REVIEWS

DOVER BOOKS

Statics and Dynamics of a Particle. By William Duncan MacMillan. Pp. xviii + 430. Price $ 2.00.

Theoretical Mechanics, An Introduction to Mathematical Physics. By Joseph Sweetman Ames and Francis D. Murnaghan. Pp. ix + 462. Price $ 2.00.

The Fundamental Principles of Quantum Mechanics with Elementary Applications. By Edwin C. Kemble. Pp. xvi + 611. Price $ 2.95.

Selected Papers on Quantum Electrodynamics. Edited by Julian Schwinger. Pp. xvii + 424. Price $ 2.45.

The Theory of the Potential. By William Duncan MacMillan. Pp. vi + 469. Price $ 2.25.

Vector Analysis with an Introduction to Tensor Analysis. By A. P. Wills. Pp. xxxii + 276. Price $ 1.75.

An Introduction to Fourier Methods and the Laplace Transformation. By Philip Franklin. Pp. x + 289. Price $ 1.75.

Introduction to Bessel Functions. By Frank Bowman. Pp. 134. Price $ 1.35.

The Foundations of Euclidean Geometry. By Henry George Forder. Pp. xii + 349. Price $ 2.00.

The Elements of Non-Euclidean Geometry. By D. M. Y. Sommerville. Pp. xvi + 274. Price $ 1.50.

An Introduction to the Geometry of n-Dimensions. By D. M. Y. Sommerville. Pp. xvii + 196. Price $ 1.50.

Lectures on the Theory of Elliptic Functions. By Harris Hancock. Pp. xxiii + 498. Price $ 2.55.

Elliptic Integrals. By Harris Hancock. Pp. viii + 101. Price $ 1.25.

The Dover Publications, Inc., has been rendering valuable service to the scientific community of the world by reprinting standard text-books and classics in science, and bringing them out as cheap editions that are within the reach of any research worker of moderate means. A glance at the list of publications of the Dover series will impress one that the selection of these books has been inspired by the highest principles of scientific standard, and several of the books of the series, if not all, have been reigning for over a few decades as the undisputed classics in their respective subjects. The books on Mathematics and Theoretical Physics of which the present review is concerned, have special value to research students, since research under modern conditions demands a basic stock of mathematical knowledge and the Dover books supply just this need.

Statics and Dynamics of a Particle by William Duncan MacMillan is an elementary text-book on the subject, which covers approximately the syllabus of the B.Sc. Degree Course of the Indian Universities. Written in a clear style, the book is illustrated through the solution of a number of basic problems in astronomy, ballistics, transmission of power, elasticity and related topics.

Theoretical Mechanics, An Introduction to Mathematical Physics by J. S. Ames and F. D. Murnaghan provides a sound basic knowledge of the principles of mechanics that is necessary for a research worker in physics, theoretical or experimental. Starting from Newton's laws, the book leads the reader soon to advanced topics and gives an excellent account of general dynamical systems, Lagrange's and Hamilton's equations, the principle of least action, holonomic and non-holonomic systems, small vibrations, wave motion and Lorentz transformation.

Among the numerous books that have appeared on Quantum Mechanics, *The Fundamental Principles of Quantum Mechanics with Elementary Applications* by Kemble occupies a respected place and has been popular ever since it was published. A special aspect of this book seems to be the detailed discussion of the theory of eigenfunction expansion and orthogonal functions, and the elaborate treatment of the operator formalism of Quantum Mechanics. Containing a wealth of information both on the mathematical formation of Quantum Mechanics and the problems of atomic structure, the book will be of great value to every student of physics who desires to get a thorough understanding of Quantum Mechanics.

