

Cosmochemical Evolution And The Origins Of Life Proceedings Of The Fourth International Conference On The Origin Of Life And The First Meeting Of The 25 28 1973 Volume Ii Contributed Papers

Devoted to exploring questions about the origin and evolution of life in our Universe, this highly interdisciplinary book brings together a broad array of scientists. Thirty chapters assembled in eight major sections convey the knowledge accumulated and the richness of the debates generated by this challenging theme. The text explores the latest research on the conditions and processes that led to the emergence of life on Earth and, by extension, perhaps on other planetary bodies. Diverse sources of knowledge are integrated, from astronomical and geophysical data, to the role of water, the origin of minimal life properties and the oldest traces of biological activity on our planet. This text will not only appeal to graduate students but to the large body of scientists interested in the challenges presented by the origin of life, its evolution, and its possible existence beyond Earth.

Traces the development of human beings' conceptions of the universe from ancient times to the modern world

Proceedings of the Fourth International Conference on the Origin of Life and the First Meeting of the International Society for the Study of the Origin of Life (ISSOL), Barcelona, June 25-28, 1973. Vol. II: Contributed Papers

This interdisciplinary book consists of the proceedings of the Alexander Ivanovich Oparin 100th Anniversary Conference, The Third Trieste Conference on Chemical Evolution, which took place at the International Centre for Theoretical Physics from 29 August till 2 September, 1994. A general overview of Oparin's life and work is followed by a review of Alfonso Herrera, another pioneer in the studies of the origin of life. The subject matter is organized in ten sections corresponding to various aspects of our current understanding of the subject that was initiated by Oparin. These subjects were covered by fifty three speakers. There were sixty seven participants from a wide geographical distribution; twenty seven countries were represented. We have included the invited lecture of Professor Igor Kulaev, who was unable to be present at the conference for reasons beyond his control. The conference was generously supported by the International Centre for Theoretical Physics, the Commission of the European Communities, the International Centre for Genetic Engineering and Biotechnology, the International Centre for Science and High Technology, and UNESCO. Cyril Ponnampetura, University of Maryland, U.S.A. Julian Chela-Flores, ICTP, Italy, and IDEA, Venezuela. xi FOREWORD As this volume was going to press we learnt of the untimely death of Cyril Ponnampetura who died of cardiac arrest on December 20, 1994.

Pathological bacteria are only 5% of the bacterial population. The other 95% promote the health and well-being of Earth. The digestive tract holds trillions of archaeobacteria from over 4 1/2 billion years ago. When in danger, bacteria create shells for protection. Are humans evolved shells in order to protect the bacteria from atmospheric oxygen? Life forms are descended from prokaryote archaeobacteria, for whom oxygen is unnecessary. After millions of years of evolution, can bacteria now direct humans to return the planet, through pollution, ozone depletion, or a nuclear disaster, to a more manageable level of oxygen from a present 21% to less than 1%? No bacteria reside in the cranial brain. Was the enteric nervous system the first brain? Are the archaeobacteria within the gastrointestinal tract directing the actions of the body? Are the archaeobacteria the architects and directors of evolution?

Reflections on Biochemistry: In Honour of Severo Ochoa offers reflections on a wide range of topics relating to biochemistry, including energy metabolism, lipids and saccharides, regulation, nucleic acids and the genetic code, protein biosynthesis, and cell biology. The essays celebrate Severo Ochoa's outstanding contributions to biochemistry spanning nearly half a century. This book is comprised of 47 chapters and begins with a biography of Ochoa and his scientific work in the field of biochemistry, particularly his research on intermediary metabolism, RNA synthesis, and the genetic code. The discussion then turns to energy metabolism, photosynthesis, and fermentation, touching on topics such as the role of lactic acid in the development of biochemistry and the biosynthesis of cell components from acetate. The next section is devoted to lipids, saccharides, and cell walls and includes chapters that deal with biotin, sulfur biochemistry, and dipicolinic acid. Subsequent chapters explore hormonal regulation of adipose tissue lipolysis; the structural relationship between genes and enzymes; bacteriophages, colicins, and ribosomes; and cell biology and neurobiology. This monograph will be of interest to biochemists and students of biochemistry.

This symposium was held at the NASA Ames Research Center, Moffett Field, California July 24-27, 1990. The NASA Exobiology principal investigators reported their recent research findings. Scientific papers were presented in the following areas: cosmic evolution of biogenic compounds, prebiotic evolution (planetary and molecular), early evolution of life (biological and geochemical), evolution of advanced life, solar system exploration, and the Search for Extraterrestrial Intelligence (SETI).

