

Enzyme Kinetics: Behavior and Analysis of Rapid Equilibrium and Steady State Enzyme Systems

by I. H. Segel

John Wiley & Sons; New York, London, Sydney, Toronto, 1975

xxii + 957 pages. £ 15.00

The author's declared aim is 'to teach the subject and not just to present a multitude of equations . . . to introduce the varieties of enzyme behaviour to advanced undergraduates and graduate students in the biological sciences and to serve as a useful, accessible reference work on enzyme kinetics for the professional researchers'.

In the reviewer's opinion only the last of these aims has been achieved and that only in a limited way. A first impression of the book is that it contains over 900 pages of algebra with some explanatory sentences interspersed. I don't believe that many undergraduates or graduate students will take the trouble to extract the basic principles of enzyme kinetics from this mass of uncritically presented information. The worst example of this found in the form of 50 pages on the effects of pH and temperature without any real clue as to what we learn about enzymes from these 'once fashionable studies'.

The research worker in areas of biology where enzymology is applied, will find almost all possible derivations of steady state kinetics. I have not checked any equations for errors. It is essential for a book which has as its main merit that it contains all these equations, that they should be correct. For this reason the volume will find an essential place as a work of reference in every library.

However, here again the uncritical attitude of the author is a serious drawback to the non-expert. A detailed study of the book gives the impression that the author lacks wide experience in enzymology. Most of his enormous knowledge comes from book work and not from having solved a range of enzymological problems himself. It is important to bring kinetics into perspective by dealing with raw data. The author states that 'specific enzymes are not discussed except where they represent a unique example of a mechanism'. All this produces a lack of reality in the treatments. The author's declared intention not to deal with transient kinetics is taken to a ridiculous extreme (pages 621–623). A well studied and elsewhere described transient kinetic phenomenon is treated by a sort of verbal step dance. Steady state kinetics certainly forms the essential grammar for the behaviour of enzymes. However, in this day and age no student should be confronted with such a large volume on enzyme kinetics, which contains no information about what can be learned from transient kinetics. I don't think this shows undue prejudice on the part of a practitioner!

H. Gutfreund

Horizons in Biochemistry and Biophysics (Volume 1)

Edited by E. Quagliariello, F. Palmieri and T. P. Singer
Addison-Wesley Publishers Ltd; London, 1974
xiii + 344 pages. £ 3.70 (hardback £ 7.45)

This volume is the first in a series whose aim is to call attention to 'major conceptual and methodological advances in Biochemistry and Biophysics . . . and to the direction future research in these fields is likely to take'.

Is yet another review publication necessary? In the

words of the editors, articles in '*Horizons*' must be 'well written and unencumbered by jargon, extensive documentation or bibliography' and comprehensible to a wide range of students, teachers and practising scientists.

The value of '*Horizons*' may be judged by the above

criteria. I felt that they were fully met by the reviews of Fridovich on 'Superoxide and evolution', Kenney on 'Isoenzymes', Zakim on 'Abnormal enzymes', and Vessey and Zakim on 'Membranes'. There are many other reviews available on all these topics, but those in *'Horizons'* scored by being informative and interesting without being incomprehensible to non-specialists in the field. I felt that the reviews of Singer and Gutman on 'Coupling site 1', Ackrell on 'Oxaloacetate', and Palmer and Coleman on 'NADH oxidation in mitochondria' were slightly less readable, but still very much worth the effort.

The review of Kearney and Kenney on enzymes with

covalently-bound flavins was good and clear, but it might be argued that the subject matter was too restricted for *'Horizons'*. Finally, the review of Arnon and Buchanan on 'Ferredoxins and photosynthesis' was clear and interesting, but I must admit to being prejudiced against it, having seen so many recent reviews dealing with ferredoxins!

Overall, I feel that *'Horizons'* is a worthwhile series if the present standard of articles can be maintained. I have no hesitation in recommending Volume 1.

Barry Halliwell

The Flavonoids

Edited by J. B. Harbone, T. J. Mabry and Helga Mabry
Chapman and Hall; London, 1975
xiv + 1204 pages. £ 27.50

The editors, a formidable trio of flavonoidologists, have done for flavonoids what Otto Isler recently did for another important group of plant products, the carotenoids. The length and weight of both books are very much the same and are both impressive, although there is probably slightly less information in *The Flavonoids* because of the use of a different typeface. The fifteen classes of flavonoid compounds are described in eleven chapters covering some six hundred and fifty pages, so the thoroughness of the treatment is obvious. These chapters are preceded by more general and, to an uncommitted reader, rather more attractive chapters on techniques for isolating flavonoids and on the use of spectroscopy in its various guises for studying flavonoids; one of the editors, T. J. Mabry, has effectively contributed to this section. One chapter is devoted to a consideration of flavonoid biosynthesis, which has recently blossomed following important enzymic and stereochemical studies. There follow chapters on the metabolism and function of flavonoids; these topics have only recently been seriously

studied and whilst metabolism seems to be well established, function still has a number of grey areas. However both chapters give balanced accounts of the present state of the subject. In the last two chapters we have an authoritative account of Flavonoid Systematics and an imaginative treatment of Flavonoid Evolution, respectively.

Biochemists who are inhibited by the word 'plant' should look at this book to see what levels of sophistication some aspects of plant biochemistry have now achieved. But that said, this important book is essentially a book for specialists and no researchers concerned with flavonoids can afford to be without it although at £ 27.50 it may be beyond the means of many young academics in the U.K. We should all be grateful to the editors for collecting such an outstanding group of authors and then persuading them to write chapters which interact so effectively.

T. W. Goodwin

Enzyme kinetics: behavior and analysis of rapid equilibrium and steady-state enzyme systems (Paper). Book. Jan 1993. The kinetics of enzyme-catalysed reactions can be analysed in terms of steady state models if the substrate concentrations are more than an order of magnitude higher than the enzyme level. Such analysis yields Michaelis constants, maximum velocities and useful information on reaction mechanisms. Thus when there are two or more substrates, the number of terms in the denominator of the rate Enzyme Kinetics. 1. In this exercise we will look at the catalytic behavior of enzymes. You will use Excel to answer the questions in the exercise section. At the end of this session, you must hand in answers to. Background Enzymes are the catalysts of biological systems and are extremely efficient and specific as catalysts. In fact, typically, an enzyme accelerates the rate of a reaction by factors of at least a million compared to the rate of the same reaction in the absence of the enzyme. Most biological reactions do not occur at perceptible rates in the absence of enzymes. enzyme-catalyzed reaction, k_1 the rate constant of the forward reaction of $E+S$, k_{-1} the rate of the reverse reaction where the enzyme-substrate complex, ES , falls apart to $E+S$ and k_2 the rate. Harold L. Segal, "Enzyme Kinetics. Behavior and Analysis of Rapid Equilibrium and Steady-State Enzyme Systems. Irwin H. Segel," *The Quarterly Review of Biology* 51, no. 1 (Mar., 1976): 106-107. <https://doi.org/10.1086/409080>. MOST READ. Of all published articles, the following were the most read within the past 12 months. Polydactyly in Development, Inheritance, and Evolution. Lange et al. Rethinking the Theoretical Foundation of Sociobiology. Enzyme Kinetics: Behavior has been added to your Cart. Add to Cart. Buy Now. Irwin H. Segel is the author of *Enzyme Kinetics: Behavior and Analysis of Rapid Equilibrium and Steady-State Enzyme Systems*, published by Wiley. Product details. Item Weight : 3.14 pounds.