

Reviews.

THE RESPONSES OF THE BLOOD VESSELS OF THE HUMAN SKIN.

THE wealth of experimental material presented in this monograph on *The Blood Vessels of the Human Skin and their Responses*¹ had already formed the basis of Sir THOMAS LEWIS'S Croonian Lectures, delivered before the Royal College of Physicians of London in June, 1926, of which an abstract was published in this JOURNAL on July 10th of that year (1926, ii, p. 61). Much of the work has appeared in detailed form in an imposing series of original memoirs, published chiefly in *Heart* and in the *Journal of Physiology*, from 1916 onwards. Sir Thomas Lewis, with his co-workers at the time, was, indeed, the first among the several investigators, in different countries, who in the past decade have contributed to the new awakening of interest in the activity of the minute blood vessels, and in its importance for the adjustment of the circulation to the needs of the tissues. Krogh's book, embodying his Silliman Lectures on the capillary blood vessels, has acquainted a wider circle with much of the work in this field. In the work under review full justice is done to the collateral evidence produced by other investigators, in so far as it has a bearing on the author's own theme; there is, indeed, a bibliography containing 273 references. The book, however, is essentially an orderly presentation and discussion of the investigations carried out during the past eleven years by Sir Thomas Lewis himself and his colleagues on the reactions of the small, and largely of the minute, blood vessels, in one tissue of one species—in the skin of man. It has, accordingly, the invaluable quality, the peculiar interest, and authority of a personal document. We see the problem as it originally presented itself to the author. We can follow the gradual unfolding of the story, the shaping and testing of every link in the chain of evidence. As the reaction of the skin vessels to each type of stimulus comes in turn under investigation we see the separate lines converging to one inevitable conclusion. The results are of high intrinsic importance, but this reasoned presentation of them is of even wider interest as a demonstration of scientific method, and, in particular, of its application to the study of reactions of the normal human body.

While apparatus of precision is used where the nature of the observation demands it—as in the measurement of small localized changes in skin temperature—many of the experiments recorded, and among these some of the most important, employ only the simplest technique. They could be repeated by anybody possessing a Riva-Rocci armlet, a needle, a flat ruler, a thermometer, and—the only uncommon item in the equipment—a faculty of keen and accurate observation. A few milligrams of histamine would also be serviceable. With such simple tools, and with a masterly ingenuity in so combining their use as to give significant results in logical sequence, Sir Thomas Lewis weaves the close fabric of his argument. From the pattern emerges a common type of vascular reaction in the human skin to mild injuries of all kinds, mechanical, chemical, or thermal—the “triple response,” consisting of the sharply localized capillary dilatation, the coincident wheal which succeeds it, and the surrounding “flare,” which is due to arterial dilatation produced by the local axon-reflex. Point by point the evidence is accumulated to show that all three constituent phases of this complex response are due to the local liberation from the injured epidermal cells of a chemical substance, identical in its action with histamine, but here referred to, with proper caution, as the “H-substance.” The idea that injured cells may liberate such a histamine-like substance, producing a local capillary dilatation and wheal or a general circulatory collapse, according to the manner and dimensions of the

injury, is not new in itself; the novelty is the production of precise and convincing evidence for what was hitherto but a plausible suggestion. In the case of the surrounding arterial dilatation, on the other hand, the conception that this, though produced by a local nervous reflex, is also due to the liberation of the “H-substance,” acting in this instance on the sensory nerve endings, is both novel and surprising. Even more so is the conclusion that peripheral liberation of the “H-substance” is responsible for the vasodilatation and vesicle formation caused by irritation of a sensory nerve, as in the Stricker-Bayliss antidromic dilatation and in herpes zoster. There is some difficulty—teleological, one may admit—in the conception that vasodilatation, resulting from such irritation of an axon having a vasodilator as well as a sensory peripheral branch, should be due to liberation of H-substance in the neighbourhood of the sensory endings, and a consequent axon-reflex, rather than to direct passage of impulses down the vasodilator collateral. Sir Thomas Lewis does not, indeed, exclude the latter mechanism as a possible factor; but it is the former which his evidence supports, and the evidence is as cogent and as irresistible as any that he brings forward.

