Books

The Earth's Magnetism (Second Revised Edition). By Sydney Chapman. 127 pp. John Wiley and Sons, Inc., New York, 1951. $1.50.

This excellent little book gathers together the facts about terrestrial magnetism presently available. It is the first important work of this sort to appear since the impressive compendium which the Department of Terrestrial Magnetism issued over fifteen years ago. It is therefore a most welcome addition to the scant literature in this important field.

In this book Professor Chapman, who is certainly one of the leading if not the outstanding authority on this subject, presents the main facts regarding the earth's field, and the variations in this field produced mainly by solar influences and the lunar tide. He also gives some of his own interpretations and conclusions about the mechanisms through which these effects operate. Professor Chapman writes in a clear and interesting style. The level of the book is suitable for graduate students and presupposes acquaintance with the laws of electromagnetism and calculus. It should be read not only by persons interested in geomagnetism but also by those upon whose fields geomagnetic effects impinge, such as students of the ionosphere, of the upper atmosphere, and of cosmic rays.

The book is of a size that can be conveniently slipped into one's pocket. It is well printed on good quality paper, is very free of errors, and is well illustrated. It is an authoritative and useful work, and should be in every physics library.

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Electromagnetic Fields. Theory and Applications. Volume I: Mapping of Fields. By Ernst Weber. 590 pp. John Wiley and Sons, Inc., New York, 1950. $10.00.

This is the first part of a two-volume treatment of electromagnetics designed for graduate students of electrical engineering, physics, and applied mathematics or for those engaged in research or development; the present volume deals with stationary fields.

The first three chapters comprise a cursory discussion of the physical quantities and relations of the static electric, magnetic, electric current, and analogous fields. The presentation is appropriate for engineers or mathematicians, the material serving primarily to define the fundamental boundary value problems to whose detailed consideration the remaining chapters are devoted. The physicist will be attracted by the well documented if sketchy survey of "critical field values" in Chapter 1, while all will appreciate the emphasis on the basic aspects of the various fields and the tabulation of their corresponding physical quantities in Chapter 3.

The remainder of the book is a comprehensive survey of analytic and practical methods for plotting potential fields. The superposition principle, image and inversion techniques, conjugate functions, conformal mapping, and separation of variables are discussed and applied to obtain exact or approximate solutions to various and numerous problems. In addition, the sections on experimental and graphical methods of field plotting are excellent supplements to the analytical techniques for more complicated geometries.

Some of the problems are treated in detail while others are merely sketched, the reader being referred to specific literature for details, graphs, or numerical results. For sheer number, this is probably the largest collection of problems compiled; e.g., the section on the Schwarz-Christoffel transformation contains more applications of this tool than found in any other text. The level of the general presentation, however, seems somewhat capricious: the author struggles to keep the book sufficiently self-contained to be useful to beginners and at the same time strives for completeness; the issue is never resolved.

This book, while not appropriate as a primary text for a graduate physics course in electromagnetics, will nevertheless serve as a useful auxiliary. Because of the number of problems discussed and the extensive references and bibliography, it is recommended to all workers in the field; no other text equals it in these regards. The price, however, is relatively too high to insure its purchase as an adjunct text by most students.

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An Introduction to Acoustics. By Robert H. Randall. 340 pp. Addison-Wesley Press Inc., Cambridge, Massachusetts, 1951. $6.00.

An unsophisticated, intermediate textbook for undergraduates in physics or engineering which stresses the physical aspects of acoustics. Only a year of college physics and some slight knowledge of calculus are required as background, the book being proposed as the starting point for advanced study. The material is on the whole well chosen and the wide variety of topics touched on serve to indicate the present day scope of the subject.

V. T.

Ultrasonic Physics. By E. G. Richardson. 285 pp. Elsevier Publishing Co., Houston, Texas, 1952. $5.00.

This is written for the experimental physicist and physical chemist working in ultrasonics by one whose own research contributions to the subject are noteworthy; its theme is the ultrasonic interferometer as a precision tool in the physics laboratory. Starting with a discussion of sources and methods of detection of ultra-