

## • New Books

FLUIDIZATION AND FLUID-PARTICLE SYSTEMS, by Frederick A. Zens and Donald F. Othmer (Reinhold Publishing Corporation, New York, 513 pp., 1960, \$15). In the preface the authors give as the purpose of this book the filling of the need for a comprehensive, organized coverage of modern developments in fluid-solids processing, particularly the moving-bed techniques, fluidization reactors, and transport reactors.

The first chapter is devoted to what the authors call "Fluid-Particle Operations in the Process Industries." In this are outlined the various techniques which have been evolved and used, *viz.*, in the petroleum industry for the moving of catalyst in the production of gasoline; in the fluid-bed roasting of pyritic ores, gold ores, and limestone; in the reduction of iron ore; in coal gasification and carbonization; and in particle sizing and drying operations, to mention only a few. Also discussed are some of the problems which are encountered in the handling of solids in these process operations. Chapter I also outlines the development of fluid-particle systems and relates them to their usage in various industries, serving to give the reader an insight into their wide and varied application.

The remaining 14 chapters the authors have devoted to the theoretical aspects of fluid-particle systems. Covered are such subjects as rheology of powders, particle and powder physical characteristics, gravity flow of bulk solids, flow through fixed beds, flow through fluidized beds, bubble phenomenon in fluidized beds, pneumatic conveying, and heat transfer in particle-fluid systems.

Because the petroleum industry has made such wide use of fluid-particle systems, it follows that it has also developed much of the technology of these systems. Liberal references to these systems have been made throughout the book.

The authors have made extensive and effective use of graphs and flow diagrams in the presentation of data. Voluminous bibliographies at the end of each chapter attest to the wide and thorough manner in which the authors have endeavored to cover the subject-matter.

The table of contents, in addition to giving the chapter titles, also provides subtitles of the various subjects which are covered. The book is adequately indexed by subject material as well as cross-indexed by authors whose work is referred to in the text.

This reviewer believes the book should find wide acceptance as an up-to-date, comprehensive reference for research, design, and plant-operating engineers whose work involves processes that require the handling of solid particles.

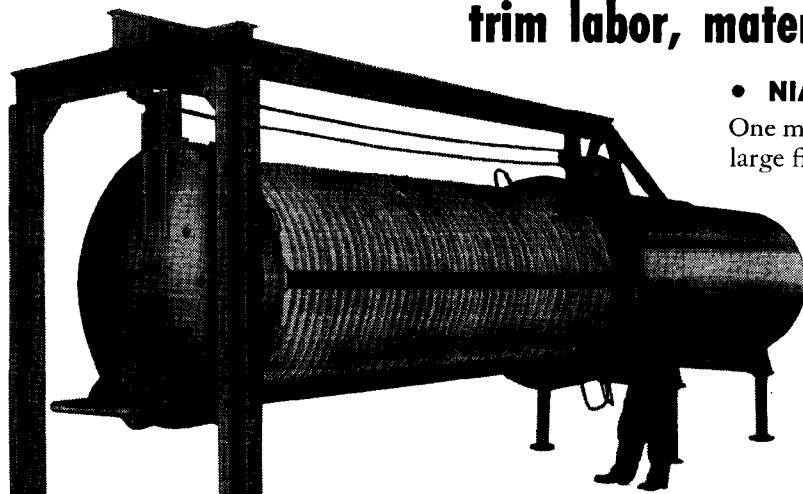
W. J. GOODRUM, Spencer Kellogg and Sons Inc., Buffalo, N.Y.

STYLE GUIDE FOR CHEMISTS, by Louis F. Fieser and Mary Fieser (Reinhold Publishing Corporation, New York, 115 pp., 1960, \$2.95). This style guide shares with the reader the problems which beset all writers. Two of the most expert contemporary writers of books and original articles take one "behind the scenes" and reveal that the clear and lucid style of this co-author team has depended on a clear understanding of word usage and the application of painstaking self-discipline. In this book the warm personalities of two people who have a profound admiration and respect for each other and their chosen profession share with the reader the problems connected with converting laboratory data to an understandable addition to scientific advancement.

The format itself reflects the informal style used by the Fiesers in this book. The table of contents of 13 chapters serves as an outline rather than as a listing of chapters. The first chapter stresses the need for concise writing and the avoidance of needless words. It is followed by chapters on coherence, the use of verbs, singular and plural forms, possessive singular, emphasis, choice of words, punctuation style, style sheet, proof-reading, pronunciation of chemical names, and the last, a plea for clear enunciation in oral presentation of data before a class of students as well as at scientific meetings.

