

Consciousness: From Reductive Physicalism to Ultimate Holism

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Abstract

In the reductive physicalist paradigm in mainstream modern science, consciousness emerges from random bits of energy/matter that bind together from lower-order parts into unitary biological organisms which somehow develop higher-order conscious control over the parts. How the closed causal chain unlinks and inserts a causally efficacious conscious mind is utterly mysterious. Consciousness must be epiphenomenal or non-existent, and thus a fundamental misperception. This paper summarizes a logically consistent alternative that incorporates progress over the past century in quantum, quantum gravity, and unified field theories extending into theorized subtle underlying nonlocal space and further into the ultimate holism of the unified field. Added to the reductionism and physicalism are real, non-local, non-physical levels of nature. These cutting edge developments – which have profound implications for addressing long-standing dilemmas in modern science such as the mind-body problem – are matching up with the consciousness-mind-matter ontology in the oldest continuous knowledge tradition of Vedic science.

Keywords: Consciousness-mind-matter ontology, unified field, big condensation, Vedic science

Consciousness in reductive physicalism: the parts create the whole

The reductive physicalist paradigm attempts to describe a clockwork-type causally closed physical universe (Hawking 2001), in which mind and consciousness have no actual ontological existence or causal role. In this bottom up matter-mind-consciousness ontology, lower-order quantized wave-particles somehow gain proto-conscious mentality and cohere into neural systems from which emerge higher-order conscious mind. From a functional emphasis within this paradigm, randomly fluctuating bits of energy/matter bind into highly ordered neural networks to generate consciousness when the parts are

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sufficiently complex. Accordingly, robots become conscious with fine-grained interactive referential networks, regardless of the construction materials. From a structural emphasis, even simple neuronal structures are inherently proto-conscious, becoming higher-order consciousness with increasingly complex referential networks. In the functional identity hypothesis, structure and function are identical in neurons and there is no objective-subjective gap – apparently where there are functioning neurons, there is some degree of consciousness. How this reconciles with the notions that some physical matter particles and cells appear to become proto-conscious while others don't, with extensive findings that most psychological processes appear to be unconscious in the normal functioning brain, and with the closed physical chain of cause and effect having no gap in which to insert an efficacious conscious mind are major concerns.

These theories are associated with a meaning of consciousness drawn from experience in the ordinary waking state, in which consciousness is present in waking and absent in deep sleep, coma, or anesthesia. Practically the entire enterprise of modern science is based epistemologically on logical reasoning and gross sensory experience shared by scientists in the ordinary waking state of consciousness; and there is virtually no recognition of this state-dependent limitation. The ordinary waking state is commonly defined in terms of the experience of being *conscious of* some outer object of experience. This is an objectified, representational, reflective mode of knowing in which there is a separate object of experience, process of experiencing, and experiencer. It directly relates to the pretheoretical assumption of the independence of observed and observer, objectivity and subjectivity, fundamental to the objective approach and its predominantly third-person perspective. In the past century, the new physics progressed beyond this pretheoretical assumption.

For example, a fundamental implication of quantum theory is that objectivity is not independent of subjectivity. According to orthodox interpretations of quantum theory, the conscious observer somehow effects the transition from quantum uncertainty to classical discreteness via instantaneous collapse of the quantum wave function upon observation (e.g., Herbert 1985). However, theoretical and empirical research in quantum theory now concerns subtler, entangled, nonlocal fields of nature and their relationship to mind and consciousness that reflect fundamental advances over orthodox interpretations of quantum theory. There is clear progress toward an ontologically real nonlocal level of nature underlying the physical.

