

THE WHOLE CREATES THE PARTS: Debunking modern science of reductive materialism*

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ABSTRACT

In the reductive materialistic paradigm still common in modern science, consciousness is theorized to be an emergent property of quantized parts or bits of matter/energy that somehow randomly bind into a unitary biological organism, which then mysteriously develops causal control over its parts. This fragmented perspective of the whole emerging from combining the parts—a bottom up, matter-mind-consciousness ontology—is backwards and leads to paradoxes it cannot solve, such as the 'hard problem' of consciousness; it is characteristic of reasoning and consensual validation based only on experience in the ordinary waking state of consciousness. Practically the entire empirical enterprise of modern science is a product of ordinary waking state experiences. There is virtually no recognition of this state-dependent limitation of modern science and how it results in fragmented knowledge and experience of nature. On the other hand, one only need investigate the holistic approach of Vedic science—the ultimate unity of nature in Vedanta and the sequential emergence of levels of nature within the ultimate unity in Sankhya—for a clear articulation of how the parts emerge from the whole. This top down, consciousness-mind-matter ontology is consistent with the fundamentally unified perspective in unified field theory, spontaneous symmetry breaking, quantum decoherence, the 'arrow of time,' and the 2nd law of thermodynamics. The application of holistic Vedic science in Yoga provides systematic means to develop a completely unified experience of nature. This unified field-based Vedic perspective has profound implications for understanding universal order in nature, and for systematic technologies to fulfill the theme of this conference of global harmony and peace.

Keywords: Vedic science, consciousness, peace

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1. INTRODUCTION

In our modern civilization, the pre-eminent means of gaining knowledge is the objective approach of modern science. This approach has produced a massive body of reliable knowledge and rigorous standard of validation, allowing us to progress quite a ways out of the shadows of superstition and toward deeper appreciation of universal order in nature. In applying this knowledge in everyday life, however, our inner subjective experience remains separate and isolated from the outer objective world. This fundamentally fragmented experience of nature is the main feature of the reductive materialistic paradigm. In this paradigm, the surface, objective level is the only 'real' level of nature; and daily life is bound to the superficial 'flatland' of material existence.

It is increasingly being recognized that this paradigm has contributed to a deep and unfortunate tear in the psychosocial fabric of modern civilization. It directly relates to the clash between existential meaninglessness in modern secular science and moral values in religion and spirituality; and it is associated with a philosophy of nihilism that fuels reactionary hedonism and violence in society. Also, its technological applications have resulted in grave threats to our fundamental security, such as in atom and gene splitting that present us with the risks of nuclear annihilation and permanent loss of our natural genetic inheritance. Applying the reductive materialistic paradigm, modern science has become powerful enough to disintegrate us, but not powerful enough to *integrate* us.

This paper summarizes a rational, logically consistent, and more comprehensive scientific alternative to reductive materialism drawn from holistic Vedic science. Consistent with core principles in unified field theory on the forefront of modern science, it describes phenomenal nature in terms of a consciousness-mind-matter ontology.

1.1 Consciousness in reductive materialism: the parts create the whole

Reductive materialism also has constrained scientific theories of consciousness. In this paradigm, consciousness is an emergent property of complex functional organization in cellular and molecular structures of the brain [1, 2, 3, 4]. At deeper elemental, atomic, subatomic, and quantum levels, physical systems follow invariant laws of nature believed to be fundamentally random, meaningless quanta. While modern science has strengthened belief in universal order, curiously this belief extends neither to the most fundamental levels of nature identified in modern science (quantum randomness), nor to the subjective domain of consciousness (unreliable subjectivity).

The reductive materialistic paradigm attempts to describe a completely closed causal nexus of a clockwork physical universe, in which consciousness has no place or role as an ontologically real level of nature. How a conscious observer could have causal efficacy in the closed physical chain of cause and effect is utterly mysterious. Although consciousness is theorized to emerge from neural complexity, it ends up being epiphenomenal and powerless, if existing at all. This paradigm is associated with other fundamental paradoxes unanswerable within it, such as order emerging from random disorder, life emerging from non-life, and ultimately everything emerging from *nothing*.