Of all the books of the series, the volume *Quantum Electrodynamics* by Julian Schwinger is perhaps the only one that deals with topics of current interest. Edited by one of the foremost figures in the field, the volume contains every paper that made its strong impact on the subject and has contributed to its development in its present form. The papers cover almost all aspects of Quantum Electrodynamics, and

the volume therefore serves even the purpose of a text-book while it has the additional advantage of unfolding the subject through its own creators, each with his characteristic individual style. This volume represents the struggle of the human mind to penetrate into the depths of Nature, the height to which mathematical imagination and ingenuity can fly, and yet tragically enough, the elusiveness of Nature to all such attempts.

The theory of the potential knows no limit for expansion and has enriched several branches of pure mathematics while lending its usefulness and application to such fields as applied mechanics. The republication of MacMillan's electrostatics, magnetostatics and quantum mechanics. The republication of MacMillan's long unavailable *Theory of Potential* will therefore meet the current need for an extensive text on the subject and will be welcomed by mathematicians, pure or applied, physicists and engineers. CONTENTS : Attraction of finite bodies, The Newtonian Potential function, Vector fields, Surface distribution of matter, Spherical harmonics and Ellipsoidal harmonics.

Vector Analysis with an Introduction to Tensor Analysis by A. P. Wills is a clear and comprehensive exposition of vector and tensor analysis and can be recommended as a text to all physicists and engineers unacquainted with this subject. Dr. Franklin's *Introduction to Fourier Methods and the Laplace Transformation* has been designed to introduce engineers, physicists, applied mathematicians, students and teachers of physical sciences, to the theory and application of Fourier series and Laplace transforms. CHAPTER HEADINGS : Complex quantities, Fourier series and integrals, Partial differential equations, Boundary value problems and Laplace transforms.

Introduction to Bessel Functions by Frank Bowman : As the title indicates, the book gives an introduction to the subject of Bessel functions.

The Foundations of Euclidean Geometry by Henry George Forder gives a connected and rigorous account of Euclidean geometry in the light of modern investigations. Although the propositions of Euclidean geometry are assumed to follow consistently from their axioms, critical examination has disclosed many vaguenesses and unproved assumptions in the Euclidean formulation. Further these researches have led to the discovery of non-Euclidean geometries, thus freeing the mind from its age-long bondage to the obvious and leading it to the newer conceptions of space that is common knowledge today. The book under review derives the Euclidean propositions from the axioms employing the mathematical discoveries of modern times and making the smallest number of assumptions possible. The book *must* be read by every teacher of geometry in schools and colleges.

Sommerville's *The Elements of Non-Euclidean Geometry* is a popular book on the subject and has been a standard text in the field. It can be read with delight by anyone with a good knowledge of high school algebra and geometry. The author outlines here lucidly the historical development of non-Euclidean geometries, the Playfair axiom and the consequences of its breakdown, elliptic and hyperbolic geometries and a few other topics like inversion and transformations. *An Introduction to the Geometry of n-Dimensions* by the same author was unavailable for many years and is perhaps the only book in English devoted to the subject of higher dimensional geometry. The author demonstrates in this book several representative topics of n-dimensional geometry which not only illustrate the extensions of three-dimensional geometry but reveal results which are unexpected and where analogy would be a faithless guide. The book treats the analytical geometry of n-dimensions both from the projective and metric points of views, and in addition contains several chapters on polytopes.

The reissue of Hancock's *Theory of Elliptic Functions* will be welcomed by all mathematicians, physicists and engineers. It is a monumental work on the subject and is unique for the wealth of information and details that it provides. Written in a rigorous and yet readable style, the book contains an exhaustive account of the theory of elliptic integrals beginning with formulas establishing the existence, formation and treatment of all three types (rational, simply periodic, doubly periodic) and concluding with the description of these integrals in terms of the Reimann surface. The author develops the theories of Legendre, Abel and Jacobi first and then gives an exposition of the $P(u)$, $\zeta(u)$ and $\sigma(u)$ functions of Weierstrass. Finally both these are interconnected by means of the universal laws of Reimann, who provided the most general theory of analytic functions by introducing the surfaces on which algebraic integrals may be represented. The book *Elliptic Integrals* by the same author is rather elementary compared with the above one and gives an introduction

to elliptic integrals of the first, second and third kinds and in addition provides a few tables associated with these integrals.

