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Missile wounds of the brain in the Russo-Japanese War and the two world wars have provided much information about the visual pathways in the cerebral hemispheres, and it is therefore particularly valuable to have this contribution from these American observers who have studied visual problems in brain-wounded subjects for 15 years or more. They review the literature about the anatomy of the visual radiation and striate cortex but add relatively little that is new to this subject. They discuss the mechanism of macular sparing and put yet another nail in the coffin of the theory of bilateral macular representation in the cortex. They stress that in their experience, though not in that of most others, incongruous field defects are very common in lesions at all levels of the visual pathways, including the striate cortex, and recommend that this point should receive special attention in future studies.

Probably the most important chapter is that which deals with 'functioning' as opposed to plotted fields. Here are assembled the authors' findings on fluctuation, extinction, completion, and the phenomena which occur when vision returns during convalescence to an area which was densely scotomatous in the acute stage. At first an undifferentiated sensation of light is appreciated, then a moving light can be distinguished from a stationary one, although rate and direction of movement are not recognized, and then objects can be c:cented in space about the time at which indistinct contours are visible. The authors also describe the role of flicker and of measurements of dark adaptation in demonstrating minimal losses or minimal remnants of function. They discuss the various types of visual function which may be lost or preserved in an abnormal part of the field. They conclude that there is no good evidence of separate cerebral localization for the various functions, but that there is a hierarchy among them according to which they are lost or regained in a certain order. A section on visual hallucinations in brain-wounded subjects includes a cautionary tale of a patient who unwisely admitted to seeing little horses and who spent the next two years in hospital with the diagnosis of schizophrenia.


The authors of this book are engaged in rehabilitation and in various aspects of physical medicine. A considerable attempt is made to explain the physiological effects of brain damage on muscles and movement, but there are many inaccuracies. Those who attempt to select snippets of physiological knowledge in this complex field encounter many pitfalls.

The Structure and Function of Muscle. Edited by G. H. Bourne. Volume I: Structure (Pp. 472; 137 figures, 24 plates, 9 tables. £5 0s. 0d.; $14.00); Volume II: Biochemistry and Physiology (Pp. 593; 73 figures, 1 plate, 29 tables. £5 18s. 0d.; $16.50); Volume III: Pharmacology and Disease (Pp. 489; 46 figures, 20 plates, 4 tables. £5 7s. 6d.; $15.00). New York and London: Academic Press. 1960.

Volume I is the first of three to be published on muscle considered both structurally and functionally. Dr. G. H. Bourne has been able to obtain the help of a number of distinguished experts in various fields and they have written chapters on the different aspects concerned.

This volume contains some excellent articles on electron microscopy, notably one by Huxley and Hanson on the molecular basis of contraction, who describe the sliding filament hypothesis. Two chapters, one by H. Stanley Bennett on the structure of muscle and the other by Sjöstrand and Anderson-Cedergren, are outstanding. Hanson and Lowy give an exhaustive and critical survey of the contractile apparatus in the muscles of invertebrates. Other interesting chapters are on tissue culture (Murray), the motor end-plates (Couteaux), and the muscle spindles (Cooper), but it is not possible to mention all by name.

The illustrations are very good, particularly the electron microscope ones, but a few do not indicate the magnification and some show artifacts.

This book will have to be read by all interested in muscle and can be recommended.

Volume II provides a detailed and highly specialized account of the functional rather than the structural aspects of muscle. The chapters are therefore mainly devoted to biochemistry, biophysics, and physiology and they are most stimulating. The reviewer especially enjoyed the chapters by Drs. Szent-Györgyi and Needham on biochemistry and Dr. Nachmansohn on the neuromuscular junction.

Volume III deals with aspects of pharmacology and disease and covers a wide field in both animal and human muscle. The clinical pathologist will be helped by a number of these chapters. There is one by Dr. Bosanquet, Professor Daniel, and Dr. Parry on the histological changes in various conditions affecting muscle and this chapter is very well illustrated.
Chapters on ageing changes in muscle by Dr. Rubinstein, on post-mortem changes by Dr. Bendall, which is especially devoted to theories of the rigor process, are also excellent. Drs. Beckett and Bourne have described their findings of various enzyme systems by histochemical studies in some diseases but, as they say, these cannot be regarded as an authoritative collection of facts. Virus and parasitic infections of muscle are dealt with in detail as are the effects of nutritional deficiency in animal muscle. The histological features in muscle regeneration and repair are found in another chapter, but unfortunately they are not illustrated.

