

## The Big Bang

According to the consensus cosmological theory of the inflationary 'Big Bang,' the universe originated, presumably instantaneously from *nothing*, as an inherently dynamic, randomly fluctuating, quantum particle-force field that eventually congealed into stars, planets, and organisms such as humans complex enough to generate consciousness. This fragmented, reductive materialistic view is associated with a bottom-up matter-mind-consciousness ontology, in which the whole is created from combining the parts. In this view, consciousness is an emergent property of random bits of energy/matter that somehow bind into unitary biological organisms mysteriously developing control over their parts. On the other hand, the holistic perspective in Vedic science is a top-down consciousness-mind-matter ontology, in which the parts manifest from the whole. In that perspective, the origin of the universe is better characterized as the 'Big Condensation' rather than 'Big Bang.' Phenomenal existence remains within the unified field and manifests, limits itself, or *condenses* into levels of subjective mind and objective matter. The holistic perspective of ultimate unity and its sequential unfoldment is contained in the structure of Rik Veda.<sup>1</sup> *Vedāna* is from the experiential perspective of unity, and the sequential unfoldment of phenomenal levels within unity is articulated, for example, in *Sankhya* and *Ayurveda*. The holistic perspective is more consistent with developing understanding in unified field theories, spontaneous symmetry breaking, quantum decoherence, the 'arrow of time,' and the 2<sup>nd</sup> law of thermodynamics, which imply the universe originated from a lowest entropy, super-symmetric, even perfectly orderly, super-unified state. The holistic perspective in Vedic science provides means for resolving fundamental paradoxes in the reductive materialistic, bottom-up ontology — including the 'hard problem' of consciousness, order emerging from *fundamental* random disorder, life emerging from non-life, free will, and everything emerging from *nothing*.<sup>2</sup>

## 1. Introduction

The pretheoretical assumption of the independence of objectivity and subjectivity has been core to the objective approach in modern science. Progress in the 20th Century has gone beyond this assumption. For example, in the orthodox interpretation of quantum theory, objectivity is not independent of subjectivity. The subjective conscious observer is central to observation and measurement, as that which collapses the quantum wave function into classical reality. This entails a major quandary. Neither of the two most successful theories in modern science – quantum theory and relativity theory – bridge the gap between objectivity and subjectivity; but the *most* fundamental theory – unified field theory – requires that the gap be bridged completely.

### 1.1 Progress on the mind-body problem: real nonlocal space underlying matter.

Historically the relationship of objective matter and subjective mind was prominent in philosophy, associated with the *mind-body problem*, and more recently with the 'hard problem' of consciousness. It also is recognized to be fundamental to the measurement problem in quantum physics and the explanatory gap between brain and mind in neuroscience. Research on these problems now concern subtler, entangled levels of nature; and have led to the rational conclusion that *matter doesn't have a material basis*. Though quite challenging to accept given the still prominent mainstream belief of materialism or physicalism, quantum, quantum gravity, and unified field theories now posit real, nonlocal, non-material levels of nature. The belief that mind is just in the head is no longer tenable, because minds as well as brains are no longer just localized physical matter but also processes in a nonlocal information space or 'mind-like' field.

This is becoming evident in interpretations of quantum theory that have progressed beyond the original orthodox view mentioned above that there is no quantum reality. Quantum wave collapse is now theorized to be an *objective reduction*, occurring spontaneously through quantum decoherence in interaction with the classical environment.<sup>3 4 5</sup> This implies that both quantum and classical objects relate to ontologically real levels of nature, and moreover that they causally interact. It also is suggestive that mind and matter interact on more fundamental levels than quantum wave collapse. Further, the neorealist interpretation based on Bohmian mechanics posits the *quantum potential* or *psi wave* as an ontologically real field underlying material existence.<sup>6</sup> Consistent with experimental tests of Bell's theorem verifying quantum entanglement, it describes a subtle but real nonlocal pilot wave that guides real local particles. Elaborations of this interpretation identify this non-material wave as a causally efficacious field of nonlocal mind or mental space underlying all matter.<sup>7</sup>

Similar progress is reflected in quantum gravity theories. For example, string theories propose six or seven compactified higher dimensions. Although higher dimensions relate to additional mathematical degrees of freedom needed to explain string motion, they also are conceptualized as higher spatial dimensions. Geometric 'objects' such as strings and branes in higher-dimensional space are proposed to be the source of all material objects.<sup>8</sup> This implies causal interactions between 'objects' or processes in conceptual, mathematical space and material objects in physical space, starting to bridge the gap between them. Also, superstring *M*-theory posits zero-branes in a non-commutative geometry that imply a real field underlying particulate matter.<sup>8</sup> Further, mathematical formulations in loop quantum gravity and black hole thermodynamics posit a *pure geometry* of quantized information space that *generates* physical space.<sup>4</sup>

