REVIEWS

Royal Society Mathematical Tables, Vol. IV. (*Tables of Partitions.*) By Hansraj Gupta, C. E. Gwyther and J. C. P. Miller. (Cambridge University Press.) Price 3 £ 3 *sh.* net.

The theory of the partition of integers into different parts is one of the most beautiful branches of Number Theory and finds application in diverse subjects like combinatory analysis, group theory and statistical mechanics. In the present tables, values are given for $p\ (n, m)$ which is the number of partitions of n into at most m parts, and three other functions $p_2\ (n, m)$, $p_3\ (n, m)$ and $p_4\ (n, m)$ which are defined only mathematically and are given by the relations

$$\sum_{n=0}^{\infty} p_s\ (n, m)\ t^n = \prod_{r=1}^{m} \frac{1}{(1-t^r)^s} \prod_{r=m+1}^{\infty} \frac{1}{(1-t^r)^{s-1}}$$

$$(s = 1, 2, 3, 4 \ldots)$$

The tables are preceded by an introductory chapter explaining the symbols used, their interconnections and the methods adopted for the computation of the functions, and an excellent bibliography for the subject of partitions of numbers. The introductory chapter reads as a good introduction to the subject of partitions itself and supplies formulæ for $p\ (n, m)$ for three different cases, namely, (1) when m is comparable with n; (2) when n is small and (3) in the asymptotic case of large values of n. When $m = 0$, the last case reduces to the asymptotic expansion for $p\ (n)$, the number of unrestricted partitions of n into integers which is a problem solved by Hardy and Ramanujan in one of their famous papers. Table I tabulates the values of $p\ (n, m)$ in the first instance for values of m from 1 to 100 and of n from 1 to 200, and secondly when $n > 200$, for all values of m from 1 to 50 and for n up to 400. Table II gives the values of $p_2\ (n, o)$ $[p\ (n)]$ for values of n up to 1,000 and the values $p\ (n, m)$ for small values of m. Table III tabulates the function $p_3\ (n, m)$, and in Table IV are given the values of $p_4\ (n, o)$ or $p_3\ (n)$ for integral values of n up to 200.

The tables would prove to be beneficial to all scientific institutions wherein the programme of work calls for the numerical application of partition functions. The authors and publishers deserve to be congratulated for bringing out this edition which is a product of arduous labour and excellent printing workmanship.

K. S. VISWANATHAN.

Nuclear Scattering. By K. B. Mather and P. Swan. (Cambridge University Press, London N.W. 1), 1958. Pp. viii + 469. Price 80 *sh.*

The subject of nuclear scattering has recently been exhaustively reviewed in several volumes of the *Handbuch der Physik*. Those who want a briefer account of this topic will welcome this book in the series of Cambridge Monographs on Physics. It deals mainly with the scattering of nucleons by nucleons and very light nuclei, where it is possible to investigate the detailed form of the nuclear two-body interaction.

Chapter 1 introduces concepts of nuclear physics necessary for an understanding of nuclear scattering. Chapters 2 to 4 are devoted to general experimental methods and are discussed only in the special context of scattering technique. This is more or less a review and adequate references are given to the original papers. Chapter 5 contains graphs of range-energy relations for charged particles in various materials, and will serve as a ready reference.

Two chapters are devoted to the theory of low-energy neutron-proton and proton-proton scattering and introduces the well known concepts of effective range and scattering length. In this region there is excellent agreement between theory and experiment. A further chapter discusses the low-energy scattering of nucleons by very light nuclei. The introduction of more particles makes calculations much more difficult and the authors show that the work done so far is inexact and incomplete. It becomes necessary to take into account the non-central interactions, namely, the tensor and the spin-orbit interactions which are important, for example, in the scattering of nucleons by α-particles.

