

REVIEWS

Mass Spectra and Isotopes. By F. W. Aston. (Edward Arnold and Co., London), 1942. Pp. xii + 276. Price 22-6-0.

This is a very readable book written with authority by one who is master of the field. It is not a treatise on the subject in which every development is dealt with in equal detail, but is written, rather, from a more personal angle, and since the personality of the author has occupied a central position in the field from the beginning, a very balanced account of the whole development of the subject from its inception to its present more or less completed stage has resulted. The book is in four parts, and is illustrated with twelve well-chosen plates.

The first part traces the history of the subject, which really entered its modern stage when the idea of isotopes was put forward by Soddy in 1910, up to about 1925. There is a chapter devoted to a description of the details of Aston's first mass spectrograph and an elementary account of the theory underlying it. I feel, however, that the full mathematical theory of the spectrograph as worked out by Aston and Fowler should have been given in the book for the benefit of those who wish to understand the working of the instrument in greater detail, and this might well have been done in an appendix in order not to encumber the text. Similarly, the questions of dispersion and resolving power might also have been treated at greater length.

The second part of the book deals with the modern technique of mass spectrography and the development of high precision instruments. It is a very well written survey of the field which enables the reader to appreciate the triumph of modern technique in the enormous increase in the precision of the modern instruments over the original mass spectrograph.

The third part of the book is a most useful and authoritative compilation and deals with each element in the order of its atomic number. For each element all the known stable isotopes, and of the naturally radio-active substances, those stable enough for mass spectrum analysis, are mentioned, and the best figures for their relative abundance and packing fractions, when known, are given. In the words of the author, "This account constitutes a summary with references, of all the data upon which have been based the first International Table of Stable Isotopes in 1936 and each of its annual publications since". It forms a most useful place of reference for the research worker in the field, whether experimental or theoretical.

The fourth part of the book deals with several distinct themes. There is an elementary chapter on modern ideas about the structure of nuclei. In this connection I doubt the wisdom of publishing a diagram like Fig. 37, which might give to the beginner a completely outmoded picture of the atom, when with the

help of the ideas of state, energy and angular momentum an accurate knowledge of the atom could have been conveyed with equal simplicity and at hardly greater length. There is a very good chapter on the isotopic effect in molecular spectra, and one on the isotopic effect in atomic spectra and the allied properties of nuclear spin. Finally there is a good chapter on the separation of isotopes. I think that the separation of isotopes by electrolysis is of sufficient importance to have merited a more detailed description of its technique, since it is the application of this method to the isotopes of hydrogen which has led to the only complete separation of a rarer isotope on a large scale that is so far known.

The author is to be congratulated on having treated a bulky subject in such a clear and simple way and yet with completeness in its main essentials. The above remarks have been made merely as suggestions, which might be considered when a new edition is contemplated, in order to increase the completeness and usefulness of what is really an excellent little book. The book is to be warmly recommended not only to the student, but also to the theoretical physicist who wishes to get a knowledge of the methods and experimental results from which the facts upon which he builds his theories are derived.

H. J. BHABHA.

Polarography. By I. M. Kolthoff and J. J. Lingane. (Interscience Publishers, Inc., New York, N.Y.), 1941. Pp. xvi + 510, with 141 illustrations. Price \$6.00.

The book is intended "to present a complete and critical account of the present status of polarographic analysis ... and the newly developed 'amperometric titration' methods". The book is divided into eight parts and thirty-three chapters. The captions of these eight parts indicate the subject-matter of the book and are: Introduction; Theoretical Principles; Apparatus and General Technique; Inorganic Polarographic Analysis; Organic Polarographic Analysis; Biological Applications of Polarography; Voltammetry with Platinum Micro-electrodes; Amperometric Titrations.