### 1.2 Nonconventional, nonlocal space is underneath the Planck scale.

The ultimate unification of all of nature is sometimes theorized to be where the four fundamental forces merge into a super-unified state at the Planck scale ( $10^{-33}$  cm). This is generally consistent with quantum gravity theories that describe material existence as fundamentally discrete and quantized. But it doesn't yet provide a model of a *completely* unified field. Quantized higher-dimensional space and a pure geometry of quantum information bits or qubits also don't describe a *completely* unified field. Discontinuous quantum bits need to merge into a continuous wholeness beyond all differences, gaps, boundaries or membranes, completely unitary and one with itself. The quantum principle as applied to the concept of the Planck scale cannot describe the most fundamental level, if nature is *completely* unified. In theories of nonconventional space *underneath* the Planck scale introduced above, the notion that space-time ends at the Planck scale refers to conventional physical space-time only.

In the theories that do posit space-time ends at the Planck scale, there is either motion within the limitations of light-speed (relativity theory) or quantum mechanical tunneling that instantaneously ports objects, in the form of information, between regions of space even outside the light cone without traveling in between (quantum theory). On the other hand, in the Bohmian interpretation of quantum theory, for example, the subtle psi wave field *mediates* nonlocal effects.<sup>6,7</sup> Interactions in this field would *not* be the mechanistic, classical causality of localized relativistic space-time, but rather nonlocal, entangled (but not instantaneous) causality. The notion of space-time is disembedded from Einsteinian locality and gravity, light-speed, quantization, and particle interaction model of causality.

In this more holistic perspective, space and time are better conceived as infinity and eternity, with increasingly limited levels within them. The levels can be likened to air being subtler than earth and water, and space being subtler but permeating air, water, and earth. Objects or forms in information or mental space would have *extension* in this nonlocal, *nonconventional* space; but nonlocal space would still not be the *completely* unified level. It would be an intermediate level in which real, non-material objects causally interact in the form of entangled waves of information/energy not built of Planck-size quanta or limited to light-speed – all within the unified field.

This provides a basis to reconcile contrasting views of space in relativity and quantum theories. According to Einstein's relativistic space-time theory, motion is limited to light-speed and the notion of space-time or any object existing *right now* outside of the light cone is undefined and cannot be known *right now*. According to non-relativistic quantum theory, instantaneous quantum mechanical tunneling (porting) anywhere in the quantum field is possible. The first notion relates to conventional, local physical space or the gross relative domain, and the second notion generally relates to the subtler relative domain in which motion is nonlocal, not limited to light-speed, but still not instantaneous.

### **1.3 Everything condenses from and within the unified field.**

In the holistic approach of Vedic science, space and time can be conceived in terms of the unified field as infinite eternal existence. It is conditioned in the process of phenomenal manifestation into tangible levels of increasing localization, discreteness, and mass. These levels are perhaps more easily conceived as mediums, *aethers*, or 'fluid' sheathes much more abstract than conventional space-time. Each grosser level is permeated by, built of, and emerges ontologically from its subtler underpinning. From that perspective, subtler levels or domains don't have to be conceived as fundamentally new spatial dimensions. There is no *outside* of the unified field. There might be individual big bangs, with respect to specific black

holes within conventional space. But with respect to the entirety of existence, the big bang could 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 infinite eternity—perhaps a ‘Big Condensation,’ but not a ‘Big Bang’ creating space-time from nothing.

## 2.1 The nature of the unified field is coexistence of opposites of infinity and point.

In the top-down consciousness-mind-matter ontology of holistic Vedic science, the ultimate, *indescribable*, unified field can be described as inherently conscious, orderly, and dynamic. To explain the process of phenomenal manifestation, the ‘nature’ of the unified field is described as the simultaneity of infinite silence and infinite dynamism, wholeness and part, infinity and point. In each point is infinity, and the infinite singularity contains infinity of points. It is the coexistence of opposites of infinity and point; but it is non-dualistic. Remaining beyond all duality, to explain phenomenal manifestation it is attributed two coexisting opposite qualities. To explain how the opposites coexist, the unified field is described as *infinite self-referral*, instantaneously reverberating from infinity to point and point to infinity, infinitely referring or *curving back upon itself*. In the process of phenomenal manifestation, the apparently opposite qualities of infinity and point become expressed in increasing limitation, extending from infinite wholeness or totality of pure existence or *Being* to the phenomenal appearance of no consciousness, no intelligence, and no life at the most expressed level of gross, inert matter.

