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 BOOK REVIEWS
 

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**Modern Aspects of Inorganic Chemistry.** By H. J. EMELÉUS, D.Sc., A.R.C.S., F.R.S. (Professor of Inorganic Chemistry, University of Cambridge) and J. S. ANDERSON, Ph.D., A.R.C.S., F.R.S. (Director, National Chemical Laboratory). D. Van Nostrand Co., Inc., 120 Alexander St., Princeton, N.J. 1960. xi + 611 pp. 14.5 × 22 cm. Price, \$7.75.

The original edition of this book, published in 1938, ranks as one of the most significant and influential books written on inorganic chemistry. Published at a time before the rapid growth of inorganic chemistry, it did much to point up developing research areas and to outline the status of problems in the field. It was written in terms of the best theoretical information of the day and added significant prestige to an area which had been eclipsed by rapid and spectacular developments in other branches of chemistry. Since 1938, the book has gone through 3 editions, the 1960 version being the third edition.

The current revision differs rather markedly from the second edition of 1952 which, in turn, differed from the 1938 version. For example, the topic of coordination compounds has been reorganized and broken into four chapters, the last of which appropriately includes the metal carbonyls, nitrosyls and organometallics—particularly the sandwich compounds. Consideration of these materials as an expansion of coordination theory is most appropriate. Two chapters from the 1952 version, "The Constitution of Solid Inorganic Compounds" and "The Structures of Molecules of Inorganic Compounds," have been effectively combined into a single unit, while separate chapters on "Free Radicals of Short Life" and on "Non-Metallic Oxides" have been omitted from the 1960 edition. Much of the information in the latter chapter has been worked into an expansion of the chapter on "Recent Chemistry of the Non-Metals." Other work has been deleted. As in previous editions the selection of topics is excellent and the authors have effectively defined many challenging and exciting areas of inorganic chemistry.

In their preface the authors describe the current revision as an attempt "to make the subject-matter reflect the present state of knowledge and the most important developments in inorganic chemistry, without radical changes in the method of presentation." They also note that "some fields of inorganic chemical research—for example, boron chemistry, the theory of coordination compounds, organometallic chemistry—are so productive of new knowledge that it is impossible to do full justice to recent progress in the whole subject." They further observe, "Some of the topics discussed are in course of rapid development, and what has been written may very soon appear incomplete." It is plainly apparent that the authors felt keenly the restrictions and problems imposed by the nature of the subject and the aim of the text. Many of the weak points noted below were probably anticipated and evaluated prior to publication.

The book is not above criticism. For example, this reviewer felt that much of the discussion of coordination compounds was handled in terms of the older valence bond models with emphasis on terminology while the currently popular and conceptually simpler ligand field model was summarized in 3 pages. Many of the exciting developments relating spectral and magnetic properties of complexes were passed over. Finally, this reviewer must disagree again [*Chem. Revs.*, 46, 507 (1950)] with the authors when they continue to attribute fundamental significance to molecular volume as it is related to bond type in coordination compounds (p. 180).

It would seem that the over-all effectiveness of the book as a review of "Modern Advances in Inorganic Chemistry" could have been improved by wider literature coverage and more complete reference to current work. Many older references are cited while newer key references, which also provide an entry into the older literature, were not included. For example, the 1952 edition (p. 408) indicates that manganese forms no carbonyl, yet on page 255 of the 1960 edition one finds the statement "Manganese and rhenium both form compounds with the predicted composition and properties." The references cited are dated 1939 and 1941.

No reference is made to the original synthesis of manganese carbonyl [*J. Am. Chem. Soc.*, 76, 3831 (1954)]. A number of such cases could be cited. In other situations rather speculative information is quoted authoritatively without literature reference. As an example, references to the following topics would be appreciated: (1) the structure of solid  $Al_2Cl_3$  (p. 50), (2) the preparation and properties of  $P(NH_2)_3$  (p. 373), (3) the comparison of the reactions between methylamine and ammonia with sodium (p. 368) and others. While the date line is 1960 and many recent references are included, one can conclude with the authors that the revision has indeed been written "without radical changes in the method of presentation." One can at least wonder whether or not a completely new approach to a few topics might not have been desirable.

Despite the above comments, which represent one man's opinion, this reviewer would still rank the current volume in the small group of chemical classics. Inorganic chemistry owes much to Emeléus and Anderson.

