

Article

Natural Philosophy: Beyond The Undulant Quiescence

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ABSTRACT

Like pandisciplinary research, natural philosophy explores the cosmos by any means necessary to understand the universe. A strategic model retains usefulness for comprehending our own nature in the environment, beyond yet integrated with the models of science. Transgressing the fortified boundary between natural science and the humanities, the hidden language of the archetypes of nature helps us translate the dynamics of our Being and Becoming. A multidisciplinary approach can present and explore a variety of theories without advocating them, ideally leading toward best practice. Complexity demonstrates a science of surprise that supersedes the boundaries of nature and culture, transcendental theorizing or unreflexive presumption. How can we understand the various cooperative effects of systems, whether they belong to physics, physiology, psychology, biology, etc.? In contrast to the analytic reductionism of classical science, systems philosophy integrates theory and philosophy to foster reorganization of thinking and knowing perceived reality. Rather than explaining what things are, we explore and describe how things work. Meta-narratives bind society and cultures together, integrating events and actions into meaningful patterns. The world of experience remains one of perceived reality and worldview.

Key Words: natural philosophy, undulant, quiescence, archetypes, multidisciplinary, reductionism, system philosophy, reality, worldview.

Introduction

Philosophy, Integrated Science (Biology, Chemistry, and Physics), and Depth Psychology are ways of realization involving a transformation in our deep experience of the world. We are liberated from attributing reality to the plurality of objects in the universe of experience. Traditionally, we tend to answer big questions through stories as much as theories. Today we read sacred texts for archetypal insight and we can view our theories in the same way as the construction of powerful symbols and shared meanings, worthy of serious philosophical and empirical reflection on shared reality.

Chalmers points out that, “the epistemological gap between physical processes and consciousness goes along with an epistemic gap between physical processes and the self.” Consciousness Studies is not a single, integrated body of knowledge, so it demands that we transcend individual professional knowledge bases. Topical areas include neuroscience, philosophy, psychology, biology, biophysics. In the new model consciousness becomes as

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fundamental to the cosmos as space, time, energy and matter -- in some respects even more fundamental. In a nutshell, physics is not beyond you.

Natural philosophy returns in the “new” concept of mind, life and matter emerging from the nature of the quantum vacuum, the energy sea that underlies all of spacetime. Space is no longer secondary to matter. Absolute space of the vacuum is the primary reality. The things we know as matter (mass, with properties of inertia and gravitation) appear as the consequence of interactions in the depth of this universal field. Our “essential nature” must be here, now. An In the emerging concept there is no "absolute matter," only an absolute matter-generating energy field.

The *Luminous Gospels* encourage us in this direction. "From this moment onward, I go forward into the Aion, and there, where time rests in stillness in the eternity of time, I will repose in silence." The key point is that Aion is not an afterlife, another form of temporality that begins after we die, but end (or "fullness") of time itself as a structuring dimension of reality.

Eternity Within

Theories of the origins and nature of life are foundational to our self-understanding. They have been there since the beginning. The mystery of the nature of reality remains an unsolved paradoxical puzzle, or enigma, despite interdisciplinary progress on several fronts. No single scientific or spiritual view is complete.

No consensus model for either life or physics has emerged (Andrulis). Our search continues to find oneness, congruent with our awareness, embodied in our phenomenological reality. Yet Deleuze & Guattari argued that attempting to jam everything into one overarching model of classification erases difference (and distance) and fixes them into a static, universal schema, proceeding from a singular point of origin.

Quantum theory may be true but its interpretations remain baffling. Hard science continues to deny the notion that experience is data yet still has not described the fundamental nature of matter, but merely measured and attempted to interpret it. Meaning needs context. There is both a philosophy of physics and a philosophy of psychology, which must be taken into account. The self, space and time are metaphysical manifestations.

There is also the philosophy of cognitive science, which deals with the traditional issues of cognition and transcendence. Phenomenology and philosophy provide constitutive explanations that describe the structural conditions of possibility of phenomena. Scientific models provide enabling accounts of the theoretical mechanisms required to generate and explain these phenomena. Although science does not directly provide constitutive explanation of transcendental foundations it can provide ground for revising philosophical theories about them. Both phenomenology and transcendental philosophy answer to naturalistic epistemological constraints. (Wheeler)

Anscombe contends, "We have a kind of spontaneous knowledge – knowledge that does not rest on observation or inference – not only of our own mental states, but of what we are doing, what

is actually happening out there in the world. Another is that intentional action and its explanation by reasons resist assimilation to explanation by efficient causes or natural laws, the only kinds that are countenanced by natural science. There is more in heaven and earth than is dreamt of in the reductive naturalist's philosophy." Kieran Setiya (*Reasons Without Rationalism*) feels, "If psychology needs to be reduced, it can be; if it can't be, I am much more confident that it is real than that it needs to be reduced."

