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Book reviews

Esiri M. M. and Morris J. H. (Eds)
The neuropathology of dementia

Cambridge University Press, 1997. 454 pages. Price £95.00 (US$120.00). ISBN: 0 521 43311 8 (hardback)

Dementia is a subject which is currently of substantial social and economic importance and undoubtedly will be a major problem to tax the world in the next millennium with the projected increase in the elderly population. It is recognized that a definite diagnosis of the underlying cause of the dementia still rests with neuropathological examination and this book is essentially a guide to making a neuropathological diagnosis in such patients. The perspective is therefore a practical and pragmatic one. In this regard there is helpful advice concerning the autopsy, macroscopic assessment of the brain, advice on selection of appropriate tissue blocks and staining methods and microscopic examination. Practical advice extends to include the role of brain biopsies, health and safety issues, morphometric analysis and addresses of dementia brain banks. There is a section on relevant neuroanatomy which, for example, includes very clear directions on how to find the nucleus basalis of Meynert which can be remarkably difficult to deduce from certain large anatomy texts. The detail of the practical help extends, for example, to the inclusion of appropriate primer sequences with which to amplify fragments of the PrP gene to search for mutations in spongiform encephalopathy. Appropriately, the first chapters on specific forms of neuropathology deal with the common causes of dementia namely Alzheimer's disease, vascular dementia and Parkinson's disease/Cortical Lewy body disease. The difficulties in Alzheimer's disease are carefully dealt with and a critical analysis of the different diagnostic protocols is included. The perhaps even greater difficulties with diagnostic criteria for vascular dementia and cortical Lewy body disease are dealt with sensibly. Following these are chapters dealing in detail with the long list of much less common forms of pathology which cause or are associated with cognitive impairment including ALS, Pick's disease, Huntington's disease, other neurodegenerative diseases, cerebral amyloid angiopathy, prions, alcohol, other toxins, metabolic disorders, hydrocephalus, head injury, infections (including AIDS) and schizophrenia. From the list it can be seen that the subject matter is covered in a comprehensive way. The text is extensively referenced and as up to date as possible with mention of new variant CJD being included.

It is difficult to find things to criticize: it is perhaps disappointing that there are very few colour illustrations when colour seems to be the norm rather than the exception in new editions these days. Where colour is used it is difficult to see why it has been chosen for the specific illustrations. Indeed, little seems to have been gained where colour has been employed – the black and white reproductions are very clear whereas the colour reproductions in general are not so good. Although this is a multi-author work the bulk of the text is written by Drs Esiri and Morris who demonstrate a refreshing clarity of thought resulting from their clearly extensive practical experiences in dementia. The book is printed well and contained in a hardback binding in readiness for the several years of constant thumbing that it undoubtedly deserves.

J.A.R. Nicoll

Moss T. H., Nicoll J. A. R. and Ironside J. W.
Intra-operative diagnosis of CNS tumours

Arnold, London, 1997. 193 pages. Price £99.00. ISBN 0 340 67737 6

This beautiful book reviews the whole subject of intra-operative diagnosis. The principle topics are the twin techniques of smears and frozen sections. Cyst fluid examination and touch techniques are briefly covered, and very little is overlooked in the clear and enjoyably readable text. It should be useful and interesting to all who work in the field whether experienced or not.

This book was much needed. I think it is the first British book exclusively concerned with the intra-operative situation since the 1981 edition on smears, with black and white photographs, by Hume Adams, Graham and Doyle in the Biopsy Pathology Series. The first five chapters are concerned with the indications, techniques, logistics and philosophy of the practice together with artefacts. Chapter 5 on differential diagnosis is particularly useful. It contains 11 of the 15 tables in the book and two line drawings of anatomical locations. The last chapter, 18, is on 'Lesions that do not smear well'; including craniopharyngiomas, cysts, vascular malformation, primary bone biopsies and tumours mentioned elsewhere but tabled here. The intervening chapters cover tumours that can be smeared most or some of the time, broadly following the WHO classification. Three hundred and six of the 312 colour illustrations are microphotographs of smears and cryostat sections. The smears are stained with H&E as well as toluidine blue, since most laboratories use one or the other. The figures show uncommon appearances of common things as well as rarities. There are 38 figures in the chapter on astrocytomas alone, 24 and 25 respectively on ependymomas and meningiomas, while no tumour chapter has less than 15 figures.

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Toluidine blue has the photogenic edge but all the pictures are a pleasure to look at. They are supported by clear, helpful legends. However, as the authors point out, this is not just an atlas. It covers succinctly, but fully, operative findings and radiological appearances and marries these to detailed descriptions of the intra-operative pathology and differential diagnosis. The authors are experienced, practising neuropathologists. Their logical, slightly didactic approach will reward leisurely perusal as well as provide support in those moments of bewilderment and surprise which we all experience.

