

ATTEMPTS TO BE UNDERSTOOD

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I am not a philosopher by training, at least from Princeton, or by professional activity. But I was naturally drawn to philosophical issues from early childhood and have a philosophical temperament. At Princeton I did not excel in philosophy classes, and did not concentrate on these, and preferred upper level mathematics and literature courses. I was in the US Industry between 1995-2008 with a year spent 1999-2000 at MIT working with Daniel Stroock that did not lead to a doctorate in Mathematics. But philosophical outlook is extremely natural to me, and this is what draws me now to the classical question of how animate life occurs from inanimate matter.

1. MY SOLUTION

My solution to the classical philosophical problem of how animate life arises from inanimate matter is a showcasing of Reason of a pure type. It is certainly good Science, in that the model I propose is eminently plausible as a Scientific Theory for it uses elements that are based on strong consensus features of the external world and the mathematical setting using classical probability theory is not exotic and does not use exotic features of probability theory.

In brief, the solution consists of considering the sunlight and the ocean and the production of arbitrary covalent bonded organic molecules that result in the Earth's oceans in a period of 1 billion years from 4.6 billion years ago to 3.6 billion years ago. The Scientific 'myth' of origin of animate matter from inanimate matter then is the following. The sun is indiscriminate in bombarding the Earth's oceans in this long period 4.6 billion-3.6 billion years ago. The carbon content of Earth's oceans in this period is roughly the same as it is today, $m_C = 38,100$ Gigatons, which produces a density $\delta > 0$. Sunlight energy available to a square meter of ocean is roughly

$$e_C = 2.9 \times 10^{12} J/m^2$$

These are roughly measured numbers. These then allow us to produce a simple model of formation of organic compounds in the ocean. There exists a probability $p > 0$, and the strict positivity is important, of two arbitrary organic molecules forming a covalent bond to extend their size every day. Then around the ocean every day for roughly $T = 3.65 \times 10^{11}$ days, organic compounds are formed that grow larger. There is no selection of particular organic compounds in this process.

Let $t = 0, 1, \dots, T$ be integral counting of time. Let M_α be an enumeration of all organic compounds of finite size. Let us consider, arbitrarily the compounds

$$A_{10000} = \{M_\alpha : |M_\alpha| \leq 10000\}$$

These are all possible organic compounds composed of 10,000 atoms or fewer. This is a finite set but quite large. For every $0 \leq t \leq T$ we will have a probability

density on A_{10000} if we consider the frequency of organic molecules in the ocean on day t . Thus every day we have a probability measure $p_A(t, \cdot)$. For any given molecule or compound M_α of interest, sunlight on ocean will produce some probability $p_A(t, M_\alpha)$ of the compound at time t .

We will have resolved the problem of production of animate matter from inanimate matter if there exists a distinguished subset of compounds $M_\alpha^{animate} \in A_{10000}$ that for various reasons we consider to be animate matter. Our prime candidate are Self-Replicating RNA. This probability model can be calibrated and we can prove that in T the probability of producing $M_\alpha^{animate}$ is close to one since $T \gg 1000 \times 10000$. These are mathematical intuition at the moment but these are not difficult. In other words I can answer the classical question of how animate matter arose from inanimate matter based on Reason and some clear assumptions to compute the probability of formation of covalent bonds. The long period of time then allows me to seek to show that probability that designated 'animate compounds' are produced in the process is close to certain, i.e. probability is close to 1 in time T .

This approach resolves the classical philosophical problem of how animate matter arose from inanimate matter with an uncaring process that is actually realistic science. It shows that the oceans of Earth can be considered an indiscriminate factory of all possible organic molecules, and the issue of which is animate and which is not is simply a matter of structure of some of these. Thus it is the indiscriminate *abundance* of molecules produced that then gives rise to *animate matter*. This is an extremely satisfactory philosophical resolution of the classical question of how animate matter arose from inanimate matter because it does not use many complicated assumptions and produces a realistic enumeration scheme. Here the solution depends strongly on the great work of biologists who have discovered that some organic compounds are indeed animate. My solution is valid so long as some sufficiently small organic molecules are considered animate for tests on these that are independent and based on laboratory experiments.

2. THE SOLUTION OF ORIGINS OF LIFE SURPRISINGLY DIFFERENT FROM RELIGIOUS ACCOUNTS

Philosophically my answer to origins of animate life here is quite the opposite of a sharp micromanaging deity being precise with life. There is an opposite type of grandeur here, which is the sheer abundance of possibilities explored by the uncaring bombardment of Earth's oceans by the sun. There is no subtlety in my answer, and it is divine in a vastly different way than a micromanaging deity who is precise in construction of life. Here there is abundance and lack of care for inefficiency. "We'll make every possible compound in excess proportions and what do we care if some are alive?" But it is an exercise of pure Reason by me and by Man that is successful here.