

original, simple, and often amusing manner in which the author characteristically presents his subject to his audience.

The first three lectures are concerned with the preparations for the journey: (1) The starting-point, our earth; (2) the length of our voyage and the start through the air; (3) journeying by telescope. The remaining lectures are devoted to the journey itself: (4) visit to the moon and planets; (5) visit to the sun; (6) visit to the stars. During the interval of ten years between the publication of the two editions, the great advances of astronomy call for the addendum. In forty pages it is only possible, as the author says, to give samples of these advances. Nevertheless, the reader is introduced to things appertaining to relativity, the study of the upper air, recent ideas on stellar evolution, and the measurement of the diameter of α Orionis.

Mathematics.

Nouveau traité de mathématiques générales. Par Prof. Eugène Fabry. Tome 2. Analyse: Intégrales, équations différentielles, dérivées partielles, courbure, séries trigonométriques; Mécanique: vecteurs, cinématique, statique, dynamique, résistance des matériaux; théorie des erreurs. Quatrième édition entièrement refondue. Pp. 276. (Paris: J. Hermann, 1925.) 40 francs.

PROF. FABRY'S object in this volume is to give a working knowledge of elementary mathematical analysis, leading to some of its mechanical applications. In the first half, dealing with differentiation, integration, and differential equations, he sketches the more familiar processes of the calculus but generally omits any reference to the refinements which a pure mathematician now considers to be essential to the discussion. Thus the account of Fourier series covers six pages, in which it is shown how to evaluate the coefficients, and includes no mention of the validity of Fourier's expansion. Subject to such limitations, the section on analysis contains little that is actually wrong. In the compass of 120 pages the ground covered ranges from elementary calculus to partial differential equations and Stokes' theorem. A reader prepared to disregard the niceties of pure mathematics will often find that the brevity of Prof. Fabry's treatment adds interest to the topics discussed.

Passing to the second half of the book, the section on statics contains three pages about catenaries. Centres of gravity and moments of inertia are discussed more fully. In dynamics there are chapters dealing with the motion of a single particle and with that of a rigid body about an axis. The last two chapters are devoted to the resistance of materials and the theory of errors, and are followed by a collection of 276 formulæ.

Prof. Fabry's style is lucid throughout, and his treatment of the various subjects discussed is brief through his ignorance of mathematical subtleties, not through over-condensation. The book, now in its fourth edition, is of greater value to engineers using mathematics as a tool than to students: the latter will generally find the author's treatment to be inadequate.

W. E. H. B.

Modern Physics.

The Spectroscopy of X-rays. By Prof. Manne Siegbahn. Translated with the author's additions by Prof. George A. Lindsay. Pp. xii + 287. (London: Oxford University Press, 1925.) 20s. net.

THIS is an excellent translation of Prof. Siegbahn's well-known book, and it will be widely appreciated. Prof. Siegbahn and his pupils have made the field of X-ray spectroscopy peculiarly their own, and no one is better qualified than the author to review the present position of the subject. The refinements in technique which he has introduced have led to a knowledge of X-ray spectra which approaches in accuracy that of optical spectra at no very recent date, and the imposing table at the end of the book giving the principal X-ray spectral lines is a revelation as to the extent of the field surveyed.

The book has been written throughout from the view-point of the experimental investigator. Discussions of the purely theoretical aspect have not been entered into, but just so much theory has been given as will illustrate the interest of the various experimental results. The matter has been most carefully and wisely chosen with this object in mind.

The subject naturally divides itself into two parts, dealing with technique and with the significance for atomic physics of X-ray spectra respectively. In the first part an account is given of the types of X-ray tube, of spectroscopic apparatus, and of sources of high-tension current. Here will be found many useful hints, tables of the properties of materials, and a mass of information collected and arranged. The second part describes the laws of excitation of the spectra, the K , L , M , and N series, absorption spectra, the systematic arrangement of the spectral-lines and its interpretation. The last chapter gives an account of the methods, other than those of wave-length measurement, which provide a means of measuring the inner energy levels of the atom.

X-ray spectroscopy is making such rapid advances that any review of it will need constant revision. One feels very grateful to the author for having found time, in the midst of his investigations, to collect the information and present it in an attractive and convenient form. His book is an excellent introduction to the subject and review of the present state of knowledge, and is in a form which will make it possible to bring it up-to-date in future editions. Prof. G. H. Lindsay has worked in the author's laboratory, and his translation does full justice to the simple and readable style of the original book.

A Treatise on Electricity. By F. B. Pidduck. Second edition. Pp. xiv + 664. (Cambridge: At the University Press, 1925.) 21s. net.

THE first edition of Mr. Pidduck's valuable treatise on electricity appeared in 1916, and the important advances made in the science during the past ten years have necessitated some changes in the present edition. In the earlier part of the book the most important alteration is to be found in the mathematical introduction, the vectorial methods and notation now employed resulting in considerable improvement in the subsequent mathematical analysis. The author, however, is on