New Books

DATA BOOK ON HYDROCARBONS, by J. B. Maxwell (D. Van Nostrand Company Inc., New York, N. Y., price $5) is a reference book of charts, tables, and formulas of particular interest to the petroleum oil industry and to the many other industries who use petroleum products. As solvent extraction becomes more widespread in the oil seed industry, the usefulness of this book in the field covered by the Journal will steadily increase.

The book contains 259 pages, of which approximately 80% are charts describing all the various properties of hydrocarbons such as are required by engineers and chemists who must pump, evaporate, condense, fractionate, store, or burn various hydrocarbons and their mixtures.

Earlier editions of this book have been used for some years by the Standard Oil Development Company and other affiliates of the Standard Oil Company (New Jersey). It has been decided to make the information available to engineers, chemists, and students in the petroleum and associated industries.

This book appears to have more complete and better assembled information on various hydrocarbons than has been available previously and is a valuable contribution to the industry. A great number of practical formulas and full explanation of the use of the charts are included. All charts and table information are furnished in American units.

R. P. HUTCHINS
French Oil Mill Machinery Company
Piqua, Ohio

ADVANCED ORGANIC CHEMISTRY, Reynold C. Fuson (John Wiley and Sons Inc., New York, 1950, 618 pp., 669 with index, price $8). This green-bound book is a new approach to the difficult problem of teaching organic chemistry to those students "who have had an introduction to organic chemistry and seek a mastery of the fundamentals of the subject." Its table of contents contains 25 major subject headings which are not particularly new to organic chemists but their arrangement is. The book starts with a short discussion of the electron-releasing power of atoms and groups and dives immediately into cleavage of C-C bonds on page 8 at the start of Chapter 2. The other 23 chapters are arranged in the following order: Aliphatic Substitution; Carbon-Carbon Multiple Bonds; Hydroxy Compounds; Halogen Compounds; Organometallic Compounds in Synthesis; The Ether Linkage; Carbon Monoxide in Synthesis; Derivatives of Carboxylic Acids; Oxidation; Hydrogenation, Dehydrogenation, and Hydrogenolysis; Substitution of the Aromatic Series; Alkylation of Aromatic Compounds; Acylation of Aromatic Compounds; Carbonyl Compounds; Ring Closures Involving Condensation of Carbonyl Groups with Aromatic Nuclei; Active Methylene Compounds; Conjugate Addition; Nitro, Nitroso, and Oximino Compounds; Amines and Amino Compounds; Azo and Diazo Compounds; Organic Sulfur Compounds; Aromatic Character; and Polymerization.

This book is the latest addition to a group of books on organic chemistry which are now being used at the University of Illinois. These books are the result of definite plans to provide real textbooks which are suitable for the purpose intended. It is interesting to note that Dr. Fuson, who is not the head of the Chemistry Department or its Organic Division, has been encouraged by his superiors to participate in the preparation of all four books. The other three books are: "A Brief Course in Organic Chemistry," by Reynold C. Fuson, Ralph Connor, Charles C. Price, and Harold R. Snyder; "Organic Chemistry," by Reynold C. Fuson and Harold R. Snyder; and "Systematic Identification of Organic Compounds," Third Edition, by Ralph L. Shriner and Reynold C. Fuson.

This book is unquestionably a must for all serious students of organic chemistry whether or not they happen at the moment to be a graduate student. Dr. Fuson shows that he keeps abreast of the organic chemical literature outside of his immediate research fields since the use of N-bromosuccinimide, new information on hydroperoxide formation in autoxidation, the new work on the Willgerodt reaction, lithium aluminum hydride (to mention only a few) are given proper attention. Examples of commercial processes which illustrate the reaction being discussed are frequently cited. Throughout the book pertinent literature references are given which will enable any student to acquire source material to follow special interests. These references have been well chosen.

As with all books, there are some typographical errors or omissions, but this book has fewer than most. Identifying letters a and b were omitted in the middle of page 3, and on page 224 ethyl linoleate is called a 1,5-diene rather than a 1,4-diene. However such errors are very minor when one real-

izes that the author has achieved his purpose of giving the student of organic chemistry a book which re-examines the fundamental behavior patterns of organic compounds but presents these patterns in an organization new to the student. In the reviewer's opinion, no other book on advanced organic chemistry is better suited to the needs of the advanced student. This book is an excellent tool to be used for the re-examination of what he knows or should know about the subject.

