

CONCISE DICTIONARY OF ATOMICS, Edited by Alfred del Vecchio, with an Introduction by Werner von Braun (Philosophical Library, New York, ix + 262 pp., 1964, \$6).

This is intended as a simplified reference book for engineers, students, and teachers who are working in or interested in the field of atomic or nuclear energy. The simplicity of the definitions would not appeal to a nuclear physicist but are about the right level for the intelligent layman. Fundamental scientific breakthroughs in atomic structure and nuclear energy have come with increasing rapidity in recent years, and with each new breakthrough comes new terminology. An entire vocabulary has grown up around research and development in the properties of the atom, a vocabulary that sounds like a foreign language to the layman or to the scientist working in another field. As a guide to this new language, this dictionary will make scientific reports and news releases more meaningful. If you are bewildered by terms like bevatron, bremsstrahlung, Cerenkov radiation, critical mass, lepton, meson, nuclear isomers, parity, pinch effect, radioautograph, spinthariscopes, synchrotron, or tamper, this book will be of help to you. If you find difficulty remembering the distinction between nuclear fission versus nuclear fusion, nuclear isobars versus isotopes, or atomic energy versus atomic energy, then you need a ready-reference dictionary such as this. The book also removes the shroud of mystery surrounding the abbreviations and acronyms glibly used by nuclear physicists and engineers, such as rd, rad, rem, rep, ANPP, bev, Cern, BEPO, NEPA, Gleep, and Zeep.

This dictionary is more than a glossary of terms, however. It also contains capsule biographies of the great names in atomic and nuclear research, giving the dates, places, and important accomplishments of Bohr, Compton, Dirac, Einstein, Fermi, Hahn, Lawrence, Meitner, Oppenheimer, Planck, Rutherford, Urey, Yukawa, and many others. Recent history and current news are also made more meaningful by the inclusion of information on places famous in nuclear developments, such as Amersham, Argonne, Brookhaven, Calder Hall, Harwell, Knolls, Tokai Mura, Trawsfynydd, and Windscale, to mention only a few.

Many of the entries are developed in considerable detail, usually at a level that would be comprehensible to the educated layman. Other entries are brief but adequate. There is a disappointingly large number of errors, most of them minor and probably of little significance to the audience toward which the book is aimed.

For oil chemists, the book would be handy to those interested in reactions of fats induced by ionizing radiation, use of isotopic tracers in fundamental research on fat biochemistry, or application of nuclear energy to fat utilization research.

C. ROLAND EDDY
Eastern Utilization Research and
Development Division
Agricultural Research Service
U.S. Department of Agriculture
Philadelphia, Pennsylvania 19118

METHODS IN MICROANALYSIS. VOL. I. SIMULTANEOUS RAPID COMBUSTION, Edited by J. A. Kuek (Gordon and Breach, Science Publishers, Inc., 560 pp., 1964, \$27.50).

Simultaneous Rapid Combustion is a series of Russian (plus a few Czechoslovakian) articles translated into English by Phyllis L. Bolton and Kurt Gingold of American not authored by Miss Korshun, are selected papers of Mirra Osipovna Korshun, the founder of the Soviet school of quantitative organic microanalysis and director of the microanalytical laboratories of the Institute of Elemento-Organic compounds of the Academy of Science of the not authored by Miss Korshun, are selected papers of USSR. Miss Korshun died in 1958. The remaining articles, not authored by Miss Korshun, are selected papers of Russian or Czechoslovakian authors that fit into the general theme.

This book is 6 × 9 × 2 in. thick. It is attractively, but not extravagantly, bound with a brown hardboard cover. With frequent use the binding will almost certainly fall

NEW BOOKS

apart. The table of contents includes titles of the 56 articles, but authors' names are omitted. The subject index appears adequate but is a little difficult

to use because the page references are run in with the subject matter rather than being collimated on the right-hand side of the page.

Miss Korshun was a proponent of the "empty tube" method of microanalysis in contrast to the classical procedure of Pregl. This method of pyrolyzing a sample in a quartz tube with insufficient oxygen is much more rapid than "packed tube" methods. Miss Korshun and the other authors describe methods for the determination of C, H, O, N, S, F, Si, P, Cl, Br, and I. In 25 of the articles the simultaneous determination of two or more elements is considered. Although Miss Korshun died before the advent of automatic microdeterminations, her "empty tube" combustion procedures will undoubtedly serve as the basis for many such methods. There are two methods by M. Veera at the end of the book which deal with the automatic determination of C, H and N by thermal conductivity detection techniques.

