REVIEWS

Peaceful Uses of Atomic Energy, Vol. 6. *Geology of Uranium and Thorium.* (Published by the United Nations, New York.) Available in India from: Orient Longmans, Ltd., Calcutta, Madras and New Delhi, 1956. Pp. xiv + 825. Price $ 9.00.

The volume under review contains the text of 129 papers on geological, geophysical, metallurgical and petrological subjects that were accepted for full presentation at the International Conference on the Peaceful Uses of Atomic Energy held in August 1955. They deal with the subjects, "Occurrences of Uranium and Thorium" and "Prospecting for Uranium and Thorium", presented by geologists from 23 countries, the bulk of the contributions being from the U.S.A. (67); there are two papers from India. The majority of the papers describe the regional and local occurrences of U and Th in 21 countries, excluding the countries of the U.S.S.R. These are illustrated by maps and sketches showing their geological environments and relationships, the control exercised by structural, stratigraphical and organic features, magmatic differentiation, contact, metamorphism and other conditions influencing the precipitation of these metallic compounds in favourable situations. They include the world-famous Uranium Province of Katanga in the Belgian Congo, the equally rich Eldorado deposits of Northern Canada, and the later finds of Beaverlodge and Blind River areas, the uranium province of Central France, the Colorado Plateau in the Western U.S. and the rich by-product uranium in the Rand Gold Mines region of South Africa. Mention may be made of the highly illustrative paper by Prof. Paul Kerr, which contains a comprehensive review of the world's notable U and Th natural occurrences.

India has an ambitious programme of atomic power development for industrial use in the next ten years and our young geologists will derive much fruitful knowledge and information about the field occurrences and methods of investigating the atomic raw materials by a careful study of the rich store of factual information provided in these 825 pages.

The last twelve years have witnessed a hectic search for uranium in many parts of the world, and one of the major contributions of the volume under consideration is the light it throws on modes of occurrences, association and paragenesis of U and Th in favourable host-rocks, their origin, age and the geological principles leading to their discovery. New, recently discovered techniques for detecting these metals, when present in minute but workable quantities, are freely and frankly disclosed and commented upon. The major commercial discoveries of uranium of the last decade have been outlined and discussed in a number of papers by experts. These include vein deposits of various types, placer and alluvial deposits, accumulations in meta-sediments, disseminations in granites and crystalline rocks, replacement deposits, uraniferous coal, lignite and phosphetic rocks. Valuable fragments of information concerning the original sources of U and Th in the Earth's crust and their exploration by electronic, magnetic and other geophysical techniques can be gathered from these papers which constitute a most up-to-date summary regarding the world's future available stocks of raw minerals for processing of Nuclear Energy.

From the above, it will be gathered that the present volume contains carefully sifted and ascertained data on the two Nuclear-fuel metals, which are going to be the prime source of the world's industrial power in the near future. It is a complete reference work on uranium and thorium and will remain for many years a standard text and basic documen a-tion on the subject.

D. N. WADIA.

Synthetic Ion Exchanges—Recent Developments in Theory and Application. By G. H. Osborn. (Chapman & Hall), 1955. Pp. ix + 419. Price 30 *sh.*

Following the pioneering work of Adams and Holmes in 1935 on synthetic ion-exchange resins, these resins have received increasing attention, and are now being used in such diverse fields as agriculture, chemistry, biology and medicine. In the rapidly-growing field of ion-exchange it has become impossible to keep track of the advances in different aspects of the theory and application of ion-exchange techniques. In presenting the widely scattered literature on the subject in a concise and handy form with relevant helpful comments, the author has indeed done great service to the user of ion-exchange resins.

The book under review is divided into eight small chapters, but the more important and main feature is a classified bibliography of about 2,000 original publications in this field. After briefly describing the salient points in the synthesis of ion-exchange resins, the author has tabulated the performance data of several commercially available ion-exchange resins. This should prove helpful in choosing the proper resin from available stock. The chapter on analytical aspects and applications of the resins, a field in which the author has specialised, is of practical importance. In another chapter, author's own findings on the ability of materials of low solubility to dissociate by their shaking with ion-exchange resins are well described, and the industrial importance of this technique is illustrated with several examples. The recently evolved technique of ion-exclusion which has already gained ground, has been adequately dealt with. The latest developments in the field of ion-exchange membranes are included, giving technical details of the commercially available membrane samples. The therapeutic applications of ion-exchange resins are also briefly stated.

The exhaustive bibliography at the end of the book should be of help to research workers as a handy source of reference. The book has a nice get-up and should be a valuable addition to libraries of all modern research laboratories.

