

INVITED ESSAY

A DYADIC MODEL OF CONSCIOUSNESS

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The proposed model of consciousness, called a dyadic model, is based on reexamination of traditional thought structures in the light of modern experimental evidence from a number of scientific fields. It is an evolutionary cosmological model using energy and information as fundamental concepts. It proposes that the antecedent attributes of anthropic consciousness find their roots in the field of the zero point quantum potential which gave rise to the Big bang. In this model consciousness has both a fundamental aspect and an evolutionary aspect in the same sense that quantized energy manifests fundamentally as wave / particles and is observed in more complex form as molecular matter.; so also must anthropic consciousness have evolved from more fundamental antecedent characteristics. The dyadic model proposes a scenario for this evolution that corresponds to the appearance of the universe we seem to inhabit.

KEYWORDS: consciousness, zero-point field, existence, intentionality

INTRODUCTION

The name “dyadic” derives from observing that an impressive number of dualisms in descriptions of reality are in fact complementary, inseparable attributes of nature, such as wave/particle, mind/body, yin/yang, etc. It is observed that evolved organisms learn and appear to have volition. The model extends the notion of dualisms by recognizing that “existence and “knowing” are dyadic labels we can use too describe two fundamental facets of reality experienced by evolved anthropic beings.

Energy and information are basic attributes in nature. Information is defined as mere *patterns* of energy. Therefore energy and information may be viewed as dyadically coupled from the origin of the universe. The organization of energy is the basis of all existence; and information is the basis of all knowing. Our universe is an evolving universe which has self organized both matter and information, and displays both existence and knowing. “Knowing” is used in a general sense of apprehending and utilizing information.

One effect of the historical split of natural philosophy into science and theology in the seventeenth century has been that science has not concerned itself with the inner experience, nor has theology been strongly motivated to incorporate scientific discovery. But when we speak of “consciousness”, “mind”, or “knowing” we are, of necessity, addressing something that is only experienced subjectively. Indeed, studying consciousness forces us to recognize that all experience is fundamentally subjective. Thus, any model of consciousness that is rigorous and complete must be compatible with

both the way that we experience consciousness subjectively and consistent as well with what we know about the physical world through the protocols of science. The dyadic model addresses both the subjective and objective aspects of the way consciousness is experienced. It addresses both the material and the ephemeral.

The dyadic model assumes that all human experience, including the mystical experience, has a valid informational basis, that is information (patterns of energy) is the root of all perception. It accepts the sciences from quantum science through paleontology have produced valid bodies of information. But the reinterpretation of the data, that is to say new meaning, may be necessary in view of a comprehensive theory of consciousness, because science has here-to-for excluded consciousness from its epistemology. All subjective experience, including the data from scientific inquiry and insights from the mystical experience, are perceptions that must be interpreted and given meaning. Scientific data is given meaning in Mystical interpretations of the inner experience have been communicated in terms of allegory and metaphor that require re-examination in terms of modern knowledge about information and learning.

Applying the model to problems in cosmology results in a self-organizing, learning, volitional universe that looks like the three dimensional universe we seem to inhabit. Applying the model to problems in science suggests that many paradoxes in science result from not rigorously observing the subtle interactions between “existence” and “knowing”, that is to say confusing the map with the territory. Applying the model to subjective experience suggests that all interpretations, the “meaning”, of experience change as additional information is added. In the dyadic model both science and religious experience are just two different ways of “knowing” that employ different functions of the brain and are dyadically coupled.