Probably the greatest value of this book is its historical accounting of Russian microanalytical achievements. However, readers interested in microanalyses will undoubtedly find technical suggestions for specific microanalytical problems. Priced at \$27.50, *Simultaneous Rapid Combustion* is too expensive for inclusion in one's personal library considering what it offers to the working microanalyst.

F. L. JACKSON
Procter and Gamble Co.
Miami Valley Labs.
Cincinnati 39, Ohio

PROGRESS IN THE CHEMISTRY OF FATS AND OTHER LIPIDS," Vol. VII, part 2, R. T. Holman, ed. (Pergamon Press-Macmillan Co., New York, 289 pp., 1964, \$5).

The book is composed of three review articles. The first one is on the analysis of lipids by gas chromatography. The second article discusses the nutritional effects of antioxidants. The third article is on the chemical properties and biological functions of the coenzymes Q.

There is no doubt about the usefulness and necessity of review articles, especially in this era of rapid and voluminous publication. A critical factor in their publication is the time elapsed between the moment they were written and their appearance, since, as stated by the authors of one of the articles "individual developments frequently come in quick succession" and make it "difficult to reach objective conclusions and to arrive at recommendations that will stand for some time". Then, the usefulness of a review is handicapped when, as in the present case, the references listed are at least three years old at the time of publication.

In spite of this limitation, the first article of the book which gives a series of practical data concerning the gas chromatographic analysis of lipids, puts together some much-needed information. Theoretical considerations have been reduced to a minimum in favor of practical data on the preparation of columns, sample introduction, systems of detection, and quantitation, with respect to both packed and capillary systems. Principles and terminology are briefly discussed. A description of systems for the measurement of radioactivity in the column effluents is also given, followed by a short discussion of the systems for preparative gas chromatography. The last part of the article is devoted to applications, mostly in the biochemical field and starts with a quite detailed discussion of the structural identification of saturated and unsaturated straight chain acids of branched chain acids. The second subsection on applications is entitled "Triglycerides, Monoglycerides, Diglycerides, and Glyceol Esters." Under this heading one would expect a description of the analysis of these glycerides as such. However, only the direct analysis of mono- and diglycerides is described, since the method given for triglycerides stipulates their

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previous conversion to fatty acid methyl esters. Moreover, the glycerol "esters" of the title turn out to be glycerol "ethers" in the context. Other applications listed include the gas chromatographic analysis of alcohols, aldehydes, ketones, esters and amines, as well as human, animal, plant, insect, bacteria and yeast lipids. Finally, the analysis of steroids is described in some detail. The relative retention time of a long list of steroids is given.

This article, with its 425 references will be useful to those interested in the analysis by gas chromatography of lipids of biochemical significance.

The second article of the book is a review on the nutritional effects of antioxidants. The effects of these compounds in several experimental animals and in man are discussed. Other topics reviewed are the deposition of antioxidants in body tissues, their effect on enzyme function and on lipid peroxidation, and the antioxidant activity of the tocopherols. These topics have been attracting considerable attention in the past few years and their review is certainly timely. Those working in such fields as lipid preservation in foods, lipid nutrition and vitamin E metabolism will benefit from this contribution.

In the third article of the book the group of coenzymes Q is described. Its structural characteristics, synthesis, isolation, assay, separation, distribution in nature and in the cell, function in the electron transport chain, and oxidative phosphorylation, and function as vitamins are discussed. A scheme for the biosynthesis of coenzyme Q is given, and various derivatives are characterized. A discussion of practically the same topics can be found in a previous review by Hatefi (*Adv. Enzymol.* 25, 275 (1963)).

The order of the chapters in the book is different from that given in the cover and the front page. No index is included.

NESTOR R. BOTTINO
Research Associate
Department of Biochemistry
and Nutrition
Texas A&M University
College Station, Texas

HANDBOOK OF INDUSTRIAL INFRARED ANALYSIS, by R. G. White (Plenum Press, 439 pp., 1964, \$19.50).

