Neuromuscular Function and Disorders


The possibility of a neurotrophic mechanism for muscular dystrophy is not a new hypothesis. It was discussed in the early years of the Muscular Dystrophy Group, but it was the motor unit counting technique of Alan McComas that made the idea a serious contender. The method of hypothesis is a standard one in medicine—the current jargon is model construction—and it is valuable in so far as it integrates known facts and suggests new experiments. It becomes less valuable if ad hoc assumptions have to be piled on each other to explain findings. This has been the main weakness of the McComas approach. A technique applicable to a single muscle (upper limb methods are doubtful) apparently produces the same order of findings in a number of clinical entities. “All cats have four legs so everything with four legs is a cat” is such an elementary syllogism as to deceive no one, but “all motoneurone diseases have reduced motor unit counts so ... ?” The fallacy in logic is not confined to unit counts, consider the angulated muscle fibre.

The model must accept all confirmed facts, histological and biochemical, and is only better than rival models if its heuristic value is higher. By these tests the “sick neurone” hypothesis is not outstanding, and experiments, such as those on parabiotic animals, and transplants do not support the predictions.

The book presents the facts of neuromuscular physiology in an exceptionally clear manner. The clinical information is adequate for the purpose, and Professor McComas does not conceal the major objections to the neurogenic theory. Indeed, they are listed specifically under headings “for” and “against”. The book has been criticised for its advocacy of the neurogenic theory of muscular disease. I think that is unfair. The author draws attention to recent work which does not support the theory and there can be no objection to him making the best of such evidence as supports him.

There is no doubt that McComas's original findings were surprising. Although the technique has been improved by later workers there is a considerable body of support for the basic findings. But is the interpretation correct? This book demands careful study for it is carefully written. (A script from Professor McComas is a pleasure for an editor, requiring so little modification. Unfortunately the proof reading can be criticised in this book.) Whatever new models of neuromuscular disease emerge they have to incorporate the motor unit counts. Agree with him or not, this book is a landmark in the study of neuromuscular disorders.

J. A. SIMPSON

Introduction to Nervous Systems


This book, which is aimed at undergraduates and medical students, presents the biological approach to the nervous system for which the senior author is well known. The anatomy of the nerve cell and the physiology of nerve conduction and synaptic transmission are described in detail, as a preface to chapters describing the increasing complexity of neuronal integration in intact nervous systems. Animal behaviour is discussed at length, and the final chapter is an extensive account of comparative neuroanatomy and neurophysiology. The text is extensively and superbly illustrated by line drawings, original figures, and photomicrographs. There is scarcely a page without an arresting illustration which focuses attention on the substance of the text. Each chapter is concluded with a brief list of references. This is a fascinating account of the nervous system, one which all medical students would benefit from reading, for it would extend their concepts of nervous function beyond the immediate restricted area of the human brain, into fields as diverse as ethology, and, for example, sun compass navigation in the ant, or the dorsal light response of the angel fish. Unfortunately, however, the medical student would also have to read a more conventional account of human neuroanatomy and neurophysiology, and lack of time would probably prevent him from enjoying this book.

C. D. MARSDEL

Aging and Dementia


There has been a 100% increase in the population of old people in the USA over the last 35 years; consequently the number of demented patients requiring medical attention has grown, and it is feared that the advances in clinical science. This book aims to fill a gap in the literature by dealing with “neuroanatomical/behavioral concepts” and will be useful both for basic and clinical scientists. It consists of chapters on prevalence, morphological changes, radiographic morphology, vascular disease, and future perspectives in aging and dementia; more selectively, essays on intellect, personality, and cognitive decline—written in the irreplaceable contemporary jargon of the psychologist—come at the end of the book.

Quite outstanding is the comprehensive chapter of Traub, Gajdusek, and Gibbs which brings up to date their renowned work on Transmissible Viral Dementia. They have now obtained 70 instances of this condition and compared the clinical and pathological features with Creutzfeldt-Jakob disease in 35 patients from whom the disease for so is not transmissible. The addendum clearly indicates that, with time, the number of non-transmissible cases declines as the number of transmissible ones rises, and yet further passages from human tissues to monkeys are achieved.

