

BOOK REVIEWS

Considering the Role of White Matter in Neurobehavioral Function

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Behavioral Neurology of White Matter, by C.M. Filley. 2001. New York: Oxford University Press. 279 pp., \$57.50 (HB).

Reviewed by C.M. CULLUM, Ph.D., ABPP, *Department of Psychiatry, The University of Texas Southwestern Medical Center at Dallas, Dallas, TX*

In his text, *Behavioral Neurology of White Matter*, Filley focuses our attention on the role of white matter in neurobehavioral functioning. He makes the point that much of clinical neuroscience, including neuropsychology and behavioral neurology, has focused on cognitive correlates of cortical lesions and disorders. Historically in neuropsychology, we have acknowledged the role of white matter more typically in vague terms of connecting pathways, but there has been a decided emphasis on cortical and subcortical gray matter regions as “where the action is.” Filley’s insightful writing clearly supports his proposal that “the mind depends as much on the white matter as on its gray counterpart.”

A basic review of neuroanatomy highlights the abundance of white matter relative to gray, not to mention the many white matter tracts connecting adjacent as well as distant areas of cortex. In fact, as we teach our students, there are few regions of the brain that are not somehow connected to other regions. Despite this recognition, however, clinical neuropsychological interpretation often focuses on the cortex. From neuropsychological as well as neurological perspectives, smaller subcortical lesions are known to be capable of mimicking larger cortical lesions, yet the effects of white matter lesions altering the interconnections between higher and lower zones within the cerebrum have typically received far less attention. One needs to go no further for a poignant example than the early psychosurgery studies, wherein frontal leucotomies severed the white matter tracts leading to and from the frontal lobes, resulting in a functional “lobotomy,” even though frontal cortex *per se* was often spared. Without the capacity of a particular cortical region to communicate with other areas, that zone may become functionally disabled as if it were lesioned directly.

The presence of microvascular changes in the white matter (the so-called “unidentified bright objects,” or UBOs) is often related to alterations in cognitive functioning, depending upon their extent and location. In fact, white matter lesions may produce neuropsychological profiles that

mimic right hemisphere dysfunction, with attendant deficits in visuospatial skills, sustained concentration, and speed of processing. Furthermore, the changes in cognition that characterize normal aging have also been described as relating to right hemisphere function, though in fact, white matter changes may produce similar patterns. Thus, the role of white matter in understanding and evaluating neuropsychological function should not be overlooked. Filley’s book represents the first systematic attempt to focus our attention on these issues, and his concept of “white matter dementia” is one that should be given particularly careful consideration. The text is logically organized and the reader is treated to an eminently readable writing style that flows well and goes quickly. The book is printed on high-quality paper, and includes useful tables, figures, and images.

Many areas of neuropsychological research are germane to highlighting the importance of white matter in cognition. Quantitative imaging studies of normal brains, for example, have suggested that greater white-to-gray matter ratios are associated with higher intellectual capacity. The many cases of multiple sclerosis and multi-infarct states further underscore the devastating effects that white matter lesions can have on a variety of cognitive abilities and emotional states. Functional brain imaging (e.g., FMRI) studies are increasingly demonstrating how various areas of the brain become active during cognitive tasks and emotional states, sometimes with surprising results that we find difficult to interpret in light of our historically localizationalistic and arguably “gray-matter-oriented” background.

Following an excellent foreword by Jeffrey Cummings, the basic anatomy, neurobiology, and development of white matter are reviewed in a straightforward, entertaining, and highly understandable fashion. These chapters are recommended to students of the field as well as more seasoned veterans, for they logically lay out the current state of knowledge regarding the function and organization of white matter systems. Chapters 5 to 17 provide overviews of a variety

of common as well as less common disorders of white matter. It is surprising to consider how many disorders directly involve white matter pathology, and it becomes clear from Filley's review that white matter integrity and its disturbance plays a critical role in neurobehavioral function. Thus, the reader is provided with a valuable resource of white matter disorders that includes some of their most common clinical characteristics.