Can we fathom the nature and depth of consciousness by direct experience? Noetics refers to the cognitive faculty that apprehends non-sensuous phenomena. Apollo 14 astronaut Edgar Mitchell experienced the phenomenon dubbed the "Overview Effect" in February, 1971. He describes being completely engulfed by a profound sense of universal connectedness, overwhelming feelings of bliss, timelessness, and connectedness. He became instantly and profoundly aware that each of his constituent atoms was connected to the fragile planet he saw in the window and to every other atom in the Universe. He described experiencing an intense awareness that Earth, with its humans, other animal species, and systems were all one synergistic whole. He says the feeling rushed over him as a sense of interconnected euphoria.

Other astronauts report the same "cosmic connection", or acute awareness of all matter as synergistically connected. Rusty Schweikart experienced it (March 6, 1969) during a spacewalk outside his Apollo 9 vehicle: "When you go around the Earth in an hour and a half, you begin to recognize that your identity is with that whole thing. That makes a change...it comes through to you so powerfully that you're the sensing element for Man." Schweikart also describes intuitively sensing that everything is profoundly connected. These and other reports intrigued scientists who study the brain.

Shaky Ground

Such unitive experiences are reported from deep meditation also. The experienced phenomenon of meditative quiescence include the "ground of becoming," characterized as a relative vacuum state of consciousness, voided of all manner of mental activity. Perceptual systems able to symbolize themselves -- self-referential minds -- can't be explained just by understanding the parts that compose them. Viewed as a symbol, consciousness is very much like many of the other grand ideas of science. Often we do not know what we are talking about, parroting old interpretations and memes.

An atom is not so much a thing as an idea, a symbol for matter's ultimate constituents. But even our ideas of the nature of an atom may be faulty, according to physicist Alan Forrester, who argues that atoms are *not* mostly empty vacuum space. "That is a misconception based on a false view of what atoms are like. People imagine that atoms are like mini solar systems: the protons are like the sun and the electrons are like planets. This is completely false, as illustrated by the fact that atoms cannot penetrate one another. In addition, if an atom resembled a mini solar system, the electron would radiate away all its energy and fall into the nucleus in a fraction of a second, so no atoms would exist."

He continues in *FOR Digest*, March 16, 2012: "So what's actually going on? Each electron exists in multiple instances that interact with one another and those instances are spread out over a region of space. The shape of the cloud of instances is determined by the other systems acting on it, mainly the nucleus, and its tendency to spread out in space if left on its own. No two electrons can have the same state, that's why atoms can't penetrate one another."

Elsewhere, he alleges, "Reality is both digital and analog". I argue that both digital and analog information are important in the foundations of quantum physics. If it is possible for information present in one system to become present in others without being erased in the original system I will say that this information can be copied. I argue that copying is important for understanding issues like causality and that all information that can be copied is digital. I then explain that analog information that cannot be copied can be understood in terms of decision theoretic probability." (arxiv.org/abs/1102.2988)

Gödel's proof emerged from deep insights into the self-referential nature of mathematical statements. He showed how a system referring to itself creates paradoxes that cannot be logically resolved — and so certain questions cannot in principle be answered. At its core, consciousness is self-referential awareness, the self's sense of its own existence. It is consciousness itself that is trying to explain consciousness.

Primordial consciousness may be regarded as an ultimate ground state of consciousness, ascertained non-dually through the cultivation of contemplative insight. The vacuum serves as the nondual source of creation of each person's experienced-world-and-its-experiencer. Nonduality is philosophical, spiritual, and scientific understanding of intrinsic oneness, awareness, or consciousness. Reality is inherently free of the dualistic opposites, such as mind/matter, subject/object, reality/appearance, self/other, substance/attribute, essentialism/nihilism, past/future, here/there, truth/falsity, good/evil, and other pairs of opposites.

Pandisciplinary science is converging on the nondual, which unifies many models at the root of being. Cosmologists seek a first cause for the universe. Physicists look for the ultimate constituent of matter. Neurophysiologists attempt to correlate physiological observables with reported experiences of nonduality. Transpersonal psychologists investigate the effects of these experiences on human mental health. Deep ecologists explore the potential consequences of global health. Even mathematical insight has been likened to sacred communion.

Psychologically, nonduality is the all-encompassing numinous archetype of Self, much as Jung described it. "The nature of the Self" is explored from the perspective of modern science, ancient traditions, cosmology, neuroscience, metaphysics, cultural context, philosophy, phenomenology and direct experience.

Common wisdom suggests this self-generated symbol of the self operates only on the level of symbols. It has no access to the workings of nerve cells and neurotransmitters, the microscopic electrochemical machinery of neurobiological life. But psychology demonstrates that activated symbols affect our attitudes and when attitudes change so do neurotransmitters and the feelings and behaviors associated with them, including immunological response.

The symbols that consciousness contemplates don't look much like the real thing. Awareness shifts from the activities of mind to the eternal presence of being. Quantum Field theory, complexity and emergence can model microcosmic dynamics emerging at the macroscopic scale in the form of very mysterious and spectacular phenomena.

In science, nonduality is an exploration of the nature of awareness, the essence of life from which all arises and subsides. Modern physics describes the world as a self-moving, self-designing pattern, an undivided wholeness. Such ultimate vacuum states of consciousness correlate with the relative and absolute vacuum states of space presented in contemporary physics (Wallace). The vacuum potential is a virtual background energy that exists throughout space, even when no matter is present.