Does the science of evolution really prove that life, humanity, and the universe as a whole are meaningless accidents? On the contrary, as science has increasingly shown how everything in the universe is subject to evolution—including matter, life, and human culture—these very facts reveal that the process of evolution is unmistakably progressive. As we come to see how evolution has progressed throughout our cosmology, biology, and human culture, this reveals evolution's purpose—to grow toward ever-widening realizations of beauty, truth, and goodness. McIntosh argues that the purpose of evolution is not "intelligently designed" or otherwise externally controlled; rather, its purpose is being creatively and originally discerned through the choices of evolutionary creatures themselves. Without relying on any spiritual authorities, the author shows how the scientific story of our origins is actually a profound and sacred teaching compatible with many forms of contemporary spirituality. In EVOLUTION'S PURPOSE, McIntosh discusses: * Science's growing recognition of the phenomenon of emergence, which ties together all forms of evolution * Why traditional philosophies no longer adequately explain the fullness of evolution * Why the idea that evolution is accidental or meaningless is just as mythical as the idea that the world was created in six days * Why growth toward beauty, truth, and goodness harmonizes with scientific truth * Reconciling evolution's purpose with the presence of evil and suffering in the world Taking us from pre-biotic forms of life right up through the development of human consciousness and our global civilization, McIntosh presents a fresh and compelling view of evolutionary science and philosophy that will inspire a deeper understanding of evolution itself and show how it can lead directly to a more evolved world.

Proceedings of the 99th Colloquium of the International Astronomical Union, held in Balaton, Hungary, June 22-27, 1987

This Carnegie volume discusses the origin and evolution of elements in our galaxy and others.

For the first time in human history, developments in many branches of science provide us with an opportunity of formulating a comprehensive picture of the universe from its beginning to the present time. It is

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an awesome reflection that the carbon in our bodies is the very carbon which was generated during the birth of a star. There is a perceptible continuum through the billions of years which can be revealed by the study of chemistry. Studies in nucleosynthesis have related the origin of the elements to the life history of the stars. The chemical elements we find on earth, Hydrogen, Carbon, Oxygen, and Nitrogen, were created in astronomical processes that took place in the past, and these elements are not spread throughout space in the form of stars and galaxies. Radioastronomers have discovered a vast array of organic molecules in the interstellar medium which have a bearing on prebiological chemical processes. Many of the molecules found so far contain the four elements, C, N, O, H. Except for the chemically unreactive He, these four elements are the most abundant in the galaxy. The origin of polyatomic interstellar molecules is an unresolved problem. While we can explain the formation of some diatomic molecules as due to two atom collisions, it is much more difficult to form polyatomic molecules by collisions between diatomic molecules and atoms. There may be other production mechanisms at work such as reactions taking place on the surface of interstellar dust grains.

Cosmochemical Evolution and the Origins of Life Proceedings of the Fourth International Conference on the Origin of Life and the First Meeting of the International Society for the Study of the Origin of Life, Barcelona, June 25–28, 1973 Volume II: Contributed Papers Springer

This publication, in two volumes, includes most of the scientific papers presented at the first meeting of the International Society for the Study of the Origin of Life (ISSOL), held on June 25-28, 1973 in Barcelona, Spain. The first volume contains the invited articles and the second volume the contributed papers, which also appear in the 1974 and 1975 issues, respectively, of the new journal Origins of Life, published by D. Reidel. A relatively large number of meetings on the subject of the origin of life have been held in different places since 1957. In terms of its organization, scope, and number and nationality of participants, the Conference celebrated last year in Barcelona closely followed the three international conferences held earlier in Moscow, U.S.S.R., 1957, Wakulla Springs, U.S.A., 1963, and Pont-a-Mousson, France, 1970. For this reason the first ISSOL meeting was also named the 4th International Conference on the Origin of Life.

Thoroughly updated and reorganized, Strickberger's Evolution, Fourth Edition, presents biology students with a basic introduction to prevailing knowledge and ideas about evolution, discussing how, why, and where the world and its organisms changed throughout history. Keeping consistent with Strickberger's engaging writing style, the authors carefully unfold a broad range of philosophical and historical topics that frame the theories of today including cosmological and geological evolution and its impact on life, the origins of life on earth, the development of molecular pathways from genetic systems to organismic morphology and function, the evolutionary history of organisms from microbes to animals, and the numerous molecular and populational concepts that explain the earth's dynamic evolution. Important Notice: The digital edition of this book is missing some of the images or content found in the physical edition.

This overview for the interested layman reviews the attempts of scientists to find answers to the question of where life comes from. After an historical introduction, he surveys the origin of the universe, the solar system, our Earth, meteorites and comets.

In recent years, an ever-increasing amount of research has been conducted on the physico-chemical basis of the origin and evolution of life, or protobiology. Many questions are raised in this endeavor: What research methodology should be employed? What sort of dependable facts are available as a firm frame of reference upon which the physico-chemical origin of life or protolife could be examined? Is the origin due exclusively to chance events? If not, what is then responsible for the origin? What physical reality underlies the evolutionarily selective process leading to the origin? What role does variation assume and how is it generated in the course of evolution? Many research workers have pursued various avenues toward answering the stated questions. Among them, we believe Sidney W. Fox has been playing a very unique and pivotal role over the past quarter of a century, presiding over 240 man-years or more of laboratory work. His laboratory syntheses of thermal proteins called proteinoids and proteinoid microspheres have emphasized the principle of the self-sequencing of amino acids as a key concept of protobiological synthesis. The significance of his contribution is seen in presenting the experimental evidence that the origin of life is largely due to nonrandom events. This discovery marks a new epoch in the conceptual development of studying the origin of life by focusing on the molecular processes that underlied the emergence and evolution of protobiological information.