The book is such a pleasure to read that I have only one regret; it isn't comprehensive enough. Although the authors have taken up the common pitfalls of writing, their success may be measured by more than 115 pages of useful sugges-

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tions. It is therefore possible and certainly desirable that this book will be expanded in future revisions. Although this style guide is written by chemists for chemists, it may provide a guide to better writing for anyone who takes time to read it.

F. A. KUMMEROW, University of Illinois, Urbana, Ill.

MAN-MADE TEXTILE ENCYCLOPEDIA, edited by J. J. Press (Interscience Publishers Inc., New York, 913 pages, 1960, \$27.50). The book is an excellent compilation of information on synthetic textile materials presented in a manner easily read and understood. An impressive amount of subject matter has been collected and integrated into a well-organized and concise reference encyclopedia. The synthetic textile field is adequately summarized, including a survey of raw materials, the manufacturing processes, the identification of the numerous synthetic fibers, the finishing processes, and the actual marketing and economic importance of each in today's commerce.

For those in the field of textile and related industries, this volume would be extremely useful, not only as a reference but as a guide in evaluation, testing, and research. Valuable information on a specific subject or product can be obtained without the necessity of a lengthy literature search. This is most essential in the diversified field of commercial testing where new problems arise each day. The reviewer feels that the vast amount of subject matter and test procedures included make this volume a valuable reference tool for all students in the textile and polymer field.

The usefulness of this book would have been enhanced if more references to books pertaining to the same subject-matter had been included at the end of each chapter. For instance, there is no information on dyestuff identification included in the chapter on dyeing and printing. A list of references, then, would allow the reader to pursue a subject more thoroughly and would increase the usefulness of this volume.

GEORGE BOND, United States Testing Company Inc., Los Angeles, Calif.

COTTONSEED AND ITS BY-PRODUCTS (INDIA), edited by H. A. Achaya (The Indian Central Oilseed Committee, Hyderabad, India, xiii and 358 pp., 1959). This book is the published proceedings of a symposium on cottonseed and its by-products held in December 1958 at the Regional Research Laboratory, Hyderabad, India, sponsored by the Council of Scientific and Industrial Research. It is printed in the English language. Organization and printing are excellent.

The material is divided into seven sections as follows. Agricultural and Compositional Studies, Processing and Storage, Solvent Extraction, Refining, Hydrogenation, By-Products, Fundamental Studies, and General Considerations. The various sections contain from two to seven papers on the subject and also include editorialized group discussions of the authors' reports.

This was a working conference, directed at the problems of the industry as it exists in India. In this respect it is fascinating reading for people who are familiar with the advanced technology of cottonseed processing and utilization in the United States.

K. A. KUIKEN, Buckeye Cellulose Corporation, Memphis, Tenn.

RECENT ADVANCES IN THE CHEMISTRY OF CELLULOSE AND STARCH, edited by J. Honeyman (Interscience Publishers Inc., New York, viii and 358 pp., 1959, \$9.25). This is a collection of 12 review articles, each by a different author. The reviews give a good account of the state of the knowledge of cellulose chemistry up to and including 1957. Starch chemistry is dealt with much less comprehensively.

Chapter 1, entitled "Introduction to the Chemistry of Carbohydrates," attempts to present the structural concepts and fundamental reactions of the simple carbohydrates, a task not easily accomplished in about 50 pages. This chapter, although interesting enough and well written, seems out of place in a book bearing the above title. Apart from the section dealing with conformational analysis and

its use in interpreting sugar reactions, which is instructive and well worth reading, it would appear to be better for the interested reader to refer to one of the standard texts on carbohydrate chemistry for the information presented in this chapter. The disposition of the formulae may be convenient from the printer's point of view, but it is rather confusing to the reader.

Chapter 2 on the "Molecular Structure of Cellulose and Starch" is clear and concise, but the interesting recent advances dealing with the controversial aspects of polysaccharide heterogeneity and the presence in cellulose and starch of structural features not generally accepted are not dealt with. This treatment of the subject may well leave the reader with the mistaken impression that all is known that is worth knowing about the molecularly structure of these two polysaccharides.

Chapters 3 through 8, dealing, respectively, with "The Hydrolytic and Oxidative Degradation of Cellulose. The Alkaline Degradation of Cellulose and Chemically Modified Cellulose, The Crystal Structure of Cellulose, The Fine Structure of Cellulose, Cellulose Derivatives, Mechanical Properties of Cellulose and Cellulose Derivatives," give a very good account of the chemical and physical properties of cellulose. Some idea of the problems facing the investigator of the fine structure of cellulose or of any carbohydrate polymer, for that matter, is brought to light in Chapter 6, page 169, paragraph 3, where it is stated: "It has been apparent for a number of years that the measurement of the crystalline-amorphous ratio of a cellulose sample is by no means sufficient to characterize, or to differentiate completely between, different celluloses. In fact, this type of measurement may be quite misleading in that it underemphasizes the vast difference between various types of cellulose. Without doubt these differences cannot be accounted for solely by the amount or type of crystalline form present and must be attributed, at least in part, to differences in the nature of the amorphous regions." This statement alone shows how much remains

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to be discovered about polysaccharides in general and cellulose in particular.

