poses the sexual and other intimidation of the young male by the old male, and the enforcement of the incest taboo. Actually, because of the basic fact that all psychic activities are heavily overdetermined, a proof of the validity of Bettelheim's thesis does not *automatically* represent a refutation of Freud's thesis and must, instead, be viewed as a valuable supplementation thereof. Bettelheim's attempted "refutation" of Freud's view also suffers from factual inaccuracies. He asserts that circumcision is nowhere equated with castration. Yet, in Merker's book on the Masai, which Bettelheim cites, we read that an initiate's father was ridiculed by the circumcisers, because during circumcision the son allegedly "bellowed like a bull which is being castrated." The statement that male Australian aborigines are kind fathers is correct but does not abolish the fact that among those people, in times of famine, foetuses are aborted to feed those already born, small children are fed to older ones, the young are terrorized by the magic "bone pointing" of old men, and the penalty for a trespass on the dietary and other privileges of the old is the indefinite postponement of the signs of sexual maturity—surely an equivalent of castration-threats.

On the whole, Bettleheim rendered an important service to anthropology and psychoanalysis alike by his thoughtful and creative discussion of a relatively neglected and highly important aspect of the relationship between the sexes and of puberty rites, which supplements but in no way refutes other psychoanalytic and anthropologic theories regarding these complex matters.

The publishers are to be congratulated for having published a fine book in a format worthy of its contents.

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Fluid Dynamics. vol. IV. Proceedings of 4th symposium in applied mathematics of the American Mathematical Society held 22–23 June 1951. M. H. Martin, Ed. McGraw-Hill, New York, 1953. v + 186 pp. Illus. $7.

This book, the fourth volume in the valuable series of reports on applied mathematics symposiums arranged by the American Mathematical Society, contains 12 papers written by specialists for specialists. Some of the authors are leading authorities in their fields, and all papers are written on a very high level of competence. There are three points of view discernible in the literature of fluid dynamics: that of the physicist, that of the aeronautical engineer, and that of a professional mathematician. All three are ably represented in this collection.

Some of the papers are comprehensive reviews of the subject. Others are technical discussions of a single problem that could just as well have been published in a scientific journal. As far as subject matter goes, some papers deal with recently developed disciplines of fluid dynamics, which abounds in open problems and even in controversies, such as the theory of turbulence and the theory of potential transonic flows. Other papers discuss such classical matters as conformal mapping and the solution of the Poisson equation, the emphasis in this case being on effective numerical solutions. The fact that new and interesting results are possible in such fields confirms the dictum of Poincaré that no mathematical problem is ever completely solved.

There are two papers on turbulence (Chandrasekhar, Lin), six papers on flows of compressible fluids (Busemann, Meyer, Thomas, Carrier and Yen, Martin and Thickstun, Burgers), five papers on incompressible flows (Heins, Theodorsen, Birkhoff, and Young and Zarantonello, Synge, Weinstein), and one paper on hydrodynamics and thermodynamics (DeGroot). The book is very attractively printed. There are voluminous bibliographies and a good index.

Although no book of 186 pages can possibly give a comprehensive picture of the present state of fluid dynamics, this volume gives an excellent cross section of this actively developing science, and it will be of great value to every worker in this field.

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Intertidal Invertebrates of the Central California Coast. S. F. Light's *Laboratory and Field Text in Invertebrate Zoology,* rev. by Ralph I. Smith *et al.* Univ. of California Press, Berkeley, 1954. xiv + 446 pp. Illus. $5.

The book under review is a new revision of the late S. F. Light's well-known laboratory and field textbook for his course at the University of California. The significance of the book is greater than its primary purpose as a guide to the identification of the fauna of a limited region for the use of a particular university course, and it is this significance that invites wide notice. What we have is a series of illustrated determinative keys to the species of the more common intertidal animals. Each key is preceded by a compact discussion of the group, emphasizing the morphology that must be mastered before attempting identifications, and each is followed by a list of species, sometimes annotated, which will find wide use faunistically.

The revision has been made mostly by specialists with a firsthand knowledge of the groups, and the work therefore makes a distinct contribution to the knowledge of the California marine fauna. There are additional sections on problems of classification and identification and a rather extended chapter on field studies that is arranged on a habitat basis. Specific suggestions are made for special problems that can profitably be investigated during a summer course. There is a highly selected, useful bibliography. The book is not meant as a self-sufficient textbook of general invertebrate zoology; the discussions of morphology, classification, and ecology are not that complete.

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