Not Long Enough for Evolution:
A response to Llewellyn Jones

John Baumgardner

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Editor:

Llewellyn Jones in his 3/21 letter seems to be persuaded that 15 billion years is an abundance of time for life to arise by random interactions of atoms and molecules, whereas I have been arguing such an idea is sheer fantasy. I believe a simple arithmetic lesson is in order.

To have some sort of ultimate limit on the number of trials -- the number of coin tosses -- we have to work with, let's use the maximum conceivable number of atom-atom interactions in all the universe during its entire history. Taking 10 to the 80th power as a generous estimate for the number of atoms, 10 to the 10th power for an extreme average number of interatomic interactions per second per atom, and 10 to the 18th power seconds, which is about 30 billion years, as a limit for the age of the universe, we get 10 to the 108th power as an upper limit on the number of coin tosses available.

We next need to address how many trials we require randomly to sort through enough of the possible protein combinations to get the thousand or so that are needed for even the most primitive form of life. Let's ignore that there are some hundred or so amino acids and restrict our consideration to the special set of 20 found in most living systems. Let's also ignore the fact that only left-handed forms appear in life proteins. Let's also ignore the extremely unfavorable chemical reaction kinetics involved in forming long peptide chains in aqueous solution.

Let's merely focus on the task of obtaining a sequence of amino acids that yields 3D protein structure with some essential functionality. Various theoretical and experimental evidence indicates that in some average sense about half of the sites must be specified exactly. For a protein of length 200, the number of random trials needed for a reasonable likelihood of hitting a useful sequence is 20 to the 100th power or 10 to the 130th power. This is ten million billion times the limiting number we computed for interatomic

interactions in the history of the universe! And this estimate is only for one of the thousand or so proteins needed for the simplest type of life!

In the face of such stunningly unfavorable odds, how can any scientist appeal to chance interactions as the explanation for the complexity we observe in living systems? This line of argument applies, of course, not only to the issue of biogenesis but also to the issue of how any new gene/protein might arise in any kind of macroevolution process.

Mr. Jones rightly presumed that my own answer as to how life originated is to be found in the writings of Moses. The greatest detail on this question is given in regard to how human beings first appeared. Genesis 2:7 says that "God formed man (or Adam) from the dust of the ground and breathed into his nostrils the breath of life, and man became a living soul." As a scientist I offer no apology for my conviction that all living systems absolutely require an intelligent and supernatural cause for their origin. To me this conclusion is so self-evident from what we know of living systems at a molecular level that, on the surface, it is bewildering why so many reject it. But then I remember the years in my own life when I also rejected it.

John Baumgardner