



## The Physics of Consciousness

The Quantum Mind and the Meaning of Life

by Evan Harris Walker

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Review by Martin Allen on Jun 8th 2001

Contemporary literature on consciousness distinguishes between "easy problems" concerning the cognitive capacities of animals and humans, to which we may profitably apply tools of traditional science, and the relative "hard problem," to which, perhaps, no such traditional avenues of investigation are open. Put simply, this problem concerns how and why some cognitive processes are accompanied by conscious experience at all. This question, and associated queries concerning how consciousness is related to the physical body through experience and action seem, at least to some, to be of a radically different order than those addressed by neurophysiology, chemistry, cognitive science, and other "normal" sciences.

Evan Harris Walker sets out to answer the hard problem of consciousness, although his ambitions go beyond the particular scientific problem, reaching to problems supposedly endemic to the entire scientific world-view. As he sees it, modern society is divorced from the spiritual, as reflected by its descent into latter-day barbarism; the "degeneration in the values of our society is not due to the waywardness of the people or to the affluence that permits a lax morality," but rather "the message of science borne on the wings of our fast technology" (13). Walker would revive a lost spirituality, demonstrating how quantum physics reveals deeper truths about consciousness and the universe. How one feels about this project will depend upon how convinced one is about the moral decay diagnosed, and upon how much one would lay blame at the feet of atheistic scientism. One's reaction to the book will also be colored by how one feels about its style. Combining explanation with memoir, Walker lays his quantum-consciousness argument alongside personal reflections upon a lost loved one. Some will find these latter sections affecting, no doubt, but the reader looking for a straightforward explication of the issues may be put off by the tone and style. In the end, however, the largest question concerns how well Walker's arguments relating consciousness to quantum physics actually work. Unfortunately, they do not stand up to scrutiny.

There is an interesting idea here, admittedly. Walker argues that the synapses—those places where signals are transmitted from neuron to neuron in the brain—may be as they are to allow *quantum tunneling*. This phenomenon, a strange-seeming feature of the quantum world, arises in models of particle behavior in which the "position" of an electron, before observation, is given by a probability distribution over all its *possible* positions. Tunneling arises when an electron crosses a seemingly impervious barrier, due to the fact that there is some small probability, suddenly realized, that the electron is in fact on the other side. According to evidence Walker has gathered, the size of the synaptic cleft and the internal structure of the synapse are just as would be needed to exploit the quantum phenomenon in order to send electrons across the synapses. This is interesting, and a cogent argument that quantum processes may play a vital role in the brain.

Beyond this, however, Walker's argument is less coherent, as he employs this testable hypothesis as but a stepping-stone to grander ideas. Simply put, he is a dualist, and believes that consciousness is not in any sense physical, but is somehow merely "associated" with the physical world. To establish this conclusion, he argues along lines that will be familiar to readers of the literature—particularly to those who have read David Chalmers' *The Conscious Mind*, although Chalmers is not mentioned anywhere in Walker's book. According to this argument, a complete description of the world, according to the understanding of that world given by physical science, will not include any mention of consciousness, since beings physically just like ourselves need have no consciousness at all. Then, since we *do* possess consciousness, we must accept that consciousness is a *non-physical* but *real* aspect of the universe.

Arguments of this form—Walker's is no exception—leave unclear whether the term "physical," as used, applies to facts

about the world, or simply marks the descriptive and explanatory capacities of current physics. If the latter, then the conclusion is more or less vacuous, and if the former, it is very hard to substantiate. That aside, dualism still opens up more problems than it resolves, since anyone accepting it must explain how a putatively non-physical item like consciousness interacts with a physical item like the brain. Walker offers nothing enlightening here. Noting that science has nothing definite to say about the issue so far, he simply asserts that the hypothetical quantum events he has picked out in the brain are somehow directly associated with consciousness, exploiting another oddity of quantum physics, namely the idea that the outcomes of certain processes depend upon *observation*. Thus, he says, consciousness must be an observer, operating the brain by causing the quantum states characterizing the brain to "collapse" in particular ways, thus determining what actions and experiences follow.