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**Les Globulines Sériques du Système Gamma. Leur Nature et Leur Pathologie.** By J. HERMANS. Editions Arscia S. A., 60, rue de l'Etuve, Bruxelles, Belgium, 1960. 340 pp. 16 × 24 cm. Price, 690 Fr. belges.

In this monograph the "Serum Globulins of the Gamma System, Their Nature and Pathology" are discussed extensively, particularly their immunochemical properties. No corresponding book is available in the English language, and, thus, it is important to emphasize that an extremely helpful table of contents with a brief summary and the conclusions of each chapter is included in English. In addition, the many illustrations will help the reader to grasp immediately the points of discussion.

Heremans presents in his well organized book a clear and comprehensive picture of what he sets out to do. He describes techniques essential to these studies, experimental data which are well documented with 72 figures and 19 tables, and reviews thoroughly the pertinent literature. Each chapter is initiated with a concise statement of the present state of knowledge on the subject and with a precise formulation of the questions to be discussed. This is followed by a critical evaluation of the results and by conclusions. Perhaps the reader might expect a more detailed description of chemical and physical chemical properties and particularly of the intermediary metabolism of the described serum constituents.

The first part of the book devoted to techniques describes in detail the different modifications of Grabar's immunoelectrophoresis and the determination of the protein concentration by Oudin's procedure. The second part brings an extensive account of the serum proteins with electrophoretic mobilities of the  $\beta_2$ - and  $\gamma$ -globulins. The method for the isolation of the recently discovered  $\beta_{2A}$ -globulin is of interest. Based on a comparison of the chemical, physical chemical and immunochemical properties of the  $\gamma$  (7S  $\gamma_2$ )-,  $\beta_{2A}$  (7S  $\gamma_{1A}$ )- and  $\beta_{2M}$  (19S  $\gamma_{1M}$ )-globulins, the new concept of the "serum globulins of the gamma system" is further developed, according to which the proteins of these three groups are considered as one large family of related serum globulins. In the third part a thorough description is presented of the anomalies of the components of the  $\gamma$ -system, particularly noted in multiple myeloma, Waldenström's macroglobulinemia and cryoglobulinemia. The critical and stimulating discussion of the present state of knowledge of this field and of the diagnostic importance of the different methods is of great value. In the fourth and last part of the book the quantitative aspects of the constituents of the  $\gamma$ -system in the normal and pathological state (changes in blood levels) is discussed and summarized in useful tables. The diversity of the topics, exemplified by the discussion of the

genetic aspects of the agammaglobulinemia and of the results of experiments in which the mentioned proteins were treated with mercaptoethanol, attests to the value of this book. Finally, mention should be made of the excellent quality of the printing and especially of the illustrations.

This impressive monograph in which a field of research on the borderline of protein chemistry, immunochemistry and medicine is discussed, is to be recommended highly to investigators and clinicians who have a major concern in these disciplines.

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**Thermoelectricity. Including the Proceedings of the Conference on Thermoelectricity Sponsored by the Naval Research Laboratory, September, 1958.** Edited by PAUL H. EGLI, U. S. Naval Research Laboratory, Washington, D. C. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 1960. X + 407 pp. 15.5 X 23.5 cm. Price, \$10.00.

Increased financial support for scientific work has created an expanded market for scientific books and journals, so that almost any technical work can now be published at an assured profit. Thus we have had in recent years an outpouring of new journals and symposium volumes from commercial publishers. If these publications were a little bit worse, it would be easy to dismiss them as a waste of money. They often fall, however, into a no man's land of value. If four or five people see one \$12 book and learn anything at all from it, it is hard to deny that they have had their money's worth.

The merchandising of these books to scientists often lacks exactitude. The jacket of the present book, for example, states that "Section I presents an introduction and broad survey of the fundamental concepts of thermoelectricity." This statement, which is copied from the editor's preface, is simply not true. The actual content of Section I is as follows: There is a chapter by C. Zener which points out the application of Carnot's theorem to thermoelectric devices. There is a chapter by W. Teutsch (with a grandiose title) which briefly defines the thermoelectric coefficients. There is a chapter which describes several devices developed by the Whirlpool Corporation. "The development of this device grew out of the cooperation of the Whirlpool Corporation and the Franklin Institute of Philadelphia. The need for its development arose out of the desire of the liquor industry to have a reliable, accurate and unquestioned instrument to determine the density of liquor"—and so on. We also learn that a similar device can be used to cool beverages but that "such items probably would not have the market potential now enjoyed by full size refrigerators." The concluding chapter in this section on "fundamental concepts of thermoelectricity" is an analysis by two G. E. engineers of "some considerations of the problems of minimizing the weight of thermopile generators in space applications."

