

LITERATURE REVIEWS

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LIFE FROM SPACE

LIFE ITSELF. Francis Crick. 1981. NY: Simon & Schuster. 192 p.
EVOLUTION FROM SPACE. Fred Hoyle. 1982. Wales: University College Cardiff Press. 30 p.

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The formation of living systems on this planet has been discussed at length from both creationist and evolutionary perspectives. To the creationist, God is plainly and simply the source of life. To the evolutionist who excludes the supernatural from his world view, the explanation of the origin of life in all its complexity must be described in terms of natural forces at work today. Early in this century A. I. Oparin performed experiments in which two or more polymers (proteins, lipids or carbohydrates) were shaken in water. When the resulting solution was examined under the microscope, small spherical droplets called coacervates were seen. When viewed more closely, these droplets seemed to have a membrane structure similar to that found in living cells. Oparin proposed that coacervates could have been the beginning structures of early life forms.

Since Oparin started with proteins in his experiments, it was important to determine how proteins could have formed. In the 1960s Fox simulated supposed prebiotic conditions by heating amino acids on hot rocks. Protein-like compounds were made, and when these were added to water, microspheres sometimes formed. When this information was coupled with the experiments of Miller and Urey in which amino acids, nucleic acids and sugars were formed from simple compounds such as ammonia, water, methane, hydrogen, etc., in the presence of electrical discharge, it seemed that the mechanics describing the formation of life would soon be known. The literature of the 60s and 70s dripped with this optimism.

Recently, new voices have been heard in the evolutionary scenario which strangely echo the creationist call that life is just too complex to have been formed by random interactions of chemicals in some primordial organic swamp. Interestingly, these new voices do not come from the lunatic fringe within the scientific community, but rather from authorities of the

stature of Nobel Laureate Francis Crick and Sir Fred Hoyle. Hoyle has used the metaphor of an explosion in a junk yard producing a Boeing 747 to show how improbable is the spontaneous generation of living from non-living material. These men are suggesting that life is just too complicated to have formed within the limited portion (2-3 billion years) of earth history in which temperatures and conditions would permit life to exist.

In his recent book, *Life Itself*, Crick devotes the first half convincing his audience that the probability of life forming spontaneously on this earth is vanishingly small. He notes, for instance, that the probability of a protein randomly forming in the proper sequence is about 1 chance in 10^{260} . When one considers that the total number of elementary particles in the *universe* is about 10^{80} , one can see that such probabilities are impossibly small. Using metaphors seemingly directly out of the creationist literature, Crick says, "There is, in fact, a vanishingly small hope of even a billion monkeys, on a billion typewriters, ever typing correctly even one sonnet of Shakespeare's during the present lifetime of the universe." He then attempts to inject hope into the situation by saying that some of the paragraphs typed would contain meaningful statements and that these are the stuff for the initial stages of the formation of life. He then proceeds to define the requirements of a living system: replication, energy, information transfer from one generation to another, etc., and discusses the difficulties these requirements present in the formation of life.

Other problems also surface. Did the primitive atmosphere of the earth contain oxygen? In order for the Miller/Urey experiment to work, none must be present. Yet much data suggest that oxygen was present. Crick discusses the difficulty of identifying the first replicating molecule and chooses RNA as his favorite. He then builds a living system upon its foundation. Still, the chances of life starting spontaneously on earth are considered to be vanishingly small. So small, in fact, that he is convinced it did not happen here. But if not on earth, then where? On some other planet?! Yes, life evolved on some faraway planet. He argues that since the earth has too short a history for life to develop, it must have developed on some planet in a solar system which was formed several billion years earlier than ours. If, he reasons, numerous planets in the universe have conditions favorable to the formation of life, then, given enough time — somewhere out there — the formation of a living system almost becomes inevitable.

But if life started on some other planet, how did it arrive here? With this question Crick rises to his speculative best. He proposed that life began somewhere else in the universe and evolved to a much higher

technical level than is now present on earth. He next suggests these life forms are now sending rockets containing primitive life forms (perhaps bacteria or blue-green algae) throughout the universe, spreading the seeds of life hither and yon. Crick even describes the rocket's design and postulates the conditions necessary for successful re-entry into our atmosphere.

In a lecture given at the Royal Institution, Fred Hoyle also postulates that life came from elsewhere. In fact, he thinks that life-forms are still raining down upon earth and contaminating it. He proposes that certain structures in meteorites might be the fossils of bacteria, and perhaps the sudden spread of virus diseases may be the result of a massive contagion influx from space.

Other authors have looked at stromatolites, life-like structures in Precambrian rocks, and have concluded that their date of origin postulated by radiometric dating to be one and a half billion to two billion years ago precludes the possibility of their development on this earth.

Have the suggestions of Crick and Hoyle helped creationists win the war over the origin of life? Although there are allusions to metaphysical ideas in the professional literature that deal with the origin of life, the concept of a Creator-God as described in Genesis is not included among the possibilities. But it is interesting to note that the song sung by creationists about the complexity of life on earth is being chorused by others, admitted in *piano* tones. Although the rhythm, harmony and melody certainly are different, the careful listener will recognize that the words are remarkably similar.