S. L. KAPUR.

Physiology of Voluntary Muscle—British Medical Bulletin, Vol. 12, No. 3. (The Medical Department, The British Council, 65, Davies Street, London, W.1), 1956. Pp. 161-236. Price 15 *sh.*

The volume under review contains a comprehensive survey of the work on the physiology of voluntary muscle by British workers. Various aspects of muscular contraction are dealt with. Prof. A. V. Hill and his co-workers deal with some biophysical aspects of muscular contraction such as the design of muscles, the thermodynamics of muscle and the mechanical properties of muscle. The article on the interpretation of muscle striations is very interesting. The articles on the biochemical aspects of muscular contraction deal with its proteins, the interaction of actomyosin and adenosinetriphosphate and the energy production of muscle. The physiology of muscle in the intact body is dealt with by articles on the activity of muscles during locomotion, nervous gradation of muscular contraction, muscular fatigue, familial periodic paralysis and changes in muscle after death. The comparative physiology of muscle deals with movement of fish and four-footed animals. Lastly, the function of the muscle membrane and its role in neuro-muscular transmission is described. This volume will be very useful to workers on muscle in particular and to physiologists in general.

INDERJIT SINGH.

Annual Review of Biochemistry, Vol. 25. Edited by J. M. Luck, F. W. Allen and G. MacKinney. (Annual Reviews, Inc., Palo Alto, California), 1956. Pp. vi + 794. **Price $ 7.00.**

Though Annual Reviews on subjects like microbiology, physiology and plant physiology published in recent years deal with a few topics of biochemical interest, the present *Annual Review of Biochemistry* continues to be as voluminous as ever before, indicating the tremendous progress made by investigators all over the world in this particular field of scientific endeavour. There are, in fact, twenty-four articles in all in this review including the prefatory chapter on the late Sir Edward Mellanby of England written by B. S. Platt. There is no doubt about the prefatory chapter serving a very useful purpose in focussing attention every year on the life's work of an individual and giving the much-needed colour to what would otherwise be mere cataloguing and critical reviewing of the year's research work in biochemistry.

A. Meister has an article on non-oxidative and non-proteolytic enzymes, in which he has reviewed the recent advances in transaminases and amino acid racemases. J. S. Fruton and M. J. Mycek have in their article on proteolytic enzymes dealt with exopeptidases, endopeptidases, transamidation reactions and the use of proteolytic enzymes in studies of protein structure and enzyme action. E. J. Bourne and R. Stephens of England in their review on the chemistry of carbohydrates have restricted themselves to certain select topics such as sulphur containing carbohydrate derivatives, infrared spectroscopy and paper electrophoresis of carbohydrates, as well as to a study of the conformational analysis of carbohydrates. F. B. Shorland of New Zealand has reviewed the advances made during the year on the chemistry of lipides, while C. E. Carter has reviewed the metabolism of purines and pyrimidines. There are, further, the usual review articles on metabolism of lipids, carbohydrates, amino acids and proteins,

nutrition, fat-soluble vitamins and water-soluble vitamins, the last mentioned subject being divided into three chapters in view of the large amount of data accumulated and significant advances made during the year under review.

Special articles on the biochemistry of viruses by F. W. Putnam, of cellular particles by W. C. Schneider and G. Hogeboom, on cancer by C. Heidelberger, on hæmoglobins by H. A. Itano, on the chemistry of fungi by C. E. Stickings and H. Raistrick, and on metabolism of drugs and other organic substances by W. H. Fishman belong to a different category altogether, and have been very ably executed by the respective authorities on those subjects. It is pleasing to note that the reviewers on various topics have taken due note of research work carried out in different parts of the world including India and Japan.

There is a useful subject index as well as an author index at the end, and the volume is sold at a very reasonable price. It is undoubtedly a very valuable acquisition for all scientists who are interested in the latest advances in biochemical and allied research.

P. S. SARMA.

Serpentoid Reptilia—A Coloured Atlas of Some Vertebrates from Ceylon, Vol. 3. By P. E. P. Deraniyagala. (Ceylon National Museum), 1955. Pp. xviii + 121. Price not given.

Volume 3 of *A Coloured Atlas of Some Vertebrates from Ceylon* is the last one on the reptiles of the island and deals with the snakes of Ceylon. In the 99 pages of the text, 83 species of snakes are dealt with. The scale arrangements, colouration, habits, range of occurrence and the features of identification are clearly described. Keys are provided for the identification of the snakes, and the many text-figures bring out their distinctive characteristics. In additian to text-figures, there are 14 coloured plates prepared by the author, and 7 half-tone plates. Some of the half-tone plates, particularly II and the second half of IV, are unsatisfactory and nothing would have been lost by not having them. The coloured plates are on the whole good and add much to the quality and value of the Atlas. If the coloured plates are true depictions, then the snakes of Ceylon are really colourful in comparison with their counterparts in India. In plates 37, 38 and 39, the hinder part of the snake is shown suddenly twisted so as to bring the ventral side up. This spoils the effect somewhat.

In a brief introduction the author discusses the evolution of the snake fauna of Ceylon attributing the recent evolutionary changes to the changes in the geological structure of the island in the last one million years. Several Ceylon sub-species are said to be more primitive and closer to the original stock than their Indian counterparts. This is in accordance with the general observation that in the geographical distribution of animals, the archaic forms of a group are found in the southern regions. There is no need to suggest any less sustainable alternative as the author seems to do.

The introduction ends with a reminder of the utility of snakes as destroyers of vermin, and a suggestion that the snake fauna may be worth exploitation as a source of delicious human food. I would rather leave them to destroy the vermin. P. K. MENON.