The clinical and the genetic aspects of diseases affecting muscle are described in two excellent chapters by Drs. Henson and Walton respectively. There is, however, no reference to levels of serum enzymes nor to the myopathy in which there is a deficiency in phosphorylase (McArdle's disease). Finally Dr. Szent-Györgyi typically comments briefly on muscle and its contractile function.

The three volumes are a fairly exhaustive record of the position concerning the structure and function of muscle as it existed a few years ago, for in the last volume there are few references to papers of the last two to three years. The production is good even though most of the illustrations would have been better if they had been larger and it is unfortunate that in places names are mis-spelt.


The symposium of which the proceedings are reported in this issue was intended to provide a common forum for neurophysiologists and for physiologists who work mainly on the cardiovascular system. The result is an authoritative statement of current views on the nervous control of the circulation. It contains contributions on the anatomy of cardiovascular reflexes, and on the physiological part played by the brain-stem, hypothalamus, and cerebral cortex in control of the cardiovascular system. Other sections deal with the reflexes controlling the circulation to the brain, the kidney, and the skin, and the final sections describe conditioned cardiovascular reflexes. It is now clear that the veins are extremely active and not merely passive tubes which return the blood to the heart. Considerable interest is now being taken in the reflexes controlling this activity of the veins, and a valuable section is devoted to studies of these reflexes in isolated venous segments.

Little is said about changes occurring in disease, but it is essential for the clinician to understand normal mechanisms if the circulatory phenomena occurring in, for instance, tabes and polynuertin, are to be understood.


This is an excellent monograph on a subject which has recently undergone an upheaval. For most of the present century, a theory of the physiology of cutaneous sensation has been generally accepted, which recognized four primary 'modalities' of sensation, mediated by four distinct types of peripheral nerve ending, each with an independent nervous 'pathway', interrupted, for no known purpose, by a number of 'relay' points. Associated with this theory is the notion that the integument can be divided into a mosaic of sensory 'spots', each of which overlies a specific 'receptor' of one of the four types. This theory has been largely demolished; on the anatomical level, the demonstration that no correspondence can be found between sensory 'spots' and histologically specific 'receptors'; physiologically, by showing that individual afferent nerve fibres respond to different kinds of 'natural' stimuli; finally, there has been some rough handling of the logical basis of the four 'modalities' and the sensory 'spots'.

The book under review is mainly concerned with the neurohistiography of the skin and mucous membranes. The subepithelial plexuses and the forms of nerve terminal are described in detail, with excellent illustrations, mainly photographs of silver impregnations. The author proposes a simple, and very acceptable, classification of cutaneous nerve endings into (1) free ramifications arising from the dermal network, including the more compact terminal arborizations seen in dermal papillae; (2) the basket-like networks around their follicles; (3) mucocutaneous endings, a large variety of compact terminal arborizations, which in the past have given rise to a bewildering array of eponymic terms; (4) Meissner's corpuscles, found characteristically in the papillary ridges of the hand; and (5) the Vater-Pacini corpuscles.

Where the author discusses function, he is less satisfying. It is not his fault that a convincing theory in terms of spatio-temporal patterns of impulses, and central re-coding of these, has not yet been worked out; on the other hand, he appears to accept too readily the classification of sensation into the four traditional 'modalities', and is guilty of verbal confusion when he uses a word such as 'touch' to cover a physical stimulus at the one end, and a sensation at the other. The fact that a Pacinian corpuscle is supplied by a nerve fibre which becomes active when the corpuscle is squeezed does not imply that these organs function as 'pressure-receptors', or that they have any concern in sensation. The alternative view, that these serve to signal local changes in the blood circulation, and form part of an autonomic reflex mechanism, is at least equally plausible. Whatever the facts may be, the author is not helping the cause of psycho-physical correlation when he speaks (on page 80) of these organs as 'perceiving' pressure changes in the tissues.

The chapter on the changes associated with disease is useful in pointing out how little is at present known about this subject. The more fundamental question of the degree to which peripheral nerve endings are labile, and undergo progressive and regressive changes during normal adult life, will probably require to be answered before the problems of peripheral neuropathology can be cleared up.

Structure and Function of the Cerebral Cortex: Proceedings of the Second International Meeting of Neurobiologists, Amsterdam, 1959. Edited by D. B. Tower and...
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This conference collected together research workers on the anatomy, physiology, and biochemistry of the cerebral cortex, and this report of the proceedings gives much information regarding present knowledge. The physiological mechanisms of the hippocampus and the microchemistry of glia and nerve cells describe many important advances in knowledge.


