"Sector Focusing Cyclotrons", by J. R. R. Richardson, University of California at Los Angeles: This is indeed a monograph on the subject, with a comprehensive discussion of cyclotron history and principles. The reader is presumed to have very little acquaintance with cyclotrons. The content is to a large extent a review of three important cyclotron conferences held between 1959 and 1963. It's a pity that the Institute of Electric and Electronic Engineering Particle Accelerator Conference in 1965 could not have been included.

"Polarized-Ion Sources and the Acceleration of Polarized Beams", by J. M. Dickson, Rutherford High Energy Lab. (England): In addition to an extensive discussion of principles and techniques, there is a valuable summary of the work that is being done at individual laboratories throughout the world. The author has limited his discussion "to sources based on the atomic-beam method in inhomogeneous magnetic fields" because these have apparently been developed to a sufficient extent to permit factual reviewing.

"Polarized Targets", by G. Shapiro, Lawrence Radiation Laboratory at Berkeley: The introduction to this chapter is really a prefatory note that refers to many other review papers on the same general subject. The author concentrates his attention on methods that have been used to produce working polarized targets, in particular the type now in use at Berkeley. The coverage of this effort is limited to recent work rather than to any historical review.

"Digital Systems for Data Handling", by R. J. Spinrad, Brookhaven National Laboratory: This author uses the primer approach to his subject: a desirable style for those who are not directly involved in the field, but who may want to become acquainted with the specific language and problems. A review of work being done at individual laboratories is included. The author could have extended himself to include the concept of programming accelerators by computers, but he would probably have been a year or so ahead of the technology. He does embrace both low- and high-energy physics problems in data handling.

"Particle Discrimination and Loading Techniques for Nuclear Emulsions", by H. G. DeCarvalho, Centro Brasileiro de Pesquisas Fisicas, (Brazil): A great amount of practical handbook information, relating to the preparation and handling of nuclear emulsions, is contained in this work. An interesting review of the photographic process serves as good background material for the discussion of methods for discriminating among nuclear particles by optimizing the characteristics of the emulsion or its processing.

"The Development of Spark Chamber Techniques", by C. Charpak and L. Massonnet of CERN and J. Favier of Faculté des Sciences (France): These authors have produced a chapter that has considerable educational value. The subject is reviewed comprehensively, from basic gaseous amplification and discharge to methods of taking data with several types of spark chambers. For those who are not immersed in the design or use of spark chambers, it is enlightening to learn that the genus "spark chamber" has many variants with differing purposes and information displays.

In summation, this book has something of value for a broad scientific readership. I hope the editor will be able to maintain, in succeeding volumes, the high standard and broad scope he has already established.

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NOTHING NEW

Title Deformation and Fracture at Elevated Temperatures

Editors Nicholas T. Grant and Arthur W. Mullendore

Publisher The MIT Press, 1965

Pages 211

Price $6.00

Reviewer A. Boltax

This book is a collection of six technical papers and review articles, which were published from 1950 to 1961 in various journals and books. The selection of papers was based on the need for technical material to support a graduate course entitled, "Behavior of Metals at Elevated Temperatures". With the exception of one paper by F. J. Clauss, the papers are either authored or co-authored by N. J. Grant (Massachusetts Institute of Technology). The papers are as follows:

1. "Stress Rupture Testing", N. J. Grant, reprinted from: *High Temperature Properties of Metals*, American Society for Metals, Cleveland, 1951, p. 41.

2. "On the Extrapolation of Short-Time Stress Rupture Data", N. J. Grant and A. G. Bucklin, reprinted from: *Transactions, American Society for Metals*, Vol. 42, 1950, p. 720.

3. "An Examination of High Temperature Stress-Rupture Correlating Parameters", Francis J. Clauss, reprinted from: *Proceedings, American Society for Testing and Materials*, Vol. 60, 1960, p. 905.

4. "An Empirical Relationship Between Rupture Life and Minimum Creep Rate", F. C. Monkman and N. J. Grant, reprinted from: *Proceedings, American Society for Testing and Materials*, Vol. 56, 1956, p. 593.

