

It is interesting to note that these metals do not occur in connection with zinc. The chief minerals of the deposits are cordierite, actinolite, antigorite, calcite and molybdenite. Apparently the indium occurs as a partial replacement of aluminum in cordierite. The mode of occurrence of the scandium has not yet been determined.

We have succeeded in developing a method for extracting the scandium. This method will be described shortly in detail (as a contribution from the Chemical Laboratory of the University of Utah).

SALT LAKE CITY, UTAH

HENDRIK ROMEYN, JR.

RECEIVED AUGUST 24, 1933

PUBLISHED SEPTEMBER 5, 1933

---

## NEW BOOKS

---

**Annual Survey of American Chemistry.** Volume VII, 1932. Edited by Clarence J. West, Director, Research Information Service, National Research Council. Published for National Research Council by the Chemical Catalog Company, Inc., 330 West 42d Street, New York, 1933. 346 pp. 13.5 × 21.5 cm. Price, \$4.00.

In this volume of the Annual Survey a new policy in regard to the selection of subjects to be considered has been put into effect. The plan followed involves the reduction in the number of fields covered in any year and the treatment of the less important topics once in two or three years. This change was made necessary as the result of the growing size of the volumes from 257 pages in the first year to 543 pages in the sixth year. The number of chapters has been reduced from 37 to 27, which cover 346 pages. Although several topics have been eliminated, the work covered is so extensive that on the average eight references are considered per page, with the result that the discussions are exceedingly brief and limited often to not more than a statement of the titles. Notwithstanding this fact the authors, in general, have produced readable articles which give a clear impression of the recent developments in the subjects treated. The volume is an example of the art of condensation in scientific writing, which is becoming more and more necessary as time goes on and production increases. Since the number of chapters has been reduced it appears to be desirable to list the subjects treated in this volume. They are as follows: theories of solution, kinetics of homogeneous gas reactions, subatomic phenomena, thermodynamics and thermochemistry, colloids, contact catalysis, aliphatic compounds, carbocyclic compounds, heterocyclic compounds, biochemistry, photochemistry, x-ray examination of materials, electrochemical practice, inorganic chemistry 1929-1932, non-ferrous metals, foods, fermentation, water, sewage and trade wastes, soils and fertilizers, coal, petroleum chemistry and technology, textile fibers, dyes and dyeing, rubber, synthetic plastics, chemical engineering. It should be noted that chemical engineering appears for the first time in the Annual Survey. The inclusion of this topic will add to the value of the book.

The Survey has proved of particular value to those who cannot find time to read extensively. It makes it possible for a chemist to learn with little effort something of the developments outside of his own field.

JAMES F. NORRIS

**Elementary Quantitative Analysis. Theory and Practice.** By HOBART H. WILLARD, Ph.D., Professor of Analytical Chemistry, University of Michigan, and N. HOWELL FURMAN, Ph.D., Associate Professor of Chemistry, Princeton University. D. Van Nostrand Company, Inc., 250 Fourth Ave., New York, 1933. viii + 406 pp. Illustrated. 14.5 × 22.5 cm. Price, \$3.25.

This book should be welcomed by all chemists interested in the teaching of quantitative chemistry. It can be characterized as quantitative analysis *per se*, not a pre-professional hurdle nor preliminary practice in technical analysis. The practice determinations are well selected, varied in nature, and in such numbers that flexibility is allowed the teacher in choice of exercises. Recent developments in quantitative methods are introduced through appropriate exercises and combined with the best of well-established, long-standing methods. Directions are written in a simple straightforward style that will impress the student with the essentials of the processes being carried out.

However, the book is more than a collection of conventional directions for carrying on specific determinations designed to familiarize the student with quantitative technique. It is especially characterized by a generous amount of space devoted to the fundamental theory of quantitative chemical processes. In a series of chapters, judiciously distributed among chapters of practical laboratory directions, the modern theoretical basis of analytical chemistry is simply but thoroughly discussed. This material is a natural continuation of the general theory of the introductory course and of quantitative analysis. Many teachers, whose training was secured more than a decade ago, will find interesting information in these theoretical chapters.

Fundamentally sound as the book is, the reviewer cannot but express regret that the authors did not continue to use their original order of treatment; that is, place gravimetric processes before volumetric. This order seems to be the more logical and more in accord with the nature of this text. To be sure, the order of treatment used is well connected and teachable, but it has been the hope of the reviewer that one good quantitative analysis might continue to place first things first, and resist the demand for pre-professional short courses, that is, for the teaching of applications before the fundamentals are thoroughly presented.

