Book Reviews

Unified calculus. Edward S. Smith, Meyer Salkover, and Howard K. Justice. New York: John Wiley; London: Chapman & Hall, 1947. Pp. x + 507. $3.50.

In their effort to introduce unity into the calculus and to provide correlation with physics and mechanics, the authors have made the following noteworthy contributions: (1) the use of the $\frac{dy}{dx}$ notation for the derivative from the start; (2) the interweaving of the ideas of differentiation and integration in connection with the simple polynomial functions; (3) the inclusion of applications of integration to centroids and moments of inertia with the earliest study of integration in company with the conventional applications to area, volume, liquid pressure, and work; (4) early presentation of the idea of definite integral; (5) a very clear explanation of the differential, with its applications and its relation to integration; (6) a line of choice problems on definite integrals and applications interspersed through all the chapters which deal with the formulas and methods of integration; (7) the adoption of right-handed space axes (the physicists should bless them for that!); (8) a small but adequate appendix of formulas and tables; and (9) a chapter on differential equations. While much of the text is identical with that of its excellent predecessor, there are many simplifications and clarifications which will please discriminating students and teachers. The typography is excellent, the cuts are clear and suggestive, and the somewhat smaller format which grew out of the necessity of paper conservation has not impaired the excellence of the presentation but should make the text look a little less formidable to the student. The reviewer is anxious to give it a first-hand working over with his classes this fall.

WALTER F. SHENTON
The American University, Washington, D. C.

The chemical kinetics of the bacterial cell. C. N. Hinshelwood. New York: Oxford Univ. Press, 1946. Pp. 284. $6.75.

Prof. Hinshelwood, who is well known for his work in chemical kinetics, has applied some of its principles to the problems of bacterial physiology and in particular to bacterial variation. The theoretical treatment is based on the assumption that the cell is, in effect, an assembly of self-duplicating units (which the author identifies with enzymes), and that the pattern of these units determines the pattern of cellular characteristics. Much of the experimental material was obtained in the author's laboratory. The possibility that the self-duplicating entities are enzyme-forming units rather than enzymes is unfortunately not considered, although this would leave many of the formal developments unchanged. The consequences of competition among different types of self-duplicating units are also ignored; this is a more serious omission with respect to the validity of the kinetic derivations.

There is an extensive discussion of mutation and selection as possible alternatives to the mechanism proposed, and of the results of combining them with this mechanism. It is a pity that the author did not clearly emphasize two important points: that the ability to adapt by a biochemical mechanism seems to require the presence of a specific gene, and that such a mechanism furnishes a key to the fundamental problem of the relation between genotype and phenotype.

It is surprising to find only one reference to the fundamental work on adaptive enzymes by Spiegelman and none to the important studies of the "killer" character by Sonneborn. Selection and the evolution of populations are discussed without reference to the contributions of Lotka, Volterra, Delbrück, and Luria. Finally, a book on the kinetics of self-duplicating units should include some mention of Darlington and Sewall Wright, who first called attention to the importance of such units for physiological genetics.

With regard to some of the experimental material cited, it is regrettable that adaptation to carbohydrates was studied by the awkward method of growth and lag measurements rather than the well-known direct biochemical procedures. Despite these criticisms, this book must be regarded as required reading for the general microbiologist and the theoretical biologist.

JOHN M. REINER
Washington University School of Medicine

The technology of adhesives. John Delmonte. New York Reinhold, 1947. Pp. viii + 516. (Illustrated.) $8.00.

The development of plastics has revolutionized adhesive technology and has broadened its usefulness into many new fields of applications which were previously either unknown or were handled by entirely different techniques. This widened industrial scope presents a complicated and often confused picture to the adhesive consumer, making it difficult to select critically the proper adhesive for a specific application.

This book, divided into 20 chapters covering all the main classes of synthetic resins as well as other well-known types of adhesives, should do much to clear up this situation. There are also chapters on the theories of adhesive action and their application to important classes of materials such as wood, organic plastics, metal, rubber, paper, textiles, and inorganic materials; tests and specifications are also described. After each chapter is a list of references, mostly to patents; much of the technical information in the text appears to be taken from patent teachings without any indication as to whether the patent claims have been substantiated by the author.

There are very few illustrations for the size of the book. More pictures demonstrating gluing equipment, techniques, and important applications would be of considerable aid to readers with little experience in the field.

The book is well written and well organized and should be very helpful to anyone connected with bonding problems in any way. It would be a valuable refresher and reference work for the expert and also serve as an up-to-date treatise for both the fabricator and layman.

J. M. GRIM
Mellon Institute for Industrial Research