This triple vascular reaction to injury, and the chemical stimulus responsible for it, constitute the central theme of the treatise. Most of the other vascular reactions described have some relation to it. Thus the reactive hyperaemia following temporary arrest of the circulation is shown to be due to the accumulation of H-substance during defect of the cleansing stream of the blood. The anaphylactic reaction, studied in terms of its local expression in the skin, receives an interpretation of new clearness. Hitherto there was difficulty in reconciling the two lines of evidence as to its nature. There was strong reason, on the one hand, for attributing it to the interaction of the sensitizing antigen and a specific antibody in the living cells. On the other hand, the obvious similarity between the details of the anaphylactic reaction in different organs and different species, and the effects produced by such substances as histamine in the same organs and species, had led many to support the view that a substance having this type of action, an “anaphylatoxin,” was liberated, by some fermentative or other action of antibody on antigen, in the blood. The two lines of evidence, when viewed in the light of Lewis's demonstration, lead to a common conclusion. The immediate effect of the interaction of antigen and cell-fixed antibody is, like that of the injury of the protoplasm by other methods, the liberation of the H-substance from the cells, producing, in each organ or tissue in which it is thus liberated, the characteristic response of that organ or tissue to histamine.

It is impossible in the scope of a review to touch upon more than a few of the numberless points of suggestive interest to be found in this monograph, but one of more general significance deserves further notice. All the world of medical science knows of the leading part which Sir Thomas Lewis played in that remarkable advance in clinical knowledge of the defects of the heart's action, made possible by the experimental analysis of the mechanism of the normal mammalian heart beat. Here we find him conducting an investigation, equally exhaustive and original, into the physiological behaviour of another part of the normal circulatory mechanism. In this study of the blood vessels of normal skin he finds that man himself provides not only a possible, but for many experiments the only possible, subject. He is led to generalize from this experience, telling us that his chief motive in writing the book was “a desire to stimulate a wider study and teaching of human physiology; for knowledge relating to the healthy man forms the most manifest and abiding bond between physiology and medicine.” It is obvious that the data of physiology can furnish a firm foundation for human medicine only in so far as they are valid for man himself. The case of the reaction of the skin vessels is, however, a special one. The human skin is peculiar in its nakedness and in the readiness and variety of its vascular responses, while the skin is pre-eminent among the organs in its harmless accessibility for experiment. In other large domains of its activity, however, as in studies of respiratory metabolism and the effects thereon

¹ *The Blood Vessels of the Human Skin and their Responses*. By THOMAS LEWIS, M.D., F.R.S. London: Shaw and Sons, Ltd. 1927. (Cr. 4to, pp. xv + 332; 76 figures. 37s. 6d. net.)

of climate and exercise, physiology has long used, and increasingly uses, the method of direct experiment on normal man. The response of physiology to Sir Thomas Lewis's stimulus is assured; there are probably several centres of teaching already in which students are watching the appearance of wheals and flares on their own arms, to the necessary exclusion from the syllabus of some of the traditional experiments on muscles and nerves of frogs. It is of more urgent interest to know what effect this brilliant monograph will have on the bond between physiology and medicine. Will pathology and medicine join with physiology and produce the appropriate "triple response" to its stimulus? H. H. D.

BIOLOGICAL MEMORY.

A VOLUME entitled *Biological Memory*² is a translation of a monograph by Professor EUGENIO RIGNANO, editor of *Scientia*, and a distinguished philosopher. Professor E. W. MACBRIDE, who is responsible for the translation, has written a useful critical introduction, in the course of which he observes that, while the theory developed by the author may require much modification in detail, it is an astonishingly successful effort to analyse vital phenomena. If it is not true, he says, it at least bears a strong resemblance to what the truth must be.

Professor Rignano aims at an exhaustive analysis of the differences which distinguish living from inert matter, and attempts to account for them as the manifold effects of a single quality—memory. Living things remember, inert matter does not remember. We are, of course, familiar with the fact that impressions made by experience leave permanent traces upon the psychism of the individual, and that these impressions are capable of being reproduced in consciousness. Mental development would clearly be impossible were it not for the existence of mnemonic phenomena. The author makes it evident that deep and unsuspected analogies can be traced between biological phenomena in general and biological development in particular on the one hand, and those of memory in its narrower or psychic sense on the other. In the course of his essay he suggests that the tendency of organisms to maintain their own internal environment in the same physico-chemical conditions which prevailed when life first appeared; the transmissibility of acquired characters which he holds to be established, and the ontogenetic development of organisms; the innate instincts of animals; psychic manifestations of whatever nature—all these phenomena, including even assimilation, thanks to the mnemonic substratum which can be detected in all of them, may be considered as merely very different manifestations of one and the same fundamental phenomenon. We cannot here outline the hypothesis of "centro-epigenesis" which the author advances as an explanation of the manner in which acquired characters—that is to say, habits called forth as reactions to a changed environment—can be transmitted to the offspring. Irrespective of the validity or otherwise of this hypothesis, we feel that the author had done much in this book to bridge the gap which exists between physiological and psychological phenomena—both of which are manifestations of life. We are apt to set down physiological and mechanical action under one head, and conscious or mental action under another, whereas the distinctions between physiological and mechanical action are similar to those between the latter and mental action. The line of demarcation is not between physiological and conscious behaviour, but between living and non-living.

