

ELEMENTS OF INFRARED TECHNOLOGY; Generation, Transmission and Detection, P. W. Kruse, L. D. McGlauchlin and R. B. McQuistan (John Wiley and Sons, Inc., New York, 448 + xxi pp., 1962, \$10.75). This book was designed to set forth the basic structure of infrared technology in a rigorous and comprehensive manner. It covers the nature of infrared radiation and the performance of infrared components. The book (9 by 6 in.) is well bound, has good press work and an adequate index. It also contains many illustrations.

There is an introductory chapter on the history of infrared and optics dating back to Herschel and Galileo. This is followed by chapters on infrared sources, theory of media, properties of optical media, optical properties of the atmosphere, semi-conductor physics, noise sources, infrared detector phenomenology, theory of detection mechanism and actual detector performances. There are about 400 bibliographic references, most of which are less than 10 years showing the recent activity in this field.

This field of technology has mushroomed during the last 15 years. This book was written for students having an academic interest in the subject and for scientists and engineers in both commercial and military laboratories. It is a very specialized treatise and will probably be used more by infrared engineers than by its intended audience. The book covers discussions of the physics and mathematics underlying basic mechanisms and phenomena and on to their application. It concentrates on properties of infrared sources and detectors. It omits optical lens designs, but briefly discusses optical media. Optical electronic and cooling systems and applications both military and commercial are left to a companion volume now in preparation.

This book is recommended to scientists and engineers interested in infrared technology and not in infrared analyses.

F. L. KAUFFMAN
Swift & Co.
Chicago, Ill.

REAGENT CHEMICALS AND STANDARDS, Fourth Edition, by J. Rosin (D. van Nostrand, 557 pp., 1961, \$14.50). This book constitutes a standard reference to over 600 substances with recent information on new reagents and solvents including directions for preparing solutions and carrying out both physical and chemical determinations. Entries include inorganic and organic chemicals and special reagents for particular compounds. For each listing physical and chemical properties are supplied along with standards of quality and tests for ascertaining purity and suitability as reagents. Some 30 odd new reagents are included for the first time. Approximately 250 assays are given representing various categories and classes of quantitative methods of analysis, some of which are newer techniques, such as titration in non aqueous solvents. Sensitive tests for close to 70 organic compounds, a pH table for more than 120 chemicals, and a table of gravimetric factors are featured. This book should prove to be a convenient and useful reference source for many types of chemical considerations.

R. L. GREGORY
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Chicago, Ill.

A COURSE OF MATHEMATICS FOR ENGINEERS AND SCIENTISTS, by C. Plumpton and B. H. Chirgwin (Pergamon Press, Ltd., Headington Hill Hall, Oxford, Vol. 1, 326 pp., \$6.50; Vol. 2, 382 pp., \$7.50). Because of the wide variety of subjects covered by these books, the student is given an early introduction to many of the important mathematical concepts that have numerous applications in the

NEW BOOKS

fields of engineering and science. The mission of rigorous proofs of theorems and the attention given to the application of these theorems is commendable. At this stage of a student's development, the rigorous proof is not generally appreciated; however, the student is mature enough to appreciate the statement of physical concepts in the language of mathematics.

Volume I begins with some elementary notions of functions that include the determination of the roots of a polynomial equation by use of Horner's method and then goes on to treat the processes of differentiation and integration. In the application of these techniques, some outstanding examples are presented. The last chapter consists of a balanced treatment of complex numbers.

Volume II begins with a thorough treatment of the various methods for solving ordinary linear differential equations. This section (Chapter II) is concluded with a brief treatment of partial differential equations and difference equations. The third chapter treats the solution of linear equations by use of determinants. Although subjects such as linear dependence that have modern applications are presented, the important subject of matrices has been omitted. The authors' treatment of vector algebra, coordinate geometry, partial differentiation, and multiple integrals appears complete. Because of the extensive use of line integrals in thermodynamics, a more thorough treatment of this subject would have been desirable.

However, in general the authors are to be commended both for their selection of subjects and their selection of illustrative examples.