The first volume of Braus’s Anatomy deals with the locomotor system, the second with the viscera. This, the third volume, covers the peripheral nervous and vascular systems (385 pages), the central nervous system (235 pages), and the sense organs, including the skin (189 pages).

The writer of a textbook of anatomy has a difficult problem in deciding how much space should be devoted to the central nervous system. If he is to cover the ground in detail, this section is likely to outweigh the whole of the rest of the work. If he summarizes another kind of disproportion arises, illustrated in this book by the fact that 47 pages, with 25 pictures, are devoted to the nervous and vascular supply of the leg but only two and a half pages, with one picture, to the vessels of the spinal cord and brain-stem.

Another difficulty arises from the peculiar methods used by neuroanatomists and neurophysiologists in their task of tracing the connexions of different parts of the nervous system. On this subject there is a mass of detailed information, some of it well-established, some probable but unconfirmed, some contradictory, and much highly disputable. This textbook seldom indicates the degree of reliability of the information it imparts; and there are no references to the work on which the information is based.

The disparity between the section on the peripheral nervous and vascular systems, which is excellent, and that on the central nervous system, which is unsatisfactory, might have been overcome by leaving aside the subject of neural connexions, and concentrating on the gross topography, with detailed dimensions, fuller descriptions of vascular arrangements, and more reference to the techniques of angiography and pneumoencephalography.

The book is handsomely produced, and beautifully illustrated. From this point of view, it would repay study by the editors of English textbooks of anatomy.


The book represents a systematic neuroanatomical record of the behavioural experiments by W. R. Hess on the brain-stem of cats followed by subsequent lesions in the structures stimulated. As the stimulation experiments have been recorded on films which, together with the brain sections, are available for study at the Hirnbiologische Sammlung at Zurich, this publication of Marchi-stained series is of considerable value in relating brain function and structure. The results have been discussed in a detailed way with the experimental studies of other authors, and for this reason an up-to-date account of the relevant literature is given. The senior author (a clinical neurologist) has integrated experimental results with clinical observations, thus adding to the neurological interest and scope of this book. Both authors are to be congratulated on their painstaking, extremely well-documented work, providing a great source of information on brain-stem structure and function available to the English-speaking neurologist, as each chapter has an extensive English summary.


The fifth section of this imposing work has now appeared. The formidable book under review forms the first part of the fourth volume, which deals with the symptoms and treatment of space-occupying intracranial lesions. This part is concerned with general surgical technique, deformities of the skull and brain, lesions neoplastic and inflammatory of the skull bones, infections and infections by metazoan parasites and fungi, and the problem of hydrocephalus. Space-occupying lesions of the brain itself, neoplasms of its coverings, abscess, and haematoma are clearly to be dealt with in the other two parts yet to appear.

The survey of general neurosurgical procedures by F. J. Irsigler is informative and one must compliment the author on a more than adequate performance of a task that is peculiarly difficult of execution in any book that aims at being comprehensive. Selection of material must indeed be a problem here. The approach naturally results in a tendency to list too much for fear of omitting something of importance. However, the author has succeeded in giving a most readable account of the basic techniques, with interesting sections on pre- and post-operative care and complications, and even one on dealing with the relatives.

Professor Gerlach deals exhaustively with congenital malformations of the skull and brain, and with G. Simon covers that most complicated and controversial subject, the recognition, diagnosis, and treatment of tumours and inflammations of the skull bones. Then Dr. Kleinsasser describes the tumour pathology of the skull and orbit in a magnificent monograph of 170 pages of which not less than 44 are devoted to a truly monumental bibliography. Not content with this effort, with another coadjutor Dr. Kleinsasser contributes another article on other skull diseases of surgical importance.

One of the most interesting articles in this volume is the monograph on the operative treatment of hydrocephalus by Professor T. Riechert and W. Umbach which brings together an enormous amount of information. Here we find a note on every method of treatment of hydrocephalus that has ever been suggested. A common
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difficulty in treatises of this kind is that though one is referred to a multitude of surgical procedures, it seems that there is a reluctance to advocate any definite measure and, therefore, relatively little attempt is made to evaluate the methods described or to suggest reasons to support one in preference to another. Those interested in the treatment of hydrocephalus will, however, find here an invaluable historical survey in which it is not difficult to separate the useful contributions to surgery from the many brilliant suggestions which have proved less brilliant in practice. It is a little surprising to find no reference to ventriculoatriostomy by the Spitz-Holter valve, which has certainly become the method of choice in this country for most communicating cases.