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THE PROPERTIES OF ASPHALTIC BITUMEN, edited by J. Ph. Pfeiffer (Elsevier's Polymer Series, pp. IX-285, Elsevier Publishing Company Inc., New York, 1950, price $6). This excellent volume compiled under the editorship of the late J. Ph. Pfeiffer represents 20 years of research by the editor and his staff at the Royal Dutch Shell Laboratory in Amsterdam. Composition and colloidal structure of asphalts are described and correlated with physical properties which are important in the service application of the bitumen. Broadly, bitumen colloids are classified as sol-type and gel-type depending upon the degree of dispersion of the asphaltenic micelle in the intermicellar oily phase. Generally speaking, the sol structure characterizes straight-reduced bitumens while the gel structure characterizes blown materials.

The colloidal structure of asphalts is then related to rheological behavior. The sol group comprises those asphalts which behave like Newtonian liquids, and those which show distinct elastic effects and Newtonian flow only after the initial stage of deformation. Asphalts in the gel group show strong elastic effects and almost complete resilience after a light deformation, and, in general, are non-Newtonian in flow behavior. Surface properties, in relation to adhesion, and electrical and thermal properties are also discussed. In addition, a critical examination is made of the usual inspection tests such as softening point, penetration, and ductility.

An admirable feature of this work is the repeated effort to relate the theoretical aspects of composition, colloidal structure, and rheological behavior to service performance requirements of the bitumen. Better to understand asphalt behavior in general and adequately to evaluate asphalt quality, the authors' presentation serves to emphasize the importance, first, of establishing the essential property requirements for satisfactory performance in service and, second, of developing fundamental and definitive performance tests to measure these properties.

The general format of this volume is excellent. Low gloss paper of high quality is used, and the type, tables, and diagrams are cleanly pointed and legible. All in all, this work is highly recommended to those who are interested in the fundamental aspects of bitumen behavior as well as to those who are concerned with ultimate service application.

F. H. MACLAREN
Standard Oil Company
Whiting, Ind.

HETEROCYCLIC COMPOUNDS, Robert C. Elderfield, editor (Vol. I, pp. vii + 703, price $11, New York, John Wiley and Sons Inc.; London, Chapman and Hall Ltd., 1950). This volume, the first in a series, covers the chemistry of three-, four-, five-, and six-membered monocyclic heterocycles containing one O, N, and S atom. It is a welcome addition to a long neglected field of organic chemistry that has developed in tremendous strides both from the academic and industrial standpoint during the past few decades. The format of this book is good. Formulae are drawn clearly and in conventional manner. The number of errors is not unreasonable for a book of this type.

An attempt has been made by the editor to present an adequate summary of the chemistry of eight major heterocyclic systems by soliciting specialists in each field to write the respective chapters. No attempt has been made to present an exhaustive literature coverage nor has any attempt been made to correlate physical properties, boiling points, etc., of the homologs and derivatives of each heterocycle, and thus the book should not be mistaken for a reference text. The preface statement, "Attention has been concentrated on the chemical principles dealing with the syntheses, properties, and reactions of the compounds under discussion, with the view always in mind of bringing the reader the latest information available, together with a critical evaluation of the published data," best describes the editor's aims. These appear to be adequately met.

Chapter I, Ethylene and Trimethylene Oxides, by S. Winstein and R. B. Henderson, contains a compilation of the methods of

preparation and reactions of ethylene oxides. Mechanisms of the more important reactions are discussed. Although the authors fail to point out reactions of commercial importance, this chapter will be of interest to industrial chemists for its valuable summation of the increasingly important syntheses in which ethylene oxides are used. It is unfortunate that the new reactions of β-propiolactone were not included in the short discussion (two pages) of the trimethylene oxides.

Chapter II, Ethylenimine, by Joseph S. Fruton, discusses the principal methods of synthesis and the reactions of this little-studied class of compounds. This section will have the greatest appeal to pharmaceutical chemists.

