood cells—hemoglobin. It binds and transports oxygen from the lungs to cells throughout the body. Hemoglobin is needed because oxygen dissolves poorly in the blood plasma. Humans carry nine globin genes, which are all slightly different to each other. Five of these genes are clustered together in a region of DNA called the ‘ $\beta$ -globin gene cluster’, which is located on chromosome 11 in humans (figure 1). These genes are not all switched on at the same time but in stages, corresponding to their position on the chromosome and the different stages of human development.

The  $\beta$ -globin pseudogene in humans is located in the  $\beta$ -globin gene cluster, between the  $\gamma$ -A and the  $\delta$ -globin genes (figure 1). There are two copies of the  $\gamma$ -globin genes, called  $\gamma$ -A and -G. The  $\beta$ -globin pseudogene shows higher similarity to the  $\gamma$ -globin gene, but is called the  $\beta$ -globin pseudogene because it was originally identified by comparing it to the  $\beta$ -globin gene of rabbits.<sup>4</sup> Chimpanzees have the same globin genes in the same order, including the  $\beta$ -globin pseudogene.

## Apparent genetic defects in the $\beta$ -globin pseudogenes

Evolutionists hypothesized several point mutations and deletions in the  $\beta$ -globin pseudogenes of humans and chimpanzees and these differences render these regions incapable of being translated (figure 1). The start codon (a codon is a sequence of three adjacent nucleotides constituting the genetic code) of the human  $\beta$ -globin pseudogene has two apparent point mutations which prevents the protein-synthesizing machinery (ribosome) identifying it as a gene. A point mutation has been suggested in humans at codon 15 that signals the ribosome to prematurely terminate synthesis of the protein (premature stop codon). At codons 20 and 145 in humans it has