Reviews

A TREASURY OF BIOLOGICAL KNOWLEDGE

It would be a thousand pities if those who are in search of the best that is known of the world of life should turn away from the two volumes entitled *Life: Outlines of General Biology*[1] because of their bulk. For consider what these two great tomes represent. Into them two of the most gifted of modern naturalists have gathered the harvests of their lifetime. Nearly half a century ago, when the authors, J. ARTHUR THOMSON and PATRICK GEDDES, were extramural lecturers in Edinburgh, they brought out together a new theory as to the cause of sex (*The Evolution of Sex*, 1889)—a theory founded on metabolic activity—the male being male because of a lavishness in the expenditure of energy, and the female, female because of a greater economy in the husbanding of resources. In this early period of collaboration they resolved that in the fullness of time they would give the world a larger and better knowledge of how life is manifested in all its aspects than it ever had before. The authors have kept their promise ; they have given thinking men and women, for to-day and for many days to come, a vast treasury of biological knowledge.

In these days, when biology tends to reserve its rewards for those who successfully extend a single aspect of its field, it is right that some signal recognition should be given by the public to those who rise above specialties and seek to weave all the manifestations of life into a systematic whole. That is what the authors of this treatise have done. Not that they have not been specialists. Sir J. Arthur Thomson won early recognition by his monograph on the alcyonaria ; he is still the leading authority on this group of lowly animals. Professor Geddes entered the field of botany. But both became interested in the " web of life "—the surprising ways in which living things of all kinds are linked together for better or for worse. They became more concerned with the biographies of animals than with the manner in which their anatomical parts have been put together. It is this common interest in the bonds which link living things together which has cemented and maintained the happy partnership formed in their early days in Edinburgh. Both were then alive to the fact that medicine, rightly considered, is a branch of biology, and hence in this work we find, again and again, problems which concern medical men discussed with knowledge and enlightenment. Their main thesis, however, is that human life in all its aspects is but part of the great field of biology. Both authors are convinced that if human beings are to live their lives aright a knowledge of biology is essential for everyone. Indeed, for many years Professor Geddes has devoted himself to the application of biological knowledge to several departments of human activity—to education, to sociology, to eugenics, and to civics and town-planning.

In their preface the authors confess that " certain shades of difference remain " in their respective outlooks. Although no indication is given anywhere in these volumes as to the parts written by each author, yet a marked difference in style and manner of statement will supply readers with a clue to their respective contributions. Both, to be sure, are masters of the art of exposition ; in simplicity and clarity of statement, and in happy choice of apposite illustration, Sir J. Arthur Thomson stands, as the world has long recognized, in a class by himself. Professor Geddes has a style of his own—Carlylean in turn of phrase—and he is often inclined, like the great seer, to preach rather than to teach. Using such clues to disentangle the respective contributions made by our authors, the reviewer is impressed, not by the " shades of difference," but by the remarkable measure of agreement which has been reached. This consensus of outlook is all the more wonderful when we consider the very difficult and delicate problems which had to be faced. What is the relationship between body and mind? Both authors agree that mind is an aspect of life ; mind cannot be separated from body ; both authors are monists, not dualists. Then there is the problem of life itself. Can the processes of life be interpreted on a purely physical or mechanical basis? Both authors return the same answer: life has to be investigated by mechanical means, but when the physicist and chemist have done their utmost there will still remain much for the vitalist to explain. They thus sail between the mechanical Scylla and the vitalistic Charybdis, and save their biological barque from shipwreck. Then there is that matter of endless debate—the respective parts played by heredity and environment, " nature " and " nurture," in shaping the lives of individuals and of species. Both authors are Weismannists, yet both hold that a living thing and its surroundings make an indivisible whole ; nature and nurture are inseparable. Indeed, it may be suspected that Professor Geddes holds, as it is right that every educationist should do, that in shaping the destiny of living things nurture is more important than nature. Then there is the pressing modern question of regulating or controlling the human birth rate. Our authors regard the practice of contraception as justifiable. The present population of the world is approaching 2,000 millions ; with unrestrained fertility the numbers might be trebled in the course of the next two centuries. With a total population of 6,000 millions our little earth would be uncomfortably overcrowded. To prevent such a consummation—a " debacle " the authors name it—a judicious regulation of birth rate and a wiser mode of selective mating must be introduced into all human communities.