In spite of the cheapness of the books, the quality of printing is of a high order and is comparable with any highly priced publication.

K. S. V.

Mathematical Theory of Compressible Fluid Flow. By Richard Von Mises. Completed by Hilda Geiringer and G. S. S. Ludford. (Academic Press Inc., New York ; India : Asia Publishing House, Bombay-1), 1958. Pp. xiii + 514. Price $ 15.00.

This is Volume 3 of the series of monograph prepared under the auspices of the Applied Physics Laboratory, the Johns Hopkins University. It could not be finished by Richard von Mises before his death in 1953. At that time he had written only the first three chapters. The work was completed by his wife Hilda Geiringer and G. S. S. Ludford, who with the help of other collaborators like C. A. Truesdell have brought the work up-to-date by an exhaustive list of 'Notes and Addenda' at the end of the book.

The first chapter deals with basic equations, influence of viscosity, heat conduction, wave equation, subsonic and supersonic flows. The treatment is very scientific and new ideas like the specifying equation are introduced, which in general, may not be the same condition of state. Both the distinguishing features and the common points of subsonic and supersonic flows are brought out neatly. In chapter II general theorems are given on vorticity, irrotation motion, limit lines, hodograph representation and theory of characteristics. A number of examples are discussed in detail.

Chapter III deals with one-dimensional flow with viscosity and heat condition and discusses steady, unsteady flows and wave motion. The theory of shocks is discussed in great detail.

Chapter IV deals with plane steady potential flow. The hodograph method is fully discussed. A number of transformations are described. The following one given by the reviewer is not noted :

$$\phi_1 = \rho^{\frac{1}{2}} \cdot \phi, \quad \rho_1 = \rho^{\frac{1}{2}}$$

$$\psi_1 = \rho^{-\frac{1}{2}} \cdot \psi, \quad \rho_1 = \rho^{-\frac{1}{2}}$$

$$\frac{\nabla^2\phi_1}{\phi_1} = \frac{\nabla^2\rho_1}{\rho_1}, \quad \frac{\nabla^2\psi_1}{\psi_1} = \frac{\nabla^2\rho_1}{\rho_1}$$

The last chapter develops Chaplygin's Method, shock theory and transonic flow. There are selected reference books at the end, an author index and a subject index.

The book does not lay much stress on the physical side of compressible flow. The mathematical side is very rigorously dealt with and will provide a great inspiration to any one interested in the subject. The historical side of the subject is fully dealt with in 'Notes and Addenda'.

B. R. Seth.

Electronic Measuring Instruments. Second Edition. By E. H. W Banner. (Chapman & Hall), 1958. Pp. 496. Price 56 *sh.* net.

Electronic instruments have surpassed in their usefulness all the previously known aids of the pure and applied scientists for accurate measurement and indication of electrical as well as non-electrical quantities. In recent years the development of electronic computing machines which carry out calculations with unimaginable speed and reliability, humanly impossible otherwise, is a remarkable achievement of the electronic engineers whose ingenuity in devising novel circuits seems to be the only limit to the marvels that electronics can play.

Employing certain well-known properties of electron tubes and circuits, a variety of measuring instruments are available commercially. Although scarcely any knowledge of the anatomy of such instruments and the principles involved in the circuitory employed therein on the part of the user is demanded, such a knowledge would satiate many inquiring minds. The book under review is intended to convey such information. The matter is divided into four parts. Part I : The characteristics of indicating instruments used with electronic devices. Part II : Electronic devices used in measuring instruments. Part III : Electronic instruments using the devices of Part II. Part IV : Quasi-electronic instruments and electronic devices used directly.

