the diversity of the ways in which timing reflects not only physiology and adaptation to the environment, but also cognitive goals and control predictions.

All the better a content, then, for the appearance of a new and valuable collection of works in Timing of Behavior, which spans many of these issues. This is a highly approachable book that will offer a lot to specialists and also provide a valuable introduction to those unfamiliar with a growing area of research. It is set out in three parts, on the basis of neural, psychological and computational perspectives. However, neuropsychological matters are confined largely to the first two chapters, which concern anatomy and function in the basal ganglia. Here, and elsewhere, a story of some considerable subtlety that is handled insightfully in this book but wherein much remains to be understood.

The bulk of Timing of Behavior focuses on the behavioral level, particularly on 'simple' repeating motor acts–gait, bimanual coordination, and dynamical oscillatory systems. These approaches to timing: autoregressive white noise models, neural networks or explicit cognition seem to be capable of unifying motor programs and dynamical approaches to temporal pattern production14. Regardless of whether my particular formulation is upheld, there seems to be a developing consensus in this area of research that we need a coherent single theory that can handle simple and complex actions, stable and unstable behavior, and lead us from the temptations of false dichotomies. For example, do oscillators or clocks drive behavioral rhythms? The predominant evidence presented in this book is in favor of oscillators (for example, the 'oscillator signature', coupled control equations), but for various technical reasons, these results are not conclusive; a better articulation of the commonalities and differences between clocks and oscillators would have been helpful in arbitrating the conflicting claims.

Later chapters in the book present an excellent summary of some fruits of the dynamical-ecological approach to coordination, which include frank discussions of limitations. Hope when a book presents this? On the basis of abstract principles of symmetry right founder for evolving cognitive behavioral systems, which typically have an adaptive commitment to time? To clear up the theoretical undergrowth, are oscillators or clocks at work? How is that the theoretical undergrowth, showing how, in the evolution of both systems, constraints shape choices and shapes shape constraints. Timing of Behavior is a noteworthy step in the exploration of such reciprocalities.

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References
4 Pressing, J. Psychol. Rev. (in press)

Comparative Neuropsychology
edited by A. David Milner, Oxford University Press, 1998. $49.99 (xx + 300 pages)

David Milner has brought together an impressive array of scientists to pay tribute to the memory of George Estinglere (1927–1993), one of the founders of comparative neuropsychology. The papers in this volume highlight the contributions that are important to Estinglere. These include the importance of research that uses both animals and human subjects, the value of the experimental method as well as animal clinical observation, and the higher order nature of the deficits seen in agnosia and acasia. It is unusual for a person to maintain active research programs with both non-human and human animals, although Estinglere did so throughout his career. He helped introduce scientific rigor to neuropsychology, but he was also a keen observer of both monkeys and patients in non-experimentally controlled situations. His papers report experiments with animal subjects, experiments with human participants and clinical case studies. Estinglere’s demonstration, in 1956, that the visual sensory abilities of patients with and without agnosia did not differ and, therefore, differences in vision could not explain visual agnosia, was a milestone in the development of neuropsychology. Similarly, Estinglere showed that the mismatching seen after damage to the posterior parietal cortex was a genuinely visuomotor deficit rather than a problem with motor execution or spatial perception. One of the pleasures of this book is the wealth of older references as well as the newest findings. Oftentimes people write books that are updated simply because they are from the past. I found the chapters by Milner and Dikeman, Habsburg, and Passingham, all of which relates to the functions of the posterior parietal cortex, to be particular highlights of the book.

It seems clear that a stark dichotomy assigning all visual object processing to the ventral stream and all visual spatial processing to the dorsal stream (including the parietal cortex) is not supported by the data available. The dorsal stream must take object properties into account to some extent and the ventral stream cannot completely ignore spatial information. I find the hypothesis that the dorsal stream is concerned with visual information needed to guide action (for example, How far should I extend my arm to pick up that object?) and that the ventral stream is concerned with the visual information needed for object identification and...
recognition memory (for example, ‘Even though this object is in a different location, is it still the same object?’) to be rather compelling.

The work of Colby and colleagues on parietal neurons, discussed in the chapter by Milner and Dijkerman, elegantly demonstrates that stimuli that will fall on the receptive field of neurons in the lateral intraparietal sulcus (LIPS) after an eye movement is completed, influence the cell’s activity before the eye movement occurs1. That result is as fascinating as the cell’s activity before the eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intraparietal sulcus (LIP) after an eye movement is completed, influence the intrapar

**Books Received**

Review copies of the following books have been received. Books that have been reviewed in this issue are marked with an asterisk (*).


*E. Barai Brain Function and Oscillations Volume 1: Brain Oscillations, Principles and Approaches Springer, 1998. DM 148.00/£57.00/$89.93 (xxviii + 363 pages) ISBN 3 540 64338 9

*J.P. Changeux and A. Corones Conver-sations on Mind, Matter and Mathematics Princeton University Press, 1999. £45.95/£12.95 (xii + 260 pages) ISBN 0 691 06005 6


*C. Goermay (ed.) Stress of Life from Molecules to Man The New York Academy of Sciences, 1998. £140.00 (xii + 547 pages) ISBN 1 57311 146 7