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Original Article

Bridging Science and Spirituality: A Continuation of Thought Regarding the Evolution of Soul

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Abstract: *This paper examines some of the universal principles of classical, relativistic, and quantum physics as a frame for a contemporary understanding of the existence and immortality of soul. Soul is a subject that has been, and continues to be, contemplated and woven into myriad religious and secular philosophies starting before the written word with the Veda knowledge of Hinduism (10,000 BCE). These last 12,000 years, the construct of soul as a form of being has been embraced by both Eastern and Western philosophical schools of thought as integral and vital to existence. Throughout history, the one idea that remains constant in the philosophical discussions regarding soul is that there is a part of our being that exists, other than the physical body that is immortal. Written from a pastoral perspective, this paper is a continuation of the ontological thought regarding the evolution of soul.*

Keywords: *Science, Spirituality, Evolution of Soul.*

I. INTRODUCTION

Soul is the nucleus of our being. It is the core of our existence and functions as the conductor for our spiritual transformation; or so it is imagined in the world according to Donna Hobbs. Spiritual transformation is the process of growth and formation that occurs organically as soul moves through space-time. Therefore, a reference to spiritual transformation is just another expression for the evolution of soul.

Sean Carroll, a contemporary theoretical physicist from the California Institute of Technology, defines physics as the study of "what stuff is and what stuff do" (Wired, 2019). More academically speaking, physics is the study of matter and energy, which are the basic components of the natural world. The fundamental premise of this paper is to examine the notion of soul as it relates to two universally accepted laws of physics: first, Albert Einstein's mass-energy equivalence formula, $E = mc^2$, and second, the law of conservation of energy.

Einstein's famous equation from his theory of Special Relativity (1905), $E = mc^2$ (energy equals mass times the speed of light squared), says that energy and mass (matter) are different forms of the same thing. Meaning that everything in the everyday world (macrocosm) and everything in the sub-atomic world (microcosm) is energy. In both physics and chemistry, the law of conservation of energy states that energy can neither be created nor destroyed; energy can only be transformed or transferred from one form to another (Feynman, Leighton, & Sands, 1989, p. 4-1). Even though Einstein did not form his formula to support his theory of Special Relativity until 1905 CE, the ideas behind the law of conservation of energy first emerged from ancient philosophers. Thales of Miletus, c. 550 BCE, posited that there was "some kind of underlying substance of which everything was made" ("Conservation of Energy", nd). Our understanding of the physical world as we know it today is organized around these two universal laws.

II. THE WORLD BEFORE QUANTUM REVELATION

The dominant scientific viewpoint preceding the 20th-century theories of special relativity and quantum physics was based on Isaac Newton's laws of motion and universal gravitation, which laid the foundation for classical physics (also known as classical mechanics). Contemporary American particle physicist Henry Stapp (2011) offers the perspective that "classical mechanics is the child of the physical half of Cartesian dualism" (p. 2). René Descartes's (1596-1650) philosophy of dualism is "a system of thought that regards a domain of reality in terms of two independent principles, especially mind and matter" ("Dualism," 2010), the physical and the nonphysical. Therefore, the connection Dr. Stapp makes between Newton's classical mechanics and Cartesian dualism is that classical physics' concern is with the physical half of dualism: matter. Thus, the focus of classical mechanics is the macroscopic material world.

Classical mechanics is a school of thought in physics that theorized there were "pre-existent laws of a separately existing universe that objectively existed independent of observation" (Levy, 2018, p. 5). This belief system was predicated on a mechanical model of the universe that did not acknowledge the opposing principle of dualism: the nonphysical. The scientific classical model of the universe did not acknowledge the existence of any nonphysical, microcosmic energy, such as soul, conscience, or consciousness.

Science serves two purposes: "to harness nature to serve the practical needs of humankind" and as "part of man's unending search for knowledge about the universe and his place within it" (Stapp, 2011, p. 4). This quest for understanding is motivated by our spiritual desire to establish values upon which we base our conduct and, ultimately, to understand our purpose in the greater whole. Scientific theories are integral to what we believe, and what we believe is integral to what we value. Therefore, our beliefs and values are strongly influenced by science.

The system of values prevalent during the Middle Ages was predicated on a structure that incorporated the nature of the universe, the creator of the universe, and man's connection to that creator. This system of values held for more than 1,200 years until it was challenged by the theories of classical mechanics. Henry Stapp writes in his 2011 book, *Mindful Universe – Quantum Mechanics and the Participating Observer*:

> In this [classical] 'scientific' vision we human beings were converted from sparks of divine creative power, endowed with free will, to mechanical automata – to cogs in a giant machine that grinds inexorably along a preordained path in the grip of blind causal process. This material picture of human beings erodes not only the religious roots of moral values but also the entire notion of personal responsibility. (p. 5)

The advent of classical physics created a chasm between science and spirituality; essentially, classical physics isolated the intellect from the soul. For nearly three centuries, classical mechanics was the prevailing scientific thought structure that framed the human understanding of reality based on an intellectual dictate (objective logic and reason), which functioned autonomously from the awareness of human senses and experience. Henry Stapp (2011) argues, "It is three hundred years of indoctrination with mechanistic ideas that now makes puzzling a conception of ourselves that is fully concordant with both normal human intuition and the full range of empirical facts" (p. 7).