1.2 Scientific consensus is based on subjective agreement

The objective approach in modern science focuses on ordinary sensory experience and reason as the basic means of gaining knowledge. Experience relates to careful observation of natural phenomena presented to the ordinary senses; reason relates to rigorous mathematical logic to analyze and predict them. Abstract reasoning ability, the Piagetian stage of formal operational thought, is theorized to be the necessary

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developmental basis for scientific thinking [5]. In order to protect against unreliable subjectivity in experience and reasoning, the objective approach relies on consensual validation or public agreement among scientists. It is important to recognize, however, that scientific consensus is based on—and limited by—the level of coherent functioning in the scientists who contribute to it. Practically the entire enterprise of modern science is based on the level of reasoning and sensory experience shared by scientists based on the ordinary waking state of consciousness. Modern science is so engrossed in ordinary waking experience that there is virtually no recognition of this limitation of it.

The ordinary waking state of consciousness is characterized by the experience of being *conscious of* some object of experience. This is a representational, reflective mode of knowing in which there is a separate object of experience, process of experience, and experiencer. It is the experiential basis for the common definition of consciousness as being *conscious of* a separate object of experience. It directly relates to the pretheoretical assumption of the independence of the observed and observer, objectivity and subjectivity, that is fundamental to the objective approach and the reductive materialistic paradigm. In the 20th Century scientific understanding in the new physics has progressed beyond this assumption. Core aspects of the most successful theory in modern science—quantum theory—indicate that objectivity is not entirely independent of subjectivity. It is now recognized that a subjective conscious observer is fundamental to the processes of observation and measurement. This entails a major quandary. Neither of the two fundamental theories in modern science—quantum theory and relativity theory—are able to bridge the gap between the observed and observer, objectivity and subjectivity. But the *most* fundamental theory emerging in modern science—unified field theory—logically necessitates that this gap be bridged completely.

1.3 Unified field theory, the objective-subjective gap, and subtler nonlocal levels

Fortunately, the forefront of modern science has progressed to the stage where the fragmented shards of understanding of nature are beginning to recollect into a unified state. In this progress, modern physics is grappling with the enigma that *matter doesn't have a material basis*. It has come to the rational conclusion that the paradigmatic belief in materialism—a core feature for much of modern scientific history—is untenable at more fundamental levels of nature.

It is through investigating these more fundamental levels that major issues have arisen in quantum and unified field theories about the relationship of observed and observer, objective matter and subjective mind. Historically these issues were prominent in philosophy, associated with the *mind-body problem*, and more recently with the so-called *hard problem* of consciousness. They also are now recognized to be embedded in the *measurement problem* in the new physics and the *explanatory gap* between brain and mind in neuroscience. These key issues concern subtler, more interconnected levels of nature and their relationship to mind and consciousness. Though perhaps quite difficult to accept given the belief that there is nothing beyond material existence, there is clear progress in quantum, quantum gravity, and unified field theories toward subtler, nonlocal levels underlying material existence.

For example, interpretations of quantum theory have progressed from the original orthodox interpretation that there is no quantum reality (only classical reality, with a quantum description of it) to the notion that quantum wave collapse is an *objective reduction* in the real world [6, 7]. Also, the quantum wave function is now theorized to collapse through interaction with the classical environment (quantum decoherence) [8, 9, 10]. These points indicate that both quantum and classical objects relate to ontologically

real levels of existence, and moreover that they causally interact. The neorealist interpretation of quantum theory based on Bohmian mechanics goes further [11]. It describes an ontologically real field underlying material existence—associated with the concept of the quantum potential or *psi* wave. This interpretation proposes that a subtle but real nonlocal wave field guides the motion of real local particles. Elaborations of this interpretation associate this subtle field with a causally efficacious level of nonlocal mind. This progress in quantum theory represents major steps toward acknowledging a subtle level of nonlocal mind that has an ontologically real place and causal role in nature [11].

