

MIND/BRAIN

The Quest for Consciousness: A Neurobiological Approach, by Christof Koch. Englewood, Colo., Roberts and Co., 2004, 429 pp., \$45.00.

Long ignored as not feasible, the search for the neural correlates of consciousness is now one of the most popular pursuits in neuroscience. There is a well-established community of scientists who write papers and hold conferences on this topic. Over the last 15 years Christof Koch and his collaborator, the late Francis Crick, have enlivened and sometimes exasperated this community with a series of proposals concerning the neural correlates of consciousness. However, work on the neural correlates of consciousness has been not only theoretical. In the last few years many well-motivated and well-designed experimental studies have been published, made possible, in part, by the rapid development of neuroimaging. One of the best things about Koch's book, and one that distinguishes it from the many previous books on the neural correlates of consciousness, is that many of these experiments, particularly those relating to the visual system, are discussed in some detail.

One of the discoveries that motivated the search for the neural correlates of consciousness is that so much information processing goes on in the brain in the absence of consciousness. Koch refers to these processes as "zombie agents." First observed in neurological patients (syndromes such as blindsight, neglect, and visual agnosia), this unconscious processing has now been observed in many neuroimaging studies. A key comparison for neural correlates of consciousness studies is between conditions where the same information is processed with and without awareness. Such comparisons have led to the novel concept of essential nodes. Essential nodes are circumscribed brain regions (or systems) that are necessary for consciousness of certain features or objects in the world. For example, an area of the fusiform gyrus (V4) is essential for consciousness of color. If this region is damaged, the patient will be unable to perceive color. If the region is directly stimulated, then the subject will perceive color. However, neural activity in this region is not sufficient for awareness of color. Interaction with other brain regions, in particular the frontal cortex, is also required.

Koch provides an excellent introduction to the neuroscience side of the neural correlates of consciousness, but he says very little about the psychological side. The existence of "zombie agents" means that purposive behavior can happen in the absence of awareness of either the behavior or the stimulus that elicits it. As a result, behavior alone is not sufficient to indicate consciousness. The consciousness side of the correlation with neural activity depends on a report by the subject. This report need not be verbal and often involves simply pressing a button to indicate that a stimulus has been seen. Nevertheless, there are many problems with such reports. How do we know if the subject is simply guessing? When the subject reports not seeing the stimulus, to what extent is this due to excessive caution? Is making such subjective reports a skill that needs to be trained? If the quest for consciousness is

going to succeed, then these questions will have to be answered. My own view is that the nature and purpose of consciousness is intimately tied up with reporting. Consciousness enables us to report our experiences, thereby creating a shared mental world.

What I find rather disappointing in this book is how Koch uses the evidence from the experiments he describes to reach conclusions about the neural correlates of consciousness. He sticks with hypotheses that he and Crick have already presented: that the neural correlates of consciousness are not in the primary visual cortex, that consciousness is an executive summary critically dependent on the prefrontal cortex, and that the neural correlates of consciousness require explicit representations. The evidence has little impact on these views.

Koch makes only superficial attempts to use the data he presents to derive a detailed account of the neural correlates of consciousness. For example, in his discussion of short-term memory, he cites the evidence for a major role of the medial temporal cortex. Damage to the region, he says, as in the case of patient CW, can lead to a severe loss in the continuity of conscious experience. CW writes repeatedly in his notebook, "I have just woken up." This observation would suggest to me that the medial temporal cortex might be an essential node for this particular aspect of consciousness. Koch concludes, however, that medial temporal regions "are not strictly needed for consciousness," since people like CW are conscious.

Perhaps I am asking too much at this early stage in the experimental exploration of the neural correlates of consciousness. By presenting us a book on consciousness with so much emphasis on experimentation, Koch is confirming the suspicion that it is so much easier to develop theories of consciousness in the absence of data.

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Masters of the Mind: Exploring the Story of Mental Illness From Ancient Times to the New Millennium, by Theodore Millon, Ph.D., D.Sc. New York, John Wiley & Sons, 2004, 641 pp., \$34.95.

In this great gift of a book Theodore Millon, Emeritus Professor at both Harvard Medical School and the University of Miami and one of the most eminent and prolific scholars in the field of personality and personality disorders today, has give us an intellectual travelogue that is both a tour de force and a labor of love.

A time map at the beginning of this ambitious volume lays out the journeys to be undertaken, tracking several streams of thought. These include philosophical themes starting with early primitive sacred Asian, Middle Eastern, and ancient Greek ideas and advancing through the major 20th-century philosophers. There are also humanitarian themes, including "third wave" and existential schools, beginning with Vives and Weyer in the 16th century and going up through Rogers, Maslow, and May to Yalom in the 21st. Other tracks include neurosciences, from Paracelsus through Kandel and Snyder; sociocultural ideas, from Hegel and Weber through Goffman,