In Part II are discussed the fundamental characteristics of hot and cold-cathode valves, cathode ray tubes, photoelectric tubes, metal rectifiers and semi-conductor devices. The basic circuits in which these electronic devices are employed are briefly discussed. In Part III instruments using these are described. Of these, one finds detailed presentation of photoelectric measuring instruments and radiation measuring instruments. In Part IV instruments for measurement of non-electrical quantities such as vibration and strain measurement employing electromechanical transducers, automatic recorders, devices for the measurement of vacuum and a number of miscellaneous instruments are

discussed. The treatment adopted a nonmathematical, brief and does provide basic knowledge of the instruments. References to other books and papers for further reading for those who might be interested are also given.

Chemists and physicists would particularly find this publication useful as also instrument engineers.

A. J.

Conformal Transformations in Electrical Engineering. By W. J. Gibbs. (Chapman & Hall Ltd.), 1958. Pp. viii + 219. Price 45 *sh.* net.

For more than a decade now, publishers of text-books have been bringing out books on mathematical topics, which we are assured are specifically written for engineers and/or physicists. Sooner or later we find a book on almost every branch of mathematics on our book shelves designed for the engineer or the physicist. Some regret this trend, others hail it, but that is largely a matter on one's predisposition.

This book, on conformal transformations in electrical engineering, goes even one step farther in this direction. It is written for electrical engineers by an electrical engineer with the object of acquainting the practising engineer with the technique of conformal transformation in the solution of the practical problems in electrical design. As one would expect then, the style and exposition are not those of the mathematician or his new cousin, the theoretical engineer, who sometimes likes to rival him in his mathematical style. So much about the general flavour.

Although one of a series of advanced engineering texts, the book begins at an elementary level, the notions of complex numbers, central fields of force and mapping being developed in the first five chapters. The reader is then introduced to the Schwartz-Christoffel transformation which forms the central theme of this book. In working out special cases of the S-C transformation, the author develops the concepts of elliptic integrals and functions and other special functions like the Jocobi's Zeta and Theta functions. A number of problems involving S-C transformations of regions containing one or more right angles have been worked out in detail with appropriate discussions of their engineering significance. Particular mention may be made of the treatment of Carter's work on the problem of the field distribution between two poles separated by an air gap, one of the poles having slots cut in its face.

This book has distinctive merits to recommend it to those for whom it is intended. Devoid of mathematical sophistication, it presents the conformal transformation as the logical tool to be used in the solution of a certain class of problems in electrical machine design. Most of the chapters are short enough to give the novice a break in assimilating the new ideas as he encounters them.

The author has guarded himself against a possible accusation that the application of conformal transformation in other fields like elasticity and fluid dynamics has not been treated, by his careful choice of the title. However, conformal transformations have an equally wide field of application in radio and electronics in the design of many types of electron tubes which is still a branch of electrical engineering. The total absence of any reference to this important field limits the use of this book to only those concerned with electrical machinery.

B. S. RAMAKRISHNA.

Dairy Microbiology. By E. M. Foster, F. E. Nelson, M. L. Speck, R. N. Doetsch and J. C. Olson, Jr. (Macmillan & Co., Ltd., London), 1958. Pp. 492. Price 42 *sh.*

This text-book of Dairy Microbiology is a very welcome addition to the existing books on this subject. During the last 15-20 years considerable advances in various branches of Dairy Microbiology have been made and the present attempt of the authors, who are well-known research workers and teachers in this subject at different American Universities, is worthy of highest commendation. The book is divided into 15 major chapters, dealing with different topics such as micro-organisms of milk and dairy products; methods of controlling growth of micro-organisms; destruction of micro-organisms by physical and chemical agents; microbiological methods of examining dairy products; microbiology of milk on the producing farm; microbiology of market milk and related products; microbiology of condensed, concentrated and evaporated milks; microbiology of sweetened condensed and dry milk products and microbiology of ice-cream and related frozen products. In addition, there are chapters devoted to microbiology of lactic cultures, microbiology of fermented milks, microbiology of cheese, microbiology of cream and butter and there is a useful chapter on dairy plant waste disposal and utilisation of by-pro-

ducts. All the topics are dealt with in an exceedingly lucid style and besides giving a historical background, the fundamental principles involved, the most recent advances in each of these aspects and their practical applications in the industry have been clearly brought out. The chapters on milk on producing farm and market milk and related products are particularly useful and methods of cleaning and sanitization of utensils have been very thoroughly discussed. Also in the chapters on microbiology of lactic cultures as well as of cheese, the discussion is very thorough incorporating the latest published literature. The book is full of good illustrations and has got an excellent subject index.