A short but very interesting summary of anaesthesia in neurological surgery comes from the hand of Dr. Torsten Gordh.

The production, printing, and illustrations are of the high standard we expect from a handbook emanating from such publishers. The references to the literature are throughout copious, widely selected, and admirably set out, and the indexes are entirely adequate. Certainly we will look forward to each new volume as it appears.


It is obvious that the intelligent use of drugs such as anaesthetics requires some knowledge of what is known regarding the anatomy, physiology, and pharmacology of nerve cells. This little book provides this information in a way that will be appreciated, especially by postgraduate students concerned with anaesthesia.


Alcoholism in France is a serious problem, for in 1956 deaths from cirrhosis of the liver were more than 14,000, and from acute alcoholism more than 6,000. Drs. Etienne-Martin and Kleppling, both of Dijon University and Hospital, have written an extremely able monograph on the liver in alcoholism. In the main they deal with cirrhosis but also to some extent with the earlier changes to be found in the liver, from aetiological, pathological, clinical, and therapeutic aspects.

Hepatic coma, the peripheral neuropathies, and the psychological aspects are included in the discussion.

The field covered is very wide and the two authors have drawn extensively upon their experience as well as upon the writings of all the well-known authorities. This volume must be read by all interested in liver disease as well as those concerned with the psychological aspects of intemperance and it can be thoroughly recommended.

The volume possesses some defects which are not uncommon in some French monographs; there are no references, there is no index, and there is a certain lack of a critical attitude to other writers on this topic.


That the mind can function independently of conscious volition or control has been realized ever since man became aware of his dreams, and that mental activity beyond consciousness continues in the waking state has been appreciated ever since introspection, analysis, and the association of ideas became the methods of metabolism, physicians and philosophers in the seventeenth century. From an entirely different field, study of autonomic and reflex nervous action in the eighteenth and nineteenth centuries provided a neurological analogy if not basis for the concept and led to the dispute whether it should be regarded as unconscious mention or cerebration. In the twentieth century Freud discovered the mechanisms of the unconscious and its links with conscious mind and laid the groundwork of its application to the understanding of normal mental development and mental illness.

The concept of an unconscious therefore has very ancient roots, and its history may be traced in the writings of philosophers, physiologists, physicians, and poets, in fact in all who have ever concerned themselves with the study of mankind. The author of this book (described as 'the eminent thinker' on the dust jacket) has gathered scattered allusions to the subject from European writings after 1600. Unfortunately he lacks the specialist vantage point (or bias) and in consequence is handicapped in distinguishing the important from the unimportant, the incidental from the vital. His thesis 'that Freudianism as we know it is but one crucial step in the development of man's knowledge of himself' is of course a truism, but this attempt to show that Freud's 'originality was in some respects less than he and others have imagined' will not detract from it. The book leaves the feeling of an urgent need for an authoritative exposition of psychological and psychiatric sources.


It is unfortunate that this excellent though elementary book has such a forbidding title which may cause it not to reach the wide audience it deserves. It has been written primarily for medical students and practitioners who are not specialists in psychiatry. It aims to provide a framework of concepts concerning physiological and mental mechanisms and emotional, social, and cultural forces. On the basis of these concepts the author describes the ways in which emotional disturbances arise and seeks to develop a basis for treating patients with ailments associated with emotional disturbances.

The author does this and more. He describes clearly how the emotional disturbances of many patients can be handled by the general practitioner or the general physician without recourse to the specialist psychiatrist. Dealing with patients' problems along common sense lines and acting not only as technician but also as counsellor. The author's wide experience and humanity pervade the book, and chapters which can be especially recommended are those on 'Interviewing' and the 'Doctor-Patient Relationship'. The author indicates whether patients with emotional disturbances should be referred to a psychiatrist, but if this book attains the wide popularity it deserves and its approach to patients is accepted it should reduce the number of patients so referred.
Psychiatrists are often shocked by the way their non-psychiatric colleagues handle their patients, not as a person but as a deranged organ or system and indeed they often have to repair the consequences of such mismanagement. Many non-psychiatrists would benefit from reading this book, and it can be especially recommended to medical students who are still malleable.

The Central Nervous System and Behavior. Transactions of the Third Conference. Edited by Mary A. B. Brazier; sponsored by the Josiah Macy, Jr. Foundation, New York, with the co-operation of the National Science Foundation, Washington. (Pp. 475; 201 figures. $7.50.) 1960.