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LES MÉTHODES ANALYTIQUES DES LIPIDES SIMPLES, by C. Paquot, J. Mercier, A. Mathieu, D. Lefort, and R. Perron (Centre National De La Recherche Scientifique, 281 pp., 1962, price 18 NF). This book is a creditable compilation of both classical and modern methods for the separation and analysis of lipids, their components and derivatives. In classical methods of analysis, this book adds little to the Official and Tentative Methods of the American Oil Chemists' Society and to the Official Methods of Analysis of the Association of Official Agricultural Chemists. With respect to some of the modern methods of analysis, however, this book has more background and more explicit instructions than the American references mentioned. In particular, the reviewer is referring to the discussion of gas-liquid chromatography, permanganate-periodate cleavage, and column chromatography, just to mention a few. Considering the relatively low price of this book, it is a worthwhile addition to the library of any laboratory working in the field of lipids and their derivatives. It is regrettable that analytical results are not reported on some uniform basis so that functional group determinations can be compared on a molar basis. The multiplicity of "numbers" which are used in the lipid field are extremely confusing. A real step forward which this reviewer would like to see adopted generally is the uniform basis for reporting analytical data on fatty materials published by J. S. Showell, *Journal of the American Oil Chemists' Society*, 36, 343-345 (1959).

DANIEL SWERN
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ABSORPTION SPECTROSCOPY, by Professor R. P. Bauman (John Wiley & Sons, 611 pp., 1962, \$12.00). This is a welcome addition to the array of new texts now appearing that up-date the hardcover literature regarding the theory and practice of chemistry. Basically a textbook, complete with end-of-chapter questions (answers in the back), the material presented is modern, accurate and certainly broad in scope. Its depth of treatment is perhaps shallow in some areas but this is a natural sacrifice for broad scope

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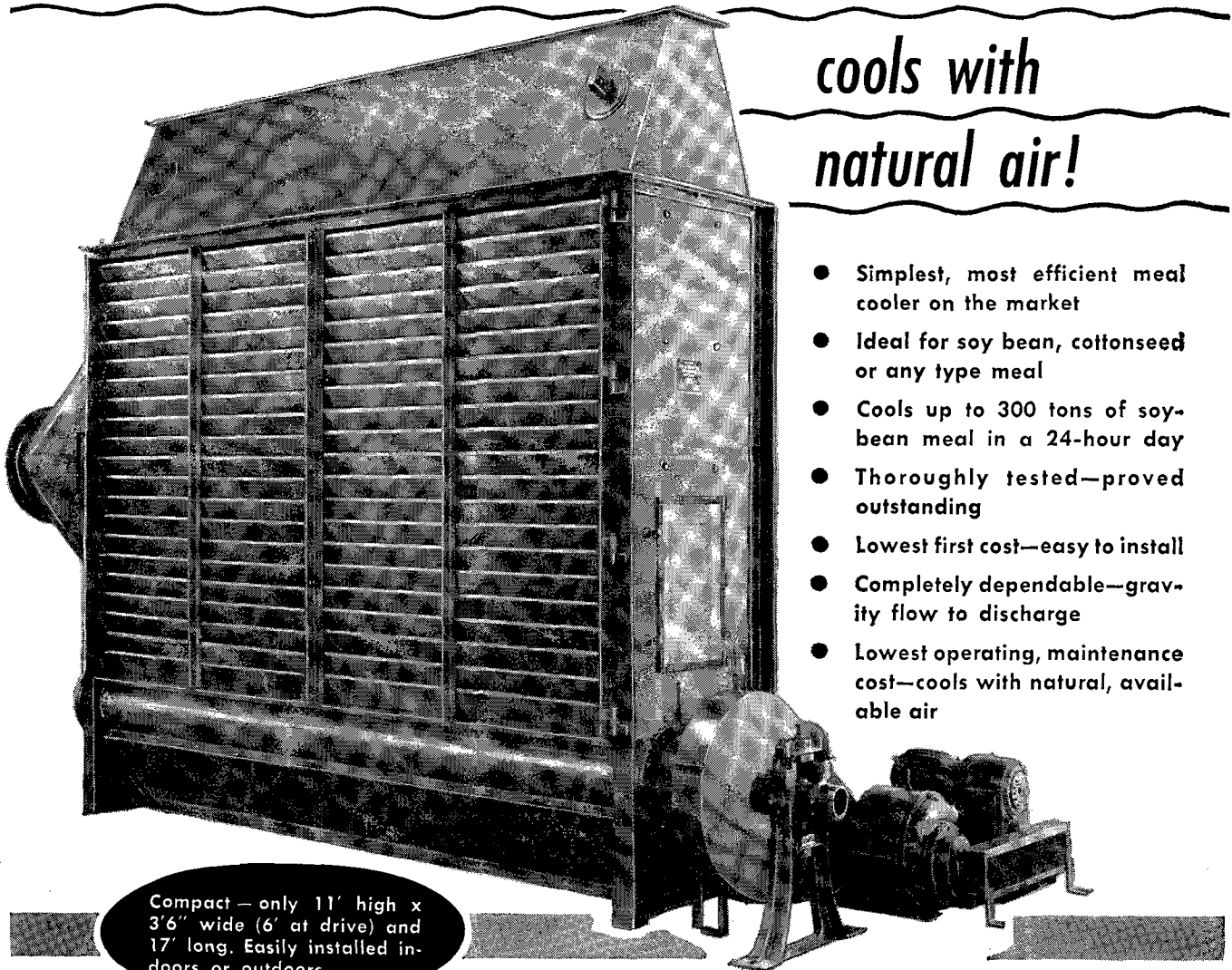
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senior level of college chemistry training. For such a purpose it appears to have about the right content; it should be useful to this rather select audience. To the readers of the Journal of the American Oil Chemists' Society it can be either too elementary (for those with a little polymer experience) or useful to some as a starting point for becoming educated in the polymer field.