Lore & Order

Nonduality is traditionally associated with meditative states. Recently meditation has been correlated with a positive thickening of the cerebral cortex and increased cortical gyrification, convolutions on the exterior of the brain. "Folding" of the cortex facilitates faster information processing. The brain changes to create narrow furrows and folds called sulci and gyri, which enhance neural processing.

Luders (2012) found a direct correlation between the amount of regional insular gyrification and the number of meditation practice years, highlighting the brain's neuroplasticity, or ability to adapt to environmental changes. Presumably, the more folding that occurs, the better the brain is at processing information, making decisions, forming memories, etc. Heightened levels of gyrification predominated across a wide swath of the cortex, including the left precentral gyrus, the left and right anterior dorsal insula, the right fusiform gyrus and the right cuneus.

"The insula has been suggested to function as a hub for autonomic, affective and cognitive integration," said Luders. "Meditators are known to be masters in introspection and awareness as well as emotional control and self-regulation, so the findings make sense that the longer someone has meditated, the higher the degree of folding in the insula."

Concentration leads to absorption of various depths in which desire, anxiety, pain, and trauma of temporal uncertainty are attenuated. Orderly global harmonic cascades of alpha and theta waves cover the cortex, modulating beta-endorphin. Brain entrainment links the meditator with the Schumann Resonance (quasi-standing electromagnetic waves, resonating at about 7.83 Hz), Earth's universal driving signal of the biosphere (Miller).

Brain wave frequencies are not confined to the brain, but cascade via harmonic wave motion into every cell and atom in the body (Oschmann). Energy and information embedded in the zero point field transfer their potential through this primal language of frequencies, including wave genetics (Gariaev).

Stuart Hammeroff suggests a fractal nature for human consciousness. The brain constitutes not only networks of neurons, but also hierarchical layers, with self-similar information patterns

represented at various different scales, i.e. fractal-like organization. The brain has fractal-like structure, known as small-world networks, with a very few large, and very many small, hubs. Pribram, Bieberich, Bohm, and others have said for many years that memory and content of consciousness may be fractal, or holographic, and many have described altered states of consciousness as fractal, or scale-free.

A study in the journal *Science* (1990) suggested that genes may contribute as much as 50 percent to individual differences in religiosity. Lars Farde found that the number of receptors for the nerve transmitter serotonin in the brain correlates with "spirituality", (Nov. 2003, *American Journal of Psychiatry*). The serotonin system helps regulate our perception and the variety of stimuli reaching our awareness. The investigators found that the number of serotonin receptors correlated significantly and inversely with subjects' scores for self-transcendence -- the higher the score on self-transcendence, the fewer the number of receptors in all brain areas scrutinized, indicating a genetically "weak sensory filter".

Neurotheology describes how calming the chatter of the higher functions turns some areas of the brain offline in meditation. The parietal lobes are associated with the orientation of the body in space and processing information about time and space (Persinger). More specifically, the left superior parietal lobe creates the perception of the physical body boundaries. The right superior parietal lobe creates the perception of the physical space outside of the body.

Blocked off from neuronal activity, the parietal lobe cannot create a sensation of boundary between the physical body and the outside world, which may explain a meditator's sense of oneness with the Universe. Since the parietal lobes are also unable to perform their usual task of creating linear perception of time, meditators achieve a sensation of infinity and timelessness.

In the journal *Nature*, Dr. Olaf Blanke implicates the angular gyrus, (an area on the surface of the brain involved in perception of our own bodies and metaphorical perception) in out of body experiences. Ramachandran suggests OBEs are metaphors that can be taken literally and so 'feed' the concept of being able to 'escape' the body. The angular gyrus is thought to play a role in the way the brain analyzes sensory information that allow us to perceive our bodies. When it misfires, they suggest, the result can be a sense of floating, and seeing the world from outside of the body. There may be a widely-distributed set of pathways, including oxygen deprivation and pain-reducing endorphin production.

Like a switchboard operator, after gathering information from particular senses, the thalamus shoots the signals along specific nerve fibers, connecting the right signal to the right part of the brain's wrinkly cortex and the cortex signals back. The thalamus receives information directly from the outside world, and information from other parts of the brain. Instead of being a driver, the thalamus may be a consciousness gauge, perhaps modulating overloads of synchrony.

Absorption in the Light

By witnessing our thoughts through the attenuating process of thought, neural and emotional response, we witness the entire stream of the thinking process. All thoughts pass. Absorption

reaches its culmination when the mind is free even of thoughtlessness, of all seeds of potential thought, beyond meditations on no-thingness and non-perception.

With nothing to cognize, pure luminous awareness ceases to be "embodied", and ceases to be mind. The myriad universe drops away, time stands still, and individual consciousness merges in the Self, the Universal Consciousness. The process of meditation and attenuation of habitual feedback loops deliberately cultivates a single thought-wave, which intensified through repeated practice, takes the form of the whole mind. Swallowing all other distracting thought-waves, it itself becomes quelled -- beyond the undulant quiescence of vacuum fluctuation. Innate radiance, crystal clear Light arises. Light is energy, information, transformation and creation.