Progress beyond orthodox quantum theory: local matter to nonlocal mind

Interpretations of quantum theory have gone beyond the original orthodox interpretation mentioned above that there is no quantum reality but rather only classical reality with a quantum description of it. Recent interpretations posit that quantum wave collapse is an *objective reduction* (Hameroff & Penrose 2000, Penrose 2005). The quantum wave

function is now theorized to collapse via interaction with the classical environment (quantum decoherence), which can occur independent of a conscious observer (Greene 1999, 2004, Smolin 2001, Penrose 2005). This implies that both quantum and classical objects relate to real levels of existence, and moreover that they causally interact. Recent 'no collapse' interpretations of quantum theory also can be understood to imply that mind and consciousness do not emerge at the classical level of neural functioning, but at even more fundamental theorized levels. In the 'many worlds' version, a new mind-world is created instantaneously for every possible outcome of an observation; but the observer doesn't cause them, and can only observe one of them (Everett 1957). However, this interpretation is perhaps best understood as a heuristic that otherwise violates the laws of conservation. In proposing *instantaneous* unmediated change, neither the orthodox interpretation nor the 'many worlds' interpretation offer even the possibility of any causal mechanics for wave-function collapse upon observation or for the creation of mind-worlds.

These interpretations of quantum theory are artifacts of subjective mathematical models imposed upon the objective world. However, more recent interpretations go beyond even the notion of wave function collapse. Wave function 'collapse' is starting to be viewed as a change of the inner knowledge state of the observer due to an observation with little if any causal influence on the objects being observed (Fuchs 2001). Importantly the mathematical wave function model is becoming conceptually disembedded from the theorized real particle and wave levels of nature. According to these views, matter and mind interact at even deeper levels. To exemplify using the Schrödinger's Cat paradox, it is not that the cat is in a superposed alive-not alive state until observed, but rather that the observer's knowledge of the cat's state is probabilistic and uncertain until it is observed. The theorized quantum wave function 'collapse' is not causal of the quantum 'object' becoming a classical physical object due to observation by an individual conscious observer. Even further, it is proposed that there is neither a subjective nor objective instantaneous 'collapse' from quantum to classical reality. In these views, there is the classical particle level of nature and the quantum wave-field level of nature, both of which are real and differ from the even subtler subjective knowledge state of the observer. To resolve the Schrödinger's Cat paradox, recognition is needed of these different ontologically real levels of nature, related to emerging theories of levels of space (Greene 1999, 2004, Smolin 2001, Boyer 2008).

Progress toward subtler, ontologically real, nonlocal levels of space that are deeper than physical existence is evident in theories of quantum gravity. For example, string theories propose six or seven higher dimensions, in which strings vibrate. Although these higher dimensions are additional mathematical degrees of freedom proposed to explain string motion, they also are conceptualized as higher spatial dimensions (Greene 1999, Randall 2005). Geometric 'objects' such as strings and branes in compactified higher-dimensional space are theorized to be the source of physical objects in ordinary space (Greene 1999). This implies causal interactions between material objects in physical space and geometric 'objects' in conceptual, mathematical space. Superstring M-theory also posits zero-branes

that imply a real field underlying matter. Further, precise mathematical formulations in loop quantum gravity theory and black hole thermodynamics posit a *pure geometry of quantized information space* as the source of physical space-time (Smolin 2001). These theories propose an ontologically real information space that underlies and generates ordinary space-time.

The neorealist interpretation of quantum theory based on Bohmian mechanics goes even deeper into nature, proposing a *sub-quantum* reality. This interpretation is consistent with Einstein's notion of 'hidden variables' associated with his belief in the incompleteness of orthodox quantum theory (Bohm & Hiley 1993, Talbot 1991). It offers a deterministic mathematical model of elementary particles as ordinary classical objects with intrinsic dynamic properties (not occurring as a result of observation or measurement) that match the probabilistic predictions of quantum theory. This is accomplished via the addition of an underlying, ontologically real, nonlocal wave field – the quantum potential or *psi wave* (Bohm 1980, Goldstein 1998). In this theory the indeterminacy of dynamic properties of quantum phenomena is not due to an inherent uncertainty – the Heisenberg uncertainty principle – but rather to unfathomable complexity, as in classical uncertainty. Importantly determinism, causal efficacy, and objectivity independent of conscious observers are all extended beyond the quantum level of nature. It proposes that a subtle, underlying, nonlocal, non-material pilot wave causally guides the motion of real local particles. Elaborations of this interpretation associate this proposed subtler wave field with a causally efficacious level of nonlocal mind, called the *implicate order* (Bohm 1980, Bohm & Hiley 1993). In distinguishing a grosser classical explicate order and a subtler non-classical implicate order, however, both are understood as aspects of an *ultimate holism*, what might be called a super-implicate order akin to unified field theory (Bohm 1980, Bohm & Hiley 1993).

