are retained without change except for the completion of the data for reference 33 and the aforementioned dropping of reference 9c (which was, significantly, the projected third volume of the treatise by Prigogine and Defay). Seven new references are cited in the second edition. They all appear, however, in connection with Chapter VII. Thus the author has ignored the entire recent literature on the subject matter of the first six chapters. In my mind, the most important single omission is a reference to the encyclopedic article by Meixner and Reik which appeared in 1959 in the *Handbuch der Physik*. I would have liked comments on the pertinent papers by Coleman and Truesdell (*J. Chem. Phys.*, **33**, 28 (1960)) and Koenig, Horne and Mohilner (*J. Am. Chem. Soc.*, **83**, 1029 (1961)) but probably these appeared too late to be mentioned.

In brief, the second edition of "*Thermodynamics of Irreversible Processes*" is essentially the same concise, readable introduction as the first edition. It still captures remarkably well the essence of the theory without dwelling on details and subleties. I therefore recommend it to the beginner on the condition that he remember that the book offers no clues to most of the literature which has appeared since 1954. For these, he must turn to the other important textbooks and treatises which are now available.

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Nonequilibrium Thermodynamics. A Phenomenological Theory of Irreversible Processes in Fluid Systems. By DONALD D. FITTS, Department of Chemistry, University of Pennsylvania. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1962. xviii + 173 pp. 16 × 23.5 cm. Price, $7.95.

This book is intended as a sequel to the recent thermodynamics text by Kirkwood and Oppenheim, and is being billed by the publisher as "the first textbook in the field of nonequilibrium thermodynamics." What makes it a textbook rather than a monograph is presumably the inclusion of a small number of problems at the end of certain chapters. In other respects, the book resembles deGroot's work on the same subject, although the range of material covered is considerably narrower. The author has confined his attention to transport processes occurring in fluids, and his treatment is rigorously postulational in character. Thus, for example, the Onsager theory leading to the reciprocal relations is discussed only in an appendix, and rather inadequately at that.

The first five chapters of the book are devoted to a development of general transport equations in a fluid with temperature, pressure and composition gradients. Three postulates are formally introduced along the way: the local equilibrium assumption, the linearity of the relations between fluxes and driving forces, and the Onsager reciprocal relations. Chapter 3 includes a discussion of the problem of defining a heat flux; two alternate definitions are given, which seems a rather unnecessary complication.

The remaining chapters are concerned with specific types of transport phenomena: heat flow, electrolytic conduction, ordinary diffusion, thermal diffusion and sedimentation. There is also a final chapter applying the reciprocal relations to chemical reactions near equilibrium. In addition to the appendix on the Onsager theory already mentioned, there are three other appendices, respectively covering tensors, stress-strain relations in viscoelastic media, and the effect of viscous stresses and inertial forces on the transport equations.

The general approach is probably too formal to appeal to most students, and concrete applications to particular systems are few in number, the principal one being a discussion of diffusion in the NaCl-KCl-water system. Even here, the only result is an experimental check on the validity of the Onsager relations when applied to cross-diffusion coefficients. The principle of minimum entropy production, surely one of the most interesting ideas to come out of irreversible thermodynamics, is not even mentioned. The student who has waded through the book (incidentally, he had better have taken a course in vector analysis beforehand) is likely to emerge wondering what all the complex manipulations and discussions of alternate definitions of transport coefficients have really accomplished. He will have been told, in considerable detail, how to set up a transport equation, but will have no idea of what to do with it from there on.

But beyond these criticisms lies the question of just how much time should be devoted to a presentation of irreversible thermodynamics in the already overcrowded curriculum facing the average physical chemistry graduate student. By writing a text on the subject, the author is suggesting a minimum of one quarter. In the opinion of this reviewer at least, to justify the expenditure of that much time, the scope of a course on irreversible processes would have to extend well beyond the contents of the present volume, to include not only the statistical foundations of the Onsager theory, but also some discussion of the molecular mechanisms by which transport phenomena occur, as well as a number of examples in which the transport equations are actually solved to give the position and time dependence of thermodynamic variables.

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Comprehensive Inorganic Chemistry. Volume Eight. Sulfur, Selenium, Tellurium, Polonium, and Oxygen. By ROBERT C. BRASTED, Professor of Chemistry, School of Chemistry, University of Minnesota. D. Van Nostrand Company, Inc., 120 Alexander Street, Princeton, N. J. 1961. ix + 306 pp. 16.5 × 23.5 cm. Price, $10.00.

This volume is the eighth that has been produced in a series that eventually will build up to a total of eleven. Its preface states that the volumes are presented as a reference work on the chemical elements and their compounds. The term comprehensive, which appears in the title, is used more in the sense of the fields covered than in any concept of encyclopedic treatment. Due to the brevity of treatment, coverage of the current literature is achieved by the author "exercising to an extreme degree, selectiveness in the material finally incorporated within a volume." A strong effort has been placed on including recent pertinent references. The volumes are intended for use by the advanced undergraduate, the graduate student, and the industrial and manufacturing chemist.

Volume VIII, which deals with the chemistry of sulfur, selenium, tellurium, polonium and oxygen, fulfills the aim as stated above. The selected material is well organized and is suitable for a rapid orientation to the general descriptive chemistry of these elements and their common compounds. It also presents considerable useful factual data on the more common aspects of the area. An abundance of literature references, mostly for the period 1945–1960, document the textual material and encourage more detailed search.

There is increasing and urgent need for up-to-date compilations of descriptive material to supplement the many new books which are devoted to general principles of inorganic chemistry but which are very light on factual information. The coverage and critical evaluation possible in this abbreviated treatment of course cannot compare with that available in the encyclopedic Gmelin Handbuch. But for the reader who wants a rapid over-all survey this volume fills a definite need and deserves a place on all scientific library shelves. Research workers and industrial chemists who are specializing in the chemistry of the sulfur group of elements should find the book a good addition to their personal reference shelves. The author has done chemistry a fine service by compiling this useful material.

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Hydroboration. By HERBERT C. BROWN ,R. B. Wetherill Research Professor, Purdue University. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1962. xiii + 290 pp. 16 × 23.5 cm. Price, $10.00.

It is less than six years since Professor H. C. Brown first reported that olefins may be converted very simply to alkylboranes, a reaction conveniently termed hydroboration. The resulting organoboranes have proved to be of very great synthetic utility in organic chemistry; *e. g.*, oxidation with