5. "Creep and Fracture", N. J. Grant and A. R. Chaudhuri, reprinted from *Creep and Rupture*, American Society for Metals, Cleveland, 1957.

6. "Grain-Boundary Behavior in High-Temperature Deformation", A. W. Mullendore and N. J. Grant, reprinted from: *Mechanisms Operating in Metals at Elevated Temperature*, Proceedings of the 8th Sagamore Ordnance Materials Research Conference, 1961.

The first comment which comes to mind, immediately after reviewing the Table of Contents, involves the question, "Why was the book published"? The book offers no new information; each chapter appears exactly as originally published, and no additional references or updating of technical material are provided. The only feature provided by the book is the convenience of finding six related technical articles in a neatly packaged form. It is acknowledged that the availability of this book provides graduate students with needed source material for a particular course. However, it is difficult for this reviewer to accept completely this justification for republication of this material.

The first four papers provide a clearly written introduction to the general subject of stress-rupture testing. This material would be of interest to the engineer who is planning to initiate stress-rupture testing or use available stress-rupture data for design purposes. The last two papers are review articles that summarize the state of knowledge of creep and fracture (as of 1956) and high-temperature grain-boundary behavior (as of 1961). These articles represent significant attempts at organizing large amounts of information into concise technical statements and, as such, are of value to the metallurgist or solid-state physicist attempting to provide further contributions to the field of high-temperature deformation of metals. However, the review articles do not reflect new information currently available on this subject. A recent publication (1965) of the MacMillan Series in Material Science by Frank Garofalo entitled, *Fundamentals of Creep and Creep-Rupture in Metals*, provides one of the most complete and up-to-date treatments of both the phenomenological and micromechanistic approaches to a contemporary understanding of creep behavior.

Alvin Boltax is Manager of Fuel Development at Westinghouse Astronuclear Laboratory where for the past five years he has been involved in the development of graphite-matrix fuel elements for nuclear rocket applications. He received his BS and ScD degrees from the Massachusetts Institute of Technology in physical metallurgy in 1951 and 1955. Prior to joining Westinghouse, he was Group Leader and Project Manager at Nuclear Metals, Inc., where his work involved fabrication and development of metallic fuel elements and basic research on radiation damage and precipitation-hardening alloys.

BOOK ANNOUNCEMENTS

Although the following books will not be reviewed, they may be of interest to some of our readers:

Technical Thermodynamics, V. V. Sushkov, Gordon and Breach, 1965, 400 pp, $12.50

An Introduction to the Theory of Superfluidity, I. M. Khalatnikov, Benjamin, 1965, 206 pp, $9.00 cloth, $4.95 paperback

Inelastic Scattering of Neutrons, International Atomic Energy Agency, 1965, Vol. I, 461 pp, $9.50; Vol. II, 574 pp, $11.50

Elementary Plasma Physics, Lev A. Arzimovich, Blaisdell, 1965, 188 pp, $2.25

Advances in Atomic and Molecular Physics, Vol. I, Academic, D. R. Bates and Immanuel Estermann, co-editors, 1965, 408 pp, $13.50

Ultraviolet Radiation, Lewis Koller, Wiley, 1965, 312 pp, $12.00

Application of Advanced and Nuclear Physics to Testing Materials, (papers presented at an ASTM symposium held February, 1964), symposium co-chairmen E. Amstutz and A. G. H. Dietz, American Society for Testing and Materials, 1965, 134 pp, $6.25

Chemical Effects of Nuclear Transformations, International Atomic Energy Agency, 1965, Vol. I, 442 pp, $9.00; Vol. II, 558 pp, $11.00

International Advances in Cryogenic Engineering, (papers presented at Tenth National Cryogenic Engineering Conference August, 1964), K. D. Timmerhaus, ed., Plenum, 1965, Vol. 10, 2 sections totaling 940 pp, $17.50 each

Reviews of Plasma Physics, Vol. I, M. A. Leontovich, ed., Consultants Bureau, 1965, 326 pp, $12.50