REVIEWS

Hi-Fi: From Microphone to Ear. (*Modern Sound Recording and Reproduction Technique.*) By G. Slot. (Philips Technical Library Popular Series), 1956. [Available from Philips Electrical Co. (India) (Private), Ltd., 7, Justice Madhab Chandra Road, Calcutta], 1956. Pp. 169. Price Rs. 9-8-0.

Though popular interest in realistic recording and reproduction of sound is pretty high, there have been comparatively few books written on this fascinating subject. This, the latest addition to the popular series of the Philips Technical Library, is meant to fill this need and gives descriptions of sound recording and reproduction techniques so as to be understood both by lay readers and trained technicians.

The book, which is a translation from the original in Dutch, begins with a historical account of sound recording methods and surveys the translation from the purely mechanical to the complex mechano-electro-acoustical characteristics of the chain from the microphone to the human ear. The next chapter deals with disc cutting techniques and the processing of records for commercial use. The several types of pick-ups commonly employed are then discussed as also the causes of distortion that usually occur in disc recording. There is a chapter, useful to the layman, on how to take care of the needle and the record (disc) to get the maximum service out of these components. Record players and record changers are described next while the succeeding three chapters are concerned with amplifiers, loudspeakers and baffles. Magnetic tape recording occupies one chapter while some musical recordings which could roughly evaluate the quality of the reproducing equipment in the home are listed. The Appendix contains a loudness ratio chart, the frequency range of some musical instruments and the response characteristics of a few pick-ups manufactured by Philips.

As can be seen from the above summary, the book is mostly concerned with disc recording, presumably because this is the field of greatest interest to the author and also to the vast majority of the lay public, particularly outside the United States. However, in view of the rapidly increasing popularity of domestic tape recorders, it might have been useful to describe in more detail the techniques of magnetic recording. A description of methods developed for mass duplication of tapes would be of interest to many readers. Further, the acoustics of recording studios and listening rooms, though briefly touched upon, could have been elaborated considering their decisive importance in the final assessment of quality. However, these are minor omissions and considering the difficult objective the author had set for himself, he has succeeded admirably in steering clear of being either too abstruse for the lay reader or too vague for the technician.

The get-up conforms to the usual high standards of the series, though there are more than a few printing mistakes in the text. Its reasonable price and easy availability would, it is hoped, make it popular both with the discriminating general public and those professionally interested in the subject.

RAM K. VEPA.

Polythene—High Polymers, Vol. XI. By R. A. V. Raff and J. B. Allison. (Koppers Company, Inc., Pittsburg, Pennsylvania) (Interscience Publishers), 1956. Pp. 551. Price $ 16.00.

The volume is the eleventh in the series on high polymers and is welcome in view of the absence of information on polythylene in an organized form. The technical developments of this particular plastic discovered as early as 1935 have far outstripped the theoretical understanding. Commencing with the first chapter on historical development regarding the high pressure, high temperature polymerization methods of ethylene and on the erection of two large-scale production plants in U.S.A. in 1941, complete details of the properties and manufacture of ethylene, kinetic studies on the diverse types of polymerization of ethylene under catalysed and non-catalysed conditions, degradation, etc., have been reported in the next two chapters. Very interesting and instructive information is to be found on polythene chain grafting by various types of mono and diolefines, allyls, amines and on procedures for chlorination, chlorosulfonation for the after treatment of modified polythene. Molecular structure determination of polythene by electron microscope and molecular weight determinations by the usual ebullometric and viscosity methods together with chain branching by infra-red spectrum are given.

A mine of information is to be found in Chapter VI on the diverse plastic properties of polythene. The chapters on analysis and testing, processing and handling, uses and applications of polythenes are very comprehensive and will be read with great interest by the fundamentalist and the technician as well. A statistical summary on consumption, production, uses and producers of polythene is an attractive novel feature of this book, which might be copied with advantage when works on other plastics are written.