Chapter III, Derivatives of Azete, by S. A. Ballard and D. S. Meltsrom, is a comprehensive coverage of this four-membered nitrogen ring system. This rarely discussed system has received considerable attention recently in the β-lactam structures that have been shown to exist in certain natural products, such as penicillin. This chapter can be read by industrial chemists as well as students for excellent background knowledge. The authors have presented their material in a very readable manner.

Chapter IV, Furan, by Robert S. Elderfield and Thomas N. Dodd, Jr., summarizes this important field of chemistry in 87 pages. The structure of naturally occurring furans is discussed, and the relationship of the furans to the carbohydrates is adequately covered. The omission of any discussion of the coumarins apparently indicates that these materials will be covered more thoroughly in a later volume. The preparation and reactions of the furans are a bit too highly condensed for satisfactory reading. The sections on introduction of substituents into the furan nucleus are particularly good summaries of the practical chemical reactions of this heterocyclic system.

Chapter V, The Chemistry of Thiophene, by F. F. Blicke, is a good but very short 68-page summary of the reactions of thiophene and its derivatives. The 27 pages devoted to the biotins appear to be out of proportion to the rest of this chapter, but this section reflects Dr. Blicke's pharmaceutical interests and is an excellent summary of this pharmaceutically important and complicated series of thiophene derivatives.

Chapter VI, The Chemistry of Pyrrole and Its Derivatives, by Alsoph H. Corwin, is one of the best discussions of this complicated class of compounds published in the English language. The section on the constitution of pyrrole is an example of the understanding of the chemistry of pyrroles that Corwin has accumulated in his own extensive researches in this field and makes excellent reading. The chemistry of natural pigments, such as that of porphyrins and chlorophyll, is given extremely light treatment since they are discussed in detail in other monographs. The reactions of pyrrole are discussed from an electronic basis with the view of attempting to explain the anomalous reactions of pyrrole in terms of a typical resonating system rather than on the basis of a fixed bond olefinic system.

Chapter VII, Monocyclic Pyrons, Pyrones, Thiapyrons, and Thiapyrones, by Joseph Fried, reviews this subject in 52 pages. The relationship of these compounds to naturally occurring products is amply discussed.

Chapter VIII, The Chemistry of the Pyridines, and Chapter IX, Piperidines and Partially Hydrogenated Pyridines, by Harry S. Mosher deserve special commendation. The complex chemistry involved in the synthesis and reactions of this heterocyclic system is presented in an exceptionally interesting and readable fashion.

One of the main criticisms of this volume is the failure to correlate the chemistry of the various systems. Perhaps the fault will be corrected in the final volume of this series although the brochure makes no mention of such plans. It would be of particular interest to have included comparisons of the chemistry of furan, thiophene, and pyrrole and to compare the chemistry of pyrrole to that of pyridine. However the industrial and academic chemist as well as the graduate student wishing to obtain general background knowledge will find this book well worth its cost.

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OILS, FATS, AND FATTY FOODS, THEIR PRACTICAL EXAMINATION (Bolton & Revis. Third edition), by K. A. Williamson (The Blakiston Company, Philadelphia; 494 + 7 pp. of index, 1950, $10). The format and arrangement in this, the third edition, are very similar to the previous editions. The printing is well done, the contents are well organized, and the information is up-to-date. Of the 15 chapters contained in this book, the first four are given to general information pertaining to

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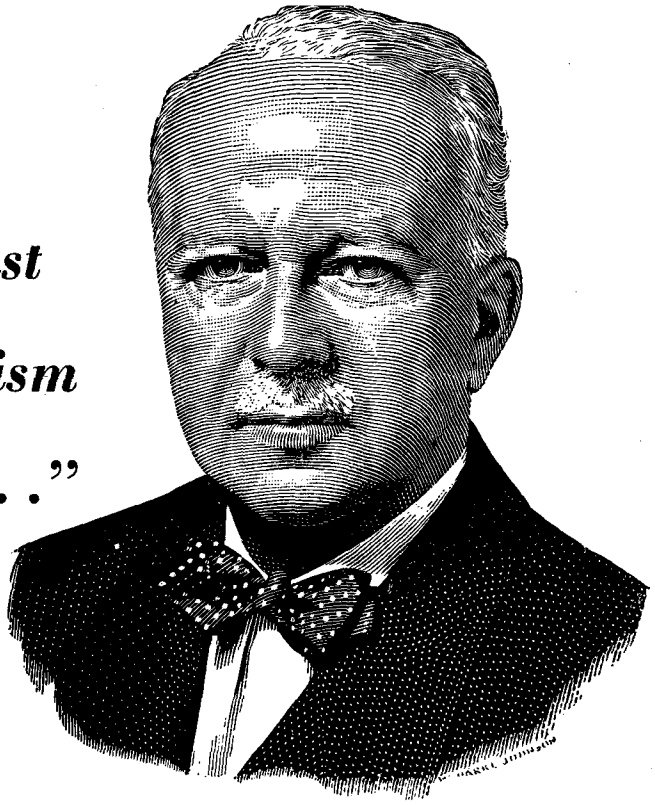