In this country with the growing interest in starting of milk supply schemes and in the organisation of milk industry by the States and private enterprises, this book on Dairy Microbiology is bound to be very popular with all workers engaged in quality control work or teaching and research work in the field of dairy microbiology.

K. K. IYA.

Indigenous Drugs of India. Second Edition. By R. N. Chopra, I. C. Chopra, K. L. Handa and L. D. Kapur. (U. N. Dhur and Sons Private Ltd., Calcutta-12), 1959. Pp. xxxii + 816. Price Rs. 50·00.

The first edition of the book under the title 'Indigenous Drugs of India, their Medical and Economic Aspects' appeared exactly twenty-five years ago in 1933. Since then the senior author had remained quite active and had collected all the necessary literature, etc., in this connection and has brought out a Second Edition of the book which will be of real help to all those who are working in the field of indigenous drugs. Col. Chopra's experience in this field for over thirty years gives this volume the stamp of authority as a reference material and a book to be referred to by everybody.

The contents have been broadly classified into five parts as in the First Edition. Besides, one Addendum and three Indices also have been added.

Part I is devoted to the medical and economic aspects of Indian Indigenous Drugs. Detailed account has been given about a historical and general survey of the Indigenous drugs. Some new chapters describing the preparation of Indian Pharmacopœia, co-relationship of botanical classification of plants, their chemical constitution and physiological properties and newer trends in drug research have been included.

Part II deals with the potential drug resources of India with particular reference to pharmacopœial drugs of India. This part includes the list of British and Indian Pharmacopœial drugs growing in India.

Part III includes the drugs used in the indigenous medicine. This part has been further divided into two sections. Section I includes drugs of vegetable origin. This section includes many more drugs as compared to what it was in the First Edition. The authors have tried their best to give the complete information about the plant's botany, chemistry and pharmacology and also its clinical and therapeutic trials. Wherever necessary economics of its cultivation has also been discussed.

Similarly Section II gives detailed account about the drugs of mineral and animal origin. The mode of preparation, the pharmacology and the therapeutic trials of some well-known 'Bhasmas' have been dealt with in details. There is also a very good chapter on the drugs of animal origin, *e.g.*, on musks and cobra venom, etc.

Part IV of the book includes the Indian Materia Medica and is divided into four sections. The first section contains a list of vegetable, inorganic and animal products, commonly used in Unani and Ayurvedic systems of medicine. Section II is mainly devoted to the description of plants having (*i*) poisonous properties, (*ii*) plants producing dermatitis, (*iii*) reputed abortifacient and emmenagogue plants and (*iv*) insecticidal and pisticidal plants. Section III gives a list of plants claimed to have antiseptic or antitubercular or antidysenteric properties or the plants which are reputed to be effective against Cholera, Snake bite or Scorpion sting. Section IV is mainly devoted to aromatic or essential oil bearing plants. This gives a detailed picture about chemistry, pharmacology and therapeutic uses and the economics of these plants. Lichens, medicinal ferns and mushrooms have also been dealt with properly in separate chapters.

Part V which concludes the book deals with common bazaar medicines of India. There is a chapter on vernacular names and popular uses. Besides, an addendum and three indices dealing with (*i*) vernacular and popular names, (*ii*) chemical constituents and (*iii*) scientific names, have been added by the author to facilitate easy reference.

