

on prions and the other on cerebral amyloidosis; while well written, their references are for the most part anterior to 1992 and important new information such as the interaction between ApoE and amyloid is not included. It is important to note that the book is biased towards degenerative diseases and excludes other areas of human disease where molecular techniques have greatly enhanced our knowledge and are now assuming diagnostic importance such as brain tumours and mutations in myelin related genes. The concept of trinucleotide repeats is not discussed. None of the techniques related to protein alterations are presented (protein purification, gel electrophoresis Western blotting) leaving out the entire topic of cytoskeletal changes in human neurodegenerative diseases. Finally, the techniques related to cell death/apoptosis are covered. This book will be useful mainly to clinicians who wish to become familiar with the basic molecular techniques currently used, keeping in mind that the topics covered are quite selective. Those who are actually contemplating the possibility of setting up molecular techniques to study human brain diseases should refer to more detailed publications and "how to" books.

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**BIOPSY DIAGNOSIS OF PERIPHERAL NEUROPATHY.** 1995. By Gyl Midroni and Juan M. Bilbao. Published by Butterworth-Heinemann. 477 pages. \$C208.00

I quite enjoyed this new atlas of nerve biopsies by Midroni and Bilbao. There are a number of very positive features about this book that suggest it should be included in all neuropathology laboratories and in the libraries of neurologists interested in peripheral nerve disease. Unlike several books about peripheral nerve there are more photographs than words and the photographs are of superb quality. This is exactly what the field needs, i.e., a pictorial "tour de force" of nerve biopsies from a lab with a great deal of experience in the area. In my mind there aren't any texts quite like this. Its closest rivals are either largely text or particularly EM. The pages are large allowing the illustrations to be very well portrayed. An additional plus is also the inclusion of a segment with clinical information on each of the conditions presented. Many publications on peripheral nerve disease fail to include such nice combinations of semi-thin sections and EMs. I particularly enjoyed the sections on sarcoidosis, vasculitis and lymphomatoid granulomatosis. To visualize these conditions in the past it would require digging through reprints.

It is the bias of these authors that they do not emphasize teased nerve fibres, although there are some pictures in the text. I think these are well illustrated in other texts. As the field progresses, a text like this and others will probably include more immunohistochemistry but there is some in the text and frankly I really wouldn't want to displace the other pictures because it would distract from the comprehensiveness of what is included.

The authors present their viewpoints on usefulness of nerve biopsy and some interesting information to help guide clinicians as to when biopsy may or may not be as helpful. Of course, some of this is subjective and based on their particular experience but these are important questions that need to be addressed.

We have been waiting for a text like this for a while now,

expecting it to come from the authors of some other well known peripheral nerve books. I am pleased that this group, with its depth of experience has shared the images with us.

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**NEUROBEHAVIORAL PLASTICITY.** 1995. Edited by Norman E. Spear, Linda P. Spear, Michael L. Woodruff. Published by Lawrence Erlbaum Associates, Inc. 472 pages. \$C104.00.

This book consists of papers presented in honour of Robert L. Isaacson by his former students and collaborators in research at a symposium held in association with a 1993 meeting of the International Society for Neurobehavioral Science. The papers fall under three main headings, namely, the relationship between the limbic system and behaviour with an emphasis on learning and memory, the phenomenon of neuroplasticity controlled at a molecular level including changes after brain damage and, thirdly, the neural and chemical determinants of normal and abnormal behaviour. In the first part, the papers deal with the effect of hippocampal lesions on conditioning to complex non-spatial events, with a quantitative model for the assessment of processing of temporal and spatial information by the hippocampus and of the effect of lesions, the experimental effects of the injection of a cholinergic antagonist or a GABA-ergic agonist into the medial septal area on maze behaviour, an innovative technique for assessing memory after short retention intervals in rodents, a review of the research and conclusions of the neurophysiologic analysis of limbic function in the Buzsaki Laboratory, the consequences of lesions in the septal area and experiments on the relationship between neurotrophic factors in the hippocampus in rats and Alzheimer's disease.

The papers on plasticity in behaviour and the brain discuss the modulatory memory system as demonstrated by McGaugh's Laboratory and the central role of the amygdaloid complex, the evidence for varieties of synaptic change derived from experience, the application of neural grafts and other techniques as treatment of experimentally-induced brain damage, the puzzling effects of implanting fetal tissue into the damaged hippocampus of adult rats, the advances in understanding of neuroplasticity through the techniques of neurochemistry and molecular biology, experiments aimed at trophic factors that mediate neuronal plasticity and the role of hormones associated with stress as studied in the laboratory of Bela Bohus and their observations on kindling in the dorsal hippocampus and amygdala which result in measurable neurophysiologic and behavioural changes.

The third part contains papers which deal with an experimental rat model of fetal alcohol syndrome, a study of the age-dependent effects of early disruption of the dopamine system, a review of the issues and evidence with respect to the four major neural transmitter systems (adrenergic, serotonergic, dopaminergic and cholinergic) and their role in combination with the brainstem for cognition, the effect of neuropeptides on cognitive behaviour in rats and in humans, the phenomenon of reinforcement and the suggested interaction of the amygdaloid complex, the hippocampus and the ordering effect of the prefrontal cortex, the application of animal research to a greater understanding of Alzheimer's disease in which analogous perseverative

motor behaviours, apparently of striatal origin, have been demonstrated, and the availability of the U.S. Environmental Protection Agency to assist in the assessment of risks from neurotoxins.