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sampling, methods of analysis, and interpretation of results. The methods are drawn from many sources, including The Analyst, Journal of the American Oil Chemists' Society, "Official and Tentative Methods of the American Oil Chemists' Society," as well as many others.

The author does not attempt to list all of the methods in use in fat and oil analysis for the determination of composition and chemical and physical properties and characteristics. Instead one, or at the most two, of the most important or most commonly used procedures are given; and, in general, these have been well selected. Many relatively new methods have been added. The remaining chapters contain general information on production and processing and specific information on composition and characteristics of oils and fats, including animal fats, vegetable and marine fats and oils, cocoa, chocolate, and milk. Many methods of specific rather than general use are interspersed in this section. More than 200 individual oils and fats are listed with information about source, composition, and the specific properties of each. This book pretends to be and is a practical book and as such is a valuable addition to the library of anyone interested in the technology of fats and oils.

V. C. MEHLENBACHER
Swift and Company
Chicago, Ill.

1949 BOOK A.S.T.M. STANDARDS, PART 5, TEXTILES, SOAP, FUELS, PETROLEUM, AROMATIC HYDROCARBONS, AND WATER (American Society for Testing Materials, 1916 Race street, Philadelphia 3, Pa., 1750 pp., with cloth binding, $10 to non-A.S.T.M. members). This is a triennial publication; the 1946 Standards were the most recent previous one. The 1946 volume, equivalent to the 1949, Part 5, was published as Part 3A of the A.S.T.M. Standards, 1946.

In Part 5 of the 1949 Standards the specifications and methods of testing, both Standards and Tentatives, for a particular materials field have been grouped together in a separate subdivision. The arrangement of these standards in the order in which they appear in the book is set forth in the first part of the Table of Contents. A second part of the Table of Contents consists of a duplicate list of the standards arranged in the sequence of their serial designations. In addition, at the back of this volume is a subject index of the standards and tentatives. The specifications and tests have been developed by the efforts of the various A.S.T.M. Technical Committees composed of producers, consumers, and parties of general interest for each product or material concerned.

The first subdivision, Textile Materials, includes specifications and testing methods for cotton-broadcloth, sheeting, toweling, duck, tape, tire fabrics; asbestos-tape, roving, yarn; bast and leaf fibers—yarn, rove, rope; glass textiles; rayon, estron and silk—tire cord, thread, yarn, woven fabrics; wool—yarn tops, pile floor covering and felt. General testing methods for the various types of fibers include physical properties, identification of materials, laundering, shrinkage, and resistance to fire, insect pests, and microorganisms.

The second subdivision, Soap and Other Detergents, includes specifications and tests for bar soap, chip soap, chip soap with rosin with olive oil or with palm oil, powdered soap, built soap powder, milled toilet soap, white floating soap, and the various inorganic builders such as borax, soda ash, caustic soda, modified soda, sodium bicarbonate, sodium metasilicate, sodium sesquisilicate, trisodium phosphate, and tetrasodium pyrophosphate. In addition, methods are presented for analysis and characterization of soaps containing synthetic detergents, of compounded alkaline detergents, of metal cleaning compositions, and of sulfonated and sulfated oils.