Similar progress in the direction of a subtler nonlocal reality is reflected in theories of quantum gravity. String theories propose six or seven higher dimensions in which strings vibrate. Although these higher dimensions are additional mathematical degrees of freedom proposed in order to explain the motion of strings, they are conceptualized also as higher spatial dimensions [8]. This higher dimensional space is associated with terms such as mathematical space, conceptual space, configuration space, field space, imaginary space, hyperspace, phase space, nonconventional space, information space, and even mental space and quantum mind. Geometric objects such as strings and branes in higher dimensional space are theorized to interact with physical objects in ordinary space via the gravitational field. This implies causal interactions between material objects in physical space and mathematical ‘objects’ in conceptual space, blurring the distinction between them. Superstring M-theory also posits zero-branes in a non-commutative geometry that imply a real field underlying material existence [8]. 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 conventional space-time [10]. These theories not only propose an underlying field more fundamental than conventional physical space, but also that this underlying information space actually generates physical space-time and material existence.

These cutting edge scientific theories are inexorably moving toward defining a causal connection between the real, local field of matter and an underlying real, nonlocal field of mind [11]. In this transition from matter to mind, reductive materialistic theories in which mind and consciousness are products only of neural functioning are giving way to more comprehensive views of deeper levels of nature. Brain and mind are no longer just in the head, because brains, minds, and all material objects are no longer just localized physical matter, but rather are also more abstract but real nonlocal processes in a subtler underlying field of existence.

1.4 Nonconventional space-time underneath the Planck scale

Unified field theories generally posit that the unification of all of nature is 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 [8, 9]. This also has been theorized to be the field of quantum gravity that is fundamentally discrete or quantized, providing a model of a unified basis for material existence [10]. But it doesn’t provide a model of a *completely* unified field. If the unified field were to be completely undifferentiated in its unity, it would have to underlie any discrete, quantized field, including the field of quantum gravity. Abstracting matter into an extra-dimensional space or pure geometry of quantum information bits (qubits) also doesn’t yet describe a *unified field*. There needs to be some level at which discontinuous quantum bits merge into a continuous wholeness if there is a field beyond all gaps and boundaries, beyond all differences, completely unitary and one with itself. The quantum principle in terms of the Planck size ultimately cannot describe the most fundamental level if nature is completely unified.

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Whether the transition to unity is at the Planck scale or an even subtler level is quite important. This requires conceptions of space-time beyond classical relativity and quantum theories, which the more holistic theories noted above are formulating [9, 11].

In quantum field theory, space-time ends at the Planck scale and the concept of something smaller is meaningless—or at least undefined. In this framework, there is either motion within the limitations of the speed of light (relativity theory) or quantum mechanical tunneling that instantaneously ports objects between relativistically undefined regions of space-time, without traveling in between them (quantum theory) [8]. On the other hand, in the interpretation of quantum theory associated with Bohmian mechanics, for example, the subtle psi wave field mediates nonlocal effects [11]. This wave field would underlie quantum fields, including the gravitational field. It is a subtler, nonmaterial field of nonlocal mind, but still not necessarily the completely unified field.

This subtler, nonlocal field has been described as a field in which motion is faster than the speed of light, but not instantaneous [9, 11]. Deterministic, causal interactions in this subtle field are not the mechanistic, classical causality of local, relativistic space-time. It is associated with the concept of an underlying quantum mind or mental space characterized by nonlocality, non-instantaneity, and causal determinism—not by Einstein locality, the speed of light, and the Planck scale that characterize material existence [11]. The distinguishing feature of this subtler field may not be its dimensionality, but rather its nonlocality and interconnectedness. It would exist in between localized material existence and the completely unified field. *Subtler* than any aspect of material existence, it would be *both smaller and bigger* than the material level. It would be hidden not so much due to involving higher-order spatial dimensions, but rather because it is finer grained and permeating (but due to its nonlocal property, simultaneously larger) than conventional space-time and all material objects in it.

