REVIEWS

Sound Pulses. By F. G. Friedlander, Cambridge University Press), 1958. Pp. ix + 202. Price 40 *sh.*

It has been said that the development of the theory of sound would not have taken the course that it did if it were not for presence of a sound receiving organ in man. The human ear and Fourier's analytical theory conspired to set the pattern for the analysis of sound waves in terms of harmonic waves. The general technique of obtaining harmonic solutions of the wave equation appropriate to the prescribed initial and boundary conditions proved to be so fruitful that even aperiodic disturbances were analyzed (or synthesized) in terms of harmonic components.

The treatment of acoustic pulses in this book is based on the theory of linear hyperbolic partial differential equations. In this theory it is easily established that pulse-fronts, considered as hyper-surfaces in space-time, are characteristics of the wave equation. Pulse-fronts are reflected, propagated and diffracted in accordance with Fermat's principle and we thus have a body of theory which may be called geometrical acoustics.

Starting with the equations of motion of an inviscid medium, this monograph develops the concepts of wave-fronts and characteristics in space-time. The chapters that follow give a more complete discussion of the applications of geometrical acoustics to problems of reflection and diffraction. *Diffraction of a pulse by wedge*, half-plane, circular cylinder and sphere by the use of Green's functions receive a thorough treatment.

In the words of the author this book is essentially an essay on the pulse solutions of the wave equation. The treatment is essentially mathematical and can be of interest not only to workers in acoustics, but also in the field of electromagnetic theory.

B. S. RAMAKRISHNA.

Beneficiation of Low Grade Manganese Ores of India. P. I. A. Narayanan and N. N. Subrahmanyam. (Council of Scientific & Industrial Research, New Delhi), 1959. Pp. 183. Price Rs. 10·00.

This monograph is based on the comprehensive studies made by the authors and their collaborators at the National Metallurgical Laboratory, Jamshedpur, on the possibility of beneficiating different types of low grade manganese ores available in India. Indigenous production of exportable grades of standard ferromanganese, rather than the export of raw high grade ore, has been accepted as a problem of national importance. But so far adequate attention has not been given to beneficiation and upgrading of low grade ores with a view to their economic utilisation. This monograph becomes at once important, particularly when one realises that 1 to 2 tons of low grade ore are discarded at the mine-site for every ton of high grade ore mined.

The first chapter gives the occurrence of manganese ores in India and other countries. The second and third chapters cover the production, export, consumption, price, uses and specifications of manganese ores. Chapter Four deals with methods of beneficiation and Chapter Five discusses the beneficiation studies made on Indian low grade manganese ores from different parts of the country. The authors summarise their work on this subject and give their recommendations in the final chapter of the monograph.

The monograph with its numerous tables, graphs and illustrations will be of great use to industry and trade concerned with manganese ores either for export or as raw materials for the production of ferro-alloys. The monograph is neatly printed and attractively got up.

A. A. KRISHNAN.

A Handbook of Colorimetric Chemical Analytical Methods. (Published by the Tintometer Ltd., Salisbury. England), 1959. Pp. 360. Price 30 *sh.*

The fifth edition of this illustrated book has been wholly rewritten and brought up to date and the book itself is now redesigned in loose-leaf form so that the tests can be conveniently revised or modified and incorporated. The published price covers also the cost of revision leaflets for a period of two years.

The book is divided into seven parts dealing with the apparatus used, pH, inorganic chemical analysis, organic chemical analysis, chemical pathological methods, noxious vapours and colour grading for quality respectively. More

than 150 complete analytical tests are incorporated.

This is an excellent book for its purpose and it should be in every chemical library and in all laboratories where Lovibond colour scale is adopted for colour comparison.

N. J.

The Mammals of North America. Two volumes. By F. Raymond Hall and Keith R. Kelson. (The Ronald Press Company, New York), Pp. 1083 + 79. Price $ 35.00.