The volume has a beautiful get-up and the number of illustrations are as numerous as they are pleasing, in every chapter. The rapid developments on the theoretical and industrial side of this versatile plastic are very nicely portrayed in the volume which will undoubtedly be read with great interest. M. SANTHAPPA.

Germanium Diodes. By S. D. Boon. (Philips Technical Library.) (Available from: Philips Electrical Co., 7, Justice Chandra Madhab Road, Calcutta 20), 1956. Pp. viii + 85.

The book under review is one of the popular series in Philips Technical Library. In about 85 pages, the author has presented an elementary and interesting account on germanium diodes which have become an important electronic component in recent years. The first four chapters are devoted to a popular exposition of the conducting properties of crystals and their diode characteristics. In the next four chapters, the behaviour of these diodes in actual circuits are discussed and the special features that distinguish them from thermionic valves in rectification and demodulation are explained with the aid of a number of well-chosen examples and graphs. The last chapter contains about twenty-five applications of this component in communication, measuring instruments and other electronic circuits. Complete data and characteristics of many of the germanium diodes of Philips manufacture are presented both in the appendix and text.

As mentioned in the preface, the author has discussed the basic nature and the electrical features of the device in a practical manner with the minimum essential theory. In the reviewer's opinion, a feature, important from either aspect, that has been omitted is their noise characteristic. However, engineers and scientists who would have occasion to design circuits involving crystal diodes would find this book useful in appreciating their correct application and operation.

K. S. CHANDRASEKARAN.

Physics of Fully Ionized Gases. By Lyman Spitzer, Jr. (Interscience Publishers), 1956. Pp. ix + 105. Price $ 1.75.

This is a slim booklet of 105 pages included in the *Interscience Tracts on Physics and Astronomy*, edited by Professor R. E. Marshak.

The book deals in a theoretical way with the physics of gases composed of electrons and ions. Such gases occur in the earth's higher atmosphere, in the atmospheres of the sun and stars, and in some regions of interstellar space. The mass-movements in ionised gases are coupled to electromagnetic fields and their study has given rise to the growing subject of magneto-hydrodynamics or hydromagnetics.

There are five chapters in the book and an index. The first chapter deals with the microscopic motion of charged particles, the second and third with the macroscopic motion of neutral ion clouds, the fourth with waves in a plasma and the last with transport and diffusion phenomena which depend on encounters between charged particles in a rarefied gas.

The physical ideas are kept well in the foreground and the mathematics can be tackled by an Honours student in physics who is familiar with Maxwell's equations and with the elements of vector analysis and the kinetic theory of gases. The book will prove particularly useful to students of solar physics and of ionospheric physics.

K. R. R.

Principles and Practice of Antibiotic Therapy. By Henry Welch. (Published by Medical Encyclopædia Inc.), 1954. Pp. xix + 699. Price $ 12.00.

Dr. Welch, as Director of the Division of Antibiotics of the U.S. Food and Drug Administration has been instrumental in the progress of antibiotics since their introduction into the U.S.A. The present volume is an enlarged and expanded edition of his earlier publication entitled "Antibiotic Therapy".

The volume is divided into three parts. Part I deals with the discovery, development and pharmacology of the antibiotics. Part II discusses the antibiotic therapy of infectious diseases. Part III deals with antibiotic therapy in medical specialities such as ophthalmology, pediatrics, oral surgery and dentistry. All the commonly used antibiotics have been exhaustively dealt with in the book under review, which merits careful study by scientific workers interested in antibiotics and by physicians using antibiotics in their daily work.

The index however does not appear to have been prepared with sufficient care. For example, the important statement made on page 181, "The *in vitro* studies indicate that a clinical trial should be made using carbomycin in the treatment of amœbiasis, leishmaniasis and trypanosomiasis" will not be easily available to the student of leishmaniasis, as this condition does not find a place in the index at all.

