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The Mindful Universe: Quantum Mechanics and the Participating Observer, by Henry P. Stapp. New York: Springer, 2007, 208 pp. (hardcover). ISBN: 978-3-540-72413-1.

Since the formulation of quantum mechanics, there have been numerous efforts to accommodate consciousness within its scope. One of the theorists to engage in these efforts has been Henry Stapp.

Stapp bases his ideas on John von Neumann's resolution of the split between an observer and the physical world that she is observing by including as part of the physical world any measuring devices as well as the brain of the observer and relegating the observer herself to an "abstract ego" (p. 167). At the heart of Stapp's theory is the idea that consciousness, as a quality of such an abstract ego, is intrinsically involved in physical reality by reducing a state of superposition of possible physical events to a finite number of possible events as part of the process of measurement in quantum mechanics. More specifically, for Stapp, in accord with our intuitive sense of being able to affect physical events, we can exercise our free will through "effort" (p. 42) which increases the frequency of similar selections of possible states, thereby affecting brain activity through the "quantum Zeno effect" (p. 36). In this manner, consciousness can direct the occurrence of physical events.

Stapp has devoted some of the 17 chapters of the book to arguments for the need to use quantum theory in neuroscience, explanations of his theory, and discussions of the consistency of his theory with the ideas of William James and Alfred Whitehead. In other chapters, Stapp has contrasted his theory with Stuart Hameroff and Roger Penrose's theory, David Bohm's pilot-wave theory, many-worlds approaches, and arguments from decoherence. There is a chapter

consisting of an interview with Harald Atmanspacher and another chapter comprised largely of e-mails sent to the online discussion group of the *Journal of Consciousness Studies* in which Stapp responded to criticisms of his theory raised after the publication of the interview in that journal. The book also contains seven appendices dealing mostly with non-locality and the theories of Michael Gazzaniga, John von Neumann, and Eugene Wigner.

This book has been written in a style that is clearly meant to make the book widely accessible. In particular, there are almost no mathematical expressions in the chapters and appendices.

Stapp is to be lauded for his effort to follow through with a controversial line of reasoning traceable to early formulations of quantum mechanics, namely, that the minds of observers are essential elements of reality, whose nature is not itself captured by the quantum mechanical formalism. Stapp makes the point many times in the book, often as a rebuttal to arguments against his theory, that our understanding of the mind cannot be based on outdated ideas about what physics used to tell us about reality, but must take into account contemporary physical theory, which, according to Stapp, grants independent status to mind as an aspect of reality. I think that neuroscientists and various cognitive psychologists, philosophers, and others need to be prompted to relinquish their outdated schemata about the physical world and to pay attention to contemporary physics. Of course, not all physicists would agree with Stapp's version of what contemporary physics tells us, let alone that it provides a role for an independent mind.

The main drawback of the book lies in its lack of details concerning the essential features of the theory. The processes of interaction between mind and matter could have been more fully elaborated. It would have been helpful also to have had a more comprehensive survey of empirical support for the theory and a synopsis of implications for experimental verification. Without such details, the theory is difficult to evaluate. Also, the contents of the book could have been better integrated in that there are numerous restatements of the main thesis; what details there are, are often presented piecemeal in the interview and e-mails; and the appendices sometimes read like chapters that just ended up being placed toward the back of the book. A more comprehensive account of the theory in a more integrated presentation would have resulted in a book of the same length but greater intellectual impact. Overall, however, I think that Henry Stapp's theory is worthy of attention, and this book provides a good introduction to it.

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