*iso*cyanuric acid are two other compounds of considerable theoretical and technical interest, and a chapter is devoted to each compound and its derivatives. Condensed ring *s*-triazine systems, and hexahydro-*s*-triazines also receive a detailed and logical discussion in separate chapters. All the above compounds contain the same six-membered ring system of alternating carbon and nitrogen atoms, usually of considerable stability. The reader therefore may come with some surprise to hexamethylenetetramine, the whole chemistry of which is so different from that of the preceding compounds : this compound does, of course, contain three such rings fused uniquely together, and the full account of its reactions is to be greatly welcomed. Both inorganic and organic chemists will also welcome the final chapter on *s*-triazaboranes.

The author and the publishers may be justly proud of this volume, which will give added strength to the whole Interscience series. The reviewer feels that the chemical public are also indebted to the American Cyanamid Co., which has ensured facilities for the writing of this considerable volume by two members of its staff, and also for the contribution to Vol. 10 by another member, Dr. Wystrach.

F. G. MANN

# ENZYMES

## Outlines of Enzyme Chemistry

By J. B. Neilands and Paul K. Stumpf. With a Chapter on the Synthesis of Enzymes by Roger Y. Stanier. Second edition, revised and enlarged. Pp. xii+411. (New York : John Wiley and Sons, Inc. ; London : Chapman and Hall, Ltd., 1958.) 68*s*. net.

## The Enzymes

Edited by Paul D. Boyer, Henry Lardy and Karl Myrbäck. Vol. 1 : Kinetics, Thermodynamics, Mechanism, Basic Properties. Second edition, completely revised. Pp. xiii+785. (New York : Academic Press, Inc. ; London : Academic Books, Ltd., 1959.) 24 dollars.

THE two books reviewed here deal with the same subject but at a very different level. They are aimed at different readers, but each in its class should prove extremely valuable.

This second edition of "Outlines of Enzyme Chemistry", by Drs. Neilands and Stumpf, has undergone considerable changes and has expanded by about one-third compared with the first edition. It is intended for the beginner and gives a concise and fairly elementary coverage of the whole field of enzymology. Also included is a certain amount of background material which will be very helpful to the student ; for example, there is an excellent section on physical chemistry which leads smoothly into the discussion of enzyme kinetics. Some chapters carry the material to a very advanced level, and the book will undoubtedly be useful to many research biochemists as a reference book. A new feature is an alphabetical list of more than five hundred enzymes, with some properties and key references.

A large number of references is given throughout the book, but their selection appears in places to have been rather random. The density of documentation is rather uneven ; for example, there are only sixteen references after a chapter on oxidation-reduction, but 136 to a chapter on the classification of coenzymes.

Vol. 1 of "The Enzymes", under the editorship of Boyer, Lardy and Myrbäck, is the first of a series of four volumes to replace Sumner and Myrbäck's "The Enzymes : Chemistry and Mechanism of Action", which since its publication in 1950 has become a classic work of reference. It is not in any real sense a second edition, but a completely new work by new authors, arranged in a different way. As the editors state in the preface, much of the material will be "supplemental to that of the previous edition, and thus the previous edition will continue to serve as a useful reference work in certain areas". The new series will not deal with metabolic relationships, nor will it contain details of methods of preparation, etc., which can be found in the companion treatise, "Methods in Enzymology". The aim is to give a full account of enzymes and enzyme action "on a molecular level".

Vol. 1 is devoted to kinetics, thermodynamics, mechanism and basic properties. It stands on its own, in fact, as a text-book on the fundamental principles of enzymology. There are four excellent chapters on enzyme kinetics, including a historical survey by H. L. Segal and the development of the complete steady-state rate equation by R. A. Alberty. The mechanism of enzyme action is discussed *inter alia* by R. Lumry, D. E. Koshland, P. D. Boyer and H. Fraenkel-Conrat. There is a useful review of structural and stereospecificity by H. Gutfreund. Probably the most difficult chapters are by P. George and J. S. Griffith on "Electron Transfer and Enzyme Catalysis", and by R. J. P. Williams on "Co-ordination, Chelation and Catalysis" ; but many enzymologists concerned with oxidation systems will be extremely grateful for these carefully written accounts of relevant fundamental chemistry. Although much of the book is concerned with the fundamental chemistry of enzymes and enzyme action, the final two chapters, on enzyme induction by M. R. Pollock, and on the control of enzyme activity by A. B. Pardee, introduce a more biological note.

There is no doubt in the reviewer's mind that, if the standard of this first volume is maintained, "Boyer, Lardy and Myrbäck" will be a worthy successor to the ubiquitous "Sumner and Myrbäck".

EDWIN C. WEBB

# HUTCHINSON'S 'FAMILIES'

## The Families of Flowering Plants

By Dr. J. Hutchinson. Second edition. Vol. 1 : Dicotyledons. Pp. xi+510. Vol. 2 : Monocotyledons. Pp. viii+511–792. (Oxford : Clarendon Press ; London : Oxford University Press, 1959.) 147*s*. net the two volumes.

THIS well-known work by Dr. J. Hutchinson was first published in 1926 (Vol. 1) and 1934 (Vol. 2), and has long been out of print ; a second edition, in which the treatment of the dicotyledons has been expanded and greatly altered, has now been produced by the Oxford University Press. This new edition will be welcomed by those interested in changing views about the evolutionary relationships of flowering plants and will be useful to students of taxonomy (if they can afford to buy it).

To begin with, it may be said that Vol. 2 is unaltered except for the addition of one family and of genera which have been described since 1934, so that this review will be concerned mainly with the first volume.

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