

CONTINUUM

QUANTUM CONSCIOUSNESS

I began my search for the ultimate connection between matter and consciousness nearly two decades ago, when the Age of Aquarius was in full bloom and I was a professor of physics at San Diego State University. There were drugs to be taken, life-style changes to be made, a war to protest, and liberated sex to be enjoyed. I embraced it all. By 1970 I had become disillusioned. I turned on, dropped out, and found myself involved with Eastern mystics, consciousness-raising groups, and others who were labeled New Age. During my year in France, as associate professor of physics at the University of Paris, I met and studied with the biblical scholar and cabalist teacher Carlo Suares. I was also visiting professor at Birkbeck College, in London, studying with physicist David Bohm, who had similar interests.

My mind reached out for understanding, and by 1974 I felt that quantum physics and consciousness were deeply connected. I began to realize that the brain may be governed by the laws of quantum physics rather than the laws of biology or neurophysiology. As a result, such feelings as love and hate, commonly thought to be God-given or incapable of scientific understanding, could be translated into the language of quantum physics.

The only mystery of quantum physics lies in the wave-particle duality described by Richard Feynman, the Nobel prize-winning physicist. Atomic objects (electrons, protons, neutrons, photons, quarks, and so on) sometimes behave like particles, and other times, like waves. When does an atomic object behave like a wave and when does it behave like a particle? According to many quantum physicists the answer depends on whether the object is observed. Unobserved, the atomic object appears as a wave spread out over space, but the instant it is observed the wave collapses to a point and behaves like a particle. The action of a simple observation "causes" a wave to collapse, producing a particle. But what kind of action is a simple observation? Nobel laureates Eugene Wigner and Brian Josephson and many other physicists, including myself, believe that it may be a fundamental event beyond physics. We view it as the action of consciousness.

I argue that the wave-particle duality of quantum physics holds true in the human brain, orchestrating the behavior of individual nerve cells as they relay their chemical messages to one another. The wave-particle duality action of electrons, for example, could give rise to feelings of loneliness, of ego and hatred. In the quantum world, electrons suffer a paradoxical life. Because of their particle behavior and their electrical repulsion, no two electrons can ever occupy the same space. They are doomed to solitude.

In their wavelike guise, however, electrons are forever seeking their opposite particle, the positron, even though such a meeting would result in their destruction. The electron's electrical charge is a cry for the return to the void. It hopes and fears to attract its opposite, its antimatter partner, the positron, in a dance of death. Similarly, love and feelings of compassion may be created by photons, particle-wave units of light. As waves, photons tend to march together, working toward a common end. Lasers work because photon waves are "in love" with, each other.

Love and hate, success and failure, violence and peace could be but manifestations of energy, of forces and atomic objects flowing through our bodies, brains, and minds as particles and waves. What we call the brain is the particlelike behavior of our observations. What we call the mind is the wavelike behavior of atomic objects, invisible and unobserved. Mind is then an outgrowth of the basic laws of quantum physics together with the actions of the observer, which I believe are the acts of consciousness.

For example, one act of consciousness could cause a change in quantum surface waves acting along the thin membranes covering our neurons. These waves are associated with the movements of the protein-gate molecules embedded in the neurons' walls. A "particle" observation would momentarily "freeze" the molecules' positions, resulting in the appearance of thought. Another complementary "wave" observation where the proteins remained unobserved would *produce* changes in the energy of these waves, resulting in the arousal of feelings. Thus feelings and thoughts would show the same type of duality as waves and particles.

Understanding how the brain/mind works may lie within the whole range and arsenal of the mathematical language of quantum physics. The probability equations and the behavior of atomic objects may depend on the wave-into-particle actions of consciousness. Without such actions the world and all of its participants would remain wispy, ghostlike quantum waves, and there would be nothing material at all.

– *FRED ALAN WOLF*

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