K. S. S.

Leukocytic Functions. By A. S. Gordon and others. (*Annals of the New York Academy of Sciences,* Vol. 59, Art. 5. Pp. 665-1070), 1955.

This volume contains a series of papers which were discussed at a conference on 'Leukocytic Functions' dedicated to Dr. Hal Downey and held by the section of biology of the New York Academy of Sciences. Dr. Downey has spent half-a-century on the study of various aspects of hematology and has published several papers on the development of the spleen and lymph nodes, on the platelet problem and on the reaction of the blood and tissue cells to acid colloidal dyes.

The volume is divided into five parts, dealing with an introduction to the leukocytes, techniques in the study of leukocytic functions, factors influencing numbers, distribution and fate of leukocytes, defence functions of the leukocytes and chemical and metabolic aspects of leukocytic activity. It will thus be seen that the several facets of leukocytic functions with special reference to each variety of the leukocytes have been dealt with by the various contributors.

The papers dealing with physiologic functions of eosinophils, the daily rhythm in numbers of circulating eosinophils, hormonal influences upon the leukocytes and enzymes of leukocytes should be of special interest to Indian physicians who are struggling hard to find an acceptable solution to the problem of the pathogenesis of tropical eosinophilia or eosinophilic lung. Recent observations have shown that serotinin sharply potentiates the eosinophenic action of cortisone. Since serotinin is a substance known to be in relatively high concentration in nervous tissue, the possibility must not be ignored that it may be liberated under certain circumstances and exert a hormonal action. The volume under review will merit careful study by those engaged in researches on tropical eosinophilia and will perhaps serve to convince them that the solution is more likely to come from the biochemical than the bacteriological laboratory.

Many of the papers are well documented with charts and micro-photographs to illustrate the points made in the text. The volume must be read not only by the laboratory worker interested in hematological problems but also by the physician who will find in it much to help him in his clinical work.

K. S. S.

Enzymes: Units of Biological Structure and Function. Edited by O. H. Gaebler. (Henry Ford Hospital International Symposium), 1956. (Published by Academic Press, Inc., New York.) Pp. 624. Price $ 12.00.

The proceedings of the international symposium on "Enzymes: Units of Biological Structure and Function" held at Henry Ford Hospital, Detroit, in November 1955, are recorded in this volume. This is one of the most informative books ever written on enzymes and it will long remain a leader in its field. The symposium satisfies to a very great extent the need for representatives of many scientific disciplines such as microbiology, genetics, physiology and pharmacology, biochemistry and biophysics, nutrition, etc., to come together and discuss the subject of enzymes.

In Part 1 on 'the origin of enzymes', the articles relate to the mechanism of enzyme induction, the role of enzymes in cellular differentiation and nucleic acids and enzyme synthesis. Part 2 pertains to the gene-enzyme relationship. The cell structure as related to enzymes is dealt with in Part 3. The intracellular physiology of the mitochondrion and other cytoplasmic structures, the administrative role of the genetic apparatus like the chromosomes and other nuclear products in the life of the cell, etc., are discussed under this topic. The enzymatic basis for physiological functions such as excretion, visual excitation, light emission and the participation of the actomysin system in organised enzyme reactions are discussed in Part 4. Part 5 on cellular energy sources and Part 6 on the regulation of enzyme activity likewise contain articles of a remarkably high order and value. Two evening lectures delivered by Drs. Linus Pauling and Szent-Gyorgyi on the 'Future of Enzyme Research' and 'Mechano-Chemical Coupling in Muscle' respectively are thought-provoking. Especially the former is almost a scientific crystal ball, the speaker extrapolating the course of the enzymes far and wide into the future and

striking a very optimistic and encouraging note about the shape of things to come.

