

### Electromagnetic Theory

By Oliver Heaviside. Complete and unabridged edition of Vol. 1, Vol. 2, and Vol. 3, with a Critical and Historical Introduction by Ernst Weber. Pp. xxx+386. (New York: Dover Publications, Inc.; London: E. and F. N. Spon, Ltd., 1950.) 63s.

**A**DMIRERS of Oliver Heaviside's work will be highly appreciative of the appearance of an unabridged edition in a single volume of his three volumes on "Electromagnetic Theory". In spite of the excellent English in which it is written, Heaviside's work is in general by no means easy to read, and only by patient search and serious study can real benefit be derived from much of it. A major difficulty in the earlier editions was the absence of a detailed index to supplement the tables of contents, and there can be no doubt that this lack accounts for the fact that a number of his important contributions were overlooked for many years. It is unfortunate that this omission has not been repaired in the new edition.

The book is a most attractive reproduction of the original text and is preceded by a historical survey by Ernst Weber, director of the Microwave Research Institute of the Polytechnic Institute of Brooklyn. This introduction comprises a short biography of Heaviside and appreciations of his contributions to vector analysis, electromagnetic field theory, transmission line theory, operational mathematics, loaded communication lines and electromagnetic units, each followed by a list of books and other texts dealing with developments of the respective topics. This survey is well written but is too short to do full justice to the subsequent text, and readers will find it helpful to refer to the much extended appreciation of Heaviside's work contained in the recently published Heaviside Centenary issue of the *Journal of the Institution of Electrical Engineers*, and be able thereby to correct a number of excusable errors in Dr. Weber's biographical statement. The thorough review of Heaviside's work given in this centenary issue makes it unnecessary to comment further on the subject-matter of the book.

WILLIS JACKSON

### Measurements of Mind and Matter

By Dr. G. W. Scott Blair. Pp. 116. (London: Dennis Dobson, Ltd., 1950.) 9s. 6d. net.

**T**HE rheologist's concern is with things like the 'body' of a dough or the 'firmness' of a clay, qualities which defy reduction to simpler physical concepts and which are assessed more consistently by human judgment than by conventional measuring-technique. Materials of this kind can be classified in terms of 'quasi-properties', intermediate between, say, viscosity and elasticity, which appear dimensionally awkward. These represent the response of a material to a changing situation as a whole rather than to a simple change of one or two factors, and Dr. G. W. Scott Blair likens this kind of classification to the methods of Gestalt psychology. He discusses the meaning of measurement in general from the philosophical point of view, and shows the dimensional difficulties that can arise in practice.

The real argument of the book is that in the relatively unexplored field of 'psychophysics', which constitutes the frontier between physics and psychology, a different approach from that of pure physics may be justified; this in itself needs no elaboration, for anything amenable to a purely physical treatment is surely well within the frontier. Nevertheless, a

number of controversial points are raised, and the author's own reflexions on them are given in a detached and critical manner. The book is addressed to the non-specialist and the general reader, the latter of whom may find it rather a tough proposition; and its object is rather to give a wider currency to the fact that certain problems exist than to lay down solutions to them.

G. R. NOAKES

### Warne's Metric Conversion Tables

Designed by Otto Klein. Computed by Scientific Computing Service, Ltd. Pp. 104. (London and New York: Frederick Warne and Co., Ltd., 1950.) 15s. net.

**T**HESE conversion tables have been compiled to meet the demand for a quick and efficient system of converting Imperial and American measures into the metric system, and vice versa. The British and American measures are in the main identical; but confusion is sometimes caused with the Imperial and American gallons, and with the American short and the British long tons. This book certainly covers fairly thoroughly the relations between these, as well as the conversion into metric units. Measures of weight, length, speed, surface, volume and capacity are included, as well as reduction tables, conversion of one temperature scale to another and pressure tables; altogether there are eighty tables.

As regards the use of this book, it will, of course, have a limited appeal in schools and universities, since the conversions are given to a higher degree of accuracy than is ordinarily required (though it might be of some use in schools if it did nothing more than resuscitate the long-forgotten art of 'learning tables'). But its chief use is in the wider field of commerce, and it should be of great value to those engaged in business transactions between countries which have adopted the Imperial measures and those using the metric system.

### Natural History

Birds and Mammals. By David Seth-Smith. (Reason Why Series.) Pp. 198. (London: Herbert Jenkins, Ltd., 1949.) 7s. 6d. net.

**D**URING his long experience as curator of mammals and birds in the London Zoo and as that popular broadcaster 'The Zoo Man', Mr. David Seth-Smith has had unrivalled opportunities for determining what questions relating to mammals and birds most frequently attract public interest. In this book he has selected and answered 324 of them. The result is a very readable volume, crammed with information, illustrated by sixteen mostly good, full-page line drawings (partly by the author and partly by L. R. Brightwell) and provided with a good index.

The book can be safely placed in the hands of anybody interested in natural history, for the young will find much to stimulate and the old perhaps many things they did not know before. It would have gained had there been a little more critical proof-reading; for example, antlers are nourished by arteries, and not by veins (p. 31); lemmings go right across Eurasia between Scandinavia and North America (p. 51); the cheetah does not owe its speed to semi-retractile claws—actually, the claws are completely retractile although they are not hidden by special lobes of skin when they are retracted (p. 59); and, of the rook, "the food is very varied . . . and probably only becomes harmful to agriculture when too numerous" (p. 159) is not what the author intended to say.

M. A. C. HINTON