Wallace describes the relative vacuum or ground state of consciousness: "All phenomena appearing to sensory and mental perception are imbued with the clarity of this substrate consciousness. Like the reflections of the planets and stars in a pool of limpid, clear water, so do the appearances of the entire phenomenal world appear within this empty, clear substrate consciousness. Contemplatives who have penetrated to this state of consciousness describe it as "an unfluctuating state, in which one experiences bliss like the warmth of a fire, luminosity like the dawn, and nonconceptuality like an ocean unmoved by waves."

He suggests, "The experiential realization of [absolute space] by primordial consciousness transcends all distinctions of subject and object, mind and matter, indeed, all words and concepts. Such insight does not entail the meeting of a subjective mode of consciousness with an objective space, but rather the nondual realization of the intrinsic unity of absolute space and primordial consciousness."

Absolute space and primordial consciousness are coterminous, nonlocal, and atemporal. Pure potential of absolute space is the fundamental nature of the experienced world. Primordial consciousness is the fundamental nature of the mind. This absolute vacuum is fathomed while letting consciousness come to rest in a state of nonduality, open to the entire universe. Devoid of all internal structure, it embodies a unique, absolute symmetry that transcends relative space, time, mind, and matter. The vacuum in itself is shapeless, but it may assume specific shapes. In doing so, it becomes a physical reality, a "real world".

Essentially, matter is "frozen" light, manifest light essence. Organisms are formed and regulated by biophotons. In physics, the energy of a photon is taken up by matter (electrons) through the absorption of electromagnetic radiation. The electromagnetic energy is transformed to other forms of energy, for example, to heat.

The absorption of light during wave propagation is called attenuation, loss of signal over distance. Usually, the absorption of waves does not depend on their intensity (linear absorption), although in certain conditions (usually, in optics), the medium changes its transparency dependently on the intensity of waves going through, and the saturable absorption (or nonlinear absorption) occurs.

Fractal Vortex Potential

Promising geometric models of fractal vortex potential, founded on the archetypal gyre, vortex, spiral, whorl, rotation, vector equilibrium, or spin have been proposed for the origins of life and the physical universe (Anrulis; Hu & Wu; Maurer, Hamein & Rauscher, Kozyrov, Fuller, etc.).

Vortex theory is an appealing notion with a long theoretical pedigree, including Democritus, Copernicus, Descartes, and Maxwell. It is an archetype of the core dynamical process. Vortex crystal is one name in use for the subject of vortex patterns that move without change of shape or size. The vortex is a perennial theme and broadly applicable model, as M.-L. von Franz suggests in *Projection and Recollection in Jungian Psychology*.

"The old way of picturing energy lived on in the alchemistic tradition in the idea of Mercurius as a "hidden fire" or fiery life-breath or a kind of life-spirit inherent in all things...This fire-spirit imagines everything in nature; he is a creation spirit who contains in himself "the image of all creatures." In the alchemical opus he must be liberated from his imprisonment in matter and then he begins to rotate in himself, vortex-fashion; at the same time he reveals himself as an immortal component of the alchemist's psyche. By way of the different stages of the so-called phlogiston theory this archetypal image gradually developed into the energy concept of modern physics. There is therefore no concept fundamental to modern physics that is not in one degree or another a differentiated form of some primordial archetypal idea."

Natural philosophy or the philosophy of nature was the study of nature and the physical universe predominant before the development of modern science. It is considered the precursor of natural sciences such as physics, optics and mathematics. Forms of science historically developed out of philosophy or, more specifically, natural philosophy. At older universities, long-established Chairs of Natural Philosophy are now occupied mainly by physics professors.

But the aesthetic paradigms of philosophy, psychology and physics still feed into our explanations and understanding of Nature and Reality. All worldviews are based on certain metaphysical assumptions about existence. Myths were the first explanations of the universe, which then became allegories for philosophical or spiritual concepts as we disenchanted nature. Culture deviated from nature. Religion takes mythology literally, whereas psychology sees the interior domain metaphorically or even regressively (romanticism, "back to nature"). First philosophy criticized mythology; now it critiques science.

Once our relationship with nature was sacred, but we lost awareness of our primordial symbiotic relatedness to materialism. We conceptually erased interiority. The brain is constantly sensing external vibrational energies which is how we have evolved our five senses over time. Throughout evolution the brain led the body to form organs to amplify these external frequencies (waveforms). Externally viewed, the natural world is analyzed as "its" with externally observable functions.

Interiority, Perception and Imagination

Is it possible that regaining our own interiority correlates with rediscovering infolded dimensions of nature and time? Interiority and exteriority are basic components in philosophy. Reflection is a metaphor for the continuum of the subject-object in the mirror-of-the-mind and the interiority of perception and its illusion of projected exteriority. Interior domains include naturalism's aesthetics, intersubjectivity, and consciousness (Zimmerman).