These cutting edge interpretations of quantum theory are moving toward defining a causal connection between the real, local field of matter and an underlying real, quantized information space (Smolin 2001), and further a nonlocal, non-quantized field of mind or abstract mental energy wave field (Bohm 1980, Bohm & Hiley 1993). In the transition from matter to mind, reductive physicalist theories in which mind and consciousness are products only of neural functioning at the much grosser macroscopic classical level of the brain are giving way to more comprehensive theories of subtler levels of nature that are ontologically real. The belief that brain and mind are just in the head is no longer tenable, because minds, brains, and all material objects can no longer be understood or described as just the localized matter of our ordinary physical world.

Nonconventional space-time underneath the Planck scale

Some quantum field theories posit that nature is unified at the level where the fundamental forces merge into a single field at the Planck scale (10^{-33} cm) – the hypothesized level of super-unification (Greene 1999, 2004, Hagelin 1987, 1989). In this view there is either

motion within the speed of light and the light cone (relativity theory) or unmediated quantum mechanical tunneling that instantaneously ports objects between relativistically undefined regions of space-time outside the light cone (quantum theory) without traveling in between (Greene 1999). On the other hand, in Bohmian mechanics, for example, the subtle psi wave field *mediates* nonlocal effects (Bohm & Hiley 1993). In this theorized nonlocal wave field, motion is faster than light-speed but not instantaneous (Greene 2004, Bohm & Hiley 1993), and not via the particle interaction model of causality. A distinguishing feature of this theorized subtler underlying and permeating field would not be its dimensionality in ordinary conventional physical space but rather its nonlocality, entanglement or interconnectedness, in a more fundamental field of ‘nonconventional’ space.

Nonconventional space would be *both smaller and bigger* than any aspect of physical existence. It would be hidden with respect to conventional space, not due to being higher-order compactified dimensions as in string theories but rather because it permeates and encompasses ordinary space and all matter in it. It would not be compactified but rather unfurled and much more extensive than relativistic, quantized, conventional space. The notion of space is starting to be conceptually disembedded from Einstein locality and gravity, light-speed and the light cone, Planck scale quantization, and the particle interaction model of causality. In this more abstract and expanded view, space and time can be conceived as the infinite eternal unified field, with levels, ethers, membranes, or mediums within it characterized by different degrees of limitation – analogous to air being subtler than water and earth, and space being subtler but permeating all of them. Mind would have nonlocal ‘extension’ in this subtler, more abstract nonconventional space, in which real but non-material ‘objects’ exist. These subtle phenomenal ‘objects’ can be understood to interact causally in the form of nonlocal, non-quantized waves of information/energy. In this perspective, light-speed (relativity theory) and Planck-scale quantization (quantum theory) both relate to textural qualities of the ether or medium of conventional space only. Subtler levels would not be characterized by these particular conditional limitations. This more abstract conception of space-time is consistent with the contemporary model of space as *flat*, in the sense of extending in all three directions without being curved. Theoretical physicist and string theorist Brian Greene (2004: 249 – 250) states:

Normally, we imagine the universe began as a dot...in which there is no exterior space or time. Then, from some kind of eruption, space and time unfurled... But if the universe is spatially infinite, *there was already an infinite spatial expanse at the moment of the big bang...* In this setting, the big bang did not take place at one point; instead, the big bang eruption took place *everywhere* on the infinite expanse. Comparing this to the conventional single-dot beginning, it is as though there were many big bangs, one at each point on the infinite spatial expanse. After the big bang, space swelled, but its overall size didn’t increase since something already infinite can’t get any bigger... [T]his example of infinite flat space is far more than academic...

