

Appendix 3

Problems in Molecular Evolution Hypotheses

The names of A. I. Oparin and Sidney W. Fox are perhaps the best known among the many who have devoted much time to research efforts to demonstrate the feasibility of the assumed evolution of life from nonliving chemicals. Oparin began to describe his idea in 1924, which involved formation of *coacervate* droplets which have been described earlier. Almost as well-known are Fox's *proteinoid microspheres*.

Both Oparin and Fox seem to be dedicated researchers of high intellect and sincerity, who have done the best anyone could for the evolutionary overview. Both have received much criticism of their hypotheses, and as scientists they seem to recognize that the "challenging" of ideas is a desirable process. In fact, they have each criticized the other's plan, while apparently remaining good friends. (Oparin, for example, wrote an introduction to Fox's recent book.)

Concerning the proteinoid theory, Oparin wrote, "Fox's microspheres, since they are obtained thermally, do not present very promising results from this point of view [i.e., evolving to include metabolic processes]. Their structure is static. This... creates many difficulties when it comes to converting them into dynamic systems which could be used for modeling the evolution of metabolism."¹

On the other hand, Fox pointed out these difficulties about the Oparin coacervates: "The coacervate droplet lacks stability; it falls apart easily on standing. The crucial difference is that the coacervate droplet is made from one or more polymers

¹ A. I. Oparin, *Genesis and Evolutionary Development of Life* (New York: Academic Press, 1968), p. 105.

obtained from living systems. . . .”² (Fox has recognized that if such experiments are to indicate anything useful, they must simulate closely what may have been natural conditions at the time of the assumed origin of life.)

All of the efforts by researchers to date are detailed in a comprehensive study by Fox and co-author Klaus Dose.³ Naturally, they present the best possible case for the proteinoid system.

Earlier we told how Fox and his colleagues obtained a dozen amino acids by use of extreme heat (900-1100° C) in the presence of silica sand or volcanic lava. These were protein-type except that they were racemic.

A separate experiment resulted in thermal linking of all 20 of the protein-type amino acids, when a prepared mixture of these was heated dry. Usually this involved heating from 6 to 10 hours at 170-200° C, or for a week at 120°. This results in chains of amino acids called thermal proteinoids.

When proteinoid chains are put in water, they tend to form *microspheres*. These are described by the experimenters as open systems which are supposed to grow and divide. They are hailed as probable precursors of living systems.

Among unique features claimed for proteinoid microspheres are the following: “Information” is said to have flowed from the geochemical matrix to the first naturally formed amino acids, and then to the proteinoid chains and microspheres. (This, of course, is an attempt to circumvent having to depend on blind randomness.)

Also, “self-assembly” is claimed for proteinoid microspheres, and much is made of their nonrandomness and catalytic activity, as if they were well on the way to becoming protein enzymes. (Nonrandomness seems to be mistakenly assumed.)

Among the many difficulties besetting this plan, some have perhaps already occurred to the reader. When others have pointed out to Fox that the extreme temperatures involved, which he theorizes might occur at volcanoes, must be followed immediately by cooling of the amino acids before they are destroyed by the very heat that formed them, he says that rain is not unknown at volcanoes and would serve the purpose. The

² Sidney W. Fox and Klaus Dose, *Molecular Evolution and the Origin of Life* (San Francisco: W. H. Freeman and Co., 1972), p. 221.

³ *Ibid.*

amino acids formed, however, are racemic, rather than being all one-handed as is necessary for proteins.

Carefully regulated heat for a rather exact period of time is next needed with the amino acids in the dried state, to bring about linking, but a far different temperature from that used earlier. During this time, there is no protection from destruction by ultraviolet radiation from the sun (of "primitive" times).

A major item is that such experiments in thermal linking have usually involved a quite artificial ratio of the amino acids in the starting mixture. One common plan is to have 2/3 of the entire supply to consist of aspartic acid and glutamic acid. Sometimes, a high percentage of lysine is used instead.

Clearly, the use of exorbitant amounts of these highly reactive acids and bases is the explanation back of the supposed catalytic activity which is described. Any strongly reactive chemical will cause a commotion in many situations. By analogy, fire causes many chemical changes, but is unhelpful unless carefully regulated, as in the cylinder of an automobile. The supposed enzymic activity is doubtless no more than could be expected in any mixture or chain where these particular amino acids predominate. In fact, it has been pointed out that chains of lysine alone have better such ability than when mixed with other amino acids.⁴

There has never been found any way to get *all* the needed amino acids by supposed natural means. Especially difficult are the vital sulfur-containing ones, cysteine and methionine. There is no way, either to bring about the proper *concentration* of even the ones that are formed, or to get them in proper ratio, since they are formed in a far different ratio from that used in proteins.

In thermal polymerization experiments, there is a serious absence of three important amino acids—serine, threonine, and cysteine—which are destroyed by the heat involved unless carefully protected by adding phosphoric acid or using lower temperatures. Even when L-amino acids are used in the starting mixture, there is racemization, changing of some of the amino acids to the opposite hand by the heat.

The degree of "catalytic activity" has been small (sometimes

⁴ D. L. Rohlfling, *Archives of Biochemistry and Biophysics*, Vol. 118 (1967), p. 470. Also: Duane T. Gish, *Speculations and Experiments Related to Theories on the Origin of Life* (San Diego: Institute of Creation Research, 1972), p. 30.

infinitesimal), and in all cases is in strong contrast to the precise, delicately regulated teamwork of multiple enzymes—each with a specific reaction to attend—such as is found in even the simplest living things, as well as in the simplest theoretical autonomous replicating system.

Experiments to account for a natural way that sugars and nucleotides might have formed have been quite discouraging. Fox and Dose therefore believe proteins began first and somehow later became involved with nucleic acids. There is no plausible way for this to have come about, however, including no adequate solution as to the source of these precursors of DNA. Regarding the origin of nucleic acids, they wrote, “The evidence is in an uncertain state.”⁵ No one will dispute that. There is, of course, nothing like any *adequate* plan to account for the origin of the protein synthesizing system (RNA, ribosomes, etc.), and the orchestra of metabolic chains. The attempts are brave but in vain.

The esteemed scientists who authored *Biology and the Future of Man* (almost 200 of the top biologists in America) included this statement by the panel on the origin of life: “It must be admitted that few of the laboratory experiments [including ones described herein] are completely convincing simulations of primitive processes,”⁶ although they hoped for better success in the future. The fact is, starting with the uncertainty that there ever even existed such a primitive atmosphere all the way to the final assembly into a living cell, the efforts are scientifically hopeless.

The reason for failure is not in the scientists but rather in the erroneous philosophy that there is no intelligent Being back of the origin of life. There could be no true “information” of enough degree to help in this matter by supposedly tracing it back to the “geochemical matrix.” Information must be put in before it can be transferred out—under any but the most meager definition.

For an analogy, suppose that scientists for some strange reason had become convinced of the absurd hypothesis that the moon once consisted of green cheese. They would be duty-bound to try to account for the changeover to the present

⁵ Fox and Dose, *Molecular Evolution and the Origin of Life*, p. 254.

⁶ Philip Handler, ed., *Biology and the Future of Man* (New York: Oxford University Press, 1970), p. 185.

condition. Their ingenuity would bring forth many ideas, some far-out, some less so. *Portions* of some schemes would seem plausible, but there would be gaps and difficulties to softpedal or skim over. This is the case with the valiant but futile attempts to account for complex life with a naturalistic overview. It cannot be done. It is like determined men trying to jump across the Atlantic ocean. Some might jump farther into the water than others, but none would succeed.