Psychology is the discipline of interiority. Identity includes both psychological interiority and physical expression. An intensification of interest in psychological interiority, particularly the nature of consciousness, and its relation to the body occurred in the nineteenth century. But empiricism, idealism, pure physiology, or pure psychology have provided adequate explanations.

Understanding of the dualistic constraints and continuity of inner and psychological life (interiority) and the material world (exteriority) has broad implications for philosophy, the physical and human sciences. The inner self refers to an interiority that is not spatial but a psychological realism -- our impressions, inner feelings, thoughts or states.

But it also refers to our physical interiority, the primordial psychophysical ground of our being that we share with cosmos. As Derrida argued, that excluded middle predates all binary terms. A symbolical image from alchemy, the uroboros is exquisitely figurative of psychological interiority -- what we elsewhere call "the zero with a thousand faces".

When we try to observe our own consciousness we never find a mere interiority, or just "our self". We never find consciousness but only what we are conscious of. Consciousness precisely consists of its myriad contents or forms; something ubiquitous is there. Consequently, "inner" and "outer" phenomena do not exist side by side but the so-called inner phenomena are nothing but the phenomenal manifestation (the phenomenality) of the outer.

Not all objects that manifest themselves in consciousness are "really there". Many are "only subjective," and in this sense we can of course distinguish between inner and outer phenomena. This is not a distinction between consciousness and outer object but one within the realm of objects;. "Objectivity" is coordinated by intraphenomenal relations (a coordination of "inner" experiences). In this way there are "inner" and "outer" phenomena. However, consciousness is not an inner phenomenon but the "being-there" -- the arising of phenomena, whether inner or outer.

Therefore, phenomenology does not view consciousness as an inner region in contrast to an external world. They are not distinct realms of being but two inseparable aspects of one and the same. The phenomenological distinction between immanence and transcendence actually means the difference between ... that which appears and its coming to appearance, or between what is present and its being-present (its presence).

With regard to this immanence the subject in the sense of an innerworldly thing (the only sense contemporary philosophy of mind knows) is already something transcendent, as a subject

substantialized in this way is no less something apperceptively constituted than any outer object, and thereby owes itself to the taking-place of manifestation as such that hence is prior to itself. Phenomenological immanence is nothing other than the opening-up of exteriority as such, which, in a certain sense, is more “interior” to consciousness in the phenomenological sense than the “psychological” interiority of a substantialized subject.

Thus the phenomenologically understood consciousness is no interiority, and for this reason exactly has no exteriority. That is why Husserl claims against Descartes that the true question is not how to infer the external world from my interiority but “whether with regard to the egological sphere an ‘outside’ has any meaning at all.” With this denial of an outside of consciousness, phenomenology can be labeled as an “idealism.” It is a phenomenological idealism that does not deny that there are things outside of the subject (there is no substantial “inside” of transcendental subjectivity at all) yet can be seen as the reflection on the fact that any reality we ever refer to is a reality that appears in one way or another. (Fasching)

Fields within Fields

Empty space seethes with the creation and destruction of virtual matter. All space contains fluctuating fields and particles, whose energy levels are never sharply defined. We are just beginning to recover the experimental values that describe how vacuum fluctuation perturbs statistical neutrino oscillation which gives rise to the cosmological constant (Goldfane).

We exist only because matter outweighs antimatter. Neutrino oscillations are vacuum fluctuations on a cosmic scale. Neutrinos are the lightest known leptons in the Universe and their oscillations are the sole detectable evidence for vacuum fluctuations on the cosmic scale. Vacuum fluctuations have been measured experimentally as the ‘Casimir Effect’. The vacuum fluctuations create a pressure, the force of empty space itself, that pushes the plates together.

Neutrinos come in three types, or flavors: electron, muon and tau. Each has an antimatter partner particle (the electron, muon, and tau antineutrinos) with equal mass but opposite charge (Moskowitz). The faster-than-light neutrinos debate remains unsettled, but is beyond the scope of our discussion.

In quantum gravity, the spacetime manifold ceases to exist as an objective physical reality. Geometry becomes relational and contextual. Foundational conceptual categories of science, including the nature of existence itself, become problematical and relativized. Space and time themselves are contextual, and meaning is relative to the mode of observation.

Sheldrake’s morphogenetic field theory is closely related to the quantum gravitational field. Mathematically, it is a “symmetric second-rank tensor”, permeating all space and interacting with all matter and energy.

Defying materialism as measure and reaching beyond metaphoric conceptualization (strings, weaves, membranes), Sheldrake suggests “actual invisible connections” are the substance of the connectedness between patterned and patented memories. A resonance is inherent in the socio-

biological nature of the Universe, of our biology, psychology and sociology. Resonance is "dynamic similarity".

Sheldrake, therefore, gravitates to Jung's concept of the collective unconscious, Kuhn's changeable paradigms of reality in time and history, and Gestalt psychology. He attempts to demonstrate to science that communications produce sustainable, duplicative patterns. Shapes and designs do occur with and/or without any sensory avenues as patterns of information (Malek).