This is followed by two chapters on high-energy scattering. The discussion of this work leads to no definite conclusion about the details of the nucleon-nucleon interaction but the method of approach given here has been followed in the recent very important work of Signell and Marshak, and Gammel and Thaler. In this section the deuteron stripping reaction is introduced and reviewed in some detail.

Many other related topics are discussed briefly, for example. nuclear saturation, meson theory of nuclear forces, the optical model and the Breit-Wigner dispersion formulæ. Considering the size of the book, the account is quite comprehensive. It is well illustrated with diagrams and figures, and has a very complete list of references. It will be very useful to research workers and post-graduate students, but the price (80 *sh.*) is rather high.

G. A.

Rockets, Missiles and Space Travel. By Willy Ley. (Chapman & Hall, London W.C. 2 ; India : Asia Publishing House, Bombay-1), 1957. Pp. xv + 528. Price 50 *sh.*

This book is a useful contribution to the rapidly increasing library on 'Conquest of space' literature.

A good half of the book is devoted to the historical background and chronological development of Rockets. Starting from the time of the Babylonians, the author describes in an elaborate and yet interesting manner the evolution of modern Rocketry.

This book should particularly interest those who believe that a combination of suitable rocket fuels and a rocket motor will make a flight to the Moon possible within the near future. However, to those who may deem it all that simple, the author's personal experience in the enormous technical problems which face teams engaged in Rocket Research, in the Chapters 'Peenemunde' and 'White Sands' (the two famous rocket research centres) will be immensely educative. Any project on rocket research involves the automatic functioning of a host of different components and the failure of even a single component in the System dooms to failure the whole project. Therefore, checks, rechecks, counter-checks must be applied first and last at all stages of the development programme. A clear insight to problems like escape velocity, exhaust velocity, mass ratio, etc., which are very important in the launching of a rocket is given in the Chapter, "The Rocket into Cosmic Space". In the Chapters "The Shot Around the World" and "The Spaceship", the future possibilities and uses of launching of future artificial satellites both unmanned and man-manned are described.

The book was published in March 1957 and so does not include the successful launching of the artificial satellites. Of course, as the author himself expresses, with the rapid progress done in this field, one cannot expect a book of this type to be up-to-date. Nevertheless information on rocket research done till the early days of 1957 has been adequately covered.

In conclusion, with the evolution of the Rocket Airplane admirably described in Appendix I, the useful notes, tables and diagrams—of which there are 84—the book attains substantial reference value, besides being useful and instructive to both the specialist and non-specialist alike.

B. M. C.

Polymer Reviews—The Effects of Ionizing Radiation on Natural and Synthetic High Polymers. By Frank A. Bovey. (Interscience Publishers, New York), 1958. Pp. xiii + 287. Price $ 8.00.

This volume is the first of a series of reviews to be published on subjects of lively and topical interest in polymer science. The choice of the radiation chemistry of high polymers as the first in the series is quite appropriate. Apart from the technological and theoretical interest, the subject is linked up inextricably with the problem of human welfare. In the light of the continuous radioactive pollution of earth's atmosphere by nuclear explosions and the general awakening throughout the world to the genetic hazards of radiations, the importance of the subject can never be over-emphasised.

The volume begins with a concise and balanced treatment of radiochemistry which is followed by an introduction to the chemical effects of radiations. Against this essential background, a general account of the radiation chemistry of high polymers is presented in the third chapter. The principal reactions induced by radiations namely scission and cross-linking and the statistical methods of treating the phenomena constitute the subject-matter of the succeeding chapter. This is followed by a detailed presentation in six chapters the results of the extensive investigation of the physical and chemical changes brought about by radiations on synthetic and natural polymers. The diverse types of synthetic polymers are grouped together under different heads from the standpoint of structure such as hydrocarbon polymers, acrylics, halogenated polymers, diolefin polymers and condensation polymers. The natural polymers and their derivatives are given a separate treatment in the last chapter. No knowledge of the structure of the polymeric materials is presupposed on the part of the reader and prior to the presentation of radiation chemistry a brief account of the structure of the polymer is also given. This undoubtedly

enhances the utility of the book and would interest a wider class of readers. Another notable feature of the book consists in the presentation of the radiation chemistry of small molecules structurally related to polymers, as a prelude to the discussion of the radiation chemistry of the polymer. This approach proves to be of immense efficacy in stressing upon the nature and the type of interaction of the vulnerable sites of the macromolecule with radiation.

