BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Annual Review of Nuclear and Particle Science: Volume 28

Editor J. D. Jackson

Publisher Annual Reviews, Inc. (1978)

Pages 620

Price Reprints of the articles are priced at $1.00 each postpaid. The minimum acceptable reprint order is five reprints or $5.00 prepaid.

Reviewer Paul F. Zweifel

As the title suggests, this volume is the 28th in a series stretching back to time immemorial. Presumably, the reader actively working in nuclear and particle physics is already familiar with the format and style of the previous 27 volumes, and, in most cases, may have a standing order with the publisher. Thus, I will direct my remarks primarily to those individuals whose interest in nuclear and particle physics may be peripheral or "cultural."

Quoting from the Editor's Preface, "In an effort to make the articles more digestible, the editors have encouraged authors in a modest innovation, a beginning section entitled Introduction and Summary. Ideally this contains an introduction to the subject in simple terms appropriate for the nonspecialist and also a survey of the main results . . . the editors keep as a primary goal the accessibility of at least the first parts of all reviews to the average reader."

The editors and authors have been pretty successful in achieving their goal. Each of the ten reviews contains a readable introduction, which cannot, in most cases, serve as an entrée to the field but which could, in conjunction with the references (and all articles are exceptionally well referenced), serve as a beginning for the individual attempting to learn the latest research results, starting from a position of, let's say, moderate knowledge. I can visualize a graduate student beginning a research career in quark physics, for example, using the two quark articles (by Greenberg and by Applequist, Barnett, and Lane) as his starting point. Similarly, a person desiring to carry out Hartree-Fock calculations of nuclear properties might well try to get off the ground by studying the review of Quentin and Flocard.

The average nuclear engineer, trying to find out what's going on in some of their areas, but not planning to work in them, might well be advised to go to less technically oriented sources, such as *Scientific America* or the *American Scientist*. The sole exception might be the excellent Barschall article on fast neutron sources, which is clearly relevant to many American Nuclear Society members.

The complete contents of Volume 28 follow:

Hypernuclei, B. Povh

Synchrotron Radiation Research, Herman Winick and Arthur Bienenstock

Experimental Nuclear Astrophysics, C. Rolfs and H. P. Trautvetter

High Energy Interactions of Nuclei, Alfred S. Goldhaber and Harry H. Heckman

Intense Sources of Fast Neutrons, H. H. Barschall

Advances in Muon Spin Rotation, J. H. Brewer and K. M. Crowe

Quarks, O. W. Greenberg

Charm and Beyond, Thomas Appelquist, R. Michael Barnett, and Kenneth Lane

Isotopic Anomalies in the Early Solar System, Robert N. Clayton

Self-Consistent Calculations of Nuclear Properties with Phenomenological Effective Forces, P. Quentin and H. Flocard

Professor Paul F. Zweifel is a University Distinguished Professor of physics and nuclear engineering at Virginia Polytechnic Institute and State University and the director of the Laboratory for Transport Theory and Mathematical Physics. Dr. Zweifel received his PhD degree from Duke University in 1954. His current active areas of interest are in transport theory and mathematical physics. Included

in his many professional honors are the Ernest O. Lawrence Award (1972) and the John Simon Guggenheim Memorial Foundation Fellow (1974 to 1975). He is a member of the American Nuclear Society (Fellow), American Mathematical Society, American Physical Society (Fellow), Federation of American Scientists, and the International Association for Mathematical Physics. Dr. Zweifel is also the editor-in-chief of the journal Transport Theory and Statistical Physics.

Nuclear Power and Its Environmental Effects

Authors Samuel Glasstone and Walter H. Jordan

Publisher American Nuclear Society (1980)

Pages 395

Price $25.95 cloth; $18.95 paper

Reviewer Carolyn Heising-Goodman

Samuel Glasstone and Walter Jordan provide a lucid and technical presentation of the effects of nuclear power on the environment. Addressing a multitude of issues ranging from the biological effects of radiation to nuclear reactor safety and the disposal of waste heat, the 14 chapter outline covers most of the issues relating to nuclear environmental impact. The book also covers the safeguarding of nuclear materials, but does not deal with the nuclear weapons proliferation issue. Written in a classic textbook style, the famous authors carry on their tradition of excellence in the presentation of important factual information. This book provides a background for more in-depth studies into any of the specific areas and, as such, is recommended as a supplemental text for advanced undergraduate or first-year graduate students of nuclear engineering. The text can also bring practitioners of nuclear engineering up to speed in areas that may not be their particular specializations.

As a more advanced textbook, the book does not provide a detailed enough in-depth treatment to qualify for use in this manner. However, as a broad overview of a wide range of material, the text fulfills its mission brilliantly. The specialist in any particular area will find the material presented elementary and introductory in nature and is thus not recommended as a text for use in advanced studies. However, the educated layperson will probably find the material illuminating if not novel, and the book serves well the purpose of educating an often misinformed public. The book is therefore recommended for use in any endeavors directed at public education in these matters.

The book is published by the American Nuclear Society and, therefore, is of utmost publishing quality. The book is written in an informative, textbook style and avoids the use of more emotional or sensational journalistic technique. As such, the reader should find the book quite educational and "to-the-point" factual. This book is highly recommended for those involved with public education projects, for introductory level nuclear engineering courses and courses that deal broadly with energy issues across the spectrum.

Carolyn D. Heising-Goodman received her BS (1974) in applied physics from the University of California at San Diego, and her MS (1975) and PhD (1978) in nuclear engineering from the Department of Mechanical Engineering at Stanford University. She also holds a PhD minor in operations research from Stanford University. Currently, she is an assistant professor of nuclear engineering at the Massachusetts Institute of Technology in the area of reliability and nuclear safety analysis. She is working on contract to the Nuclear Safety Analysis Center with Professor Norman C. Rasmussen on class 9 accident mitigation system analysis and methods for resolution of generic nuclear safety issues.

Formation of Uranium Ore Deposits
(Proceedings of a Symposium, Athens, May 6-10, 1974)

Editors Editorial Staff, International Atomic Energy Agency

Publisher International Atomic Energy Agency (1974)

Pages 748

Price $38.00

Reviewer Arthur L. Reesman

These proceedings contain 42 papers, which were contributed from 23 countries and reports from the six working groups. English dominates (32 of the papers) and all papers have English abstracts. Absent from the volume are papers from the USSR, China, and Eastern Europe, except Yugoslavia and Rumania.

The objective of the symposium was to provide information that will aid in future exploration of uranium ores. Papers are organized into sessions that parallel the "working groups," which were established at a previous meeting sponsored by the International Atomic Energy Agency. The six groups are

I. Chemical and physical mechanisms in the formation of uranium mineralization, geochronology, isotope geology, and mineralogy (8 papers)

II. Sedimentary basins and sandstone-type deposits (three sessions, 21 papers)

III. Uranium in quartz-pebble conglomerates (1 paper)

IV. Vein- and similar-type deposits (6 papers)

V. Other uranium deposits (3 papers)

VI. Relation of metallogenic, tectonic, and zoning factors to the origin of uranium deposits (2 papers).

The number of papers in each category shows an inbalance that does not represent the relative significance of it but the experiences of the authors. The single review paper on quartz-pebble conglomerate deposits is not indicative of the ~40% of low-cost reserves represented by them. The sandstone-type deposits, considered by group II, contain about an equal amount of low-cost and most of the known moderate-cost reserves (the next