This is a truly outstanding achievement. Not within a hundred years has an account of the mammals of North America appeared and it is clear that this work fills an important need. It has been a colossal undertaking, involving a great amount of labour and expense and the collaboration of a number of specialists. Dr. Hall's dedication of a life-time for the guidance and preparation of the work, and the devoted efforts of Dr. Kelson have been responsible for producing a book of monumental importance, one which will remain on the reference shelves of all whose work even remotely touches on mammals.

Over 3,000 species and subspecies are described here. The distribution of every one is shown on a map and drawings of a very large number of typical mammals have been made, along with their skulls. Their arrangement in the book is illustrative of what is known of their evolutionary sequence, starting with the Marsupialia. Even within each order, family or genus, the species known to be the oldest is treated first, the other species being listed according to their age.

One of the interesting features of taxonomic work in recent years is the gradual decrease in the number of species described. For instance, the number of species of North American mammals recognized in 1923 was 1,399 ; in 1953 it was 1,065 ; in 1957 (in the book under review) there are little more than 1,000. This decrease is largely due to the recognition of the fact that many of the species described earlier could now be regarded only as subspecies. It shows the trend of modern taxonomy, the necessity to recognize resemblances, even as, over a hundred years ago, Darwin himself did. Far too many species are listed and described, even as it is ; but with the recognition of the basic unity underlying living organisms, the trend is sure to continue, and in other animals as well in mammals, a stable discipline will result—the New Systematics.

B. R. S.

Cytology and Cytogenetics. By Carl P. Swanson. (Macmillan & Co. Ltd., London), 1958. Pp. 596. Price 45 *sh.*

The establishment and elaboration of the Chromosome Theory of Inheritance imperceptibly ushered in the current phase of analyses of the nature of the gene, its reproduction and mode of action. The corpuscular discrete gene of classical Genetics has given place to the *operational gene* defined. "as the smallest segment of the gene string that can be shown to be associated with the occurrence of a specific genetic effect" (p. 425). Its rather blurred boundaries is reminiscent of Goldschmidt's contention that the *hypothetical gene* of classical Genetics has no existence, that mutations are merely rearrangements of the chromosome at microscopic and sub-microscopic levels and that the hereditary potentialities are determined by the spatial relationships within the chromosome.

In that context the answers to the questions : "What is the chromosome ?", "What does it do ?", and "Why does it do what it does ?", considered in this volume, are of topical interest. "The reader will observe that few definitive answers can be given, but it is believed that these discussions will be useful to those working in the immediate fields of cytology, genetics and evolution and also those in the areas of cellular physiology, embryology, systematism, medical research and plant and animal breeding" (p. vi).

A good background in Cytology is essential to appreciate the book and the brevity of treatment of the many problems stimulates but does not satisfy the curiosity of the reader. The volume would afford much food for thought to active investigators in the field.

M. K. SUBRAMANIAM.

Implantation of Ova—*Memoirs of the Society for Endocrinology*. No. 6. Edited by P. Eckstein. (Cambridge University Press, Cambridge, England), 1959. Pp. 96. Price 10 *sh.* net.

The present memoir of the Society for Endocrinology is the proceedings of a Conference held in November, 1957 to survey the vital phase in mammalian development during which the fertilised ovum becomes embedded within the uterine mucosa. The papers presented at the Conference have been arranged sequentially on the basis of morphological, histochemical and physiological studies.

The memoir is fittingly prefaced by an admirable general survey of ovum implantation

