REVIEWS

DOVER BOOKS

Linear Groups with an Exposition of the Galois Field Theory. By Leonard Eugene Dickson. Pp. xvi + 312. Price $ 1.95.

The author of this book is well known for his contributions to the Theory of Groups as well as to the Theory of Numbers and the re-edition of this book, for long out of print, will therefore be welcomed by mathematicians.

The Dover edition for this book has incorporated an Introduction by Professor William Magnus, who surveys the development in the subject since the book was first written and gives his own assessment of its significance for the present-day student. *Linear Groups* is divided into two parts. The first part contains an extensive presentation of the Theory of Galois Fields, and includes a large number of examples. The second part of the book is a comprehensive treatment of linear groups in a Galois field and contains a survey of the known simple groups of finite composite order.

K. S. V.

Introduction to Symbolic Logic and Its Applications. By Rudolf Carnap. Pp. xiv + 241. Price $ 1.85.

This book gives a clear and rigorous introduction to modern symbolic logic. The author develops the subject from elementary concepts and simple exercises through the construction and analysis of a number of relatively complex logical languages. The second part of the book is a detailed treatment of the applications of symbolic logic to the clarification and axiomatization of various theories in mathematics, physics and biology. Different topics, such as, the sentential constants, predicates, truth-tables, universal and existential sentences, cardinal numbers, finite and infinite concepts, axiom systems for the set theory, arithmetic, geometry, space-time topology and biological concepts, are treated in detail. The logic of relations is given a particularly extensive treatment.

There are very few readable books on symbolic logic and the present one will therefore satisfy the needs of all who wish to get acquainted with this abstract subject.

K. S. V.

Cambridge Tracts in Mathematics and Physics : Integral Equations. By F. Smithies. (Cambridge University Press), 1958. Pp. x + 172. Price 27 *sh.* 6 *d.* net.

The book under review has been brought out as a successor to Maxime Bocher's tract *An Introduction to the Study of Integral Equations* which has long been out of print. It is devoted entirely to non-singular linear integral equations, that is, those for which the main results of the Fredholm theory are valid.

The Lebesgue integral is used throughout. Most of the theory is given for the case of L^2 kernels, which illustrate all the phenomena likely to be encountered in practice. Apart from the introductory chapter which gives the connexion of integral equations with differential equations and a few mathematical preliminaries, the book contains seven chapters, each consisting of several existence or convergence theorems. *Chapter Headings*: Introduction, The Resolvent kernel and the Neumann series, The Fredholm theorems, Orthonormal systems of functions, The classical Fredholm theory, The Fredholm formulæ for L^2 kernels, Hermitian kernels, Singular functions and singular values.

While the flavour of the book is essentially pure mathematical, it will prove to be valuable to the wider circle of applied scientists as well. The tract is bound in paper cover, but the quality of printing leaves nothing to be desired.

K. S. V.

Crystal Structures. Supplement IV. By R. W. G. Wyckoff. (Interscience Publishers, Inc., New York.)

Reviews on this monumental work have appeared in the columns of *Current Science*. In order to bring the work up-to-date, supplements are issued from time to time and the material under review styled as Supplement IV completes Chapters IX, X, XIII-XV. The sheets consisting of text, tables, illustration and bibliography are in the nature of either replacement or supplement pages. The bulk of the material deals with organic compounds. In the pages devoted to inorganic compounds, Hydrates and Ammoniates fill the bulk. The bibliography is brought up to 1955.

Supplement IV should be acquired by all those who have already got the other volumes of *Wyckoff Crystal Structures*.

A. J.

Visual Problems of Colour, Vols. I and II. (Symposium No. 8 of the National Physical Laboratory, U.K. Her Majesty's Stationery Office, London), 1958. Pp. viii + 750. Price per set of two volumes £ 2. 2 *sh.*

The perception of colour and the physico-chemical processes responsible for it has been in recent years a field of considerable fruitful activity by physicists, biochemists, and physiologists. The above two volumes contain the Proceedings of a symposium on the "Visual Problems of Colour" held at the National Physical Laboratory, from 23rd to 25th September 1957. The symposium opened with the Selig Hecht Commemorative Lecture by Prof. George Wald (Harvard) on the "Retinal Chemistry and the Physiology of Vision". Besides the above lecture, the two volumes reproduce the forty contributed papers and the discussions thereof that took place during the symposium. The papers are grouped under the heads of (i) Visual pigments particularly in relation to colour vision, (*ii*) Brightness matching and colour matching, (*iii*) Subjective colour measurement, (*iv*) Electro-physiological aspects of vision, particularly colour vision and (*v*) Colour theories.

The two volumes are replete with diagrams, graphs and references to literature and the publishers have indeed got up a fine record of the symposium which would no doubt prove useful to all those engaged in the study of the problem of appreciation of colour by the human eye.

