

## NEW BOOKS

**Matter, Electricity, Energy. The Principles of Modern Atomistics and Experimental Results of Atomic Investigation.** By WALTER GERLACH, University of Tübingen. Translated from the second German edition by Francis J. Fuchs, Ph.D., St. John's College. D. Van Nostrand Company, Inc., 8 Warren Street, New York, 1928. xii + 427 pp. 119 figs. 16 × 23.5 cm. Price, \$6.00.

Since the first edition of this work was published in German, and reviewed in THIS JOURNAL, 46, 517 (1924), experimental advances in atomistics have all but kept pace with the unprecedented development of the theoretical side of the subject. Among newer subjects discussed here will be found Atomic Rays and the Compton Effect but, in general, no great effort appears to have been made to bring the book really up to date. It is gratifying that a book as good as this, yet which does not follow the lines either of an orthodox text or a reference work, can appear in translation. It should be useful to many students of modern physical developments.

NORRIS F. HALL

**Collection of Czechoslovak Chemical Communications.** Edited and published by E. VOROČEK AND J. HEYROVSKÝ under the patronage of the Bohemian Royal Society of Sciences. 1929. Year 1, No. 1, January. Printed by "Politika," Prague. Agent U. S. A., Dr. N. V. Emelianoff, Havemeyer Hall, Columbia University, New York City. Subscription price, U. S. A., \$5.00.

It appears that the limited knowledge of Czech outside of Bohemia has, on the one hand, forced the chemists of that country to publish their chief works in foreign journals and, on the other, has resulted in many important contributions remaining untranslated in the archives of the Czech learned societies and institutions. The Editors have founded this journal to remedy these difficulties by publishing in full the more important contributions of their countrymen in the field of "pure" chemistry, provided they have not been published previously in any widely known language. This journal will also include a bibliography of all publications of Czechoslovak chemists, as well as reviews of their books.

This first issue contains four articles, one on inorganic, one on physical-analytical and two on organic chemistry. One of these articles is in English; the other three are in French.

ARTHUR B. LAMB

**Leçons sur la Chimie Générale. (Lessons in General Chemistry.)** By RENÉ DUBRISAY, Professor at the National School of Bridges and Roads. Gauthier-Villars et Cie., 55 Quai des Grands-Augustins, Paris, France, 1929. vi + 246 pp. 16.5 × 25.5 cm. Price, \$2.98.

This is a short course of lectures, intended as a second trip over the chemical field for students of engineering who have already studied de-

scriptive chemistry. The author shows the application of physical chemistry to many industrial processes. The work is divided into an introduction and four parts which deal, respectively, with atomistics, thermodynamics, kinetics and equilibria, electrochemistry and surface chemistry. In part one, the treatment is rather too brief to be satisfactory but the material seems well selected. Figures one and two are misleading. In part two the discussion of oxidative catalysis and the drying of oils is interesting. In developing the fundamental equations for chemical equilibria and the phase rule, a rather detailed analytical discussion is used, in which the Gibbs Zeta-function is emphasized and this function is called the "thermodynamic potential" while the Psi-function is called the "free energy." A rather extensive use of phase diagrams is made in the section on metallography. In particular the  $T$ - $X$  diagram for the system Cu-Sn is presented in considerable detail. In the section on ionization the hypothesis of Arrhenius is uncritically applied to strong electrolytes. The electrochemical section is very brief and modern solution theory finds no place in it. In the section on surface chemistry the Gibbs Zeta-function is used once more in developing the adsorption equation of Freundlich. Chapters on clays and cements conclude the book.

The style is clear and extremely concise and the methods of selection and presentation testify to the intelligence both of the lecturer and of French students of engineering.

NORRIS F. HALL

**The Fundamentals of Chemical Thermodynamics. Part I. Elementary Theory and Applications.** By J. A. V. BUTLER, D.Sc., Lecturer in Chemistry in the University of Edinburgh. Macmillan and Co., Ltd., St. Martin's Street, London W.C. 2, England, 1928. xi + 207 pp. 51 figs. 12.5 × 19.5 cm.