in mammals. The authors (Eckstein, Shelesnyak and Amorose) have outlined the nidational patterns in mammals and their variants, against a perspective of the analytical approaches that could be made for probing into the mysteries of the implantation problem. Harrison and Neal's paper is an account of the peculiar delayed implantation in European badger. The physiological mechanisms responsible for this phenomenon are still imperfectly understood but the authors have been able to show that at least the corpus luteum does not play any important role in the mechanism. Boyd's demonstration of the presence of intra and extracellular glycogen in certain anatomical components of the human implantation site is perhaps the first of its kind ever done. Lutwak-Mann has reviewed her notable contributions to the biochemistry of implantation. For obvious reasons, the reviewer feels that this is one of the most important papers in the memoir. The superb photographs of 6-day guinea-pig blastocyst from *in vitro* cultures (taken by Blandau) presented by Amorose chronicle the progressive morphologic changes in the attachment cone. The findings are in complete agreement with the classical studies of Graf von Spee and the relatively recent investigations of Blandau. On the pharmacologic side Robson has studied the effect of a number of compounds (spindle poison, chromosomal poison and antimetabolites) on pregnancy in mice. Shelesnyak reiterates his earlier view regarding the involvement of histamine in the process of decidua formation and nidation. The most significant point which emerges from this memoir is the concept of relative autonomy of the ovum within the uterus and the synchronization of some of the metabolic events in the ovum and the uterus to maintain this autonomy.

The present number of the *Memoirs of the Society for Endocrinology* like its predecessors is a worthy publication and research workers would look forward to the appearance of other numbers in this series devoted particularly to problems of mammalian reproduction.

A. B. KAR.

Journal of Medicinal and Pharmaceutical Chemistry. Vol. I, No. 1. (Interscience Publishers, New York, London), 1959. Pp. 1-120. (Bi-monthly Subscription £ 5·15 per year.)

Early dissemination of the results of research activities of the various laboratories is sure to benefit the scientists engaged in allied types of research. This new journal may be expected to fulfil this objective efficiently and quickly.

The increased tempo of pharmaceutical and pharmacological research all over the world is reflected in the pages of this journal.

The strong Editorial Advisory Board consisting of reputed Chemists and Pharmacologists is indicative of the international character of the journal. The main articles presented and discussed in this volume are :—

Hypotensive hydrazinophthalizines, pyrrole derivatives as a new class of antispasmodies, Alpha and Beta prodine type of compounds, Chemistry and Pharmacology of some synthetic organophosphorus compounds, derivatives of 3-Pyrrolidinols, compounds related to Pethidine and natural products from *Piper methysticum* Forst.

M. SIRSI.

Acetophenetidin. By Paul K. Smith. (Interscience Publishers, New York, London), 1958. Pp. x + 180. Price $ 5.75.

This volume is the fourth in the series of monographs published by the Institute for the Study of Analgesic and Sedative Drugs. The chief value of this series lies in making available in one volume the pertinent literature found scattered in various journals all over the world.

Acetophenetidin, introduced as an antipyretic in 1887, is one of the very few drugs that has stood the test of time. It still occupies a prominent place amongst the innumerable, antipyretics and analgesies of recent origin.

This monograph on phenacetidin also deals with the major metabolite of this drug—N-acetyl-*p*-amino phenol. The aspects reviewed cover physical, chemical, biochemical, biological and pharmacological properties of these two compounds and ends with a comprehensive bibliographical index.

M. SIRSI.

Advances in Clinical Chemistry. Vol 1. Edited by Harry Sebotka and C. P. Stewart. (Academic Press, New York and London ; India : Asia Publishing House, Bombay-1), 1958. Pp. xi + 308. Price $ 12.00.

The first volume of the new series, *Advances in Clinical Chemistry*, with its laudable object of presenting an unbiassed and critical discussion of many border-line subjects, is a worthy companion for the already well recognised 'Advances' Series.

Progress of medical science is mainly dependent on elucidating the fundamental biochemical abnormalities which underlie disease processes. Emphasis on this aspect has resulted in a new

and highly desirable orientation to clinical chemistry in this volume.

The topics discussed are widely divergent in nature. Plasma iron; the assessment of the tubular function of the kidneys; protein-bound iodine; radioactive iodine-131 in the diagnosis of hyperthyroidism; adrenocortical steroids; 5-hydroxy indoles; composition of the body fluids in childhood; clinical significance of transaminase activities of serum and paper electrophoresis in clinical investigations are the subjects dealt with in this volume.

The importance of these selective subjects needs no emphasis since they are in the forefront of clinical research all over the world. They are presented in a manner highly stimulatory and thought-provoking. The volume is a useful companion for both clinical chemists and clinicians.