THE EFFECTS OF CONTRACEPTIVE PRACTICES ON THE FEMALE SEXUAL ORGANS.

THIS pamphlet on *The Effect of Contraceptive Practices on the Female Sexual Organs*³ is written by the president of the League of National Life, Dr. FREDERICK J. McCANN. The objects of the League are to combat the theory and

practice of contraception (birth prevention); to oppose any form of State or municipal assistance for the promotion of contraception; and to uphold the honour and blessing of parenthood. In the pamphlet an attempt is made to establish the thesis that a woman deprived of the full physiological value of sexual union will sooner or later develop changes in her genital organs, the most important of which is a slight uniform enlargement of the uterus, with softening of the cervix and body. The symptoms of "the Malthusian uterus," as the author terms it, are menorrhagia, leucorrhoea, backache, and pelvic discomfort, all of which are far from unusual in women who have had large families and have never tried to prevent conception.

He is on safer ground in discussing the ill-effects of mislaid sponges and pessaries, left indefinitely in the vagina, the dangerous "wish-bone" type of intrauterine pessary, and the irritation caused by some chemical pessaries. Possibly because of the title chosen for his pamphlet, Dr. McCann says little of what is undoubtedly by far the commonest ill-effect of birth prevention, and that is, the mental. The remark is made, however, that the psychological effects of contraception often culminate in dissatisfaction, disappointment, and ultimately disgust, and may end in a nervous breakdown which compels attention. The resulting disorders of the menstrual and other functions of the reproductive tract and symptoms referred to the pelvic organs are scarcely touched on, whilst vague and unscientific statements are made, such as that contraception promotes "congestive changes in the pelvic organs." The more cautious conclusion in regard to the etiology of fibroids will meet with general acceptance, for all that is said is that whether they are the cause or the consequence of sterility is still a debated question, but that the available evidence favours the view that both sterility and diminished fecundity conduce to their growth. On the other hand, the basis of his argument in the sections on cancer of the body of the uterus, ovarian tumours, and contraception during pelvic disease is insecure, and the evidence for his conclusions very thin.

There are many good points in Dr. McCann's essay, and among them we are pleased to notice the attention he draws to the exaggerated fertility of women and its results often assumed by birth control propagandists; we regret, however, that he has not resisted the temptation to overstate his case and has not kept more strictly to the lengths accurate clinical observation will allow. As a result he falls into the same errors as the propagandists on the opposite side, and may thus offer an easy target for their counter-attack.

COMPARATIVE ANATOMY OF THE EYE.

To the average English reader French is a more accessible language than Italian, and we welcome with pleasure the translation by Dr. CHARLES DEJEAN of the classical work of Professor OVIO of Padua on the comparative anatomy of the eye.⁴ The volume is a large and formidable one, but contains in very readable form a wealth of information which, as far as English literature is concerned, remains completely unclassified.

The first part deals with the elementary response of the primitive visual apparatus to light. This, it will be remembered, was primarily motor, a tropism, and out of this the sensory functions of vision developed. The second part describes the various types of eyes met with in the animal kingdom: the epithelial structures (simple or composite) of the invertebrates and the "cerebral" eye of the vertebrates. Each individual structure is then dealt with and its morphology and phylogeny described in considerable detail. The last part deals with the physiology of the organ and comprises a description of the nutrition of the eye, its extrinsic movements, the movements of the iris and the migration of pigment, the dioptric system, accommodation, visual sensations, adaptation, colour vision, appreciation of form and movement, the visual field and binocular vision.

Considering the vast extent of the field which is covered, it is evident that the treatment of many of the subjects

² *Biological Memory*. By Eugenio Rignano. Translated with an introduction by E. W. MacBride, D.Sc., LL.D., F.R.S. London: Kegan Paul, Trench, Trubner and Co., Ltd. New York: Harcourt, Brace and Co., Inc. 1926. (Demy 8vo, pp. vi + 253, 10s. 6d. net.)