The informal tone of the discussions affords glimpses of the participant's personalities, some of whom delve into the exciting possibilities that are ahead in enzyme research. The contributions strike a balance between the basic and experimental approaches, thus bridging the gap from theory to experimental evidence, especially the articles on cell biology, hitherto considered as merely descriptive. The book is packed with information which is judiciously presented and will be equally useful to the advanced worker as well as the student. After going through this vast store-house of information one readily discerns that enzymology is fast entering into a state of healthy adolescence and is no more an infant science. The editing has been done in a most scholarly manner and regarding the printing and get-up of the book, suffice it to say it is another Academic Press volume.

K. V. GIRI.

Epidemic and Endemic Diarrheal Diseases of the Infant. (*Annals of the New York Academy of Sciences*), 1956, **66**, **Art.** 1. Pp. 3-320. Price $ 3.50.

The diarrheal diseases of the infants still constitute a major group amongst the diseases responsible for infant mortality. This problem is more acute in the underdeveloped countries lacking in public health programmes and complete eradication is yet to be achieved even in the highly advanced countries.

The present monograph on the subject is a timely publication setting forth the advances made in our knowledge of the etiology, pathogenesis, diagnosis, specific therapy and prophylaxis of epidemic and endemic diseases of the infants in a concise manner, presenting at the same time the limitations in our knowledge and the challenging problems still awaiting solution. The volume contains contributions from research workers of different disciplines, virologists, bacteriologists, veterinarians and physicians, thus providing an unique opportunity to review a synthesis of thoughts rather than canalization into a restricted compass.

The initial chapters deal with a historical review and global appraisal of the diarrheal diseases in man by Hardy, and the prevalence of diarrheal diseases in animals by Hagan; Nungster describes the host parasite relationship and the importance of genetics and nutrition of the host in relation to susceptibility to infection is shown by Schneider. The immunological studies presented by Edsall and Gamma globulin deficiency in infancy by Spain *et al.* are of great interest in understanding the higher susceptibility of the infants to diarrheal infections.

A critical appraisal of the etiology of the diarrhœal diseases, constitute the second group of papers. These include *Salmonella* and *Salmenellois*, *Enteropathogenic escheria coli* and their importance as causative organisms of diarhœa, the role of paracolobactrum proteus and Clostridia in the diarrheal diseases of man.

The improvements over the conventional diagnostic agglutination methods by the monovalent and polyvalent enterobacterial hæmagglutination and the hæmolytic modification of these tests and the potential usefulness of these methods for the diagnosis and epidemiological investigations of enterobacterial diarrheal diseases are described by Neter *et al.*

Besides the bacterial origin, the possibility that infantile diarrhœa might be caused by viruses has received considerable attention. There are a number of natural diarrheal diseases among animals that are caused by viruses. Epidemic diarrheal disease of viral origin of newborn calves, newborn swine, suckling mice, diarrhœa in puppies by distemper virus, *Miyagawanella bovis* infection in calves have been discussed in detail. These observations together with the identification of a new, large and heterogeneous group of many antigenically distinct viruses in the very young children have focussed attention and the possible role of poliomyelitis, Coxsackie, APC and ECHO viruses in various syndromes in which diarrhœa is a prominent clinical manifestation.

M. SIRSI.

Journal of the Palaeontological Society of India, Vol. I, No. 1. Inaugural Number. (The Palæontological Society of India, Alimanzil, Walaquadar Road, Lucknow), 1956. Pp. xxxvi + 229. Price Rs. 30.

The inaugural number of the above journal contains 32 articles by distinguished scientists both Indian and foreign. Some of these are general introductions to problems in palæontology. Others are articles on original work done by individual authors.

M. R. Sahni, the President of the Society, summarizes the various aims of the Society which include not only strictly scientific ends but also the aim of disseminating popular knowledge among the lay public. He also gives in the second article a fascinating review of

the development in India, Pakistan, Burma and Ceylon, of the science of palæontology, palæobotany and prehistory. As a joint author with J. P. Srivastava, he describes the discovery of Eurydesma beds at Khemgaon Chorten and Wak in Sikkim, and of conularia-bearing horizon in the Subansiri Forest Division, North-East Frontier Agency, and indicates the stratigraphic significance of these discoveries.