In *The Science Delusion* (2012), Sheldrake extends his critique of scientific dogma, orthodoxy, and assumptions -- the belief that science already understands the nature of reality. Are the fundamental questions answered, leaving only the details to be filled in? The 'scientific worldview' has become a belief system in which all reality is material or physical. But the world is not a machine, made up of dead matter. Nature may or may not be purposeless, but it is self-organizing.

Consciousness may conceal mysteries beyond the physical activity of the brain. But Sheldrake's ideas are colored by his own mysticism. Several scientists have explored the possibility of a connection between physics and transcendence (Capra; Zukov; Bohm; Muses; Wolf; McTaggart). Quantum science has revealed the presence of the zero point field, with all its virtual subatomic particles and photons that jump into existence from apparently nowhere to return to oblivion nanoseconds later. Virtual particles may travel faster than light, but macroscopically these fluctuations average out to the speed of light. Therefore, this does not imply the possibility of superluminal information transmission.

Virtual photons are common, partly because a photon is its own antiparticle. But there is still no reasonable explanation as to how and why particles and photons can appear and disappear just like that. In Heisenberg's uncertainty principle we find that the lifetime of a given zero-point photon, viewed as a wave, corresponds to an average distance traveled of only a fraction of its wavelength. Such a "wave fragment" is somewhat different than an ordinary plane wave and it is difficult to know how to interpret this.

As we search for "meaning," "pattern," and "cause," in the swirling vortices of quantum field theory and vibrating string theory, we encounter scientists who borrow the language of philosophy, psychology and theology to talk about the physical universe. Myth, religion, and philosophy compete with physics for our belief. There are four classic definitions of existence: Experiential, Empirical, Material and Mathematical. Physicists including Newton, Einstein and Pauli expressed lifelong interest in the nuances of alchemy, looking toward the ancient intuitive science for inspiration. Some ideas have universal reach, while other guiding theories do not.

David Deutsch suggests that judging the reach of an explanation does not involve conjecturing a second theory. The reach of an explanation is an inherent property of it. It is determined by the fact that the explanation becomes a bad explanation if its domain of applicability were restricted or extended outside a certain range. Moreover, the better the explanation, the narrower that range is, as discussed in *The Beginning of Infinity*, (pp26-29). According to Deutsch, we are subject only to the laws of physics, and they impose no upper boundary to what we can eventually

understand, control, and achieve. A good explanation is universal when assuming any smaller domain of applicability would make it a bad explanation.

Creative Observer

Our "view" is crucial to questions of ontology and epistemology -- the nature of being and how we know what we know. Epistemology is the branch of philosophy concerned with the origins, structure, methods, and validity of knowledge. Epistemological metaphors and analogies are used to discuss the structure and validity of knowledge. Even while informing us, both physics and psychology have fostered alienation from nature. Popper suggested the empirical basis of objective science has nothing 'absolute' about it. Science does not rest upon rock-bottom foundations.

Natural science was based strictly on cognition, observation and knowledge, whereas science uses experimental control, isolating and measuring things. But the "pure" science of theoretical physics is still considered philosophy. The philosophy of physics studies the fundamental philosophical questions underlying modern physics, the study of matter and energy and how they interact. The philosophy of physics begins by reflecting on the basic metaphysical and epistemological questions posed by physics: causality, determinism, and the nature of physical law.

Centuries ago, the study of causality, the fundamental nature of space, time, matter, and the universe were part of metaphysics. Today the philosophy of physics is essentially a part of the philosophy of science. Physicists use the scientific method to delineate the universals and constants governing physical phenomena, and the philosophy of physics reflects on the results of this empirical research.

Quantum mechanics describes two kinds of reality. One of the regular properties of particles is that they have a fixed position in space, while waves can occupy more than one place as they are vibrations not things. When relativity combines these two ideas we get the Heisenberg's Uncertainty Principle.

Physicists treat an unobserved object not as a real thing but as a probability wave, not as an actual happening but only as a bundle of vibratory possibilities. Yet, when an object is observed (measured), it always manifests at one particular place, with one particular spin and velocity, instead of a smeared-out range of physical properties. All other potentials evaporate.

With that mysterious quantum jump, "things" became an artifact of reality-nostalgia. QM left the crude materialism of the clockwork universe behind for the potential of a variety of philosophical roots, including Idealist Panpsychism, focusing on such issues as consciousness, quantum mind, free will, and the mindbody link, reflecting the holistic spirit of the age and its relatively sensuous cosmos.

Since no measurement can explain what the unmeasured world is like, the world of mind and consciousness remains a conceptual black hole. Nick Herbert suggests, "Mind is not a rare

phenomenon associated with certain complex biological systems but is everywhere, universal in nature, a fundamental quantum effect more akin to superconductors and laser tubes than to computer circuitry."

"Quantum animism" implies consciousness is an integral part of the physical world, not an emergent property of special biological or computational systems. "As the cornerstone of holistic physics, I [Herbert] assume that every quantum system has both an "inside" and an "outside", and that consciousness in humans as well as in other sentient beings is identical to the inner experience of some quantum system. A quantum system's outside behavior is described by quantum theory, its inside experience is the subject matter of a new "inner physics" yet to be developed."