Another way of saying this is that there are levels of space-time, with conventional space-time being the grossest, most localized level [12]. The notion of space-time is disembedded from Einstein locality, the speed of light, and ordinary gravity. In this more abstract perspective, space and time can be infinite and eternal, with levels within them characterized by different limitations—analogueous to air being subtler than water, and space being subtler but permeating both air and water. In this perspective, mind has nonlocal ‘extension’ in *nonconventional* space—a subtler field or *ether* much more abstract than the conventional space-time defined by Einstein locality [11] and the Planck scale. This subtle, nonlocal field would have fewer limitations than the gross, local material level, but still some limitations—not the completely unified level of nature. It would be an intermediate level of existence in which real, non-material ‘objects’ exist, causally interacting with each other and with gross matter in the form of abstract, more holistic, nonlocal waves of information/energy that are not built of Planck-size quanta.

2. The whole creates the parts: the Vedanta perspective

A helpful strategy in building a more holistic understanding of levels of nature is to disembed from the reductive approach in which everything is brought down through smaller and smaller scales to nearly or apparently *nothing*. The reductive approach involves starting with ordinary sensory experience and then analyzing material objects to their most fundamental constituents. Through this strategy, we now are arriving at an intellectual understanding of real levels of nature beyond material existence. But still, the means of gaining knowledge is *objectified*—outside oneself—and maintains its strong habit of reductionism. This makes these more holistic theories quite challenging

to comprehend, and also has rendered the mind-body problem unanswerable. From the reductive perspective, it is impossible to build a coherent explanation of how the whole comes from the parts but gains top-down, causal control over the parts. The reductive perspective has things backward, or upside down—or outside in. Instead of the universe narrowing down to a non-spatial, infinitesimal point, such as in some ‘black hole’ theories, it appears to be just the opposite: there are deeper, subtler, increasingly expansive, more abstract, nonlocal levels of nature. In other words, it is helpful to add to the perspective that the whole is greater than the parts the perspective that the parts are lesser than the whole, especially concerning the ultimate wholeness of nature.

In addition to progress toward an ontologically real, nonlocal, highly interconnected field underlying material existence, there is theoretical progress toward the ultimate unity of all of nature in unified field theory. However, a major challenge of unified field theories emerging in the past decades is to integrate classical relativity theory with quantum theory [8]. This concerns some of the same issues in bridging the gap between objectivity and subjectivity, in the mind-body problem, and in the ‘hard problem’ of consciousness of how mind and consciousness relate to matter.

Unfortunately, modern scientific progress toward the ultimate unity of nature has been theoretical, only an ‘intellectual wholeness.’ It hasn’t included empirical validation of that unity in direct experience. The difficulty of bridging the gap between objectivity and subjectivity in a completely unified field theory is due to inability to experience the subtle levels of nature underlying the material level and systematically transcending them to experience directly their ultimate unified basis. This is the technological specialty of the holistic approach of Vedic science. It involves not only objective empirical research of the outer natural world, but also systematic subjective, empirical research in consciousness—in the inner laboratory of the mind.

2.1 The holistic perspective of Vedic science, Vedanta, and unified field theory

The great accomplishment of modern science of formulating theories of the ultimate unity of nature has established the theoretical basis for linking up with the most ancient continuous knowledge system of holistic Vedic science that directly accesses that unity. Only in recent decades has modern science glimpsed deeply enough into nature to be able to link up with this most ancient continuous knowledge tradition. Previously thought to be at variance with modern scientific accounts, ancient Vedic science has been supported by contemporary formulations that provide similar descriptions of an infinitely dynamic, self-interacting unified field at the basis of nature. The most parsimonious explanation for this correspondence is that the two traditions of knowledge converge on the same unified field [13, 14].

Vedanta is an aspect of holistic Vedic science from the directly experienced perspective of the ultimate wholeness and unity of nature. In this holistic perspective, the whole creates the parts. The phenomenal parts of nature sequentially emerge within the ultimate wholeness of the unified field. The whole precedes the parts, and is the basis of the parts: eternity is the basis of time, infinity is the basis of space, immortality is the basis of mortality. This subtle but profound change in perspective is logically consistent with understanding that is emerging in unified field and related theories.