Traditional philosophic models of existence may be categorized as materialist, idealist or dualist, meaning that existence originates in physical matter; existence originates in consciousness; or existence is both. The dyadic model has elements of the traditional models but is unique in its viewpoint of how matter and consciousness are related. In the dyadic model existence and knowing are linked at all scale sizes and all along the evolutionary path. Virtually all theologies concern themselves with some variation of the idealist model, as does the many Worlds interpretation of quantum mechanics. Following the widespread acceptance of Cartesian dualism in the seventeenth century, science began its rise eventually adopting a materialist viewpoint by the middle of the nineteenth century. The classical Newtonian thought structure assumed the Cartesian view that physicality could be studied independent of mind and that all matter consists of discrete, separate particles obeying the classical laws of physics. Of course general relativity and quantum theory challenged that viewpoint. The relationship between physical measurements in different reference frames emerged from special relativity, and in quantum theory the act of making a measurement was seen to affect the outcome of the experiment. Both theories call into question the Newtonian notion of absolutes and the separateness of things. Quantum theory suggests that mind, or knowing, must now be considered when making observations at this level of existence. Thus quantum theory

raises questions about determinism in its strictest sense and raises challenges to the materialist assumption of epiphenomenalism.

It has been subsequently discovered that at most elemental levels dynamic exchanges of quantized energy between matter and the zero point field continuously take place somewhat analogous to a liquid exchanging molecules with a vapor above its surface. The zero point field is considered to be the field of quantum fluctuations at the zero-level of manifest energy. It underlies all matter and all empty space throughout the universe. It is the most likely candidate for the source of the Big Bang. Further, experiment has demonstrated (Aspect, 1982) that particles have non-local properties insofar as their previous interactions involved an identical quantum state.

When we consider the way the human organism receives information, science has limited itself to considering information from the five normal senses, all of which find their basis in electromagnetic theory. However the human body not only receives but *perceives* information from external sources and also has an elaborate internal “feeling sense” which manages information internally. “Feeling” is by definition a subjective experience. This internal feeling sense and the associated information management system is a key element in the dyadic model.

The feeling sense monitors the internal well being of the system, provides access to intuition, provides response to sublimated memories, provides stimuli for the emotions and *provides a response to non-local information*. All of the functions, however, may be described simply in terms of information management. Although non-local effects have been observed and studied for over a century by parapsychologists, in the absence of a compelling theory the results have been ignored or disparaged and certainly misrepresented by mainstream science. Non-locality in quantum physics now provides a physical basis for these effects. A large number of investigators for several decades have demonstrated that brain waves can be synchronized and information transferred between individuals across Faraday cage barriers. The results do not obey the inverse square rule of electromagnetic propagation, nor are they time dependant, suggesting the phenomenon is a macro-scale version of quantum non-locality, but with more degrees of freedom than simple particles undergoing a double split experiment.

Split brain theory, mapping the functional capabilities of the brain, plus anthropological studies suggest that the linguistic and reasoning capabilities, resident in the left hemisphere and frontal lobe, are later capabilities to have evolved. The functions of the right hemisphere and the limbic region are pre-linguistic and are responsible for pattern recognition, intuition, emotional response and more holistic functions. The dyadic theory suggests that the molecules of the body and brain are also in dynamic exchange of energy with the zero point field (as is all matter) and also resonate non-locally with each other and the remainder of the universe. The brain/body inner “feeling” sense provides perception of this information. Likely the zero point field is the mechanism for this resonance. The non-local resonance of energy and matter throughout the universe is suggested as nature’s most fundamental information management scheme. Dyadic theory predicts that patterns of resonance become more complex as the complexity of the

molecular structure increases; that the modes of resonance parallel the degrees of freedom of molecular structure. Perception possesses additional degrees of freedom in more complex matter. Observed first at the level of subatomic particles, but by extension to all matter, non-locality provides an information basis for all subjective experience. In retrospect it seems exceedingly strange that if both energy and information have been present from the beginnings of the universe, and that matter seems to have self organized from energy, that information would not also be utilized in the organizational process. But information is the basis of “knowing” and “knowing” implies the attribute that *Homo sapiens* experience as “consciousness” or “mind”. Thus mind in some elemental sense is ubiquitously present in the universe.