[T]here is mounting evidence that the overall shape of space is not curved... [T]he flat, infinitely large spatial shape is the front-running contender for the large-scale structure of space-time.

The unified field as the lowest entropy, super-symmetric state of perfect order

In quantum field theory, space is *not* empty nothing; it at least contains vacuum fluctuations. With the advent of unified field theory, the universe is more appropriately viewed as manifesting from *something* – even from the source of everything. A key component of super-symmetric unified field theory is that the four fundamental force fields emerged through spontaneous sequential symmetry breaking as temperature dropped and the universe expanded (Greene 1999). This can be likened to phase transitions of H₂O condensing from steam to water to ice as temperature drops; at each stage, symmetry is reduced. In this view, the fundamental forces potentially *pre-existed* in the perfectly symmetric super-unified state. But also, as the source of continuously occurring quantum vacuum fluctuations, random jitters, zero point motion or inherent dynamism, the unified field continues along with the sequential symmetry breaking. If it continues even after the fundamental forces differentiated, then it is more than the unification of these forces. The underlying unity and perfect symmetry does not vanish when the diversity of symmetry breaking occurs.

In addition, the quantum mechanical principle of the unbounded quantum wave as a coherent state that decoheres through interaction with the classical environment is suggestive that fundamental quantum fields are associated with increased symmetry, coherence, and order (Greene 2004). Further, the notions that the unified field is the source of everything, the basis of all the laws of nature, and the origin of universal order throughout nature are consistent with the understanding that it is a field of highest or even perfect order. As well, the understanding that time is unidirectional (past to present to future, the ‘arrow of time’), and the second law of thermodynamics which states that change is from orderly states of low entropy to less orderly states of higher entropy, suggest that the origin and source of change in nature is a state of lowest entropy (Penrose 2005, Greene 2004). These points are crucial for understanding the source of order expressed in the laws of nature. In this view, order emerges from the perfectly symmetric lowest entropy unified field, not from *fundamental* randomness. If the universe were fundamentally random, any outcome would have equal possibility at any moment, making any consistency or patterns – and any science – incredibly unlikely (Smolin 2001). But ‘when’ the theorized big bang ‘began,’ an orderly temporal sequence also began. At least in the natural world as we understand it through science, an event manifests in an orderly manner from the previous event, consistent with the 2nd law of thermodynamics, decoherence, and the arrow of time (Penrose 2005), all of which imply that the source of the universe is a state of lowest entropy.

Unified field, Higgs field, and cosmological theories

To explain symmetry breaking of the unified field and condensation into particles with mass, the theory of *Higgs fields* developed in recent decades. This theory is considered to be one of the most important concepts proposed in the past century in theoretical physics (Greene 2004). It posits that in the third phase of symmetry breaking into the weak and electromagnetic forces, a Higgs field condensed to a nonzero value when the temperature of the universe dropped to about 10^{15} degrees, creating a Higgs ocean – analogous to steam condensing into water. The Higgs ocean can be described as a kind of viscosity (ether or medium) throughout space that resists change in motion, giving the property of *mass* to particles. Another Higgs field – grand unified Higgs – was proposed to explain the earlier second phase of symmetry breaking of the strong and weak nuclear forces. A third Higgs field was proposed to explain the first phase of symmetry breaking when gravity emerged. This first Higgs field relates to *inflationary big bang theory* (Greene 2004).

According to this theory, for an extremely brief time period of 10^{-35} seconds at the outset of the big bang, gravity became a repulsive force that drove the emerging universe into a colossal expansion (Guth 1997). This inflationary event functioned as a Higgs field – the inflation field – contributing a uniform negative pressure to space that produced a repulsive force so strong that the universe expanded by a factor as much as 10^{90} . This is much faster than light-speed but is thought not to be inconsistent with it, because light-speed applies to motion *through* ordinary space whereas inflationary expansion refers to the inflation *of* ordinary space (Greene, 2004). It also can be understood to imply a level of space involving motion faster than light-speed but not instantaneous, similar to the theorized level of the implicate order and psi wave field.