In response to the need "of an elementary introduction to the subject which shall stress the underlying principles and at the same time give due attention to their applications" the author has "tried to present the subject in a logically precise, yet simple form, having in mind not only the student who intends to specialize in Physical Chemistry, but also that class of chemistry students which has only a very moderate knowledge of mathematics and little sympathy with mathematical methods." This volume is based mainly on cyclic processes, and comprises nine chapters, as follows: first law; second law; changes of state; solutions; homogeneous-gaseous reactions; the galvanic cell; electrode potentials; concentration cells and activities; electrolysis. To each chapter is appended a group of examples, taken from recent papers and not obsolete data copied from other textbooks. In his purpose the author has, I think, succeeded perhaps as well as is possible within the compass of 200 small pages; but one wonders whether it is not rather condensed nourishment, except for

the few with thoroughly analytical minds, and whether for the others the thermodynamic pill must not be gilded with a more discursive treatment, with a large use of analogies, with philosophy and even with humor, if it is to produce any beneficial effect upon the patient. Indeed, I fear that it is nearly impossible to write a good brief exposition of thermodynamics—unless as a summary which would be amplified greatly by the teacher in class—which will appeal with any degree of success to the *average* student of chemistry; he should, however, find the texts written within the last fifteen years much less unattractive and less incomprehensible than the older books, many of them written by men who allowed but little real chemistry to slip in.

J. JOHNSTON

**Introduction to Modern Physics.** By F. K. RICHTMYER, Professor of Physics at Cornell University. McGraw-Hill Book Company, Inc., 370 Seventh Avenue, New York, 1928. xv + 596 pp. 169 figs. 15 × 23.5 cm. Price, \$5.00.

This fairly large and leisurely book has already found a warm welcome among students and teachers of physics, and should equally please those chemists and other non-physicists who are forced by interest or necessity to follow as best they can the brilliant pageant of modern physical advance. Intending neither to produce a textbook of physics in general nor a work of reference, the author has been able to select his material with a relatively free hand.

His method is as follows. First, the whole history of physics is surveyed in a section of about seventy pages, which brings the account to the last decades of the nineteenth century. The electromagnetic theory of light is then expounded, followed by the story of the photoelectric effect from Hertz to Ives. Next is a long section devoted to thermal radiation, the origin of the quantum theory and its application to specific heats. Then comes a study of series relations in line spectra, the development of the nucleus-atom and its introduction into spectral theory. The arrangement of electrons in atoms is discussed in connection with both static and dynamic models and, finally, a complete survey of the history and present status of x-rays introduces a last chapter on the nucleus and radioactivity. Appendices contain valuable tables. This choice of subjects permits the author to dwell with each in turn, to regard it from different points of view, to raise interesting side issues and to show the essentially continuous and even recurrent character of the evolution of physics. Of course, not everything "modern" finds a place—there is no general and little special relativity, no matrix—or wave—mechanics, no ultrasonics, no electron tubes. There is even no treatment of sound, or of light as such, or of ordinary mechanics.

Therefore let the reader or purchaser of this book understand just what

he is getting: a readable, solid and thorough *introduction* to those parts of physics which by common consent are regarded as most interesting. The diagrams have evidently been very carefully prepared.

A list of minor errors has been sent to the author.

NORRIS F. HALL

**A Guide to the Literature of Chemistry.** By E. J. CRANE, Editor of *Chemical Abstracts*, and AUSTIN M. PATTERSON, Professor of Chemistry, Antioch College, Formerly Editor of *Chemical Abstracts*. John Wiley and Sons, Inc., New York, 1927. ix + 438 pp. Illustrated. 15.5 × 23.5 cm. Price \$5.00.

The literature of chemistry, including those closely related subjects which engage the chemist's attention, is more extensive than that of any other branch of science, and there is probably no other field of pure or applied science in which consultation of the existing literature is more highly essential. Even in routine work some contact with published information is desirable, while in investigation the use of existing records is imperative. Every research should begin with the literature of the subject; frequently it may end there.

The student of chemistry is given detailed instruction in the manipulation of the apparatus he is to use; but too frequently he is given only superficial instruction, or none at all, in the method of approaching the literature, though indexes and library catalogs are tools, also, and the technique of using them properly does not come intuitively. But while there are many books for the chemist in the laboratory, there have been very few for the chemist in the library. A pioneer work is the pamphlet by Miss Marion Sparks,<sup>1</sup> who up until her recent untimely death gave instruction in chemical literature to students at the University of Illinois. In his valuable guide to research in organic chemistry, Dr. E. E. Reid<sup>2</sup> of Johns Hopkins University wisely devoted approximately one-third of the space to libraries and literature. A recent work by Dr. M. G. Mellon,<sup>3</sup> based on instruction at Purdue University, gives considerable attention to actual library problems and assignments.

There are a few other brief guides, but the book by Crane and Patterson presents the maximum cross-section of the literature. Its content cannot be reviewed in detail here, but, in general, it surveys the important classes of literature (such as books, periodicals, patents, and trade literature), and indicates the approach thereto by means of the available tools (such as indexes, abstracts, reviews and bibliographies). Supplementing the

<sup>1</sup> Sparks, "Chemical Literature and Its Use," privately printed, Urbana, Ill., 2d. ed., 1921.