I argue that the most fundamental aspects of consciousness with which we are concerned are actually “perception” (or awareness) and “intentionality” (or volition). Thus it is these fundamental attributes that are likely the primordial antecedent to the evolved consciousness that *Homo sapiens* experiences. The “mentality” that we experience is the evolving component of consciousness that requires a more complex brain and nervous system.

Likely all matter in nature, but certainly all living matter *perceives* information within some nuance of the word “perceive”. In other words, fundamentally nature has provided a subjective experience. But in the same sense that we cannot directly observe wave/particles in action at the subatomic level and must devise intricate experiments to detect behaviors at that level of existence; neither can we observe subjective experience except our own personal subjectivity. Therefore we must use other means to deduce its existences in entities other than humans. In the dyadic model perception and intentionality are dyadically coupled, that is to say they occur together. If one can discover the intentional behaviors in nature, then awareness will be present also. The rationale behind this coupling is: a) we experience both perception and intentionality at our level of organization, b) complexity theory points out the repeating patterns in nature at different scale sizes and at different levels of molecular complexity, c) awareness without an ability to respond, and intentionality without feedback of the results, would both be useless attributes, d) awareness and intentionality create a learning feedback loop which we do observe in nature. Thus it is both reasonably and experimentally verifiable that perception and intentionality are coupled. One can observe with present day instrumentation behaviors in simple forms of nature that are neither random nor deterministic. Such behaviors are of necessity intentional, such as the search for food, mating opportunities, predator avoidance, etc. These behaviors are indicative of a volitional presence, and thereby are internal subjective experience.

It is necessary to be very specific about the meaning of “awareness” as proposed by the dyadic model. *Homo sapiens* experiences self-reflective awareness, meaning the ability to reflect upon the information content of our thoughts. The primates are perhaps on the edge of experiencing self reflection but certainly have a full measure of self-awareness. By self awareness I mean the ability to distinguish self from other, to experience an I/thou dualism. It is likely that self-awareness can be found in many, if not most, animals having multiple sensors and a brain. Below self-awareness is undifferentiated awareness

which means the ability to perceive information and to react to that information but without a self concept. If the development of an individual traces the evolution of a species, then we may say that any fetus certainly has undifferentiated awareness. Self-awareness does not develop in the human child until several months after birth. How far down the evolutionary chain one can detect undifferentiated awareness is a valid area for research. The dyadic model suggests that undifferentiated awareness, or simple perception, is a more fundamental attribute of matter than life itself, and the crucial point is the distinction between reception and perception of information. If non random, non deterministic behavior can be observed within the degrees of freedom permitted matter by the conservation rules, perception can be inferred at that level of organization.

Norbert Wiener of M.I.T. provided a numerical definition of information as the negative of entropy, circa 1942. James Shannon of Bell laboratories provided the seminal paper developing information theory six years later. A tacit assumption of information theory is that the meaning of information is carried in the signal. It can be easily shown that this assumption can pertain on to “intended” information, but is in general false. The meaning of information is assigned by the percipient. Even if the originator of information intended a meaning for the signal, there is no assurance that that any percipient will recognize the intended meaning. Information is just a pattern of energy that requires perception to utilize and an information base (experience) from which to assign meaning. “Meaning” is internally created information which connects the perceived information to the information base residing in memory. To assign meaning is a fundamental function of “mentality”, the evolutionary component of consciousness. At very simple levels of living matter, behaviors such as the search for food, mating opportunities, predator avoidance, etc. require that information from the environment be perceived and given meaning. And since information does not carry within the signal, but is just a pattern of energy to be interpreted, assigning a meaning is an evolved, learned behavior. Learning is precisely the activity of giving meaning to information and retaining the meaning for future use. Non-local resonance allows experience to be shared.