Inflationary big bang theory postulates a total amount of matter and energy in the universe that is considerably more than the tally of visible objects, which contribute about five percent of the total. Astronomical research suggested that additional matter is needed to hold galaxies together, which led to the theory of *dark matter*, estimated to account for an additional 25 percent. Observations that the universe is expanding based on measurements of the recession rates of supernova led to revival of Einstein's discarded notion of the cosmological constant, this time associated with *dark energy*. It was estimated that the rate of expansion requires a cosmological constant associated with an amount of dark energy that contributes about 70 percent of the total, which fits the remaining amount in inflationary theory (5% + 25% + 70%). Dark energy is associated with super-symmetry, for which there is yet to be empirical evidence in our familiar natural world.

But what triggered inflationary expansion? How did literally *nothing* blast out? An elaboration of inflationary theory proposes that the big bang emerged from a *pre-inflationary* period, in which the gravitational and Higgs fields were bumpy, chaotic, and highly disordered; and eventually a random fluctuation produced the values needed for inflationary expansion. But this certainly does not sound like everything came from *nothing*. Astronomer David Darling (1996: 49) states the point clearly:

What is a big deal is how you got something out of nothing. Don't let the cosmologists try to kid you on this one. They have not got a clue either... "In the beginning," they will say, "there was nothing – no time, space, matter, or energy. Then there was a quantum flutter from which..." Whoa! Stop right there... First there was nothing, then there was something. And the cosmologists try to bridge the two with a quantum flutter, a tremor of uncertainty that sparks it all... and before you know it, they have pulled a hundred billion galaxies out of their quantum hats... You cannot fudge this by appealing to quantum mechanics. Either there is nothing to begin with, no pre-geometric dust, no time in which anything can happen, no physical laws that can effect change from nothingness to somethingness, or there is something, in which case that needs explaining.

How inflationary cosmology reconciles with theories of the unified field is of concern. If the unified field is the state of lowest entropy, then the theory of the pre-inflationary period that low entropy came from inflationary expansion suggests the inconsistency that something existed prior to the unified field. Also of concern is how the pre-inflationary period reconciles with quantum gravity theories that posit information space or some form of higher-dimensional space generating physical space. Information space is not characterized as just a bumpy, chaotic, randomly fluctuating field. It at least suggests order, in the sense that it is theorized to generate the functional structure of physical space-time and all matter in it.

A more integrated way of looking at these issues is to consider pre-inflationary theory as another angle in the attempt to understand the subtle, non-local, non-material domain of nonconventional space underlying the Planck scale. This subtle level as a pre-inflationary period or 'pre-conventional' level would include the order in nature that forms the gravitational field, Higgs field, and inherent dynamism. Cosmological and field theories attempting to account for these fundamental fields and dynamics, taken together, can be viewed as progressing toward three ontological domains of nature: 1) local, physical, conventional space-time characterized by Einstein locality and Planck-scale quantization associated with the explicate order; 2) subtler, non-material, nonlocal, nonconventional field space associated with nonlocal mind and the implicate order; and 3) the lowest entropy, super-symmetric, infinitely self-interacting, all-encompassing unified field of nature (Boyer 2006, 2007, 2008).