D. K.

An Introduction to Electronics for Physiological Workers, Second Edition. By I. C. Whitefield, D.Sc. (MacMillan & Co., Ltd., London), 1959. Pp. xi + 263. Price 18 *sh.*

Here is a good introductory text on electronics specially suited for those who frequently use electronic devices and techniques but do not have the necessary background of electronics. It "aims to provide an introduction to the subject for those graduate students and others who wish to use electrophysiological techniques, and who should be prepared to do so with some understanding". Although the analogies taken from common biological phenomena and processes will specially appeal to physiological workers, the material chosen and the presentation are such that the book should be quite useful to workers in other fields as well.

Within the limited space of about 250 pages are treated the fundamentals of the operation of electron devices—the vacuum and gas-filled tubes, the photoelectric cells, the cathode-ray tube, and also the basic functions performed by them. Separate chapters deal with each of the important topics like feedback, the cathode follower, noise, interference and screening, filters and attenuators, trigger circuits and time bases. The last two chapters incorporate a brief account of the more recent advancements, *viz.*, the physics and circuitry of transistors. The good get-up and the large number of neatly drawn and self-explanatory figures and curves are among the attractive features of the book. Select references to standard advanced texts are appended to each chapter.

The book may not be very helpful in designing and building electronic apparatus to given specifications. It is, however, easily readable and covers, mostly in a qualitative manner, all the basic principles and other relevant information to give a good understanding of the subject.

A couple of additional chapters describing the operation of typical complete units like a cathode-ray oscillograph, stimulators, a telemetering unit, a recorder, a counter, etc., would have made the book more useful for physiological workers.

V. N. CHIPLUNKAR.
M. SIRSI.

Principles of Alternating Currents. By W. Sluckin and J. R. Greener. (Cleaver Hume Press, London W. 8), 1959. Pp. 338. Price 15 *sh.*

Technicians and practising engineers who are already familiar with the popular books in the Cleaver-Hume Electrical Series, edited by Professor Cotton, will welcome this second edition of the book *Principles of Alternating Currents* by Sluckin and Greener. This edition has been revised in the light of the general adoption of the M.K.S. system of units and in keeping with the modern trends in electrical engineering. The fundamentals of electronics have been included with special reference to semi-conductor devices for rectification.

Assuming no more than the essential elementary knowledge of Electricity and Magnetism

on the part of the user, the book has been written as a self-contained text which can be read and understood easily. Students and technicians taking the preliminary examination in electrical engineering will find the book very useful.

A. S. G.

Recent Progress in Hormone Research, Vol. XIV. Gregory Pincus—Editor. (Academic Press, New York), 1958. Pp. vi + 582. Price $ 13.50.

We welcome the publication of the Proceedings of the Laurentian Hormone Conference 1957, portraying authoritative articles and discussions on varied endocrinological topics. The subjects traversed comprise cancer, ageing, sexual abnormalities, steroid chemistry, anxiety neuroses, etc. The first essay is on 16-Hydroxylated steroid and its biological activities. A number of steroids are known to exhibit hormonal activity. A chapter on the effects of cattle-raising and poultry makes interesting reading. It is known that certain hormones have profound influence on rate of growth, fattening, milk secretion, etc. Treatment of poultry with estrogen has been exploited to produce millions of meat chicken, more than 150 millions being treated per year.

Mammogens and lactogens have been engaging our attention from a long time and particularly there appear to be a number of mammogens and lactogens. The chapter on mammary growth and lactation by hormones includes discussions on the above aspects. Five important pituitary hormones play major role in mammogenesis and lactogenesis ; thyroid-stimulating hormone appears to be not connected with the above.

The presence of sex-chromatin as a distinct stainable body in the nucleus has been an excellent tool in the hands of cytologists in distinguishing the female sex. Majority of rodentia so far examined do not show this dimorphism, probably due to difficulty in technique, while a number of other mammals (a marsupial, ungulata, carnivores, primates) disclose the sex-chromatin. In addition, an account of sexual pathology is also included.

Lipids are present in the blood serum as lipoproteins and these are present in increased proportion in certain patients. It is well known that lipid concentrations in serum are to a certain extent under hormonal control. Besides, in the ground substance of the connective tissue, acid mucopolysaccharides are constantly present and these are also influenced by the hormones. Cortisone and hydrocortisone are found to inhibit the metabolism of mucopolysaccharides. It is also pointed out that growth hormone may be involved in the formation of another type of mucopolysaccharide.

In discussing the excretion of epinephrine and norepinephrine, reference is made to individual variations taking instances from hockey players and to how Goodall tested the adrenal of a lion by specially going over to Africa and found high amounts of norepinephrine.

We are sorry to note quite a few printer's devils but this does not detract the usefulness of the volume for advanced students in Endocrinology, in keeping with the volumes that have already been published. The volume is adequately indexed.

L. S. R.

Analytical Applications of Diamino-Ethane-Tetra-Acetic Acid. By T. S. West and A. S. Sykes. (Published by the British Drug Houses Ltd., England), 1959. Pp. 106.