The volume is a critical and competent survey of one of the rapidly advancing fronts in polymer science and is a welcome addition to the existing treatises on the subject. The author has presented much scattered and even some of the inaccessible information in a very concise and readable manner. As the first of the series, it has set up an excellent standard and one would wish that the succeeding volumes of the series keep up the standard of the first volume.

The printing is excellent and free of mistakes.

S. L. KAPUR.

Number Average Molecular Weights. By Robert U. Bonnar, Martin Dimbat and Fred. H. Stross. (Interscience Publishers, New York, London), 1958. Pp. 310. Price $ 7.50.

The determination of molecular weights of solutes is a common routine laboratory experiment described in texts for undergraduates. Since Beckmann's classical experiments, for a considerable time very little beyond refinements in techniques found their way into textbooks. Except under osmotic pressure, the monograph on Physical Methods of Organic Chemistry does not give an adequate treatment and the volume under review fills a gap. The study of compounds of high molecular weights has revealed often considerable differences between different methods and a monograph dealing with all the methods including viscosity average and weight average (centrifugal) methods would have been desirable. The present volume is of strictly restricted scope dealing only with the number average methods alone.

The subject is dealt in eight chapters starting with an introductory survey with cryoscopic, ebullioscopic, osmotic pressure, vapour pressure, vapour density and functional group methods each forming a chapter and the theory of the first two methods forming a separate chapter.

Every chapter gives a clear picture not only of the conditions to be fulfilled for precision measurements but also the pitfalls in each case. Where alternative procedures are adopted, we see a critical appreciation of these so that an investigator can make his choice. The cryoscopic method rightly emphasises the factors which vitiate experimental results and amongst them is one not commonly mentioned in the routine texts : reduction in solubility of a solute by the presence of another apparently inert substance. The chapter on ebulliometry is complementary to that of Swieteslowski in *Techniques of Organic Chemistry* and we have a useful account of using this procedure in determining molecular weights up to 20,000. The volume is specially valuable for a thorough discussion of the theory of these methods. Following Lewis and Randall, expressions are derived which lead to the need for not only the conventional cryoscopic or ebullioscopic constant but second and third terms in the integrated form of the Clapeyron equation. Where precision measurements are needed, one has to know precisely the errors involved and the basis on which these can be eliminated. The fourth chapter gives us a very useful picture of this aspect.

Under vapour pressure lowering methods, both thermoelectric and isopiestic methods are described. The reviewer is unable to agree with the author that Barger's method of isothermal distillation 'was novel and not very accurate'. As a micromethod, with very simple equipment, this method gives as accurate values as many others with more complicated equipment. The last two chapters give a brief account of recent techniques in vapour density and functional group methods.

The book is well produced and both the contents and the treatment make it a valuable addition to any laboratory training students of Physical Chemistry.

S. V. A.

Organic Electrode Process. By Milton J. Allen. (Chapman & Hall Ltd., London), 1958. Pp. xi + 174. Price 32 *sh.*

The author has given a lucid account of the techniques of Electro-organic Chemistry and has discussed in detail the factors affecting the course of organic oxidations and reductions brought about by the influence of electric current. The reduction of nitro compounds, of imines and imidic esters, aldehyde and ketones, carboxylic acids, esters, amides and imides as well as some complicated systems such as alkaloids, aliphatic-substituted compounds,

sulphamated compounds, unsaturated compounds etc., are all discussed. Similarly the oxidation of aliphatic acids and their salts with special reference to Kolbe reaction, oxidation of alcohols, aldehydes, ketones, sugars, carboxylic acids, alicyclic compounds, etc., are also discussed in detail. A chapter is devoted towards anodic substitution reactions. A perusal of the subject-matter as well as the references shows that the book is rather outdated since there appears to be but scanty references to the work done during the last decade, with the result that some of the important developments have not been included in the book.