With regard to detailed criticisms few objections can be raised. The work is well written and printed throughout, although reading the preface might not seem to promise this, as, in the second paragraph, there is an error in printing and a split infinitive. The authors have included a number of problems and review questions but not too many, and more discussion of methods of solving quantitative problems, the use of reference tables, handbooks, slide rules, etc., might be included. Since some students are familiar with proton chemistry, mention of Brönsted's concepts might have been included in Chapter VI.

The authors have avoided specifying complicated or highly specialized apparatus and only occasionally references are made to specific forms of conventional apparatus or materials. This is commendable since such practical details are administered differently in different laboratories. For example, the reviewer would not agree that the type of buret described and illustrated is the best even for general use, or that a certain excellent rubber paint is the preferred method of lining standard alkali bottles.

There are admittedly other details, described in the book, on which opinions differ, but they are after all mere details. The general impression remains that the authors have produced a thoroughly good textbook of elementary quantitative chemistry, commendable both as to teachability and scope of information presented.

C. R. HOOVER

**Der Glaszustand. (The Glassy State.)** By GUSTAV TAMMANN, Göttingen. Verlag von Leopold Voss, Salomonstrasse 18 B, Leipzig C 1, Germany, 1933. 123 pp. 86 figs. 16 × 23.5 cm. Price, RM. 8.70.

In this monograph there are collected and reviewed the results of numerous researches by Professor Tammann and his students upon substances in the glassy state together with some of the related work of others in the same field. A complete review of the field would be impossible in a book of this size. Consequently the plan is adopted of presenting first in each chapter the author's work upon a phase of the subject and then concluding with a consideration of the parallel work of others, where such work exists. This monograph is unique among books upon glass in that attention is wholly directed to the scientific aspects of the subject with almost no reference to the practical side of glass manufacture.

Because of this point of view, the glasses which were studied were chosen rather because of their suitability for the investigation to be carried out than because of their practical utility. Most of the work was done upon organic glasses softening between 0 and 100°, but the author states that the general results may be carried over into the field of the technically important silicate glasses where the higher temperatures required greatly increase the experimental difficulties encountered.

After a brief review of work upon the formation of crystallization centers and the linear rate of crystallization in supercooled liquids, which will be familiar to most readers, the first half of the book is devoted to a discussion of the changes which occur in all the physical properties of a glass as its temperature is increased through the interval in which it softens. It is shown that for normal glasses the physical properties in general undergo rapid but continuous changes in the interval between the temperature at which the glass ceases to be brittle and that at which it can first be drawn out into threads. In this section is discussed also some most interesting work upon the behavior of glasses under high pressures.

The last half of the book does not possess the unity of the first half but treats a number of more or less unrelated topics. For the most part it is devoted to a further consideration of the phenomena of crystallization or devitrification. There are, however, chapters upon the relation between the properties of the glassy state and the crystalline state, upon the increase in the strength of glass threads with decreasing size, upon the induced birefringence of glass surfaces, upon the molecular constitution of glasses, and upon irreversible changes in the physical properties of glasses. It is perhaps worthy of special mention that condensation and polymerization products such as Bakelite and polyisoprene are found to be distinctly "abnormal" glasses.

While this book contributes nothing directly to the technology of glass it may be recommended highly to those having a scientific interest in this state of matter. It should prove most suggestive to those engaged in the study and development of silicate glasses and should be valuable to the general student as shedding light on what is probably the most obscure realm of physical chemistry.

C. H. GREENE

**Phase Rule Studies. An Introduction to the Phase Theory.** By J. E. WINFIELD RHODES, Lecturer in Physical Chemistry, Municipal Technical College, Blackburn. With an introduction by E. L. RHEAD, Lecturer in Metallurgy and Assaying in the University and College of Technology, Manchester, England. Oxford University Press, 1933. x + 131 pp. 58 figs. 13 × 19 cm. Price, \$2.25.

This is a somewhat elementary though entirely scientific presentation of the whole field of the phase rule, including the treatment of four-component systems. In order to secure such a breadth of field, it has been necessary to make some sacrifices in depth.

The introduction indicates that the book is intended to bridge the gap for students whose knowledge of the subject has come from the brief study usually given it as a part of their physical chemistry, but who find that they need something more extensive upon taking up mineralogical or metallurgical investigations. The book will certainly do something of real value for such students, though it just as certainly leaves much reading to be done. A number of the systems taken for discussion are of mineralogical interest and not previously available in textbooks. The presentation is clear and in good form.

ARTHUR E. HILL

**Chemische Grundlagen der Lebensvorgänge. Eine Einführung in biologische Lehrbücher.** (The Chemistry of Living Processes. An Introduction to Biological Literature.) By Professor CARL OPPENHEIMER, Dr. Phil. et Med., Berlin. Georg Thieme Verlag, Antonstrasse 15/19, Leipzig C 1, Germany, 1933. vii + 298 pp. 1 fig. 17 × 25 cm. Price, M. 22.50; bound, M. 24.50.