If nature’s primordial information management process is non-locality, it would seem that evolution rather quickly availed itself of other information produced by the environment as the environment became more complex. Acoustic, tactile, olfactory, visual and taste senses undoubtedly evolved rather early in the planetary environment once mobile organisms existed. Multi-sensory information requires an information management process within the organism. The dyadic theory suggests that information in the environment caused “mentality” to begin its own organizing process. Thus the antecedents to human consciousness find their roots in the primitive processing of environmental information, but the most primitive of the processes is centered around non-locality.

Prior to the evolution of Homo sapiens, which means prior to brains developing self-reflective awareness, before linguistic capabilities, before reasoning and other high level mental functions, animals were solving problems, creating tools and otherwise being quite intelligent. This activity should be characterized as subconscious or unconscious activity (as compared to anthropic type self-reflective conscious awareness). Wolf packs

likely discovered by accident that splitting forces and encircling prey was an effective hunting strategy. But the successful experience connected with other information in the brain, and “meaning” was established and remembered. It is likely the same for beavers learning to construct dams of stick and mud, and bees learning to communicate through the waggle dance. Nature's creatures likely learned through trial and error, thus nature itself must be said to learn through trial and error. We say that animals obey “instinct”, but how did they acquire the instinct – most likely by learning it through trial and error in the process of evolutionary development. Non local resonance undoubtedly played a significant role in communication of “instinctual” behaviors. Non-local resonance as used in the dyadic model is similar to the morphic resonance as proposed by Sheldrake.

Perhaps the most compelling reason to interpret natural learning processes in this manner is the fractal evidence from chaos theory; nature repeats patterns at different scale sizes. Recursive evaluation of simpler nonlinear equations has been discovered to simulate exotic forms in nature, at different scale sizes. This suggests, not that nature knows mathematics, but that nature uses multiple feedback loops of energy and molecules to produce form. Together these phenomena are highly suggestive of learning behaviors and non-local resonance.

The dyadic model suggests that the anthropic consciousness experienced by humans must be viewed in an evolutionary sense as having emerged from antecedent conditions that can be traced back to origins before the Big Bang in the sea of zero point energy. The elemental components of perception and intentionality seem to be irreducible attributes, and must be considered “hidden” or at least unobserved attributes of elemental matter. If intentionality exists at all, it must be fundamental. Intentionality cannot arise from a deterministic nature. Physicists have only looked for and verified nonlocality for basic correlations of polarization, momentum, etc. – the most basic wave/particle measures. But given that evidence, reason suggests that a most fundamental behavior of matter resides in the property of nonlocality and that nonlocality operates at all levels of complex matter. We do no more injustice to reason to say that particles “instinctively” maintain correlation than to say that photons “know” that they are undergoing a double split experiment. It is language and *our knowing* that is incomplete, not the properties of matter.

In the dyadic model, wave/particle are coupled, perception/intentionality are coupled, existence/knowing, internal/external, subject/object, life/death, success/failure, and so fourth. They are coupled because in our universe, at least, they always seem to be found together when we attempt to describe process. The subjective experience of an entity undergoing process may encounter but one aspect of a dyadic pair at a time, however. For example, in a learning, trial and error universe, the limits to the outcome of any process may be labeled as success or failure, but an aware entity will only experience one or the other. Both cannot be experienced together simultaneously. However from a broader perspective both aspects exist and they are connected as one implies the other.

The question immediately arises, by what means does nature indicate successful and unsuccessful behaviors, below the level of self reflective awareness. The subjective

“feeling sense” and emotional responses certainly provide a clue. Animals clearly display fight and flight behaviors. Isn’t this of necessity stimulated by an internal sensation like anger or fear? And the hunger response or the mating instinct; aren’t these motivated by internal sensations and rewarded in the same way – by pain/pleasure. I believe the evidence is quite clear but long neglected or denied. The internal, subjective experiences of animals are likely little different from our own – except for the wonderfully evolutionary addition of language and self reflective awareness. Most certainly, higher organisms possess self aware consciousness even if not processing a high level of mentality by anthropic standards. By considering self reflection, reasoning and intellect an evolved “add on” to nature’s information management process, we gain additional clues to the evolution of mentality by observing mental processes other than intellect and reasoning, specifically by observing the intuitive and pattern recognition functions of the right brain and the emotional processes.