Elementary Practical Geology. By E. deC. Clarke, R. T. Prider and C. Teichert. Third Edition. (Revised by R. T. Prider). The University of Western Australia Press, Nedlands, Western Australia. Pp. v + 172. Price 27 *sh.* 6 *d.*

The book consists of four sections on mineralogy, petrology, palæontology and the making and interpretation of maps, and is divided into 13 chapters. There are two appendices dealing with materials suggested for laboratory study and derivation of geological terms. In the introduction, the authors give the chief distinctions between igneous, metamorphic and sedimentary rocks. In the second chapter on crystallography are given definitions, the enumeration of crystallographic axes, the several crystal notations, the crystallographic laws and the forms of the various crystal systems. In the third chapter are given the chemistry of minerals and blow-pipe tests. In the two subsequent chapters the physical and optical properties of minerals are dealt with. In the sections on petrology, palæontology and interpretation of maps, lucid statements are made of the fundamentals of these branches of geology. The appendix on the derivation of geological terms is particularly interesting and illuminating.

In Indian Universities, where geology is taught for intermediate classes the book will be of great help to the teacher and the student. Though it falls a little short of the B.Sc. syllabus, students will find the book a valuable introduction to geology. P. R. J.

The Distribution of the Standing Crop of Zooplankton in the Southern Ocean. By P. Foxton. *Discovery Reports*, Vol. XXVIII, Pp. 193-235. (Cambridge University Press), 1956. Price 7 *sh.* 6 *d.*

The present report on the distribution of the standing crop of Zooplankton, is yet another valuable addition to the *Discovery Reports* issued by the National Institute of Oceanography. Unlike the planktonic studies of other expeditions, the present is based on collections from almost all parts of a large oceanic area at almost all times of the year. The precautions taken to avoid errors in the measurement of volume of total plankton which is particularly small in vertical hauls, as well as the measures taken in separating plants from animals, will prove useful to those making quantitative studies of plankton. Through numerous tables, graphs and block diagrams, are presented the data relating to (*a*) seasonal vertical movements between superimposed water-masses and seasonal variations in the amounts of plankton, (*b*) the standing crop in different latitudes, and (*c*) the standing crop in different longitudes.

That there is a gradient in the quantity of Zooplankton from low to high latitudes has been found by other authors, but in the present report it has been made clear that while from 0° to 55° S we have a steady increase, there is a fall from 55° to 70° S even though this fall is only slight.

The author believes that since "probably no other oceanic region is richer in life than the Antarctic, an area far greater than any other of comparable fertility", this study will contribute to what is known of the fertility of the oceans as a whole. Estimations of the standing crop, especially of the Zooplankton, can at best form only a gross index of the fertility of any water-mass. However, as a report on the standing crop of Zooplankton of an oceanic area, the account is excellent and will serve as a pattern for all such studies in future.

This report will be a welcome addition to all biological libraries.

Books Received

Physical Techniques in Biological Research. Vol. I. Edited by G. Oster and A. W. Pollister (Academic Press, Inc., New York), 1956. Pp. xiii + 564.

Perspectives in Organic Chemistry. Edited by A. Todd. (Interscience), 1956. Pp. x + 527.

The Physics of Nuclear Reactors—British Journal of Applied Physics, Supplement No. 5. (The Institute of Physics, 47, Belgrave Square, London, S.W. 1), 1956. Pp. iv + 111. Price 25 *sh.*

The Storage of Seeds for Maintenance of Viability. By E. Biasutte Owen. (Commonwealth Agricultural Bureaux, England), 1956. Pp. v + 81. Price not given.

Automaton in Theory and Practice. By E. M. Hugh-Jones. (Oxford Basil Blackwell, Macmillan & Co., London W.C. 2), 1956. Pp. ix + 140. Price 12 *sh.* 6 *d.*

Atomic Structure and the Strength of Metals. By N. F. Mott. (Pergamon Press), 1956. Pp. 62. Price $ 2.75.

Die Technischen Anwendungen der Radioaktivitat. By Engelbert Broda and Thomas Schonfeld. (Veb. Verlag Technik, Berlin, Porta-Verlag, Munchen), 1956. Pp. x + 313. Price not given.

Eels—A Biological Study. By Leon Bertin. (Cleaver-Hume Press), 1956. Pp. vi + 192. Price 25 *sh.*

Glossary of Indian Medicinal Plants. By R. N. Chopra, S. L. Nayar and I. C. Chopra. (C.S.I.R., New Delhi), 1956. Pp. xx + 330. Price not given.

Progressive German Reader for Arts and Science Students. By Haragopal Biswas. (University of Calcutta), 1956. Pp. xx + 367. Price Rs. 12-8-0.

Recent Advances in Science—Physics and Applied Mathematics. Edited by Morris H. Shamos and George M. Murphy. (Interscience), 1956. Pp. xi + 384. Price $ 7.50.

Fundamentals of Immunology. Third Edition. Revised. By W. C. Boyd. (Interscience), 1956. Pp. xiv + 776. Price $ 10.00.