

Elemental Mind: Human Consciousness and the New Physics

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*Elemental Mind: Human
Consciousness and the New Physics*

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Published by Plume Penguin
New York, 1994, pp.294, \$ 11.95
(ISBN 0-525-93506-1, 0-454-27245
paper back)

Human mind, often considered synonymous with consciousness, has been called the last frontier of science. In addition to neurobiologists, psychologists and cognitive scientists, in recent years it has increasingly attracted the attention of physicists. This book is yet another in the series by a physicist who believes that, “there is no excuse save lack of imagination for physical science not to attempt to provide a technical solution to the mind/body problem”. The author adds a new dimension to the unresolved conflict between the monoists who believe that mind is an emergent feature of certain electrochemical events occurring in the brain, and the dualists who like Descartes consider brain and mind to be distinct independent entities. The author argues that, “mind is a fundamental process in its own right, as widespread and deeply embedded in nature as light or electricity”. He claims, “Mind is, in a word, elemental, and it interacts with matter at an equally elemental level”. To support his hypothesis he invokes some features of

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quantum theory “for understanding how mind might enter matter at the quantum level”. Like most authors, he uses the term mind and consciousness interchangeably.

The book is divided into eleven chapters. Chapter 1 deals with ‘steps towards a science of consciousness’. Recognising the difficulty of giving a definition of consciousness, the author resolves the issue thus: “Consciousness seems not to be concerned so much with what an entity does as with what it experiences while doing it”. Obviously the real challenge for experimental scientists is to devise ways and means to measure the presence of subjective experience. He refers to several theoretical possibilities like ‘cogitons’, ‘mental telepathy’, ‘mind links’ and his own, and others’ efforts – so far unsuccessful – to construct a conscious machine. In the light of these experiences he reflects upon the limitations of the two dominant hypotheses of mind – monoistic and dualistic. The author also tries to answer the important question, “How will we recognize a good theory of consciousness when we see it?”. He proposes twelve parameters for the same.

Chapter 2, 'Consciousness from Inside: Prominent Landmarks of Inner Space' deals with some psychobiological aspects of consciousness. He emphasises its most important feature, the experienced unity of human consciousness. To dissect it further he attempts to provide some quantitative information regarding the various inner spaces like the five senses along with thinking space, feeling space, memory and other higher functions; he points out that in its single-minded pursuit of unity, consciousness strives to integrate sensations, memories, emotions, cognition into one ongoing inner experience.

Chapter 3 'Consciousness from outside: a tour of mind's mansion' gives a brief account of brain in embryo, its development to adult state, and its various parts. It goes on to provide some information regarding its energy consumption in various states – normal awake, sleep, coma, mental arithmetic etc. He argues, "If consciousness is a new form of energy, we should be able to measure a number in brains of conscious creatures that represents its energetic equivalent". He gives a very brief account of various imaging techniques currently used for 'looking into the brain', and an outline of the electro-chemical basis of the functioning of the brain. This is followed by the possible role of different parts of the brain in search for location of human awareness. The rest of the chapter is devoted to an elaboration of the work of James Culbertson, author of several books like "The Minds of Robots",

"Sensations, Memories and the Flow of Time", "Consciousness – Natural and Artificial". The author concludes Culbertson's work is the first step towards a new science – the science of *artificial awareness*.

The author then turns to physical principles which may provide a link between the mind and matter. Next five chapters are thus devoted to elaboration of various aspects of quantum theory and its possible application to explain human consciousness/mind. The author elegantly summarises the problem of quantum reality in chapter 5. "Quantum theory is our most upto date theory of the physical world. It has been flawlessly successful in describing the world at all levels from quarks to quasars".

He then elaborates the eight tentative pictures of the quantum world e.g. there is no deep reality, reality is created by observation, undivided wholeness, the many-worlds interpretation, quantum logic, neorealism, consciousness creates reality, and the Duplex world of Werner Heisenberg.

One may wonder, what has all this to do with consciousness/mind? He goes on to argue that "The quantum reality problem is, strictly speaking, not a physics question at all, but a problem in metaphysics". One of the most important use of metaphysical pictures is to help extend quantum physics into new areas like models of mind.

The author claims that for the construction of models of mind and clues to the true role



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of consciousness in the universe-as-a-whole, these eight quantum realities (with two exceptions) offer tantalizing suggestions. Thus von Neumann extending the Copenhagen picture of quantum reality gives mind “an independent role to play in constructing the phenomenal world”. His model of reality treats mind as “elemental”, as fundamental as quarks and gluons for the proper functioning of the universe. In the von Neumann interpretation of quantum reality, consciousness is a process lying outside the laws that govern the material world. It is obvious that such theories tend to support the dualistic model of mind.

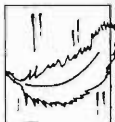
The significance of quantum inseparability for models of mind is two-fold. First the peculiar variety of wholeness possible for quantum systems may offer a possible mechanism for achieving the unity of experience observed in so many (human) minds. Second, the notion that mind operates by influencing the occurrence of otherwise random events giving rise to the possibility that mind can influence distant matter in a decidedly non-local manner.

Some interesting experiments which may throw light on views, like The Denver experiments on photons, Schmidt machines, Princeton, San Antonio, and San Francisco experiments have been briefly referred to. The author then describes his own groups’ work on developing a *metaphase typewriter*.

In the final chapter the author considers possible research directions that might take the mind/body problem out of the province of philosophers and theologians and into the physics lab.

Unlike several other books on mind/consciousness written by physicists and mathematicians, it is easy to read and comprehend, though it may not be so for completely uninitiated. The title of the book, as also its Introduction, arouses much hope as if the author has resolved this vexed issue, when he declares, “I propose, in fact, that mind is elemental, (or a kind of “quantum animism”) my dear Watson!” Without being flippant one could ask, “where is the proof, my dear Sherlock Holmes!”. Nevertheless, both biologists and physical scientists wishing to develop an interdisciplinary dialogue will benefit by reading it.

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Science seeks generally only the most useful systems of classification: these it regards for the time being, until more useful classifications are invented, as true.

S I Hayakawa