The point being argued here is that the internal feeling sense and the intuitive function is a basic mechanism in nature’s scheme of information management, that is to say – “knowing”. It evolved long before the left hemispheres and frontal lobes that seem to be responsible of language, reasoning and other high level mental functions upon which humankind has placed emphasis in the historic period. Thus examination of the more primitive brain functions in the human organism is most likely to yield clues as to the historic role of consciousness and mentality in the evolving pre-anthropoc world.

The most consistent accounts of the pre-reasoning brain functions come from the mystical traditions. Only the Aristotelian line of thought emphasizes information from the five “physical” senses, and the external experience. From Lao Tse, Guatama Buddha, Zoroaster, Plato and the Gnostic Greeks, the traditions emphasize the “internal experience”. Critical self reflective analysis dates in the historical record only to the sixth century B.C.E., with Plato and Aristotle standing at the junction, two hundred years later, where the Gnostics and the rationalists go their separate ways. The dyadic model suggests that subjective/objective, internal/external must be considered complementary ways of knowing, in that both are required to properly describe reality. The objective, epitomized by the scientific method features precision, detail and logic but linear thinking with the intellect. The subjective emphasizes the right brain functions of pattern recognition, intuitive and nonlocal responses; and is expressed with metaphor, analogy, art, etc. The impact is emotional. Both are required to map the terrain of consciousness. It is not surprising that pictorial images emerged before linear, symbolic grammatical language.

Several factors emerge immediately from considering the mystical experience from the dyadic point of view. The first is that mystical insights are just information that requires interpretation, not absolute and literal realities, that can stand alone. The flaw in cultural interpretation of mystical interpretation is precisely that of interpreting metaphors literally. However, a valid information function is taking place nevertheless. Consider the experience of the *nirvikalpa samadhi* which is described similarly in different traditions. In this experience the sense of Self merges with the cosmos and reality is experienced as unity of Self with All-That-Is. The experience is accompanied by intense ecstasy, a sense of eternity and a complete loss of fear. The experience is ineffable in the sense that

description is inadequate to convey the experience and the description alone does not assist others in attaining the experience. The cultural interpretations are generally that the experience represents union with the godhead, or the ground of being. It is the experience of the “peace that passes all understanding”.

The dyadic model interpretation is that the body/brain is experiencing its “ground state” or resonance with the zero point field. The awareness is the undifferentiated awareness of the primordial field, as the sense of Self is merged totally into the field. The question immediately arises as to why an intense ecstasy plus a sense of security and eternity accompany this state. It is only within the larger question of why nature provided feelings at all that this question may be answered. The internal feeling sense accesses the state of wellbeing of the organism. In addition the subconscious brain functions integrate information from external senses and from non local sources to provide a “feeling” of alarm or security as to the state of the environment. The feeling sense also provides reward or punishment for behavior influencing survival: gratification of thirst, hunger, sex drive, and discomfort or pain for dangerous behaviors, etc.

The foregoing information management functions undoubtedly take place in all multisensory organisms. But in self reflective humans who have learned to consciously manage certain internal states, additional feeling states come into play, such as the various Samadhi experiences. Is nature just continuing to act out the same survival oriented teleology by providing ecstasy with the samadhi? Is the ecstasy, security, connectedness and eternity experienced in Samadhi a nature signal that the organism is doing something right, that should be repeated? Probably so. The ecstasy of the Samadhi is more intense (in my own experience and as reported by others) than any other positive human experience. All others are pale in comparison.

The meaning of the experience is traditionally communicated in mystical and religious terms. However, the physiological correlates indicate coherent brain function with EEG strongly in the alpha and theta frequencies, a high state of relaxation, but mental alertness.

