also a delightful first hand account, by A. T. James, of the growing pains of early gas chromatography apparatus. This reviewer found several ideas in this book which he plans to adapt in some of his own applications; he feels certain that even a superficial reading will yield a similar benefit to most readers. He was impressed by the array of data on relative retention times obtained for a variety of substances on each of several standard columns available for one commercial instrument. He deplores, however, the type of paper submitted for a few of the apparatus manufacturers. It would appear that one or two of these articles had been prepared for the mystification or astonishment of the reader rather than as contributions to scientific or technological knowledge.

The final bibliography, continuing the 442 entries compiled in the first volume of this series, now extends to 1975 entries. While apparently exhaustive, the reviewer feels that the bibliography would be more useful if the classification had been left in the chronological form in which it certainly was first obtained. The present arrangement, alphabetical by the first author's surname, would appear to be the least useful format.

N. R. C. No. 6475
DIVISION OF PURE CHEMISTRY
NATIONAL RESEARCH COUNCIL K. O. KUTSCHKE
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Gmelins Handbuch der Anorganischen Chemie, Achte Völlig Neu Bearbeitete Auflage. Quecksilber. Lieferung. Geschichtliches. Vorkommen. Darstellung. Physikalische Eigenschaften des Elements. System-Nummer 34. Edited by Gmelin-Institut. Begonnen von R. J. MEYER. Fortgefuhrt von E. H. ERICH PIETSCH. Stellvertretender Hauptredakteur, Alfons Kotowski. Verlag Chemie, G.m.b.H., Pappelallee 3, Weinheim/Bergstr., Germany. 1960. xvii + 466 pp. Price, $67.50.

This work deals with the history, occurrence, preparation and the physical properties of the element mercury with very little pertaining to its compounds. The historical section of this volume has some 80 pages. This part is quite complete and should be of decided value to the student of the history of chemistry.

The occurrence of mercury, both free and in its ores and minerals, is thoroughly discussed. A survey of countries and regions where mercury occurs is listed with a geological inventory on this metal.

The part dealing with the physical properties of the element is most complete. Many pages are given over to the thermodynamic properties of the metal in all of its states. Some 27 pages contain a complete and thorough expose on the subject of colloidal mercury. I am sure no other inorganic references volume has such an unique discussion of this phase of the metal.

This volume should be welcomed to the family of Gmelins Handbuecher.

DEPARTMENT OF CHEMISTRY
INDIANA UNIVERSITY FREDERIC C. SCHMIDT
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Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Lithium. Erganzungsband. System-Nummer 20. Edited by Gmelin-Institut. Begonnen von R. J. MEYER. Fortgefuhrt von E. H. ERICH PIETSCH. Stellvertretender Hauptredakteur, ALFONS KOTOWSKI. Verlag Chemie, G.m.b.H., Pappelallee 3, Weinheim/Bergstr., Germany. 1960. xxviii + 525 pp. 17.5 × 25 cm. Price, $77.50: Cloth bound, $78.50.

This is a supplementary volume to that which appeared in 1928, and it is much more complete and inclusive than the original.

The geochemical references of the element lithium take up some 142 pages which include both terrestrial and extraterrestrial studies. Economic deposits of lithium ores of practically every region of our globe are specifically listed. Analytical data are given regarding the extent of the lithium deposits.

Physical chemical data on both the element and its compounds are about as complete as could be. Both liquid and solid state of the element are discussed. Even mechanical properties, such as Young's modulus and compressibility of the solid, are given. This seems to be unique for such a book.

The properties, both physical and chemical, of the salts of this element are extended over the original volume.

It is encouraging to note that many data have been included regarding non-aqueous solutions of the salts of lithium, particularly conductance and thermochemical data.

This supplementary volume is most valuable and is done with the usual and expected German thoroughness.

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Gmelins Handbuch der Anorganischen Chemie. Achte Völlig Neu Bearbeitete Auflage. Schwefel. Teil b. Lieferung 2. System-Nummer 9. Edited by Gmelin-Institut. Begonnen von R. J. MEYER. Fortgefuhrt von E. H. ERICH PIETSCH. Stellvertretender Hauptredakteur, ALFONS KOTOWSKI. Verlag Chemie, G.m.b.H. Pappelalle 3, Weinheim/Bergstr., Germany. 1960. xxxviii + 758 pp. 17.5 × 25 cm. Price, $111.00: Cloth bound, $112.00.

This volume constitutes the second half of Part B on the subject of the element sulfur. Here the oxides and particularly the oxyacids of sulfur are described both from the standpoint of physical properties and their chemical behavior; 183 pages alone are given over to the properties of sulfuric acid. The survey is most complete.

Oxyacids of sulfur of both lower and higher oxygen content than sulfuric acid are considered. The physical properties and chemistry of some 18 oxy and thio acids of the element are listed. Besides these acids several pages are given over to the polythionic acids. Complete and well chosen analytical determinations for the ions of the simple and more complex acids are given in detail.

This book has many good two-component phase diagrams of water plus the oxides of sulfur as well as those involving the acids themselves. This volume contains all that is known about the oxygen compounds of sulfur. I doubt that any information has been neglected. It is the "One Thousand and One Tale" on this subject.

As is usual with a Gmelin Handbuch, the literature references are complete.

DEPARTMENT OF CHEMISTRY
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International Series of Monographs on Inorganic Chemistry. Volume 3. An Introduction to Co-ordination Chemistry. By D. P. GRADDON, M.Sc., Ph.D., F.R.I.C., Senior Lecturer in Inorganic Chemistry in the University of New South Wales. Pergamon Press Inc., 122 East 55th Street, New York 22, N. Y. 1961. vii + 111 pp. 15 × 23 md. Price, $4.00.

During the past decade, a considerable number of books on coördination chemistry has appeared. These have been of great variety, ranging from small to large, and from broadly general to highly specific. There have been books for the general reader, textbooks, reference books, and collections of symposium papers. All of them have been well received and have won wide readership. As. Dr. Graddon points out in the preface to his book, this great interest in coördination chemistry indicates "that the process of coördination, far from being an academic sideline, is one of the dominant factors determining the chemistry of the elements."

This little book is extremely well written, and should be useful, not only to students (for whom it is primarily intended) but to all who want a brief introduction to the modern aspects of coördination chemistry. The discussions of ligand-field theory, and the comparison of it with the valency bond theory, and the chapter on carbonyls and π-complexes, are particularly well done.

While this volume can well serve as "An Introduction to Co-ordination Chemistry" it is not a general introduction, for many important topics are omitted, or are touched on only lightly. These come from classical coördination chem-