For example, a key component of supersymmetric unified field theory is that the fundamental force fields (gravity, strong, weak, electromagnetic) emerge from the unified field through spontaneous, sequential symmetry breaking [8, 13]. This logically implies that the unified field itself is highly symmetric, even perfectly symmetric—a field of perfect order. Likewise, the notions that the unified field is the source of everything, the basis of

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all the laws of nature, and the origin of universal order throughout nature also imply that it is a field of perfect order. The quantum mechanical principle of the unbounded quantum wave function as a coherent state that decoheres through interaction with the environment also suggests that fundamental quantum fields are associated with coherence and order [9]. It is recognized as well that time is unidirectional—past to present to future—related to the 2nd law of thermodynamics which states that nature moves from orderly states of low entropy to less orderly states of higher entropy. This likewise implies that the unified field is a field state of lowest entropy [7, 9].

If the universe were *fundamentally* random, any outcome would have equal possibility at any moment, making any consistency through time incredibly unlikely [10]. But ‘when’ the big bang ‘began,’ an orderly temporal sequence also began. At least in the natural world we live in, an event manifests in an orderly manner in the context of the previous event, consistent with the 2nd law of thermodynamics, decoherence, and the arrow of time. This also strongly implies that the source of space-time at the beginning of the universe was a state of lowest entropy and highest order. It is consistent with the holistic Vedic understanding that the unified field is the perfectly orderly, unified totality of all the laws of nature within which all phenomenal diversity emerges [13].

From the holistic perspective of levels of phenomenal nature, gross is a limitation of subtle, and subtle is a limitation of the unified field; there is nothing outside of the unified field [15, 16, 17]. With respect to the entire cosmos, the big bang thus could be considered not an *explosion* but an *implosion* or *condensation*—because everything resulting from the big bang remains *inside* the unified field. The big bang would not create time and space, but rather be a phenomenal limitation of eternity and infinity. In the holistic perspective, dimensions of space and time in addition to the ordinary four dimensions may not be necessary to account for nonlocality. Subtle levels of nature don’t necessarily require spatial dimensions in addition to the ordinary three dimensions; they are limited phenomenal manifestations within infinity.

Because modern science is just now approaching the doorstep of the ultimate unity of nature in unified field theory, it initially might be difficult to accept that ancient Vedic scientists—Vedic *rishis*—had that knowledge long ago. Until recently ancient records didn’t seem, at least on their surface, to provide major answers supporting the thesis that the ancient records embody advanced scientific knowledge. Archaeological theories have fit these ancient records into a general view of history concluding that all ancient civilizations were at lesser developed stages of knowledge. While its philosophical depth and influence were noted, the practical technologies in ancient Vedic science were not recognized or applied. When that knowledge provided little practical value to daily life, it fell out of sight for millennia. In our modern times, the work of the world’s 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, as *Maharishi Vedic Science and Technology*.

2. 2 Sequential emergence of parts within the whole

The holistic approach of Vedic science begins with wholeness or unity, not with the tangible, fundamentally fragmented level of ordinary waking experience. If the ultimate unity is to be analyzed into parts, its first conceptual delineation is in terms of infinity of points in the undivided wholeness, each point containing the whole—infinately self-interacting. The intellectual delineation of undivided wholeness into parts is a duality of point and infinity, part and whole, with each part remaining the whole. In ancient Vedic science, this can be associated with the unmanifest level of *Veda* where the abstract

laws of nature are structured, and within which the subtle and gross levels of phenomenal nature sequentially emerge.

Sankhya is an aspect of holistic Vedic science that enumerates the sequential emergence of levels of nature within the ultimate unity—how the parts emerge from the whole. It identifies 25 categories or levels of nature, which manifest in a sequence from the undivided wholeness of the unified field. These 25 levels group into three basic domains: the unmanifest domain of the unified field or universal Self (Purusha/Prakriti), the subtle relative and subjective domain of mind (Mahat, Ahamkar, Manas, Indriyas, Tanmatras), and the gross relative objective domain of matter (Mahabhutas). This is associated with the consciousness-mind-matter ontology [18, 12].