The many facets of dementia inevitably lead to an uneven approach which does not make for easy reading. The “soft” approach of the psychologist, relating data obtained by indirect and often highly inferential means, contrasts in both style and value with Tomlinson's obsessively careful work in relating plaque counts to age, areas...
the cortex, and to a dementia score. The importance of vascular disease to the general causation of dementia rests somewhat precariously; Tomlinson's group found evidence of an ischaemic basis in 16% of their dements, contrasting with a much larger incidence obtained by other methods. O'Brien highlights the dilemma: does vascular disease produce dementia by the production of multiple infarcts (recognisable in life as strokes), or can chronic anoxic cells remain viable for long periods during which they contribute to the dementia and ultimately cause atrophy? O'Brien favours the latter explanation on the basis of his cerebral blood flow studies, though many will remain sceptical of the conclusions reached by means of a single method which to date has yielded no therapeutic dividend.

These topics hint of the stimulating and controversial value of this book. In a complex field no clear message stands out, unless it is the self-evident need for further work of the calibre of the Newcastle and NIH schools. It is perhaps a pity that there is no serious account of the clinical approach to the assessment and investigation of the dements, but this is a book better suited to the established expert than to the embryo neurologist, or dare one say psychogeriatrician. It is well produced with clear tables, and should command a wide readership.

J. M. S. PEARCE


This book represents a collection of review articles on selected topics of the biochemistry of the nervous system, the aim of which is to attempt some correlation between structure and function. The individual authors are all acknowledged experts in their field, and the accounts are generally clearly written and well illustrated. The first three chapters provide the clearest basis for correlating structure and function—that is, on the morphological and biochemical changes which occur during brain development. The first chapter is a concise statement and summary of general aspects of development, and it is followed by a valuable description of the rapidly expanding and related field of nucleic acid metabolism. I would have liked to have seen included here some assessment of current views on the effects of nutritional deficiency. Chapter 3 deals well with the effects of drugs and hormones on the developing brain.

The central section consists of chapters on cyclic nucleotides and retinal disorders, the functions of monoamine neurones and on energy metabolism. All are excellent reviews but do not seem to fit any particular overall theme, and the relevance of this section to the stated objectives of the book is not clear. The final three chapters on behaviour learning, memory, and sleep, provided the most interesting reading for this reviewer, and the book is, therefore, recommended particularly for this section which gives a nicely balanced perspective of value to all neurobiologists.

H. S. BACHELARD

Clinics in Endocrinology and Metabolism Volume 6 No. 3 Catecholamines Edited by Lewis Landsberg. (Pp. 279; illustrated; £7.50.) W. B. Saunders: London. 1977.

This is a useful and stimulating book, about the adrenergic nervous system rather than about catecholamines. It is not a textbook of catecholamine chemistry or pharmacology and is not concerned with schizophrenia or Parkinsonism. The subject is the peripheral rather than central, hormonal rather than neurotransmitter, actions of catecholamines. There are 10 chapters by 11 North American authors which give a selective view of the behavioural responses to adrenaline and noradrenaline. One wants to read most of them. The sections on adrenergic receptors (Steer), neuroendocrine tumours (Metz and Levine), and the brief discussion of diseases of the autonomic nervous system (Moskowitz) are particularly good. The initial chapters describe current knowledge of catecholamine metabolism and release from the adrenal medulla, and other subjects discussed include the sympathetic system in hypertension and hyperthyroidism.

On the practical side, catecholamines play a role in the pathogenesis of many diseases, and the management of phaeochromocytoma and the diagnosis of autonomic malfunction are reviewed succinctly. The book is well written, produced, and illustrated with a lot of references and is reasonably priced. Without question it will repeat the success of earlier volumes in the Clinics series.

DAVID PARKER


The purpose of this short book, as stated in the foreword, is to separate the core from the minutiae of neuroanatomy and thus confer a sense of proportion upon the student. The text is divided into three main sections—a review of the organisation of the nervous system with special emphasis on the cranial nerves, a brief summary of the functional neuroanatomy of the major motor and sensory pathways, and an atlas of the brain and cord. The useful features of the third section are the use on freshly cut brain sections of a staining technique which leaves white matter unstained while colouring grey matter blue, and the presence adjacent to each horizontal brain section of corresponding scans obtained by computerised axial tomography.

The atlas of the brain and cord is the strong feature of this book. The photographs are so labelled as to encourage self-testing, and there is ample space on each page to add personal notes if desired. The index is excellent and there is an adequate list of references for further reading, but this is confined to North American works and omits too many other books. For example, Neurological Anatomy by Brodal.

This book is worth having at the modest price, by today's standards, of $8.95.

W. F. DURWARD