M. SIRSI.

Tabulated Information on Tropical and Sub-Tropical Grain Legumes. (Plant Production and Protection Division, Food and Agriculture Organization of the United Nations, Rome, Italy), 1959. Pp. xiv + 367. Price $ 3.50.

Grain Legumes or pulses are those leguminous plants which produce seeds or grain used primarily for human consumption. They include such important crop plants as groundnuts, soyabeans, lentils, peas, pigeon peas and the many other types which could, if properly developed, make a great contribution to human nutrition, particularly in tropical and sub-tropical countries where diets are generally deficient in proteins, fats and oils.

This publication brings together for the first time a wealth of information collected by the FAO from authentic sources from the various countries of the globe enclosed between 25° Latitude North and South.

The tabulated information consists of about 360 information sheets, one for each individual species or variety, arranged in alphabetical sequence. The information in each sheet consists of Identification, Station submitting the information, Source of crop, Genetic origin, Uses, Seed availability, Major insect pests, Major diseases, Morphology and Habit, Culture, Resistance to (factors), Yield and Quantity.

A publication such as this helps specialists in those regions to know what others possess in the way of varieties of these important crops and to pool their knowledge and experience.

Agricultural Research in India—Institutes and Organisations. By Dr. M. S. Randhawa. (Indian Council of Agricultural Research, New Delhi), 1958. Pp. v + 448. Price Rs. 20·00.

The importance of scientific development of agriculture in India cannot be overemphasized when it is realized that nearly 80% of her population live in villages and are directly dependent on agriculture for a living. Traditional methods of cultivation, harvesting of crops and marketing of the products according to the native genius of the people of the locality, though excellent in their own way, have certain inevitable drawbacks which are brought to the forefront under the rapidly changing conditions of living, the growing economy of the country as a whole and, above all, the increasing population where the rate of increase is threatening to outstrip the resources of the environments.

At the turn of the present century there was a general awakening of interest in the scientific study of agriculture in all the advanced countries of the world and this had its impact in India as well. The first fruit of this impact was the scheme to establish by the then Government of India, agricultural research institutes, experimental farms and agricultural colleges in different parts of the country. It was in the year 1905 that a munificent donation of £ 30,000 by Mr. Henry Phipps, an American philanthropist, enabled the establishment of the first Government of India Agricultural Research Institute (IARI), popularly known as the Pusa Institute, after the name of the village in Bihar where it was started. After the disastrous Bihar earthquake of 1935, the Institute was transferred to Delhi. In recent years under the ægis of the Ministry of Food and Agriculture rapid expansions have taken place in the IARI not only in buildings and expert staff but also in laboratory facilities, scientific equipments and experimental farms. It stands today as the premier institution of the country and one of the important sources of expert technical knowledge, advice and instruction in agriculture and its cognate branches.

After the First World War, as a result of the constitutional changes of 1919, agriculture became a provincial government subject and there was no agency between the Centre and the provinces to bring about co-ordination of work. In 1928 the Indian Council of Agricultural Research was established as a statutory body, with the primary function of promoting, guiding and co-ordinating agricultural research

throughout India. With the advent of freedom the Council has developed into a premier organisation which guides, finances and co-ordinates research problems connected with agriculture and animal husbandry. Another important function of the ICAR is the dissemination of results of research.

The volume under review *Agricultural Research in India—Institutes and Organisations* by the Council's Vice-President, Dr. M. S. Randhawa, gives an exhaustive account of the nine Central Research Institutes and seventeen Central Commodity Committees (pertaining to Cotton, Jute, Coconut, Oilseeds, Sugar, Lac. Tobacco) their research activities and achievements. It also contains the details of all research schemes sponsored by the ICAR.

Excepting the specialists who deal with researches and research organisations not much is known to the general public, and even to administrators in other fields, about the activities of the institutes and laboratories functioning under the Central Ministry of Agriculture. The present volume supplies the need by providing an integrated account of these research institutions and their organisation and activities. The volume is attractively got up and contains 79 plates of photographs and maps giving a wealth of information at a glance. The reviewer has it at his desk as a ready reference volume and he feels sure that every library, editorial and research establishment, administration department, agricultural institute and college will own a copy of this informative publication.

