

Book Review

Science gets serious about consciousness

By Bernard J. Baars

A review of *The Quest for Consciousness: A neurobiological approach* by Christof Koch. Roberts & Co: Englewood, Colorado, 2004.

Like the weather, everybody talks about consciousness but nobody seems to do anything about it. We have seen a great upsurge in books on the topic, many of them dubious, while some are actively misleading. Indeed, some of the most popular books seem designed to keep alive the endless arguments that have not changed basically for centuries. Those books seem designed to show off the brilliance of their authors. But they do not improve our understanding. Human consciousness is too important to be left to the hair-splitters.

Christof Koch's new book is a refreshing exception. His "Quest for Consciousness" summarizes the brain basis of our own experience about as well as can be done today. The style is breezy and enjoyable. The facts are honest facts. Needless to say, it leaves many questions unanswered, but that reflects the state of our ignorance today. While scientific journals now cite consciousness in thousands of articles per year, what we know with certainty can still be said in a few hundred pages.

In a way this is a diary of an intellectual journey. It reflects Koch's years of working with Francis H. C. Crick, who provides the Foreword. The opinions expressed here are shared by them, as Koch makes very clear. It is worth remembering that even a scientific celebrity like Crick had to take a dangerous professional gamble by tackling the brain basis of consciousness a decade ago.

I have a few quibbles, and one or two caveats. Koch's book assumes considerable familiarity with brain science and psychology. Its readability is somewhat deceptive - the content is harder than it looks. It would make good reading for scientists, physicians, and graduate students. Undergrads and the general reader can certainly try it, but they will need to fill in many gaps from other sources.

Some of the figures are confusing. It took me many minutes to understand that the inside cover photos are mislabeled, and that the front photos are cited as being in the back; worse, that their captions will be technical gobbledegook to most readers. One could argue with the selection of figures like the famous “oil refinery” of visual connectivity in the macaque cortex. This is good science but unsuitable for the audience, as if a beginner’s guide to computers began with detailed circuit diagrams.

Koch presents a significant scientific approach to consciousness, but not the only one. Inevitably his book reflects certain predilections. For example, there are excellent introductions to the cellular basis of brain processes, but very light treatment of the extraordinary revolution in brain imaging of the last ten years. But neuroimaging has made it possible to “see” human conscious processes in the living brain. We can now image people silently talking to themselves by the activation of speech areas of cortex. We can clearly observe the difference between conscious and unconscious visual processes. But these advances are not much talked about, presumably because Crick and Koch prefer to think at the cellular level.

Even at the level of nerve cells some debatable arguments are advanced. Crick and Koch make a case that visual consciousness does not depend on cortical area V1, the first place where visual information reaches cortex. But there are decades of studies showing that damage to V1 eliminates visual consciousness, while stimulation in that region can evoke conscious visual flashes (phosphenes). It is certainly true that V1 is not necessary and sufficient for visual consciousness. But it seems to be necessary. Koch devotes many pages to proving that these rather obvious points can be disregarded. I was not convinced.

Koch does not devote much space to integrative conceptions of consciousness and its role in the brain. The recent book by Gerald Edelman and Giulio Tononi does a good job on the other side of that debate. (*A Universe of Consciousness*, 2000, Basic Books). And just to scratch a personal itch, Koch does not say much about psychological approaches to consciousness. Yet there is much to be learned from all these levels of analysis. No single scientific story explains all the evidence.

These are minor complaints. There are perhaps half a dozen books on consciousness science that are “must” reading. This is one of them. I highly recommend it to anyone trying to understand the most intimate aspect of our common humanity.

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