

Pragmatic Neuropsychology

A Review of *The Neurological Side Of Neuropsychology* by Richard Cytowic

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REVIEW OF: Richard E. Cytowic (1996) *The Neurological Side of Neuropsychology*.
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1. Introduction

Richard Cytowic is perhaps best known for his work on synesthesia (*Synesthesia: A Union of the Senses* (1989); *The Man Who Tasted Shapes* (1993); *Synesthesia: Phenomenology and Neuropsychology: A review of current knowledge* (1995)). However, his most recent book, an approach to the field of neuropsychology, is squarely aimed at the textbook market. Thus, readers who expect merely more about synesthesia from its "guru" will be disappointed. Also, because it is a practical book, it will have limited appeal to those seeking invigorating discussions of current research topics and issues in consciousness and the mind. On the other hand, for those readers who are simply interested in learning more about the relationships between neurology and contemporary neuropsychology or an introduction to neuropsychology in general, Cytowic's new volume may be of interest. It will appeal particularly to those who would like to gain a better understanding of what practitioners of behavioral neurology and clinical neuropsychology encounter in their work with patients. It is also a book professionals interested in the "human" side of neuropsychology might want to consider for their reference bookshelves.

2. Content and Orientation

The Neurological Side of Neuropsychology is an ambitious work packed with useful information about symptoms, syndromes, lesion effects, perceptual and cognitive deficits, clinical assessment, and a host of other topics of interest to a broad range of neuroscience professionals. In a sense, it is three small books rolled into one, i.e., a book about the history of ideas about mind, brain, and behavior (Part I, Conceptualizations), a practical guide to assessment strategies and techniques (Part II, Clinical Assessment), and a collection of papers about selected processes and pathological conditions (Part III, Specific Neuropsychological Topics).

The author's conceptual centerpiece is that contemporary neuropsychology is a multi-disciplinary enterprise whose working model of brain, mind, and behavior is not based on the global or hierarchical views of the past, but a new multiplex model. Such a view stresses such things as the nonlinear flow and parallel processing of information, the concept of a distributed system (e.g., non-localization of function), and a more decentralized view of the role of the cortex. The importance of non-neural information also is stressed (e.g., volume transmission) as is the involvement of "lower" brain structures (e.g., limbic system) in determining the salience of information. Throughout the book, Cytowic interprets symptoms, syndromes, and neural structures in terms of this general model as a means of explaining the elusive nature of cognitive processes (e.g., memory) or to prevent student-readers from making simplistic assumptions and conclusions that frequently can lead to erroneous clinical interpretations and courses of action. Such errors occur, Cytowic suggests, when we fail to take into account the fact that cognition, emotion, and behavior and their neural substrates are interactive and nonlinear rather than linear and hierarchical.

The primacy of emotion and its continual influence on cognitive processes and experience is another point of emphasis that Cytowic weaves into his presentation. One of the most interesting chapters is, in fact, specifically directed toward the elusive and intricate relationships between emotion, consciousness, and self-awareness. His discussion of distributed processes and how they act to tie experience to the external world via attentional representation is thought-provoking as is his argument that metaphoric concepts are based in physical experience.

Cytowic's discussion of emotion is only one of the six chapters that round out Part III. Each focuses on a specific neurological area that frequently confronts the clinical practitioner. Among these are: general disconnection syndromes (chapter 7), memory and amnesia (chapter 9), dementia (chapter 10), epilepsies (chapter 11), spatial knowledge (chapter 12), and language (chapter 13). Although each of these offerings provides many useful facts and concepts to the reader, as a group they suffer from a lack of coordination between them. Even so, three chapters stand out: viz., spatial knowledge (chapter 12), dementia (chapter 10), and the epilepsies (chapter 11).

The author's discussion of spatial knowledge is particularly well done. In it, he eschews the customary overemphasis on vision in space and spatial representation, and instead offers the reader a more balanced account that includes discussion of other modalities and concepts (audition, form constants, auditory scene analysis, body schema disturbances, etc.). Cytowic's chapters on dementia and epilepsy are notable for their organization and informativeness. His presentation on dementia as a collection of disorders with no set clinical path or pattern is particularly good. In it he provides the reader with a logical and useful schema for understanding the diffuse nature of this disease. The same general comments apply to the chapter on epilepsy. Both chapters are excellent introductions to these important areas.

Regretfully, Cytowic's chapters on language (chapter 13) and memory and amnesia (chapter 9) do not match the strength or informativeness of the other special topic chapters. In his chapter on memory and amnesia, for example, little more than an elementary introduction to the area is provided. As for the "language" chapter, although a number of exciting topic areas worthy of fuller discussion are noted, little is done with them. In both chapters this reader came away with the impression that Cytowic missed an opportunity to apply his considerable knowledge and skills for the benefit of the student-reader.

3. As a Textbook

Content aside, a number of things are bothersome about this book when viewed as a textbook. First, to this reviewer's mind a text should accomplish some of the following: 1) It should organize and present material so that students come away with a greater appreciation and understanding of the topic area; 2) It should introduce new terminology and vocabulary so that readers are not left wondering about a term (here a glossary can help); 3) It should weave and tie ideas together in a logical and integrated package; 4) Tables, figures, and other supporting materials should be chosen to help the reader understand the points that are being made in the text; 5) Like other kinds of written material, a textbook should have a logical beginning, middle, and end; and perhaps most important of all, 6) Students should come away with an optimistic sense of the area borne of their new knowledge, skills, attitudes, insights, and so on. In short, a textbook should instruct and teach.