III. THE BIRTH OF QUANTUM PHYSICS

In 1900, German theoretical physicist Max Planck hypothesized "that the energy carried by electromagnetic waves [light energy] could only be released in 'packets' [quantized form] of energy" ("Photoelectric effect," nd). In 1905, Albert Einstein advanced this hypothesis with the publication of his paper on the photoelectric effect, which explains the data from Heinrich Hertz's 1887 research on the photoelectric effect. Einstein's theory supports Planck's hypothesis that light energy is carried in discrete quantized packets: that light is made of particles. These ideas were so impactful on the scientific community that Planck's theory, regarded as the birth of quantum physics, earned him the Nobel Prize in 1918, and in 1921, Einstein was awarded the Nobel Prize in Physics for his discovery of the law of the photoelectric effect.

There were other renowned physicists during the 1920s that were instrumental in pioneering the birth of quantum theory. Most notably:

- Niels Bohr, who conceived the *principle of complementarity*, stating energy could behave like waves or particles;
- Werner Heisenberg, known for his *uncertainty principle,* which purports there is always an element of uncertainty when characterizing quantum entities (or, more simply, that one cannot get exact measurement of both position and momentum of a particle at the same time);
- Wolfgang Pauli, who formulated the *exclusion principle*, which says two identical particles cannot occupy the same quantum state within the same quantum system simultaneously; and
- Erwin Schrödinger, who developed the equation that calculates the quantum mechanical wave function of a system and how it changes dynamically in time (actualization and impermanence).

Each of these men received a Nobel Prize for his work in the foundation of quantum mechanics and helped to refine the scientific understanding of the quantum world. Leon Lederman (contemporary experimental physicist and Nobel Laureate) says in his 2011 book, *Quantum Physics for Poets*, that the "physicists of the early 1900s knew that the weird new quantum laws that ruled the atom were primary and fundamental to everything – everywhere in the universe" (p. 17). Dr. Lederman asserts that quantum physics is the child of the non-physical half of Cartesian dualism; it is a theory about the energy that makes up the

microcosm, which is the foundation for the macrocosm. The beauty of quantum philosophy is that it makes room for non-physical energy fields to exist, i.e., soul, conscience, and consciousness.

The Copenhagen Interpretation (of quantum theory), 1925-1927, devised by Niels Bohr and his co-founders of quantum physics, proposes that "particles do not exist until the act of observation" (Lederman, 2011, p. 275). This is a significant departure from classical physics, which is predicated on a universe that exists independently of observation. It is this proposition that allows for the existence of something in our being that has a function other than as a participant in the outer material world, a function other than as a "cog in a giant machine" (Stapp, 2011). Quantum theory gives birth to awareness, to the eye of the soul whose function is to observe.

IV. INTEGRATION OF THE QUANTUM WORLD

The advent of quantum theory in the 20th century initiated a deep philosophical paradigm shift in how we understand the natural world. This new theory of physics, which claims that energy is transmitted in sub-atomic bits and pieces that do not exist until observed, is severely incompatible with the classical model that considers energy to be physical, deterministic, and continuous. As Leon Lederman (2011) points out, "The conceptual difficultly here is the importance of the observer" (p. 275). Lederman further suggests that the arrival of an observer creates "a tinge of subjectivity that makes scientists very uncomfortable" (2011, p. 275).

Classical theory is predicated on the idea that the universe is a mechanical object that exists independently and outside of us, that space and time are separate, absolute, and unchanging. The equations of classical mechanics, supporting the solidity of a macroscopic outer world, are precise in measurements. Quantum theory, conversely, examines the non-physical, microscopic, inner world that is uncertain and imprecise in measurement and is predicated on the idea that the universe does not exist until observed. Quantum mechanics incorporates Einstein's postulate from his theory of special relativity that space and time are not separate; there is only space-time, which is a continuum.

The difference between the exactness of the objective universe of classical mechanics and the inexactness of the subjective universe of quantum mechanics allows for something other than a physical outer world to exist. This difference opens the door to our "inner world," the place that holds our connection to the unifying energy field of consciousness, home of the soul. According to Gary Zukav (2001), "[quantum] physics is the study of the structure of consciousness" (p. 34), thus making quantum theory the foundation of our inner world. Soul is the nucleus of our being, the nucleus of our inner world that exists in this quantum energy field of consciousness.

V. THE WAVE-PARTICLE DUALITY

One of the most famous experiments in physics is the double-slit experiment, or Young's experiment. This experiment was conducted during the reign of classical mechanics, a time when light was thought to be particles, not waves. Newton's postulate that light was made up of particles was the accepted and prevailing thought of the time. In 1801, seventy years after Newton's death, Thomas Young used the double-slit experiment to demonstrate the wave behavior of light.

