

NEW BOOKS

Industrial Fermentations, Vol. I

Edited by L. A. UNDERKOFER and R. J. HICKEY, Chemical Publishing Company, New York, N. Y. 1954 565 pp. \$12. Reviewed by C. S. BORUFF.

The past twenty years have witnessed the evolution of industrial fermentation from an art to a well-integrated science founded on such heretofore unrelated disciplines as bacteriology, mycology, genetics, chemistry, and engineering. A number of widely diversified fermentation processes have been developed to commercial scale during this period and a vast amount of patent and published literature has appeared. To the reviewer's knowledge, this book represents the first effort to sift this literature and set down the basic "know-how" of these fermentations. Each of the nineteen authors of Volume I has had first-hand industrial fermentation experience or has made substantial research contributions to his respective field.

Volume I deals mainly with the tonnage items of the industry; forthcoming Volume II will cover the production of antibiotics, vitamins, enzymes, some minor fermentations, waste disposal, culture selection and variation. The seventeen chapters of Volume I are grouped into an introduction and the following four sections:

- I. "Alcoholic Fermentation" alcohol from grain, molasses, sulfite liquor and wood, malt beverages, wines and glycerol.
- II. "The Production of Yeast"—commercial, food and feed yeast.
- III. "Butanol-acetone Fermentations."
- IV. "Fermentative Production of Organic Acids"—lactic, acetic, citric, gluconic, fumaric, and itaconic acids.

The treatment in each chapter follows the same general pattern of historical, raw materials, cultures, and culture maintenance, process steps and variables (often with a flow diagram), yields, mechanisms, operating problems, analyses, recovery methods, by-products and waste disposal, economics and literature. Patent literature is particularly well cited and the book is amply illustrated with 72 figures. Where applicable, the competitive positions of synthetic and fermentation processes are discussed without prejudice. The result is a compact and authoritative treatise which anyone engaged in practical bacteriology—student, teacher, re-

search worker, executive—will find indispensable.

While fuller disclosure of techniques would be desirable in a number of instances, the reader will be impressed with the fact that the authors have attempted to lift the shroud of secrecy, too long associated with fermentation arts. The book contains remarkably few omissions and errors, again illustrating the advantage of dividing the broad subject of industrial microbiology among experienced authors.

General Biochemistry

JOSEPH S. FRUTON and SOFIA SIMMONDS, xii + 940 pages. John Wiley & Sons, Inc., New York, 1953, \$10. Reviewed by FRANCIS JOSEPH WEISS, Washington, D. C.

While most biochemistry textbooks deal with the chemical properties of organic matter as found in living organisms, here we have a comprehensive treatise of chemistry of life itself. Embracing the manifold dynamism and complex interrelationship of organic action it comes remarkably close to a *biochemistry in vivo* as contrasted to the customary *biochemistry in vitro* which is the subject of more chemically and less biologically oriented works.

The authors free themselves from the traditional sequence of carbohydrates, fats, and proteins and begin their book with a discussion of the central role which proteins play in living organisms. They put greater emphasis on the physical chemistry of biochemical reactions than is found in other textbooks. Their examination of equilibria, free energy changes, and kinetics of enzyme reactions in living systems throws much light on the motive forces of biological action.

On this broad basis, the authors discuss the biochemical aspects of life such as oxidation and reduction reactions, fermentation and respiration, photosynthesis and nitrogen fixation as well as the intermediate metabolism of carbohydrates, lipids, and proteins. Especially well written is the chapter on chemistry and metabolism of sterols giving a lucid and up-to-date presentation of a most difficult field of biochemical research. Recommended also for the advanced student is the chapter on "General Aspects of Metabolism" discussing the role of inorganic ions, heat changes, hormonal control, vitamins and growth factors in living systems.

Agricultural and food chemists who have expressed a desire for a more dynamic approach to the problems of biochemistry, should welcome this book.

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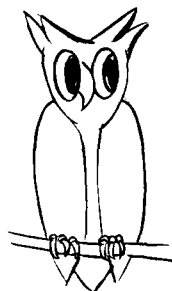
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