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Consciousness in Contemporary Science. Edited by Anthony J. Marcel and Edoardo Bisiach. Oxford: Oxford University Press, 1988, 405 pages, $95.00 hardback, $42.00 paperback.

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Consciousness in Contemporary Science (CCS) contains a number of thought-provoking chapters on consciousness and its place in scientific theories of human cognition and behavior. The book grew out of a conference held in April 1985 at the Villa Olmo, on the shore of Lake Como, Italy. It includes an introductory chapter by the editors and sixteen additional chapters by sixteen different authors. The authors include well-known experimental psychologists, neuropsychologists, and philosophers. All of the writers seem to be firmly grounded in scientific, materialist viewpoints on the mind-body problem; no fuzzy-headed dualists here.

CCS is mainly concerned with conceptual and meta-theoretical issues in consciousness. There is little presentation of new research, and no research is discussed in enough detail to warrant the inclusion of data figures or tables. However, pertinent research is briefly described. The research that is discussed comes mainly from two of the four fronts of consciousness research in contemporary psychology, namely neuropsychology (e.g., blindsight, amnesia, split-brain) and cognitive psychology (perception, subliminal perception, memory, human performance). There is little mention of the other two fronts of consciousness research, namely social psychology (the limitations of introspection in social cognition) and topics of altered states of consciousness (e.g., dreaming, hypnosis, meditation, drug states). However, the emphasis on conceptual and meta-theoretical issues of consciousness is timely and appropriate. This book is worth reading for anyone who is interested in the scientific study of consciousness and related topics. (For a discussion of research from all four fronts of consciousness research, see: Farthing, G.W. [1992]. *The Psychology of Consciousness.* Englewood Cliffs, New Jersey: Prentice Hall.)

As the editors describe it, "The main themes that emerge concern (a) what is to be explained, (b) how to explain it, and (c) what level of discourse or theory is necessary, is most useful, and is scientifically legitimate. These issues arise out of the focus of two complementary types of inquiry: one can address oneself to the question of consciousness or to problems posed by behavioral phenomena" (p. 8). A wide range of opinions on these issues is represented. Some writers are more concerned with explaining phenomenal awareness (Marcel, Weiskrantz, Kinsbourne, Shallice, Oatley), while others are more concerned with explaining performance in cognitive tasks

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(Bisiach, Umiltà, Johnson-Laird), and some are concerned with self-knowledge or the lack of it (Erdelyi, Gazzaniga). Some writers view different manifestations of consciousness as different aspects of a single entity (e.g., Umiltà, Johnson-Laird), while some doubt that "consciousness" is a single coherent phenomenon (Allport, Wilkes). Others argue that some meanings of consciousness are not open to scientific investigation (Bisiach), or that there is really nothing to be explained (Dennett). Some take a functionalist approach to explanation (Bisiach, Shallice, Johnson-Laird, Van Gulick), while others are more concerned with brain processes (Kinsbourne, Gregory, Churchland, Gazzaniga), and some acknowledge the importance of social factors (Marcel, Erdelyi, Oatley).

For examples of some of the topics and viewpoints discussed in CCS, let us briefly consider the chapters by the book's editors, Bisiach and Marcel, who have fundamentally different opinions concerning the most useful definition of consciousness and the functional role of phenomenal experience (conscious awareness). In his chapter, "The (Haunted) Brain and Consciousness," Bisiach begins by describing three definitions of consciousness: C_1, C_2, and C_3. C_1 is phenomenal experience. It is inaccessible to the external observer, and it must not be equated with its report. C_1 "constitutes the inner aspect, as it were, of complex physical [brain] events." C_2 refers to "the access of parts or processes of a system to other of its parts or processes, though not to all;" it might serve the function of some sort of "print-out." C_3 refers to "non-physical" entities, such as the Cartesian "immaterial mind," the "conscious self" (Eccles), or the more archaic "soul." Bisiach says little about C_3, apparently because its very existence is questionable, and in any case it is irrelevant to a natural science approach to consciousness. Bisiach does not doubt the existence of C_1, but he argues that it is not a scientific concept because it "does not conform to the scientific requirement of public observability" (p. 103). Of these three meanings of consciousness, only C_2 is legitimate for science, in Bisiach's view, although to reduce confusion it might better be replaced by other terms such as attention.

Bisiach's C_2 refers to the "monitoring of internal representations" of one part of the (brain) information processing system by another part. Thus, apparently, the scientific study of consciousness is limited to studying the access of one part of the system to information being processed or stored in other parts of the system. He stresses the point that C_1 cannot be mapped onto C_2, because some cases of C_2 (information sharing) do not have corresponding representations in C_1 (phenomenal awareness), and some cases of C_1 cannot be discovered by experimental operations designed to reveal C_2.

