

Enzyme Chemistry

Kurzes Lehrbuch der Enzymologie
 Von Theodor Bersin. Pp. viii + 170. (Leipzig :
 Akademische Verlagsgesellschaft m.b.H., 1938.)
 12.80 gold marks.

DR. BERSIN'S interesting book covers a very large field in a very small space and he is to be congratulated on the brevity, clarity and, on the whole, the accuracy of his exposition. The book is highly condensed, probably too much so for those with little acquaintance with the subject, and whilst general analytical or mathematical treatment is restricted to the barest outline, prominence is given to some of the remarkable advances which have been made in the field of enzyme chemistry during the last few years.

The subject-matter is divided into three sections. The first is concerned with the general properties of enzymes, the second (taking up about half the book) is concerned with the properties of individual enzymes, and the third has to do with a much too brief treatment of the parts played by enzymes in respiration, nutrition and metabolism.

Dr. Bersin's conception of an enzyme is a generous one. He includes in his classification such substances as cytochrome and flavoprotein. It is not clear what is his justification for this procedure, especially as he states that the activation of a substrate by an enzyme takes place only at certain suitable areas (*aktive Gruppen*) of the enzyme surface. One would like to know what substrate molecules are specifically activated by cytochrome or flavoprotein; there is no indication of their nature in Dr. Bersin's book. It is characteristic, however, of the state through which a certain section of enzyme chemistry is now progressing that prominence is given to the nature and functions of prosthetic groups (coenzymes) rather than to the specific proteins which are the actual activating agencies of the substrates that undergo change. This is entirely to be expected, for it is only recently that the chemical nature of these prosthetic groups has been elucidated. Yet there seems to be a definite danger that the significance of the special protein to which the substrate molecule is specifically attached is being overlooked; certain it is that the importance of the specific protein is at present overshadowed by that of the 'prosthetic group'.

Dr. Bersin deals shortly in the first section of the book with such topics as the protein nature of enzymes, enzyme reactions in heavy water, enzyme kinetics, optical specificity, temperature effects,

enzyme formation in the cell and with some other topics relevant to a chapter on the general chemistry of enzymes. He has but little to say, however, on the recent work on adaptive enzymes, on the reversible inhibitors of enzymes, on the protective influence of substrates on their enzymes, and it is surprising that, in a text-book of this nature, details concerning enzyme equilibria (for example, with the dehydrogenases, fumarase, aspartase, etc.) are absent.

Dr. Bersin proceeds to deal at greater length with esterases (considered, however, very scantily), carbohydrases, amidases and proteases. Due prominence is given to the recent work on the crystallization of proteolytic enzymes, useful descriptive procedures are noted and care is taken to impress the reader with the importance of the thiol groups in the activity of papain. It should, however, be pointed out that Bergmann and Ross have shown that the activity of papain cannot be interpreted solely on a $-SH$, $-SS-$, basis. The section is terminated by chapters on carbonic anhydrase, carboxylase and the reduction-oxidation catalysts. These are fairly adequately treated considering the space at Dr. Bersin's disposal, but there are many omissions (for example, carrier linked reactions, amino acid oxidases) and there are several points where criticism may be directed.

Dr. Bersin states, for example (p. 124), that disulphide-thiol systems (for example, glutathione, cystine) act as hydrogen acceptors to the succinic acid dehydrogenase system. There is no evidence for the truth of this statement. Moreover, he states that succinic acid enters into an equilibrium with its dehydrogenase giving rise to fumaric acid and a reduced form of the enzyme. The latter is held to be not autoxidizable but to reduce cytochrome. Such a statement is at present without direct experimental support, and the text-book under review seems scarcely the place to make such a statement without some sound evidence to support it. A similar criticism may be directed against the inclusion (p. 119) of glyoxalase as a system consisting of two dehydrogenases, flavoprotein and another, unknown, factor.

Dr. Bersin's book would have been improved, especially for those for whom it claims to be a guide, by the inclusion of more references to original articles. The total number of references cited is just over a hundred, of which one third are references to review articles in the *Ergeb. d. Enzymforschung*. The book is well printed and free from typographical errors. J. H. Q.