The book has been made quite palatable to these beginners by the use of several devices. It has a generally fast-moving, easy-to-read, style. There is liberal use of visual aids such as structural formulae, graphs and equations. Trade names of many commercial polymers are introduced at appropriate places in the discussion. These should further stimulate the reader's interest by relating the discussion to materials with which he is already familiar.

Professor Stille approaches the subject from the organic chemist's viewpoint, treating such areas as mechanisms and kinetics of polymerization, condensation polymers, vinyl addition polymers and copolymers. Physical aspects are discussed briefly in chapters on physical chemistry of polymers and characterization. The author admits to having over-emphasized some of the new developments in polymerization chemistry. This has the danger of giving the beginner a poor perspective of the field. Along this line, it seems to me that the short chapter on "Cyclopolymerization" might better have been lumped in with another one on "Special Polymerization Reactions." This would have reduced somewhat the focus on new developments.

Since the book is intended to be the first exposure of college students to the field of polymer chemistry it is unfortunate that numerous errors relating to spelling of chemical names and proper use of chemical nomenclature have persisted into final print. The most striking examples are the misspelling of "vinylidene" wherever used and inconsistency in separating the parts of names of esters, ethers, etc.

Despite the criticisms, the book should serve a useful purpose in filling in a spot in the literature which has been poorly covered.

W. I. LYNES
The Procter & Gamble Co.
Cincinnati, Ohio

FISK'S PAINT YEAR BOOK AND A-Z BUYER'S GUIDE, by N. R. Fisk (Neil R. Fisk, Harrow, Middlesex, 416 pp., 1962, \$11.00). This book is a compendium of practical, commercial, and technical information for the British paint, printing ink, and related industries. It is approximately equally divided between a dozen articles covering various aspects of the industry and a Buyer's Guide section.

Six of the twelve articles comprising the first portion of this book are mainly concerned with prospects and predictions for the industry while with one exception the remainder cover more technical aspects. The exception is a profit history (1955-59) of the major British paint and printing ink firms.

Those who have missed ex-editor (1938-1958) Fisk's sprightly "Comment" in Paint Technology will enjoy his introduction. E. Rhind again provides the illustrations.

The Buyer's Guide consists of an extensive and well cross-referenced classified list of paint and allied materials available to the British industry. The list of Trade and Brand Names as well as the alphabetical lists of names and addresses of manufacturers, merchants, etc., appear quite comprehensive and should prove valuable to those desirous of this information concerning British sources of supply.

This directory was obviously primarily written for the British trade and should prove useful and valuable. American readers will find it interesting in proportion to their interest in that nation's industry.

RALPH J. BRYSSON
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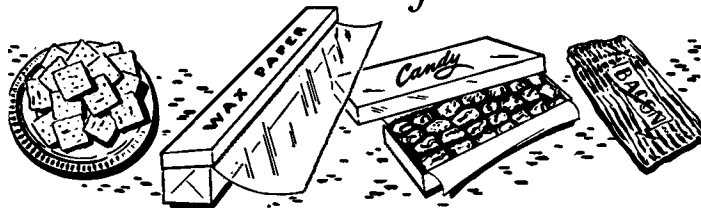
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A. V. Graci, Jr.

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Advisory Committee: A. A. Rodeghier, A. F. Kapecki, and C. W. Hoerr.

