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.

W. T. EDMONDSON
Department of Zoology, University of Washington

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.

MARK H. ADAMS
Department of Microbiology,
New York University College of Medicine

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