## 2.2 Space-time as the infinite eternal is present everywhere and doesn’t ‘blast out.’

Conventional space-time is a phenomenal limitation of the underlying infinite eternity *that is already present everywhere*. In this sense, space would not begin at a point and expand out in all directions from an almost infinitely dense singularity or Planck-size quantum blasting out in a big bang. Rather, infinite space and eternal time phenomenally *condense* many ‘points’ simultaneously (everywhere). The subtlest finite space would be the closest to the infinite self-referral of infinity and point. At the grosser level of conventional space-time, infinite self-referral appears completely hidden in local object-referral; and discrete, independent, local objects are the predominant experience. The subtle, nonlocal level doesn’t have the particular limitations of conventional space-time associated with Einstein locality and gravity, the light cone and light-speed, and Planck-size quantization that characterize our familiar objective world. Four-dimensional space-time is sufficient to provide the experiential framework for the senses of perception; and no higher order spatial dimensions need be postulated. That is, the phenomenal universe and the capacity to experience it match or refer to each other. Conventional space-time relates to the locus of experience or frame of reference associated with phenomenal experience in the ordinary waking state of consciousness.

This expanded conception of space 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 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.<sup>8</sup>

In holistic Vedic science, the self-referral dynamics of the unified field *curving back upon itself* characterizes the mechanics of manifestation at all levels of nature. On the unmanifest level, it is infinite self-referral. On the ultramicroscopic manifest level, it is associated with a *mandala* form (like a circle or sphere) as in the concept of *Hiranya garbha* or cosmic egg; and ultramicroscopically, with curving back into discrete, quantized particles (as in point particles and atoms).

*"Prakritim swam avashtabhya visrijami punah punah (Bhagavad-Gita, 9.8)*

Curving back upon My own Nature, I create again and again."<sup>9</sup>

### **3.1 The unified field is the lowest entropy, super-symmetric field of perfect order.**

In quantum field theory, space is *not* empty nothing, in that 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*. In sequential stages, phase transitions spontaneously occurred as temperature dropped and the universe expanded, in which the four particle-forces differentiated. This can be likened to phase transitions of H<sub>2</sub>O *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. If it continues even after the theorized big bang and the forces differentiated, then it is more than unification of the fundamental forces. The underlying unity doesn't go away when diversity begins: all diversity is within the unity. The perfect symmetry of the unified field is undisturbed by symmetry breaking into finite manifestation. This is crucial for understanding the source of order expressed in the laws of nature. Order emerges from the perfectly symmetric, lowest entropy state of the unified field, not from *fundamental* random disorder.

### **3.2 Higgs field theory relates to the condensation of the unified field into matter.**

To explain the spontaneous phase transitions of symmetry breaking or *condensation* into particles with mass, the theory of *Higgs fields* developed in recent decades. Higgs field theory is considered to be one of the key concepts proposed in the past century in theoretical physics.<sup>8</sup> According to this theory, 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<sup>15</sup> degrees, creating a Higgs ocean — analogous to steam condensing into water. The Higgs ocean is theorized to be a kind of viscosity 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*.

### **3.3 Inflationary cosmology assumes everything came from nothing.**

Einstein's formulation of general relativity predicted that space, and the entire universe, would either shrink or stretch. Because this contrasted with his belief in a static universe, he added

another term – the *cosmological constant*. This allowed the equation to contain a negative value, meaning that gravity could be *repulsive* rather than just its familiar attractiveness. If carefully chosen, repulsive and attractive forces could balance out, resulting in a static universe. When evidence showed that the universe is expanding, however, Einstein withdrew the cosmological constant, reportedly identifying it as his greatest blunder.<sup>10</sup> However, it was later revived, associated with Higgs fields and the modification of the standard big bang model called inflationary big bang theory.

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. This *inflationary* event acted like a Higgs field—the *inflaton* 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* space whereas inflationary expansion refers to inflation *of* space itself. This implies a level of space with speeds faster than light-speed but not instantaneous.

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 5% 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%. Observations that the universe is expanding based on measurements of the recession rates of supernova led to revival of the cosmological constant, 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% of the total, which fits the remaining amount in inflationary theory.