<sup>2</sup> Reid, "Introduction to Organic Research," D. Van Nostrand Co., New York, 1924.

<sup>3</sup> Mellon, "Chemical Publications, Their Nature and Use," McGraw-Hill Book Co., New York, 1928.

general instruction, there are useful features of rather special nature, for example, the principles of indexing, and the transliteration of Russian names.

The procedure for systematic searching of the literature is well outlined, and at least a part of the instruction given in the book should be incorporated in every formal course in chemistry, to the end that every chemist shall be able to find information in print, and to record it with such accuracy that his references will enable him, or anyone else, to find the material again. In addition to its value for actual study, the volume offers a large amount of reference material—mainly in the form of lists. These include a bibliography of chemical literature and lists of abbreviations, libraries, periodicals, societies, publishers and books—all considered from the viewpoint of the chemist. Some of these lists are of more ephemeral nature than the rest of the book and they will need occasional revision. At present, they are of enormous reference value and the book should be available for consultation in every laboratory which does anything beyond the most ordinary routine work.

Having been invited to review this "Guide" so long after its appearance, the present reviewer accepted because the book continues to justify its existence and (where used as it was intended to be) to evoke enthusiasm as evinced by the following comment in a letter from a personal friend who has had wide experience in the use of technical literature: "What a beautiful piece of work Crane and Patterson have done in their *Literature of Chemistry*. I admire it more and more every time I use it."

E. H. McCLELLAND

**Richter-Anschütz Chemie der Kohlenstoffverbindungen oder Organische Chemie.** (Organic Chemistry or the Chemistry of the Compounds of Carbon.) Edited by DR. RICHARD ANSCHÜTZ. Vol. I. Aliphatic Compounds. By DR. FRITZ REINDEL, Lecturer in Organic Chemistry at the Technical High School of Munich. Twelfth edition. Akademische Verlagsgesellschaft m. b. H., Markgrafenstrasse 4, Leipzig C 1, Germany, 1928. xvi + 882 pp. 18 figs. 16 × 24 cm. Price, unbound, M 57; bound, M 59.

After an interval of nineteen years, during which many of the friends of the "Richter-Anschütz" began to fear that its faithful editors had succumbed to an ever-growing mass of facts, this first volume of the twelfth edition has appeared—thoroughly up to date, cleanly printed on good paper, therefore just as reliable and much more attractive than any of the preceding editions.

Since the plan of this text has remained the same throughout its long history, the differences between successive editions give a good indication of the subjects which from time to time have engrossed the interest of investigators in organic chemistry. In the present edition the sections dealing with alcoholic fermentation, polysaccharides, proteins, porphyrins,

bile-acids, sterins and enzymes have been completely rewritten and considerably expanded. These sections contain the major changes from the eleventh edition but the entire text has been thoroughly revised and there is hardly a page in which no new material has been incorporated. Both the editors and the publishers are to be commended for the high quality of the present volume. It deserves to win a host of new friends for an old favorite.

E. P. KOHLER

**Organic Syntheses.** An Annual Publication of Satisfactory Methods for the Preparation of Organic Chemicals. Vol. IX. Edited by JAMES B. CONANT, with ROGER ADAMS, H. T. CLARKE, HENRY GILMAN, C. S. MARVEL and FRANK C. WHITMORE. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, 1929. v + 108 pp. 1 fig. 15.5 × 23.5 cm. Price, \$1.75.

The ninth annual volume of Organic Syntheses arrived on time, with a long list of contributors of whom many—perhaps most—appear for the first time in this edition. Evidently the little guide is enjoying increasing favor not only with those who look to it for assistance, but also with those who have had occasion to devise new methods or carefully study old ones for the preparation of organic compounds. The list of substances dealt with in the present volume is as follows: Acid ammonium *o*-sulfobenzoate, *dl*-alanine, ammonium salt of aurintricarboxylic acid, anisole, benzoyl-piperidine, *p*-bromophenacyl bromide, *o*-bromotoluene, *n*-butyl carbamate, *n*-butyl *p*-toluenesulfonate, *n*-butyryl chloride, *o*-chlorobenzoyl chloride, cyanoacetamide, ethyl cinnamate, hydrocinnamic acid, iodobenzene, levulinic acid, *l*-menthone, mercury diphenyl, methylene bromide, monochloromethyl ether,  $\beta$ -naphthol phenylaminomethane, *o*-nitroaniline, nitrostyrene, pentamethylene bromide,  $\gamma$ -phenoxypropyl bromide, phloroglucinol, pyrrole, *o*-sulfobenzoic anhydride, *ac*-tetrahydro- $\beta$ -naphthylamine.

E. P. KOHLER