The theoretical principles underlying these methods of analysis have been treated in some detail and the experimental evidence on which they are based have been amply cited. The recent work of the senior author and his collaborators have been drawn upon extensively. The book gives a full account of the present position of our knowledge regarding polarographic analysis. It will be found very useful by those interested in this branch of electrochemical analysis and more particularly by research workers in this subject. Its very wealth of detail, however, may cause embarrassment to those who are concerned more with the use of the method than with the details of numerous investigations some of which have

not passed beyond the formative stage of development. It would be of great advantage if the subjects were presented in the next edition in two parts, one giving a brief outline of the theoretical principles, just sufficient experimental details for accurate results and only those examples of analyses where these methods have been found to be reliable and most useful. Detailed theoretical treatment and the various applications where the method does not yield results which are quite unequivocal might be dealt with in the other part. The theoretical background of the whole subject though it has been considerably cleared up by recent work seems to admit of considerable improvement in many places. One such topic is the interpretation of maxima. The fundamental relations in section 6 of the second chapter would, it is hoped, in due course be capable of a more direct theoretical treatment. One would have liked a more comprehensive discussion of the investigations on the electro-capillary curve which, as the authors have indicated, is of utmost significance in polarographic work.

Taking all in all, however, the book is a welcome publication and illustrates the great progress made in the development of these methods and their utility in which the authors and their collaborators have actively participated. In addition to the subject and author indices there is an appendix containing half-wave potentials of inorganic substances which will be found to be very useful.

The reviewer regrets the delay in reviewing the book partly due to pressure of work and partly for other reasons. J. N. M.

Electrical Engineering Practice, Vol. II. By J. W. Meares and R. E. Neale. (Chapman & Hall Ltd., London), 1942. Pp. xii + 663, Figs. 244. Price 35sh.

This is volume number two of the well-known work of the authors which is now running in its fifth edition and which is published in three volumes. The first volume was published a year earlier.

Volume two, as it appears in its present form, is an improved and enlarged edition of the previous one. The contents and the index are so arranged that they form one single unit for the three volumes together. Further, reference is to numbered paragraphs and not to pages. There are in all 1060 paragraphs of which the first 386 are in volume I and 669-1060 in volume III and the rest in the volume under review. The subject-matter included, therefore, is divided into three parts called parts IV, V and VI and it runs through eleven chapters in all, beginning with chapter 17 and ending with chapter 27. Part IV deals with transformation, conversion and storage of electrical energy; part V deals with distribution and control in branch circuits; and finally, in part VI are given the applications of electrical energy.

The book is packed with useful and valuable information. It has been brought up-to-date and one distinctive feature about it is that although

it deals essentially with modern practice still it gives wherever necessary information about the older practices on which later practices are based. This is a book which will be found of great help to every engineer—whether electrical, mechanical or civil. It has all the advantages of a hand-book without its disadvantages. The field covered is very large and yet it is written in such a way that whatever the topic that is being discussed, the reader gets the impression that he has been given a good bit of information which he can understand and which will be of definite use to him. The balance that has been achieved between what one calls 'theoretical' and what one calls 'practical', makes the book unique.

There are plenty of illustrations included in the text as also a large number of tables which give information not easily accessible. At the end of each chapter a more or less exhaustive bibliography is given which makes the book still more valuable.

In conclusion, in the opinion of the reviewer, this book is meant for an engineer whose duties demand from him both technical knowledge and experience. Money spent in buying these volumes is money well invested.

Prakashlektan Shastratil Ascharye. By K. A. Damle, B.Sc. (Published by the author at Damelewada, Shastripol, Baroda), 1943. Pp. 156, Figs. 39. Price Rs. 2.

This little volume of 156 pages written in Marathi, is not exactly a treatise on photography and allied subjects although it contains a lot of information. It is essentially meant for the general reader. It is written in an easy style and succeeds in keeping the interest of the reader throughout.

The book can roughly be divided into two parts. The first part which covers four chapters unfolds the remarkable story of the birth and growth of the science of photography. The rest of the book is devoted to a number of topics connected with photography the range of which is suprisingly wide. Here are some of the items dealt with: Cinematograph, talking pictures, trick photography, colour photography, X-ray, infra-red, ultra-violet photography, spectro- and micro-photography, photostat, etc. The reader will find something interesting to read about almost every one of these.

The author has done a distinct service to the Marathi reading public in writing this interesting and instructive book.

A Text-Book of Intermediate Physics in Tamil, Vol. II. By R. K. Viswanathan and V. N. Ramaswamy. (Annamalai University, Annamalaiagar), 1941. Pp. lxxi + 689-1372 + xii.

This is a successful first attempt at writing the more advanced general science in Tamil. The book is written in free Tamil and the presentation of the subjects, light, sound, magnetism and electricity, follows the routine text-book type. The scientific equivalents coined