In the preface the author states that this work was originally planned to appear in two parts, "Chemie der Zellvorgänge" and "Energetik der lebenden Substanz" to supplement the recent "Lehrbuch der allgemeinen Physiologie" by Ernst Gellhorn. This plan, however, was later changed because the author wished to appeal to a somewhat wider audience than simply animal physiologists. The present volume is directed not only at zoological and medical problems but the author hopes that it will prove of equal value to botanists and bacteriologists.

The book is divided into five parts: (I) Living Substance as a Chemical System, comprising sixteen pages and considering briefly a short introduction in which the composition of protoplasm is considered, followed by a discussion of the elements which occur in living cells.

II. Chemical Compounds in Protoplasm, comprising a short discussion of colloids, association, molecular size, etc., and followed by brief considerations of some of the more important characteristics of the fats and waxes, the carotinoids and the phospholipides, the carbohydrates, the respiratory pyrrole-containing pigments and the proteins.

III. Anabolism and Catabolism, including carbon and nitrogen assimilation and changes which organic compounds undergo in living cells.

IV. The Chemical Mechanism of Cell Activity, in which attention is called to the role of enzymes in biological processes.

V. The Energy Process of Living Substance, in which are considered the general nature of energy transfer and energy cycles, followed by a discussion of living substance as a chemico-dynamical machine.

The volume closes with an adequate subject index.

As might be expected from a knowledge of the field of interest of the author, the major emphasis in this volume is devoted to enzyme chemistry. Almost two-thirds of the book may be regarded as a condensed consideration of enzyme reactions, so that those workers who do not have access to the author's extensive (and expensive) "Die Fermente und ihre Wirkungen" can here find a very excellent, and adequate, résumé of Oppenheimer's views on enzymes, their reaction and the role which they play in vital processes. This is the chief value of the book. The brief introductory discussions of proteins, carbohydrates, fats, etc., are so brief as to contribute little that is new or unique and serve only to introduce the later portions dealing with enzymes and their reactions. Few persons are better qualified than is Oppenheimer to discuss enzymes and their reactions and it is this discussion which appeals to the reviewer and which he feels justifies the addition of the present volume to the mass of biochemical texts.

ROSS AIKEN GORTNER

**Chemistry of Food and Nutrition.** By HENRY C. SHERMAN, Ph.D., Sc.D., Mitchell Professor of Chemistry, Columbia University. Fourth edition, rewritten and enlarged. The Macmillan Company, 60 Fifth Ave., New York, 1932. xiii + 614 pp. 14 × 20.5 cm. Price, \$3.00.

The fourth edition of this standard work has been very largely rewritten and somewhat enlarged to include the most recent advances in biochemistry and nutrition. Separate chapters are now devoted to iron, copper and iodine, and to vitamins A, B, G, C, D and E. The chapter on "Dietary Standards" is especially to be commended for the well-balanced treatment it gives this controversial field.

CARL L. ALSBERG

---

---

## BOOKS RECEIVED

July 15, 1933–August 15, 1933

K. F. BONHOEFFER AND P. HARTECK. "Grundlagen der Photochemie." Verlag von Theodor Steinkopff, Residenzstrasse 32, Dresden-Blasewitz, Germany. 295 pp. RM. 24; bound, RM. 25.

ERWIN B. KELSEY AND HAROLD G. DIETRICH. "Laboratory Manual to Accompany 'Principles of General Chemistry.'" Revised edition. The Macmillan Company, 60 Fifth Ave., New York. 133 + 73 pp. \$1.50.

MARTIN KRÖGER, Editor. "Grenzflächen-katalyse." Verlag von S. Hirzel, Königstrasse 2, Leipzig, Germany. 387 pp. RM. 10.59; bound, RM. 12.50.

JULIUS SCHMIDT. "Lehrbuch der Organischen Chemie." Vol. XIX, 1932. Verlagsbuchhandlung Franz Deuticke, Helferstorferstrasse 4, Wien, Austria. 360 pp. M. 36, öst. S. 54; bound, M. 39, öst. S. 58.50.

J. E. VERSCHAFFELT. "Thermostatica." De Sikkel, Antwerpen, P. Noordhoff, N. V., Groningen-Batavia. 472 pp.

HARRY BOYER WEISER. "Inorganic Colloid Chemistry." Vol. I. The Colloidal Elements. John Wiley and Sons, Inc., 440 Fourth Ave., New York. 389 pp. \$4.50.