

REVIEWS

General Physics for Students of Science.
By Robert Bruce Lindsay. (John Wiley & Sons, Inc., New York; Chapman & Hall, Ltd., London), 1940. Pp. 554. Price 22sh. 6d.

It is difficult to write a book purporting to cover the whole of physics, aiming at a fairly high standard, within the limits of a single volume, when advance in every branch is both rapid and profound. In fact the tendency is to devote books to particular branches of physics.

The present book is an attempt to cover in a single volume of 554 pages the whole range of physics, including some of the more recent developments. The standard aimed at can be gauged from the fact that simple calculus methods are freely employed and a small attempt is made to introduce vector methods in certain parts. The subject-matter is divided into five parts comprising 29 chapters.

The first part, chapters 1 to 3, gives a general introduction, dealing with scientific method, a historical review of the progress of physics from Aristotle to the present day and a short exposition of the general properties of matter. Part two is devoted to mechanics, dealing with general dynamics, oscillatory motion, work and energy, gravitation and planetary motion, systems of particles, motion of a rigid body, statics, elasticity and some properties of liquids, in succession. The five chapters of part three are given to heat, including a short treatment of the kinetic theory and thermodynamics. Magnetism and electricity are comprised in part four, wherein alternating current circuits, and electrical discharge through gases are included. Part five, styled Radiation, deals in succession with sound, geometrical and physical optics, thermal and spectral radiation, with a short excursion into atomic structure.

It will thus be seen that an attempt is made to traverse the most important fields in physics in a comparatively short compass. The treatment is naturally not detailed or intensive, though a clear exposition of such topics as are taken up is attempted. Lack of adequate space limits the scope of such attempts. As a text-book for students of other sciences to obtain an insight into the domain of physics, the book will be very

useful. But for those who specialise in physics to the standard attempted in the book—which may be taken as the B.Sc. standard—the book may fall short of their needs.

Each chapter is followed by a good selection of examples illustrative of the principles embodied in the chapter.

Errors are few, but we may point out on page 81 the definition of an erg as the energy of 1 gm. moving at 1 cm. per second.

A. V. T.

Electrical Measurements in Principle and Practice. By H. Cobden Turner and E. H. W. Banner. (Chapman & Hall, Ltd., London). Pp. 354. Figs. 219. Price 7sh. 6d.

This is a cheaper edition of the book which was first published in 1935. It meets the long-felt want for a book dealing with the general description and working of the various types of measuring instruments that any electrical engineer may come across. The list of instruments described is almost exhaustive and the treatment clear and simple. The use of mathematics with which many operating engineers feel rather uneasy, has been avoided. The technical terms, symbols and abbreviations employed are in accordance with the recommendations of the British Standards Institution.

The book is divided into five parts. The first part consists of three chapters dealing with units and standards, the second part is divided into nine chapters giving general descriptions of almost all the different types of electrical measuring instruments met with in practice. Parts III and IV consist of three and five chapters respectively dealing with electrical measurements. The last part which consists of four chapters covers indirect electrical measurements some of which such as the 'dryness of timber' and 'acidity of fruits' are interesting.

The authors might consider the following suggestions before the publication of the next edition:

(1) More adequate treatment of the testing of Energy Meters and Instrument Transformers.

(2) The addition of a chapter on high voltage tests on insulators and insulating materials.

The book is abundantly illustrated. A

glossary of technical terms and a few charts indicating at a glance the scope and range of the various measuring instruments employed are other desirable features. The get-up of the book is good and its low price of 7sh. 6d. brings it within reach of almost everyone.

K. ASTON.

Television: The Electronics of Image Transmission. By V. K. Zworykin and G. A. Morton. (Chapman & Hall, Ltd., London), 1940. Pp. 646. Price 36sh.

This book on the electronic aspect of television by two of the foremost workers in the field, supplies to the radio engineer and experimenter a long-felt need for an authoritative work on the subject. So far as the reviewer is aware, this is the first book on the electronics of television meriting the name of a reference book which brings together the more relevant parts of the numerous technical papers that have appeared during recent years.

The book opens with a brief historic survey of the discovery of electrons and the photoelectric effect leading on to the discussion of such phenomena as the photoelectric and thermionic emission of electrons, the mechanism of luminescence and certain aspects of electron optics, and several other physical principles that provide a useful background for the proper understanding of the subject. The second part deals with the general principles of television and gives a fairly clear conception of the factors contributing to the quality of pictures in relation to the various physical methods employed. Such items as synchronization, scanning, amplifiers, and certain aspects of high frequency transmission and reception of television signals, are all dwelt upon. What is probably most interesting from a practical point of view is the section dealing with the various component parts and electronic devices employed in television; like iconoscopes, kinescopes, electron guns, etc., and their methods of construction. Sufficient practical details are included to enable one to construct some of these devices in the laboratory. This feature in conjunction with a very detailed account of a model television receiver (a circuit diagram of which is given with the values of the component parts) should prove to be valuable to those entering this interesting field.

What would appear as a discontinuity of subject-matter in the chapters of the main text is partly made up towards the end, by

a detailed description of the sequence of working of a typical television equipment at RCA and NBC installations.