The wide measure of harmony, so noticeable in this combined work, springs not from agreement in such single items as have just been cited, but is due to a very interesting circumstance. The authors have succeeded in coming to common decisions because both are convinced believers in evolution. It is not a lip-service they pay to Darwin ; they are just as convinced as the master was that every form of life is now in process of evolution. The sceptics still ask for instances when, as Sir Arthur Thomson points out, with numerous illustrations, proofs are staring them in the face—if the anti-evolutionist will only look. It may be thought that the reviewer pays the authors a poor compliment when he ascribes to them a belief in living evolution. Nearly every modern biologist believes in evolution—but most of them think of it as working in the past, not in the present. Our authors belong to that small school which sees evolution shaping our present world of living things. It is this sense of the actuality of evolution which gives distinction and value to the *Outlines of General Biology*.

Life, as presented by its distinguished authors, is to be welcomed for its wealth of fact and clarity of description—to say nothing of many sly touches of humour. It is especially to be welcomed because it marks a return to a form of biological learning which has long been out of fashion—that kind of learning which was known as " natural history " in the latter part of the eighteenth century—the natural history cultivated by John Hunter in London and by the Monros in Scotland.

[1] *Life : Outlines of General Biology*. By Sir J. Arthur Thomson, M.A., LL.D., and Patrick Geddes. Two volumes. London: Williams and Norgate, Ltd. 1931. (Pp. 1,515 ; 202 figures. £3 3s. the two volumes.)

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The teaching of Cuvier, Owen, Huxley, and of the German morphologists swept natural history out of English laboratories, but it lingered on in Edinburgh, where our authors came across it as an almost moribund tradition. They have taken the "natural history" of the eighteenth century, and in the present work we see infused into it the teachings of Darwin, the discoveries of Weismann and Mendel, the modern science of chromosomes, the discoveries which have revealed man as a prey to an infinite number of living organisms. They have absorbed and applied the latest discovery of physiologist, embryologist, and geneticist. Sir J. Arthur Thomson and Professor Patrick Geddes have infused the best of the new learning, and of their own learning, into the best of the old, and they have done it in such a way that, heavy to hold as these volumes are, they will appeal to both young and old, expert and amateur.

ARTHUR KEITH.

CALCIUM IN METABOLISM AND IN THERAPEUTICS

Calcium Metabolism and Calcium Therapy,[2] by Dr. A. CANTAROW, is divided into three parts: on normal calcium metabolism, on abnormal calcium metabolism, and on calcium therapy. This division indicates the general purpose of the volume, which is to give a reasonably concise account of modern knowledge on calcium metabolism, and to explain how this knowledge can be used as a rational basis for calcium therapy. The need for such a volume is emphasized in the preface by Professor H. A. Hare. Dr. Cantarow has evidently taken great pains to master the literature of his subject, and has endeavoured to give a coherent account of normal and abnormal calcium metabolism. But the regulation of normal calcium metabolism is extremely complex and only understood in part, and the evidence on the subject is contained in literature which is not readily available to the clinician. Calcium therapy has, as a result, developed empirically. To say it has "developed" is perhaps misleading, because much of its past progress might be more suitably described as an aimless wandering between the extremes of credulity and scepticism.

The normal function of body cells depends upon the presence in the plasma of a few milligrams of ionized calcium per 100 c.cm., and this figure is influenzed by the supply of vitamin D, the activity of the parathyroids, the reaction of the plasma and the amount of calcium absorbed from the gut; this last factor is influenced by the calcium content and the calcium-phosphate ratio of the food, the reaction of the gut, and the supply of vitamin D. Diverse causes may produce similar alterations in calcium metabolism. Hypervitaminosis and an excess of parathyroid both cause a rise in blood calcium, a loss of lime salts from the trabeculae of the bones, and an excessive secretion of calcium in the urine. On page 119, the author gives a table showing twelve distinct types of tetany, in nine of which the blood calcium is decreased and in the other three normal. These difficulties account for the fact that much of calcium therapy still rests on a very insecure basis.

The author has compressed his subject into a volume of 200 pages. The parts dealing with calcium metabolism are difficult reading, but it is doubtful whether anyone could construct a straightforward account of this subject unless he ignored half the evidence available. Some of the chief points discussed are: The treatment of tetany, the protective action of calcium on the liver, the influence of calcium on oedema, the action of calcium in atopic disorders and in the treatment of lead poisoning. The volume concludes with a bibliography of fifteen pages, giving adequate references to American writings on the subject. Other work is dealt with less fully—for example, no mention is made of any English work in connexion with the discovery of the antirachitic vitamin.

[2] *Calcium Metabolism and Calcium Therapy*. By Abraham Cantarow, M.D. With a Foreword by Hobart Amory Hare, B.Sc., M.D., LL.D. Philadelphia: Lea and Febiger. 1931. (Pp. x + 215. 2.50 dollars net.)