Biotic Crises in Ecological and Evolutionary Time emerged from the third Field Museum Spring Systematic Symposium held in May 1980. The symposium attempted to explore the nature and effects of crisis over as wide a range of temporal and spatial scales as possible. To this end, contributions were included from such diverse fields as astronomy, paleobiology, ecology, and anthropology. The kinds of crises considered ranged from events in the cosmological history of the universe all the way to the effects of a single introduced species on a present-day living community. The book begins by providing a definition of "crisis" and a general discussion of methods and approaches to the study of crises. The subsequent chapters present studies on topics such as the physical mechanisms underlying the cosmological framework in which life evolved; physical disturbance in the life of plants; the impact of species introductions; and evolutionary aspects of pre- and post-interchange fossil land mammal faunas in South America.

The Present Volume Provides An Excellent Up-To-Date Account Of The Course And Development Of Biochemistry. The Text Revolves Around The Basic Principles Of Biochemistry As Well As Molecular And Biochemical Control Mechanisms Responsible For Structural, Informational And Behavioural Properties Of Cells Resulting In A Composite Picture Of Modern Biochemistry. The Book Is Organized Into Five Sections That Follows An Introductory Chapter Dealing With Biochemical Basis Of Life. Part I Treats The Foundations And Fundamentals Which Includes Four Chapters To Help Prepare A Student Finally To Enter The Realm Of Biochemistry. This Part Is Especially Designed To Clarify The Basic Concepts And Introducing Quantitation In Biochemical Sciences And Represents A Distinctive And Crucial Feature Above All The Existing Texts. Part Ii Deals With Molecular Structure And Organization Of Biomolecules. This Part Is Composed Of Five Chapters Describing In Detail, The Biochemical Organization Of Information Molecules In Living Cells. Part Iii Represents Biosynthesis Of Biomolecules Covering Five Chapters Describing In Detail The Biochemical Control Of Traffic Of Information Molecules In The Living Cells. Part Iv Describes The Dynamics Of Energy Transformation And Represents Six Chapters Dealing With The Maintenance And Expenditure Of Energy In Biochemical Processes. Part V Deals With Enzymology And Special Aspects Of Metabolism And Includes Eleven Chapters Especially Devoted To Cover Recent Developments And Topics Of Current Importance. This Volume Concludes With A Chapter Dealing With The Place And Relevance Of Biochemistry On An Interdisciplinary Platform. Every Chapter Is Followed By A Short List Of Selected General References Pertaining To That Particular Subject. There Are Seven Indices Following The Complete Write Up And Is Primarily Directed Towards Providing Additional And Extra Information Useful To Establish A Link Between All The Sections And Chapters. In View Of Academic Curriculum Existing In Various Universities And Institutions (Including Agricultural Universities), The Present Book Should Conform To The Requirements And Interests Of Honours And Postgraduate Students In Life Sciences In General Including Biochemistry, Botany, Zoology, Genetics And Microbiology.

This publication, in two volumes, includes most of the scientific papers presented at the first meeting of the International Society for the Study of the Origin of Life (ISSOL), held on June 25-28, 1973 in Barcelona, Spain. The first volume contains the invited articles and the second volume the contributed papers, which also appear in the 1974 and 1975 issues, respectively, of the new journal Origins of Life, published by D. Reidel. A relatively large number of meetings on the subject of the origin of life have been held in different places since 1957. In terms of its organization, scope, and number and nationality of

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The Advances in Chemical Physics series provides the chemical physics and physical chemistry fields with a forum for critical, authoritative evaluations of advances in every area of the discipline. Filled with cutting-edge research reported in a cohesive manner not found elsewhere in the literature, each volume of the Advances in Chemical Physics series serves as the perfect supplement to any advanced graduate class devoted to the study of chemical physics.

The return of Halley's Comet in 1986 has generated much excitement in the scientific community with preparations already afoot for an International Comet Watch and a comet launch by the European Space Community, the Japanese and Soviet Space Scientists. The meeting held at the University of Maryland in October 1980 was primarily stimulated by the preparations for further study of this comet and by one of the most important unanswered questions related to comets, namely, whether they may have made a contribution to the origin of life on earth. Our understanding of the role of comets in the origin of life must necessarily come from our studies of the astronomy and the chemistry of comets. Some clues to the processes which led to the formation of organic molecules and eventually to the appearance of life have come from these studies of comets, perhaps the most ancient of all objects in our solar system. Whether there is, however, a biology of comets still remains to be seen, although some claims have been made that perhaps comets might themselves provide an environment for even the beginnings of life. Scientists with the latest available information on comets and differing opinions as to the role of comets in the origin of life attended this symposium. The formal papers presented are now being made available to the students of chemical evolution within the pages of this volume.

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