The presentation of the subject-matter is satisfactory with very few errors.

K. S. G. D.

Methods of Biochemical Analysis, Vol. VI. Edited by Glick. (Interscience Publishers, New York), 1958. Pp. ix + 358. Price $ 9.50.

Methods of Biochemical Analysis, the sixth one of the annual series, is now published. It is a most welcome addition which has quite maintained the tradition of previous volumes, so far as the wealth of materials and the varieties of newer techniques and methods dealt with in this volume are concerned. The volumes published uptill now really constitute a "self-modernizing encyclopædia" of methods of biochemical analysis. The progress of science depends considerably on the development of newer techniques and the refinement of the older ones already in use. That is why so much emphasis is given now-a-days on the methodology and instrumentation for all branches of science.

The current volume covers a variety of methods including physical, microbiological, chromatographic, electrophoretic, etc., for the determination, mostly in micro amount of the important biochemical constituents, particularly nucleic acid, serotonin, enzymes, vitamins, etc. Of exceptional importance is the procedural details of the different methods given in the book which are not always available to the workers interested in them. The contributors of this volume are either pioneers or have personal experience in the development of the methods they have discussed. So it is needless to add that a book with such a stamp of authority will be most welcome to all biochemists and other workers in the allied branches of science.

M. C. NATH.

Irrigation and Hydraulic Design (Vol. II)—Irrigation Works. By S. Leliavsky. (Chapman & Hall, London W.C. 2; India: Asia Publishing House, Bombay-1), 1958. Pp. xiv + 864. Price 294 *sh.*

The author has attempted to write a comprehensive treatise covering all aspects of irrigation and hydraulic design in three volumes. Volume I deals with general principles of hydraulic design, Volume II with designing and planning of perennial canal schemes, and theory of irrigation works including regulators, cross-drainage works, siphons, weirs and other canal structures from the smallest to the gigantic sizes. The third volume which is to be shortly published will deal with all types of sizes of diversion works, on alluvial rivers and electrification of irrigation works.

Dr. Leliavsky has undertaken this stupendous task single handed. His experience covers over 40 years which includes service with the Russian Government on the Hydroelectric Works of the Dnieper Project and the Irrigation Department of the Egyptian Government.

The second volume begins with a chapter on design of regulators of all sizes. The Egyptian practice has been discussed thoroughly. The discussion on the hydraulics of the flow of the water from the weirs has been thorough from purely theoretical point of view. As is well known, mere mathematics cannot give a correct answer in many cases and the author could have stressed on the usefulness of model studies. Under such conditions, model studies alone can give a dependable answer.

In the chapter dealing with the hydraulic works, a reference could have been made to what in India are called Relieving Weirs to dispose of the surplus water from canals. The practice of having intermediate regulators, and cross-canals is not in vogue in this country. As the author has rightly pointed out, this induces other troubles like those of silting and encouragement of weed growth, while it may be helpful in maintaining a good head at the tail end. While discussing the various types of falls, it has been correctly pointed out that the hydraulic ideal would be satisfied if the water level over the crest of irrigation work would vary precisely in the same manner as in the canal it controls. Thus for every discharge slope, the canal should remain the same, so that, all the outlets whether at the head or at the tail of the canal takes its appropriate share of irrigation water in all conditions. The Indian design of notch type of falls approaches

