ENZYME KINETICS

The Chemical Kinetics of Enzyme Action

By Prof. Keith J. Laidler. Pp. vii+419. (Oxford: Clarendon Press; London: Oxford University Press, 1958.) 60*s*. net.

ENZYMOLOGY lies between the fields of physical and biological chemistry. Consequently, there is the need for a book to acquaint scientists from each discipline who are interested in enzymes with the basic principles of the other. In his preface, Prof. Laidler states that "this book has been prepared with the idea that it might be helpful to collect together some of the main results and concepts that have developed on the physical side". Because of this emphasis this book is, in the opinion of the reviewer, more suitable for the biochemist wishing to learn about the application of physico-chemical methods to the problem of enzymes than it is to a physical chemist interested in enzymology.

In the first chapter there is an elementary and limited introduction to enzymes for the physical scientist, and this is supported by some of the material of the final chapter concerning protein denaturation. Providing the reader does not expect to learn much about the biochemistry of enzymes from it, the book fulfils its purpose well.

The author is well known for his contribution to chemical kinetics, and in this volume he presents a clear and skilful account of this subject. The treatment is thorough, beginning with a sound introduction to kinetic principles followed by their application to very many interactions between enzyme, substrate and inhibitors. One topic which has been overlooked is a reaction between enzyme and substrate which occurs in more than two kinetically distinguishable steps.

It is regrettable that there is no standard nomenclature in the literature for the description of enzyme-catalysed reactions. Although the treatment in this book is generally consistent there are, unfortunately, a few examples of enzyme reactions for which individual algebraic analysis is required. The reciprocal of the Michaelis constant is used. This is advantageous in that it provides a direct measure of the affinity of enzyme for substrate; but it is unlikely that this change will be popular with many enzymologists. There are a small number of errors in the kinetic expressions, generally due to confusion between rate constants—for example, k_{-1} is sometimes written for k'_{-1}.

Forty-six pages are devoted to the important effect of hydrogen ion concentration on enzymatic activity. The theory is well illustrated by recent examples from the literature, though one might have chosen examples which have given kinetic data of greater precision. Such speculation makes interesting reading, but may, of course, be subject to revision in the light of new work.

The outstanding questions of enzyme action, efficiency and specificity receive brief but stimulating mention. Then follows a review of methods, kinetic and otherwise, which have been of assistance in elucidating enzymic reaction mechanisms.

The author devotes four chapters (110 pages) to a small number of the enzymes which have been subjected to most study, and reviews knowledge about them derived from kinetic and other evidence. The hydrolytic enzymes are treated in some detail; unfortunately, some of the tabulated data (for example, Tables 22 and 35) are not the best available Many values given are now known to be in error The oxidative enzymes and catalase and peroxidase receive brief mention. This review of current work is a difficult task in such a rapidly developing field, and it has not been assisted by the long time-lapse (two years) which appears to have occurred between completion of the manuscript and publication. This is partly compensated by including an appendix of references, some for 1958. Unfortunately, most topics can receive only a curt statement in this.

The emphasis in this volume has been placed on kinetic principles rather than individual enzyme systems, so that most chapters will not become too rapidly out of date. The book can be warmly recommended to biochemists; it is less suitable for physical chemists and others working in the field, although they, too, may find it useful to have as a reference book to specialized kinetic treatments necessary for enzyme reactions. B. R. Hammond

INSECTICIDES

Die Insektizide

Chemie, Wirkungsweise und Toxizität. Von Dr. Werner Perkow. Pp. viii+384. (Heidelberg: Dr. Alfred Hüthig Verlag, 1956.) 28 D.M.

THE author suggests that more research is needed at present on modern insecticides. He asks if enough is really done on a matter the results and progress of which are so essential to the basis of our food supply. Fundamental research work on insecticides is almost non-existent; but it could be decisive for the future efficiency of the pest control mechanism. The book is not a handbook in its strict sense, but the attempt to compile a German compendium on modern insecticides. Its disposition is somewhat uneven. For example, there are chapters named "Phenothiazin . . . " alternating with such titles as "Acarizide".

The chief stress in the contents is on chemical constitution, industrial manufacture, historical development and analytical methods. These subjects are discussed in a substantial form, the author himself being very familiar with them as an industrial chemist. The methods of application are described from the point of view of the insecticides, that is, the chapter on a specific insecticide tends to describe the manner in which this insecticide may be applied. On the other hand, the brevity of the book compared with the enormous extent of the whole subject leads to the result that the matter dealt with is limited: the book cannot be complete inasmuch as some minor subjects are omitted. For example, the reviewer missed calcium arsenite as well as the application to warm-blooded animals of systemic insecticides. But this fact is no vital fault of such an introduction; seen as such, the book is quite comprehensive in the subjects discussed.

However, in a very few cases the formulations of the text are not very convincing; for example, such a sentence as "Stored food protection is no simple problem and needs knowledge of the matter as well as responsibility" could have been applied similarly to other insecticidal matters. The chapter on bioassay methods is sufficiently comprehensive for an introduction, while the chapter on insecticide application by aircraft is too short for an English reader. It is a good idea of the author's to go into the subjects of toxicology and biology. Concerning these chapters,