
Books

Trends in Atomic Physics: essays dedicated to Lise Meitner, Otto Hahn, Max von Laue on the occasion of their 80th birthday. Edited by O. R. Frisch, F. A. Paneth, F. Laves, P. Rosbaud. 285 pp. (Vieweg & Sohn, Germany) Interscience Publishers, Inc., New York, 1959. \$7.50. *Reviewed by R. Bruce Lindsay, Brown University.*

WHEN three distinguished atomic physicists like Lise Meitner, Otto Hahn, and Max von Laue reach the age of 80 within a year of each other, the suggestion is strong that the event might be celebrated appropriately by a collection of relevant scientific papers dedicated to them. This pleasant idea has been carried out through the efforts of the four editors named above together with 28 collaborators, and the book under review is the result. Unfortunately, one of the editors, F. A. Paneth, died before the publication of the volume and since its appearance, the melancholy news has come of the death of Max von Laue. The book contains 26 essays (16 are in German, 8 in English, and 2 in French) in the fields of research represented by the work of Meitner, Hahn, and von Laue and in many cases these concern contemporary developments, thus in a certain measure justifying the title.

On the other hand, the volume has a strong historical flavor, owing in the first instance to the essays of Przibram, Zimen, and Ewald, which contain brief reminiscences of the early studies of the dedicatees in the first decade of the century in Vienna, Berlin, and Munich. Moreover practically all the technical articles include interesting historical material showing the evolution of the field being discussed. Thus much of the early history of the elucidation of crystal structure by means of x rays will be found in the nine technical articles dedicated to von Laue. Similarly the essays for Meitner and Hahn contain many fascinating references to the early work on radioactivity and nuclear physics. Though it is doubtless invidious to single out of such an interesting collection any articles for special comment, the reviewer found particularly valuable C. S. Wu's "History of Beta Decay", S. Rosenblum's "Spectres magnétiques des Particules Alpha", Kathleen Lonsdale's "Vibrating Atoms in Crystals", and G. Borrmann's "Röntgenwellenfelder".

The book is well produced, though there are some misprints and errors. Excellent photographs (suitable for framing) of the dedicatees are included. All who are interested in the history of atomic physics will find the volume very attractive.

The Study of Elementary Particles by the Photographic Method: an account of the principal techniques and discoveries. By C. F. Powell, P. H. Fowler, D. H. Perkins. 669 pp. Pergamon Press, Inc., New York, 1959. \$40.00. *Reviewed by M. W. Friedlander, Washington University.*

BOOKS on physics are diverse in their styles. Some are businesslike, encyclopedic, others develop their arguments with mathematical analysis. This book is aristocratic. Rare in these days is the book sprinkled with quotations, from Bacon, from Maxwell, and others, and with such distinguished prose. The quality of the printing and of the photographic reproduction is of the highest, but the resulting \$40 price will deter many prospective buyers.

With the improvement in the sensitivity of photographic emulsions in the immediate postwar years, detection of very lightly ionizing particles became possible. Although the photographic plate has been much used as a detector of low-energy particles from nuclear reactions, its widest applications and most important results have been in the fields of elementary particles and cosmic rays, until recently intertwined. The nuclear photographic method has been developed to a highly sophisticated degree, and the photomicrographs collected here provide a clear demonstration of the insight into nuclear and mesic processes which we have gained from this elegant technique. There are many photographs of historical interest, such as the first identified interactions and decays of the π mesons; there are photographs of virtually every type of event yet observed in emulsions.

The accompanying text is in the nature of an amplifying commentary upon the photographs and the physical processes they represent. There is a wealth of information and many references—on the history of the technique, on measurements, on mesons and hyperons, on cosmic rays. It is a pity that more recent references on complementary experimental methods and theoretical calculations have not been included in some sections.

The three authors have been major contributors in many of the improvements in this experimental method, and in its extensive applications. This book will take its place alongside the atlases which depict similar phenomena, observed in expansion chambers.

Physics of the Earth's Interior. By Beno Gutenberg. Vol. 1 of Intern'l Geophysics Series, edited by J. van Miegheem. 240 pp. Academic Press Inc., New York, 1959. \$8.50. *Reviewed by E. J. Öpik, University of Maryland.*

WHILE the exploration of outer space proceeds in strides, direct access to the interior of our own planet is well-nigh impossible. Except for a few uppermost miles of the earth's crust, our knowledge of the earth's interior will always depend on extrapolation of surface experiments. The main clues are seis-

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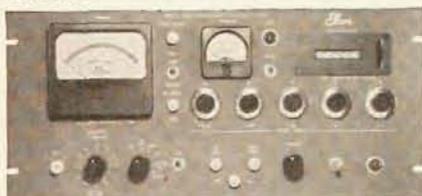
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mological observations, supplemented by experimental and theoretical analysis of the properties of earth materials.

About one half of this treatise is devoted to deciphering the travel times of seismic waves. It begins and concludes by emphasizing the incompleteness of the picture, and warns against too rigidly believing in the hypotheses of a discipline which is still in a state of flux. It is therefore gratifying to point out some basic features of the internal structure of the earth which no longer appear to be hypothetical: a crust bounded by the Mohorovičić discontinuity at a depth of 9–13 km under the oceans and 30–50 km under the continents; a silicate mantle reaching to a depth of some 2900 km; a liquid core of 3400 km radius; a small inner core, possibly solid.

The other half of the book contains a comprehensive review of the thermal processes, density distribution, flattening, elastic, and nonelastic processes in the earth. Theoretical formulas and tables are given. Wegener's continental drift theory is revived in the light of modern paleomagnetic measurements; the weakness of this theory when relating to postcretaceous events, however, is not pointed out.

Although most of the formulas and numerical data appear to be in order, there are some obvious errors. However, these minor shortcomings do not detract from the value of the book. Beno Gutenberg died four months after the completion of this book, which can be fully recommended as the last word of this eminent geophysicist to all students of the earth sciences and related disciplines.

Introduction to Atomic and Nuclear Physics. By Rogers D. Rusk. 482 pp. Appleton-Century-Crofts, Inc., New York, 1958. \$7.50. *Reviewed by Hans Bichsel, University of Southern California.*

IF the course in which this book is used is given to students majoring in fields different from physics and engineering, it will suit its purpose very well. To a large extent only elementary physics and algebra are used in the development of the ideas. Calculus practically does not occur except in a chapter on wave mechanics.

Approximately two thirds of the book is devoted to atomic physics, the rest to nuclear physics. The list of subjects treated is very comprehensive. Among the things which one would not ordinarily expect in an introductory text are: Bose and Fermi statistics, genetic damage of the human race, detection of the neutrino, neutron velocity selectors, antiproton, about ten different kinds of particle accelerators (including the linac for heavy ions), elementary theory of the nuclear reactor, plasma fusion, reactor poisoning, and Cerenkov radiation. This has the advantage that the book can almost be used as an elementary reference work; on the other hand, much of the treatment of the subjects will be too elementary and too abbreviated. Consider-