Bisiach raises the profound question of consciousness – concerning its functional role. Does consciousness (phenomenal experience, C_1) have a role in selecting actions? Or is consciousness a *consequence* of action selection? Evidence indicates that actions are sometimes selected and initiated by nonconscious (nonreportable) processes, and that consciousness (awareness) is sometimes a consequence of action selection. Thus, there is no firm support for a causal role of consciousness (C_1) in action selection. C_1 appears to be epiphenomenal, but C_2 is not epiphenomenal, as information access between subsystems has an obvious role to play in action selection.

Marcel, in his chapter titled "Phenomenal Experience and Functionalism," argues (contrary to Bisiach) that discussion of consciousness as phenomenal experience (Bisiach's C_1) is "demanded, legitimate, and necessary" in psychological science. "Psychology without consciousness, without phenomenal experinece, may be biology or cybernetics, but it is not psychology" (p. 121). By "phenomenal experience" Marcel means "that which, over and above information or internal representation, we refer to as known directly or non-inferentially when we report our states of feelings" (p. 128).

Marcel discusses four reasons why consciousness is important to psychology. First, by "mental life" we mean *conscious* mental life. No account of mind that omits consciousness can be a complete account. Second, consciousness is what psychologists actually examine. Studies of perception, remembering, mental imagery, and emotion involve introspective reports. Third, the concept of consciousness has ideological implications. Consciousness is the basis of empathy. Non-conscious beings are not agents – they are not held responsible for their behavior. Fourth, consciousness has causal status.

The fourth point is particularly controversial and important. From introspection, the function of consciousness may seem obvious: consciousnes is the executive decision maker that chooses goals and controls actions to achieve those goals. But despite folk psychology beliefs, most psychologists agree that introspection alone cannot tell us how the mind works. Cognitive psychologists usually either ignore the concept of consciousness altogether, or try to link it with functionalist concepts such as working memory or information-access (Bisiach). Marcel points out that we would not have a concept of consciousness if it were not for phenomenal experience, and he argues that phenomenal experience, as such, has causal status. He is not arguing that consciousness is something independent of the brain or that it is necessarily a direct, efficient cause of behavior. Rather, consciousness can have causal status if it enables or permits certain behaviors to occur. He discusses four situations where consciousness (phenomenal experience) may have causal status: self-monitoring, metacognition and learning, intentional task performance, and voluntary actions on the environment.

In my view, Marcel rightly emphasizes the question of the functions of consciousness as phenomenal experience, independently of functionalist conceptions equating consciousness with control or information-access processes. Behaviorists such as Skinner have long denied that consciousness has causal status, but most psychologists have ignored the issue. An expanded, liberalized cognitive psychology should face the issue of consciousness and its causal role. But, I would argue, even if consciousness as phenomenal experience does not appear to have a causal role, it is still important to try to explain the nature of consciousness and factors that influence the stream of consciousness, because conscious experience is of the essence of what it means to be a living human, from the introspective viewpoint.

Yet, some of the authors in CCS would argue with my point that consciousness – phenomenal experience – is something worthy of explanation. For example, Kathleen Wilkes says that consciousness is not a "natural-kind explanadum" – conscious versus nonconscious is not a useful basis for sorting natural phenomena into distinct categories prior to explanatory attempts. Further, many languages do not have a word equivalent to the English "consciousness," which casts doubt on the idea that consciousness is a natural category phenomena. Alan Allport also doubts that consciousness is a unitary phenomenon that could be candidate for scientific explanation; particularly troublesome is the fact that there is no satisfactory criterion for identifying instances of consciousness. And Daniel Dennett presents philosophical arguments for doubting the very existence of "qualia," those ineffable, intrinsic, private, directly apprehensible characteristics that are thought by some to be the essence of conscious experience. These counter-conceptual arguments deserve serious consideration by those of us who would like to charge ahead with the study of consciousness, while pointing at our heads to indicate some sort of inner events that we cannot clearly define.

Readers who are looking for firm answers to questions about consciousness will be disappointed, but those who are fascinated by the topic and enjoy controversy will be stimulated by this book. I have but two complaints about CCS. First, it could have

been improved by the inclusion of selected transcripts of the discussions among conference participants. It would have been fascinating to hear the exchanges among these leading researchers and theorists. There is however, a fair amount of cross-referencing between the various chapters. Second, the book's exorbitant price will prevent most interested students from buying their own copies. A paperback edition at $14.95 would attract students of philosophy and psychology, and increase the book's use as a supplementary text. Despite these minor complaints, I highly recommend this book to people who are interested in the concept of consciousness and the controversies concerning its nature and possible functions.