been published as a separate book. In accordance with its title, "Silicone Polymers," most of the chapter's 130 pages are devoted to polysiloxanes with only a few pages covering polysilazanes, polysilalkylenes and arylenes, polysilanes and polymetallosiloxanes. The latter four systems are discussed in more detail in Chapters 6 and 7.

Chapter 6 (R. K. Ingham and H. Gilman), in addition to polymers based on silicon–silicon and silicon–carbon chains, also reviews polymers containing germanium, tin and lead in their backbones. Most of the research covered by this chapter is quite recent and the authors have succeeded in presenting an excellent up-to-date summary of the large amount of work which has been published.

Chapter 7 by D. C. Bradley is primarily concerned with linear polymers containing metal–oxygen bonds. After a discussion of metal alkoxides—mostly oligomers—the polymeric products formed by their hydrolysis are reviewed as well as polymetallosiloxanes and polysiloxymetalloxanes.

This reviewer will not comment on Chapter 8 ("Coordination Polymers," by B. P. Block) since he had the opportunity to discuss the manuscript with its author. For those interested it should be pointed out that two groups of polymers are discussed—natural and synthetic coördination polymers, the former referring to materials that are included even though their polymeric structure is probably limited to the crystalline state. Since a very broad definition of the term coördination polymer has been used, the review is not limited to chelate polymers.

A brief chapter on electron-deficient polymers by A. J. Leffler which includes metal alkyls, boron and aluminum hydrides and carboranes, concludes the book. Many of the compounds mentioned are of interest as building blocks for high polymers. Success in this field since the book appeared points out the importance of understanding the basic chemistry of such systems.

As far as typographical errors are concerned the book contains no more than the usual number of misprints. Thus the formula for phenylsilsesquioxane on p. 12 is given as $C_6H_5SiO_{2/3}$ and the arrows are incorrect at the bottom of page 356—to mention two of the errors which the reader will not find too disturbing.

More attention to details on the part of the editors could have made the book shorter and probably clearer without impairing the large amount of well documented information. For example, the editors apparently made no effort to have the authors adhere to a uniform nomenclature. Quite often there are confusing inconsistencies, even within the same chapter. Thus in Chapter 7 the R_3SiO- group is referred to as silyl oxide (p. 411), silyloxy (p.433), siloxy (p. 434) and finally siloxano (p. 433). Furthermore, the terms "polyorganosiloxanometalloxanes" and "polyorganometalloxanosiloxanes" are introduced to describe two types of polymers. Yet the author himself uses the more common names for these polymers, as illustrated by the statement on p. 437 under the heading "Polyorganometalloxanosiloxanes": ". .In recent years Andrianov and co-workers developed other methods for preparing polyorganometallosiloxanes." The same polymers are named polysiloxanemetalloxanes in Chapter 5 (p. 288). All this may not seem important—but the reviewer feels that the book could have provided systematizing leadership instead of adding confusion by introducing new terminology which it does not even use consistently.

Because of the substantial price difference "Inorganic Polymers" will have competition from another recent book on the same subject ("Developments in Inorganic Polymer Chemistry," edited by M. F. Lappert and G. J. Leigh, Elsevier, 1962 ($10.00)) for a place in the chemist's personal library.

PENNSALT CHEMICALS CORPORATION
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The Chemistry of Rhenium. By K. B. LEBEDEV, Candidate of Technical Sciences, translated by L. RONSON in collaboration with A. A. WOOLF, Ph.D. Butterworth and Co. (Publishers) Ltd., London, 88 Kingsway, W. C. 2. 1962. x + 105 pp. 14.5 × 22 cm. Price, $7.50.