The third subdivision, Petroleum Products and Lubricants, is further divided within itself to cover specifications and methods of analysis for motor and aviation fuel, diesel and burner fuels, kerosene and illuminating oils, lubricating oils, greases, petrolatums and paraffin waxes, plant spray oils and petroleum sulfonates, electrical insulating oils, light hydrocarbons, hydrocarbon solvents, crude petroleum. To list only a few of the tests: sulfur, ash, acid content, heat, color, cloud and pour, melting point, flash and fire, gum, oxidation stability, distillation, metals in oils, burning quality, consistency, sampling, and vapor pressure.

The subdivision, Industrial Aromatic Hydrocarbons, includes specifications and tests for various grades of benzene, naphtha, toluene, and xylene. Tests such as acid wash color, paraffin content, gravity, acidity, etc., are included.

The subdivision, Water, covers the sampling and analysis of industrial waters. Such tests as acidity and alkalinity, calcium, magnesium, carbon dioxide, chloride, dissolved oxygen, hydroxide, iron, manganese, phosphate, silica, sulfate, x-ray diffraction methods for water-formed deposits are included.

Another subdivision covering general testing methods lists screen standards for sieve testing; methods for pH determination, melting point, particle size, including sub-sieve size. Another section lists specifications for the A.S.T.M. thermometers required for the tests in this volume.

Each triennial edition of the A.S.T.M. Standards represents the previous edition changed to conform with the interim actions taken by the various A.S.T.M. Technical Committees and the Society relative to the specifications and testing methods for each type of material covered. Therefore it would be desirable for anyone wishing to keep abreast of the specifications and testing methods development for each type of material to familiarize himself with the section of the most recent A.S.T.M. Standards allied with his interests. In other words, Part 5 of the 1949 A.S.T.M. Standards should prove very useful to any organization engaged in the manufacture, consumption, or testing of any of the materials covered herein.

CARL F. GRAHAM
Wyandotte Chemicals Corporation
Wyandotte, Mich.

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Barnard William Cooper, control chemist, William Davies Company Inc., Danville, Ill.

MONSANTO CHEMICAL COMPANY'S Plastics Division has developed a new guide for comparisons of material costs and properties. This new tool is a "Comparator," a two-dial reference to facts and figures on plastics and 11 other structural and fabricating materials.

New CI Catalog Out

AS Part 2 of the October 1950 issue of Chemical Industries the 26th revision of the annual Buyer's Guide has been published. This 800-page chemical encyclopedia contains one new feature, a compilation of several thousand chemicals, both organic and inorganic, which are available only in research quantities, together with the names of their manufacturers. The list comprises 2,904 compounds and takes up 12 pages.

In addition to the Research Chemicals department the Guide lists 3,544 commercial chemicals and raw materials, 1,003 chemical specialties, and 1,542 types of equipment and containers.

Second Edition of "Who Knows"

Selected readers have received, or shortly will receive, from the A. N. Marquis Company, Chicago, requests for information pertaining to their personal specialties within their occupational fields. Information submitted will be reviewed to determine suitability for inclusion in the new reference work, "Who Knows—And What," the second edition of which has been put into immediate compilation following the widespread acceptance of the first edition, published earlier this year. The unique reference value of "Who Knows" stems, according to the publishers, from two major features:

a) the inclusion of only those persons having special skills or knowledge in one or more of thousands of highly specific topics judged by the editors to be subject to general reference interest, together with information on research and experience in these fields; general public or professional eminence is not a deciding factor in selections.

b) the Locator Index, which refers the user by means of a simple key to the listing of any person in the book having special knowledge about any one of the subjects included in the Index.

Books for Pakistan

The latest books on physics, chemistry, chemical engineering, and metallurgy are greatly needed at the University of Punjab, in Lahore, Pakistan, according to information received at CARE headquarters, 20 Broad street, New York 5, N. Y. Pakistan is one of 20 countries now reached by the book plan which CARE added to its food and textile package service last year. Those who wish to help provide the books needed by the University of Punjab can send their contribution to the CARE Book Fund at the agency's New York address or any local CARE office.

The International Labor Office has recently published "The Record of the First Session of the Chemical Industries Committee" (Paris, April 1948), "The General Report of the Second Session" (Geneva, 1950, "Safety and Hygiene in the Chemical Industries" as the second item on the agenda of the second session, and "The Organization of Working Hours in the Chemical Industries" as the third item on the agenda of the second session. The set is priced at $3.50.