this ideal to the greatest extent possible (p. 334). In this respect, the American designs mentioned require further improvement. While discussing the design of automatic siphon spillways, the author is apparently not aware of the recent work done in India. The world's biggest siphons each 18 feet diameter of the Ganesh Iyer's type are working efficiently at the Mahatma Gandhi Hydroelectric Works in Mysore State. The important point to be considered with the design of siphon is the priming depth in relation to the diameter of the siphon. This has not been discussed. Another point that could have been discussed is the limitation of the height of the siphon barrel at the crest. The discharge in a siphon is not increased proportionately with the increase in the diameter of the siphon barrel at the crest. The author has done well in describing clearly the Prasil's flow net diagrams for fixing the exact shape of the trajectory flow over the spillway. This knowledge is very useful as the reviewer does not know of any other book dealing with this important subject. The author has made a statement that to reproduce cavitation in a model, the zero pressure must be taken equal to the vapour pressure p_v. He gets the equation :

$$p_a' = p_v + \frac{p_a - p_v}{n} .$$

The problem for scaling down is not as simple as that. Experiments have shown that cavitation depends on the solid-gas-nuclei content of the water. It is not known whether any correlation exists at all between Reynolds Number of the flow and inception of cavitation in the turbulent region of the flow. It is not possible to obtain a functional relationship between model experiments and prototype performances with our present knowledge of cavitation phenomenon. It should also be understood that cavitation damage is not scalar. While discussing the characteristics of the spillway flow, the author has stressed only on the design of the spillway free from any negative pressure. This restricts the coefficient of discharge over the weir. It is well known that the discharge for the same length of the weir can be increased by designing a weir (as has been successfully done by the reviewer) with negative pressure at the crest and these are called high coefficient weirs in India. As long as the pressures are above cavitation pressures, there need be no fear of vibrations or other instability problems. While designing a perennial irrigation scheme, the various anti-malarial measures necessary have also to be considered. In India, it has become a standard practice to leave a margin of a furlong or so round every village where cultivation is restricted for only dry crops. This is done to prevent water-logging in the villages coming under the command of the canals. Soil surveys and crop planning data are also necessary for designing of a perennial irrigation scheme.

The few remarks made above are intended to make the future editions of the book even more useful. The treatment of the subject has been thorough both from the historical and the analytical points of view. This is a book which every irrigation engineer ought to possess. The book contains well over 700 diagrams, charts and tables. The price, considering its excellent get-up and its value to designers, is not too high.

N. S. Govinda Rao.

Isotopic Tracers in Biology—An Introduction to Tracer Methodology, Third Edition. By Martin D. Kamen. (Academic Press, Inc., Publishers, New York ; India : Asia Publishing House, Bombay-1), 1957. Pp. 474. Price $ 9.50.

It must have been immensely satisfying to Dr. Kamen, the co-discoverer of Carbon-14, to watch the field of research pioneered by him and a few others to expand and cover a vast territory including many disciplines of scientific research.

The first edition of this book came out in 1947 when isotopic tracers were a novelty in many laboratories. It was immediately accepted as a standard text-book for the frontier science of tracer methodology. The popularity of the isotopes in biological research grew exponentially in the following years and a second edition had to be brought out in 1951. The third edition has long been overdue.

"The objective", as the author puts it, "of this third edition is the same as those defined in the first edition. The main task in preparing it has been to evaluate new material covering many aspects of a number of fields, some not even mentioned in the first edition. I am tempted to borrow the diplomatic phrase 'agonizing re-appraisal' to describe the difficulties inescapable in such a process."

In fact, the author has packed together an unbelievable amount of material within a book of a comparatively small size and as a result, the current edition, apart from attaining its obvious objective, meets the requirement for a supplementary text-book for subjects, such as biology, physiology, biochemistry and medicine.

The most impressive section of this book comprises of three chapters on the survey of tracer methodology in which the application of tracers in biological processes has been reviewed. After dealing with the principles and limitations of the tracer technique, the author proceeds on to diverse subjects, such as the dynamic state of cell constituents, the concept of metabolic pool, precursor-product relationships, metabolic cycles, isotopic competition, Ogston's hypothesis about the stereospecificity of the enzymes of the Kreb's cycle, reversibility of biochemical-equlibria and the mechanism of enzyme reactions.

