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Book reviews

Recent Advances in Neuropathology 1 Edited by W. T. Smith and J. B. Cavanagh. (Pp. viii+325; illustrated; £19.00.) Churchill Livingstone: Edinburgh. 1979.

This is a welcome addition to the Recent Advances series and testifies to the impact that experimental neuropathology and neurobiology have had on classical neuropathology in recent years. Not that the latter has been completely forgotten since there are chapters reviewing recent work on such diverse topics as the aging brain, human neuro-oncology, and metallic toxicity and the nervous system. Other topics covered are the use of tracer techniques in neuropathology, cerebral oedema, cell turnover studies, regeneration in the central nervous system, the application of image analysing systems to neuropathology, experimental neuro-oncogenesis, the pathogenesis of spina bifida, multiple sclerosis, and Parkinsonism.

The editors have persuaded a distinguished group of authors to contribute and, since my width of knowledge is such that I cannot comment critically on all of the chapters, it would be invidious to mention individual authors by name. Nevertheless, it would not be out of place to say that I found the chapter on regeneration in the central nervous system both fascinating and provocative; the chapters on image analysing systems and on human neuro-oncology most interesting and instructive, and the chapter on cerebral oedema—a topic much in need of a critical, authoritative, and informative review—disappointing.

As in any multiauthor book, there is a great variation in style but every chapter reads well. The illustrations, however, do not achieve the standard one normally expects in books incorporating photomicrographs and electron micrographs.

This is an important book that will, I hope, be the first of a series, and essential reading for neuropathologists, neurobiologists, and clinicians with an interest in fundamental changes in the nervous system.

HUME ADAMS

Central Nervous System Pharmacology: a Self-Instruction Text By Donald E. McMillan. (Pp. 167; illustrated; $12.50.) Little, Brown and Co: Boston. 1979.

This is the second edition of a self-instruction text in central nervous system pharmacology. Unlike some similar volumes this is written in a standard narrative style which greatly helps to hold the reader's attention. This edition contains new chapters on general principles of pharmacology and synaptic transmission and also a section on CNS toxicology. The book generally achieves its aim of providing a foundation in CNS pharmacology because the text includes not only a sound background but also a balanced account of current views on the mechanism of action of drugs with CNS activity. In particular recent developments are included and unlike many other standard teaching texts, the drugs discussed are actually in current use. The book is clearly aimed at a wide audience and readers with any pharmacological background may wish to take the author's advice and skip some of the early sections. Generally, this book is accurate although some might disagree with the claim that propoxyphene is of low abuse potential. However, as a whole the volume appears to cover CNS pharmacology at least as well, if not better, than some widely available standard texts. It could well become popular with medical and biomedical science students in addition to postgraduates beginning study in the neurosciences, provided they like or can adapt to the general style of a self-instruction text.

JOHN L. REID

CNS Aging and its Neuropharmacology: Experimental and Clinical Aspects Edited by W. Meier-Ruge. (Pp. 218; illustrated; Sw fr 88.00.) S. Karger: Basel. 1979.

This volume, number 15 in the series *Interdisciplinary Topics in Gerontology*, consists of a collection of 13 papers on various aspects of the neurochemistry and pharmacology of aging. These are topics which have become of great interest since our understanding of the role of central neurotransmitters has increased, and a substantial number of drugs have been developed and marketed which purport to improve cerebral function in old age. The papers range from an excellent account by Davison of neurotransmitter deficiencies in extrapyramidal disorders, Huntington's chorea, and Alzheimer's disease and senile dementia, to accounts of experimental animal studies of the endocrine aspects of aging, whose relevance is at best doubtful. The remaining contributions include some evidence by Calne on the relationship of age to the treatment of Parkinsonism, but mostly consist of reviews of the literature and speculations on the possibility of improving intellectual capacity in the elderly. These can be considered as current sources in the literature of negative results, though the middle-aged can only encourage further efforts towards the development within the next few years of truly effective measures for preventing or retarding decline in cerebral function in old age.

F. I. CARR

Practical Enzymology of the Sphingolipidoses Edited by R. H. Glew and S. P. Peters. (Pp. 321; illustrated; $34.00.) Alan R. Liss: New York. 1978.

The area of neurolipidoses and leucodystrophies has been revolutionised by the study of specific enzymes along the pathways for the synthesis and degradation of the sphingolipids. A number of laboratories throughout the world have specialised in the study of specific enzymes, but this book is quite exceptional in bringing together many of the original experts to give practical tips on how to prepare the substrates with the appropriate radiochemical as well as detergent, and also to detail important questions of final pH and ionic strength. Dr Kolodny has given a masterful overview, not only from a clinical point of view, but also from his practical experience of running an enzyme reference laboratory. The diseases covered include Niemann-Pick's, Gaucher's, Farber's (lipogranulomatosis), Krabbe's, Tay-Sachs' (G_{M1}) and G_{M2}) including Sandhoff, metachromatic leucodystrophy, Fabry's,

fucosidosis, and reference to the mucopolysaccharidoses. This book will be indispensable reading for the neurologist with a molecular outlook, especially the paediatric neurologist and the chemically oriented neuropathologist.