The present edition is undoubtedly the result of practical experience as well as hard labour and this task has been done very creditably. The printing and get-up of the book are of a

high order. The authors as well as the publishers should be congratulated for bringing out such a useful volume.

B. MUKERJI.

Metabolism of Lipids. (Published by the Medical Department, the British Council, 65, Davies Street, London W. 1). (*British Medical Bulletin*, Vol. 14, No. 3), 1958. Pp. 197-278. Price 20 *sh.*

Though not exhaustively covering the entire field of Lipid Metabolism, the articles presented in this Bulletin review most of the major issues that are in the forefront of this rapidly expanding field of study. Biosynthesis of fatty acids in various animal systems, with acetate as the precursor, has been reviewed in detail by Hele. "B oxidation in reverse" is broadly the process involved in the synthesis. Divergence in the anabolic and katabolic reactions as being due to the differential distribution of enzymes and co-factors in mitochondria and microsomes and the specificity of synthetic system in the mammary gland are interesting features of this review. The discovery of mevalonic acid and its significance as a precursor of cholesterol and the possibility of this compound acting as a key intermediate in the synthesis of many steroids is discussed by Cornforth and Popjak. Of the many factors influencing the biosynthesis of fat, Folley and McNaught have discussed the effect of endocrines on lipogenesis in the mammary gland. Utilizing this sensitive tissue and elegant isotope techniques, the role of insulin, glucagon and steroid hormones of adrenal cortex on lipogenesis has been studied. "The hormonal control of the circulating lipids" by Oliver and Boyd forms the continuation of the absorption studies. The fundamental change in concept that glycerides need not be broken down to fatty acids and glycerol, before absorption of lipids from intestines; some of the outstanding problems in the cellular and distributive phases of fat absorption and faulty intraluminar emulsification of fat in human subjects are the features of Frazer's article on 'Fat absorption and its disorders'. The importance of lipoproteins, both in absorption and in the transportation of lipids in the blood stream and the mechanisms of the removal of chylomicron lipids and unesterified fatty acids from the blood are some aspects of lipid metabolism presented in other chapters.

Diseases of the coronary arteries and disorders of the cardiovascular system, constitute major medical and public health problems of today. The intimate relationship between the increasing incidence of ischæmic heart disease, and the derangement of lipid metabolism; the essential fatty acid theory envisaging the importance of certain poly unsaturated fatty acids, *viz.*, linoleic and arachidonic acids in the causation of skin diseases and coronary artery involvement; the effect of fatty acids on coagulation and thrombosis and other advances in our knowledge of lipid metabolism in relation to human diseases are very ably presented and constitute highly informative chapters of this volume.

M. SIRSI.

Advances in Veterinary Science, Vol. III. Edited by C. A. Brandly and E. L. Jungherr. (Academic Press, Inc., New York; India: Asia Publishing House, Bombay-1). Pp. xi + 579. Price $ 13.00.

The present volume, the third in the series of the "Advances in Veterinary Science", contains nine essays written by people active in and familiar with specific areas of the different branches of veterinary science and animal husbandry. Of the ten authors, dealing with different subjects, 5 are from U.S.A. It would be advantageous for editors, Brandly and Jungherr, to concentrate on lesser number of topics giving thereby greater attention to a detailed and exhaustive survey in selected fields of veterinary research.

A varied fare is offered to the reader. Thus, the first review in this issue is by L. W. Hall and covers anæsthesiology. Therein, the author has discussed the principles and practice of veterinary anæsthesia with special reference to premedication, narcosis, relaxation and analgesia, including the use of antidotes and has very ably reviewed the recent advances in this field. The treatise will prove highly useful to veterinary surgeons engaged in work on operative surgery in the different species of domesticated animals and birds as well as students of surgery undertaking advanced studies in this subject.

J. R. M. Innes and I. Z. Saunders have written, jointly, the second essay on "Disease of central nervous system of domesticated animals and comparisons with human neuropathology". A ditinguishing feature of this article, the only one of its kind in veterinary neuropathology, is the compilation, in over hundred pages of all that is known about veterinary neuropathology, serving as an excellent source of information in a concise form, and of references to the litera-

ture on the particular topics covered in this comprehensive review.