AN INTRODUCTION TO MEDICINE

Professor HENRY E. SIGERIST of Leipzig has written an admirable book entitled An Introduction to Medicine,[3] which might well be translated into English. The author intends it primarily for the young student, but many doctors could also read it with great profit. Beginning with three chapters on anatomy, physiology, and psychology, he leads skilfully, in simple language, to a consideration of sick people. In particular, the third chapter, entitled "Seele und Geist," is an excellent introduction to the difficult psychological side of medicine, which critics of the profession rightly allege is so neglected in the average medical school. A section on signs of disease leads to a large chapter on disease in general, and this is followed by a description of the external and internal causes of disease. Under the heading of medical aid, Professor Sigerist considers the three divisions of diagnosis, treatment, and prophylaxis, and concludes with forty pages on "The Doctor," packed with common-sense advice on conduct and the general management of patients. Here, perhaps, the special conditions existing in Germany do not altogether apply to this country, but the advice given is, for the most part, of universal application. Throughout the book the author draws a clear distinction between disease and diseased individuals, and the so-called neo-Hippocratic ideals are evident in most of the chapters. As a guide-book for the student in the early and confusing days of his career this volume is excellent, and those who read it will want it on their shelves as a sort of medical Baedeker, for reference whenever they find themselves lost in the difficulties of practice.

DIATHERMY

It is surely time that an English translation of Dr. H. BORDIER'S *Diathermie et Diathermothérapie*[4] appeared. This book, honoured by the Académie des Sciences and winner of the Prix Montyon (physiology), has now attained a sixth edition in the ten years since it was first published—a proof that its value has been widely recognized. The new edition, dedicated to d'Arsonval, will be welcomed for its many new features as well as for the amplification of existing chapters. All the subjects dealt with, in diverse fields of medicine, are described with the directness and clarity indicative of vast practical experience. The chapter on the production of high-frequency currents and their propagation through various media is both interesting and intelligible—qualities rarely coexistent in the usual descriptions of the physical properties of electricity. Various electrodes devised by the author are of special interest, and increase the scope of diathermy in stomatology and oto-rhino-laryngology. Its application in gynaecology and genito-urinary disorders is already established.

The author seems most happy in the "surgical" use of diathermy, and he has worked for years with the

[3] *Einführung in die Medizin*. Von Dr. med. Henry E. Sigerist. Leipzig: G. Thieme. 1931. (Pp. vi + 405. M.12.50.)

[4] *Diathermie et Diathermothérapie*. Par Dr. H. Bordier. Sixième édition. Paris: J. B. Baillière et Fils. 1931. (Pp. xii + 659; 297 figures. 60 fr.)

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increasing belief that the "bistouri diathermique," or other suitable electrode, will revolutionize surgery, particularly in its relation to the cure of cancer. The treatment of accessible cancers and tumours by diathermy coagulation has yielded results beyond all hopes, and in certain cases quoted has proved superior to *x* rays and radium. The chapter on cancer of radiologists shows that diathermy coagulation has brought fresh hope to the treatment of radium dermatitis. This treatment has also been successful in cases of lupus where actinotherapy was not suitable—that is, where the lesion was extensive and deep, and the patient anxious for a quick cure and less concerned with the good cosmetic result achieved by light. The author supports his observations with convincing notes and photographs of the patients he has treated.

As long ago as 1919 Dr. Bordier was using diathermy coagulation in treating tonsillar hypertrophy and infection, and continues to find the results all that he wishes for. There is never any haemorrhage, the bactericidal effect is enormous, and the scar non-adherent and supple. He has treated children with success, but does not advocate this method for those under 10 years. His original treatment of anterior poliomyelitis, combining radiotherapy and galvanization with diathermy, is now being practised by many electrotherapeutists.

To the casual observer, this book may seem to be advocating diathermy as a universal remedy, but on closer study it is obvious that the author speaks from a thorough experience, and has a sound basis for his statements.

CUTANEOUS RAY THERAPY

During the last twenty years actinotherapy in one form or another has become increasingly important in the treatment of skin diseases, and in particular the debt owed by dermatologists and their patients to the healing powers of *x* rays and radium has become incalculable. Nevertheless, there have not been many practical handbooks written on the subject, and consequently we welcome Dr. H. H. HAZEN's volume on *Cutaneous X-ray and Radium Therapy*.[5] Dr. Hazen is a dermatologist of very great experience in this subject, and the methods and technique which he describes can be safely followed. There is, however, one great difference between American and European practice in the measurement of *x*-ray dosage. On this side of the Atlantic we are still accustomed to rely on the Sabouraud pastille, while in America (owing apparently to the dryness of the atmosphere) it has proved unsatisfactory, and hence Americans for the most part use an arithmetical formula, which has to be worked out separately for every *x*-ray tube. In consequence of this, gas tubes, the output of which varies considerably, are almost extinct in America, and their place is taken by the Coolidge tube, which lends itself to comparatively easy standardization.