Filley's book is well conceived, eminently readable, informative, and timely. Advances in the ever-evolving neuro-

sciences emphasize the importance of a systems-approach to our conceptualization of the brain and mind, and our increased understanding of neural networks and the processes which represent *more than the sum of their parts* will no doubt require a new emphasis on cerebral white matter, as Filley's work suggests. This book represents an excellent step in this direction and should be added to the must-have list for neuropsychologists, neurologists, and students of the clinical neurosciences at all levels.

Cognitive Systems and Systemic Disease: Internal Medicine for the Neuropsychologist

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Medical Neuropsychology, 2nd ed. Ralph E. Tarter, M. Butters, and Sue R. Beers (Eds.). 2001. Hingham, MA: Kluwer Academic/Plenum Publishers. 346 pp., \$75.00 (HB).

Reviewed by OLA A. SELNES, Ph.D., *Department of Neurology, Johns Hopkins University School of Medicine, Baltimore, MD.*

This is the second edition of a book originally published in 1988 as part of the series *Critical Issues in Neuropsychology*. The editors describe it as expanding the content and updating the rapidly growing literature on the relationship between cognition and systemic (nonneurological) disease. Although most of the chapter titles remain the same, some of the authors are new. Some of the chapters from the first edition, including those on childhood nutritional disorders and on cancer, have been dropped. New additions include chapters titled "Autoimmune Disorders," "Sleep Disorders," and "Neurobehavioral Complications of HIV Infection." While the contents of the book remain clearly focused on the effects of *systemic* illness on cognition, some chapters, such as the one devoted to neurobehavioral complications of HIV infection, discuss cognitive impairment secondary to presumed primary central nervous system diseases. However, with evolving knowledge of the pathophysiology of HIV-related cognitive impairment, systemic factors are also increasingly being recognized.

In most cases, the diagnosis of a systemic condition, whether thyroid disease, vitamin deficiency, end-stage renal disease or dehydration, will be known to the neuropsychologist at the time the patient is seen. In such cases, the referral question will typically be two-part. First, is there evidence of neuropsychological impairment? and second, is the pattern of the impairment consistent with what might be expected given the nature of the systemic disease? Answers to the first part of the referral question are usually relatively straightforward. The answer to the second part, however, is much more complex, because our understanding of the time course and patterns of cognitive change produced by systemic disease is constantly evolving. This book promises to provide state of the art information regarding the incidence and type of cognitive symptoms typ-

ically associated with various systemic medical conditions. Some of the topics, such as disorders of the pancreas or neuropsychological dysfunction secondary to liver disease, are most likely relevant for neuropsychologists practicing in highly specialized medical centers. Other conditions, such as sleep disorders, thyroid disease, and coronary artery disease, will almost certainly be encountered by most neuropsychologists in general practice.

The initial chapters consider, among other conditions, cognitive effects of endocrine and pulmonary disorders, coronary artery disease, and liver disease. The quality of the chapters range from somewhat below average to very good. The chapter entitled "Cognitive Neuroendocrinology," its intriguing title notwithstanding, was to some degree disappointing, because, rather than a didactic overview, it is a summary of previously published findings of two studies of the effect of plasma glucose elevation in patients with Alzheimer's disease. The chapter on the neuropsychological correlates of cardiovascular disease, on the other hand, is both comprehensive and readable. The authors note, in particular, that the nature of the cognitive impairment associated with bypass surgery remains poorly specified. Very few studies have asked the question: which cognitive domains are most vulnerable after bypass surgery? Since this might provide important clues to the etiology of the post-operative cognitive changes, it is disappointing that many studies still focus only on the *degree* rather than *type* of cognitive impairment.

The chapter on autoimmune disorders is very informative and covers both the cognitive symptoms of systemic lupus erythematosus as well as the somewhat less frequently encountered Sjögren's syndrome. The author discusses the important and controversial issue of the relationship of the patient's psychological status to the cognitive findings. There

has been a tendency to attribute cognitive complaints to depression, anxiety, or other psychological stressors often associated with chronic disease. This is a well-known phenomenon in other areas of medicine. For example, the cognitive complaints of patients who had undergone coronary artery bypass surgery were initially dismissed as simply due to depression. Despite numerous studies showing that cognitive impairment as demonstrated by neuropsychological testing cannot be accounted for by depression alone, this perception is still sometimes encountered among cardiac surgeons and others.