In the next chapter a masterly treatment is given to three selected topics in intermediary metabolism, *viz.*, the pathway of carbon dioxide in photosynthesis, the biosynthesis of cholesterol and the biosynthesis of porphyrins, the elucidation of which can be regarded as the outstanding achievements of tracer research.

Dr. Kamen in his brief but sparkling review has been able to recreate the thrills and excitement marking these great events in biochemistry.

In the third part of this section a wide cross-section of material has been presented in connection with the applications of tracers in physiology, immunology, chemotherapy and medicine.

The reviewer fails to understand the significance of putting the last four chapters dealing with the chemistry of various isotopes at the end of the book. These should have been brought forward to follow the first three chapters—where they logically belong.

An unfortunate and probably unwitting lapse from the high standard maintained throughout the book is the structure of DPNH given on p. 176. The formula for DPNH as shown was accepted up to 1954 but has undergone revision since 1955. However, the third edition has not only kept up to the standards set by the previous editions but also has surpassed them in many respects.

P. K. BHATTACHARYA.

Thermodynamics of One Component Systems. By W. N. Lacey and B. H. Sage. (Academic Press Inc., Publishers, New York; India: Asia Publishing House, Bombay-1), 1957. Pp. xi + 376. Price $ 8.00.

Among engineering sciences thermodynamics is the oldest. The analysis and design of specific engineering systems require a comprehensive appreciation of the varied facets of thermodynamics—the breadth and usefulness of which is implied in the first and second laws.

This book is intended to meet the needs of engineering students in thermodynamics. The book is divided into two parts. Part I which consists of seven chapters deals with basic thermodynamic principles. The various terms are defined clearly and adhered rigidly throughout. The First and Second Laws of thermodynamics and their applications are logically and lucidly discussed. The general thermodynamic equations are derived and tabulated.

In Chapter 4, the behaviour of perfect and real gases is treated. While compressibility factor is dealt with, no mention is made of the "Amagat Unit". Irreversible processes and reactions between systems of constant weight and systems of variable weight are next dealt with. This latter is of considerable engineering importance.

In Part II is dealt Flow Processes. The flow of fluid through a plant may be steady flow or unsteady flow, *i.e.*, variable with respect to time. The latter is not treated in this book. The mechanics and thermodynamics of steady flow processes in view of its engineering importance are presented in great detail. The usual steady flow cycles such as Carnot, Rankine, Regenerative, Reversed, divided and multiple fluid cycles are uniquely treated in a single chapter enabling the student to a better appreciation of the same. A chapter each has been devoted to prime movers of engineering importance, *viz.*, steam turbine, steam engine and compressors. Refrigeration and liquefaction of gases form the concluding two chapters.

A noteworthy feature of the book is a brief discussion in Appendix I of the methods used in the determination of Thermodynamic properties.

The get-up of the book leaves nothing to be desired. This well-written book is a welcome addition to the numerous text-books on Thermodynamics.

A. R.

Chemotherapy and the Central Nervous System. By Henry McIlwain. (J. A. Churchill Ltd., 104, Gloucester Place, London W. 1), 1957. Pp. viii + 328. Price 45 *sh.*

Dr. McIlwain's book *Chemotherapy and the Central Nervous System* is an expensive volume and is probably meant to be used as a text-book by students to learn some of the outstanding facts on chemotherapy with reference to Central Nervous System. It is didactic

in its tone and has a bibliography attached to each chapter ; most of the references are from among the English authors. The historical anecdotes given in the various chapters of the book are interesting and give a picture of the advances that have been made during the course of time by authors working with different approaches in trying to understand the problems of chemotherapy. These anecdotes can also be fairly easily remembered.