Dr. Hazen's remarks on the action of radiation upon pathological tissues are very interesting. He does not believe that the cure of cancer depends upon the direct destruction of cancer cells, and thinks that the work done by those who have spent their energies in searching for the lethal dose necessary in dealing with various forms of cancer has been largely wasted. He believes that the tissue reaction is the central factor in the cure. His discussion of this very important and interesting subject is well worth reading. The importance of radiation as a therapeutic agent is brought home by his classification of skin diseases amenable to its effects. These are classified into thirteen groups, ranging from those in which radiation gives good results with or without the aid of other therapeutic agencies, down to a group of rare diseases in which radiation has occasionally been successful. Perusal of this list shows quite clearly how wide is the scope for actinotherapy in dermatology. In some conditions the *x* ray, and in others radium, is the agent of choice. In the treatment of plantar warts much better results are claimed for radium than for *x* rays, but the difficulty which these troublesome lesions give to the dermatologist is proved by the very odd confession that very old warts are so difficult to handle that they are best left untreated. In our opinion, even the most stubborn will yield to a suitable combined therapy. We have but little else to cavil at in an excellent and practical book, which should be read alike by dermatologists and by those radiologists who interest themselves in the problems of superficial therapy.

[5] *Cutaneous X-ray and Radium Therapy*. By Henry H. Hazen, M.D. London: H. Kimpton. 1931. (Pp. 166; 28 figures. 12s. 6d. net.)

NOTES ON BOOKS

The fifth edition has now appeared of Professor HERRICK'S textbook, *An Introduction to Neurology*.[6] With the increase of knowledge now available the subject-matter has been thoroughly revised and the details brought up to date. The main part of the book consists of a detailed account of the anatomy and physiology of the brain and nervous system; the illustrations are clear and the index is good. Controversial difficulties, such as the functions of the cerebral cortex, are dealt with thoughtfully, and the book will be welcomed by those who wish to place their neurological knowledge on a sound basis.

The seventh edition of *Bainbridge and Menzies' Essentials of Physiology*[7] has been again revised by Professor H. HARTRIDGE, who contributes new chapters on the basic principles of the blood, the heart, the circulation, respiration, the autonomic nervous system, the digestion, the metabolism, the kidneys, ductless glands, and sex organs. The account of the central nervous system has been rearranged with a view to clarifying the information. In the previous issue—which appeared in 1929—the chapters dealing with the sensory nervous and muscular aspects of physiology were rewritten by him. The whole volume is now up to date; it can be warmly commended to medical students and others interested in elementary physiology.

The appearance of a fourth edition of the well-known book *Tropical Hygiene*,[8] by the late Sir PARDEY LUKIS and Colonel BLACKHAM, is in itself the best testimony to the useful purpose which it serves. The present edition has been revised by Lieut.-Colonel A. D. STEWART, and chapters on sprue, filariasis, relapsing fever, leprosy and typhus, maternity and child welfare, etc., have been added. The aim is to provide a book on elementary hygiene which will appeal to the ordinary resident in the Tropics, and peculiarly in India. This aim has been well fulfilled. The book is admirably conceived, its scope has been carefully chosen, and the subject-matter, though intended for the non-medical reader, is treated in a properly scientific manner, and opinion when expressed is well balanced. Communicable diseases in the Tropics, and the part played by insects, climatic conditions, water, food, nutrition, clothing, housing, and sanitation, are dealt with in turn as in a large textbook. Its chief use will be,

[6] *An Introduction to Neurology*. By C. Judson Herrick. Fifth edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company. 1931. (Pp. 417; 138 figures. 12s. 6d. net.)

[7] *Bainbridge and Menzies' Essentials of Physiology*. Seventh edition. Edited and revised by H. Hartridge, M.D., Sc.D., M.R.C.P., F.R.S. London and New York: Longmans, Green and Co. 1931. (Pp. x + 583; 166 figures. 14s. net.)

[8] *Tropical Hygiene*. By the late Surgeon-General Sir Pardey Lukis, K.C.S.I., and Colonel R. J. Blackham, C.B., C.M.G., C.I.E., D.S.O., M.D., D.P.H. Fourth edition, revised and enlarged by Lieut.-Colonel A. D. Stewart, M.B., F.R.C.S.E., D.P.H., D.T.M. and H., I.M.S. Calcutta: Thacker, Spink and Co. 1931. (Pp. xi + 441; 79 figures. Rs.5.)

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