The book is relatively comprehensive, with only a few possible omissions. For example, a chapter devoted to delirium, which is perhaps one of the most common cognitive disturbances caused by systemic disease, would have been useful. Symptoms of delirium are still frequently missed by internists and neurologists alike, and neuropsychologists should therefore be trained to recognize such symptoms. Other themes that might have been explored in the context of a text like this would be chapters on nutritional disorders such as vitamin B₁₂ and folate, and the mild neurocognitive symptoms that sometimes accompany conditions like chronic fatigue, fibromyalgia, and migraine headaches. Nonetheless, this book still provides the most comprehensive overview of the neurobehavioral symptoms associated with systemic illness currently available in one volume.

There are some drawbacks. Perhaps the biggest concern is that on balance, most chapters contain more medical information than they do neuropsychology. For example, it would have been helpful to include more discussion of the specificity of the patterns of cognitive change that may be associated with various systemic disease. Second, although billed as an updated edition, even a cursory look at the list of references for many of the chapters suggests that more contemporary studies have not been included. The editing is generally speaking very good throughout the book, but with some curious lapses. For example, the legend to Figure 1 on page 33 of the chapter titled "Pulmonary Disorders" states that the CT "shows ventricular enlargement" when in fact what is visible of the lateral ventricles appears normal in size. In Figure 2 (page 35) the legend seems to follow the radiological tradition of reversing left and right when displaying images.

These minor shortcomings notwithstanding, this book is testimony to how the discipline of neuropsychology is increasingly playing an important role in all areas of medicine. It is no longer just about dementia and stroke and closed head injury. It also serves as a reminder that training in neuropsychology should be multidisciplinary. Practitioners of neuropsychology should ideally strive to become well versed in several topics previously thought relevant only to internal medicine.

A Treatise on the Neural, Structural, and Psychological Bases of Declarative and Other Memory Systems

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From Conditioning to Conscious Recollection, by H. Eichenbaum and N.J. Cohen. 2001. New York: Oxford University Press. 583 pp., \$65.00 (HB).

Reviewed by EDITH V. SULLIVAN, Ph.D., *Department of Psychiatry and Behavioral Sciences and Neuroscience Program, Stanford University School of Medicine, Stanford, CA 94305-5723.*

This book is a thoughtful treatise, written by two well-respected memory researchers and theorists, on dissociable processes comprising the broad concept of memory. To characterize this work, it is truly a book, not a collection of chapters, not a classroom textbook of facts, and not simply a monograph of personal research. Rather, it is a worthwhile read for all levels of students, teachers, and researchers of memory and offers an interesting perspective on the historical context of the authors' theoretical position.

The book comprises 15 chapters, divided into three parts. "Fundamentals" reviews cellular mechanisms of memory in terms of cortical modification and repair in response to internal and external environmental events. "The Brain System That Mediates Declarative Memory" focuses on hippocampal function and structural underpinnings of this memory system. Evidence for the necessity of the hippocampal system for memory consolidation ranges from animal models of amnesia to the human condition. "Specialized Memory

Systems of the Brain" includes findings and concepts on nondeclarative systems supported by extrahippocampal systems and covers emotional memory, habits, skills, procedural memory, and working memory.

The first two chapters are another integral part of the book although not included in the division count. These 50+ pages supply the essential backdrop for the rest of the book. It is a reminder to us who read volumes, oh, so long ago, such as Hilgard and Bower or Postman, of the early memory researchers and theorists, such as Watson, Tolman, Guthrie, Hull, and Thorndike. It is a relevant sampling of the evolution of operational definitions of the central psychological constructs of "knowledge" and "memory" and an exposé of critical divisions between Gestalt psychologists and stimulus-response theorists. We are further reminded of the care the early theorists took in devising rigorous experiments that yielded the basis for creating and operationalizing constructs. Understanding of this back-

ground carries far more importance than mere nostalgia for aging aficionados of memory. Indeed, it is the foundation of current psychological constructs of memory that have all too often become reified in the hands of current writers who have no historical perspective and proclaim that pre-2000 Medline or PsychAbstracts publications are dated.

