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

even remotely connected with the field of fracture, for it is an authoritative source for background information and for information about current experimental practices and concepts of the phenomenon. It does not pretend to be a complete answer to the technical problem, but it should serve as a useful guide in the further development of the subject.

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New World Culture History

Aboriginal Cultural Development in Latin America: An Interpretative Review. Betty J. Meggers and Clifford Evans, Eds. Smithsonian Institution, Washington, D.C., 1963. vi + 149 pp. Illus. $5.

This publication consists of ten papers prepared by specialists on the aboriginal culture history of specific geographical regions of Latin America and presented at a symposium held in Mexico City on 22 August 1962, as a part of the 35th International Congress of Americanists. The 11th paper, by Betty J. Meggers, attempts to synthesize the content of the others into a comprehensive outline of the major factors that underly the rise of civilization in the New World.

As one might expect, the papers vary widely in their adequacy. Limited space precludes a critique of each paper, but I offer the following ranking of the papers in terms of their clarity of organization, accuracy, and overall probability and the degree to which specific problems were pointed up rather than glossed over. From best to worst they run: Coe on southeastern Mesoamerica; Gonzales on northwest Argentina; Estrada and Evans on Ecuador; Di Peso on northern Mexico; Baudez on lower Central America; Augulo Valdés on Colombia; Kidder, Lumbreras, and Smith on the Central Andes; Piña Chán on central Mesoamerica; Sanoja on Venezuela; Silva and Meggers on Brazil. My extremely negative reaction to the paper on Brazil derives only from the section on the Amazon Basin, evidently by Meggers. The other section, on Central and southern Brazil, seems satisfactory. Something of the scope of my disagreement with Meggers may be expressed by comments on one of her sentences. "The earliest ceramic complex, represented so far at four sites distributed from eastern Peru to the mouth of the Amazon (Tutishcainyo, Yasuní, Jauarí, Ananatuba), is characterized by broad-line-incision and zoned-hachure decoration, relating it in a generalized way to the late Formative Complexes of Peru and Ecuador." Under no definition of ceramic complex could Early Tutishcainyo and Ananatuba be considered as belonging to the same complex. Aside from the fact that both do show zoned, hatched incision (Early Tutishcainyo almost invariably, Ananatuba very rarely), and the fact that both are made of fired clay, it is extremely difficult to find any points of similarity. Early Tutishcainyo does not show generalized relationships to the Late Formative complexes of Peru. As I pointed out earlier [*American Antiquity* **23**, 385 (1958)], Early Tutishcainyo shows a series of specific similarities to some of the ceramic materials from Kotosh, which is located at the eastern edge of the Peruvian Highlands. It is now known that the Kotosh ceramics most like Early Tutishcainyo are the earliest found at that site; they have a carbon-14 date of 1838 ± 110 B.C., which makes them the oldest dated pottery in Peru. It is by no means clear, either to me or to the Japanese archeologists who have worked at Kotosh, that Early Tutishcainyo represents highland influence which dribbled down into the Amazon Basin [Scientific Expedition of the University of Tokyo, *The Japanese Journal of Ethnology* **26**, No. 4, 23 (1962)]. There are good reasons to suspect that the cultural movement was in the opposite direction, and, if this is correct, the time depth of Tropical Forest Culture in the Amazon Basin is far greater than 500 B.C., the estimate offered by Meggers.

The summary paper by Meggers tends to rise above the striking and interesting discrepancies in dating and interpretation, which are found among the various papers. As a highly generalized statement of our present knowledge with respect to the prehistory of Latin America, the paper has much to recommend it. Its greatest strength is that it emphasizes the importance of the study of long distance contacts for a full understanding of New World culture history. This is all to the good in the face of a long-standing provincialism on the part of New World archeologists.

Included as a part of Meggers' summary is a table that indicates the first appearance of a number of culture traits in various parts of Latin America. The data were compiled by the various participants, and the fairly numerous errors (of omission and commission) and the inconsistency can not all be charged to Meggers. The significance of the flow diagrams derived from this table is reduced by these random errors and by a rather consistent overdating on the part of Piña Chán and underdating on the part of Kidder, Lumbreas, and Smith. Figure 19 is particularly suspect because of these factors.

This book is required reading for any serious student of New World culture history. The best papers offer excellent introductions to key problems, and much important new work is summarized. Even the poorer papers are provocative.

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Research Techniques

Newer Methods of Nutritional Biochemistry. With applications and interpretations. Anthony A. Albanese, Ed. Academic Press, New York, 1963. xii + 583 pp. Illus. $18.50.

According to its editor this volume is intended to provide the graduate biochemistry student and the medical scientist with a ready and descriptive résumé of recently developed biochemical procedures that have extensive applications in the currently most active areas of nutrition research. It only partially succeeds in this objective. Not only are many of the most active areas of nutrition research ignored but the varied approach of the many contributors results in a volume that is extremely uneven in both style and content. Thus, in an excellent chapter, almost twice as much space is devoted to vitamin B_{12} and intrinsic factor as is given to a chapter in which the discussion covers vitamins B_1, B_2, B_6, niacin, and ascorbic acid; the other vitamins are neglected. A good chapter on fats, fatty acids, and sterols is followed by a poor one on minerals; among the faults noted in this chapter, vitamin D and phytate are omitted from the list of factors that influence calcium absorption and the only mention of selenium is the statement that it has been found in the human body