This conference met at Princeton in February, 1960, under the Chairmanship of Dr. H. W. Magoun. As with its predecessors, the aim appears to have been to bring together men working in a variety of disciplines converging on neurophysiology rather than to hold a genuine symposium built round a particular topic. Indeed, choice of topics appears to have been governed almost wholly by the special interests of the participants, which range from the brain of Neanderthal man to the response of the infant monkey to a surrogate mother. Although it is hard to see much relation between the different topics, the frequency with which leading speakers were interrupted at least suggests that much interest was aroused, and one may hope, some mutual understanding created. It is pleasant to note that two distinguished Russians took part.


There is a need for more and better textbooks on mental deficiency, all the greater for the advances which have been made in recent years on a broad front. These have been marked by major improvements in biochemical and cytological techniques, a more biological approach to the problems of deficiency, greater understanding of aetiology, and a revolution in methods of training and rehabilitation of patients. One might have expected that all these would have provided rich material for the writing of a new textbook to show new trends and extensions in the field.

The book under review falls somewhat short of such an expectation. The authors set out to cover their subject comprehensively, and their book contains much useful information. Nevertheless this is often very sketchy, as in the chapter on abnormal protein metabolism which, as it stands, would have been better omitted. Important work carried out elsewhere than in the United States, such as that of O'Connor and Tizard on the training of the mentally subnormal, is passed over. The bibliographies at the end of chapters are short, but mention too many minor papers while omitting classical key references. References in the text are not always included in the chapter bibliography. There is no author index.

The material could have been better arranged. The chapter on 'Research' is largely redundant, overlapping with the chapter on 'Etiology and Classification'. No mention is made in the paragraph on the aetiology of mongolism of a chromosomal anomaly, reference to this being confined to six lines at the end of the chapter. Valuable space is taken up with case histories, and with histograms of which the meaning could have been better expressed in a few sentences, while important facts of general interest are omitted. The sections on prophylaxis and medical treatment, in which helpful hints are handed out to the obstetrician and physician, could have been drastically pruned.

Despite faults which deprive it of value for the specialist, the book is both readable and well illustrated, and will be appreciated by those who come new to this field of work. The sections on case taking and physical examination will be a useful guide to those embarking on clinical work with defectives; and the forthright approach to practical problems make it suitable selected reading for nurses and social workers.


The study of behavioural responses in children provides an enormous amount of information regarding brain mechanisms, and Russian experimental psychologists have studied this subject by observing the young child's reaction to simple experimental situations. Professor Luria reported some of these studies in lectures he gave in London in 1958, and this expensive little book consists of a translation of these lectures. Of special interest is the demonstration that speech from the observer, or by the child himself, has a tremendous influence on the accuracy of a simple motor response. The power of speech is certainly overwhelming as regards the development of behavioural patterns.


This small and, for its length, extremely expensive, book is highly recommended in a preface by Dr. Norbert Wiener, who may perhaps be regarded as the father of cybernetics. Its aim is to illustrate the application, in a non-quantitative way, of some of the principles of control engineering to neurophysiology and psychology. It may be said at once that the authors, except in a last chapter on human society, stick to this task more consistently and in more concrete terms than is common in many popular and semipopular works in this field. They discuss with some considerable show of detail a vast number of physiological and other biological mechanisms in cybernetic terms, and perusal of the book may well encourage many readers to assimilate these concepts into their own thinking. It is a pity, therefore, that only a selection from the cybernetic repertoire of basic ideas is used. Questions of the nature and the role of communication in the nervous system are deliberately avoided, and while the notion of 'information' is not introduced, the disturbing expression 'neural dynamic' is coined, hardly defined, and widely employed. The cybernetic principles with which
the book deals are largely confined to those of negative and positive feedback (the latter word here—rather gratuitously as it seems—replaced by ‘reflection’) and the operation of these to produce, on occasion, ‘runaway to zero’ and ‘runaway to maximum’. These ideas hardly provide sufficient equipment for the informed interpretation of any physiological or psychological function. While often superficially enlightening, there is some danger of their being ultimately confusing. The physiological detail, too, is often too sketchily presented to enable the worth of the argument to be judged.

It must be emphasized, however, that in the course of these not always satisfying discussions a number of interesting and thoughtful ideas are thrown up. It is for these, rather than as an authoritative exposition, that the book ought to be read.

BOOKS RECEIVED

(Review in a later issue is not precluded by notice here of books recently received.)