Chapter 7 is worthy of study by the industrial chemist, even though it does not cover all the possible derivatives of cellulose, inasmuch as it provides the cellulose and the starch chemist with some idea of the type and usefulness of certain derivatives. A consideration of only the simple functional groups of organic compounds will reveal how much more there is to be done in the field of the industrial utilization of polysaccharides.

Chapter 9, dealing with the sorption of water by cellulose and starch, is characterized by a clarity of expression that is a pleasure to encounter. This subject, which is important from an academic and an industrial point of view, is worthy of the attention of those interested in the research and technology of all those polymers which sorb water.

In Chapter 10 are discussed the physical methods for determining the degree of polymerization of cellulose and starch. There is some excellent practical advice concerning the techniques that may be used in viscometry and osmometry, and the relative merits of light-scattering and sedimentation results are presented. It is curious that nowhere in the book is very much attention paid to the possible use of chemical methods for determining the degree of polymerization of carbohydrate polymers.

Chapter 11 is concerned with the preparation and properties of starch and some selected uses of starch, starch dextrins, oxidized starches, thin boiling starches, starch ethers and esters, and pregelatinized starches. Reference is made to an interesting class of polyoses formed by the acid polymerization of glucose in the presence of formaldehyde; this is a development worthy of the attention of those interested in the chemical utilization of starch and other readily-available polysaccharides. Some improvement in this section of the book could have been made by attempting to give some structural explanations for the uses of starch and its derivatives. This article, brief as it is, shows that the full realization of the potential of carbohydrate polymers as industrial chemical products still remains to be contemplated.

Chapter 12 on the enzymic synthesis and degradation of cellulose and starch brings into focus the importance of biochemistry in the comprehensive study of carbohydrate polymers. The section is naturally concerned largely with the enzymatic synthesis and degradation of starch since so much more is known about starch than cellulose. Unlike most of the other chapters in the book, this one is not only informative but provocative. The reader is not only brought up to date with the facts but also is confronted with the questions that face the present-day biochemists. The age of biochemistry and the role of the biochemist in industrial polysaccharide chemistry are here. There is good reason to believe that biological reagents will play an ever-increasing part in the further utilization and investigation of such polysaccharides as starch and cellulose.

The book provides interesting reading and valuable information about cellulose and is worthy of the attention of the specialists in this field. The starch chemists will find Chapters 9 and 12 especially interesting.

FRED SMITH, University of Minnesota, St. Paul, Minn.

### November 1 Is Deadline

The scope for the two awards of the Glycerine Producer's Association for outstanding work, scheduled to be awarded in January 1961, will be broadened to give special recognition and emphasis to practical applications for glycerine and its derivatives. Although entries covering the practical application of glycerine or its derivatives have not been excluded from previous competitions, the high scientific level of biochemical and medical research which has marked winning entries in previous years may have tended to discourage entries dealing with more practical phases of glycerine application.

Deadline for nominations for the awards is November 1, 1960. Nominations can be made for individuals or teams directly by the researchers or by third parties, based on either published or unpublished data, to Glycerine Producers' Association, 295 Madison Avenue, New York 17, N.Y.

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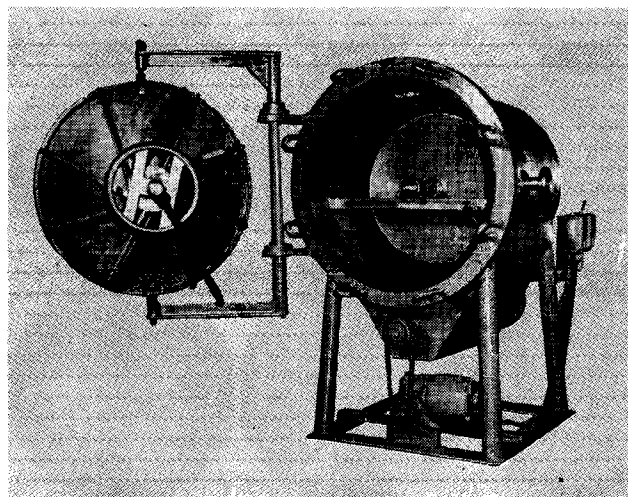
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