Otto H. Schinderwolf reviews the history of palæontological societies, and J. B. S. Haldane writes on the biometrical analysis of fossil populations. P. Evans and Y. Nagappa describe the economic applications of palæontology in oil industry, particularly the use of small foraminifera in correlation. A. Morley Davies compares the "ladder of life" conception of Bonnet with the ramification postulated by Lamarck. Other very interesting original articles by J. C. Troelsen, Bruno Accordi W. E. Le Gros Clark, S. R. N. Rao, J. K. Verma and various others follow.

The get-up of the journal is excellent and all lovers of palæontology will welcome this inaugural number.

P. R. J.

Books Received

Recent Progress in Hormone Research, Vol. XIII. Edited by Gregory Pincus. (Academic Press), 1956. Pp. 453. Price $ 10.00.

International Review of Cytology, Vol. V. Edited by G. H. Bourne and J. F. Danielli. (Academic Press), 1956. Pp. vii + 570. Price $ 11.50.

Spot Tests in Organic Analysis, Fifth Edition. By Fritz Feigl. (Cleaver Hume Press), 1956. Pp. xx + 616. Price 55 *sh.*

The Reactive Intermediates of Organic Chemistry. By John E. Leffler. (Interscience Publishers), 1956. Pp. ix + 275. Price $ 6.00.

Technique of Organic Chemistry, Vol. III. Second Edition. Part I. *Separation and Purification.* Edited by Arnold Weissberger. (Interscience Publishers), 1956. Pp. ix + 873. Price $ 17.50.

Advance in Carbohydrate Chemistry, Vol. 11. By W. G. Frankenburg, V. I. Komarewsky and E. K. Rideal. (Academic Press), 1956. Pp. xviii + 465. Price $ 11.00.

Enzyme Antigen and Virus—A Study of Macromolecular Pattern in Action. By M. Burnet. (Cambridge University Press), 1956. Pp. viii + 193. Price 18 *sh.*

SCIENCE NOTES AND NEWS

A First Record of *Hepaticites* sp. A Fossil Bryophyta from the Karewas of Kashmir, India

Sri. S. K. Goswami, Department of Biology, Shakumbri Das College, Saharanpur (U.P.), writes as follows:

Fossil Liverworts have been described from the Upper and Middle Coal-measures of Staffordshire and Shropshire (England) respectively by Mr. J. Walton of the University of Manchester. In India the discovery of fossil Bryophyta of the type *Hepaticites* from the karewas of Kashmir has been made by the author for the first time. The specimen of *Hepaticites* was released during the bulk maceration of the lignite collected from the Nichahom-Handwara area of Kashmir (altitude 6,000-10,000 ft.) and is being studied in detail.

European Brewery Convention

The Sixth International Congress of the European Brewery Convention will be held at Copenhagen, Denmark, during June 2-7, 1957. Scientific meetings will relate to the following subjects: Hops and Foam, Barley and Malt, Nitrogenous substances, Yeast and Fermentation, Oxidation-Reduction and Miscellaneous. Those wishing to attend the Congress are requested to apply for a Registration Form to the Secretary, The Institute of Brewing, 33, Clarges Street, London W 1. Registration Forms are to reach the Institute of Brewing not later than 8th April 1957.

Alan Johnston, Lawrence and Moseley Research Fellowship

Applications are invited by the Council of the Royal Society for the Alan Johnston, Lawrence and Moseley Fellowship for research into the problems of human and animal health and diseases and the biological field related thereto. The Fellowship will be tenable at any place approved by the Council of the Royal Society. Applications should be made on forms to be obtained from the Assistant Secretary, The Royal Society, Burlington House, London, W.1, and should be received as early as possible, in any case, not later than April 6, 1957.