

MIND, MATTER AND QUANTUM MECHANICS

By Henry P Stapp

Springer Verlag, Berlin, 1993

248 pp, DM 58, ISBN 3-540-56289-3

This is a collection of eleven papers written over a span of twenty years on a topic identified in the title of the book. Stapp has written extensively on this subject, the earliest reference to his work goes back to 1959 and the newest, published in this volume, appeared in 1993. In a collection of this sort, some amount of repetition, among the essays, is unavoidable. But this will not appear as a negative factor to a reader trying to grasp the new ideas presented in this compact volume. A series of references and a glossary provided by the author are helpful to a serious reader.

The true nature of matter and mind have intrigued thinkers since antiquity. On the philosophical front, one could start, as done in this book, with Rene Descartes with his famous dualistic theory of body and mind, now apparently in decline among philosophers, but apparently supported by Stapp. [For Descartes the world is made up of two incompatible types of substance, — mind or consciousness (*res cogitans*) which is unextended and indivisible and matter (*res extensa*) which is extended and divisible.] On the scientific front one could start with the solid foundations of classical physics laid by Newton and Galileo in the 17th century. The classical picture was not so much disturbed by Einstein's Theories of Relativity (1905, 1915) as with the old (Bohr) and new quantum theories. In particular, the new quantum mechanics, associated with the work of De Broglie, Schrödinger, Heisenberg, Dirac, Born, Pauli, revolutionised

our picture of the microworld. According to Stapp, quantum mechanics, or rather a particular interpretation of it offered by Heisenberg in his later years (1958), makes an important contribution towards our understanding of the mind-body interrelation, consciousness, reality, etc, some of the perennial questions which remained unsolved through the ages. Classical, mechanistic physics, Stapp says, was totally inadequate to deal with the working of the human brain and consciousness, while quantum mechanics with its probabilistic structure, is eminently suited to do it.

Daniel Dennett, in his book *Consciousness Explained*, writes: *Human consciousness is just about the last surviving mystery, a phenomenon that people don't know how to think about.* In his book *The Astonishing Hypothesis*, Francis Crick writes: *Consciousness is a subject about which there is little consensus, even as to what the problem is.* Consciousness is indeed a hot potato to discuss either scientifically or philosophically, but it seems to have turned into a bandwagon where scholars from different disciplines are happy to climb on. There is today a flow of books and periodicals, conferences and lectures focussing on human consciousness. Stapp, realising the difficulty of applying a theory which is successful in physics, to brain functions and to the origin of consciousness, writes that the problem *appears to be so intricate that many scientists have judged the problem to be a pseudo problem not suited to scientific study.* (p. 145). On the following page Stapp quotes William James (a pioneering psychologist a hundred years ago): *The passage from physics of the brain to the corresponding facts of consciousness is unthinkable.* Nevertheless Stapp does not

give up. Patiently, drawing support from various authorities, in particular from Heisenberg's interpretation of quantum mechanics, he tries to convince his reader that the new physics is indeed able to point to a solution of the mysteries of human consciousness. How far Stapp succeeds is questionable. The present reviewer remains unconvinced. This does not mean that I did not enjoy reading the book, because Stapp has an honest and clear style of writing and the book gathers a lot of interesting and important information within its modest size.

Quantum Mechanics is the other topic dealt with by Stapp. In this connection we might quote from a recent article in the New Scientist (24 October 1995, by Lee Smolin): *What is quantum mechanics really about? Physicists are still arguing about how they should interpret quantum mechanics.*

Quantum Mechanics is an enormously successful and powerful theory. It firmly underlines our understanding of all domains of physical theory save one — gravitation. But the physical interpretation of quantum mechanics is as controversial today as it was 50 years ago, in the period just after the invention of the theory. Is quantum mechanics just a highly successful tool for calculations, or does it give us a coherent picture of what reality is like on the macroscopic scale?

Even among those who think it does give us such a picture, there is wide disagreement as to just what that picture shows.

Stapp, quoting Karl Popper writes (p 117): Two important problems in science are the interpretation of quantum theory and the

connection of conscious process to brain process. Stapp lists four main interpretations of quantum theory:

1. Bohr's Copenhagen Interpretation: the nominal orthodox interpretation. The aim of quantum theory is merely to describe certain connections between human experiences. Physics is about human consciousness.
2. Everett's relative state interpretation. (1957).
3. David Bohm's pilot-wave model of the universe, conforming closely to the ideas of classical physics. (1952).
4. Propensity interpretation of Heisenberg (1958) and Popper.

Stapp says (p. 118) that each of the first three interpretations hinges on the nature of the connection of the quantum world to human consciousness. While in the fourth, the propensity interpretation, consciousness emerges naturally from an application of quantum theory to brain process.

As a central theme of the book, Stapp writes (p 118) that the old prejudice *that consciousness must lie for ever outside the domain of science, survives even today in spite of the fact that efforts to comprehend quantum theory have persistently led to an entanglement of quantum theory with consciousness and in spite of the fact that the growing mass of empirical data relating conscious process to brain process now cries out for scientific explanation.*

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