The third, fourth and fifth articles deal with brucellosis in cattle (Thomsen), sheep and goats (Renoux) as well as swine (Cameron). Thomsen has summarised the work done in Scandinavian countries on several aspects of bovine brucellosis, which made possible the successful launching of a scheme for eradication of this disease from these countries. This may be of assistance in planning a similar campaign in India. Renoux has brought together data on brucellosis in goats and sheep, scattered very widely in the literature and it is pleasing to note that this reviewer has taken due notice of research work carried out in different parts of the world including India. He has succeeded in his stated purpose of bringing out the interest in and importance of caprine and ovine brucellosis as hazards to the health of man and animals. Cameron has dealt with swine brucellosis, with special reference to epidemiology, diagnosis and eradication, which is the shortest article in this book, the several other parts of which form a balanced and acceptable collection.

Similarly, the sixth and seventh articles on "Helminthic diseases" (Gordon) and "Antinematodal drugs" (Jones) are both thought-provoking, comprehensive and lucid in their scope and treatment of the subject. The section dealing with immunity in helminthic diseases is a redeeming feature of this review article by Gordon.

Vendeplassche has written an exhaustive review on "Artificial insemination of cattle with special reference to fertility and disease control". The author, in his concluding remarks, poses numerous problems in the field of artificial insemination and its bearing on sterility, spread of diseases and transmission of lethal genic characters, that remain to be tackled and solution of which will necessitate "well-organised teamwork and a well adapted extension service" as important and indispensable links for application and control of artificial insemination in practice.

The last chapter on "Clostridial disease of animals" is a first-rate account of an important and exceedingly difficult subject by L. D. S. Smith, a very experienced worker in this field. This essay, constituting a critical summary of the recent literature, will be of great value to any worker who wishes to have an up-to-date account of all that is known about diseases of animals due to anærobes and will be especially useful to any one undertaking research in this field.

As in volumes I and II, each part is followed by a copious list of references and critical selection of worldwide literature has been attempted. However, it would be a good addition to specify the time at which the survey of literature pertaining to the review was completed as a foot-note on the opening page as is the practice in the Annual Reviews of Biochemistry, Microbiology, *et cetera*.

There is a useful subject index and 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 and teachers and practitioners who are interested in veterinary and allied research. The book is packed with information which is judiciously presented and will be equally useful to the advanced worker as well as the serious student. All the chapters are of a uniformly high standard and the volume will be a most useful addition to any scientific library. Further volumes in the series will be keenly awaited.

The editing has been done in a most scholarly manner, and regarding the printing and get-up of the book, suffice it to say that it is another academic press volume. However, a printing mistake has been observed on p. 324 where the last line "*et al.* (1953)" should be printed as 15th line of the first para following the word "Rick" in the 14th line.

I venture to suggest to the Advisory Board that, while choosing subjects for review, due recognition must also be given to diseases that take a heavy toll of livestock in South-East Asia, like Rinderpest and Hæmorrhagic septicæmia and global representation of authorship should include, as well, veteran workers in these fields in different countries of Asia.

M. R. Dhanda.

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

At the surface of the sun and of most stars, the temperature is so high that atoms are ionised, and the motion of charged particles generates strong electric currents and associated magnetic fields. It is no wonder, therefore, that electrodynamics plays an important role in problems of astrophysics and especially in phenomena related to our nearest star, the sun. The book under review presents the diverse electromagnetic phenomena that occur in the stars and the sun, such as the magnetic fields in the sun

and the stars, magnetic storms and auroræ, the acceleration of cosmic ray particles and interstellar fields, while at the same time giving, as the title indicates, an introduction to the subject of magnetohydrodynamics.