Inflationary big bang theory has been described as the consensus view in contemporary cosmology, additionally strengthened because it is said to provide an explanation for how matter formed into stars and galaxies. But what triggered inflationary expansion? How did *nothing* blast out? An elaboration of inflationary theory proposes that the big bang emerged from a *pre-inflationary* period, in which the gravitational field and the Higgs field were bumpy, chaotic, and highly disordered. Eventually a random fluctuation produced the values needed for inflationary expansion. But this certainly doesn't sound like everything came from *nothing*. Astronomer David Darling states the issue 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.”<sup>11</sup>

### **3.4 Inflationary cosmology needs to be consistent with unification theories.**

How inflationary cosmology reconciles with theories of the unified field is of concern. If the unified field is the lowest entropy, super-symmetric state, then the theory of the pre-inflationary period that low entropy came from inflationary expansion might seem to suggest 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 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 of generating the functional structure of physical space-time and all matter in it. This seems more consistent with the unified field as the state of lowest entropy, rather than reductive theories of pre-inflationary and inflationary cosmology.

A more integrated way of looking at these issues is that pre-inflationary theory is another angle in the attempt to understand the subtle, non-material domain of nature underlying the Planck scale. This subtle level as a pre-inflationary period or 'pre-conventional' space would include the order in nature that creates the gravitational field, Higgs field, and inherent dynamism. It would be underneath gross or conventional space-time and quantized fields, as their immediate source — again underlain by the unified field. In other words, these theories taken together are progressing toward three domains of nature: 1) the conventional physical space-time field; 2) a nonlocal field of nonconventional information or mental space; and 3) the lowest entropy, super-symmetric unified field. This is consistent with ontological levels in Vedic science.

#### **4.1 Three core issues in cosmology relate to forces of nature in Vedic science.**

In these theoretical developments concerning the origin of the universe, three issues are emerging: from whence the order, the dynamism, and the mass? These three fundamental issues are beginning to match up with the three fundamental forces of nature in Vedic science, called *Sattva*, *Rajas*, and *Tamas*. These fundamental forces can be related to the principles of attraction (gravitation), activity (inherent dynamism), and inertia or resistance to change (mass, Higgs fields). They also can be associated with creation, maintenance, and dissolution operators conducting all change in nature.

In the gross material domain of conventional space-time, *Sattva* can be related to the attractive force of gravity, and the gravitational constant. It also can be related to the 3<sup>rd</sup> law of thermodynamics: decreased activity associated with decreased temperature in material systems, resulting in decreased entropy, a fundamental negentropic process in the maintenance of order in nature. *Rajas* can be related to inherent dynamism, and possibly the Planck energy and light-speed, associated with the creation operator. *Tamas* can be related to inertia or resistance to change, the concept of mass and Higgs fields that counteract change, and possibly Planck's constant. The three values from which the *Planck length* is derived — gravitational constant, light-speed, Planck's constant — appear to correspond on the gross material domain with the fundamental forces or abstract principles of *Sattva*, *Rajas*, and *Tamas* in Vedic science.

#### **4.2 Fundamental forces in Vedic science match the known fundamental forces.**

In holistic Vedic science, such as in *Sankhya* and *Ayurveda*, the three fundamental forces condense into five fundamental constituents comprising all phenomenal objects. They are expressed in sequential enumeration, or symmetry breaking, into the ancient delineation of five basic *constituents* of space, air, fire, water, and earth that comprise all phenomenal objects in the gross material domain. Unfortunately these ancient concepts were interpreted much too crudely, and have not been seriously considered with respect to their possible relationships to

the known fundamental forces in modern physics.<sup>10</sup> These five constituents express the abstract principles of vacuity (space), mobility (air), transformation (fire), liquidity (water), and solidity (earth). They also can be described as fields with progressive limitations, each more expressed one embedded in the previous one and expressing an additional limitation or quality, like concentric sheathes or aethers. The constituent of *space*, for example, contains in latent form all the other four properties, but expresses only the qualities of space, similar to the unified field before symmetry breaking. As physical phenomena, these five fundamental constituents would be expected to map onto the quantum particle-force fields. A reasonable mapping is that *space* relates to gravity, *air* to gravity and the strong nuclear force, *fire* to gravity, strong and weak forces, and *water* and *earth* to all four including electromagnetism.

**Space (Akasha).** Conventional physical space-time is characterized by local interactions limited to light-speed, directly related to the Planck scale, zero point motion, and the uncertainty principle. These characterize the unifying gravitational force field, associated in Vedic science with the level of gross space.

**Air (Vayu).** The unifying force of gravity attracts space-time into clumps of the space-time field, further condensing and binding into a gaseous state, which expresses the principle of *air*. Air has the quality of expansion to fill the available space within gravity, with the additional limitation of *impermeability*. The aether of space condenses into a more limited field or medium, which transfers energy via compression and rarefaction of quantized wave motion in space. In particle physics, the forces that bind or glue particles into atomic nuclei and compounds are the strong force and gravity.

