The book is very successful in meeting its particular aim, but its practical usefulness will decrease with distance from central California. Some of the features are obviously designed to fit the particular University course for which it was written, and these will probably find varying usefulness elsewhere. The term *intertidal* is broadly construed, for we find some material on fresh-water and even terrestrial forms; the term *invertebrates* is treated equally liberally, for there are keys to common marine algae and intertidal fishes. Nevertheless, the emphasis matches the title, and the supplementary material is justified.

It seems almost impossible to assemble an extensive group of keys without having some of the couplets involve undefined terms and unspecific comparisons. The difference between *short, stout,* and *slender* is always quite obvious to the constructor of a key but is likely to worry even an experienced zoologist until he becomes familiar with the group. In the present case, there seem to be relatively few uncertainties that cannot be resolved by reference to figures. This condition is not surprising, for the original version was used for many years.

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Adaptation in Micro-organisms. Third Symposium of the Society for General Microbiology, London, April 1953. R. Davies and E. F. Gale, Eds. Cambridge Univ. Press, New York, 1953. 339 pp. Illus. + plates. $6.

This book records the papers and some of the discussion presented at the third symposium of the Society for General Microbiology held in London in April 1953. The quality of the contributions is rather uneven, as might be expected; some papers are valuable and important summaries of the work of major contributors to this branch of biology, whereas other papers are mediocre or even misleading.

An introductory chapter by Stanier is an attempt to limit debate by carefully defining the fields to be discussed. Unfortunately the effort was in vain, for the next paper by Dean and Hinshelwood is a clear-cut example of the anarchy that results from the refusal to accept any restrictive definitions. It is obvious also that these authors refuse to accept any experimental results that conflict with their own preconceptions of the mechanisms of adaptation. An enlightening comment by Hinshelwood in discussion (p. 42) is

> Strictly speaking, it is begging the question to include in this argument those cases [such as the lactose variants] where it is still *sub judice* whether the change was or was not a mutation. If and when such cases are examples of mutations, these are of course positive ones.

It is precisely the case of the lactose variants of *E. coli* in which the interplay of genetic control and phenotypic expression has been most clearly demonstrated.

Then follows a series of remarkably clear and well-written papers: on adaptation to the utilization of various substrates in the citric acid cycle by Ravin; on the adaptive synthesis of cytochrome oxidase by Slonimski; on the nature of the precursors in the induced synthesis of enzymes by Spiegelman and Halvorson; on a hypothesis concerning the specific control of the synthesis of adaptive and constitutive enzymes by Cohn and Monod; on a cyclic mechanism of adaptive enzyme formation to explain the kinetics of penicillinase synthesis by Pollock; and on the important role played by temperature in enzymic adaptation by R. Knox.

The discussion of the development of drug resistance in microorganisms by Abraham is strongly biased toward the Hinshelwood school, although a deceptive air of impartiality is attempted. The discussions of drug resistance in staphylococci by Barber and in mycobacteria by Mitchison are primarily descriptive and avoid controversial aspects. The paper by Hewitt on the influence of bacteriophage on bacterial variation and evolution presents a remarkably confused and distorted picture of this important field. It is unfortunate that this is the only paper in this symposium that deals with the effects of bacteriophages on the properties of bacterial cultures. The remaining three papers deal with adaptations in paramecia by Beale, adaptations in thermophiles by Clegg and Jacobs, and adaptations in fungi by Brown and Wood. This book makes very interesting reading, but the reader must be alert to distinguish fact from fancy.

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Introduction to the Chemistry of Enzymes. Keith J. Laidler. McGraw-Hill, New York–London, 1954. ix + 208 pp. Illus. $5.

According to the publishers, this book was "written particularly for biochemistry students . . . at the undergraduate level." They further state that "The author has kept in close focus the needs of the biologist desiring adequate knowledge of the chemical aspects of his subject and those of the physical chemist who wants to learn something of enzymes. . . ."

The first chapter deals with the general characteristics of enzymes, including their role as catalysts, their specificity, classification, and an explanation of prosthetic groups. The second chapter is concerned with the kinetics of enzyme reactions. The topics covered in this chapter include a brief explanation of the order of enzyme reactions and the influence of *p*H, substrate concentration, inhibitors, and temperature. The derivations of the Michaelis-Menten equation under normal conditions and in the presence of inhibitors are well covered in the classic manner. The use of the Arrhenius equation is presented at the proper level.