Chapters 6 and 8 are especially compelling. The exposition of chapter 6 provides a lucid unfolding of concepts and results, highlighting through demonstration, the importance of animal models in the ultimate identification of the locus of lesions essential for inducing specific forms of amnesia for declarative information. Following Milner's landmark observation of global amnesia resulting from bilateral resection of medial temporal lobe structures, decades of research ensued in rigorous attempts to create an adequate animal model of global amnesia. The recounting of the unfolding of these lesion studies to test specific hypotheses regarding the single medial temporal lobe structure responsible for the laying down of new memories was as exciting as any novel and captured the experience and contention of the times. Chapter 8 is a careful review of neuron activity related to mnemonic processing. The authors' facility in writing makes it obvious that they have a first-hand understanding of the importance and nuances of elegant manipulations of environment and learning contingencies relevant to animal studies. The evidence presented from behavior and cell recordings conducted in the rodent model was anything but loose associations of studies published by the authors, included here with the sole intention

of inflating the reference section with their own work. Instead, these studies were selected to address particular critical theoretical issues of hippocampal function not amenable to controlled and experimental study in humans.

The organization of the book makes clear the central theme of multiple memory systems both in terms of psychological constructs and neurological substrates. Although this theme is certainly not novel to Eichenbaum and Cohen, their treatment of the nonunitary nature of memory is a serious attempt to define with clarity and evidence memory's distinct components, to identify brain structures supporting each component, and to propose a scheme whereby these disparate processes may cooperate. A strength of this author pair is that each has a fundamental appreciation for complementary lines of evidence, one line from animal research and another from human research, and each has conducted important studies in both domains.

The finale is a highlight. The conclusion is the perspective of the authors, who provide a straightforward, unabashed conceptualization of multiple, dissociable, and discontinuous memory systems. Read this thoughtful book and be challenged to arrive at the same conclusion as proffered by these authors. Perhaps their next volume will propose how these systems are integrated in daily functioning, the conditions under which conflict, interference, or emotion can disrupt or bias their integration, and whether other brain systems can compensate for functionally relevant disruption of critical medial temporal lobe structures.

Beyond the Homunculus

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The Executive Brain: Frontal Lobe and the Civilized Mind, by Elkhonon Goldberg. 2001. New York: Oxford University Press. 251 pp., \$29.95 (HB).

Reviewed by WILLIAM B. BARR, Ph.D., *NYU Comprehensive Epilepsy Center, New York University School of Medicine, New York, NY.*

There is an old saying that one of mankind's biggest challenge will be to fully understand the functioning of the human brain. Some point out the ultimate irony of needing to utilize all 1400 grams of this organ to understand itself. When confronted with the riddle of frontal lobe functions, this argument can be extended further: the part of the brain that is considered to be most responsible for the highest forms of mental activity is likely to be pushed to its own limits in an effort to understand its own functions. While this might seem like an endless loop to some, the good news is that our field has been making serious advances in understanding the executive functions, those abilities we commonly attribute to the frontal lobes. Many of these successes are presented in a clear and engaging manner in this monograph.

This is a book that is intended to appeal to a lay audience while also giving professionals in the large field of neuroscience a rich account of the frontal lobe functions and

other aspects of higher order cerebral activity. The author is a highly regarded, though somewhat enigmatic, neuropsychologist who received the bulk of his training in Moscow, under the tutelage of the great Alexander Romanovich Luria. He begins the book with a personal account of his days as a graduate student and his successful attempt to leave the Soviet Union. The book continues with an outline of a personal approach to neuropsychology that is unlike most others.

Since coming to the United States, Goldberg has been known primarily as a theoretician who has also made contributions to both the clinical and experimental literature. His background in mathematics and topology have left him with a unique perspective on the organization of higher cerebral functions that differs from the mechanistic conceptions filling many of today's textbooks. For reasons that remain unclear, his original articles have lacked the recognition they deserve, with the noted exception of the follow-

ing of a group of loyal students and colleagues. This book provides another chance to those who have not read nor fully grasped his previous work. I recommend those individuals not familiar with Goldberg's body of work to avail themselves of this opportunity.