Space-time as the infinite eternal unified field may not 'blast out'

In holistic unified field theory, nature condenses via spontaneous sequential symmetry breaking into increasing localization, discreteness, and mass. In the framework of levels of space-time introduced above, gross conventional and subtle nonconventional levels of space are phenomenal limitations of the underlying unified field that is

already present everywhere. Space does not begin at a point and expand out in all directions from an inert Planck-size quantum, an almost infinitely dense singularity, or literally nothing blasting out in a big bang (Greene 1999). Rather, infinite space and eternal time phenomenally condense many ‘points’ simultaneously (everywhere). Consistent with this holistic view, there might be individual big bangs with respect to specific black holes in conventional space-time. But with respect to the entirety of cosmological existence, the ‘Big Bang’ would not be an explosion but an implosion or condensation, because everything resulting from it remains inside the unified field. It would not create space-time, but rather be a limitation of the infinite eternal unified field – perhaps a ‘Big Condensation,’ but certainly not a ‘Big Bang’ inexplicably emerging from literally nothing (Boyer 2007).

Consciousness, the Veda and the unified field: the whole creates the parts

The trinity of ontological domains of nature described above is consistent with the consciousness-mind-matter ontology of holistic Vedic science (Boyer 2006, 2008). The word *Veda* is associated with the totality of nature – total knowledge. Vedic science begins with ultimate unity or wholeness; the whole creates the parts, and the parts remain within the whole. The ultimate whole is simultaneously *smaller than the smallest and bigger than the biggest* (Katha Upanishad 1.2.20, Nader 2000), beyond ultimate reductionism and holism.

In distinct contrast to the bottom up matter-mind-consciousness ontology of reductive physicalism, in Vedic science as systematically unfolded in Rik Veda, phenomenal nature condenses within the unified field or universal Being – from higher-order holism to lower-order inert parts. It is consistent with sequential symmetry breaking, quantum decoherence, the ‘arrow of time,’ and the second law of thermodynamics that imply the universe emerged from the lowest entropy, super-symmetric ground state of the all-encompassing unified field, the source of everything.

This top down consciousness-mind-matter ontology has the task of explaining how the parts emerge from the whole. It also needs to explain how a considerable portion of phenomenal nature appears not to be conscious, if everything is ultimately the unified field of conscious universal Being. This is opposite of the impossible task in reductive physicalism to explain how inert randomly fluctuating particle-forces emerging from nothing create conscious beings with unitary causal control over their parts in an unbroken deterministic causal chain that existed long before conscious minds came into existence.

In the completely holistic view of Vedic science, the transcendent, *indescribable* unified field can be described as inherently conscious, orderly, and dynamic – extending from the totality of Being to the phenomenal appearance of no consciousness, no intelligence, and no life at the grossest level of inert matter such as

rocks and earth. Remaining nothing other than ultimate unity or wholeness at every level of nature, its phenomenal expression is perceived in terms of levels from the most to least reflection of the ultimate unity. Infinity is the basis of space, eternity is the basis of time, and immortality is the basis of mortality. The contrasting reductive physicalist view in modern science and the completely holistic view in Vedic science are reconciled in the natural development of higher states of consciousness. Systematic technologies in the Vedic science of Yoga are said to be natural means to develop higher states of consciousness for direct empirical validation of the ultimate holism or unity of nature and the consciousness-mind-matter ontology.

Practical applications: the Vedic developmental technology of Yoga

For many centuries Vedic science remained in obscurity and was largely considered irrelevant to daily life. It was classified as mythological, pre-scientific, and only of historical significance. This was the result of investigators not conducting sufficient empirical research to validate Vedic knowledge in the inner laboratory of their own minds using the systematic subjective technologies it contains. While the philosophical depth and influence of ancient Vedic science were noted, its practical developmental technologies were not applied or even properly understood. In recent years the work of foremost Vedic scientist and educator His Holiness Maharishi Mahesh Yogi has been invaluable for reestablishing the completely unified value of ancient Vedic science and reviving its practical applications in the language of modern science, as *Maharishi Vedic Science and Technology*.

This approach applies systematic replicable subjective means of gaining knowledge to develop the mind directly – first-person direct empirical experience, in addition to the indirect third-person objective approach within ordinary developmental limitations that has characterized objectified modern science. It emphasizes the fundamental principle that ‘knowledge is different in different states of consciousness (Maharishi 1972). Our state of consciousness determines our view of the world. The type of separation of objectivity and subjectivity in the objective approach of modern science is identified as a defining feature of the ordinary waking state of consciousness, in which knowledge and experience of nature are fragmented, partial, ungrounded, and lacking fundamental unity – even essentially random and existentially meaningless.