Chapters 3–7 discuss individual enzyme systems with special reference to the proteolytic enzymes, particularly the specificity of the peptide bonds hydrolyzed; the remaining hydrolytic enzymes and the

phosphorylases, with brief examples of the members in the various classes; the oxidative enzymes; and the splitting, transferring, and isomerizing enzymes.

The last two chapters, in which the author discusses the inactivation of enzymes and the mechanism of enzyme action, are by far the best in the book. In these chapters, the author introduces the student to many concepts that are not found in the average college textbook.

The main criticism that I offer concerns the lack of adequate references, especially in the first seven chapters. It is my opinion that this introductory textbook will serve the purposes for which it was intended.

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The Dynamics of Virus and Rickettsial Infections. International symposium sponsored by the Henry Ford Hospital, 21–23 Oct. 1953. Frank W. Hartman, Frank L. Horsfall, Jr., and John G. Kidd, Eds. Blakiston, New York, 1954. xii + 461 pp. Illus. $7.50.

A résumé of this symposium written by one of the editors of the book recently appeared [*Science* **119**, 427 (1954)]. Since it provides an excellent summary of the content of the symposium and, thereby, an outline of the present volume, this review is critical rather than abstractive. Taken individually, the majority of the articles are timely and thought provoking; several are detailed research reports and several are general reviews. Most, however, attempt to reveal or to stimulate inquisitiveness into the basic dynamics of viral and rickettsial action and host relationships; the greater proportion of these succeed in this attempt.

The editors have allowed drastic revision by the participants. This is lamentable. A few of the authors, in the obsequious interest of a stereotyped scientific report, have removed the spice that added savor to their original presentation. One paper in particular has little, if any, resemblance to the original. Many references to earlier papers made by later participants and discussants are therefore without precedent.

In the main, the illustrations are well chosen and presented. The book would have had a more polished appearance if several charts of the quill-pen variety had been redrawn.

This book, because of a timely topic presented by a select group of participants, should be both stimulating and informative to the virus worker. The provocative viewpoints of these authorities, no doubt, will establish the trend for basic viral research for some time. Had these papers and the discussions been organized more coherently, this book could have been recommended to readers other than those actively engaged in research in this field.

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A First Course in Ordinary Differential Equations. Rudolph E. Langer. Wiley, New York; Chapman & Hall, London, 1954. 249 pp. Illus. $4.50.

This is a teachable and eminently sound textbook for a beginning course, written by a recognized authority on the subject. The author has included an astonishing range of topics in a very few pages and has achieved the happy combination of mathematical clarity with physical applications. Each item is treated with the utmost brevity compatible with precision. Abundant problems are supplied. Besides what may be called the usual material included in a beginning course, there are sections on the Riccati equation, Legendre, Bessel, gamma, and hypergeometric functions, and Laplace transform. These sections should be valuable and stimulating introductions to further study. Other features that may be mentioned are greater emphasis on exact equations, systematic use of first integrals, and reduction of the solution of the second-order linear equation with constant coefficients to the solution of a Riccati equation.

Here is a first-class addition to the postwar spate of differential-equations textbooks.

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Introduction to Nuclear Engineering. Richard Stephenson. McGraw-Hill, New York–London, 1954. xii + 387 pp. Illus. $8.

Richard Stephenson has produced a volume that admirably fills a very important gap in the field of engineering textbooks. As stated in the preface,

> . . . although the original development of nuclear energy was carried out almost entirely by theoretical scientists, now that the fundamental principles have been established, the further use of nuclear energy is falling more and more into the province of the engineer. If the engineering profession is to accept the responsibilities created by this new scientific field, the younger engineers must be willing to undertake such problems as radiation shielding, radiation damage, chemical processing of radioisotopes, and the engineering design of nuclear chain reactors.

The author has succeeded in writing a textbook that provides a solid basis for any engineering student, in his senior or graduate years, to acquire the rudiments of the underlying technology in this field. He has written from an engineer's viewpoint, supplying many illustrative worked-out examples in the text and a large selection of problems at the end of each chapter.

For those readers unfamiliar with the properties of neutrons and their interactions with matter, the first four introductory chapters are provided. The last of these is a fairly complete account of reactor theory, which is probably the part of the book that would be expected to be the most difficult for the average engineering student. However, adequate references to the more extensive discussion in the recent book by Glass-