The subject has been discussed in twelve chapters ; there is also an author and subject index. The accepted formulæ of many of the drugs now in use have been presented, perhaps, to show the possibility of synthesis of some of these drugs ; the specific action of any one part of the molecule is, however, not indicated. The last two paragraphs of each chapter show, in a summary form, the work done so far towards the specific chemotherapeutic processes and the possible lines of advance of knowledge that might take place in the coming years. The assay of many of these chemotherapeutic drugs during the metabolism in the human body are indicated but are not given in sufficient detail, for which other books and the works of other authors have to be consulted. The graphs shown in many of the chapters are simplified to reveal and to impress the memory of the results that have been obtained by various authors during their experimentation on chemotherapeutics.

The typing and format are excellent. The publishers have, as usual, given an excellently bound book. There seems to be no typographical errors.

The book can well be recommended to any post-graduate student for understanding various aspects of neuro-chemistry and the approach towards the treatment and chemotherapeutic measures evidenced by the vast quantity of work that has been done during the last few years. The author is to be congratulated on producing a very valuable textbook in a field in which there is not much available literature, presented in an easily understandable form.

M. V. GOVINDASWAMY.

A Revision of the Genus *Camellia*. By J. Robert Sealy, Royal Botanic Gardens, Kew. (Published by the Royal Horticultural Society, Vincent Square, London S.W. 1), 1958. Pp. 240. **Price 3 £ 10 *sh*.**

Students of the tea plant will welcome the publication, by the Royal Horticultural Society, of J. Robert Sealy's *A Revision of the Genus Camellia*. Mr. Sealy has been engaged on this for nineteen years and it fully justifies the labour. As exquisite colour plate by Stella Ross-Craig draws attention to the horticultural possibilities of the genus. Species are illustrated by drawings notable for their clarity and of great value to the taxonomist. Descriptions of the species in this difficult genus are presented for the first time in a convenient and accessible form. Special attention is given to the tea plant. More than one species has made its contribution to cultivated tea, and the taxonomic affinities given by Sealy must necessarily be taken into account by specialists, botanical and otherwise, who wish to extend our fundamental knowledge of this important crop. The format of the book maintains the high standard expected of the publishers : one hopes that its reception in India will be followed by a national collection of living specimens that might, in time, rival the camellias of the Huntington Gardens in America.

W. WIGHT.

Enzymes in Blood (*Annals of the New York Academy of Sciences*, Vol. 75, Art 1). (New York Academy of Sciences), 1958. Pp. 384.

This volume is a collection of papers presented at a Conference held by the New York Academy of Sciences in February 1958. The stated objective of the volume is to "increase the contact between clinical investigators of blood enzymes and members of other groups, such as enzymologists and physical chemists, so that.... each might gain in understanding and some increased ability for his own investigations". More than eighty participants report their latest findings under five major headings : Enzymes in White Blood Cells, Enzymes in Red Blood Cells, Enzymes in Blood Coagulation and in Platelets. Serum Enzymes and their Origin, and Clinical Significance of Blood Enzymes. Time and space do not permit a detailed coverage of the material (which took two days to present). It ranges from "Leukocyte glycolysis : an investigation of the Factors Controlling the Rate Behaviour in Multienzyme Systems" by William S. Beck to "Immunochemical Studies on Alkaline Phosphatase" by Max Schlamowitz, with papers on Carbohydrate, Protein and Nucleic Acid Metabolism and Blood Coagulation sandwiched in between.

So wide is the coverage of subject-matter that any scientist with any biochemical propensity whatever will find much to interest him. The volume is well edited and will be

a very worthwhile addition to the bookshelf of the biochemist and clinician.

T. RAMAKRISHNAN.

The Indian Zoological Memoirs. [Monograph No. 6 on The Indian River Prawn, (*Palæmon*)]. (Published by the Zoological Society of India). Pp. 102. Price Rs. 5·0.