Throughout the history of psychology, accounts of the mind have assumed a progression from the laboratory outward. Initial studies focused on sensation and perception. Developments in several fields helped our understanding of language. With new technologies, we developed paradigms that enabled us to tackle the problems of attention and memory. While advances in experimental psychology have had a clear impact on the development of clinical neuropsychology they have left largely unexplained many of our most important psychological capacities, including insight, judgment, and problem solving. For many functions commonly attributed to the frontal lobes, the path of development has been reversed. Many of the modern day conceptions of these executive functions originated in clinical descriptions of individuals who had undergone neurologic damage to the frontal lobes, with the case of Phineas Gage as the most salient example. Goldberg, who is also a seasoned clinician, uses this approach to its fullest, incorporating his experiences with a variety of patients, including those with schizophrenia, Tourette's syndrome, and traumatic brain injury, to add vitality to his systematic account of the executive skills and how they relate to the larger scope of brain functions.

In one of the earlier chapters, Goldberg points out that many popular books now cover the topic of memory and its disorder. Until now, no similar book had been written on the frontal lobes. In the case of memory, we now can say that it has something to do with encoding, storing, and retaining information. Goldberg notes that the functions of the frontal lobes do not fit so neatly into any such soundbite. Many neuropsychologists have had the experience of trying to explain the concept of executive functions to laypersons only to see their eyes gloss over when encountered with the terms organization, planning, and sequencing. Some practicing neuropsychologists have become quite lazy in this regard, by simply equating their discussion of frontal lobe functions with performances on various tests such as

the Wisconsin Card Sorting Test, Stroop Test, and Trailmaking Test. Goldberg takes a longer route in his discussion of the frontal lobes, thereby providing a more enriched and practical language to use in describing the functions of this fascinating part of the brain.

In this book, Goldberg goes beyond a discussion of the frontal lobes to other important topics including hemispheric differences and clinical testing procedures. His theoretical account of left and right hemisphere functioning is one of few that escapes the teleological dichotomy of verbal and non-verbal functioning. While his discussion of left hemisphere capacity in terms of descriptive systems may, at first glance, be consistent with most other accounts, it is actually quite different. His depiction of the right hemisphere as mediating responses to novelty also provides a more rich and dynamic account of this oft-neglected part of the brain. He also argues for the need to move from a horizontal focus on left and right hemispheric differences in favor of more vertically and longitudinally oriented conceptions of the brain and its key connections. His description of the differences between adaptive decision-making *versus* veridical decision-making should appeal to those concerned about the limitations and ecological validity of many neuropsychological tests. Goldberg offers a novel means for testing individual styles rather than abilities that, if accepted more widely, could have a significant impact on the field.

By having in mind an audience that is larger than the field of professionals, Goldberg manages to make this book informative, while being highly readable and entertaining. The book progresses with arguments on how an understanding of frontal lobe functions has the potential to enhance understanding of social issues and even some aspects of political organization. He also provides a unique perspective on mental illness in general. Negative points include some repetition. Some might consider the review of the literature to be highly partisan. However, these are minor points that do not detract from the overall quality of the book. Neuropsychologists at all levels of training will benefit from reading this book. Its success in describing very complex issues in simple terms will make this a book that many will recommend to friends and professional colleagues alike.

An Introduction to Human Neuropsychology

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Principles of Neuropsychology, by E.A. Zillmer and M.V. Spiers. 2001. Belmont, CA: Wadsworth/Thomson Learning. 606 pp., \$86.95 (HB).

Reviewed by JEFFREY M. HALPERIN, Ph.D., *Department of Psychology, Queens College of the City University of New York, Flushing NY.*

Education and training in neuropsychology has been primarily directed to pre- and postdoctoral students with numerous excellent books available for these target audiences. However, as indicated by Eric Zillmer in the preface to

Principles of Neuropsychology, this book is geared toward undergraduates and beginning-level graduate students, a group that in this reviewer's opinion, has received considerably less attention from the field. According to Dr. Zill-

mer, the goal was to “teach brain function in a clear, interesting and progressive manner.” This goal was clearly accomplished by the authors in this stimulating, well-organized, and comprehensive introduction to human neuropsychology, which masterfully merges a solid neuroscientific perspective with human interest stories and an array of fascinating clinical vignettes.

