EDITORIAL: SPACE BIOLOGY AND THE ORIGIN OF LIFE

The search for extraterrestrial life has been described as the prime goal of space biology. If there is life on Mars, and we can demonstrate its independent origin, then we shall have reason to question the uniqueness of the origin of life on earth. If it occurs twice in our own planetary system, it surely must be found elsewhere in the countless number of planets associated with the stars in the universe.

The study of life beyond the earth thus becomes only a part of the scientifically broader question of the origin of life in the universe. In this framework the earth is considered to be the model laboratory, in which a cosmic sequence of events led to the appearance of life. This transition from the inorganic to the organic, from monomer to replicating polymer, may be described as chemical evolution.

The Oparin-Haldane hypothesis of the origin of life, first discussed in the 1920's, was not put to an experimental test until 1953, when Miller for the first time synthesized four amino acids, by the action of electric discharges on a mixture of gases, simulating the earth's primordial atmosphere. Since that classic experiment, the expectation that organic compounds may be generated from the inorganic milieu has been substantiated in a large number of cases.

Two features in this issue of *Space Life Sciences* focus our attention on the great strides made in the field of chemical evolution. The report on the Third International Conference on the Origin of Life, held at Pont-à-Mousson, France, on April 20–25, 1970, highlights the important events of this international symposium. Over a hundred scientists from 18 different countries were invited to this meeting. Many aspects of the subject, from the thermodynamics of planetary atmospheres to the analysis of lunar samples, were discussed. Another milestone in the development of the subject was the inauguration of the International Society for the Study of the Origin of Life, with Alexander Ivanovich Oparin as its first president. The study of chemical evolution had indeed come of age.

The comprehensive bibliography of publications on the origin of life also published in this issue has gathered together the pertinent publications related to the subject. The vast number of references is most impressive. In earlier studies, emphasis had been laid on the identification of various molecules synthesized, but more recent investigative studies have been directed to the quantitative and mechanistic aspects of the problem. The thermodynamic approach is the subject of an increasing number of papers.

The examination of ancient sediments and extraterrestrial materials such as the lunar samples and meteorites has also provided an insight into this subject. In planetary exploration the information gleaned from laboratory studies has helped in the design and development of experiments for the investigation of the Martian surface for signs of life or of prebiological evolution.

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No subject seems to draw together scientists of varied disciplines from microbiology to astronomy so closely as the study of chemical evolution. The impact of these investigations will be felt beyond the realm of science and contribute to our understanding of the very nature of life and of man's place in the universe.

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