

cellular differentiation programs, the photosynthetic pathway, or a bacterial flagellum. The difference is between incidental (and accidental) function and essential biological structure.

### References

1. Liu, Y. and Moran, D., Do new functions arise by gene duplication? *J. Creation* **20**(2):82–89, 2006.
2. Deng, C., Cheng, C.-H.C., Yea, H., Heb, X. and Chen, L., Evolution of an antifreeze protein by neofunctionalization under escape from adaptive conflict, *PNAS* **107**(50): 21593–21598, 14 December 2010.
3. Cheng, C.-H.C., Freezing avoidance in polar fishes; in: Gerday, C. (ed.), *Encyclopedia of Life Support Systems (EOLSS)—Theme 6.73 Extremophiles*, Developed under the Auspices of the UNESCO, Eolss Publishers, UK, 2003; www.eolss.net.
4. A second mutation may have also been necessary to achieve a functional AFP. See Deng *et al.*, ref. 2, supporting information, p. 1; Figure S1. A 6-nt deletion near the end of an early *AFPIII* may have somehow enabled what was a previously silenced duplication to be translated again, becoming a functional AFP. This deletion may have been necessary because the 5' pseudogene  $\psi$ *AFPIII* possesses a 6-nt sequence in its E2 that is present in E6 of *LdSAS-B*, but not present in E2 of any coding *AFPIII* gene. This suggests that  $\psi$ *AFPIII* is ancestral to *AFPIII*. However, near the end of the protein-coding sequence of E2 seems a strange place for a mutation that enables a sequence to be translated again. Moreover, the  $\psi$ *AFPIII* precursor has been functional, and may simply have become pseudogenized after a tandem repeat was created, and the repeat (an early *AFPIII* gene) underwent the 6-nt deletion which created a better AFP than the  $\psi$ *AFPIII* precursor. The repeat was itself then tandemly repeated.
5. Deng *et al.*, ref. 2, supporting information, p. 1; Figure S2.
6. Deng *et al.*, ref. 2, p. 21594.
7. Davies, P.L. and Hew, C.L., Biochemistry of fish antifreeze proteins, *FASEB J.* **4**:2460–2468, 1990.
8. Deng *et al.*, ref. 2, supporting information, p. 2; Figure S6.
9. Williams, A., Florid forensic fable: a review of *The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution* by Sean B. Carroll, *J. Creation* **21**(3):27–31, 2007.
10. Behe, M., *The Edge of Evolution*, Free Press, New York, p. 81, 2007.
11. Behe, ref. 10, pp. 80–81.
12. Williams, A., Mutations: evolution's engine becomes evolution's end! *J. Creation* **22**(2): 60–66, 2008.

## Is the faint young sun paradox solved?

Michael J. Oard

Scientists who believe in evolution find themselves confronted with many paradoxes. One of those paradoxes is the existence of males and females within each kind. Logically, reproduction in evolution should be asexual; it is a very difficult problem to figure out why there should be a male and female in evolution. This conundrum was one of the top 18 science mysteries showcased in the Aug 18–25, 1997, issue of *U.S. News & World Report*, under the title of ‘Why should males exist?’<sup>1</sup> This is really a problem of their own making because they’ve chosen to believe in evolution. This is where Bible believing Christians have the evidence hands down in this area, since it says in Genesis 1:27 that God created man in His own image and “male and female He created them”. Another paradox of their own making is the faint young sun paradox.<sup>2</sup>

### What is the faint young sun paradox?

It was discovered about 40 years ago that in the evolutionary origin of the solar system the sun would have been significantly less luminous with the earth receiving about 20 to 30% less sunlight than today.<sup>3</sup> This difference is believed to have been caused by a higher ratio of hydrogen to helium in the sun’s core at that time. Even in the late Precambrian, solar luminosity is estimated to still be about 6% less than today.<sup>4</sup> On this basis, the earth should have been totally glaciated from near its beginning, after it cooled down from its initially hot state within evolutionary scenarios. This is because a slight decrease in solar luminosity is enough to cause an ice age:

“Simple energy-balance climate models of the Budyko/Sellers type predict that a small (2–5%) decrease in solar output could result in a runaway glaciation on

the Earth. But solar fluxes 25–30% lower early in the Earth’s history apparently did not lead to this result.”<sup>5</sup>

So the early earth should have been easily glaciated from the poles to the equator.