The book contains 16 chapters, organized into five parts. Part One, provides a highly engaging overview of the history of neuropsychology and conceptualizations regarding brain function. The evolution of modern thought is traced back to antiquity, where trephination or the removal of skull tissue was practiced, to ancient Greek perspectives on brain function, through the middle ages and Renaissance, to early European perspectives of Gall, Freud, Broca and Wernicke. More current issues surrounding models of localization *versus* equipotentiality are reviewed and the section ends with the emergence of more modern conceptualizations as put forth by giants in the field such as Luria, Teuber, Halstead, Reitan, Geschwind, Benton, and Lezak.

Part Two, entitled “The Functioning Brain,” contains five chapters that offer a remarkably in-depth introduction to neuroscience addressed to novices in the field. The reader is first introduced to the basic building blocks of the central nervous system such as neurons, glia cells and astrocytes, as well as physiological mechanisms such as the blood brain barrier, action potentials and synaptic transmission. The organization and anatomy of the nervous system is described in detail with regard to bone structure, the ventricular system, the vascular system, and the major subdivisions and structures of the brain. Separate chapters include “Sensory-Perceptual and Motor Systems,” “Higher Functional Systems,” and “Methods of Investigating the Brain,” the latter of which covers an array of techniques ranging from neurohistological/staining procedures to the most current neuroimaging technology. These chapters include numerous figures depicting virtually all key domains as well as fascinating clinical case material that highlight what might happen when things go wrong. In all, this section provides a very readable, yet quite sophisticated and detailed review of the human central nervous system.

Part Three focuses on the developing brain and highlights differences between child and adult brains. The process of neural development from conception to adulthood is reviewed as well as the emergence of neuropsychological/cognitive functions throughout development. Issues surrounding vulnerability and plasticity of the developing brain are discussed and the reader is introduced to an array of teratogens that can have an impact on neural development.

Developmental disorders are discussed within the domains of abnormalities of anatomic development, chromosomal and genetic disorders, and acquired disorders, with hydrocephalus Turner’s syndrome and fetal alcohol syndrome serving as detailed examples in each of the three domains. Learning and neuropsychiatric disorders of childhood are reviewed with particular focus placed on learning disability subtypes, the autism spectrum disorders, and attention deficit hyperactivity disorder. While a thorough presentation of

developmental neuropsychology is beyond the scope of this book, the authors provide a seamless weaving together of data, theory, and clinical material that yields an interesting and highly informative picture of key issues in the field.

In many respects, part 4 distinguishes this text from most other neuropsychology textbooks. Rather than reviewing typical functional domains, such as disorders of language, memory, or perception, five chapters on disorders of the brain focus on cerebrovascular disorders, tumors and traumatic head injury, normal aging and dementia/Alzheimer’s disease, subcortical dementias, and alterations in consciousness. These highly informative chapters rely heavily on the basic neuroscience that the reader will have already learned in part 2. This exposition of the nature of cognitive/neuropsychological deficits that emerge from the various pathologies, would not be meaningful with less sophisticated groundwork.

Finally, part 5, “Neuropsychology in Practice,” covers neuropsychological assessment, interpretation and diagnosis, and recovery, rehabilitation and intervention. I found this section somewhat weaker than the earlier parts of the book, and a bit too focused on “what the neuropsychologist does.” However, this limitation is acceptable when one considers the intended audience. Overall concepts regarding assessment and treatment are provided, but there is only limited detail regarding how these clinical tasks are accomplished.

This book can provide an excellent overview for graduate students specializing in neuropsychology. However, such students need greater detail, presented in four or five distinct courses. Still, this is an outstanding text for either high-level undergraduate students or nonneuropsychology graduate students who want some familiarity with human neuropsychology. This book could serve as the basis for a wonderful course on the biological basis of behavior, which is a requirement in most psychology graduate programs. In particular, graduate students in clinical, counseling, or school psychology programs will likely find this text extremely informative and considerably more relevant to their work than the more traditional physiological psychology or behavioral neuroscience text.