A. S. G.

Books Received

Discovery Reports, Vol. XXIX. Octocorals (Part I) Pennatularians. By H. Broch. Pp. 245-80. Price 17 *sh.* 6 *d.*; *The Fœtal Growth Rates of Whales with Special Reference to the Fin Whale,* Balænoptera physalus *Linn.* By R. M. Laws. Pp. 281-308. Price 12 *sh.* 6 *d.*; *Distribution and Life-History of* Euphausia triacantha *Holt and Tattersal* A. de C. Baker, Pp. 309-340. Price 15 *sh.* (Cambridge University Press, London N.W. 1).

The Analysis of Mixtures of Volatile Substances. By Emil F. Williams and others. (*Annals of the New York Academy of Sciences,* Vol. 72, Art. 13), 1959 Pp. 559-785. Price $ 4.00.

Chlorpropamide and Diapetes Mellitus. By M. G. Goldner and others. (*Annals of the New York Academy of Sciences,* Vol. 74, Art. 3), 1959. Pp. 407-1028. Price $ 5·00.

Quantum Aspects of Catalysis—The Drying of Linseed Oil. By Raymond R. Myers. (*Annals of the New York Academy of Sciences,* Vol. 79, Art. 1), 1959. Pp. 1-8. Price 50 cents.

Antibiotics Annual 1958-59. Edited by Henry Welch and Felix Marti Ibanez. (Interscience Publishers, New York-1). Pp. xxii + 1107. Price $ 12.00.

Virus Growth and Variation. Edited by A. Isaacs and B. W. Lacey. (Cambridge University Press, London N.W. 1), 1959. Pp. viii + 272. Price 35 *sh.*

Excursion Flora of the British Isles. By A. R. Clapham, T. G. Tutin and E. F. Warburg. (Cambridge University Press, London N.W. 1), 1959. Pp. xxxiii + 579. Price 22 *sh.* 6 *d.*

Trigonometric Series, Vols. 1 and 2. II Edition. By A. Zygmund. (Cambridge University Press, London, N.W. 1), 1959. Pp. xii + 383 ; vii + 354. Price 84 *sh.* each.

Astronomy, VII Edition. By Robert H. Baker. (D. VanNostrand Co., 358, Kensington, High Street, London W. 14), 1959. Pp. viii + 547. 52 *sh.* 6 *d.*

I.C.A.R. Misc. Bulletin No. 82—*Bovine Stars of India.* (Indian Council of Agricultural *Research,* New Delhi). 1957. Pp. 29. Price Rs. 2·37.

Plant Nematodes, Their Bionomics and Control. By J. R. Christie. (Agricultural Experimental Station, University of Florida, Gainesville, Florida), 1959. Pp. xi + 256.

Biochemical Society Symposia No. 16—*The Structure and Function of Subcellular Components.* Edited by E. M. Crook. (Cambridge University Press, London N.W. 1), 1959. Pp. 100. Price 15 *sh.*

Electricity, Magnetism and Atomic Physics, Vol. II—Atomic Physics. By J. Yarwood. (University Tutorial Press Ltd., Euston Road, London N.W. 1 ; India : Oxford University Press, Mount Road, Madras-2), 1958 Pp. viii + 644. Price 40 *sh.*

Mites, or The Acari. By T. E. Hughes. (The Athlone Press, London W.C. 1). Pp. vii + 225. Price 42 *sh.*

The Two Cultures and the Scientific Revolution. —The Rede Lecture by C. P. Snow. (Cambridge University Press, London N.W. 1), 1959. Pp. 51. Price 3 *sh.* 6 *d.*

Introduction to Robot Technique—Multivibrator Circuits. By A. H. Bruinsma. (Philips Technical Library, Eindhoven ; India Philips India Ltd., Calcutta-20), 1959. Pp. 65. Price Rs. 5·00.