This glaciation should have continued indefinitely to this day with no possible biological evolution, unless something drastic occurred to warm the earth:

“Without any change in atmospheric  $p\text{CO}_2$  [ $\text{CO}_2$  partial pressure], an increase in solar flux by ~27% above the present value would be needed to melt the equatorial ice (emphasis mine).”<sup>6</sup>

A 27% increase over the present solar luminosity seems like an impossible task.

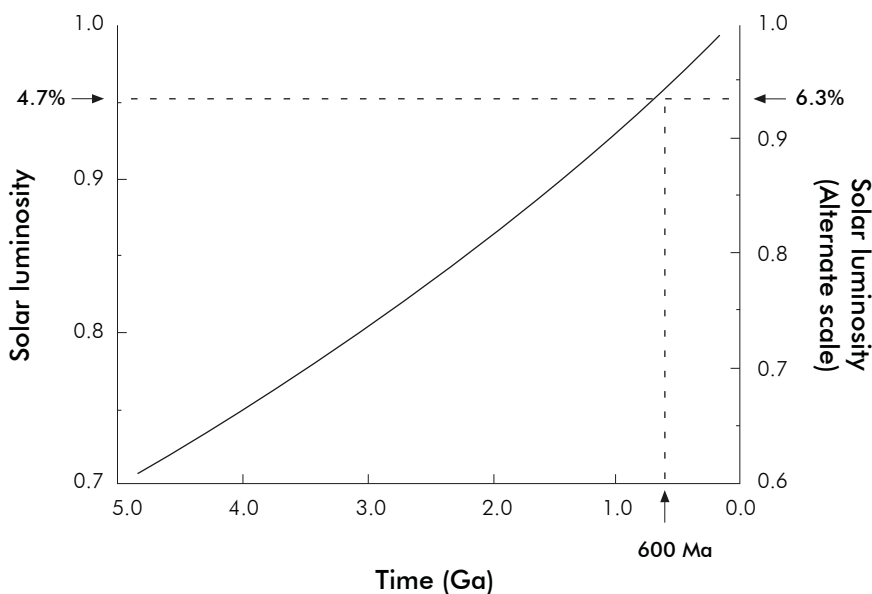
So, the evolutionary scientists have a major paradox since most of the Precambrian, except for several global and near global ‘ice ages’,<sup>7</sup> shows evidence of relatively warm temperatures:

“One of the major puzzles of the Earth’s history is that the global-average surface temperature has been fairly constant over geological time scales (within about 10 deg of the current value) even though solar luminosity was as much as 20–30% lower  $4 \times 10^9$  years ago, according to established knowledge about stellar evolution.”<sup>8</sup>

A further problem is that evolutionary scientists need the earth relatively warm for the evolution of life, which would be impossible within their paradigm if the earth is totally frozen over. The issue is even more of a puzzle since some evolutionary scientists believe that the ocean water, which would heat the atmosphere, was extremely hot back then, around 55–85°C!<sup>9</sup>

### Attempted resolution of the paradox

The faint young sun paradox has generated a lot of hypotheses that attempt to explain it. To counter the much lower solar luminosity and keep Earth temperatures relatively warm, researchers have suggested



**Figure 1.** Change in solar luminosity with time. Two different vertical scales are used that represent uncertainties in the initial luminosity that in turn depends on estimates of the original composition of the sun's core. The beginning luminosity can vary from 25% to 40% less than at present. Note that even in the late Precambrian, solar luminosity is still 4.7 to 6% less than today. (From ref. 4, p. 16724.)

two differences, either separate or in combination, between the early earth and today: more greenhouse gases and a lower planetary albedo (reflectivity). Water vapor is the strongest greenhouse gas today, accounting for around 95% of the greenhouse effect. It would be an obvious choice, except it does not help, because when water vapor condenses to clouds, it makes the problem worse by increasing the albedo from the cloud tops.<sup>10</sup> So, the other minor greenhouse gases, namely carbon dioxide, methane, and ammonia, have been evoked to solve the problem.