As plans develop, the Journal will keep you advised as to technical program, interesting places to visit in Chicago, and a schedule for visiting ladies.

New Books . . .

(Continued from page 28)

in a volume of reasonable size (and price).

Five chapters, about 300 pages, treat the practical aspects of spectrometer components, design and performance (including "how to select a spectrometer"), sample preparation, qualitative and quantitative analysis. Theoretical treatment is given in chapters on theoretical foundations, electronic states and spectra, molecular vibrations and rotations, and the principles of molecular spectroscopy.

Appendices provide help for those undisciplined in matrix methods, group theory, nomenclature or character tables. The Greek alphabet, a classified bibliography and an extensive index conclude Professor Bauman's book.

Equitable treatment is given to infrared, ultraviolet, visible and Raman spectroscopy, both from a theoretical and operational standpoint. Optical aspects of spectrometer design and operation are emphasized; electronic considerations are almost totally lacking. Specific instruments are described when they possess design features of merit. Included, in a somewhat melancholy way, are some the author reports as being no longer produced. Only incidental mention is made of foreign instruments, possibly because U. S. instruments cover the range of features discussed.

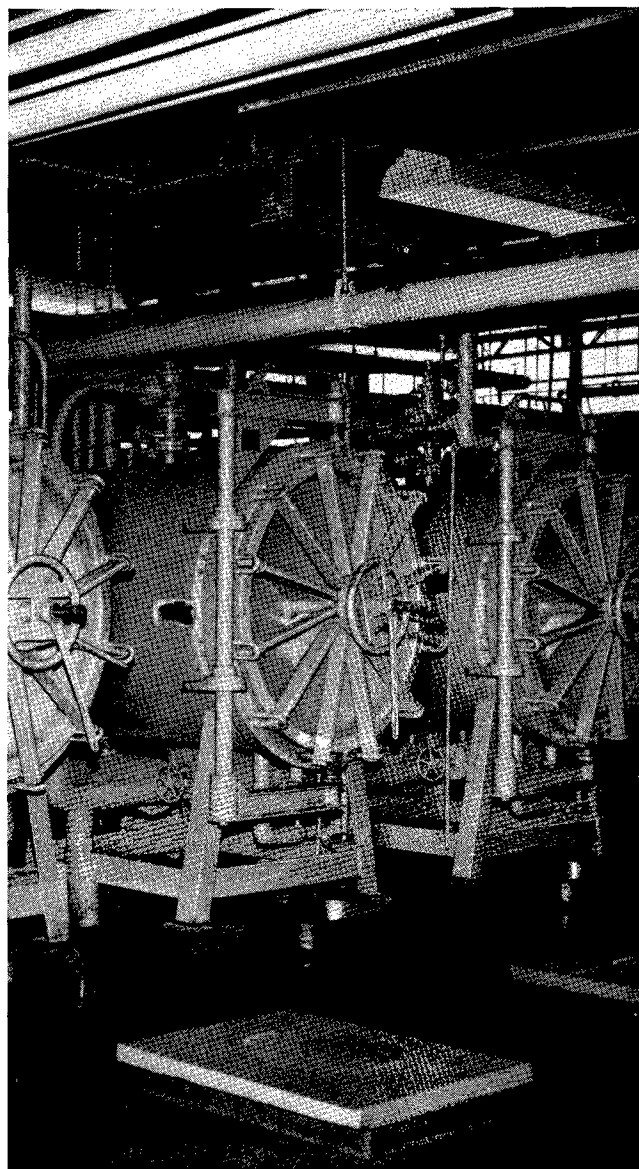
The theoretical sections would provide a good sound background for a sincere student of spectroscopy. The practical chapters, so designated by this reviewer in the sense of direct analytical applicability, provide a good background for moving into the laboratory with a spectroscopic method and an instrument operating manual in hand. This is certainly not to intimate, however, that this book takes the place of either formal fundamental training or experience.

Professor Bauman's Absorption Spectroscopy should well replace the older reference-texts that ought to be found in any spectroscopy laboratory or on the desk of anyone seriously interested in the fundamentals of absorption of electromagnetic radiation.

H. WHITNEY WHARTON
The Procter & Gamble Co.
Cincinnati, Ohio

INTRODUCTION TO POLYMER CHEMISTRY, by J. K. Stille (John Wiley and Sons, Inc., New York, 248 pp., 1962, \$6.95). This book is intended to furnish a one semester introduction to polymer chemistry to students at about the

(Continued on page 47)



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