³ *The Effect of Contraceptive Practices on the Female Sexual Organs*. By Frederick J. McCann, M.D., F.R.C.S. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd. 1927. (Med. 8vo, pp. 16. 1s. net.)

⁴ *Anatomie et Physiologie de l'Œil dans la Série Animale*. By Professor Joseph Ovio. Revised translation by Dr. Charles Dejean (of Montpellier). Paris: Felix Alcan. 1927. (Sup. roy. 8vo, pp. vi + 736; 307 figures. 120 fr.)

must necessarily be somewhat cursory, but in spite of its comprehensive and ambitious nature the book never loses proportion in the presentation of the subject matter, and never loses interest in its manner of treating it. It is primarily a reference book, although in no sense a mere encyclopaedia. It reveals the vast industry and comprehensive knowledge of its author, and the translator has done it every justice.

TWO X-RAY ATLASES.

A LITTLE over two years ago the first edition of MCKENDRICK and WHITTAKER'S *X-ray Atlas of the Normal and Abnormal Structures of the Body* appeared, and now a second edition⁵ is issued. Many additional radiographs appear in the new edition, and special attention should be called to the series which show lipiodol injections of the bronchi. These have been supplied by Dr. John Guy, who also furnishes a note on the method employed.

The book has been extended by thirty-four pages, but, except for these additions, is substantially the same as when first published. No attempt seems to have been made at any definite revision, and many very poor and quite inadequate radiographs have been retained. One notable omission is in the part dealing with the spine, for with one exception—a lateral view of the cervical spine—no lateral views are reproduced; this is difficult to understand, as there is no doubt that in probably most cases of disease and injury the lateral view is of more importance than the antero-posterior. A further criticism might also be made that, with ample space, the authors have not seen fit to add to the descriptions accompanying each radiograph. The bald statement that this or that picture is an example of this or that condition is hardly calculated to convey much information of value to a practitioner who may not be an expert, and it is obvious that it is to the general practitioner that a book of this kind appeals. We venture to think that, generally speaking, a greater effort should have been made to point out the nature of the x-ray changes shown. This could have been done without increasing the size of the book, and would have added much to its value. However, that a second edition has been called for in so short a time shows that there has been a considerable demand for the atlas, and there is no doubt that it serves a useful purpose. It is a pleasant book to handle, inasmuch as it is well presented and attractive, and it is printed on paper which suits the illustrations and renders good reproduction of the radiographs possible.

The *Atlas de Radiographie Osseuse*,⁶ by HAREL, DARIAUX, and QUÉNU, presents a series of radiographs in a somewhat novel manner. There are two reproductions of each, either side by side or opposite to one another, the one in the usual style, whilst the other is the same radiograph with the outlines artificially strengthened, and marginal notes stating what is the cause of each part of the shadow. The atlas is beautifully got up and is of large size, but very unfortunately in the bulk, and especially the more difficult parts; such as the head, etc., the radiographs are by no means up to the standard of modern x-ray technique. Except for a very short introduction, and at the end a few tables dealing with the data of ossification of the bones and epiphyses, there is no printed matter other than the marginal notes. The material for practical purposes is divided into two main parts, the first consisting of some sixty odd representations of the adult human skeleton, and the second, with sixty illustrations, dealing with the child from the time of intrauterine life to the age of 16. A book of this kind, dealing only with the normal, is useful for teaching, and will be valuable for occasional reference in an x-ray department. It is a novelty, inasmuch as it differs from most atlases in portraying only the normal appearances; and as a knowledge of the normal is essential in reading the abnormal it is a handy method of having

at hand a series of the normal in which any individual bone can be looked up, whilst the marginal notes will at once indicate the various radiographic points. Medical students and those reading for a diploma in radiology will find it of value.

NOTES ON BOOKS.