"This quantum model of mind offers a new perspective on conscious experience, which could lead to a new "quantum psychology" linking our internal experiences in a testable way to the objective external behavior of certain (so far unidentified) brain-resident quantum systems. The problems of human perception, emotion and personality as well as the mysterious extra-physical origin of quantum jumps may well yield to a disciplined marriage of keen introspection and quantum biology. Moving beyond quantum psychology, the realization that behind every visible quantum process lies an invisible psychic extension will result in a new kind of physics." Herbert calls it "quantum tantra", in which human awareness becomes an essential component of every experiment.

Persistent Unity of Organization

Panpsychism argues that the fundamental level of reality undergirds even completed physics, and is entirely experiential and self-organizing. Therefore, physics can't deal with the ultimate nature of reality. Under this hypothesis we must accept the closest approach we can make in any epoch. A scientific revolution occurs, according to Kuhn, when scientists encounter anomalies unexplainable by the universally accepted paradigm. The paradigm, in Kuhn's view, is not simply the current theory, but the entire worldview in which it exists, and all of the implications which come with it.

"Solid ground" foundations have yielded to coherence metaphors, braiding many belief threads together. What matters is not the strength of a particular proposition, but its connections with numerous other propositions, as if the number and interconnection of beliefs justifies them. In physics, metaphors come and go often in relation to our technological perspective. Scientific revolutions and paradigms shift. Thus we've seen eras of the hydraulic, computer, emergence and holographic models Each has been applied to both universe and psyche.

Panpsychism points to flaws in quantum theory that suggest it is out of synch with reality even while making successful predictions useful for "work". Not all theories of quantum mind are panpsychic but many are. Such arguments around assumed truths and disharmony among theories are usually ignored by popular physics enthusiasts or New Age proponents. Is quantum spirituality more of a quest for meaning beyond the search for absolutes?

Can a less true model predict better than a truer one? The Humanities adopts an array of stances, and so does physics. It calls them theories, which explain basic facts yet remain open to interpretation. But a theory can always be made to fit with the available empirical data. Confirmation holism, developed by W.V. Quine, states that empirical data are not sufficient to make a judgment between theories.

Panpsychism is the view that all things, living and nonliving possess some mind like quality. Ellis lists six predictions of panpsychism characterizing fundamental physics:

1. The behavior of an elementary entity depends on the detailed configuration of all other entities in its environment.
2. Fundamental physics is information-theoretical in character.
3. Elemental entities can amalgamate to form indecomposable compound entities.
4. Fundamental physics is likely inextricably bound up with consciousness.
5. Fundamental physics will have difficulty describing a coherent ontology. Copenhagen is an epistemology; the mystery of QM is lack of an ontology.
6. In any given environment, elementary entities show an irreducible spontaneity of behavior.

According to Kuhn, a paradigm shift occurs when a significant number of observational anomalies in the old paradigm have made the new paradigm more useful. That is, the choice of a new paradigm is based on observations, even though those observations are made against the background of the old paradigm. A new paradigm is chosen because it does a better job of solving scientific problems than the old one.

Mental and Fundamental

Physicalists argue that mind emerges from synchronous activity of cerebral-cortical-pyramidal cells that give rise to consciousness, emotion and memory. The processing cascade includes cognition (understanding) and decision-making that initiates behaviors and generation of speech content. Emergent mind produces consciousness, emotion, cognition and decision making. Research suggests mind emerges from synchronous activity of cerebral-cortical- pyramidal cells that give rise to consciousness, emotion and memory.

We can separate hard-wired brain reflexes and programmed behaviors from volitional actions. Qualities of mind include 1) consciousness / memory 2) emotion generation / associated memories, 3) cognition / understanding, and 4) decision-making. Together, they form our personalities and define our intellects.

It can be argued that physicalism, which fails to account for nonlocality, entails panpsychism. Is physical reality being constantly computed or is time an illusion? We don't know what kind of consciousness "goes all the way down." We have to participate in a "participative cosmos" even to research it fully.

Although the omnipresence of the mental is a hallmark feature of panpsychism, some versions of the doctrine make mind a relatively rare and exceptional feature of the universe. The

recalcitrance of the mind and consciousness to fit smoothly into the scientific picture suggests we at least consider panpsychism among other possibilities. Arguments for it are made in terms of metaphor, analogy, genetics, and intrinsic nature.

Psyche in Nature

From the beginning, psychology was concerned with the questions and problems of consciousness. Carl Jung, known for his idea of collective unconscious, wrote that "psyche and matter are contained in one and the same world, and moreover are in continuous contact with one another", and it is probable that "psyche and matter are two different aspects of one and the same thing". Is that the same as "universal consciousness"? Is it panpsychism of the neutral monism type?