**Fire (Tejas).** The next level of *condensation* is fire, associated with luminosity, form, transformation, heat, temperature, radiation, combustion, oxidation, and similar processes. When there are aggregates of quantized points as volumes in space that cannot penetrate each other, as in air, their agitation increases when space is further limited. Pressure and activity rise, increasing temperature or heat, which can lead to radiation. This involves the weak and strong nuclear forces along with gravity.

**Water (Apas).** The next level is water, *condensing* further from space, air, and fire; which expresses the abstract principle of liquidity, fluidity, or flow of energy along a path, such as a current of water. This concerns flow or motion to fill the available space within the limitations of its permeability, but a dense flow due to increased mass. This type of energy flow can be associated with the electromagnetic force, and especially the properties of electricity, in conjunction with weak and strong forces along with gravity.

**Earth (Privithi).** The grossest constituent, earth, expresses solidity and inertness, with the least degree of directional freedom or flow. It is a further limitation of the liquid form, such as ice from water, when motion and temperature associated with heat or fire is reduced into a more rigid, less dynamic state of solid matter. It is the endpoint of the process of manifestation or *condensation* — the most fixed, inert state of nature. Earth seems to be associated most closely with magnetism (water with electricity), in combination with the other four forces. The magnetic force is a dipole system in which the opposites of attraction and repulsion (north and south poles) are contained in one field. It flows in a defined *circular* path that *curves back upon itself* in a closed loop perpendicular to the flow of electric current, a further limitation compared to electricity.

In holistic Vedic science, these five fundamental constituents of space, air, fire, water, and earth together constitute the most expressed, grossest domain of phenomenal existence. They also

directly correspond to the ordinary five senses of perception. Although no additional *ontological* levels of existence emerge from them, a vast diversity of phenomena manifest from their combinations and permutations. These phenomena comprise the ultramicroscopic, microscopic, macroscopic, and ultramacroscopic levels of the physical universe that have been the object of objective science. Cutting edge theories are progressing beyond this gross relative domain to the underlying subtle nonlocal relative level of nature and to the infinitely self-interacting unified field.

### **5.1 Consensus is based on empirical experiences shared by its contributors.**

Modern science focuses on ordinary sensory experience and logical reasoning 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. To protect against unreliable subjectivity in experience and reason, the objective approach relies on consensual validation, or public inter-subjective agreement. It is important to recognize, however, that consensus is based on – and constrained by – the level of functioning of those contributing to it. Practically the entire empirical enterprise of modern science is based on reasoning and sensory experience characteristic of the ordinary waking state of consciousness. It is so engrossed in ordinary waking experience that there is little recognition of this limitation.

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 phenomenological 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 observed and observer.

### **5.2 Vedic science includes systematic technologies to verify the unity of nature.**

Vedic science is comprehensively articulated in the language of modern science by His Holiness Maharishi Mahesh Yogi in *Maharishi Vedic Science and Technology*.<sup>12</sup> It identifies the reductive materialistic view in modern science as a product of the typical range of experience in the ordinary waking state of consciousness that produces fragmented, partial knowledge of nature. When the fragmented, reductive view that the whole emerges from combining fundamental parts is experienced as primary, the wholeness or unity of life is lost. This is called '*Pragya aparadh*,' the '*mistake of the intellect*.'<sup>12</sup> Development of higher states of consciousness reestablishes wholeness or unity as the natural primary experience. Systematic developmental technologies in *Yoga* are applied to validate through direct empirical experience the underlying levels of nonlocal mind and the transcendent unified field – in the *inner laboratory* of the mind.

## **Conclusion**

The reductive materialistic view still prominent in modern science is associated with a bottom-up matter-mind-consciousness ontology in which the whole emerges from combining fundamental parts. It attempts to describe a completely closed causal nexus of a clockwork physical universe emerging from random quantum bits of energy/matter.<sup>3</sup> Generally, consciousness is theorized to emerge from neural complexity, but it ends up being epiphenomenal and powerless, or even non-existent in this view. The holistic approach of Vedic science articulates how the parts manifest from the whole, in a consciousness-mind-matter ontology. The whole creates the parts.<sup>13</sup> The phenomenal origin of the universe is a *condensation* of the total

potential of the unified field into limited manifest levels of nature – the Big Condensation. This is consistent with developing theories of the unified field as the lowest entropy, super-symmetric, super-unified state. It is a logically consistent and more comprehensive alternative to the reductive materialistic view and related inflationary big bang cosmology. Vedic science includes systematic developmental technologies for direct empirical validation of the consciousness-mind-matter ontology.

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