THE third edition of *Ker's Manual of Fevers*⁷ has been ably revised by Dr. CLAUDE RUNDLE, medical superintendent of the Fazakerley Hospital, Liverpool, who is to be congratulated on having brought the work up to date without modifying its essential features. The new matter includes information about the bacteriology of measles and scarlet fever, the Dick and Schultz-Charlton tests, immunization against scarlet fever and the antitoxin treatment of the disease, and the serum prophylaxis of measles. We are pleased to see that the reviser recommends much larger doses of antitoxin than those mentioned by Dr. Ker, and that he deprecates the routine administration of alcohol in diphtheria, which was advised in previous editions of the work. We have detected a few omissions. Although reference is made to Caronia's organism, there is no mention in the paragraph on the etiology of measles of Tunncliffe's green producing diplococcus, which is more likely to be the causal agent of the disease; nor do we find any reference to Ramon's anatoxin, erythema infectiosum, or exanthema subitum, to which so much attention has been given lately in Continental and American literature. We note with regret that the two half-tone illustrations of scarlet fever and serum rashes have been retained, though they might, as we pointed out in the review of the last edition (*JOURNAL*, April 22nd, 1922, p. 646) have been better replaced by coloured plates or omitted altogether.

Practical Tropical Sanitation,⁸ by Drs. MINETT and SEVERN, represents the second edition of a somewhat smaller work by the first named author published seven years ago. It is a little difficult properly to assess the value of this book, as the preface states that it is for "sanitary inspectors and others in tropical countries." The "others," from the general character of the book, must mean non-medical persons, and the directions to inoculate all contacts with antiplague and T.A.B. vaccines would not come within the province of either. There is a considerable improvement on the first issue. The number of pages has been increased by fully one-third, and the illustrations by 25 per cent., but, as several pages previously occupied by the regulations and by-laws in force in British Guiana have been omitted, the additions are more than the mere number of pages would indicate. We note incidentally that the picture of Dr. Balfour's fly-trap is still deprived of its tempting approach, without which the flies depicted would certainly not be enticed to enter. The authors' experience in China enhances the value of the present edition, for the former was based almost entirely on conditions in British Guiana. The most notable addition in the present issue is the final chapter on schools, for which the assistance of Mrs. Minett, who has had experience in both the West Indies and the Far East, has wisely been enlisted.

For a book he has written on therapeutics in general practice⁹ Dr. CHARLES FIESSINGER, who is a corresponding member of the Académie de Médecine, draws on an experience of nearly fifty years. These years have taught him that in many maladies nature is still more intelligent than the doctor. It is not surprising, therefore, to find that he has small respect for intravenous medication, which seems to be very popular in France, and still less for the intraspinal administration of drugs. He does not believe in homoeopathy, but he finds that two of Hahnemann's principles were correct. For confirmation of the principle that like cures like he advances the doubtful argument of vaccination. The other principle is that if the immediate effect of a remedy is violent its duration is short, and vice versa. Upon this principle Dr. Fiessinger bases his view that the causes of disease should be treated by large doses, in order, so to speak, to knock the disease on the head, while the symptoms of disease should be treated by minimal doses of drugs. Dr. Fiessinger is insistent upon the confidence inspired by the doctor as a therapeutic agent of the highest value. After a chapter devoted to meditations such as these, and a second on general therapeutics, the author describes the treatment he has found successful in diseases of various tracts of the body.

⁷ *Ker's Manual of Fevers*. Revised by Claude Rundle, O.B.E., M.D., etc. Third edition. Oxford Medical Publications. London: Milford, Oxford University Press. 1927. (Cr. 8vo, pp. xv + 346; 15 figures, 4 plates. 12s. 6d. net.)

⁸ *Practical Tropical Sanitation*. By E. P. Minett, M.D., D.P.H., D.T.M. and H., and A. G. M. Severn, M.A., M.D., D.P.H. Second edition. London: Baillière, Tindall and Cox. 1927. (F'cap. 8vo, pp. viii + 180; 59 figures. 5s. net.)

⁹ *La Pratique Thérapeutique en Clientèle*. Par Ch. Fiessinger. Comment Guérir. Bibliothèque des Praticiens. Paris: N. Maloine. 1927. (Imp. 16mo, pp. 342. 20 fr.)

⁵ *An X-Ray Atlas of the Normal and Abnormal Structures of the Body*. By Archibald McKendrick, F.R.C.S.Ed., D.P.H., F.R.S.E., and Charles R. Whittaker, F.R.C.S.Ed., F.R.S.E. Second edition, revised and enlarged. Edinburgh: E. and S. Livingstone. 1927. (Demy 4to, pp. xv + 255; 448 figures, 120 plates. 30s. net.)

⁶ *Atlas de Radiographie Osseuse: I. Squelette Normale*. Par G. Harel, A. Dariaux, Jean Quénu. Avec la collaboration de H. P. Châtellier. Préface du Professeur Pierre Duval. Paris: Masson et Cie. 1927. (Roy. 4to, pp. 129; 123 figures. 160 fr. sans majoration.)