In the reductive perspective, space is conceptualized in terms of the measurement of distance and time in terms of duration. This is associated with the ordinary function of intellect that delineates, analyzes, and enumerates the phenomenal parts of nature – sometimes called *Buddhi* in Vedic science. When the phenomenal parts of nature are experienced as primary, the essential wholeness, unity, or totality is lost – called *Pragya aparadh*, the *mistake of the intellect*. Development of higher states of

consciousness is said to reestablish wholeness, oneness, or ultimate unity as the natural primary experience of being (Alexander *et al.* 1987, Nader 2000, Boyer 2008).

Transcendental consciousness: direct experience of unity

The objective means of gaining knowledge is described as a rigorous focus on outer tangible observables. In the past century, however, modern science has progressed far beyond tangible, directly observable sensory phenomena, and has been relying more on indirect investigations as well as mathematical principles such as symmetry. This places more emphasis on logical reasoning, as in mathematical modeling, in formulating consistent scientific theories (Smolin 2001, Penrose 2005, Boyer 2007). However, as with sensory observations, reasoning processes still involve active mentation. Thinking – whether concrete or abstract, whether of matter, energy, nothing, the unified field, or God, as well as introspection, self-reflection, or being mindful of some object of experience – tends to keep the thinker in the mental activity of ordinary waking experience. Within this active mental state, the inner silence of *transcendental consciousness*, the ground state of the mind, is rarely attained or understood (Maharishi 1963, 1967).

A reliable technology drawn from Vedic science for effortlessly settling down and transcending all mental activity to experience directly its underlying universal ground state, transcendental consciousness, has been taught by Maharishi since the 1950s. This systematic procedure, known as the *Transcendental Meditation™ technique*, is said to be an effective means through which the gap of empirical experience leading to these divergent reductive and holistic views of consciousness is naturally bridged. A large body of research on the psychophysiological, physiological, and behavioral correlates of Transcendental Consciousness has accumulated in refereed scientific journals (Scientific research – Collected papers, Vols. 1-5, 1977-90). This research corroborates ancient Vedic references on the transcendent state as a *fourth state of consciousness* distinct from the ordinary three states of waking, dreaming, and deep sleep – described as the active ingredient in naturally fostering human development to higher states of consciousness (Boyer 2008).

The *hard problem* of consciousness is due to lack of the application of systematic reliable means to isolate consciousness from the mental activity of ordinary waking experience. Without direct experience of consciousness itself, it is habitually embedded in individual active mentation and is thought to be a conceptual construction in some yet to be identified brain function – rather than the brain as a gross material transducer of nonlocal consciousness (Boyer 2008). In holistic Vedic science the physical brain and body do not produce consciousness, but rather just the opposite: consciousness creates mind and body – the consciousness-mind-body ontology. Mind and body *localize* consciousness into a *state of consciousness* in the individual. Both the universal, unbounded, non-contextual and the individual, bounded, contextual levels of experience need to be incorporated into an inclusive definition of consciousness, such as in this direction (Boyer 2008):

Consciousness is wakefulness, alertness, or awareness itself; in its simplest self-referral state it is the unbounded, universal, transcendental essence of phenomenal nature, and in the ordinary waking state it is the bounded, individual, object-referral awareness of some object of experience in nature.

Conclusion: validating the consciousness-mind-matter ontology

The paradigm shift from the reductive physicalist matter-mind-consciousness ontology to the holistic consciousness-mind-matter ontology has profound implications for understanding the foundations of reality and making progress on long-standing dilemmas in modern science, the most significant of which directly concern the relationship of matter to mind and consciousness. It promotes a rational understanding of systematic technologies drawn from ancient Vedic science that naturally settle down the mind to its ground state in transcendental consciousness, direct experience of the unified field of consciousness – like a wave settling back into the ocean. It is said to offer reliable systematic means for direct empirical validation of the consciousness-mind-matter ontology, and for integrating reductive physicalism into ultimate holism.