There are some minor points. Chapter 3 on smear interpretation deals with reactive and inflammatory conditions but does not quite cover the difficulties posed in differentiating tumours from granulomatous lesions such as tuberculosis. The discussions on grading gliomas could probably be expanded a little. Beyond reporting malignancy, many people would not attempt grading at this intra-operative stage. There are a few typographical errors in the first edition. The alcohol strengths in Table 1:2 are unusual.

This essential textbook is good value at £99.00. In its stated purpose as a practical work of reference for neuropathologists, histopathologists and interested neurosurgeons it triumphantly succeeds. I think that any pathologist, indeed anyone, would like such a lovely, elegantly produced book. I wonder how I managed for so long without it.

Anne Marshall

Development of the cerebral cortex

Wiley, Chichester, 1996. 337 pages. Ciba Foundation Symposium 193. Price $90.00. ISBN: 0 471 95705 4

This book is another in the Ciba Foundation series which report on the proceedings of symposia attended by small groups of researchers who lead the field in the particular area under review. Their purpose is to 'brainstorm' a particular topic and promote critical review of newly acquired information. In this case a number of the leading researchers in developmental neurobiology discuss the development of the cerebral cortex. The chairman, Colin Blakemore, puts the significance of the topic in clear perspective at the outset when he proposes that the most formidable task faced by developmental neurobiology is to give an account of how this remarkable neuronal machine, the cerebral cortex, is constructed. Certainly it is difficult to disagree with this clarion call and he goes on to outline the scale of the problem in the opening chapter. The sheer number of neurons in the cerebral cortex, about half of all in the brain, and the number of connections both within the cortex and to subcortical regions is astounding. Adding further complexity are the tens of thousands of synapses that each neuron receives. The cerebral cortex cannot, however, be considered a single functional unit and it has long been known to be functional and anatomically subdivided. Firstly, neurons are not randomly scattered throughout the cortex. They are arranged into distinct layers of morphologically similar cells, six layers in the neocortex and three in the phylogenetically older allo- and mesocortex. Moreover, the entire cortex is segregated into distinct territories which are arranged tangentially. Brodman's cytoarchitectonic studies at the beginning of this century identified a large number of these distinct cortical fields based on relative thickness of cell and fibre layers. We now know that most of Brodman's areas are also functionally specialized. The sharper definition provided by modern anatomical and physiological methods tells us that these regional fields are further divided into mosaics of specialized subdivisions. Classic examples of these include the orientation and ocular dominance columns of the primary visual cortex of primates and the 'barrel' fields of the rodent somatosensory cortex. This informative introductory chapter also gives an authoritative account of the current state of our knowledge of cortical development as well as succinctly illuminating the historical foundations of that knowledge. Deviating somewhat from the norm, he then highlights some of the major outstanding questions concerning cortical development by summarizing what follows in the remaining papers. Generally these are ordered thematically according to these questions.

Articles by Chris Walsh, Jack Price, John Parnavelas and their co-workers are concerned with the issues of lineage and the generation of cell diversity in the cerebral cortex primarily using the retroviral gene transfer cell marking technique. Their findings, although contradictory at times, emphasize the early specification of cortical cells and the different migratory strategies employed by neuroepithelial precursor cells. Another collection of articles by well known researchers deals with the intriguing role of the subplate and thalamocortical innervation in the patterning and specification of the developing cerebral cortex. These present the results of elegant co-coculture and subplate ablation experiments and analysis of the Reeler mouse mutant phenotype in which the cortex form in a roughly 'outside in' sequence, essentially the reverse of normal development. From these studies it is clear that thalamocortical afferents acquire vital positional information from the transient subplate cells and go on to play a pivotal role in the differentiation of neocortical regions. Nonetheless, there remains considerable controversy regarding the degree to which cortical differentiation is already pre-programmed in the early ventricular germinal layer. Studies on development nowadays would be incomplete without mention of growth

factors and there are several papers included here which focus on this crucial area.

Finally, Roberts and colleagues, and Jones present interesting but quite speculative theories that attempt to correlate development with neuropathology. Unfortunately, they somewhat overlap as both cover the same ground in reviewing the putative neurodevelopmental aetiology of schizophrenia, though the former paper also looks at the evidence for abnormal cortical development underlying some forms of epilepsy.