The concluding part of the book deals with the nature of certain television problems and the future of television, and gives an extremely practical view-point of the television art, and its future, as gauged from its present stage of development, by one whose contributions to the subject are so well known.

The book is profusely illustrated with neat diagrams and leaves nothing to be desired in the nature of artistic get up. The bibliography at the conclusion of each chapter should prove very useful and will be appreciated by those who need original references. The book should prove of great value to the engineer, the experimenter and to all those interested in the subject, and should find a prominent place in every technical library.

C. C.

Intermediate Practical Physics. By T. M. Yarwood. (MacMillan & Co., London), 1940. Pp. 307 + xii. Price 6sh.

The book is well written, describing 106 different experiments ranging over the whole course in Physics. Each experiment begins with a statement of the apparatus required, followed by a brief description of procedure. The formulæ required are written out and figures and diagrams given showing the apparatus, its disposition and working wherever necessary. Tabular statements and graphical methods of studying results are provided. Thus the description, though generally brief, is precise and helpful.

The first chapter is devoted to general instructions dealing with procedure, errors of observation, limits of accuracy, methods of calculation and graphical work. Ten pages towards the end contain some 20 tables of useful physical data, and these are followed by four-figure tables of logs, anti-logs, sines, cosines and tangents.

Several of the experiments are probably outside the normal routine of the Intermediate courses of most Indian universities, though these differ in their standards in individual subjects, depending on the number of subjects taught, the attention devoted to languages and the number of hours assigned to practical work per week. Thus, experiments on Young's modulus, surface tension, viscosity, Clement and Desorme's experiment, fourth power law of radiation,

Newton's rings, Lloyd's mirror, Kundt's tube, magnetisation curves, earth inductor and capacities of condensers, to mention a few, are likely to lie beyond the scope of the syllabus, practical or theoretical, of Intermediate courses in most Indian universities. However, it is possible to make a judicious selection of experiments to suit any Intermediate course, from those given in the book.

A. V. T.

Plant Viruses and Virus Diseases. By F. C. Bawden. (Chronica Botanica Co., Leiden-Holland), 1939. Pp. 272. Price 7 guilders.

Although virus diseases of animals and plants were recognised since the middle of the last century, the nature of their causal entity remained obscure for a considerable time. The study of viruses was rendered difficult by the fact that their isolation and culture could not be achieved by the orthodox methods practised by bacteriologists and mycologists. The early investigations in the field of virus diseases were mainly directed towards the elucidation of symptomatology, mode of artificial and natural transmissions, relationships between viruses and their vectors, range of host-plants, and the nature of immunity in hosts.

With the discovery of Stanley in 1935, that the tobacco mosaic virus could be obtained in a state of crystallinity, a new era of spectacular progress in this field was ushered in. A wide circle of scientific investigators immediately got themselves interested in a field of research, till then considered purely biological and obscure. Bawden and Pirie were the first to establish the nucleoprotein character of the mosaic virus. Chemists, crystallographers, serologists, physicists, and others have interested themselves in a fascinating study of these intriguing pathogens, many of which could be obtained in a state of perfect crystallinity. Their intensive labours have resulted in the accumulation of a large volume of significant data. Bawden's contributions in this field have been both intensive and substantial. There was the imperative need to correlate and critically appraise these data. The appearance of the volume on this subject is therefore timely and appropriate. It would be difficult to find an equal more competent to handle the subject with the critical thoroughness, logic and clarity which distinguish the entire volume. By producing

this classic, the author has placed a wide circle of investigators in this field under a deep debt of gratitude.

M. S.

Annual Review of Physiology, Vol. II. By James Murray Luck and Victor E. Hall. (American Physiological Society and Annual Reviews Inc.), 1940. Pp. vii + 501. Price \$5.00.

The second volume of this new series of Annual Reviews has appeared in spite of the terrible distractions of war confronting the world; the direct result of this unhappy state is reflected in the fact that there are no contributions from Europe which is the scene of the crisis. It is indeed creditable and flattering to the American continent that, in spite of this unavoidable exclusion of European physiologists, a comprehensive review on the most important topics of physiological research has been presented in this volume.

Twenty reviews comprising the volume cover the field of the physiology of tissues and tissue fluids like, the blood and the lymph. Important systems and processes which are fundamental to life, like respiration, the heart, the central nervous system, the autonomous nervous system, reproductive organs, the digestive system, have been individually treated; progress in the field of the special senses and the endocrine glands are covered by two separate reviews.

Of special interest to organic chemists and pharmacologists are the two chapters on the pharmacology of barbiturates and arsenicals. The review on the defense mechanisms in infectious and related diseases is very stimulating while that devoted to exercise has a public appeal in a country where national fitness has long been neglected. The part which physiological researches could play in the removal of "physical illiteracy" and the attainment of National Fitness and efficiency, is revealed in this chapter. Attention should be invited to the chapter on physiological psychology which contains a useful summary of the researches carried out in this field, particularly the influence of hormones and vitamins on the emotional and intellectual qualities of the animal.

Like its companion series, the Annual Reviews of Physiology will render themselves indispensable to all chemists, physiologists, psychologists and to the progressive man of medicine.

M. S.