References

- Alexander CN, Boyer R, Alexander V, 1987. Higher States of Consciousness in the Vedic Psychology of Maharishi Mahesh Yogi: A Theoretical Introduction and Research Review. *Modern Science and Vedic Science*, 1(1), 89-126.
- Bohm D, 1980. *Wholeness and the implicate order*. Routledge & Kegan Paul, London
- Bohm D, Hiley BJ, 1993. *The undivided universe*. Routledge. London
- Boyer RW, 2006. The whole creates the parts: Debunking modern science of reductive materialism. *Proceedings of the Fifth International Conference of the World Association for Vedic Studies*, July 8-10, Houston, Texas, USA.
- Boyer RW, 2007. The big condensation—not the big bang. *Quantum Mind 2007: Conference Abstracts*. July, 34, Salzburg, Austria.
- Boyer RW, 2008. *Bridge to unity: unified field-based science & spirituality*. Unpublished manuscript.
- Darling D, 1996. On creating something out of nothing? *New Scientist*, Vol.151, No. 2047, 14, p. 49.
- Everett H 1957. *Review of modern physics*, 29, 454-462.
- Folger T, 2001. *Quantum schmantum*. *Discover*, September, 2001, p. 42.

- Goldstein S, 1998. Quantum theory without observers, *Physics Today*, March 98, 42-46. April 98, 38-42.
- Greene B, 1999. *The elegant universe: Superstrings, hidden dimensions, and the quest for the ultimate theory*. Vintage Books, New York
- Greene B, 2004. *The fabric of the cosmos: Space, time, and the texture of reality*. Alfred A. Knopf, New York.
- Guth AH, 1997. *The inflationary universe: the quest for a new theory of cosmic origins*. Perseus Books Group, Cambridge, MA.
- Hagelin J, 1987. Is consciousness the unified field? A field theorist's perspective. *Modern Science and Vedic Science*, 1(1), 29-87.
- Hagelin JS, 1989. Restructuring physics from its foundation in light of Maharishi's Vedic Science. *Modern Science and Vedic Science*, 3(1), 3-72.
- Hameroff SR, Penrose R, 2000. Conscious events as orchestrated space-time selections. In Shear, J. (Ed.) *Explaining consciousness—The hard problem*. Cambridge, MA: The MIT Press, pp 177-195.
- Hawking S, 2001. *The universe in a nutshell*. Bantam Books, New York.
- Herbert N, 1985. *Quantum reality: beyond the new physics*. Anchor Books, New York.
- Maharishi Mahesh Yogi (1963). *Science of being and art of living*. Age of Enlightenment Press, Washington, DC.
- Maharishi Mahesh Yogi 1967. *Maharishi Mahesh Yogi on the Bhagavad-Gita: A new translation and commentary, chapters 1 to 6*. Penguin Books, London.
- Maharishi Mahesh Yogi 1972. *Science of creative intelligence: knowledge and experience*. Syllabus of videotaped course. MIU Press, Los Angeles.
- Nader T, 2000. *Human physiology: Expression of Veda and the Vedic Literature*, 4th Edition. Vlodrop, The Netherlands: Maharishi Vedic University.
- Penrose R, 2005. *The road to reality: A complete guide to the laws of the universe*. Alfred A. Knopf, New York.
- Randall L, 2005. *Warped passages: unraveling the mysteries of the universe's hidden dimensions*. London: Penguin Books.
- Scientific research on Maharishi's Transcendental Meditation and TM-Sidhi programme—Collected papers, Vols. 1-5 (1977-90), (Various Eds.). Maharishi University of Management Press, Fairfield, IA:.
- Smolin L, 2001. *Three roads to quantum gravity*. Basic Books, New York.
- Talbot M, 1991. *The holographic universe*. Harper Collins Publishers, Inc., New York.