E. J. THOMPSON

Single Fibre Electromyography By Erik Stålberg and Jože V. Trontelj. (Pp. 244; illustrated; £10.00.) Mirvalle Press: Old Woking, Surrey. 1979.

Those of us familiar with the papers of Stålberg and Trontelj on single fibre electromyography will not be surprised to find that this monograph, both in presentation and content, is of the high standard we have come to expect of the Uppsala School. The book brings together in a general review the results of work with single fibre electromyography at Uppsala and Ljubljana over the past 15 years. The early chapters introduce the reader to the basic principles of electromyography and evaluation of the properties of various concentric needle electrodes in a simple and straightforward way that will be comprehensible to those who are not familiar with the discipline. The technique of single fibre EMG, the rationale of jitter and fibre density measurements and multielectrode studies are explained along with pitfalls of interpretation and artefacts that can arise in the use of these techniques. Approximately one-third of the book is devoted to the technical aspects of these investigations, followed by the results of their application to a variety of neuromuscular disorders. The understanding of this subject is greatly facilitated by illustrative examples and the book is copiously supplied with these. Apart from the illustrations to the text there are 35 pages in an atlas of representative electrophysiological tracings in a number of disorders. There is a comprehensive list of references to the subject.

This is a complete manual for the electromyographer wishing to learn and practice single fibre EMG. Even for those who may not have the facilities to undertake such studies the book will be of value in increasing their understanding of the basic pathophysiological processes underlying the electrical activity in diseased nerve and muscle states. I have no hesitation in recommending it wholeheartedly.

J. P. BALLANTYNE

The Mindful Brain. Cortical Organization and the Group-Selective Theory of Higher Brain Function By Gerald M. Edelman, and Vernon B. Mountcaste. (Pp. 100; illustrated; £7.00.) MIT Press: London. 1978.

Two essays from the forthcoming *The Neurosciences: Fourth Study Program* are selected for prior publication. Mountcastle's paper entitled "An organising principle for cerebral function: the unit module and the distributed system" is an important condensation of his well-known studies on cortical function. In ontogenetic development, migration of neurones along the surfaces of radially orientated glial cells causes a columnar organisation of cortical cells, microcolumns, assembled into columns which have strikingly similar morphology and processing functions in all areas, the functional differences depending on specific input and output connections. The details are interesting —for example, that only those columns in which stimulation produced movement of the fingers contained neurones with cutaneous receptor fields. The columnar organisation exhibits partially shifted overlap, local sign being sharpened by surround inhibition. General regulatory systems engage the cortex in all its layers and do not have columnar modules. The latter form distributed systems and one or more columns may be involved separately or synchronously in different distributed systems. As Mountcastle points out, the complex function controlled or executed by the system is not localised in any one of its parts, yet the parts are not equipotential in Lashley's sense. Distributed systems are re-entrant and cycle phasically, allowing continual updating of the perceptual image of self and its world, matching the neural replication of the external continuum with a readout of internally stored information (unlocalised). Thus for Mountcastle, unlike Eccles, conscious awareness does not require external influences incompatible with thermodynamic laws.

Edelman will be less well known to British readers as his neurobiological theories arise from immunobiology which leads him to a selectionist—as contrasted with instructionist—theory of neuronal organisation, the detectable signals being limited by genetic constraints modified by early development, independently of the structure of outside signals. There is then a hierarchy of "recognisers" and "recognisers of recognisers" but unlike earlier formulations this is not regarded as an infinite sequence. Groups of cells can have primary and secondary repertoires, altered by selection and commitment during experience, important modifiers being repetition of input, including reentrant inputs, and association. Versatility is provided by making selection by cell groups "degenerate", a term used to mean that, under given threshold conditions, there must be more than one way of satisfactorily recognising a given input signal, a more flexible safety factor than "redundancy". There is a most interesting discussion of how reentrant signalling between inputs and recognisers in a phasic model can signal temporal order, an important feature missing from earlier models but essential for speech and other higher functions including, according to Edelman, conscious awareness. It is, of course, a model but the author lists some predictions and consequences, including six conditions which, if they held, would falsify the theory.

In his thoughtful introduction Francis O. Schmitt indicates how well the Edelman model fits with the experimental findings and conclusions of Mountcastle. Unquestionably this book will help to make cerebral function intelligible, a valuable template for interpreting new observations.

J. A. SIMPSON

Peripheral Neuropathies (Proceedings of the International Symposium on Peripheral Neuropathies held in Milan, Italy, 26–28 June 1978) Edited by N. Canal and G. Pozza. (Pp. 514; illustrated; $64.50.) Elsevier/North-Holland Biomedical Press: Amsterdam and New York. 1978.

This volume is divided into seven sections dealing with nerve pathology, axonal transport, the neuropathies of chronic renal failure and diabetes, compression neuropathies, the metabolic, genetic, and inflammatory neuropathies, and ends with a miscellaneous section containing eight papers on a variety of observations on peripheral neuropathy. It is always difficult in a book of this size containing so many individual contributions from many different authors to single out any one author or groups of authors for special comment. How-