with an interesting chapter on "The Fire of Life" and passes on to a study of the control of temperature in the body, before he deals with the nerves, from the double aspect of the mechanism of nervous activity and organisation of the nervous system, and with the muscles, which he considers from a wide point of view under the heading 'movement'.

Throughout the book there are evidences of wide teaching experience in the shape of simple illustrations and analogies. In the main these are useful, though occasionally some of the drawings seem so simplified as to be unnecessary and the analogies to be unduly strained. The early chapters, interesting and unusual as they are in their presentation in a book of this kind, are likely to be hard reading for the ordinary lay person, though admirable for students of physiology whether working in the medical or science faculties.

As, however, nearly one-third of the book is devoted to these introductory chapters, the rest of the body has to be less fully considered; though here again valuable and less usual aspects of the systems are stressed. There are, for example, good sections on the factors controlling the circulation in different organs, on the functions of the kidney, short but excellent paragraphs on integration, and instructive maps showing the relationship between the amount of iodine in water supplies and the incidence of goitre as shown by the Army recruiting figures from the United States.

Altogether the book provides an interesting and thought-provoking introduction to a subject of much practical importance, and is one which should help those for whom knowledge of physiology forms a part of their training to a realization of its fascination.

W. C. CULLIS

FUNDAMENTALS OF HEAT ENGINES

Elements of Applied Energy

By Prof. Frederick T. Morse. Pp. ix+444. (New York: D. Van Nostrand Co., Inc.; London: Macmillan and Co., Ltd., 1947.) 30s. net.

THIS book, by the professor of mechanical engineering at the University of Virginia, may best be described as an up-to-date heat engines text-book of an essentially descriptive character. It is intended as an introduction to heat power for second-year students, to show them "the how and why of machines and other equipment in which energy plays a part". As such, it should fulfil its purpose admirably, the subject-matter being presented and illustrated in a manner which makes its reading particularly easy and agreeable.

It makes no claim to deal with the underlying theory, the mathematics being limited to occasional formulae inserted in the text, and presented without proof. The limitations imposed by this method of presentation inevitably lead to occasional difficulties, which on the whole are successfully overcome; but it is disappointing to find such inaccuracies and oversimplifications as "hence isentropic process is a synonymous expression" (for adiabatic process); or "in the reaction turbine the nozzles are themselves attached to the shaft", even though these statements be qualified later in the text.

The extent to which this book brings its subject up to date may be judged by the fact that sections are included on atomic energy, gas turbines, jet engines and the war-time rockets and flying bombs.

These sections form a small proportion of the 435 pages, the greater part being devoted to a modern presentation of the subjects commonly met with in a heat engines text-book such as this. Useful tables of the properties of steam and other fluids are included in a supplement.

In general, the book might best be described as suitable for higher national certificate courses in Britain, though this does not mean that the book is unsuitable for courses leading to an honours degree; its agreeable manner of presentation makes it very suitable for spare-time reading by the honours student, to provide him with the necessary practical background to his more theoretical studies, and in that way to stimulate his interest.

R. W. HAYWOOD

ELEMENTARY THEORY OF ELECTRICITY AND MAGNETISM

Electricity, Magnetism and Modern Physics

A Textbook for the use of Scholarship Candidates and University Students. By Dr. G. T. P. Tarrant. (Being Vol. 2 of Physics.) (Dent's Modern Science Series.) Pp. xii+468. (London: J. M. Dent and Sons, Ltd., 1948.) 15s.

THE author states in his preface that this book is intended for students of physics who have placed the higher school certificate examination behind them and are proceeding to university scholarships or degrees, and there is no doubt that he has succeeded in producing one ideally suited for them. Much care and thought have obviously been given to the elucidation of the more difficult points in the theory of electricity and magnetism which are so often passed over in silence. The opening synopses of the histories of electricity and magnetism are likely to be very helpful to those students who might otherwise be worried by our modern conventions and order of presentation of the subjects.

The author is particularly sound in his discussion of dimensions, although the reviewer prefers to take e as a fundamental quantity in these modern days. The mathematical portions of the book are set out fully and in a manner which the average student should find easy to follow, and there are tables of practical importance, such as that of magnetic quantities on p. 278, which are very valuable in a book of this kind.

About three-fifths of the book are devoted to what is usually termed modern physics, and of which there is a survey fully adequate for the pass or general degree student. There are one or two small blemishes in the chapter on the theory of magnetism; for example, it is desirable always to emphasize that it is the magnetization vector of a domain which rotates, and this is best done by inserting the word vector wherever possible. Again, the figure on p. 284 and the use of italics on p. 286 may give the impression that Bitter figures are formed only upon a surface to which an applied magnetic field is perpendicular. Most teachers will appreciate the clear and helpful diagram which illustrates Dunnington's (not Duddington) method for finding e/m ; but the inclusion of an electron path in the Bainbridge mass spectrograph may put dangerous ideas into students' heads. But these suggestions should not be taken to detract from a book which is warmly welcomed.

L. F. BATES