The length and nature of this book are such that one may ask why it was not published in a review journal. There is an encouraging trend to make available advanced topics in inexpensive paperback form. It is hoped that topics of this nature might be made available at an even lower price than that listed for this volume.

This book is well written and brings together a large amount of interesting information concerning the Group IV hydrides and their derivatives. It is recommended to anyone wishing to expand their knowledge of this increasingly important field.

DEPARTMENT OF CHEMISTRY
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The Mössbauer Effect. A Review—With a Collection of Reprints. By HANS FRAUENFELDER, University of Illinois. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1962. xiv + 336 pp. 15.5 × 23 cm. Price, $3.95.

In 1958, Mössbauer published several papers on the resonant fluorescent scattering of nuclear gamma rays, papers in which his discovery of recoilless emission and absorption was described, together with a correct theoretical explanation of the phenomenon, now known as the Mössbauer effect. For more than a year the importance of his work remained virtually unrecognized; then suddenly workers in many laboratories began intensive studies using the effect as a tool for the exploration of various fields of modern physics such as relativity and the solid state. Many theoretical calculations were also made. In other words, after a slow start the subject developed with the speed typical of important modern physical discoveries. For his discovery Rudolph Mössbauer received the 1961 Nobel Prize in physics.

Professor Frauenfelder's book is clearly divided into two parts. The first is an account of the history and the concepts of the subject; the second, comprising two thirds of the volume, is a set of reprints. The first section is written in a clear and interesting style. The reader needs a modest acquaintance with quantum mechanics. At one point it is stated that "In nearly every theory there exist steps that are omitted in theoretical papers and not treated in the textbooks. These steps are obviously designed to keep the experimental physicists in their place." In the present case the first section supplies most of those steps. A ten-page bibliography concludes the first section.

The reprint section contains a wide variety of papers beside the classic three by Mössbauer, including one by Lamb (1939) entitled, "Capture of Neutrons by Atoms in a Crystal," giving the theory later modified by Mössbauer to explain his effect, and one by Dicke (1952) on the possible reduction of the Doppler broadening of lines through the effect of collisions. Also included are the well known paper by Pound and Rebka entitled, "Apparent Weight of Photons," and a number of others describing applications in solid state physics, especially ones trading on the uses of the nuclear Zeeman effect. Both experimental and theoretical subjects are included. For some of the theory the reader will need a good grasp of quantum mechanics.

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Comprehensive Biochemistry. Volume 2. Organic and Physical Chemistry. Edited by MARCEL FLORKIN, Professor of Biochemistry, University of Liège (Belgium), and ELMER H. STOTZ, Professor of Biochemistry, University of Rochester, School of Medicine and Dentistry, Rochester, N. Y. (U.S.A.). American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York 17, N. Y. 1962. xii + 328 pp. 16 × 23 cm. Price, $14.50.

It is now a commonplace observation that, after the extensive progress in the elucidation of metabolic pathways of the last few decades, biochemistry is now advancing in two somewhat divergent directions—toward a more detailed understanding of problems which were previously in the realm of biology, and toward an elementary understanding of the detailed chemical processes involved in biological catalysis and synthesis. The growing interest in the second of these directions is reflected in the recent publication of no less than four books concerned with the application of the mechanistic approach of the physical-organic chemist to enzymic reactions. Some two-thirds of the volume under consideration here represents such an undertaking by two eminently qualified chemists, Myron Bender and Ronald Breslow, who have themselves contributed a good deal of the significant work in this field. The greater part of the text is concerned with a description of the mechanisms of chemical reactions which have a relevance to enzymic reactions, with emphasis on the rates and mechanisms of catalysis of such reactions. Although there is relatively little discussion of enzymic reactions, the importance of these mechanisms to any consideration of enzymic mechanisms is obvious in many instances even when analogies are not given. It is inevitable that in such a rapidly advancing field there should be some disagreement about the interpretation of certain areas (for example, this reviewer would favor a different interpretation of much of the data on the mechanism of phosphate reactions), but the treatment is generally authoritative and always stimulating. The marked resemblance of much of the material on the mechanism of acyl transfer reactions to Bender's recent review on this subject (*Chem. Rev.*, **60**, 53 (1960)) can doubtless be justified by the theorem that if something has been said once in the best possible manner then, if it is restated, it should be said the same way. Certainly, this chapter will be required reading for biochemists who wish to conclude their papers on enzymes with proposals for mechanisms of enzyme action.

The latter third of the book contains two chapters by W. D. Stein on the related topics of "Behavior of Molecules in Solution" and "Diffusion and Osmosis." The reader's reaction to these chapters will depend on his attitude toward the subject. Physical chemists will undoubtedly object to the rather elementary approach to these very difficult topics and to the inaccuracies of the treatment (for example, the signs are incorrect in the various expressions of the Debye–Hückel relationship). On the other hand, it is a fact that many biochemists have only a very limited acquaintance with this important subject, although most have been exposed to the relevant equations, and have difficulty obtaining a non-specialist's knowledge of the field from the available advanced treatments. Stein's discussion has the great virtue of providing an intelligible, non-mathematical exposition of the present state of knowledge in this area and non-specialists should find it a very useful introduction.

This reviewer would like to believe that this volume, along with the three other related recent publications, will mark the beginning of a period of rapid advance in the understanding of the mechanisms of enzyme-catalyzed reactions, as did Hammett's classic work for the mechanisms of organic reactions. It will certainly be an important addition to the libraries of biochemists and of those biochemistry students who can afford it.

DEPARTMENT OF BIOCHEMISTRY
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Mechanisms of Organic and Enzymic Reactions. By S. G. WALEY. Oxford University Press, 417 Fifth Avenue, New York 16, N. Y. 1962. xiii + 365 pp. 16 × 24 cm. Price, $11.20.

Too often, mechanisms for enzymic reactions have been proposed by biochemists with little feeling for organic reactions, or by organic chemists with little feeling for the capabilities of enzymes. A critical synthesis of the findings of both fields therefore would be a most welcome contribution. Unfortunately, the present volume does not go very far toward filling this need, though it does have merits in other ways.

The book follows a conventional order for reaction mechanisms texts, starting with chapters on molecular structure and the fundamentals of mechanisms and kinetics. These are followed by treatment of the various reaction types: substitution, addition, elimination, carbonyl additions, reactions of acids and acid derivatives, rearrangements and aromatic substitution. The book concludes with a chapter on polymerization. At the end of each chapter is a discussion of enzymic reactions analogous to the organic reactions treated earlier.

The general level of sophistication of the book is comparable to that of Alexander's "Ionic Organic Reactions." It is clearly written, and will be useful to undergraduate and beginning graduate students seeking a first acquaintance with organic and enzymic mechanisms. The more advanced biochemist or organic chemist is likely to find it too superficial to be of much help. Though there is occasional presentation of kinetic support for organic mechanisms, there is no quantitative discussion at all of enzyme kinetics. Space used merely in listing enzymic reactions whose mechanisms are uninvestigated (though possibly similar to other mechanisms treated in the same chapter) might better be devoted to more thorough discussion of those on which something illuminating can be said. Some topics of great interest are dismissed with bare mention. Enzymic polymerization, for example, receives a page and a half, and this is devoted only to polysaccharides.

To criticize a book for superficiality is perhaps not very fair if the author has obviously not even intended to produce a critical and comprehensive work. It is impossible to avoid the temptation, however, when the book he did not write would have been so much more useful than the one he did.

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