Thus, similar accounts of Rutherford's early life are told in many of the papers. It is, of course, easy to skim over this duplicated material rather quickly. It is sometimes even rather interesting to note the minor variations in the same anecdotes.

A few fragments from Rutherford's correspondence are preserved in this book. The exchange with Schuster in which Rutherford discussed a possible move from McGill to Manchester will strike a familiar chord for any modern academician who has been through the same process. Rutherford's early comments on Bohr's work in atomic structure will no doubt amuse every reader.

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Metallurgy

Radioactive Tracers in Physical Metallurgy. C. Leymonie. Translated from *Les Traceurs Radioactifs en Métallurgie Physique* (Paris, 1960) by Vernon Griffiths. Wiley, New York, 1963. xiv + 208 pp. Illus. $8.50.

In view of the numerous potential applications of radioisotopes to the solution of metallurgical research problems, it is perhaps surprising that a book on the subject has not been published previously. Undoubtedly, a comprehensive and critical exposition of the usefulness and the limitations of the methods, the design of experiments using tracers, the techniques for handling radioactive material, and related topics, would constitute a valuable addition to the book shelves of many metallurgists.

Those who are searching for a single source of such information are likely to be disappointed with this volume. The chapters on the nature of radioactive isotopes, the properties of their radiations, and the measurement of radiation and the general discussion of tracers in metallurgy are very brief (only 38 pages). Although this material provides a well-written introduction to the subject, anyone who contemplates using tracers for the first time will need to seek additional sources of information and guidance.

The section on diffusion is somewhat more comprehensive. Following the brief chapter that surveys the field, there is an extensive discussion of various methods of measuring diffusion coefficients; this examination is particularly valuable because it considers some clever Russian developments with which many Western workers are not familiar. A rather detailed review of the results of tracer diffusion studies is followed by a quite extensive discussion of grain boundary diffusion. The treatments of surface diffusion of metalloids in metals, and diffusion in liquid metals are very brief, a reflection of the rather limited amount of work in these areas.

Finally, there are three sections which describe the use of tracers in studies of segregation, surface reactions, and vapor-solid equilibria. Each section is characterized by the completeness of its review of published work, but each lacks a critical evaluation of the topic considered.

In summary, the book provides a good introduction to the language and basic concepts of radioactivity, and an extensive compilation of published metallurgical research in which tracers have been used. Its value will be largely as a guide to published literature rather than as a source of detailed instructions for using tracers in research.

The translation into English, with several exceptions, follows the original French edition with reasonable accuracy. Unfortunately, there is a disappointingly, almost an inexcusably, large number of minor typographical errors; in this sense the editing of the translation leaves much to be desired.

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Conference Report

Fracture of Solids. Proceedings of a conference held at Maple Valley, Washington, August 1962. D. C. Drucker and J. J. Gilman, Eds. Interscience (Wiley), New York, 1963. x + 708 pp. Illus. $28.

The fracture of materials is not only of vital technical importance but also represents a fascinating scientific problem. Consequently, a prodigious amount of energy and funds have been expended in attempts to secure a satisfactory rationale for this phenomenon, from both a theoretical and an experimental viewpoint, and a wealth of publications in the technical literature record this search. Despite considerable progress, the present state of the art is unsettled; this situation is reflected in the proceedings of this conference, which was held only 3 years subsequent to a similar international meeting.

The volume is divided into four sections: Continuum Mechanics, Microstructural Phenomena, Atomistic Mechanics, and Environmental Effects. Each section commences with a thoroughly annotated and comprehensive survey of the subject, written by a recognized authority, and is followed by a group of from four to seven invited research papers. The latter are essentially unrelated and deal with narrower aspects of the topic, although some of them include significant literature reviews. An excellent balance was maintained between the space devoted to the continuum and the atomistic viewpoints. The logical order in which the content is presented attests to editorial care, although two characteristics, which appear to be unavoidable in any compilation of this type, are present—on one hand, overlap and, on the other, isolation. It is also significant that all sections incorporate both theoretical and experimental results, although, quite naturally, the former dominates the continuum area, while the latter overshadows the investigations into microstructure and environment. The vast majority of the contributions are from the United States, with a smaller representation from Japan and England.

As in the past, the major objectives of the investigators were concerned with the development of criteria for both the nucleation and the propagation of cracks. This is pursued on the basis of stress and energy determinations, in the first section, utilizing the results of elasticity and plasticity theory; by means of microscopic examination in the second, where a distinction is made between brittle cleavage and fatigue fracture and ductile and creep rupture; and by the dislocation mechanisms in the section on atomistic mechanics. A distinct measure of progress in the field is the fact that the present contributions evidence a much greater cross-pollination (or perhaps mutual tolerance) between the continuum and atomistic approaches than is evident in even recent publications, an indication that the gap between these views is gradually narrowing.

The volume will be a valuable addition to the library of anyone who is