In the reductive perspective, space is related to the measurement of distance and time to the measurement of duration. This perspective can be associated with the function of intellect, or discriminating mind—sometimes called *Buddhi* in Vedic science. In the holistic perspective, space ultimately refers to infinity and time to eternity. When the reductive perspective is experienced as primary and the holistic perspective is secondary, the wholeness or essential oneness of life is lost. This is called '*Pragya aparadh*,' the '*mistake of the intellect*.' In Vedic science, development of higher states of consciousness reestablishes wholeness or unity as the natural primary experience.

3. Practical applications: the technology of Yoga

For many centuries, Vedic science remained in obscurity as irrelevant to daily life, due to misinterpretation by scholars without the needed experience to interpret it in its totality. It was classified as mythological, pre-scientific, and only of historical significance. These investigators did not conduct sufficient empirical research to validate Vedic knowledge in the inner laboratory of their own minds using the systematic, subjective technologies contained in ancient Vedic science. Maharishi [19] points out:

“This tragedy is the fate of a path of knowledge based on direct experience when the means to that direct experience has been lost. Past attempts to interpret the *Vedas*, whose basic subject matter is the recorded experience of evolution through... (higher) states of consciousness, must obviously have been hopeless in the absence of any personal knowledge of these...states.”

Maharishi Vedic Science and Technology applies systematic, replicable subjective means of gaining knowledge to develop the mind directly—in addition to the indirect, objective approach that focuses only on outer-directed experience and reason within ordinary developmental limitations. It emphasizes the fundamental principle that ‘knowledge is different in different states of consciousness [20].’ Our state of consciousness determines our view of the world. Holistic Vedic science identifies the type of separation of objectivity and subjectivity fundamental to the objective approach of modern science as a characteristic feature of the ordinary waking state of consciousness that produces fragmented knowledge and experience of nature. It is associated with the reductive materialistic paradigm in the ordinary waking state. Maharishi [21] explains:

“Being objective in its approach, modern science brings only intellectual understanding about the functioning of the laws of nature. It does not penetrate into the life of the scientist. It does not integrate his personality. He can do some little jugglery here and there in the field of creation, converting this into that and that into this, but he himself is open to all kinds of destructive values because the modern approach to the investigation of natural law does not and cannot enable the scientist to imbibe knowledge and live it in daily life.”

3. 1 Pure consciousness: the direct experience of wholeness

In the objective means of gaining knowledge, the positivistic focus is almost entirely on outer, tangible observables. In the 20th Century, modern science has progressed far beyond tangible, directly observable sensory phenomena. This places more emphasis on reason, such as mathematical modeling, in formulating consistent scientific theories [7, 10]. However, reasoning processes still involve an active mental state. Thinking, whether concrete or abstract, whether of matter, energy, nothing, the unified field, or God—as well as introspecting about oneself—habitually keeps the thinker in the mental activity of ordinary waking experience. Within this pattern, the inner silence of *pure consciousness* is rarely experienced or understood. Maharishi [15, p. 394] explains:

“Underneath the subtlest layer of all that exists in the relative field is the abstract, absolute field of pure Being [pure, transcendental consciousness] which is unmanifested and transcendental... Experience shows that Being is the essential, basic nature of the mind; but, since It commonly remains in tune with the senses projecting outwards toward the manifested realms of creation, the mind misses or fails to appreciate its own essential nature, just as the eyes are unable to see themselves. Everything but the eyes themselves can be seen through the eyes. Similarly, everything is based on the essential nature of the mind...and yet, while the mind is engaged in the projected field of manifested diversity, Being is not appreciated by the mind, although It is the very basis and essential constituent.”

