Chapter I is an introduction wherein pertinent aspects of kinetics are discussed and the basic organization of the work is explained. In Chapter II the various experimental methods for generating free radicals and measuring their activities are critically reviewed. Chapter III is an excellent addition wherein kinetic and thermodynamic methods for evaluating bond-dissociation energies are discussed. Chapters IV and V cover the role of free radicals in thermal and photochemical reactions, respectively. Chapter VI is a discussion of the various types of elementary processes, well illustrated with examples from the literature. Chapters VII–XV cover individual elementary reactions, classified as in the first edition, according to the elements participating in the reaction.

Workers in the field of free radical reactions owe a real debt of gratitude to Dr. Steacie for this superb critical evaluation of the field. This work should be in the hands of every chemist interested in free radical chemistry. It is unfortunate that the publishers have deemed it necessary to price the book for the industrial market rather than for the university professor and his graduate students.

DEPARTMENT OF CHEMISTRY
ILLINOIS INSTITUTE OF TECHNOLOGY HARRY E. GUNNING
CHICAGO 16, ILLINOIS

Gmelins Handbuch der Anorganischen Chemie. Schwefel, Teil A, System-Nummer 9. Edited by E. H. ERICH PIETSCH. Verlag Chemie, G.m.b.H., Weinheim/Bergstr., West Germany. Available in the U.S.A. through any American book importer such as Walter J. Johnson, Inc., 125 East 23rd Street, New York 10, N. Y., and Stechert-Hafner, Inc., 31 East 10th Street, New York 3, N. Y. 1953. xvi + 252 pp. 17.5 × 25 cm. Price, $34.00.

The publication of this Part A completes System Number 9 on the chemistry of the important element sulfur and its compounds for the Eighth Edition of the Gmelin Handbuch. It also provides an index for the entire volume. In line with the general plan of the Handbuch, System Number 9 covers elementary sulfur and its compounds with hydrogen, oxygen, nitrogen and the halogens. Compounds of sulfur with elements treated later in the Gmelin series are discussed in the later volumes.

The new Part A, dealing only with elementary sulfur, affords an exhaustive and excellent coverage of the formation and production of the many different polymorphic forms, their phase equilibria, physical properties and electrochemical characteristics. The chemical behavior of sulfur in general toward other materials and classes of substances, such as water, alkalies, acids, non-metals, metals, hydrides, oxides, halides and salts is summarized. The solution characteristics of sulfur in non-aqueous solvents are treated in detail. References to patents are included.

The literature of sulfur is covered completely up through December, 1949, and all of the references carried over from earlier editions of the Handbuch have been re-evaluated in the light of modern theory. This comprehensive, critical and very usable treatment is particularly welcome because of the great confusion of reports in the literature concerning the various modifications of sulfur. Chemists, both academic and industrial, will find it most helpful.

CORNELL UNIVERSITY
ITHACA, N. Y. A. W. LAUBENGAYER

Rare Metals Handbook. Edited by CLIFFORD A. HAMPEL, Chemical Engineer, Homewood, Ill. Formerly Supervisor, Extraction Metallurgy, Armour Research Foundation, Chicago, Illinois. Reinhold Publishing Corporation, 330 West 42nd Street, New York 36, N. Y. 1954. xiii + 657 pp. 16.5 + 23.5 cm. Price, $12.00.

This is a very useful reference book of data on more than 35 of the less familiar elements . . . . . an undertaking in which 34 contributors participated in the preparation of its 29 chapters. The book will probably be of greatest use to process metallurgists and mining geologists, although chemists, physical metallurgists, physicists and mechanical engineers will also find it a source of useful information. The style and chapter organization are remarkably uniform, when one considers the plurality of authorship. The text which accompanies its numerous tables is very well written . . . . . far from dry and uninteresting. In many respects it performs the same functions as does Van Arkel's "Reine Metalle."

A brief historical introduction is given for each of the elements, followed by sections which discuss such topics as occurrence, production and economic statistics, derivation, physical properties, chemical properties, toxicity, alloys, fabrication techniques and applications. Abundant references to recent technical and scientific publications appear at the end of each chapter.

Care seems to have been exercised in the tabulation of data, although a few errors appear even to the browsing eye of the reviewer. Thus, the latent heat of fusion of lithium is given as 32.81 calories per gram (Table 2, Chapter 12). This value, which appears in practically all handbooks (including Lange's Handbook of Chemistry, Landolt-Börnstein, and the American Society of Metals Handbook, to mention a few) is clearly much too low and falls far short of Richards' rule (ΔS = 2 e.u./g. atom). An unfortunate repetition of about one page of text occurs on pages 46 and 47.

On the whole, this is a reliable helpful ready reference which deserves a place on the limited bookshelf. The paper, illustrations, and general format are good.

RESEARCH INSTITUTES 348
THE UNIVERSITY OF CHICAGO NORMAN H. NACHTRIEB
CHICAGO 37, ILLINOIS

Chemical Specificity in Biological Interactions. Edited by FRANK R. N. GURD. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. xv + 234 pp. 15.5 × 23.5 cm. Price, $6.00.

This is the third volume of the Memoirs of the Harvard University Laboratory of Physical Chemistry Related to Medicine and Public Health. Like its predecessors in the series ("Enzymes and Enzyme Systems, Their State in Nature" and "Blood Cells and Plasma Proteins, Their State in Nature"), this volume is based on the contributions to a symposium organized annually by the Laboratory and reflects in many ways the scientific interests of the director, Professor E. J. Cohn, who died shortly before the volume went to press.

Being a key problem in biology, the theme of specificity merits the attention that a symposium can provide, and efforts to focus thinking on the question of specificity are to be applauded. It has become a truism nowadays that the particular properties of organisms and cells are to be accounted for in the precise structure and the restricted organization of their constituent parts. This precision in structure and restrictedness in organization is what is meant by *specificity* and what is believed to underlie such specific relations as exist between antigens and their antibodies, enzymes and their substrates, genes and the metabolic processes they exert a direct effect upon, inductors and the pathways of cell differentiation they induce. A major goal of modern biology is to discover the ways in which the structural features of molecules contribute to the specificity of biological processes. It is becoming increasingly clear that proteins and nucleic acids are involved in most of these processes, and for this reason the detailed structure of these substances needs to be understood. Progress is being made in this direction and in concomitant studies of the extrinsic conditions essential for the expression of the specific activities of these substances. Because of its vastness and complexity, a periodic comprehensive consideration of the subject should be both enlightening and stimulating.

Unfortunately, not all of the papers in the present volume bear with equal relevance on the subject of specificity, nor do they furnish as a whole a sufficiently broad picture of the present state of our knowledge. Recent experimental advances in chemical immunology have been neglected, for example, and one would have liked to see contributions on the X-ray and amino acid sequence analysis of proteins as well as a more expanded section devoted to nucleic acids, the sole contribution on this topic being W. E. Cohn's review of his highly interesting studies utilizing ion-exchange chromatography. This criticism does not detract from the fact that many of the papers are excellent reviews of the particular fields of which they treat. Of special value is a group of articles dealing with specificity in protein–metal