A typical solution in the past has been to suggest a whopping increase in carbon dioxide on the early earth, resulting in a super greenhouse effect.<sup>11</sup> However, it is unknown exactly how much carbon dioxide would have been needed to counter the faint young sun and keep Earth temperatures somewhat like today. One estimate is that Precambrian CO<sub>2</sub> concentrations would have to be in the range of 1,500 to 2,500 times the present atmospheric level!<sup>12</sup> Other estimates are significantly lower than these values. Such a radical increase in CO<sub>2</sub> does not seem very likely in any evolutionary scenario. Besides,

new information from 'ancient soils' indicates that Archaean carbon dioxide levels were much too low to counteract the faint young sun.<sup>10</sup> All these old solutions using CO<sub>2</sub> and other greenhouse gases have been rebutted, but two new solutions have recently been proposed and are believed to show promise.<sup>13</sup>

### The new solutions

One of the new 'solutions' to the faint young sun paradox proposes that a lower planetary albedo with slightly higher greenhouse gases solves the problem.<sup>14</sup> The researchers 'solve' the problem by postulating smaller continents, a higher methane concentration, and a lower planetary albedo because the cloud condensation nuclei (CCN) were much fewer and larger. Fewer CCN translate into larger cloud droplets that are less reflective, so planetary albedo is reduced.

One problem with a high concentration of methane in the atmosphere is that it combines with nitrogen to form an organic haze. Although methane is a greenhouse gas that results in a warmer atmosphere, the organic haze increases the planetary albedo, more

than offsetting the greenhouse effect of increased methane.

This is where the second mechanism enters in to 'solve' the problem, claiming that the organic haze will have clumped aggregates.<sup>15</sup> Such an organic haze lowers the planetary albedo for visible light, and has the added benefit that it shields the early earth from ultraviolet light, thus allowing the origin of life from chemicals. Such a scheme will also increase the amount of ammonia in the atmosphere, which will give an added heating to the atmosphere. With ammonia and methane back in the early atmosphere, the researchers are coming back to the rejected early atmosphere postulated in the mid-1950s by Miller and Urey.

### The paradox is not solved

As a result of this new research, some people are thinking the faint young sun paradox is finally solved. Even the title of the first research paper is: "No Climate paradox under the faint early Sun".<sup>16</sup>

However, it does not take much analysis to realize the two new solutions are an *ad hoc* house of cards. The first set of researchers has the gall to state that the problem is solved by using a *one-dimensional* (vertical) climate model. This is amazing since any climate model, other than a three-dimensional general circulation model with a realistic ocean, biosphere, and cryosphere (the snow/ice component), is inaccurate. For example, such a one-dimensional model ignores important feedbacks, such as the powerful ice albedo feedback. As snow and ice increase, the albedo increases to cause further cooling.

Furthermore, comments on the two recent proposals from the main science journals are not very positive. James Kasting stated in *Nature*: "Despite all these proposed warming mechanisms, there are still reasons to think that the faint young Sun problem is not yet solved."<sup>17</sup> Alicia Newton writes in *Nature Geoscience*: "Challenges for

each hypothesis remain, and are likely to remain for some time.”<sup>13</sup>

Of course, creationists do not have a paradox with a faint young sun because the solar system is young. Moreover, the failed solutions to the paradox provide one more reason why the solar system is young.<sup>2</sup>

### References

- Ridley, M., Why should males exist? *U.S. News & World Report* **123**(7):52, 54, 1997.
- Faulkner, D., The young faint Sun paradox and the age of the solar system, *Journal of Creation* **15**(2):3–4, 2001.
- Molnar, G.I. and Gutowski, Jr., W.J., The ‘faint young sun paradox’: further exploration of the role of dynamical heat-flux feedbacks in maintaining global climate stability, *Journal of Glaciology* **41**(137):87–90, 1995.
- Crowley, T.J. and Baum, S.K., Effects of decreased solar luminosity on Late Precambrian ice extent, *Journal of Geophysical Research* **98**(D9):16723–16732, 1993.
- Caldiera, K. and Kasting, J.F., Susceptibility of the early Earth to irreversible glaciation caused by carbon dioxide clouds, *Nature* **359**:226–228, 1992.
- Caldeira and Kasting, Ref. 5, pp. 226–227.
- Oard, M.J., *Ancient Ice Ages Or Gigantic Submarine Landslides?* Creation Research Society Monograph No. 6, Chino Valley, AZ, 1997.
- Molnar and Gutowski, ref. 3, p. 87.
- Oard, M.J., Evolutionary origin of life even more difficult, *Journal of Creation* **21**(3):15–16, 2007.
- Kasting, J.F., Faint young sun redux, *Nature* **464**:687–689, 2010.
- Kuhn, W.R. and Kasting, J.F., Effects of increased CO<sub>2</sub> concentrations on surface temperatures of the early Earth, *Nature* **301**:53–55, 1983.
- Graedel, T.E., Sackmann, I.-J. and Boothroyd, A.I., Early solar mass loss: a potential solution to the weak sun paradox, *Geophysical Research Letters* **18**(10):1881–1884, 1991.
- Newton, A., Warming the early Earth, *Nature Geoscience* **3**:458, 2010.
- Rosing, M.T., Bird, D.K., Sleep, N.H. and Bjerrum C.J., No climate paradox under the faint early Sun, *Nature* **464**:744–747, 2010.
- Wolf, E.T. and Toon, O.B., Fractal organic hazes provided an ultraviolet shield for early Earth, *Science* **328**:1266–1268, 2010.
- Rosing *et al.*, ref. 14, p. 744.
- Kasting, ref. 10, p. 688.