A new branch of analytical chemistry—Complexometry—was created about fifteen years ago as a result of the pioneering researches of Schwarzenbach, on the formation of complexes between metallic cations and a group of amino-poly carboxylic acids called 'complexones'. Owing to the presence of both ligand forming nitrogen atoms and carboxyl oxygen of the acetate group, ethylene-diamine-tetra-acetic acid is one such versatile complexones. This chemical (or its disodium salt) has found extensive applications in a variety of analytical and industrial problems. The booklet under review gives a comprehensive account of this under 10 chapter headings. The physico-chemical principles involved in this technique and the choice of metal ion indicators used in E.D.T.A. titrations are described in earlier chapters. The use of E.D.T.A. in the analytical estimation of over 40 metals has been indicated with adequate experimental details in the procedure. Several anions like arsenate, bromide, chloride, chromate, ferrocyanide, phosphate, etc., may also be determined by E.D.T.A. method. A particular application of E.D.T.A. which has received wide attraction is its use in the determination of hardness of water. Analysis of several technical materials can also be made with E.D.T.A. and its ability to mask several interfering metals has attracted wider attention. Such an exhaustive account of the analytical application of E.D.T.A. has been described in

the short space of about 90 pages with 468 references to the original contributions by the two authors who are well known analytical chemists. The printing error in the Nerns't equation on p. 18 will have to be rectified in the next edition.

It goes to the credit of B.D.H. who have been bringing out such handy publications from time to time for ready reference.

M. R. A.

Third Tissue Homotransplantation Conference. (*Annals of the New York Academy of Science*, New York, Vol. 73, Art. 3), 1958. Pp. 539-868.

The discipline of tissue transplantation has been the venue of much experimental work but it is only in recent years that any advances have been made. Having in mind that the ultimate goal of this discipline is the elimination of the cause of human suffering and death, its importance cannot be overstressed. However, the difficulty involved is apparent when one sees that the only examples of permanent transplant survivals in man, to date, are skin and kidneys in identical twins, and occasional successes in functioning endocrine homografts.

The hopeful advances, referred to above, are mainly with reference to invertebrates and, in some specialised circumstances, to vertebrate homotransplantation. Degree of immaturity and alterations in the immune mechanisms of the host seem to be factors responsible for successful homotransplantation in vertebrates. And it is these successes which have led clinicians to hope that "spare parts" may one day be used in human medicine.

In presenting this series of papers, at the "Third Tissue Homotransplantation Conference", the editors have provided a picture of the present-day status of this subject. It is dealt with under various heads.

A short introduction by John Converse and Blair Rogers does not claim to act as a review of the papers that follow.

Part I is devoted to Embryonal, Fœtal, Neonatal and Infant Tissue Transplantation. In this connection Helene Toolan has shown that in Cortisone-treated rabbits there is a prolonged survival of adult and embryo homografts. Synderman's duplication of Toolan's embryo graft experiments in humans have indicated interesting possibilities of graft survivals. Besides these two papers, there are five others on related topics.

Eight papers of Immunogenetics of Tissue Transplantation constitute Part II. It seems, from the work done by Berrian and Brent, that the destruction of transplants is due to the process of active immunization entailing the formation of antibody-like reaction sites either on the surface of cells of regional lymphoid tissue or within them.

Part III, on Antibodies and Antigens in Tissue Transplantation, contains eleven papers and some problems of the most absorbing interest, such as those dealing with specific desensitization of the delayed hypertensive state and passive transfer of serum antibody against skin homografts.

The last eleven papers in Part IV involve Graft *versus* Host Reaction in Acquired Tolerance in Tissue Homotransplantation. Ten questions, concerned with tissue transplantation, have proved as captivating to the minds of investigators as those on acquired tolerance.

The monograph is highly recommendable to students of Homotransplantation.

B. R. S.

Books Received

The Value of Science. By Henri Poincare. (Dover Publications, New York 10, N.Y.), Pp. 147. Price $ 1.35.

Conceptual and Methodological Problems in Psychoanalysis. By L. Bellak. (*Annals of the New York Academy of Sciences*, New York 21, Vol. 76, Art. 4). Pp. 971-1134. Price $ 2.75.

Chemical Analysis—Vol. 3, *Colorimetric Determination of Traces of Metals*, III Edition. Revised and Enlarged. By E. B. Sandell. (Interscience Publishers, New York 1), 1959. Pp. xxii + 1032. Price $ 24.00.

Technical Note No. 22—*World Meteorological Organisation Preparing Climatic Data for the User*; No. 24—*Turbulent Diffusion in the Atmosphere.* By H. E. Landsberg. (WHO Avenue de La Paix, Campagne Rigot, Geneva). Pp. 18 ; 68. Sw. Fr. 4 and 7.

Endocrine Control in Crustaceans. By D. B. Carlisle and F. Knowles. (Cambridge University Press, Bently House, London, N.W. 1).

Science, Philosophy and Religion. By Russell Brain. (Cambridge University Press, London, N.W. 1). Pp. iii + 30. Price 4 *sh.* 6 *d.*

The Coconut Palm—a Monograph. By K. P. V. Menon and K. M. Pandalai. (Indian Central Coconut Committee, Ernakulam, S. India). Pp. xvi + 384. Price Rs. 38·00.