What the Young experiment demonstrated is that when light passes through one slit, the pattern formed on the screen is a single bar. When a second slit is added, the pattern that forms is an alternating pattern of light and dark bars. The light bars are the result of the crest of two different waves combining, and the dark bars are the result of the crest of one wave combining with the trough of another wave, thus canceling each other out. The alternating pattern of light and dark bars is the *wave interference pattern*. This experiment had a significant impact on the science community, which at the time operated under Newton's premise that light was made up of particles. The result of the Young experiment has become known as *classical wave behavior*.

One hundred years later, the pendulum of thought regarding light as either particle or wave swung back the other way when Plank and Einstein were awarded the Nobel Prize for Physics by showing that light seemed to behave as a discrete particle (photon). This shift in thought led Erwin Schrödinger, in 1926, to formulate a *wave theory of particles* expressed in the language of mathematics that could explain the results of the Young interference pattern.

The 1801 Young experiment projected the wave interference pattern of light after passing through two slits as a fringe pattern of light and dark bars appearing across the screen. When the experiment was conducted again, what was witnessed was astounding. Taking the double-slit experiment a step further, a photon detector was added, allowing for observation/measurement of the photons as they approached and passed through the two slits. Unlike the classical *wave*

interference pattern of light and dark bars across the screen that formed during Young's experiment, the result from this experiment revealed a projected pattern of just two light bars. The only difference between this experiment and Young's experiment was the addition of the photon detector at the slits.

Removing the photon detector, the experiment results again appeared to be the same as the Young *wave interference pattern*, projecting a fringe of light and dark bars across the screen. Again, startling results. The experiment was re-tested by adding back the photon detector. The photon detector observed the light approaching the panel with slits, then observed how each individual particle either went through one slit or the other. Once more, with the addition of the photon detector observing the light as it passed through the detectors, the formed particle pattern of two light bars appears. Without observation, what forms is the classical wave behavior; with observation, what forms is discrete particle behavior. Jim Al-Khalili, British theoretical physicist, quotes Richard Feynman (Nobel laureate) regarding the double-slit experiment as saying, "this is the central mystery of quantum mechanics" (as cited in The Royal Institution, 2018).

The double-slit experiment proved that light travels in both waves and particles. When light travels in waveform, there is a *wave interference pattern*. When observed light travels in particles, the waveform has collapsed and there is no interference pattern. In 1927, the experimentation of Davisson and Germer revealed that electrons demonstrate the same behavior as photons; later, this was found to be true for atoms and molecules. Herein lies the great mystery: what is it about the act of observing that caused the waveform to collapse into particles? How does the particle know it is being observed? How does the particle choose which slit to pass through?

VI. SUMMARY AND CONCLUSION

The double-slit experiment reveals that the smallest piece of matter that makes up our existence can be discerning; it has the ability to choose which slit to go through. Even this quantum piece of matter is aware that it is being observed, signifying there is a field of consciousness, which it is connected to. Jean Houston, American author and activist in the *Human Potential Movement*, writes:

> Quantum theory demands a radical re-visioning of the role of consciousness as the underlying organizing principle of the universe. With this understanding, quantum physics is introducing us to ways of seeing that profoundly impact human thinking, feeling, sensing, knowing, and being. (as cited in Laszlo, 2016, p. 5)

Everything in our world, animate and inanimate, is a manifestation of quantized energy. Hungarian-American theoretical physicist and Nobel laureate Eugene Wigner (1997) says, "Present quantum mechanics is based solely on phenomena involving inanimate objects" (p. 55). Inanimate objects are composed of these elementary particles that the Copenhagen Interpretation claims do not exist until observed, which is explained by Schrödinger's equation using the double-slit experiment revealing the transition of a wave into existence as a detectable particle.

Quantum theory/quantum mechanics/particle physics is fundamentally about existence. At the center of our existence is the soul, the nucleus of our being composed of elementary particles, a form of energy that cannot be destroyed, only transformed, with freewill to be discerning. Spiritual transformation occurs as the soul becomes aware of itself. It is this evolution of soul that brings into awareness our existence as a spiritual being. Pierre Teilhard de Chardin says, "We are not human beings having a spiritual experience; we are spiritual beings having a human experience" (as cited in Graber, 2009, p.9). In the world according to Donna Hobbs, quantum physics is the bridge that reconnects science with spirituality.

Awareness functions as the spiritual eye of the soul. When the soul has evolved to the point that it is aware of itself as a spiritual being living as a three-dimensional human being with a body, mind, and soul, the observer comes into existence. The observer exists in the place between absolute and possibility, in the delta between exactness and probability. This place is known by many names: Chi, Tao, Eck, Nirvana, Noetic Realm, Quantum Realm, Christ Consciousness, Paraclete, Buddha Nature. Spiritual transformation is about the evolution of soul as it exists in a particle field of consciousness. Coming into the awareness that the observer exists is a manifestation of the evolution of soul. Observing our spiritual transformation is the actualization of our soul.

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