Studies in accelerated learning strategies show that relaxed, high alert states produce coherent information assimilation and retention at prodigious rates of information flow.

Because human brain mass virtually unchanged for more than a hundred thousand years, and the evidence from persons with hydrocephalus who survive into adulthood demonstrates that only a portion of that brain mass is needed for normal human activities., the evolutionary path seems quite clear: more coherent, integrated use of both intellect (left brain) and intuitive (right brain) functions is where nature will take us (provided we are willing to go). To bring the light of science into this picture, however requires abandoning the long held dogma against anything subjective.

Before self reflective awareness and emphasis on intellect evolved in *Homo sapiens*, information management in a living organism was centered on much more simple functions. Survival pressure was the teleology and pain/pleasure the feedback mechanism

in the self aware organism. The sensory information available to each species is only a tiny fraction of the information available in a particular frequency band. Visual sensing is but a fraction of the electromagnetic spectrum and different species are sensitive to different frequency ranges. And so it is also for other sensors. When humans began to label experience with language, it was reasonable to believe that the labels attached to external things. The problem of confusing the map with the territory began at that point with language. Our labels for things can only attach to our internal images. Our sensory information maps the region of reality the sensors are capable of perceiving. And our labeling, or language, must be construed as mapping the internal perception, not the external reality. Written language which followed, maps the spoken language. Both oral and written symbols are reintroduced into the sensory organs as new information. A jumble of levels of information now exist in the brain – a tangled hierarchy of information.

It is quite conceivable that self reflective thought and logical reasoning evolved in direct response to the greater complexity of information management required by the written and spoken language. The beginning of the period of critical self reflection only follows the creation of a written language by a few millennia. The introduction of language as symbolism to express reality produced greater levels of complexity in information. It also permitted greater latitude in assigning meaning to information – and multiplied the sources for error in interpretation.

From these early analytical attempts, but without the knowledge available in the modern period, mystical interpretations of information, idealist philosophies and materialist philosophies arose to give meaning to information both external and internal. For the purposes of this paper, and if one accepts the evolutionary evidence available in modern times, reality in our universe may be said to consist of two things: existence and knowing. These two aspects of reality are interacting evolutionary processes. They stem from two fundamental attributes of nature: energy and information. It is why in this model they are called dyadic. By using this model to examine traditional thinking, beliefs and dogma in both science and mystical experience, inconsistencies, paradox and flaws are uncovered. These inconsistencies and paradox invariably result from giving meaning to experience based upon limited information, from considering reality from a narrow perspective, from science denying the value of the subjective experience and religion ignoring the mounting information from science. The primary error always has been to consider the current understanding absolute and to confuse the map with the territory.

Were a strict interpretation and materialist philosophy and determinism valid, there could be no innovation, creativity, volition or evolution possible. Volition and creativity are at the base of an evolutionary universe which has knowing and learning. Were the strict idealist model correct, the universe would change when we change our minds. But nature routinely invalidates our most cherished beliefs, therefore there is existence beyond what we think about. The many Worlds interpretation of quantum mechanics and the Schrödinger's Cat paradox result from confusing the map with the territory and believing the wave equation in fact is reality. The dyadic model suggests that deities, discarnates, other dimensions, etc. are not necessary to explain our universe, but if they exist they

should be knowable and verifiable through physical experiment. Nonlocality and intentionality in the dyadic model do permit most psychic effects to occur except for long term precognition. Precognition of things not yet in existence, nor in process, is not possible because time is only defined in the macro-scale universe which is nonlinear and not predictable. But humans do create the future through their intentions. Psychokinesis is possible by interaction of intentionality with the quantum fluctuations of the zero point field. Indeed it is now possible to write quantum equations to express resonance of information nonlocally between brain/body and the zero point field. Equations to map psychokinetic functions seen the next reasonable step.