A fundamental tenet of Maharishi Vedic Science and Technology is that the unified field of nature is a field of consciousness that can be directly experienced as the source of both objectivity and subjectivity. This sharply contrasts with the reductive materialistic paradigm in which consciousness is a property of cellular and molecular levels of the brain and does not exist at more fundamental levels. In this holistic Vedic approach, the physical brain and body don't produce consciousness, but rather just the opposite; consciousness creates mind and body—the consciousness-mind-body relationship. Mind and body can be said to localize consciousness into a *state of consciousness* in the individual. The difficulty of resolving the 'hard problem' of consciousness has been due to lack of systematic, reliable means to isolate consciousness from the mental activity of ordinary waking experience. A reliable technology for effortlessly settling down mental activity to the ground state of the mind and experiencing pure transcendental consciousness, drawn from ancient Vedic science, has been taught by Maharishi since the 1950s. This systematic procedure, the *Transcendental Meditation™ technique*, provides a practical means through which the gap of empirical experience leading to these divergent views of consciousness is naturally bridged.

A large body of research on the psychophysiological, physiological, and behavioral correlates of pure, transcendental consciousness has accumulated over the past 35 years in refereed scientific journals [22]. This state has been distinguished from the three ordinary states of waking, dreaming, and deep sleep using psychophysiological and phenomenological criteria. This research corroborates ancient Vedic references on the transcendental state as a *fourth state of consciousness*, identified by terms such as *Atma*, *samadhi*, *turiya chetana*, *para chetana*, and *parame vyoman*.

3.2 Individual inner peace, the basis of collective peace

The aspect of Vedic science called *Yoga* has become popular in recent years, with growing interest in healthier lifestyles and the mind-body connection in preventive

medicine. The *Yoga Sutras* are said to stitch together the *union* of individual self and universal Self for perfection of the consciousness-mind-body relationship. Called *Sidhis*, they have been revived in the developmental technology of the *TM-Sidhi™ program*. The *Yoga Sutras* serve not only as means to develop higher states of consciousness, but also as *empirical tests* of the degree to which higher states are stabilized enough to have mastery over different laws of nature. In other words, they are to develop and to demonstrate mind over matter—and ultimately consciousness over mind.

Perhaps the most tangible of the *Sidhi* practices is ‘yogic flying.’ Sometimes thought to be an impossible violation of gravity, it is rather that more fundamental laws are activated that supersede ordinary classical gravitational effects—analogueous to quantum mechanical phenomena such as superfluidity or superconductivity that appear to violate classical laws. In our modern civilization, such demonstrations of mind over matter seemed to be only imaginary science fiction, or illusion and trickery. However, the scientific theoretical and experimental basis for such phenomena has now been established. In considering the possibility of this mind-over-matter effect, it is helpful to keep in mind that the state of *samadhi* or transcendental consciousness is described as direct contact with the unified field, the field of all possibilities. Even within rigorous scientific theory, anything is possible at the level of the unified field.

Practitioners of ‘yogic flying’ report inner bliss, lightness, and sometimes spontaneous energy and lifting up of the body in a hopping pattern (consistent with developmental stages described in Vedic literature). Electrophysiological recordings of this specific period show the highest levels of global EEG coherence in the brain. Maharishi [23] states:

“The body lifting up in the air by virtue of a thought...demonstrates the command of individual awareness over gravity...proof of our ability to function on the level which is completely free... The science is there...the technology is there...”

Extensive research has indicated that regular practice of these developmental technologies result in more coherent, orderly, and life-supporting mental and physical functioning. The associated deep state of restful alertness dissolves accumulated stress, strain, and fatigue and increases mind-body coordination, leading to increased ability to maximize mental potential to fulfill personal desires in accord with others. Less stressed individuals, with higher levels of coherent brain functioning, have a healthier influence on their surroundings. Individuals at peace on the inside naturally radiate a peaceful influence outside. The immediate environment feels calmer around an individual in a deeply settled, restfully alert state of meditation, and is more noticeable with a large group meditating together. Sometimes called the *Maharishi Effect*, this coherent, peaceful effect is recorded in *Yogi Sutra* 2.35 [24]:

“In the vicinity of Yogic influence—unifying influence, integrating influence, coherent and harmonious influence—conflicting tendencies do not arise.”