## Defining terms— John Endler’s refreshing clarity about ‘natural selection’

David Catchpoole

Long-time readers of this Journal would know, in relation to natural selection and evolution, that:

- Natural selection is a fact—it was recognized by creationists before Darwin, as it is by informed creationists today.<sup>1,2</sup>
- Natural selection favours certain *already-existing* genetic traits in populations by *culling* genes out of the gene pool; thus it helps *adaptation* of a population to its environment. (Sometimes the new population is given a new *species* name—adaptation and speciation are accepted by informed creationists.)<sup>3</sup>
- Natural selection by itself generates *no new genetic information*. So any adaptations that are purely the result of natural selection acting on pre-existing genetic information are not changes in the right direction to drive particles-to-people evolution.<sup>4</sup> So, *natural selection is not the same thing as evolution!*<sup>5</sup>

However, proponents of evolution repeatedly cite examples of natural selection—examples in which populations *lose* genetic information—as evidence of microbes-to-man evolution (which would require an *increase* in genetic information). This is clearly unjustified.

The evolutionists’ vague and ambiguous definition of terms facilitates their frequent use of the bait-and-switch tactic.<sup>6</sup> In theory, evolutionists look to *mutations* as being the process responsible for generating the new genetic information evolution requires, which is then sorted by natural selection. But when pressed

to give specific evidence of mutations that *increase* the information in the genome, evolutionists struggle to give coherent answers.<sup>7</sup> They ought to be able to point to *hundreds of examples* of such mutations by now. But they can’t. There is at best a tiny handful—one or two to our current knowledge—which could represent a modicum of information increase, and the lead candidate, the ability of a bacterium to digest the man-made substance nylon, involves considerable doubt.<sup>8</sup>

Only a very few evolutionists have been upfront about this. However, they have been largely ignored. Our attention was recently drawn (see box) to one such evolutionist, Dr John Endler, whose 1986 book *Natural*

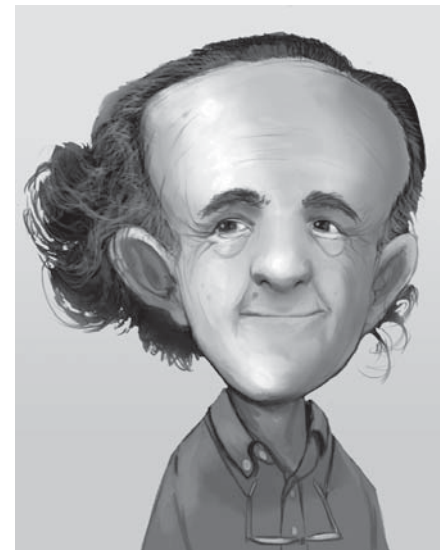


Illustration by Caleb Salisbury

**Figure 1.** Dr John Endler, an evolutionist, has impressive academic credentials. Born in Canada, Endler has a Ph.D. from Scotland’s Edinburgh University and subsequent research and professorial experience at the University of California, USA, as well as Australia’s James Cook University and Deakin University, and England’s University of Exeter. In 2007 he was elected as a Fellow of the American Academy of Arts and Sciences. In 2008 the European Research Council announced that he was among the first cohort of Life Scientists to receive an award under its Advanced Grants scheme. His fellow evolutionists are happy to cite Endler’s research work on natural selection and adaptation in guppies but have all but ignored key observations in his definitive 1986 book, *Natural Selection in the Wild*.<sup>9</sup>