

REVIEWS

THE ORIGIN OF LIFE ON THE EARTH. By A. I. Oparin, translated from the Russian by Ann Synge. Third and Revised and Enlarged Edition. Oliver and Boyd, London. 1957. Pp. 495. 35s.

This is the third and greatly enlarged edition of the famous Russian book which was first published in 1938. It appears at a time when the Russians have been highly successful in their first stages of determining whether there is life on other planets and it may well be that the next edition will need to have an extended title !

Many readers, particularly the less specialised ones, will find this a popular and quite fascinating book on a tantalising subject. In the earlier chapters the author reviews, in an exhaustive manner, the history of the many efforts by which the philosophers and early investigators sought either by the theoretical approach or by experimentation to solve the riddle of the origin of life. The treatment of such matters as spontaneous generation is not highly critical but it makes fascinating reading. One wonders, however, whether the description of the work concerning attempts to construct models of living organisms is worth perpetuating despite the pretty pictures of artificial fungi and algæ.

The summary of evolutionary theories on the origin of life is concise and excellent. In Chapter IV there is provided a long and altogether feasible account of the possible mode of formation on earth of simple organic substances. The author marshals the ideas taken from a diverse range of papers, particularly from authors in the Soviet Union, and from Urey's writings, showing that hydrocarbons could be made abiogenically. He gives also an interesting chapter providing evidence for the presence of hydrocarbons in various planets as determined by spectrographic methods. These chapters are again not highly critical but it is clear that the author holds firmly to the theory that simple organic substances had a chemical origin and he amplifies and extends his views in a plausible and logical way in a further discussion of oxidising and reducing conditions of the lithosphere.

The possible sources of the great amount of energy needed for the chemical synthesis of carbon compounds are discussed at length and the account makes fascinating reading. Ultra-violet light played its full part in these chemical reactions and Oparin deduces that the formation of more complicated organic compounds occurred mainly in the waters, in the seas and in the oceans. He is well aware that the substances catalysing the reactions must have been salts in aqueous solution or in the insoluble deposits. In view of recent developments in polymer formation at low temperatures by inorganic reagents, surface catalysis merits closer attention by future research workers.

The author approaches the important question concerning the mode of synthesis of dissymmetric molecules in a cautious manner and would appear to favour among other things the possibility of using dissymmetric crystals as catalysts. He evidently likes the outmoded idea of making sugars from formaldehyde and states categorically that sugars arose primarily on the waters of the earth's surface long before the appearance of life on it.

Ideas on the formation and structure of other biologically important compounds, particularly those containing nitrogen, receive a good deal of

attention. The question of amino acids both from the viewpoint of their structure and their origin comes in for careful review. Indeed the chapters on the origin of structures and functions in regard to physiologically active compounds, particularly proteins and nucleic acids, are amongst the most interesting and best described in the book and they will be most useful to the non-specialist reader. Clear accounts are given of ideas on the development of organic multimolecular systems and the author makes good use of the idea of coacervates or colloidal macromolecules as being ideal initial systems in which self duplication of molecules could begin.

Theories on the origin of enzymes and on the first organisms are set forth in an attractive manner and there is no doubt that the literature has been surveyed in a thoroughly exhaustive way.

Further chapters on energy, metabolism, photochemical reactions, photosynthesis and on respiration bring the subject matter up-to-date from the biochemical point of view. It is important to note that all chapters include many important references to Russian work which has hitherto been inaccessible to most of the world.

To those of us who have had the good fortune to meet Professor Oparin in his own laboratory and to talk with his enthusiastic young colleagues, this book is particularly welcome for his genial personality pervades every page. He has assembled the published claims and his own life's work in a masterly way and has provided thereby much food for thought and stimulation to young workers who are interested in this very important biological field. The book, which is cleverly and sympathetically translated by Ann Syngé, must find an important place in every science and general library. It is beautifully printed and arranged and the photographs reproduced are of considerable interest.

However, some specialists will not find the book sufficiently critical and may not like some of the "paper chemistry". On the first reading some non-specialists may find the description of the complexity of living things and their origin somewhat bewildering. Moreover, since this is a singularly God-less book some readers may need to regain equilibrium by reading in all its beautiful simplicity the First Chapter of Genesis! M. STACEY.

CONFERENCE ON CHROMOSOMES. Lectures held at the Conference on Chromosomes, Wageningen, 16th-19th April 1956. Willink, Netherlands. Pp. 231. f. 8.10.

This book contains the papers presented at the first of a series of triennial conferences organised by the Agricultural University and intended to discuss fundamental subjects which would be of interest to every scientist. It contains seven papers:—"Die Chromosomen struktur in kern während der kerntielung und der entwicklung des organismus" by E. Heitz; "Some aspects of the chemical structure of proteins and nucleic acids" by H. D. Springall; "Cytochemistry of nuclear elements" by T. Caspersson; "The recognition, distribution and action of nucleic acids" by N. W. Pirie; "Studies on the mutation process in plants—regularities and intentional control" by L. Ehrenberg, A. Gustaffson and D. von Wettstein; "Chromosomes in relation to species differentiation and plant breeding" by A. Müntzing; and "Messages and movements in the cell" by C. D. Darlington.