This claim is novel, but by its nature unjustifiable speculation. Despite some impressive-looking calculations, the reasoning in these parts of the book is unclear where not evidently weak. Walker's concept of the "will" that observes and controls is vague, and the best reason to relate particular quantum processes to consciousness seems to be that the "information content" possibly carried by the quantum events is close to that necessary for conveying a "sense of realism" in an audience, by way of a multimedia theater system. The values used in this calculation are themselves speculative, and the comparison of consciousness to an electronic media device is unconvincing; indeed, it is hard to know how seriously we are supposed to take it. By the end, "consciousness" itself becomes unclear, since Walker does not explain how such a thing, which he distinguishes from "mere" information-processing and decision-making capacities, is supposed to observe and decide anything, physical or not. The idea that quantum theory requires *conscious observers* is also a fudge, and nearly counts as begging the question. Nothing in the scientific literature suggests that this "observer" has to be a conscious entity, as we commonly understand it, but rather only that there be some macroscopic physical effect determining outcomes at the quantum level. Walker mystifies this idea, playing on the suggestive, but imprecise, language of a particular interpretation of quantum physics in a way that obscures more than it reveals.

Finally, Walker commits a classic error, attempting to go beyond his already ambitious initial goals to explain even more "hard problems." Rather than showing the strength of his theory, however, this wide-ranging grasp more reveals its limits. In later chapters, he suggests that the will behind consciousness also explains the present state of the universe as a whole—since a creative will could, as God is said to have done, determine that state by intervening in quantum events immediately following the Big Bang—determine the direction of time, and explain legitimate psychic phenomena and miracles. In the end, all of this is somehow related to tenets of Zen Buddhism, and the need for a "religion for the 21st Century." Even a reader inclined to the spiritual, or looking for explanations of such phenomena, will be mystified by much of this.

If a reader is interested in a defense of a dualist metaphysics of consciousness, then the work of Chalmers already mentioned would be a much better place to look, since the arguments there are far more cogent and imaginative. (I say this even though I am not at all inclined to accept dualism in any form.) Too, if one is interested in quantum physics, there are a score of better introductions, popular or technical, than Walker's book. As for those intrigued by the spiritualist claims mentioned, be aware that there is a certain amount of technical scientific and mathematical material present, not all of it easy to understand, and not all of it supportive of Walker's claims.

The Physics of Consciousness. Working Paper (PDF Available) · April 2017 with 1,897 Reads. DOI: 10.13140/RG.2.2.11124.55683. The nature of consciousness, the mechanism by which it occurs in the brain, and its ultimate place in the universe are unknown. We proposed in the mid 1990's that consciousness depends on biologically 'orchestrated' coherent quantum processes in collections of microtubules within brain neurons, that these quantum processes correlate with, and regulate, neuronal synaptic and membrane activity, and that the continuous Schrödinger evolution of each such process terminates in accordance with the specific Diósi-Penrose (DP) scheme of 'objective reduction' ('OR'). The American physicist Richard Feynman said this about the notorious puzzles and paradoxes of quantum mechanics, the theory physicists use to describe the tiniest objects in the Universe. But he might as well have been talking about the equally knotty problem of consciousness. Some scientists think we already understand what consciousness is, or that it is a mere illusion. But many others feel we have not grasped where consciousness comes from at all. The perennial puzzle of consciousness has even led some researchers to invoke quantum physics to explain it. That notion has always been met with wit. In addition, the physics of complex systems and quantum physics have played stimulating roles in the discussion from their beginnings. As regards the issue of complexity, this is evident: the brain is one of the most complex systems we know. The study of neural networks, their relation to the operation of single neurons and other important topics do and will profit a lot from complex systems approaches. Other features of quantum theory, which became attractive in discussing issues of consciousness, were the concepts of complementarity and entanglement. Pioneers of quantum physics such as Planck, Bohr, Schrödinger, Pauli (and others) emphasized the various possible roles of quantum theory in reconsidering the old conflict between physical determinism and conscious free will.