Regarding Belief in Primordial Soup to explain the Origin of Life

Belief in a primordial soup where life might spontaneously evolve is as wrong as believing the earth is flat, or, as Hoyle and Wickramasinghe (1981) suggest, as wrong as believing that the pre-Copernican idea that the earth is the center of the universe. They state, “It will be no bad thing to abandon this position” (p. 138).

The belief in primordial soup goes something like this: “Somehow a brew of appropriate chemicals managed to get together, the organic soup, and somehow the chemicals managed to shuffle themselves into an early primitive life-form. From then on, all appeared to be plain-sailing, natural selection operating on randomly generated mutations would do the rest” (p. 131).

Today we know that life does not arise spontaneously. In the 1860s, Louis Pasteur demonstrated that “the concept of spontaneous generation” was incorrect using “carefully designed experiments” (p. 36). Yet many biologists still “believe that life started on Earth through spontaneous processes” (p. 37).

“The recourse to an organic soup to cross this biggest hurdle is evidently a blatant recourse to the spontaneous generation theory which Pasteur claimed to have destroyed. Nevertheless, most scientists, even to this day, have been satisfied to accept it” (p. 37).

What scientific tests did Louis Pasteur conduct about spontaneous generation of life? How did he set up his experiment? What were his steps? What was his result?

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“Already in the mid-nineteenth century, however, it was seen that the chemical shuffling part of this argument was weak. Thus Charles Darwin wrote: ‘... if (and oh what a big if) we could conceive in some warm little pond, with all sorts of ammonia and phosphoric salts present, that a protein compound was chemically formed ready to undergo still more complex changes...’” (p. 131).

“Although the difficulty was admitted, just how big a ‘if’ would be needed (one part in 10^{40000}) was not understood in the nineteenth century. As the enormity of the supposition was slowly revealed in the present century, there was an attempt to evade this difficulty through the invention of pseudo-science (p. 131).

Did Charles Darwin believe that the spontaneous generation of life was likely?

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What is the mathematical chance of spontaneous generation of life, according to Hoyle and Wickramasinghe?

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Describe assumptions made by the primordial soup explanation. What is required?

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Just think about how silly this idea is. Chemical industries would "descend to chaos if it elected to depend only on a random throwing together of substances" (p. 140).

The problem with randomness will be explored further in the next video. Regarding RNA and the genetic code, the case does not get much simpler as we look at simpler forms of life, "With minor exceptions, the genetic code is 'universal', which means that it goes across the whole face of terrestrial biology. This means that all plants and animals, and all bacteria too, have t-RNA molecules that operate in exactly similar ways" (p. 27).

"There are many kinds of t-RNA molecules, and it is the sum total of their properties as a set that determines the well-known genetic code" (p. 27). "Assigning an explicit probability for arriving at [such] a highly complex structure ... is not co clear-cut [but] will be assuredly be small, and it will moreover be raised to something like the 60th power, for the reason that there are of the order of sixty different t-RNA molecules (p. 30).

Regarding "the origin of DNA[,] DNA transcription to RNA[, and] the program whereby cells organize themselves ... the chances of such complexities arising from a soup initially without information, a soup that can proceed by trial and error, are still more minute than the exceedingly small probabilities estimated above" (p. 30).

What's your opinion? How strongly do you believe that a primordeal soup can explain the origin of life? How might the primordeal soup hypothesis be tested?

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