



Natural Code LLC

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To: Chris Linhart
From: Perry Marshall
Date: November 21, 2016
Subject: Natural Code LLC Prize Submission

Thanks for rigorously thinking through these questions. You've done a much more concise job of stating these issues than most I've seen, and I've seen a lot. A much more elegant statement of the problem.

The "self replicator leading eventually to genomes" model has been around a long time and Jack Szostak won a Nobel Prize for his work in genetics and is also developing related ideas. Other researchers include Steve Benner of FFAME (I'm personally acquainted with him) and there is much discussion in Suzan Mazur's book "The Origin of Life Circus."

You can search Google for ribozyme experiments and find a lot of discussion about the possibility of randomness perhaps inevitably generating life, much as you have described.

"How small must this genome be for randomized search to work?"

Smaller than a Google ad, certainly. <39 bits is a good answer.

"Is there a possibility that such a small genome triggers evolution?"

Only if it embodies some special fractal principle.

The reason I say this is, since chance and selection alone are incapable of directly shaping much more than 39 bits (for reasons you articulate above), and since the permutations double with every bit, you have to have some fractal self-similarity in the system so that it can self-regulate as it expands.

"Another insight is that the initial system may not need to have a code. But a code is likely to be developed by the system down the road."

The word "likely" is questionable.

"That is, the initial device can be simple as long as the feedback loop is in place."

Correct, but my experience is that information entropy is your enemy at every level of this problem and the bigger systems get, the exponentially less likely it is that randomly generated solutions will ever get you anything useful.

"Creating a universe that can self-start life, is clearly a work of a genius."

Yes.



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"Even if life could have self-started, this is not a proof that it really started itself."

Correct.

"The distinction between the universe and god might be purely academic. So, if the universe has started life, this may still be synonymous to saying that god has started life."

That would be pantheism or panentheism. A monotheist would disagree. Judeo Christian theology states that God is necessarily outside and distinct from the universe. I believe this is logically necessary as well, as outlined at www.perrymarshall.com/godel.

A lot of people have asked me: "Would showing that origin of information is statistically likely in the history of the universe, be adequate to win the prize?"

My answer is no, you have to produce an empirical result not a statistical model, because nobody can patent or derive anything practically useful from a statistical model that takes billions of years. Personally I believe that if a solution exists, the answer will be much better than that.

More to the point: The presumption in your paper is that randomness could create a system that self-replicates; and that its capacity for self-replication would eventually overcome various forms of entropy. And that it would develop an evolutionary toolbox and that advantages would accrue through selection.

Perhaps you know something I don't, because of your in-depth computer programming experience. But I do not know that the above assumption has ever been shown to be true in computer experiments. I do not believe it is possible for any of this to ever happen without first including some element of a system which, in and of itself, generates negative entropy.

So far as I know, only living things possess this property. In humans, this property is the capacity to think. I'm willing to be corrected, but I've never seen anything other than a living organism solve this problem - certainly no man-made system. At the present time, only living things self-evolve without outside help.

Do you know of an exception?

Thank you once again for your thought-provoking submission.

Perry Marshall