The issue of a second edition of the Indian Zoological Memoir on the Indian River-Prawn, *Palæmon*, though long overdue since its first publication in 1937, will be warmly welcomed by students and teachers of Zoology in the steadily increasing numbers of Universities and Colleges in the country. It is to be hoped that when a revised edition of the Memoir is contemplated, the following will be borne in mind: the addition of a key to the Indian species of *Palæmon* and of a separate chapter on Embryology, and the enlargement of Chapter XII on Bionomics and Distribution. A short bibliography of essential literature referred to in the text on the subject-matter of the Memoir may prove to be a useful addition.

The price of the Memoir is reasonable considering that the quality of printing and get-up equals that of the contents.

H. S. R.

Books Received

Nuclear Magnetic Resonance. By H. S. Gutowsky, F. C. Nachod and others. (*Annals of New York Academy of Sciences*, Vol. 70, Art 4.) Pp. 763-90.

Gypsum and Anhydrite. By A. W. Groves. (H.M. Stationary Office, London S.E. 1), 1958. Pp. iv + 108. Price 7 *sh.* 6 *d.*

Metals and Enzyme Activity. Edited by E. M. Crook. (Cambridge University Press, London N.W. 1). 1958. Pp. 102. Price 21 *sh.*

Cosmic Electrodynamics. By J. W. Dungey. (Cambridge University Press, London N.W. 1), 1958. Pp. ix + 184. Price 32 *sh.* 6 *d.*

Scientific Uses of Earth Satellites. By J. A. Van Allen. (The University of Michigan Press: India: Asia Publishing House, Bombay-1). Pp. x + 316. Price $ 10.00.

The Exploration of Space by Radio. By R. H. Brown and A. C. B. Lovell. (Chapman & Hall, London W.C. 2; India: Asia Publishing House, Bombay-1), 1957. Pp. xii + 207. Price 35 *sh.*

Instrumentation in Testing Aircraft. By C. N. Jaques. (Chapman & Hall, London W.C. 2; India: Asia Publishing House, Bombay-1), 1957. Pp. xi + 291. Price 45 *sh.*

Report for 1957, Rothamsted Experimental Station, Harpenden, Herts. (Rothamsted Experimental Station, Harpenden, Hedts), 1958. Pp. 316. Price 10 *sh.*

Space Exploration. By P. Moore. (Cambridge University Press, London N.W. 1). Pp. 36. Price 3 *sh.*

Modern Geometrical Optics. By M. Herzberger. (Interscience Publishers, New York-1), 1958. Pp. xii + 504. Price $ 15.00.

Mind and Matter. By Erwin Schrodinger. (Cambridge University Press, London N.W. 1), 1958. Pp. vii + 104. Price 13 *sh.* 6 *d.*

Gas Turbines for Aircraft. By A. W. Judge. (Chapman & Hall, London W.C. 2), 1958. Pp. vii + 439. Price 60 *sh.*

Science and Education at the Cross Roads. By J. W. Still. (Public Affairs Press, Washington 3 D.C.). Pp. viii + 140. Price $ 3.75.

Progress in Crystal Physics, Vol. 1. By R. S. Krishnan. (S. Viswanathan Central Art Press, Acton Lodge, Madras), 1958. Pp. vi + 198. Price Rs. 20.

Solving the Scientist Shortage. By D. C. Greenwood. (Public Affairs Press, Washington 3 D.C.). Pp. viii + 68. Price $ 2.00.

Adventures in the World of Science. By C. G. Abbot. (Public Affairs Press, Washington 3 D.C.). Pp. ix +150. Price $ 3.50.

Proceedings of the Symposium on Ground Water. (Central Board of Geophysics, Calcutta-16), 1955. Pp. xvi + 400.

Advances in Enzymology, Vol. 20. Edited by F. F. Nord. (Interscience Publishers, New York-1, N.Y.). Pp. vii + 488. Price $ 12.50.

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