The numerous papers contain new evidence, descriptions of procedures as well as theories which will influence future behavioural neuroscience research and are authored by a number of researchers who are foremost in their respective fields. The book provides ready access to the various approaches to research on neurobehavioural plasticity.

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NEUROGLIA. 1995. Edited by H. Kettenmann and B.R. Ransom. Published by Oxford University Press, New York. 1079 pages. C\$278.95.

With the exception of my Webster's dictionary, Neuroglia has become the heaviest book on my bookshelf. It is well bound and the matte-finish paper is of high quality. The book is dedicated to "those who believed in glial cells during the long, dark period when the neuron concept dominated brain science." The book has 108 contributors who are evenly derived from Western European countries and North America. The editors have done an excellent job in selecting experts in all fields of glial research to write chapters. The down side is variability in style. While all chapters I looked at in detail (approximately half) were well written, some of the English style is excessively formal and difficult to read. The book contains many black-and-white photos which generally are very good although a few lack good contrast and some, reproduced from other sources, are not well focused. There are many diagrams; most are professionally done but some appear very amateur and difficult to read. Reflecting the time to print such a book, all chapters had 1993 references, and some had 1994 references, but I only came across one 1995 reference which was "in press".

The 69 chapters are logically organized into 12 major groupings (Morphology, Lineage, Physiology, Receptors, Mechanisms of cell-to-cell communication, Molecular and biomechanical mechanisms, Myelin, Membrane structure and cytoskeletal proteins, Glia as part of the immune system, Neuron-glia cell interactions, Role of glia in injury and regeneration, Glia and disease) and, with a few exceptions, all have a useful half page summary at the end. There is frequent overlap in subject material written from different perspectives. For example chapters dedicated to microglia appear in the morphology, lineage, immune, and injury sections. As a compensation the editors seem to have allowed authors rather free rein to express a particular opinion. In Chapter 10 by Fedoroff, the author promotes his own and not widely supported view that microglia are derived primarily from CNS precursor cells rather than marrow stem cells. Therefore, I found it worthwhile to consult several authors chapters to appreciate what the "accepted knowledge" is.

The chapters I focused on for this review were ones I thought might be relevant to the predominantly clinical audience of the Canadian Journal of Neurological Sciences. The morphology chapters concerning oligodendrocytes, Schwann cells, and microglia are excellent, as are chapters 7 and 8 which address basic issues of cell lineage. These would be valuable reading for

neuropathologists and others interested in microscopic anatomy of the nervous system. Chapters 37-40 concerning myelin, would be useful reading for neurologists interested in demyelination/remyelination. Chapters 55-60 concerning injury and regeneration relate more to experimental aspects of brain injury than to practical issues relevant to clinical neurosciences. The Disease section includes nine chapters concerning edema, hepatic encephalopathy, ischemia, disorders of myelination, viral infection, and gliomas. In some cases, for example the chapters on epilepsy, MPTP-induced Parkinsonism, and Alzheimer's disease, the discussion focusing on glial cells is quite artificial.

Overall, I would suggest that this is an excellent reference book that should be purchased by all major libraries. Clinicians should be aware of its existence but I would advise against purchase. In no way does this book take the role of a more balanced pathology or pathophysiology text. I would suggest that the book be considered for purchase by those actively engaged in research pertaining broadly to glial cells. A quick reading has already opened my eyes to some previously unappreciated aspects of these (perhaps) ignored cells.

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BRAIN REPAIR. 1995. By Donald G. Stein, Simòn Brailowsky and Bruno Will. Published by Oxford University Press Canada. 156 pages. \$C35.00.

Brain injury has tremendous impact on everyone but is poorly understood. One of the greatest obstacles to providing hope to those suffering from brain injury is the belief, held by scientists and the public, that the brain cannot repair itself and that damage is permanent. This book describes how incredibly resilient the brain is with fascinating anecdotes from laboratories around the world. Although *Brain Repair* has been written for lay readers by simplifying many complex concepts and avoiding as much technical jargon as possible, neuroscience researchers and practitioners would also benefit from, and enjoy reading this well-written report of what is currently being done in the field of head injury.

The authors begin by taking us on a historical journey of neuroscience from prehistoric trepanation, through Gall and Spurzheim's phrenology and the practice of lobotomies, to the latest observations of today's neuroscientists pointing out how far we have come in the last decade at understanding how the brain functions. The second chapter, *Looking into the living brain*, highlights some of the latest imaging techniques, such as CAT and PET scans, EEGs and MRI, that are used to measure tiny changes in metabolism, blood flow and electrical activity of brain cells in living beings without having to operate and remove tissue for biopsy. Chapters 3, *Neurons at work* and 4, *The injured brain*, prepare the reader for discussions of brain repair in Chapter 5, *Regeneration repair, and reorganization*, by clearly and succinctly describing neurophysiology and neuropathophysiology. Chapter 5 comprehensively deals with the major forms of brain injury including stroke, Alzheimer's disease and Parkinson's disease. *Factors in the brain that enhance growth and repair*, Chapter 6, describes the how NGF and NCAMs promote neuronal growth and sprouting. The authors are careful to emphasize, however, that, in spite of the tremendous industrial efforts