Such science-philosophers tend to be pandisciplinarian. Jung, a vocal protagonist of universal interconnectedness through his concepts of the collective unconscious and archetypes, predicted this synthesis. In *Aion* (1951), he prophetically states that "sooner or later nuclear physics and the psychology of the unconscious will draw closer together as both of them, independently of one another and from opposite directions, push forward into transcendental territory, the one with the concept of the atom, the other with that of the archetype" (9: Part II: 412).

As an ultimate mental structure, the Self resists ordinary articulation so completely that, according to Jung, it is the primary object of mysticism. An experience of the Self also constitutes one of Reality. The two reflect each other, providing para-psychological knowledge of and influence over Reality. Jung considers the Self as repository of all archetypes -- a meta-archetype.

Archetypal psychologist James Hillman suggested a "return of psychological subjectivity to the outer, non-human world, including the world of nature." All psyche, all living soul-qualities, must be withdrawn from nature in order for the modern self, psychology's self, Jung's self, our selves, to subsist. A relationship that was once a sacred one, an animistic interaction through which soul was "in" the natural world as well as "in" the subjective self, could not continue. Animistic projections on nature were withdrawn and the world lost soul - *Anima Mundi*.

The post-Jungians encourage an ensouled approach in which we imaginally reside in her, rather than she in us. Psyche is manifesting itself once more in the outer world. There is no psyche in nature without projection and animation. The process for re-enchanting the world is through a return of sacredness and the recognition of the survival value of animism as a way of nurturing the human soul and protecting the soul of the world. Hillman removed the Jungian concept of the archetype as objective inherited pattern and replaced this with the archetypal image as existent within the natural world.

Hillman (1982) says "that cataclysm, that pathologized image of the world destroyed, is awakening again a recognition of the soul in the world. The anima mundi stirs our hearts to respond: we are at last, in extremis, concerned about the world; love for it arising, material things again lovable. For where there is pathology there is psyche, and where psyche, eros. The things

of the world again become precious, desirable, even pitiable, in their millennial suffering from Western humanity's hubristic insult to material things. He emphasizes, for one thing, that "the more we confine interiority to within the individual, the more we lose the sense of soul as a psychic reality . . . within all things."

Such approaches come down to choosing what quality of consciousness you experience. Which existential experience you perceive depends on the filters of your options (environment), beliefs and values. Belief systems are like reality wormholes into the past. Part of us can live in the 14th, 17th, or 19th century, depending on eclectic spiritual ideas we have embraced or gotten stuck in. The same individual, such as a religious scientist, can embrace conflicting beliefs from different centuries. Compartmentalization is the only way to deny this cognitive dissonance.

Each researcher takes a different approach to the concept of universal consciousness, rather like the different types of pantheism. Some are world-denying, others are world-affirming, suggesting that a shared consciousness forms and changes our phenomenal world. Defenses of panpsychism have redefined the supposed 'hard problem' of how to reconcile the 'qualia' of experience with the physicality of the brain, placing the real debate on which is the underlying causative factor. The gulf between neural tissue and phenomenology remains (Gumble).

Panpsychism and emergentism are alternative ways to bridge extreme reductionism and crude holism. Panpsychism has developed in nearly every camp. Panpsychism differs from emergentism. In panpsychism even the smallest physical particles have mental characteristics. Emergentism claims that some systems formed by mindless particles do possess mental attributes. The human brain is a case in point.

Nagel explicitly links panpsychism to a necessary failure of emergentism, which cannot rise to the status of a metaphysical relation. Nagel says: "there are no truly emergent properties of complex systems. All properties of complex systems that are not relations between it and something else derive from the properties of its constituents and their effects on each other when so combined."

Thus an emergent epistemological doctrine is about the limits of our understanding of the behavior of complex systems. Nagel's denies of reductionism identifying mental properties with complex physical properties. Mind is associated with matter in general and in its most fundamental forms, which brings us back to the holographic theories.

The Holographic paradigm brings new meaning to the term whole, one hinted at by the world's religions, the schools of mysticism, various philosophies and a broad range of sciences. From this holistic perspective, the universe is a living, conscious entity, and every aspect of it is inseparable. This concept can be observed in miniature on earth.

The Light of Nature

Multidisciplinary studies herald the return of the natural philosopher. Jungian psychology is an exemplar, with its alchemical metaphors and dynamics provides comprehensive models for

uniting psyche and physics, psyche and matter, and demonstrating the indissoluble weld that binds them. It radically revises the mind/body split, healing that which should never have been torn asunder.

In our inquiries when we go beyond a certain depth in psychology or physics, we enter the realm of the ultimate mysteries of life. The mystic veil of the starry firmament parts revealing the underlying matrix of creation, the luminous ground of the virtual vacuum -- the void created by the zero point radiative fluctuation of matter and antimatter, the void that gives birth to all images and form.

With limited knowledge of mind and matter, science and humanity keep searching for ultimate truth. Ultimate truth is not matter nor is it material -- it is closer to the quintessence, formerly called Spirit.

Archetypes help us understand our complex dynamics. Quantum mechanics reveals stunning secrets of nature, but it is a science of frozen frames, snapshots of measurement. Process-oriented science reveals their common essence as the living light of the virtual vacuum, described by natural philosophers throughout the ages.

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