

LITERATURE REVIEWS

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A CANDID REEVALUATION

THE MYSTERY OF LIFE'S ORIGIN: REASSESSING CURRENT THEORIES. 1984. Charles B. Thaxton, Walter L. Bradley, and Roger L. Olsen. NY: Philosophical Library. 228 p.

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Upon noticing this book on a library table, I was immediately intrigued by its title and possible approach to the scientific solution of life's origin. Here I found a masterful critique of chemical evolution.

The scientific credentials of the authors are impeccable. Charles B. Thaxton received a Ph.D. in Chemistry from Iowa State University. He was a post-doctoral fellow at Harvard. Walter L. Bradley holds a Ph.D. in Material Science and is a Professor of Mechanical Engineering at Texas A&M University. Roger L. Olsen received his Ph.D. in Geochemistry from Colorado School of Mines.

In the late 1920s Oparin and Haldane proposed a naturalistic evolutionary scenario for the origin of life on earth. They suggested that certain conditions existed in the earth's primitive atmosphere which led sequentially to the formation of amino acids, sugars and other simple biomolecules, and their accumulation in the oceans. From these simple compounds the more complex biopolymers — proteins and nucleic acids — required for life presumably would emerge naturally. These ideas led, in the early 1950s, to a series of classical experiments in which Stanley Miller was able to demonstrate the formation of amino acids under so-called prebiotic conditions. Miller's success opened up a broad interest in chemical evolution and gave impetus over the next 25 years for a number of scientists to carry out many experiments designed to produce biologically significant compounds and subcellular structures under presumed prebiotic conditions. *The Mystery of Life's Origins* presents a thorough, objective and scientifically sound analysis and critique of these experiments.

The first two chapters of the book introduce the problems. Chapter 3 deals with experiments aimed at the synthesis of prebiotic monomers. Chapter 4 presents the serious questions concerning the character of the presumed primordial prebiotic soup. The question of whether the early earth's atmosphere was reducing or oxidizing is discussed in Chapter 5. Chapter 6 exposes the bias introduced in these experiments by the investigator, bias which must be recognized as uncharacteristic of natural prebiotic situations. The thermodynamics of living systems and its relationship to the origin of life are presented in Chapters 8 and 9. The function of presumed protocells compared to their actual living cells is presented in Chapter 10.

The scientific evidence presented in this book is overwhelmingly against the probability of life having originated through chemical evolution. Too many questions are left unanswered by the evolutionary scenarios that have been proposed. There is too much discrepancy between the results of origin-of-life experiments and the beautifully ordered systems found in nature. The low yields of the compounds formed in these experiments, the instability of key intermediates, the cross-reactions between amino acids and sugars, the condensation reaction involving a dehydration under aqueous conditions, the high level of stereospecificity found in biological systems, and sequence specificity of biopolymers are but a few of the unanswered questions relating to a naturalistic evolutionary origin of life. For these reasons in their concluding chapter the authors present five alternative solutions to the mystery of the origin of life, one of which is a special creation by a Creator beyond the cosmos.

Each chapter of the book contains a comprehensive list of references that make it a valuable tool for anyone interested in further investigation. A minor criticism could be offered regarding the omission of any discussion on the enantiomer preferences so unique to all biological systems.

It is interesting to note that within the scientific community there is decreasing interest in this field, as reflected by a diminishing number of publications and fewer new workers undertaking research on chemical evolution.

Throughout this work one is impressed by the thoroughness and objectivity of the authors in presenting the results of experiments and in giving a careful analysis of these results. While this book is addressed to a scientific audience, it can be read and understood by laymen with a solid foundation in science, and will be valuable to anyone interested in questions related to chemical evolution.