The emphasis of the book is decidedly on the theoretical developments in the subject, though at some places factual information has also been provided. The discussion in the first chapter on the order of magnitude of quantities involved in problems of cosmic electrodynamics seems to be very appropriate, especially for this subject wherein phenomena occurring in huge stellar scale are built up apparently from tiny atomic particles, and this will give the reader a clear insight into the mathematical quantities that he is handling. After discussing the motion of magnetic fields and a few static problems, the author describes some dynamic phenomena, the most important among them being the propagation of the magnetohydrodynamic waves. These are waves that pass through the magnetic lines of force, if these are pictured as elastic strings. In chapter six, the author discusses the problem of the acceleration of particles to high energies, which is related to the riddle of the origin of cosmic rays. All primary cosmic ray particles have energies greater than 10^9 eV., and some have energies as high as 10^{17} eV. Since there is no other conceivable mechanism by which the particles could acquire such tremendously high energies except the acceleration by some electric field, the origin of cosmic rays becomes a problem of cosmic electrodynamics. Chapter seven dealing with solar phenomena departs from the main theoretical trend of the book and in it the author summarises our observational knowledge regarding the sun, its dark spots, prominences, flares, etc. One wonders whether this departure is necessitated because no satisfactory theory exists as yet to explain the origin of the sun spot magnetic fields, and the host of phenomena associated with the sun spots such as their periodicity, their magnetic fields, the polarity of the fields, the Evershed effect are still a mystery!

The book besides contains two chapters on magnetic storms and Auroræ and ionospheric electrodynamics which will be of interest to meteorologists particularly. The bibliography at the end gives a list of references to the important papers on the subject published during recent years.

K. S. V.

Books Received

Nomenclature of Plants. By Herold St. John. (The Ronald Press Co., 15, East 26th Street, New York-10), 1958. Pp. vii + 157. Price $ 2.50.

Text-Books of Optics (for Advanced Studies). Part I. Geometrical Optics. By K. Ghosh, Art Union, 80/15, Grey Street, Calcutta-6), 1958. Pp. x + 480. Price Rs. 16·00.

British Medical Bulletin, Vol. 15, No. 1—*Haematology.* Edited by D. A. G. Galton. (Medical Department, the British Council, London W. 1), 1959. Pp. 83. Price 20 *sh.*

Tube and Semiconductor Selection Guide. Compiled by Th. J. Kroes. (Philips' Technical Library, Eindhoven ; India : Philips India Ltd., Calcutta-20). Pp. 34. Price Rs. 5·00.

Physics of Meteor Flight in the Atmosphere. By Ernst J. Opik. (Interscience Publishers, New York-1), 1958. Pp. viii + 174. Price $ 3.85.

Introduction to the Physics of Many-Body Systems. By D. Ter Haar. (Interscience Publishers, New York-1), 1959. Pp. viii + 127. Price $ 3.85.

The Potential Theory of Unsteady Supersonic Flow. By J. W. Miles. (Cambridge University Press, London N.W. 1). Pp. xii + 220. Price 45 *sh.*

Screening Procedures for Experimental Cancer Chemotherapy. By C. Chester Stock and others. (*Annals of the New York Academy of Sciences,* Vol. 76, Art. 3). Pp. 409-970. Price $ 5.00.

Symposium No. 6 of the International Astronomical Union—Electromagnetic Phenomena in Cosmical Physics. Edited by B. Lehnert. (Cambridge University Press, London N.W. 1). Pp. xii + 544. Price 50 *sh.*

Proceedings of the Third Congress on Theoretical and Applied Mechanics. (Indian Society of Theoretical and Applied Mechanics, Kharagpur), 1957. Pp. 362.

Genetical Theory of Natural Selection. By Ronald A. Fisher. (Dover Publications, Inc., New York). Pp. xiv + 291. Price $ 1.85.

Elasticity, Plasticity and Structure of Matter. By R. Houwink. (Dover Publications, Inc., New York). Pp. xviii + 368. Price $ 2.45.