Now, to say that Cytowic failed on each of these hypothetical guidelines would be untrue, if not grossly unfair. Nevertheless, he departed far enough from them to warrant mention. In his introductory chapter, the author states that his intent is to present a practical, problem-centered introduction to contemporary ideas in neurology and neuropsychology for beginners. He further suggests that method will be emphasized over facts to help the student to see the "forest" rather than the "trees," patients over abstractions, and so on. Although Cytowic does present a generally problem-centered approach to the reader, one is hard-pressed to see how most students could easily come away with a useful overview of the area based on a reading of his volume alone. This is due to several factors, not the

least of which are the lack of summaries to integrate the material. Indeed, one cannot help but be struck by the fact that the book ends abruptly with a chapter on language (chapter 13) without even so much as a one- or two-page summary of what has gone before. For that matter, even the final chapter lacks an integrating summary. A related problem is lack of a feeling of continuity not only between the chapters, but among the three major parts of the book as well. It is hard to avoid the impression that the some of the chapters were written as stand-alone pieces without a great deal of consideration as to where they might best "fit" within the book as a whole. This is particularly troublesome with some of the chapters in Part III (Specific Neuropsychological Topics).

As for terminology, there is no way, of course, to get around the fact that many "fifty-dollar" words and terms are used in the area (e.g., prosopagnosia, attentional dysmetria, Gerstmann syndrome, etc.). To his credit, Cytowic does a generally admirable job of introducing and explaining most of them to the reader. However, appropriately placed glossaries for easy referral by the reader would have been a nice touch. Clinical terms notwithstanding, readers not familiar with basic neuroanatomy and its own special terminology will encounter special difficulty in all but the most clinical of chapters. The remedy for this does not lie in the hands of the author, of course, but with the prerequisites necessary for understanding any of book of this kind.

Cytowic's use of tables and figures is another matter. Although many of the tables and figures are informative, one gets the impression that overall, relatively little attention was paid to the decision to include them, or if they were chosen, how they were integrated with the text. Many figures in particular seem to stand alone or add little to the understanding of what is discussed in the text (e.g., Figure 6.8, page 256). The tendency to put too much detail in some of the tables is also a problem and sometimes it is unclear why a table was substituted for additional textual material. Couple these problems with the general lackluster appearance of the figures, tables, and sidebars (N.B. which is not a fault of the author's but of the publisher, MIT Press) and a visually unexciting presentation is the result.

On the positive side, one of most refreshing and welcome aspects of the book has to do with Cytowic's conviction that to appreciate the intricacies of mind and brain and their relationship to behavior, it is essential for the student and would-be practitioner to have some overall sense of what has gone before. To that end, in Chapters 2 and 3 the author takes the reader on a historical tour of models, conceptions, methods, and developments that led to present day attempts to understand the mind and brain and their manifestations in behavior. Throughout the volume Cytowic takes pains to cite and provide precursor and historical material when a context for understanding a current view, conception, or position is necessary. While more knowledgeable scholars may find this material sketchy and superficial, he is to be commended for his efforts in this regard.

One of the most delightful features of the book, that is quaintly reminiscent of William James in his *Principles of Psychology*, is the tendency of the author to give direct practical advice, directions, and cautions to wannabe-practitioner readers. It ranges from broad imperatives like, "Beware of little knowledge," to examples of how to write up

your notes when conditions did not lend themselves to an adequate screening of a patient's intellectual and cognitive functioning. On balance, they are well chosen and give the reader the feeling that the success of the reader as a working neuroscientist is uppermost in the author's mind as teacher. They also underscore the rich and considerable experience of the author in the field both as teacher and as a day-to-day laborer in the field.

In short, despite the fact that the author does seem to know what is needed in the way of a textbook for the newcomer to the field (Chapter 1), his attempt to implement those characteristics and features in his own book misses the mark on a number of counts. Thus, in contrast to its appeal as a reference or source book, its usefulness as a focal textbook in formal lecture-type courses would appear to be limited. Its value as one of a number of required readings in a seminar course is another matter. There it has much to offer in helping students develop a well-rounded view of the practical side of modern neuropsychology. Coupled with additional readings in neurophysiology, neuroanatomy, and general psychological processes, it could fill the "clinical" niche very well in a comprehensive course in neuropsychology.

4. Summary and Conclusions

Organizing the formidable set of facts and concepts in neuropsychology into a readable and instructive text is not a task for the fainthearted. With some notable exceptions, Cytowic has met this challenge and done a credible job. Certainly, he has produced a relatively painless introduction to the area for a broad range of neuroscience professionals. *The Neurological Side of Neuropsychology* is a practical book about neuropsychology. As such it is aimed more at the would-be practitioner in field than researchers. However, any professional doing research on the mind, brain, consciousness, and behavior will find much in Cytowic's book that will help ground them in the practical facts of modern neuropsychology. They are encouraged to consider Cytowic's book in terms of its value in presenting the raw facts gleaned from clinical neuropsychology.

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