The chapter headings, Production and Application, Rhenium Sources, Extraction of Rhenium, and Preparation of Metallic Rhenium, are more indicative of the contents of this book than is its title. Brief chapters on the properties, compounds and analytical chemistry of rhenium are incomplete and contain some rather loose statements and errors. The status of rhenium amalgams and carbides is not clear from the text. The citation of rhenium tetroxide complete with vapor pressure curve will jar most readers, as will the use of contemporary (1932) heptoxide data from the same source. Much of the excellent work of Boyd, W. T. Smith, Cobble, and others in this country appears to be unknown to the author. Presumably, the Russian and foreign literature through 1959 has been utilized. But, in spite of the title, the book does not intend to replace those of Druce or of Tribalat; *i.e.*, it is not concerned with the "pure"chemistry of rhenium.

Parenthetically, neither is this work as complete or as authoritative as is the recent compilation edited by Gonser with respect to alloys, applications and some aspects of metallurgy. The book does, however, give a relatively complete summary of Russian practice in attempting the extraction and economical isolation of rhenium from a great variety of materials. This is the primary purpose of the book, and the extractive procedures are adequately described and often novel to those in this country. While of some interest to metallurgists, the work is not complete regarding the metallurgy of rhenium.

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Ions in Hydrocarbons. By ANDREW GEMANT, Research Associate, The Grace Hospital, Detroit, Michigan. Interscience Division, John Wiley and Sons, Inc., 440 Park Avenue South, New York 16, N. Y. 1962. viii × 261 pp. 16 × 23.5 cm. Price, $12.50.

The author has attempted coverage of a tremendous field in a short treatise. His efforts have resulted in a pleasant, readable introduction to the subject. The book contains sections covering (1) correlation with other fields; (2) hydrogen ions; (3) ions in amine–aliphatic acid solutions; (4) ions from oxidation of *ortho*-substituted aromatics; (5) ions from ozonolysis of aromatics; (6) metal–complex ions; (7) electron transfer ions and (8) radiolytic ions. Unfortunately each section treats its subject matter in so superficial a manner as to leave much to be desired in a reference book. If one looks upon this book as an introduction to the subject of ions in hydrocarbons, it fulfills its purpose and can be recommended on this basis. However, a second thought might be necessary before an expenditure of $12.50 is considered.

MELPAR, INC. M. J. ALLEN
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Elements of Chemical Thermodynamics. By LEONARD K. NASH, Department of Chemistry, Harvard University. Addison–Wesley Publishing Company, Inc., Reading, Mass., 1962. ix + 118 pp. 15 × 22.5 cm. Price, $1.75.

This book is one in a series on Principles of Chemistry, designed to be used as a supplement to an introductory text on general chemistry. Prepared for the beginning college student, the topics covered are: an introduction on heat and work; the first principle of thermodynamics, including enthalpy, thermochemistry, heat capacity, ideal gases; the second principle of thermodynamics, including the Carnot cycle and entropy; consequences of the thermodynamic principles, including free energy and equilibrium, colligative properties, equilibrium constant, galvanic cell, and the temperature dependence of the equilibrium constant. Three appendices give, respectively, some operations of the calculus, problems, and some thermodynamic data at 25°. The author carefully states the topics which are omitted from this text. This book represents a good step in the direction of bringing chemical thermodynamics as such to the student in the first course in college chemistry. The author has the material under actual trial for the second year with students at his university, and reports good success. Lecturers in general chemistry will wish to examine this book carefully to determine whether it will fit into their respective courses.

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Electronics for Scientists. Principles and Experiments for Those Who Use Instruments. By H. V. MALMSTADT, University of Illinois, and C. G. ENKE, Princeton University, with the assistance of E. C. TOREN, JR., Duke University. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1962. xi + 619 pp. 16 × 23.5 cm. Price, $10.75.

This book is written to be of practical service to a wide variety of scientists covering the range from biologists and medical researcher through to chemists, physicists and engineers. This is a very ambitious undertaking and it is with some skepticism that this reviewer undertook to evaluate the success with which the objective was reached. There are many books and pamphlets on the subject of electronics which give simple pictures of how various electronic devices work. However, to say that these are of practical value is another matter.

An experimental scientist should be expected to produce data as good as his instrumentation permits and his experiment justifies. Thus practical for him often means the sophisticated