

REVIEWS

The Chemical Action of Ultra-violet Rays.

By Carleton Ellis and Alfred A. Wells.
Revised and enlarged edition by Francis
F. Heyroth, University of Cincinnati.
(Reinhold Publishing Corporation, New
York), 1941. Pp. ix + 961. Price \$12.00.

This well-known book on photochemistry which appears in its second and very much revised and enlarged edition is characterised by comprehensiveness. It is divided into four parts. The first part gives a very complete account of the various sources of ultra-violet radiations, continuous and discrete, available at the moment, together with chapters on related topics such as filters and glasses permeable to these radiations. The second part on "photochemical processes" begins with an admirable short account of molecular spectra and their meaning to photochemical phenomena and gives a masterly account of the various known photochemical reactions in all three states of matter, organic and inorganic. The last two parts deal with the innumerable and evergrowing applications of photochemistry to industry and of ultra-violet rays to biology. In these, a fairly detailed account is given of the service rendered by spectroscopy in general and ultra-violet radiations in particular to various problems in applied biology and to such various industries as, preservation of foods, oils, paints, varnishes, rubber, textiles, paper, dyestuffs, leather, petroleum, gum, tobacco, alcoholic beverages, asphalt, fertilisers, linoleum, etc. In each part, references to original papers are given with a thoroughness which is necessary. The work will no doubt be of immense and constant use not only to persons working in photochemistry but also to those who are interested in industry in general. R. K. A.

Reports on Progress in Physics. Vol. VII, 1940. (The Physical Society, London), 1941. Pp. 362. Price 22/6.

The latest number of *Reports on Progress in Physics*, Vol. VII (1940), published by the Physical Society of London is the second volume of the series which has come out after the war broke out. It is interesting to note that neither the size of the

Report nor the quality of the matter has suffered on account of the war.

The present volume begins with two articles, one on Sound, and the other on Musical Acoustics, both by Dr. Richardson. He has summarised the advances in these subjects in his usual comprehensive manner. The next article is by Dr. Wright on "Photo-electric spectrophotometry and its applications to Industry". This is followed by two other articles dealing with the technical applications of science, one by Dr. Lee on "New Lens Systems" and the other on "Electron Microscopy" by Dr. Klemperer. One of the topics dealt with by Dr. Lee is the increasing use to which the Schmidt reflector is being put in the design and construction of astronomical telescopes. The growing use of the Electron Microscope in Medicine and Microbiology is the subject-matter of an interesting article by Dr. Klemperer. At the beginning of the article Dr. Klemperer gives a clear account of the construction and working of the Electron Microscope with appropriate diagrams. Photograms are reproduced to show how the Electron Microscope is a distinct improvement over the Optical Microscope in virus research where the size of the virus which is beyond the resolving power of the Optical Microscope is clearly within the range of the Electron Microscope.

Advances in Classical Physics are represented by an article on 'Surface Tension' by Dr. Brown and another on 'Equations of State' by Dr. Beattie and Dr. Stockmayer. One would have thought that these two subjects were fairly completely understood, but from a perusal of these two articles it becomes clear that the last word has not been said on these familiar topics. Messrs. Francis and Jenkins have written a comprehensive article entitled 'Electrical Discharges in Gases and their Applications' Part I. The authors have discussed briefly the present position in regard to our knowledge of this subject and further have outlined the lines on which progress is being made. It is a pity that the more useful part dealing with the practical applications of the phenomena treated could not be included in the present volume. The

next article is one on 'Some Interactions of Gases with Metals and Crystalline Solids' by Dr. Roberts. This report makes very interesting reading, no doubt due to the fact that Dr. Roberts himself has been responsible for a considerable portion of the developments embodied in the article. This is followed by a report on 'Viscosity and the Nature of Substances of High Molecular Weights in Solution' by Dr. Eirich. It is unfortunate that this article is without a bibliography so necessary in reports giving recent advances. We are told that this was due to the internment of the author while engaged on this report. Advances in Astrophysics are treated in two articles, one by Dr. Thackeray on 'Solar Physics' and the other by Dr. Hunter on 'The Absorption of Light in Interstellar Space'.

The article by Dr. Feather dealing with 'Gamma Radiations Emitted during Nuclear Processes' deserves particular notice. The whole subject is surveyed in a comprehensive manner. No one who wants to get acquainted with the present position in regard to this intriguing phenomenon connected with nuclear processes could afford to ignore this very interesting Report. The other article on Modern Physics is by Dr. Peierls on 'The Bohr Theory of Nuclear Disintegration'. This deserves special mention for the clear and lucid manner in which he has made a difficult subject intelligible to the average reader. He has achieved this by confining himself mainly to the phenomenological aspect of the theory.

Last comes a very readable article by Dr. Ferguson dealing with the history of 'The Development of the Teaching of Experimental Physics in British Universities'.

In conclusion, we warmly recommend this volume to all those who wish to keep themselves abreast of the latest developments in the realm of contemporary Physics.

B. V. R.

A Text-Book of Electricity and Magnetism. By G. R. Noakes. (Macmillan & Co., London), 1941. Pp. x + 513. Price 8sh. 6d.

Of the many text-books on electricity and magnetism so far available, the needs of the B.Sc. students of Indian universities were best met by the well-known book of Starling. That book, particularly in its most recent edition, was so good that we could not recommend a better one to our students.

Here we have before us now a book which bids fair to outrival 'Starling'. On account of the fact that in this book modern developments have not been added during a process of revision, but the treatment is uniformly modern throughout, it will have a distinct advantage for some time to come over new editions of well-established texts. The even balance between pure theory and technical applications maintained in this work will recommend its adoption in preference to others where one or the other aspect has been stressed. The treatment is throughout elegant and the uniform use of the calculus has no doubt contributed to this happy result. Without sacrificing a thorough presentation of the older material, the author has succeeded in incorporating adequate descriptions of modern advances such as the Van de Graaff generator, hot cathode lamps, the M. K. S. system of units, recent determinations of the electronic charge, mass-spectrographs, electron optics, electron configurations in atoms, artificial radioactivity, the cyclotron, Heisenberg's theory of Ferromagnetism, cosmic rays, the mesotron and so on. The illustrations are numerous and well chosen. There is a set of problems at the end of each chapter and some hints for the solution of difficult ones are included at the end. The price is also moderate and compares favourably with that of similar books. We have no hesitation in recommending this book as being eminently suited to fulfil the requirements of the pass degree examinations of Indian universities.

T. S. S.

Electrotechnics (The Honorary Secretary, *Electrotechnics*, Indian Institute of Science, Bangalore), 1941. Price Rs. 2.

This is the fourteenth number of the *Journal of the Electrical Engineering Society* which is published once a year. The issue opens with an "Editorial" which is mainly devoted to the consideration of the relation between industrial research and industrialisation. This is perhaps a topic of special significance at the present time and some of the observations made in the course of the Editorial are interesting. It is pointed out that a mere programme of industrial research—however successful—cannot automatically lead to the industrialisation of the country. Successful research and its subsequent exploitation are two distinct problems, each beset with its own peculiar difficulties.