Once these "fundamentals" are disposed of, the book branches out into the fascinating field of "materials research." There are good informative chapters on how to measure and interpret a wide variety of properties of solid materials: thermal and electrical conductivity, mechanical properties of ceramics, thermionic emission, and even thermoelectric coefficients. There are also short chapters on the properties of mixed valence semi-conductors and porous semiconductors. Most of these chapters were originally prepared for a 1958 Naval Research Laboratory symposium. They are excellent summaries and do much to alleviate the pain caused by the earlier sections. A short chapter on liquids appears to have wandered in by mistake from another book.

The book has been given a truly beautiful production. Paper, illustrations, printing and binding are of the highest quality. In other words, the packaging is up to the highest standards of a highly competent industry.

If a book like this were presented modestly and truthfully we could welcome it as a survey of the technology of thermoelectric devices, with valuable background information for engineers working in the field. As a scientific work on "Thermoelectricity" it is poorly organized, incomplete and strongly biased toward the development work done in a

few industrial laboratories. The important Russian work in this field, for example, is only briefly mentioned, and the general thermodynamic theory is not discussed. The omission of an author index, in view of the sketchy bibliographies, may have been a defensive measure. My criticism finally comes to the point that this is a fairly useful book, but the same amount of time and effort could surely have produced a more useful one.

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**Fundamental Aspects of Normal and Malignant Growth.**

Edited by WIKTOR W. NOWINSKI, Associate Professor of Bio-chemistry, Director of Tissue Metabolism Research Laboratory, University of Texas, Medical Branch, Galveston, Texas. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, New Jersey. 1960. xv + 1025 pp. 18 X 25 cm. Price, \$37.50.

This large volume consists of 13 separate monographs, each by an outstanding investigator in his field. The subject matter is concerned with the many aspects of growth, including definitions of growth (L. von Bertalanffy), the metabolism of proliferating cells (S. Kit), the role of nucleic acids in growth (J. Brachet), embryonic development and induction (A. M. Dalcq), regeneration (A. E. Needham), plant growth (K. V. Thimann) and aging (W. Andrew). Special chapters are given to wound healing (W. W. Washburn, Jr.), nitrogen metabolism and growth (H. Clark) and the protein-forming system of developing cells (H. Hermann). Neoplastic problems are reviewed in separate sections on carcinogenesis (A. Kirschbaum), the metabolism of the cancer cell (A. C. Griffin), and the effects of antimetabolites on mitosis (J. J. Bieseke). The monographs are generally broad and detailed, with an extensive list of references; several have been published separately in a more extensive form. The book, however, falls short of the goals of the editor, to publish an "introduction into various aspects of the growth problem," and to provide "an up-to-date survey of the results of basic cancer research and allied fields." While an investigator may find the book useful for information or references on a particular problem, it is not integrated or organized to provide a coherent or unified synthesis of the problems of growth. Thus, it does not wholly succeed as an introduction, a general survey, a fundamental analysis, or a current review of the status of our knowledge on normal and malignant growth. References are lavishly used, but only a few are cited after 1957. A detailed outline is provided for each chapter, and there is a 52 page subject index.

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**Anleitungen für Die Chemische Laboratoriumspraxis.** Band IV. Polarographisches Praktikum. Zweite Neuedition. By JAROSLAV HEYROVSKY. Springer-Verlag, Heidelberger Platz 3, Berlin-Wilmersdorf, Germany. 1960. vii + 116 pp. 16 X 23.5 cm. Price, DM. 19.80.

This second edition of this famous little book adheres to the purpose of the original edition, namely, to introduce the reader to the field of polarography by emphasizing basic technique and practical applications. In the author's own words "Das Werk soll als Einführung in die polarographischen Arbeitsmethoden dienen, namentlich für Analytiker, die die Polarographie als Routine-analyse benutzen sollen; diejenigen, die in der Polarographie wissenschaftlich arbeiten wollen, können sich nicht mit dieser Schrift begnügen und sollen eines der modernen Lehrbücher der Polarographie studieren."

The text comprises two main parts. The first (Messanordnungen) reviews in 53 pages cardinal aspects of polarographic technique, with emphasis on manipulative details and the simplest instrumentation. The neophyte should appreciate the wealth of detailed practical directions un-