

derstanding "how nature works". The book also includes a description of how particles lose energy as they pass through matter and a few related topics such as the application of the field-ion microscope to damage investigations.

To put it explicitly, this book is highly recommended. It is well written, it is short, and the information it contains can be efficiently assimilated. It should be particularly useful for anyone, from undergraduate to experienced researcher, who is learning about radiation effects for the first time. It is also recommended to persons who have been doing radiation work, particularly of an applied or engineering nature, and have an incomplete or old-fashioned understanding of the basic physical phenomena.

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#### **A BROAD SUBJECT**

*Title* Mechanics of Solids and Strength of Materials

*Authors* F. Warnock and P. P. Benham

*Publisher* Sir Isaac Pitman & Sons, Ltd., 1965

*Pages* xix + 595 + XVI plates

*Price* 50 shillings

*Reviewer* Joseph Marin

This text by Warnock and Benham is different from most texts on the subject as it combines both the subjects of stress analysis and material behavior.

The material is presented in a thorough manner. However, in view of the broad coverage of the subject, only summaries of information on some subjects could be included. For curricula where a condensed version of both strength of materials and mechanical properties of materials is indicated, this text should prove useful.

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*sored research projects, written over 150 technical papers and 80 final technical reports in this area, and developed about 20 new types of materials testing machines. He is the author of five books on materials and stress analysis and a member of numerous technical societies and committees. His undergraduate work was done at the University of British Columbia, and his PhD degree was obtained from the University of Michigan in 1935.*

#### **FIRST OF A NEW SERIES**

*Title* Progress in Nuclear Techniques and Instrumentation, Vol. 1

*Editor* F. J. M. Farley

*Publisher* John Wiley & Sons, Inc., 1965

*Pages* viii + 398

*Price* \$17.50

*Reviewer* E. Alfred Burrill

The scope of this new "progress series" is indeed ambitious, as expressed by the editor in the preface to the first volume: "We shall range over all aspects of experimental technique that can be useful, both in the study of nuclei themselves, and in high-energy particle physics... Our policy will be to present techniques which are new, but have, nevertheless, reached sufficient maturity to be passing into current experimental use". The selection of the six review papers in the first volume indicates that the editor has not yet been deflected from his goals; the subjects cover moderate-energy cyclotrons, polarized-ion sources and polarized targets, particle detection by nuclear emulsions and by spark chambers, and data handling.

It is difficult to review a compilation of this type, because it is essentially a bound version of six individually conceived and executed monographs with no common denominator or connection except the title of the book and its preface. However, a few general comments can be made before reviewing each chapter. I am pleased to see that each contribution has its own date. For those who do not follow these rapidly progressing fields, the point in time at which the review was made is of importance. On the other hand, it is unfortunate that the individual dates (January to June 1964) are about a year earlier than the release date of the book. A lot of progress has been made in these fields during the past year. All publishers will, I am sure, sympathize with my wistful desire to have "instant publication".

As would be expected, the styles, approaches, and scope of the six chapters are diverse. All contributions are well organized within themselves, with extensive bibliographies. A few comments on each work follow:

"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.

*E. Alfred Burrill is Vice-President (since 1957) and Director of Marketing (since 1960) of High Voltage Engineering Corporation, Burlington, Mass., with which he has been affiliated since 1947. Since 1939, he has been involved in the design and development of Van de Graaff accelerators and their applications in research, medicine, and industry. A member of several scientific societies and various technical committees, including the USAEC Advisory Committee on Isotope and Radiation Development, he is Vice-Chairman of the American Nuclear Society Isotope and Radiation Division and a member of the Editorial Advisory Board of Nuclear Applications. His BS degree (in physics) was won from Massachusetts Institute of Technology in 1943.*

#### 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.