Recent years have seen the publication of a considerable number of books on infrared spectroscopy. For the investigator whose primary interest lies in application of infrared spectroscopy to a particular field of chemistry, it is not always easy to select the proper volumes for study and reference. The distinguishing characteristic of the present work is that it is essentially a handbook, not a text. Emphasis is decidedly on practical analytical applications. An absolute minimum of theoretical background is offered. The form of presentation is extremely concise, at times approaching telegram style. An extensive bibliography contains over fifteen hundred references. The book contains very useful guides to existing collections of infrared data, to review articles, and books. The comments offered in this connection reflect the overall approach of the Handbook. Thus, the basic work by Wilson, Decius and Cross is recommended for those who "... either can enjoy or must endure the theory of infrared and Raman spectra."

The Handbook is divided into seven chapters: History, Theory and Terminology; Instrumentation; Techniques; Qualitative Analysis; Quantitative Analysis; Applications; Literature. The first chapter gives the essentials of terminology and a very brief introduction to the physical

phenomena underlying infrared spectra. The instrumentation section is much more detailed and describes at some length the optics and performance of a considerable number of domestic and foreign instruments. The chapter on techniques is by far the longest one in the book. Various types of cells, mulling and pressing techniques, as well as some more specialized topics such as matrix isolation methods and polarized radiation, are covered.

A word of caution might be in place concerning the chapter on qualitative analysis, which offers a large number of correlation tables on group-frequencies. Such tables are of unquestionable value but, to quote Bellamy (*The Infrared Spectra of Complex Molecules*, p. 3): "It cannot be too strongly emphasized that the indiscriminate use of . . . summaries for correlation work without reference to the detailed work on which they are based can only lead to error." By studying enough correlation tables almost any complex spectrum can be "interpreted" in a great number of ways. Numerous references are given in the Handbook. They should be consulted.

The chapter on quantitative analysis is, in contrast to some other parts of the book, lucidly written and well suited as an introduction to this topic.

The most useful feature to the analytical spectroscopist is probably Chapter 6, "Applications." It is essentially a guide to literature, organized along somewhat unconventional lines. Various areas of application are covered in alphabetical order under 60 subtitles such as: Acids, Absorbed Phases, Air Analysis . . . , Esters, Ethers, Fats and Oils . . . , Tobacco, Water.

Although termed a "Handbook," the work does contain some statements which obviously reflect somewhat subjective opinions of the author. Thus, on p. 138 the KBr technique is called the best sampling method for solids. There also are occasional imprecise statements. On p. 243 the legend for Figure 5.1.1.1.2. reads: "Linear plot of transmittance vs. concentration." The plot itself exhibits a considerable curvature, as it should.

The *Handbook of Industrial Infrared Analysis* contains a considerable amount of information in a condensed form. It constitutes a concise guide to the various techniques and instruments encountered in analytical infrared spectroscopy. Theoretical aspects are deemphasized. Comments occur throughout the book which, understandably, occasionally seem to reflect personal preferences and attitudes of the author (No smoking in instrument rooms!). The literature dealing with infrared analysis in various areas of practical importance is extensively covered, including oils and fats. The book should prove very useful as a guide to literature on practical infrared analysis.

H. SUSI
Eastern Utilization Research
and Development Division
Agricultural Research Service
U. S. Department of Agriculture
Philadelphia, Pennsylvania 19118

Statistics and Design of Experiments Courses Set for Rochester

Registrations are being accepted for the 22nd Annual Statistical Techniques in Quality Control and the 13th Annual Design of Experiments courses for the chemical and processing industries, sponsored by Rochester Institute of Technology (Rochester, New York) and scheduled to be held at the Institute on June 14-23 and June 22-30, respectively.

Heading a distinguished faculty for the two seminars will be M. E. Westcott, Professor of Applied Sciences at Rutgers-The State University; F. C. Malone, Professor of Statistics and Acting Head, Dept. of Mathematics, Case Institute of Technology; and A. D. Rickmers, School of Photography faculty member at R.I.T.

Inquiries regarding registration may be sent to James H. Swanton, Extended Services Division, Rochester Institute of Technology, Rochester, N. Y. 14608.

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1111 Flora St. P.O. Box 1163 Columbia, S.C.