In addition to its clarity and breadth, this book has a number of additional attributes. Each chapter begins with a section entitled “Keep in Mind,” which poses a series of questions that the reader should think about while reading through the chapter, and each chapter ends with a series of “Critical Thinking Questions,” which are answered by the authors at the end of the book. In addition, each chapter ends with a listing of key terms defined in a glossary at the end of the book. Citations for web connections that can be used to expand knowledge are provided. Further, each chapter contains several “Neuropsychology in Action” inserts which provide real life examples of clinical cases and situations that bring the material to life.

Overall, I have nothing but kudos for the authors of this book, who have produced a truly solid introductory text to human neuropsychology that is firmly grounded in neuroscience, yet will interest and excite even the most clinically oriented students.

OTHER BOOKS OF INTEREST WITH BRIEF NOTES BY THE BOOK REVIEW EDITOR

Has functional localization gone too far? Each of the following three books answer with a resounding YES! Steriade, presenting mostly electrophysiological data at all levels of brain structure (see below) sums up their conclusions in his chapter 1—with italicized emphasis—that “*all data discussed in this chapter tend to demonstrate that the genesis of behavioral states cannot be localized within discrete brain areas, but depend on interactions between various structures.*”

Fodor, J. (2001). *The mind doesn't work that way. The scope and limits of computational psychology*. Cambridge, MA: The MIT Press. 126 pp., \$13.95 (PB).

Steriade, M. (2001). *The intact and sliced brain*. Cambridge, MA: The MIT Press. 366 pp., \$55 (HB).

Uttal, W.R. (2001). *The new phrenology. The limits of localizing cognitive processes in the brain*. Cambridge, MA: The MIT Press. 255 pp., \$39.95 (HB).

These two books deal with Asperger's syndrome, each designed for a different audience. Both are clearly written, have workable indexes and a good reference list. In addressing clinicians, Gillberg includes several assessment/screening measures. Ozonoff and her colleagues speak to parents with a truly “how-to” focus.

Gillberg, C. (2002). *A guide to Asperger syndrome*. New York: Cambridge University Press. 178 pp., \$30 (PB).

Ozonoff, S., Dawson, G., & McPartland, J. (2002). *A parent's guide to Asperger syndrome and high-functioning autism. How to meet the challenges and help your child through*. New York: Guilford. 278 pp., \$17.95 (PB)

Many clear illustrations contribute to making this a useful introductory textbook. Unfortunately it lacks adequate ref-

erencing; even cited studies are not referenced, and most of the material listed under “Further Reading” date to before the first (1992) edition.

Dowling, J.E. (2001). *Neurons and networks. An introduction to behavioral neuroscience* (2nd ed.). Cambridge, MA: Harvard University Press. 563 pp., \$61.50 (HB)

Focusing on hippocampus and learning, Gluck and Myers, too, stress the interactive nature of brain activity: “Hippocampal function can best be understood in terms of how the hippocampus interacts and cooperates with the functioning of other brain systems.”

Gluck, M.A. & Myers, C.E. (2001). *Gateway to memory. An introduction to neural network modeling of the hippocampus and learning*. New York: Cambridge University Press. 448 pp., \$59.95 (PB).

This book should interest both pediatric clinicians and those whose practice includes adults who have/had these disorders. Each chapter provides a review of the course and outcome of a prominent childhood disorder with comprehensive referencing. The 12 conditions are: (1) attention deficit hyperactivity disorder; (2) developmental language disorders; (3) reading and other specific learning difficulties; (4) metabolic disorders; (5) hemiplegic cerebral palsy; (6) autistic disorders; (7) Down syndrome; (8) fragile X syndrome; (9) Prader-Willi and Angelman syndromes; (10) Rett disorder; (11) tuberous sclerosis; (12) Williams and Smith-Magenis syndromes.

Howlin, P. & Udwin, O. (Eds.). (2002). *Outcomes in neurodevelopment and genetic disorders*. New York: Cambridge University Press, 178 pp., \$60 (PB).