3.3 Experimental research on the Maharishi Effect

Over 50 studies on the *Maharishi Effect* have accumulated in leading scientific journals that evaluate the influence of coherence-creating groups on standard sociological measures of the quality of life in cities, nations, and the world [25]. Large groups of individuals practicing ‘yogic flying’ together have been shown to be associated with exponentially more powerful collective effects, evidenced by significant improvements in economic growth, health, crime rate, conflict, and other quality of life indicators. In some physical systems—such as magnetism, lasers, crystallization, and

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primary organizer cells in embryos—there is a phase transition to a coherent state when 1% of the elements in the system begin to function coherently. A similar field effect has been used to explain the Maharishi Effect [13, 17].

This collective coherent effect appears to radiate through a social population not based only on physical distance from the generating source, but also population density and possibly other psychosocial factors. The sociological nature of the effect, spreading through a social network but not via ordinary contact interactions or other physical means, suggests that a subtler causal process mediates the effect. A physical analogy for the effect is the quantum mechanical version of the *Meissner Effect*, associated with superconductivity and superfluidity [26, 13, 17]. In the case of the sociological effect, however, the mediating force field may be subtler. If the coherent effect is initiated from enlivenment of transcendental consciousness at the level of the unified field, it would have nonlocal distributive properties that first influence the subtle field of mind, and then extend into the objective levels of neural functioning and overt individual and collective behavior where the outcome variables are measured. This is consistent with the empirical findings that the distributional properties of the collective coherence effect don't seem to be localized in a manner that fits the field properties of any of the four fundamental forces. The gravitational force is too weak, the strong and weak nuclear forces function at too short of distances, and the electromagnetic force also is too weak (and is screened out by metal buildings).

The Maharishi Effect thus has been described as a unified field-based effect [13]. In this model, the individual enlivens the unified field of consciousness at the deepest level of individual being, which radiates through subtle nonlocal and gross local levels of nature to increase collective coherence. This provides a rational and plausible explanation for these extraordinary sociological findings, based on scientific principles that incorporate progress over the past century beyond reductive materialism to the more comprehensive and integrated unified field-based understanding of nature.

The research on the Maharishi Effect further indicates that the threshold for a coherent sociological influence is approximately the square root of 1% of a population practicing 'yogic flying' together—the technology that produces the most coherent brain state in the individual. The square root of 1% of the current world population is about 8000 individuals. The findings show that such a group can produce a coherent influence sufficient to change incoherent trends of conflict and violence toward global harmony and peace. Based on the carefully conducted and peer-reviewed research, Maharishi has called for a coherence-creating group or groups of 8000 practitioners as a systematic alternative to counteract terrorism, war, and weapons of mass destruction. A fraction of the military budget of any advanced country is sufficient to implement this technology; and it is the only theoretically coherent, empirically supported, and economically feasible proposal available [24].

Given the current volatility in our world family—with terrorist violence basically impossible to protect against—no defensive or offensive weapon system can keep us safe. Whether one understands or agrees with the theory, which is based on cutting edge unified field theory and nonlocality, the empirical evidence supports it as a practical means to create world peace. Inner peace is the basis of outer peace. Along with the old, costly, ineffective, and destructive strategies we continue to deploy—which may give some sense of assurance but also assures continuance of the problem—this new approach at the very least warrants further rigorous, full-scale field testing.

CONCLUSION

The change from the reductive materialistic matter-mind-consciousness ontology to the holistic consciousness-mind-matter ontology consistent with Vedanta has profound implications for understanding universal order in nature and applying it for individual and societal progress. It promotes a rational understanding and appreciation of systematic technologies drawn from ancient Vedic science that develop inner peace by naturally settling down the mind through the transcending process to its ground state, the unified field of consciousness. This state of inner silence naturally radiates a peaceful, coherent influence. Group practice of this systematic technology, including the TM-Sidhi of 'yogic flying,' produces a superradiance effect that has been validated through well-designed empirical research to change individual and collective trends toward global harmony and peace. Through reviving and applying the systematic holistic technologies in Vedic science that develop inner and outer peace in higher states of consciousness, our Age of Science is evolving into a genuine Age of Enlightenment.

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