A distinctive feature of the Ciba series is that the discussion which followed each presentation and the general discussions on specific topics which took place at the symposium are also included in the book. Presumably these are edited transcripts as they sometimes contain supplementary illustrations and are always followed by a list of references. It would be helpful to know the editorial arrangement adopted here because the discussions occupy a considerable portion of the book. The value of this approach, particularly to those not working directly in this area, is not immediately clear. For those keenly following the developmental neurobiology literature it is interesting to read the arguments and counter arguments put forward 'as spoken' by the participants. However, such interest can be rather short-lived as the discussions often comprise a series of unrelated, disjointed statements which can be difficult to read. This is a small reservation as undoubtedly this book should appeal to anyone with even a passing interest in developmental neurobiology. At 337 pages it is obviously not a wholly inclusive review of the topic but the quality and relevance of the articles ensure that the book will be a useful resource for those working in this area.

K. McDermott

Hilton-Jones D., Squier M., Taylor D. and Mathews P.
Metabolic myopathies

W.B. Saunders, Philadelphia. ISBN 0 7020 1607 1

Myopathies were neglected in the first half of this century, at least in part because of the difficulties associated with diagnosing and treating these complicated disorders. However, improvements in biochemical methods of assessing metabolic function, the rapid development of molecular biology and the advent of magnetic resonance spectroscopy have resulted in considerable progress in this field over the last three decades. Moreover, the relatively high incidence of myopathies secondary to endocrine disorders and drug use makes it necessary for neurologists and internists to be familiar with these diseases. To the non-specialist, the subtleties that distinguish the different metabolic myopathies and the selection and interpretation of appropriate tests can be confusing and there is a real need for clear reference texts.

Metabolic Myopathies provides a concise but comprehensive and up-to-date review of all aspects of myopathies resulting from metabolic enzyme defects, endocrine abnormalities, ion channel dysfunction and toxicity. The first section of the book covers the basic diagnostic techniques commonly used to investigate metabolic myopathies. This is followed by a chapter that describes the normal characteristics of muscle and the rest of the book focuses on specific groups of conditions, finishing with a chapter on the genetics of metabolic myopathies.

The introductory chapters on the clinical evaluation of metabolic myopathies are comprehensive. The first chapter on clinical signs is of use to those with little experience of myopathies as a quick reference text. Its aim is to accentuate the clinical features of metabolic myopathies and this is certainly achieved. There are useful reference tables listing the different diseases that can cause specific signs, and it also provides clear tables of the clinical investigations that can be performed to diagnose the different classes of primary metabolic myopathies. A short chapter is dedicated to electromyography and is to be particularly praised for the clear, concise summaries of the different parameters to be assessed in myopathic patients and its explanations of how abnormalities of these parameters can be interpreted. There are already detailed texts on electrophysiological testing for those who wish to read about electromyography in more depth, and these are adequately referenced. Similarly, the chapters on muscle biopsy and magnetic resonance spectroscopy give concise accounts of the methodology involved in these diagnostic aids and the kind of information that can be gained from them. All three of these chapters on diagnostic aids are clear and informative, with adequate referencing for those who wish to read in more depth. The authors go on to describe the functional structure of normal muscle and to discuss the sources of energy for muscle contraction at different levels of activity in the fifth chapter. This chapter might have been placed more logically at the start of the book.

The chapters on primary metabolic enzyme defects cover abnormal carbohydrate metabolism and mitochondrial myopathies. These chapters summarize the relevant biochemical pathways and go on to describe specific diseases. There is in particular a very useful overview of how to approach mitochondrial myopathies. The chapters on secondary metabolic myopathies (endocrine and toxic/nutritional) provide clear explanations wherever possible on how the myopathy is induced. The chapter on endocrine myopathies is notable for the clear sections on pathophysiology. The myopathies caused by ion channel

abnormalities, periodic paralysis and malignant hyperthermia, are covered in separate chapters and again, clear overviews are provided. The important recent advances in the understanding of the molecular basis of these diseases are mentioned, and are discussed more fully in the final chapter of the book.

The authors address a very important topic, the genetics of metabolic myopathies, in the final chapter. This section does not fall into the potential trap of being incomprehensible to those who are not conversant with molecular biology. The majority of the chapter is dedicated to explaining the principles of medical genetics and the relevance of genetics to the clinical evaluation of disease. It also describes the most common molecular techniques used. It therefore provides a simple summary of the relevance of molecular biology to clinicians, ideal for people who are overwhelmed by the wealth of information that is being generated in this field. It finishes with details of those myopathies in which the molecular basis is understood.

The strength of this book lies in the fact that each chapter is a complete but concise review of the subject that it covers, complementing the more specialist books available very effectively. This book is ideally suited for those with an interest in metabolic myopathies who need a concise but complete reference text.

N. Olby