

*Science in Action.* EDWARD R. WEIDLEIN and WILLIAM A. HAMOR, Mellon Institute of Industrial Research. McGraw-Hill Book Company, Inc., New York City, 1931. xiii — 310 pp. 32 illustrations (figures). vi tables. 15.5 x 23.5 cm. \$3.00.

The preface to this interesting and instructive book sets forth its scope and purpose in an accurate and precise manner. The result of the authors' effort is a sketch, "in clear language, of the methods and accomplishments of industrial research, that is, scientific investigation as applied to the production and merchandising problems of various branches of manufacture, and to the promotion of human welfare, especially in the United States." The treatise is intended primarily for the layman and it accomplishes its aim; for it is intelligible to an ordinary reader with no knowledge of science in particular, who desires to learn about the general procedures and results of scientific research particularly in this country.

While throughout the volume the spirit of industrial research methodology takes a prominent place, here and there bits of related history, appropriate philosophy and supporting literary gems are found; and at times the authors exhibit the zeal of a crusader of science. Quoting: "This applied science scintillates with splendid achievements; she exhibits her opportunities; she allures young specialists from the universities. But in the background is the pure science who feeds her, the mother whom she profoundly respects.

"Science, scientific management, and industrial research never stop moving, never relax; they are full of zest and eagerness and contemptuous of obstacles."

Following the groundwork of industrial research is a chapter on the development of industrial research in the United States in which is given a brief description of the successive stages by which our industries have expanded. After this comes a discussion of the present status of industrial research in this country, Germany and Great Britain. Here facts and figures are arrayed in a convincing and at times startling manner.

Of peculiar interest to the ordinary reader is that portion of the book dealing with the importance and contribution of scientific research to the necessities of life, its relation to modern medicine and such familiar industries as agriculture and its products.

The reviewer regrets that the authors have so little to say about research in pharmacy.

It is impossible in a brief space to enumerate all the progressive research and robotization of operations which, page after page, flashes before the eye; but we are unwilling to pass by in silence the two chapters dealing with exploits of science with plastics and new industries through chemical synthesis, respectively, without saying "well done."

The treatment of scientific management and rationalization is an excellent exposition of the philosophy and principles involved. Here, the authors are at their best. Here, is the masterpiece of their book. Here, they are no longer telling, but are teaching. Here, will be found a valuable discussion (1) of labor and its relation to automatic machinery improved manufacturing methods, and continuous processes; (2) of scientific research, management and banking; and (3) of the international aspect of industrial research.

A discussion of the industrial-research laboratory management and industrial-research workers concludes the main portion of the book. Then follows an index of the names of persons and organizations mentioned in the text, a subject index follows and concludes the book. This last list includes scientific, technical or commercial designations. In both indexes especially important page references are printed in bold-face type. An additional aid to the reader is the "Contents" on page xi. The type is clear; the paper good.

The book will be helpful to those desiring to improve their plant operations and practices as well as to young men who are thinking of scientific careers in industry.—TOWNES R. LEIGH.

*Practical Physiological Chemistry.* By P. B. HAWK and OLAF BERGHEIM; tenth edition, 1931. P. Blakiston's Son & Co., Inc., Philadelphia. Price \$6.50.

This is the tenth edition of one of the best-known American textbooks on physiological chemistry, comprising 930 pages with 280 illustrations and a number of colored plates. The present volume marks the twenty-fifth anniversary of the book since the appearance of the first edition, written by the senior author, Dr. P. B. Hawk. A comparison of the book before us with the first edition of the text strikingly emphasizes the enormous advances made in both the science of physiological chemistry and the teaching of that sub-

ject in the last quarter of a century. The original edition, which appeared in 1907, was only about one fifth of the size of the present volume. Even a comparison of the present tenth edition with the ninth edition, which appeared in 1926, reveals the enormous strides made by the research man in this important branch of medicine and biology. The ninth edition of the book has been largely rewritten and revised to bring it up-to-date with the advances in the science itself and the elaboration of its quantitative methods and technique. Some of the chapters have been entirely rewritten, as, for instance, that with which the book begins on physicochemical properties of solutions and those on metabolism and vitamins and others.

As one would expect, a great deal more information borrowed from the field of physical chemistry has been incorporated into this modern textbook on physiological chemistry than before. The subject of metabolism is now discussed in several chapters: one devoted to metabolism of proteins, carbohydrates and fats; another to inorganic metabolism, a subject which received scant attention in the old textbooks; and a third to the vitamins and deficiency diseases. In addition to these, there is a special chapter on the respiratory metabolism and neutrality regulation. Another contains a discussion of energy metabolism, and special attention has been given to blood and tissue analyses.

The present volume consists of thirty-five chapters and an appendix. This being a work on *practical* physiological chemistry, the actual informative reading matter is interspersed with practical experiments for the laboratory student. The use of different types serves to emphasize the important and practical parts of the book. An adequate but not too profuse list of references is incorporated in the work and conveniently printed in footnotes at the bottom of the pages.

The book opens with a discussion of the physicochemical properties of solutions, followed by a chapter devoted to carbohydrates. Succeeding these are three long chapters on proteins, their composition, chemical structure of amino-acids, etc., and their various properties, a special fourth chapter being devoted to nucleoproteins and nucleic acids. Chapters VII and VIII are devoted to fats and milk. These are followed by three chapters dealing with the chemistry of epithelial and connective tissues, muscular tissues and

nervous tissues, etc. Twenty-four pages are devoted to enzymes and their action in Chapter XII, and the whole subject of gastrointestinal digestion, absorption, putrefaction, detoxification, etc., is covered in Chapters XIII to XXI, inclusive, embracing about one hundred pages. Blood and lymph and tissue analyses are discussed in Chapters XXII and XXIII. Then follows an exhaustive treatment of metabolism from every conceivable angle, covering 234 pages. Five chapters are devoted to the study of urine, its physiology, pathological constituents, methods of analysis, etc. The appendix contains a list of reagents and solutions, a table of atomic weights and logarithmic tables.

The chapter on endocrine organs is perhaps not as satisfactory as those regarding most of the other topics treated in the book, only a superficial description being given. This may have been done purposely because of the shifting opinions on the subject at the present time.

The physical form of the book is all that could be desired, the print clear, the paper of excellent quality and the illustrations in nearly every instance distinct and well reproduced. Some of the colored plates are beautiful. The numerous tables and graphs scattered through the pages will be found of immense value by the student and other workers using the book for reference. One of the best features of the work is a clear and cogent exposition of the chemical relationships of the various compounds, the chemistry of which has been solved by modern investigators.

In the authors' opinion, the work presents one of the best written, most comprehensive and useful texts on biochemistry, not only in English but in any modern language. . . .  
DAVID I. MACHT.

*The Merchandising of Drug Products.* By PAUL C. OLSEN, PH.D., Lecturer in the School of Business of Columbia University and the Philadelphia College of Pharmacy and Science. Member of the Directing Committee of the Druggists' Research Bureau, Appleton and Company, Publishers, New York, N. Y. Price \$2.50.

This book is the outcome of a study undertaken by the author for the American Association of Colleges of Pharmacy, to outline a course on merchandising to be required of all students in its accredited schools. Manufacturers and wholesalers of pharmaceutical products and